

中央研究院歷史語言研究所會議論文集之二

中國境內語言 暨語言學

第三輯 詞法與詞彙

曹逢甫 編輯
王旭

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出版說明

「中國境內語言暨語言學國際研討會」最早是由中央研究院歷史語言研究所語言組發起的。第一、第二屆也分別於民國七十九（1990）、民國八十（1991）年在中央研究院召開。論文的修訂稿，在經過嚴謹的審查修正後於民國八十二（1993）和民國八十三（1994）年結集出版，可以說為台灣的人文社會科學界在會後論文集的出版上立下了典範。

在第二屆會議籌劃期間，史語所語言組同仁深深覺得要讓語言學的研究在國內生根一定得讓更多的同行、同好及同學共同來參與。於是遂有第三屆由清華大學語言學研究所接辦之提議，當時的代所長王旭教授在徵得所內的同仁的同意後，毅然接下了這個重擔，幾經研商之後把主題訂為「詞法與詞彙」。並且由於1992年適逢趙元任先生的百年冥誕，所以我們當時也用第三屆的會議來紀念趙先生在中國語言學方面的特殊貢獻。

籌備之事開展以後，一切工作在所長的用心策劃以及同仁的戮力幫忙下，進行得頗為順利。我們總共收到60多篇摘要，再經評審的仔細篩選最後錄取了27篇論文。另外大會還安排了四位邀請講席，會議於民國八十一（1992）年七月一、二、三日在新竹清華大學召開，與會學者多達一、二百人且分別來自歐、美、澳等洲以及香港、新加坡、日本以及中國大陸等國家或地區。發言踴躍、討論熱烈，是一次學術討論的大豐收。

研討會完畢之後，承辦單位覺得應該延續論文集由中央研究院史語所出版之傳統使成為一系列出版品以增加其流通性，但編輯仍由承辦單位負責。因翌年適逢王旭教授獲得國科會之贊助出國研究，所以集稿、送審之工作便落到我的頭上，這其間因為個人除了研究與教學之外還兼有繁重之行政工作，又缺少專人來從事聯繫工作，所以在審稿又集稿過程中多有延誤，這是個人很感抱歉之處。

現在編選的工作已近尾聲，論文集也付梓在即，個人眼見兩年的辛苦總算有了成果，內心自是萬分高興，同時也想藉這個機會對這項工作有過貢獻的人道聲由衷的「謝謝」。首先當謝謝所有的作者，謝謝他們的合作與耐心，其次要謝謝王旭教授，要不是他勇敢地承擔了這項任務，這個集

子是出不來的。當然，大會的成功贊助者的功勞是很大的，因此，個人也擬在此對教育部、國科會以及徐元智文教基金會致上誠摯的謝意。最後要感謝我的助理特別是鄭縈小姐以及史語所語言組鄭秋豫主任和她的助理們，沒有她們的幫忙，這本集子恐怕還得等很久才能見天日。

曹逢甫

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于清大人社院

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詞匯與詞法現象—— 台灣話的代名詞

鄭 良 偉

美國夏威夷大學

摘 要

本文討論台語代名詞的詞匯與詞法現象：我們將把不符合一般句法、語音、語意規律的語詞分成兩種：需要個別記憶在詞匯裡的語詞以及用特列結構形成記存在長程記憶，在短程記憶臨場配詞的語詞。

下面是本文討論過的，牽涉到代名詞的主要特列結構與詞匯結構分析。符合一般規律的詞組單位放在左面。雖然放在同行，有的有語意或語用功能劃分，不一定是同義語。

從歷史語言學分析者的觀點看，某特別結構的出現可能後於，也可能先於其詞組同義語。前者的情形不外是因為代名詞使用頻率特別高，所以特別容易引起各種語詞的省略和語音的簡化（變調分界的省略，輕聲音節產生聲調對立的中立化、傳調、合音）都不均勻地、非全面地影響各語詞，因而產生不規律的現象。（如「NP的NP」「我的小弟」在特定的環境下有結構標誌「的」的省略，因而產生特列結構【PPron N*】「阮小弟」。特列結構先於同義詞組的情形是因為代名詞的使用頻率特別高，所以雖然有新的句法和語詞（如「家己，互相，量詞」）產生，卻有一部分舊語法語詞仍然例外地繼續使用，不按照新的一般規律，只靠詞匯（如：「相愛」{相 V*}「別人，別物，甚物」D * N*}）或特列結構記憶（如【D * M】「別枝，別本，別個」）這兩種方式處理。

從心理語言學的角度來看，各種語詞的學習先後，應該是人腦處理語言的策略。有些特列結構或詞匯裡的個別語詞的形成與運用先於一些特列結構或詞匯組合結構的形成與運用。先因為某種語意特別常用，又有簡短而方便的語詞結構，因而就以儲存於詞匯或詞法這兩種特別模組來記憶、來收發訊息。因為語言裡已經有語意固定化，又有特別的語音簡化，語詞脫落，語詞搭配僵化的一些詞匯組合形式、詞法特列結構，因而個人能以類比原則形成新語詞。如果從語言使用人的語言發展過程觀點看，這些語詞並沒有經過語詞的脫落或語音的簡化。又如先學好特列結構【sio + V】處理特定的一些語詞（如sio怨妒，然後學會句法結構的“互相 + VP”（如「互相怨妒」），之後也不會放棄已經儲存與長期記憶裡的特列結構【sio + V】

0. 導 言

本文的代名詞指可以代替名詞詞組，單獨擔任其主語或賓語的語法功能的語詞。按照語意分類，代名詞有人稱、指示、疑問、自他、互相、異同、範圍等七類。這些代名詞中只有單數人稱代名詞「我，你，伊」由單一詞素構成，其他都由幾個詞素構成；多半由代名詞和代名詞或其他語詞結合，出現在同一個NP裏（如：「這幾個，全這三本，你這個人」）。這些語詞的結合，產生各種各樣很有趣的詞匯化和詞法化現象。

0.1 詞匯化

在一個齊全的語法裏，凡是在語意、語法、語音規律不能解釋語詞的都放在詞匯或詞法裏。因此，藉著研究某語言的詞匯結構，語言學者常獲得很好的機會去反省並探討該語言的整套語法是否合適、完整。討論某特定語言的詞匯結構與其理論和方法也可讓我們語言學者認真的思考語言學現階段的語法理論是否足夠描述所有的語言現象，是否在發展上有以偏概全，顧此失彼的地方。下面先從詞匯化和詞法化的一些實例來探討詞匯和詞法意義。

廣義的詞匯化，包括詞組性語詞變成新詞條(lexical item)，以及詞條在語用、語意、語音、語法特點上，產生詞條裏的詞項記載(lexical entry，採用湯廷池1988的譯語)上的改變。前者如「所愛的人」變為新詞條「愛人」，意義有所改變而近似「情人」。後者如詞條「愛人」的意義在中國大陸多了一個用法---表「配偶」。例如：「我的丈夫」「我的太太」都以「我的愛人」來指稱。詞匯條目，除了一般的所謂詞，也可以含有詞頭、詞尾、中插等構成成分，也可能是由兩個或兩個以上的詞所組成的成語、慣用語、俗語等無法用一般語音、語意、句法規律來解釋的語詞。本文所指的詞匯採取狹義的用法，不包括詞以上的語詞單位，也不包括以結構形式列在長程記憶裏的特列結構。

0.2 詞法化和特列結構

按照傳統的用法，詞法(morphology)是詞的結構規律。但是詞在漢語裏無法下定義（湯廷池1988:1-28），它和詞組的界限在人類的自然語言裏並不像英語的書面語那樣約定俗成。

a)特列結構的兩種成因：

1. 常用語詞經過特別的簡化（語詞省略或語音簡化）：筆者(1991a, 1991b)曾討論台灣話的一些語詞、語音的簡化，結果詞組性語詞(phrasal expression)變成半詞組性且半詞匯性的單位（本文稱為「特列結構」。下同）產生句法單位和詞法單位之間的同義語或者類義語（如：「四萬#七千」簡化成「四萬七」，「一斤#過半斤」簡化為「斤半」，「有六尺#hiah長」變為「六尺長」，「你／恁(#)的老師」轉變為「恁老師」，「親像麻仔#hiah大」簡化成「麻仔大」）。特列結構與詞組性對等語的不同包括三項目：成分結合僵化，語意特定化，語音凝結化（如：變調分界脫落形成一個單一聲調變化組）。特列結構化的過程很類似詞匯化(lexicalization)（如「愛人」之不同於「所愛的人」），但是特列結構含有規律性的語法範疇（如：【d M A*】裏的d（基本數詞），M（量詞），所形成的個別語詞（如：六寸長，六尺長，三尺闊）並不需要列在詞庫裏。“A*”指一部分A（形容詞），有別於指全部形容詞的“A”。

2. 舊句法裏的常用語詞轉變為詞匯單位，或詞法特列結構：句法結構詞法化成為特列結構還有另外一種來源：句法有了新語法、新結構之後，舊語詞、舊結構轉變成詞法裏的一部分。在台語裏表互相的有新起的「互相」，能跟較複雜的VP或S結合。「互相行一個禮。互相指出互相的缺點。互相容忍對方的過失。互相講話講甲誠歡喜」。單音節舊詞「sio」在Adv+VP這個大而靈活的結構裏已經被淘汰，但是還是詞法裏的副詞，出現為【sio+V】這個特列結構裏，（它不能算是詞匯結構裏造語力有限的詞頭），跟新起的副詞「互相」還算是語意、語法類同的共存同義語。（如：「～尊敬，～怨妒，～推辭」各動詞之前，兩者都可以出現）。

b)特列結構的定義

特列結構本文不給一個明確的語法定義，只給一個心理語言學上的定義---以結構的形式存在長程記憶，不必靠短程記憶臨時衍生（包括變換）。至於詞組性語詞與特列結構間的語法與語意關係，很可能有一種高層的抽象結構，處理兩者之間語意相同和結合上互相排斥等語言事實。有如王旭(1991)對台語的連調變化的處理法；母語使用人先學好變調形式，以後學好變調規律，就將變調規律存在於高層結構裏，表層結構的變調發音仍然繼續存用。

c)特列結構的心理特點

特列結構還有如下特點：1)使用頻率高，由學習母語的階段來看，屬於早期語詞。2)因為有減少記憶的需要，舊同義語容易被淘汰（如有了「斤半」之後「一斤半」就被淘汰），不像詞組性的同義語容易共存。3)和別的語言接觸時比詞匯或句法不容易向外移借（鄭良偉1989b, Thomason & Kaufman 1989）。4)特列結構的另一特點是：過去的語音變化規律導致詞匯化、詞法化，結果今日的詞法單位有的無法追溯原型，說話人只能指出語意類同，無法說出其間的語法關係。我們認為這些特列結構與詞組結構之間的不同，都與特列結構的心理真實性有密切關係：例如因使用頻率高，所以先整理在長程記憶裏，也需要繼續存用…。

d)特列結構與詞組詞匯單位之間

特列結構是一種介於詞組與詞匯之間的特別詞法單位，相當於趙元任的「過度詞transient word」，可以看成語法系統裏的一個「模組」（湯廷池1988，黃正德1988）。特列結構一般沒有內部變調分界。（例外的情形就特別記憶在個別的結構裏），下面句b裏的「麻仔大」是一個特列結構，有別於句a或c裏的詞組「麻仔#大」「親像麻仔#hiah大」。Matthew Chen (1987)有系統地討論閩南語句法和語音的互動關係，認為a和b的分別在於non-adjunct和adjunct的不同。在沒有肯定詞法的特列結構有特別地位的語法裏，這可能是最合適的分析法。只是c裏的「親像麻仔#hiah大」是副詞修飾副詞的結構，應該也是adjunct結構之一種（鄭良偉1991）。現在運用特列結構不但可以說明a和b的不同，也可以解釋b和c的分別，我們認為沒有內部變調分界正反映說話人高速度地處理特列結構的心理真實性特點之一。

特列結構的語言特殊性很高。例如日語的對譯語雖然能清楚分辨台語的對立，卻算為詞組單位(jbb)。

- a 麻仔#大# 的燒餅
- aa 【ㄌ ㄒ # ㄒ】 詞組單位
- b 麻仔大# 的燒餅
- bb 【ㄌ ㄒ ㄒ】 特列結構
- c 親像麻仔# hiah大# 的燒餅
- cc 【ㄘ ㄌ ㄌ # ㄌ ㄒ ㄒ】 詞組單位
- ja goma ga ooki-i kasi
- jaa NP KS A 詞組單位
- jb goma no ooki-sa no kasi
- jbb NP KS N 詞組單位
- jc goma no yoo ni ooki-i kasi
- jcc NP KS N KM A 詞組單位

e)特列結構的語意特點

特列結構通常經過虛詞的省略，因此不能由內部成員得到它語型上的語意。例如下面各例『心愛』的含意並不來自語詞內的詞匯，而來自特列結構。也就是在特列結構這個模組裏存著表所有格情感領有的特列結構【PPron-Name】具有如下的意義：【參與說話的情感所有人 - 被領有的特定心中人】。

- | | |
|-----------|--------------------|
| d 咱 - 阿英啊 | 恁 - 張先生 |
| 【咱們的阿英】 | 【你們的張先生】 |
| 【咱們心中的阿英】 | 【你心中的張先生】 |
| e 阮 - 阿英啊 | 恁 - 張先生（所有格--情感領有） |
| 【我的阿英】 | 【你的張先生】 |
| 【*我阿英】 | 【*你張先生】（只能做為同位格） |

0.3 本文目的與編排

本文目的有二：描述台灣話裏代名詞的語音、語意、語法與語用現象，二)根據有關語言事實，探討語言整體中的語意、語用、句法、語音各種規律和詞匯、詞法（本文指特列結構）之間的異同和互動關係。

有關代名詞的語法語意，可分兩部分，第一部分討論台語代名詞的語意、語用和詞匯裏的詞項記載的關係，因為篇幅所限，將以另文發表〈台語與華語代名詞的語意與語用〉。第二部分討論台語代名詞的詞匯化和詞法化現象。

因為代名詞的使用頻率特別高，所以特別容易產生各種語詞的省略和語音的簡化（變調分界的省略，輕聲音節產生聲調對立的中立化，傳調，合音），然而這些簡化多不均勻地，非全面地影響各語詞，因而產生不規律的現象。第四節討論各種代名詞結合時的詞匯化、詞法化現象。如：NP的NP「我的小弟」在特定的環境下有結構標誌「的」的省略，因而產生特列結構【PPron N*】【阮小弟】。第5節討論合音的詞匯化現象。

又因為代名詞的使用頻率特別高，所以雖然有新的句法和語詞（如「互相，家己」）產生，卻有一部分舊語法語詞仍然不被淘汰，而繼續使用，不按照新的一般規律和語詞，只是退為詞匯或詞法的一部分。第6節討論句法的新語詞「家己」的產生和詞法裏的「自、己」如「自滅，克己」的關係。第7節討論句法的「互相」和詞法的「相[sio]」的關係。

本文在討論語音、語意、語法、語用時並不採用某一學派的理論。也不準備對某理論做任何評估。關於互動理論有王士元(1969)，謝信一(1991)，何萬順(1990)，張郁慧(1991)，M Chen(1987)等人各種不同的角度做過很有創見性的觀察。

0.4 本文的體例

為了討論的方便，本文狹義的詞法化專指語詞變化為特列結構的現象，詞匯化即專指詞組、詞法單位變成詞（包括複合，單音詞）的現象。本文的特列結構以【__】標示；個別的語詞，包括詞匯單位的複合詞，以「__」標示；詞匯單位的內部成分結構分析就以{__}標示。N*表示只限

於N的成員的某一部分，也就是有詞匯擴散現象的詞類範疇。特列結構一般的內容是至少有一個沒有限制的範疇和一個詞匯或有限制的範疇。詞匯單位全靠記憶，如果分析，沒有一個結構成分是有規律地涉及到全詞類。個別的語詞台語以「__」，華語以【__】標示。

詞組（句法結構）	特列結構（詞法結構）	詞匯（單語）
d NU d NU 四萬# 七千	【d NU d NU*】	四萬七 {A* N*} 愛人
QNT Cj QNT 一斤# 閣半斤	【M 半】	斤半 {D* N*} 別人
K NP H A 有六尺# hiah長	【d M A*】	六尺長 {N* V*} 地動
NP SM N 伊# 的老師	【PPro N*】	個老師 {N*#A*} 心悶【想念】
	【A* M】	大本 {A* M*} 大籬【胖】

在台語裏詞匯與特列結構內部以沒有變調音組分界為原則。有例外時特別以“#”標誌。又各成分之間以“+”或空格“ ”連結。

1. 代名詞的結合和特列結構

各種語意的代名詞有些可以單獨出現為NP（如：伊、遮）。有些必須跟其他的代名詞結合才能出現（如：彼本、一本、仝人）。因為代名詞使用的頻率特別高，容易產生語詞省略規律，如：「一」的省略或語音簡化（變調分界的省略，輕聲，傳調，合音）。另一方面為了要維持句法上、語音上的辨義功能，（諸如「的」省略後修飾結構的語法關係，靠變調分界來標誌句法單位分界，又如：「一」省略後，單數的標誌更需要不斷在規律上、結構上尋求合理化）。簡化與辨義，這兩種力量的互動結果，便是本節所要討論的代名詞在NP裏句法與詞匯、詞法之間的相互關係。前者有規律性很高的句法上的詞組組合結構；後者有處理例外情形或規律性較低的詞匯、詞法結構。

有一項很重要的語音規律隨時跟任何種類的NP有關係：NP不管有多長，除非中間有「的」隔開，始終構成一個變調組，中間不能有變調分界。特列結構也是如此（有極少數的特例就在詞匯裏特別記憶（鄭良偉

1991)。這種句法與語音之間的互動關係是台語的最大特色。

根據上述有關三類單位的瞭解，本節先討論名詞詞組的基本邏輯結構(1.1) (D+d+M+N 如：「這三條索仔」) 之後討論如下的單位以及其間的差異：

詞組	特列結構	詞匯	詞組	特列結構	詞匯
D+一+M	【D*+M】		這一枝	這枝	1.2
	【D*+M】	{Pron}	這個	這	1.3
aD*+N*}	【D*+M】N		別人	別個人	1.4
S+的+NP	【S#D*+QNT】		我愛看#的這本	我愛看#這本	1.5
NP+的+NP	【PPron+N*】		個的老師	個老師	1.6
	【PN#個】		老師及一陣人	老師個	1.6
	【NP#NP*】		阮做查某人的	阮#查某人	1.7

台語的名詞詞組的基本邏輯結構和普通話沒有很大的差異，都有下面的共同特點。各種代名詞在NP有如下的組合結構：

名詞詞組 = 〈定語〉〈名詞〉 例：這三本，小說，這三本小說
NP = 〈DET〉〈N〉

定語和名詞兩者可以同現，也可以只出現其中之一。台語和華語的一個共同特點是：需要有量詞才能有數目詞或指示詞。反映在如下的定語的結構：（鄭良偉1991）

P1 DET（定語）= (D)QNT 例：這五本，彼本，…
P2 QNT（數量語）= Num + M 例：三本，三百個，…
P3 Num（數目語）= d+NU 例：三百，一千，五，…

L1 D（指稱詞）：這，彼，每，逐，任何，全，叨，第…【注：解釋看語例2】

L2 d（基數）：一，二，…，幾

L3 M（量詞）：本，個，枝…

L4 NU（數目單位）：十，百，千…

NP						
<DET>						
(D)		QNT		<N>		
	Num	M		D	Num	N
2a chit	chít	pún	chheh	this	one	book
b hit	chít	pún	chheh	this	one	book
c moé	chít	pún	chheh	every	one	book
d tak	*chít	pún	chheh	each	one	book
e jîm-hô	chít	pún	chheh	any	one	book
f kāng	chít	pún	chheh	the same	one	book
g thâu	chít	pún	chheh	the first	one	book
h soah-boé	chít	pún	chheh	the last	one	book
i bô-kāng	*chít	pún	chheh	a different		book
j lēng-goā	chít	pún	chheh	another		book
k tó	chít	pún	chheh	which	one	book
2a 這	一	本	冊	這	一本書	
b 彼	一	本	冊	那	一本書	
c 每	一	本	冊	每	一本書	
d 逐	*一	本	冊	每	一本書	
e 任何	一	本	冊	任何	一本書	
f 仝	一	本	冊	同	一本書	
g 頭	一	本	冊	頭	一本書	
h 煞尾	一	本	冊	最後	一本書	
i 無仝	*一	本	冊	不同	一本書	
j 另外	一	本	冊	另外	一本書	
k 叨	一	本	冊	哪	一本書	

「逐」本身就有「一個一個」的意思不必加【一】，也不能跟任何數目結合。（如*逐三本）。

	D	d	M	N		
3a	這	幾	本	冊	這	幾本書
b	彼	三	本	冊	那	三本書
c	每	四	本	冊	每	四本書
d	逐	*九	本	冊	每	九本書
e	任何	五	本	冊	任何	五本書
f	全	六	本	冊	同	六本書
g	頭	三	本	冊	頭	三本書
h	煞尾	兩	本	冊	最後	兩本書
i	無全	*九	本	冊	不同	九本書
j	另外	九	本	冊	另外	九本書
k	叨	九	本	冊	哪	九本書

漢語代名詞另一特點是「一」以上有的數目表多數，「一」可省略。

語例2（如：這一本）和語例3（如：這三本）結構相同，分別表單數、多數。語例2（如：這一本）和下面的語例4（如：這本）組合結構不同，但是意義相同，都表單數。從邏輯觀點看可以將語例3(D+一+M)看成為語例4(D+M)的邏輯形式，也就是在深層結構沒有D+M（如：「hit本」需要從D+d+M的「hit一本」變換而得）。這樣可以解釋兩者意義相同，「一」、「本」都不單獨出現而「這本」的「本」有「一本」的意義。如：

3l 我有 *一/*本/一本 小說。

	D	M	N	
4a	這	本	冊	這本書
b	彼	本	冊	那本書
c	每	本	冊	每本書
d	逐	本	冊	每本書
e	?任何	本	冊	任何一本書
f	全	本	冊	同一本書

1.2 單數的標誌法：「一」或零標誌

在另文裏筆者將台語代名詞分為三類：一、單數，二、多數，三、通數（單、多數通用）。（看鄭良偉1993）。本節討論這些代名詞的內部結構和單數的標誌法。單數的標誌法有兩種：一）一般情形以「一」標誌，二）特列結構以零標誌標示。

a)【D* M】：多項代名詞結合成一個NP所遵循的規律是屬於詞法性或是句法性？這是很難判斷的問題。我們認為人有能力發展「一」的省略規律來整理這些結構之間的語意、語法關係。但是有下面一些語言事實使我們不能不承認【D*+M】比「D*—M」先學會。之後，仍繼續存用在長程記憶裏，這也是很合理的看法。【D*+M】是特列結構，但不一定拒絕省略衍生，其理由如下：

1)「一」省略的規律相當複雜。就「一」可否出現有三種情形：一）不能出現(a-c)，二）可以出現也可以不出現(d-i)，三）一定要出現(j-n)。在語法理論上的重要問題是這三種語詞在哪一個模組裏處理。如果不肯定在語法裏有特列結構這個模組，就只能由變換規律由【D*+一+M】取得【D*+M】。如肯定有特列結構這一個模組，我們認為說話人能以【D*+M】和【D*+一+M】特列結構列舉這些不同的指稱詞。並且認為這樣做反而簡單，也較能說明為甚麼有這種差異。另一個可能是將【D*—M】看成最有造語力的D d M的一部分。

D d M

【D* M】D* = 逐，別，這… 【D* — M】D* = 第，最後…

1a 逐本	每本		
b 別枝	別枝		
c 無全個	不同個		
d 這個	這個	這一個	這個
e 彼隻	那隻	彼一隻	那隻
f 每個	每個	每一個	每個
g 全間	同一間	全一間	同一間

h 頭個	頭一個	頭一個	頭一個
i 煞尾個	最後一個	煞尾一個	最後一個
j		最後一個	
k		第一個	第一個
l		任何一本	任何一本
m		另外一本	另外一本書
n		叨一本	哪一本書

2)上面第二種情形的跨屬【D*+M】和【D*+一+M】指稱語D，分別有不同的頻度。「這、彼」時「一」很少出現，只有強調單數時才會說【這一隻】等。至於「每、仝、頭、煞尾」時【D*+M】就不比【D*+一+M】常出現。並且「每一本」的「一」的出現並沒有強調單數的含意。學習語言的過程中，常用的結構先學習成功，並在「這」、「彼」兩個詞條裏記住【D* M】比【D*—M】又有不強調「一」的含意，較為常用。如果因「一」省略規律而導致特列結構從長程記憶裏被刪除，則很難解釋頻度上與含意上的差異。

以上是從描寫語法的觀點支持「這枝、每本」的特列結構論。從歷史語法的觀點看，下面的合音、省略、類比現象值得注意。

漢語自從發展量詞以後，「NUM+M」「數詞+量詞」成為「QNT」「數量語」的規律結構。D+NUM+M成為最有造語力的結構，如：每一本，叨一本。但是在「這本，彼本」裏通常沒有「一」，在「逐本、別本」裏不能有「一」。如不從過去語言合音的發展來看，很難解釋上述現象。「chit, hit」本來是「ch-, h-」與「一」(this one, that one)的合音。(ch- 可能是「是」、「此」或「者」，h- 可能是「許」)。但是今日的語法裏，類比「每三本」等而有「這三本」等。再類比「這三枝」、「彼三擺」，而新產生了「這一枝，彼一擺」的結合。也運用一個相當普遍的「一」的省略規律，將「chit一個，每一本」等省略為「chit本，每本」，可是「另外一本」不能省略為「*另外本」。「逐本、別本」沒有產生「*逐一本、*別一本」，可能是因為另有類同語「每一本，另外一本，其他一本」，也就沒有發展的需要。

這些指稱語將來會更整齊化，更簡單化，這是個很可能實現的臆說。語例1的複雜現象卻是當前台語的語言事實，我們將之歸因於人類運用特列結構模組的心理現象，相信是一個合理的推理。

1.3 輕聲「e°」和傳調的詞法現象

台語的指示代名詞分單、多數已經詞匯化。其詞法結構如下。D*只指「這、彼」。

{D*+e°}：這是表單數的詞法結構最常用的指量語詞「這個[chit e° > chille 卜一](1aC)有輕聲現象和傳調現象，因為台語輕聲詞前音節不變調，這個語詞應該來自現在已經被淘汰的輕聲語詞「e°」語詞(A或B)。而不直接來自沒有輕聲化的「e5」語詞AA或BB。沒有傳調的輕聲形式(B)在台灣一般方言裏已經被淘汰(注1)。只剩下傳調的形式C。D是由C再度合音的形式，裏頭含有三個詞素。(「這[chit]，彼[hit,]」—[chit8]都是訓用字，語源請看1.2末尾的討論)

	AA	XX	BB	A	B	C	D
1a	這一個 > ??? >	這個 >	這	*chit chit8 e°	*chit e°	chit e°	che
	卜 卜 卜	卜 卜	卜	卜 卜 卜	卜 卜	卜 卜	卜 卜
b	彼一個 > ??? >	彼個 >	彼	*hit hit8 e°	*hit e°	hit e°	he
	卜 卜 卜	卜 卜	卜	卜 卜 卜	卜 卜	卜 卜	卜 卜

{DN*+e°}{DQ* e5}：這些是表多數的兩種詞法結構，DN* (= D+N)已經合音為「遮[chia]、遐[hia]」。DQ* (D+QNT)已合音為「□[chiah]，□[hiah]」。「e°」「e5」兩者的歷史來源不明，其間是不是有語源關係也無法證明。下面是它們的可能來源：也有合音和傳調現象。(「這幾個」是E的另一個可能；在語意上很合適，但是在語音上並不合理。)沒有傳調的輕聲的舊形式(C)還共存下來。

	A	B		C{D*+e°}	D {D* e°}
2a 這搭兮	chit-tah e°	*chiah e°	遮兮	chia e°	chia e°
【這裏的】	卜 卜 卜	卜 一	【這些】	「 卜	「 一
b 彼搭兮	hit-tah e°	*hiah e°	遐兮	hia e°	hia e°
【那裏的】	卜 卜 卜	卜 一	【那些】	「 卜	「 一
↘ ↓					
	E	F{D* e5}		G{DN* e5}	H{DN*}
3a*這寡個	*chit-koa2 e5	chiah e5	諸個	chia e5	遮 chia
【這些個】	卜 卜 卜	卜 卜	【這些】		【這些/這裏】
b*這寡個	*hit-koa2 e5	hiah e5	許個	hia e5	遐 hia
【彼些個】	卜 卜 卜	卜 卜	【那些】		【那些/那裏】

H的「遮，遐」有時也表【這些，那些】（如：遮互你【這些給你】）很可能來自G，C或D。

1.4 無量詞舊語法時代指稱的語詞詞匯化{D*+N*}

在1.2節我們討論指稱詞加沒有數詞的數量語的指稱語，【D*+M】；本節討論連量詞都沒有，由指稱詞直接搭配名詞的指稱語。【請注意：D*只指「這、彼」；D就指所有的指稱語（這、彼、別、每、逐…）】{D*+N*}是詞匯的結構分析。D+d+M+N是詞組結構。【D*+M】是特列結構】

在現代台語的句法裏，D一般不直接與名詞結合，「*逐冊，*這厝」【每書，此屋子】，有{D*+N*}形式的語詞不能算是詞組性的。它也不能算是特列結構，因為沒有造語力。下表比較沒有量詞的指稱語與特列結構【D*+M】（指稱詞加量詞）搭配名詞的造語力。

表中「搭」是bound morpheme，「時」表「時機，天機」時是free morpheme，是一個詞；表「時陣」【時候】時一個bound morpheme。「國」是一個free morpheme，因而不難瞭解為甚麼b項語詞的結合中「搭」和「時」不能和{D*M}搭配。

指稱詞與名詞的搭配

	N	N	N	N	N*	N	N*	N	N*	N
	人	醫生	物	物件	時	時陣	搭	所在	國	國家
1a這	+/-	-	-	-	+	+	+	+	+	-
b這+M	+	+	+	+	-	+	-	+	+	+
2a別	+	-	+	-	+	+	+	+	+	-
b別+M	+	+	+	+	-	+	-	+	+	+
3a每	+	-	-	-	+	+	+	+	+	-
b每+M	+	+	+	+	-	+	-	+	+	+
4a各	+	-	-	-	+	+	+	+	+	-
b各+M	+	+	+	+	-	+	-	+	+	+
5a逐	+	-	-	-	+	+	+	+	+	-
b逐+M	+	+	+	+	-	+	-	+	-	+
6a任何	+	-	-	+	-	+	-	+	-	+
b任何+M	-	-	+	+	-	+	-	+	-	+

有些詞法結構組合詞類的詞素完全與詞組性結構(phrasal structure)裏的相等(如[chit*+M, hit+M, NUM+M, hit+M+N]裏的M(量詞)NUM(數量語)N(名詞))，有些結構裏的詞類成員卻和詞組裏的不相同，如：別+N* 啥+N* chit+N*裏的N*，只指極有限的幾個名詞詞素，並且只能在特定的詞匯裏出現。「別物，別人，別搭，*別貨，啥物，啥人，啥貨，*啥搭。chit搭，chit時，*chit物」。值得一提的是「這人」出現於一百多年前的廈門話聖經，在台灣現代人的詞匯裏已經被淘汰。其他的無量詞語詞也有地方差和個人差。

從歷史語法的眼光看是先有「人」(如：己所不欲，勿施於人)，再有「別人：D*+N*」，最後才有「別個人：D+M+N」。三者之間在今日的台語裏各有各的語意和語法特點(請參考本文第1.1, 1.2節)。有這種歷史的知識我們不難瞭解D在句法上不跟現代才有的雙音名詞搭配，連單音名詞或名詞性詞素也很有限。除了搭配限制，我們更可擬構過去詞

匯化的過程如下：

有{D*+N*}形式的詞匯應該是古代語法的遺留語詞，古時的句法結合經由僵化而詞匯化，跟合於現代語法的同義語共存。過去的句法變化為現代的語法的過程中，以詞匯和句法劃分生存空間。【D*+M】如：「別個」表單數，因有過「一」的省略。{D*+N*}是通數（如：「別人」，或是單數（如：「這時，這人」。是語法精密化而使用量詞分單、多數以前的古時語法現象的遺跡。

1.5 描述性和限定性子句修飾語：【S#D*+QNT】vs S+的+NP

「的」字修飾語(MODE)有兩種：「S+的」和「NP+的」，兩者都可以修飾N，也可以修飾整個NP。「的」是修飾結構的標誌語。但是修飾結構不一定有「的」標誌語。「的」的省略有句法現象也有詞法現象。

a)修飾NP裏的N的子句修飾語「S+的」，是限定性的（句1a, b, d）。出現在定語之後、名詞之前的「的」不能省略。如果有「V+N, A+N」的形式(c, e)是一種詞法或詞匯單位，通常沒有變調分界，也就是前面音節要變調（以“-”標誌；前面音節不變調的情形以“#”標誌）。請注意「愛人[jin5]」這個詞並不來自「所愛的人[lang5]」（「人[lang5]」是訓用字）。在現代人的腦裏，「俗厝」是詞匯單位。

[S 的]+N

- | | |
|----------------|----------------|
| 1a 兩枝老師買的筆無去。 | 【兩枝老師買的筆不見了。】 |
| b 彼間真俗#的厝無人愛買 | 【那棟很便宜的房子沒人買。】 |
| c 彼間俗-厝無人愛買 | 【那棟很廉價的房子沒人買。】 |
| d 伊有兩個伊所愛# 的人。 | 【他有兩個他所愛的人。】 |
| e 伊有兩個愛- 人。 | 【他有兩個愛人。】 |

子句修飾語修飾NP的是描述性的，出現在定語之前，如定語是

「彼」【那】、「這」，則「的」可以省略。但是變調分界不能省略，因以不變調來標誌本身的子句分界(2a, b, c)。而有別於原來就沒有「的」的VO的情形(2bb, cc)。華語裏【的】不能省略。這是台語語音變調辨別句法結構，而影響句法變化的一個很特殊的例子。這種「的」的省略不同於省略後同時詞法化而省略變調分界的情形(1.6)。

2a 你講真俗# (的) 彼間厝無人愛買 a 【你說很便宜的那棟房子沒人買。】

b 伊送我# 彼本小說(MOD+NP)真好看。 b 【他送給我的那本小說很好看。】

「卜卜# 卜卜卜

「卜卜#

bb 伊送我- 彼本小說。V+OBJ+OBJ bb 【他送給我那本小說。】

「卜卜- 卜卜卜

c 無人愛看# 彼本小說MOD+NP c 【沒有人要看的那本小說】

cc 無人愛看- 彼本小說V+OBJ cc 【沒有人要看那本小說】

b)被修飾的人稱代名詞的特殊語音：凡是受修飾的代名詞，應該是NP被修飾的情形，而不是N被修飾的情形。既然是NP的替代語，本身就具有獨立的指涉功能，因此代名詞的修飾語都是描述性的。因有語意重點，不能輕聲化，也不能變調。

S#的Pron

3a 無依無倚# 的我# (卜)

b 走頭無路# 的阮# (卜)

c 無分你我# 的咱# (卜)

d 我所冥日思念# 的你# (卜)

e 無人敢批評# 的恁# (卜)

f 每日花天酒地# 的伊# (「, 卜) (*ㄈ)

g 自認為應該有特權# 的(「, 卜) (*ㄈ)

只有第三人稱的調可能【卜】也可能【「】。這種情形有兩個可能的

解釋：一)「伊」[i55]有同音字「依、衣、醫」，「個」[in55]有同音字「因、姻、茵」，[i33]，[in33]就沒有成詞的同音詞。「我、阮、咱、你、恁」等字的變調都沒有同音字（如：goa55 lan55）。二)因方音的混合（「詩，斤」一般發音爲「，也有方言（如鹿港等地）發音爲卜，跟「是，近」同音，個別地吸收不同方音，兩者共存【卜、「】。不管哪一個原因，詞匯裏的發音記述，不能不提到「伊、個」語音上的特別變型。

c)【PN#個】：PN指專有或特定名詞，表【PN等一群人】，語意上等於「PN及hiah ê人=PN及個彼陣人=PN及PN的伴」。雖然句法上無法追溯明確結構來源，很可能是由被「個」所修飾那部分的省略而來。（PN=Proper Noun，後面有變調分界#）

- 4a 蔡老師個。張律師及阮小弟個。 【…等兩人，…等人】
b 秀英=啊# 個攏會來。 【秀英等人都會來。】
c 阿英=兮# 個攏猶teh讀小學。 【阿英他們都還在念書】

這裏的「個」一定要說成變調[in卜]。跟「個」的另外一個發音[in「]之間有功能的劃分。

1.6 修飾語「NP+的」的詞法化

a)NP修飾NP的一般情形：「NP+的」出現在定語之前可以省略「的」(1a-c)，但是一般不省去變調分界，仍保留其單獨的NP性格。這種「的」的省略是一種句法規律。

- 1a 老師#(的)兩枝筆無去。 【老師(的)兩枝筆不見了。】
b 老師#(的)彼兩枝筆無去。 【老師(的)那兩枝筆不見了。】
c 老師#(的)財產的買主無來。 【老師(的)財產的買主沒有來。】
d 阮(的)朋友(的)籃仔內的柑仔。 【我(的)朋友(的)籃子裏的橘子。】

代名詞在定語之前的「的」如果省去，變調分界也經常省去，有詞法化的

現象。有些有變調分界【Pr# NP】，有些沒有【Pr- NP】。後者最主要的特列結構是b節所要討論的親屬結構。

- | | |
|-----------------|--------------|
| 2a 無相像(#的)九本册 | 【不同(的)九本書】 |
| b 另外(#的)九本册 | 【其他(的)九本書】 |
| c 其他#(的)九本册 | 【其他(的)九本書】 |

在DET的前面還可以加異同代名詞。

- | | |
|---------------|-----------|
| 3a 全- 彼九本册 | 【相同 的九本書】 |
| b 另外-/# 彼 九本册 | 【另外 那九本書】 |
| c 其他# 彼 九本册 | 【其他 那九本書】 |

b)親屬結構：【PProP+N*】PProP=plural personal pronoun

台語的人稱代名詞的多數形式有特別的詞法現象。比較下面第一行詞法結構的語詞與第二、三行句法語詞之間意義、結構及發音上的不同。

- | | | | |
|--------|------|------|--------|
| 1 阮老師 | 恁媽媽 | 個老爸 | 咱學校 |
| ㄗㄣˊ | ㄣˊ | ㄍㄣˊ | ㄗㄢˊ |
| 2 我的老師 | 你的媽媽 | 伊的老爸 | 你及我的學校 |
| 3 阮的老師 | 恁的媽媽 | 個的老爸 | 咱的學校 |
| ㄗㄣˊ | ㄣˊ | ㄍㄣˊ | ㄗㄢˊ |
| ㄌㄞˊ | ㄌㄞˊ | ㄍㄣˊ | ㄗㄢˊ |

台語的「個老爸」(他們父親)不一定是「個的老爸」(他們的父親)，也有可能是「伊的老爸」(他的父親)。代名詞所有格後的「的」可以省略的情形只限於親屬關係，或是所屬機構(N*)。省略時單數代名詞「我、你、伊」要改為複數形式「阮、恁、個」。並且一定要變調。如果不變調只能有同位格意義。(如「我-/#老師愛守信用。」的意思是「我是老師，要守信用。」)做同位格的代名詞可以不變調(如4a)，也可以變調(如4b)。同位結構下面再討論。

4	咱台灣人	個美國人	我做工人的	你陳水螺
4a	ㄅㄛㄌㄞˊㄌㄞˊ	「ㄅㄛㄌㄞˊ	ㄌㄞˊㄌㄞˊㄌㄞˊ	ㄌㄞˊㄌㄞˊㄌㄞˊ
4b	ㄅ	ㄌ	ㄌ	ㄌ

表領有或親屬的人稱代名詞如帶「的」時，單、多數形式都可以出現。「的」前人稱代名詞的變調，比照一般代名詞當做NP的情形，可變調，可不變調(7a'-f')。但是如省略「的」時，一定要變調(7a-f)。(請比較句7的兩種情形)。

親屬

不常用	常用【PProP N*】	不可用
6a 我-/#的小弟＝	阮-小弟	*我-/#小弟
b 你-/#的小妹＝	恁-小妹	*你-/#小妹
c 伊-/#的朋友＝	個-朋友	*伊-/#朋友
d 阮-/#的小弟＝	阮-小弟	
e 恁-/#的小妹＝	恁-小妹	
f 個-/#的朋友＝	個-朋友	
g 咱-/#的學校＝	咱-學校	

領有 [PPro-NP]

Pro-/# 的 NP

7a 我彼三本冊	7a' 我-/#的彼三本冊
b 你彼間房間	b' 你-/#的彼間房間
c 伊這兩條褲	c' 伊-/#的這兩條褲
d 咱彼三個寶貝	d' 咱-/#的彼三個寶貝
e 阮厝裏(#)彼個	e' 阮-/#的厝裏(#)彼個
f 恁彼兩本真好看#的小說	f' 恁-/#的彼兩本真好看＝的小說

c)處所語詞的特別詞法：同樣是被人稱代名詞修飾「遮，遐，這搭，彼搭」等處所語詞(PN*)有特別的詞法現象，不同於「所在，位」等一般名詞。「兜」'home'和「厝」'house'之間又另有不同的詞法限制。(注

意：「伊兜」表【輪到他】不表【他的家】）。「兜」不單獨出現為一個 NP。

PPro 的 N

	【PPro-PN*】	*PPro-N	【PProP-兜】	【PProP-N*】
8a	伊這搭【他這裏】	*伊鉛筆/ *伊位		*伊老師
b	彼搭【他們那裏】	*個小說/ *個位		個老師
9a	伊遮【他這裏】	*伊所在	*伊兜	*伊厝
b	遮 【他們那裏】	*個所在	個兜【他(們)家】	個厝【他(們)家】

	N# 的 NP	N# 的 N	N# 的 NP	N# 的 NP
10a	*伊的遮	伊的所在【他的地方】	*伊的兜	伊的厝【他的家】
		伊的位 【他的位子】		
b	*個的遮	個的所在【他們的地方】	*個的兜	的厝【他們的家】
		個的位 【他們的位子】		

1.7 所有格和同位格結構之間的辨認問題

無「的」的領有結構和本來就沒有「的」的同位結構，組合結構很類似。同位格是指涉(reference)相同的兩個詞放在一起。同位格的代名詞跟所有格的代名詞有如下的不同：

一)同位格的代名詞及被修飾的名詞是個別存在的名詞性語詞，兩個都可以單獨出現，意思並沒有改變。

1a	咱讀冊人艱苦無人知	(同位格)	【咱們讀書人的艱苦沒人知道】
b	讀冊人艱苦無人知		【讀書人的艱苦沒人知道】
c	咱艱苦無人知		【咱們的艱苦沒人知道】
2a	咱的財產被沒收	(所有格)	【咱們的財產被沒收】
b	財產被沒收		【財產被沒收】
c	*咱被沒收		【*咱們被沒收】

二)因爲同位格的兩個語詞是單獨的語詞，代名詞可以用原調，所有格代名詞若無「的」的時候一定要用變調。句3a裏的「阮-/*查某人」的意思是【我們做女人的】有兩個發音，本調的[goan ˨˩]和變調的[goan ˨˩˦]，強調「阮」的時只用本調。句b裏的「阮查某人」的中文的意思是【我太太】只有變調一種發音。

3a 阮#/-查某人攏嘛愛彼種疼某大丈夫的查埔人。(同位格)

【我們女人家都愛那種疼太太是大丈夫的男人。】

b 阮-查某人無愛我這種拍某豬狗牛的查埔人。(所有格)

【我的太太不愛我這種打太太有如豬狗牛的男人。】

同位格PPron-˨˩#NP

4a 我-˨˩#這個歹命人，做齣到。 【我這個苦命者，做不到。】

b 你-˨˩#這個有頭有面的人 【你這個有頭有面的人】

c 伊-˨˩#陳處長 【他陳處長】

d 咱-˨˩#台灣人 【咱們台灣人】

e 阮-˨˩#散鄉人 【我們貧窮人】

f 佢-˨˩#日本人 【他們日本人】

g 恁-˨˩#好業人 【你們有錢人】

三)同位格的代名詞的主要功能在於表達說話者的心態(4a-g)，他對所指涉的事物加以分類，歸類於「阮、恁、個、咱」【我們、你們、他們、咱們】等不同的類別，常有拉近距離，排除其他類別的作用(4a-g)，沒有限定功能，不影響指涉；如下面兩類語詞，第一類是中性的(5a)，指涉已經清楚。第二類語詞是表達所屬歸類的，用不分你我的「咱」(6a)、有建立親切感的效果。用「阮、恁」有劃清「你、我」的作用，「恁」排除說話人，「阮」排除聽話人。「個」有拉近說話當事人的「你、我」，而排除第三者「個」的功能(f)。

- 5a 台灣人 散鄉人 日本人 好業人 無黨無派的
- 6a 咱-\#台灣人 咱-\#散鄉人 咱-\#日本人 咱-\#好業人 咱-\#無黨無派的
- b 個-\#台灣人 阮-\#散鄉人 個-\#日本人 恁-\#好業人 阮-\#無黨無派的
- 【他們台灣人 我們貧窮人 他們日本人 你們有錢人 我們無黨無派的】

所有格的主要功能是限定名詞的指涉範圍，但是指涉清楚的固有名詞或帶有指示詞的語詞，再加代名詞也有表達心態的功能。如下面兩類語詞，第一類是中性的(7a)，指涉已經清楚。第二類語詞是表達所屬歸類的，「咱」(8a, b)裏「阮、恁、個」的功能完全和純粹的同位語的情形(6a, b)相同。語義上表所屬、認同，而不表領有，8a的「咱」可翻譯為「咱所屬的，咱所認同的，咱所關心的…」而不翻譯為「咱所領有的」。這種所有格的變調規律有別於1.6節所談的表親屬關係的所有格，如「阮-小弟」。(8c)所表達的只限於同位格。

- | | | | | | |
|----|---------|----------|----------|---------|---------|
| 7a | 這間店 | 這個鄉社 | 這個政府 | 民進黨 | 國民黨 |
| 8a | 咱-\#這間店 | 咱-\#這個鄉社 | 咱-\#這個政府 | 咱-\#民進黨 | 咱-\#國民黨 |
| b | 阮-\#這間店 | 個-\#這個鄉社 | 恁-\#這個政府 | 個-\#民進黨 | 個-\#國民黨 |
| c | | | | 咱-\#民進黨 | 恁-\#國民黨 |

2. 合音與詞匯化

台語有多量的合音現象。兩個音節合成一個音節，形成一個音節裏有兩個甚至三個詞素的現象。因為語音簡化產生許多同詞異形語，研究者可透過內部擬構(internal reconstruction)來探討同義語或同詞異形語的共存與淘汰的條件與過程。台語的合音現象筆者已經討論過(Cheng 1985b)。本文只討論一些跟下面現象有關的語詞，也就是從詞匯化與詞法化的觀點看起來值得注意的現象：

一)合音的語音簡化規律的詞匯擴散現象。合音是一種語音過程。凡是常用的語詞大部分的詞類都發生過個別的合音現象。如名詞的昨昏【昨

天】[cha55-hng55 > chang35；動詞的 phah-m33-kiN21 > phang53-kiN21]「起來」[khi54--lai0 > khillai43 > kiai43]。但是，不是所有的名詞或動詞在類似語音條件下，都會有合音現象，也就是有詞匯擴散現象 (William S-Y Wang 1969)：一個語音或語法規律開始運作並不是同時影響到所有適用該語音或語法範疇的語詞，乃是從高頻度，高速度的個別語詞，逐漸擴散到其他詞匯。產生新發音以後舊發音也未必立刻地或均勻地被淘汰。

二)合音的歷史語言變化規律不一定是現代人的語法的一部分。新舊語詞兩者均共存的，我們仍可追溯其間的語音簡化規律；舊語詞被淘汰的情形，研究者往往無可追溯。有些合音詞地方差很大，甚至有個人差。顯示人們已經不再運用語音規律，而只憑記憶存進詞匯裏。

三)未簡化的語詞和簡化過的語詞，有些中間音說話人並不意識到。顯示語音簡化規律存在，中間音不一定存入詞匯裏。

四)合音規律和其他的語音規律（變調，輕聲，傳調）一樣，只影響到頻率高的語詞，只是不如後者（其他語音規律）的運用範圍廣，往往發生在後者之後，遵守後者的規律。

2.1 人稱代名詞的合音

因爲人稱代名詞都很常用，全詞匯很均勻地受過合音規律影響。台語的單數代名詞之後加一個「n」就是同人稱多數代名詞的形式。本節以阿拉伯數字標出調值。

la góa	53我	I	我
b goán (goá + n)	53阮	we (exclusive)	我們
c lí	53你	you	你
d lín (lí + n)	53恁	you	你們
e i	55伊	he, she	他，她，它
f in (i + n)	55個	they	他們
g lán (lí + goá + n)	53咱	we (inclusive)	咱們

多數詞尾原形（也就是所謂本字）是甚麼？有「儂農郎[lang13]，等[tan53]，人[jin13]」等可能性。這幾字當中「人[jin13]」在語意和語音上都合適，但是文言音搭配白話音不符合通例(2e,f). [lang13]還有方言在使用。如「阮」說成「我lang13」，很可能輕聲化後有過鼻母音化發展為「na┑」。這是王育德(1987)引用黃丁華的分析。是較可能的發展。(2g,h)

值得注意的是單數的代名詞跟多數的同聲調。從台語的語音規律看，除非詞尾有過輕聲化，不可能傳調，因此一定是多數詞尾先輕聲，又傳調，之後再合音。下面列出台語有關變調、輕聲、傳調的規律。從這些規律中我們可判斷台語的多數代名詞過去有過如「牽＝來」(2c, d)的輕聲和傳調的詞法，有別於「牽-牛」(2a)的只有變調沒有輕聲的詞法。

今歸納其演變規律如下：

- 一)凡是不在變調組最後的音節都要變調，
- 二)但是如最後的音節是輕聲時，輕聲前的音節不變調，其他前面的音節都要變調。
- 三)輕聲只出現在NP的末尾位置。
- 四)有輕聲音節時才有傳調現象。

因此經由

一)變調 二、三)詞尾 四)重音聲調向＝合音
輕聲化 輕聲音節傳調

2a 牽牛	khan55+gu13	khan33-gu13	
b 昨昏	cha55+hng55	cha33-hng55	chang35
c 張兮	tiu ⁿ 55+e13	tiu ⁿ 55+e0┑	tiu ⁿ 55+e0┑
	「┑」	「┑」	「┑」
d 牽來	khan55+lai13	khan55+lai0┑	khan55+lai0┑
e 伊人?*i55+jin13		*i55+jin0┑	*i55+jin0┑ in55個
f 我人?*goa53+jin13		*goa53+jin0┑	*goa53+jin0┑→ goan53阮
g 伊儂 *i55+lang13		*i55+lang0┑	*i55+na0┑ in55個
h 我儂?*goa53+lang13		*goa53+lang0┑	*goa53+na0┑→ goan53阮

2.2 指示代名詞的合音

指示詞(Demonstratives)「ch- h-」都是一個音節的一部分，不構成單獨的音節。從歷史的眼光看很顯然經過合音(contraction)的過程。

「chit」本來是「ch」(來源不明，可能是「是」，「此」或「者」)與「一」(this one)的合音。「hit」也可能是「h」(可能是「許」和「一」的合音)。現在只能從古無量詞的基礎上去推理。

1a chit-ê	hit-ê	這個	彼個	【這個】	【那個】
b chit=ê 一	hit=ê 一	這個	彼個	【這個】	【那個】
c che55	he55	這	彼	【這】	【那】
2a chit-tah	hit-tah	這搭	彼搭	【這個地方】	【那個地方】
b chia55	hia55	遮	遐	【這兒】	【那兒】
3a chia=lin°/nih	hia=lin°/nih	遮裏	遐裏	【這裏頭】	【那裏頭】
b chit-lāi-bīn	hit-lāi-bīn	這內面	彼內面	【這裏面】	【那裏面】
c chin55	hin55	(只限台南等地)		【這裏面】	【那裏面】
4a chiah toā	hiah toā	這仔大	彼仔大	【這麼大】	【那麼大】
b chiah-līn toā	hiah-līn toā	這仔裏大	彼仔裏大	【這麼樣大】	【那麼樣大】
c chian533 toa33	hian533 toa33	(只限台南等地)		【這麼樣大】	【那麼樣大】
5a chit chūn	hit chūn	這陣	彼陣	【這時候】	【那時候】
b chin533	hin533			【現在】	【那時】

2.3 介詞一代名詞的合音和代名詞的省略

介詞和代名詞的合音只發生在動詞的前面。合音後介詞和代名詞的變調調值，前者的聲母，後者的韻或韻尾都會出現在合音詞裏(詳細討論請看Cheng, R.1985b)。請注意台語介詞ka【把】，hō-【被，給，讓】的原調都是33，變調都是11，和後面的代名詞「我、恁、伊、個」合音後，前者以變調11的前半部的1出現；後者以變調55或33的後半部5或3出現在合音裏。

變調後	聲母或韻母脫落後 合音後		
1a ka33 我講	ka11 goa55 kong53	ka11 oa55 kong53	kaa15 kong53
b hou33我看	hou11 goa55 khoaN21	hou11 oa55 khoaN21	houa15 khoaN21
2a ka33 佢講	ka11 lin55 kong53	ka11 in55 kong53	kan15 kong53
b hou33佢看	hou11 lin55 khoaN21	hou11 in55 khoaN21	houn15 khoaN21
3a'ka33 伊講	ka11 i33 kong53	ka11 i33 kong53	kai13 kong53
b'hou33個看	hou11 in33 khoaN21	hou11 in33 khoaN21	hoin13 khoaN21

第三人稱的情形「伊、個」除了跟「hou33、ka33」合音以外還有「伊、個」被省略的情形。省略時「伊i55,個in55」的韻不留痕跡(a, b)，從變調的情形可判斷是一種語詞的省略(R. Cheng 1974)；並且省略了輕聲的「伊、個」，「hou33、ka33」都保留變本調，應該是輕聲音節省略前有過重音聲調向輕音節傳調的現象。我們也可以說是重音音節向輕聲音節傳調又傳韻，也可說輕聲音節在重音音節之後，動詞之前完全脫落。

留下本調的介詞：經過後面輕聲詞的省略

	代名詞輕聲後	聲母或韻母脫落後	合音後
3a ka33 伊講【跟他說】	*ka33 i0 kong53	*ka33 i0 kong53	ka33 kong53
b hou33個看【讓他們看】	*hou33 in0 khoaN21	*hou33 in0 khoaN21	hou33 khoaN21

這兩個介詞跟「人」[lang13]合音就有「人」輕聲受到傳調的痕跡kang33(4a,4b)的情形，也有合音前「人」lang13不輕聲而留下變調lang33痕跡的情形。(4a' 4b')。在筆者1985b的論文裏只注意到變調，沒有注意到輕聲和傳調規律。這裏所引用的變調、輕聲、傳調規律，都是台語裏相當普遍的語音規律，已在2.1節裏引述過。也在另文廣泛地討論過這些規律的運用(1990MS, 1991MS)。句5的「自按呢」合音成一個音節「choan 25」只運用到變調和合音的規律，沒有經過輕聲或傳調。

- 4a ka33人講 * ka33 lang0 kong53 *ka33 ang0 kong53 kang33 kong53 (人經過輕聲)
a' ka11 lang33 kong53 ka1 ang33 kong53 kang13 kong53 (人未曾輕聲)
b hou33人看 * hou33 lang0 khoaN21 *hou33 ang0 khoaN21 hong33 khoaN21 (人經過輕聲)
b' hou11 lang33 khoaN21 hou11 ang33 khoaN21 hong13 khoaN21 (人未曾輕聲)
5 自按呢來 chu11 an55 ne55 lai13 chu33 an55 lai13 choan15 lai13

從語法比較上值得一提的是：華語的介詞「被」之後省略的是「人」，「別人」。台語的對等語「hō」之後的「人」不省略，只合音為[hong 33]。

6【被（人）搶了。我被（人）看到了。你被（人）選上班長。】

有些華語方言「給」之後也有省略第三人稱代名詞的現象，和台語類同。

7a【水龍頭壞了，我們給（它）修。】

b【房間都讓我們給（它）修理好了。】

2.4 合音詞的詞匯化現象

由於過去的語音變化規律導致今日的詞匯產生單音節裏有兩個詞素，『原形』和今日的語詞中間經過幾種語音簡化規律。從詞匯的觀點看有三種情形：

一)原型已被淘汰，又無法追溯，如：指示代名詞che, chit, chiah, chia【這些兒，這一，這麼，這兒】；he, hit, hiah, hia【那些，那一，那麼，那兒】裏的「ch, h」；多數代名詞goan53, lin53, in55, lan53【我們，你們，他們，咱們】裏的「n」【們】。這幾種合音詞所有的詞典都列為詞條，並找漢字代表。

二)未合音的語詞在今日語言裏還與合音者共存，如：昨昏[cha-hng /chang]【昨晚】，這陣[chit-chun/chin]【這時】。互人[hō lang/hong]【被人】。這種合音語詞沒有任何詞典有系統地列為詞條，甚至不提有合音現象，更談不到尋找漢字代表。陳修的《台灣話大詞典》列了

「hông」，卻沒列「kâng」。

三)原來的語詞和合音詞之間有些過渡音很不穩定，說話人一般不意識到有這種發音。如[hou11 oa55/a55 khoaN21]裏的[oa55]或[a55]。

我們認為說話人對第一種合音語詞始終列為詞條，後來可能會作詞法分析為「goa+n」等，但是「goan53」這個詞調始終保留著。對第二種合音語詞與原型共存的情形有可能（但是不一定，也因人而異）憑藉合音規律，但也把合音形式存入詞匯。至於第三種情形可能顯示著語音簡化規律存在，中間音不一定存入詞匯裏。

3. 自己代名詞的詞匯現象

在台語裏「自+V*」（如：自救，自殺，自生自滅）是來自古文，或移借自現代華文的詞匯單位「家己+VP/S」（如：家己救家己，家己害死家己，家己發展，家己滅亡。古漢語與現代華語之間的【自】的語法異同湯廷池做過很詳細的研究1992）是台語內部發展的詞組單位。詞匯單位與詞組單位之間的同義語動詞不一定使用同樣的詞素。前者也可能有限度地透過類比創造新詞或是向華語、日語、客語移借漢字同形語。詞匯單位不經過變換(transformation)不來自詞組單位的「家己+VP/S」是一個很明顯的實例，但是兩者之間有語意類同關係，並且在對外的搭配上有很明顯的限制（如：*家己自救，*家己自殺家己）。我們儘量採用獨立的語意結構的做法，但是又跟句法隨時有互動關係的做法（而不是附屬於句法的語意規律）來處理這些現象。先把語意上有家己【自己】和別人對立的都列入(a-h)。（有關「家己」和「別人」的句法的類同，以及語意的對立，請看第3.2節。）然後按照「自」的句法對譯語「家己」是名詞性或副詞性分成三類。下面「自」字語詞大半取自陳修《台灣話大詞典》。

一)名詞性：(a-d)「家己」的語法功能是名詞性的情形：「家己」跟「別人」有語意對立的關係，語法上都佔同樣的論元角色。【有關華語的【自】字詞的論元分析，Kao R.（高蓉蓉1993）舉出與【自己】句的重要不同。】

a)施加在自己。在語法功能上同一個指涉兼著主語和賓語的雙重角色。句1a裏的動詞前的「家己」是副詞性的，可以省略，不影響句義。動詞後的「家己」不能省去，也不能只用「伊」而不改變句義（句1a, b）。

- 1a 伊（家己）責備（伊）家己。 【他（自己）責備（他）自己。】
a' 伊（家己）責備別人。 【他（自己）責備別人。】
b 你免犧牲（你）家己。 【你不需要犧牲（你）自己。】
c 伊家己問家己。 【他自己問自己】
d 家己誇口家己 【自己誇耀自己】

- 2b 自重，自誇，自勵，自盡，
自誤誤人，自欺欺人，自利利人
自衛，自責，自助，自給（自足），自量，自問，自治，自恨
自封，自律，自省，自殺，自焚，（自暴）自棄，自慰，
b 誰我欺，不己欺，己所不欲
c 省己，待己，知己，律己，利己利人，推己及人
d 他殺，他動，
e 被殺，被告，被迫，被害
f 受掠【被捕】，受辱，受關，受騙

從台語「家己」的句法看，{自 V*}裏的「自」相當於表受事者的賓語的「家己」，而不是副詞性的「家己」。也就是「自欺欺人」的論元結構相當於「欺己欺人」。 $\{V^* \text{ 己}\}$ 和 $\{\text{自 } V^*\}$ 語序相反。 V^* 的個別動詞 $\{V^* \text{ 己}\}$ 的比 $\{\text{自 } V^*\}$ 少。如「自殺」等2b的語詞看成 $\{\text{Pron}^* V^*\}$ ，語序屬於古代較早的OV類型。2c「待己」等的語序屬於OV。值得注意的是台語代名詞「家己」的詞素有「己」沒有「自」，是VO語序時代的詞素。但是有 $\{V^* \text{ 己}\}$ 結構的語詞在台語裏的使用頻率遠不如 $\{\text{自 } V^*\}$ ，其實兩者都沒有造語力，都靠記憶。這是詞匯獨立於句法的很好的例子。「他殺，他動」(d)支持「自」是一種代名詞的看法。「被殺」(e)來自「被人殺」，「受騙」(f)來自「受人騙」，也跟代名詞有關。

從古代句法的觀點看，{V* 己}和{自 V*}語序相反，在某時期並不是VO和OV語序的不同，而是代名詞和副詞之間的不同。按照太田（1958，蔣、徐1987譯本111頁）『古代漢語中「自」不能做主語和賓語，而且不能放在動詞後面。因此它不是代名詞。「自」是副詞。…「己」是代名詞，既可作主語，又可作賓語，還可作名詞的修飾語。』。這個看法可以解釋現代漢語詞匯裏【自】和【己】的語序的分佈。不能不注意的是「自」、「己」都是古代句法的成分，在當時很有造語力，可是在今日漢語裏已經退為詞匯裏的成分。現代人所意識到的是整個詞匯的語意和搭配關係。他能翻譯成現代台語的「家己」句法結構，也能做語意分析。

b)自我估價

- | | |
|----------------|----------------|
| 3a 家己感覺家己真滿足。 | 【自己覺得自己很滿足。】 |
| a'伊家己感覺別人攏真滿足。 | 【他自己覺得別人都很滿足。】 |
| b 家己認為家己真偉大。 | 【自己認為自己很偉大。】 |
- 4 自滿，自大，自謙，自卑，自尊，自覺，自作自專，自主，
自作聰明，自作主張

c)自我領有物

- | | |
|--------------|--------------|
| 5a 家己的厝。 | 【自己的家。】 |
| a'別人的厝。 | 【別人的家。】 |
| b 家己的車。 | 【自己的車。】 |
| c 家己的費用，家己的厝 | 【自己的費用，自己的家】 |
- 6 自費，自傳，自宅，（比較：己任）

d)對自己的領有物施加動作

- 7a 伊家己經營家己的店 【他自己經營自己的店】
a' 伊家己經營別人的店 【他自己經營別人的店】
b 家己誇口家己的才能 【自己誇口自己的才能】
b 個駛（個）家己的車。 【他們開他們自己的車。】

- 8 自豪，自誇，自悔，自用，自耕，自營，自決，自用車
自取其辱，自食其果，自絕其路，自掘墳墓

二)副詞性：(e-g)「家己」的語法功能是副詞性的情形：這些情形都是：一)在「家己」改換成「別人」之後不成句，需要做一些調整才能表達「自己以外的人」的意義和所回應語詞的關係。二)「家己」的有無不影響動詞的論元結構。三)語意上仍然與「別人」有關係，只是不在句法上有直接的對立(9b)。

e)單獨行動。這種「家己」沒有適當的{自V*}詞匯對譯語。

- 9a 伊beh（家己）（一個人）去就好 【他要自己一個人去就好。】
b 我無愛家己去，愛有別人及我做夥去。【我不要自己去，我要別人
跟我一起去。】
10 獨斷，親身。

f)不靠外力而不由己的行動。副詞性用法。

- 11a 你（家己）m著。 【你（自己）錯了。】
b 禁脔tiâu，家己笑笑出來。 【忍不住，自己笑了出來。】
c 阮某家己m知影。 【我太太（自己）不知道。】

- 12 自轉，自來水，自動
自己，自身，自我，自私，自然
自暴，自強，自新，自鳴，自立，自由，自動，自覺
親自辦理

g) 自願行動。副詞性用法。

- 13a 伊(家己)欲去。 【他(自己)要去。】
 b 無人請家己(自動)來。 【沒有人請自己來。】
 c m̄ 免kā 伊強逼；伊會(家己)去。 【別強迫他；他會(自己)去。】
 d 伊家己beh 去。無人叫伊去。 【他自己要去。沒人叫他去。】

14 自願，自首

三)重複結構裏的名詞性：(h)「家己」重複出現表各自行動，可由表同情況的副詞「各自」取代：這種重複的情況也可以由子句並聯結構裏的名詞性的「家己、你、我」來表達。

h)各自行動。下面各句各子句裏名詞性的「家己」(a, e)，都和「別人」對立。句d的「你，你」改為「你，我」，「我，我」改為「我，你」就是句d'，整句變為表「互相」的句子。「各自」有些特點跟「互相」很類似：一)都是副詞性的，二)在語意上都可以改變為有同樣論元結構的子句所表的情況重複發生，如句d-g。所不同的是「各自」所重複的情況是指涉到同一個人，「互相」所重複的情況牽涉到不同的人。「互相」的語意將在下面第七節討論。

- 15a 每人攞看家己的冊 【每個人都看自己的書。】
 a' 每人攞看別人的冊 【每個人都看別人的書。】
 b 我看我的冊，你寫你的字。 【我念我的書，你寫你的字。】
 c 隨人食，隨人付錢。 【誰吃，誰付錢。】
 d 你食你家己出錢，我食我家己出錢 【你吃你自己出錢，我吃我自己出錢。】
 d' 你食我出錢，我食你出錢(互相) 【你吃我出錢，我吃你出錢】
 e 家己食，家己付錢 【自己吃，自己付錢。】
 f 家己做家己負責。 【自己做自己負責。】
 g 家己的代誌家己負責。 【自己的事自己負責。】

16 各自付錢

上面列出「家己」各種語意功能，在句法裏可以用不同的結構，精確地表現出來。表達類似語意功能的「自」在詞匯裏結構簡單，只有{自 V*}{自 V*自 V*} {V* 己} {各自}，因為語意、語法古今不同，動詞的論元關係複雜而模糊，有很多無法分析的情況。如用嚴格的句法理論分析，可能在某方面得到更合理的分析。但是像「自誇」是【自己誇耀自己】還是【自己誇耀自己的功勞】的問題，並沒有方法決定。

漢語句法的歷史演變中單音節副詞如「自」（例：自愛）先於多音節副詞「自己」【例：自己愛自己】。這個語言發展歷史還反映在今日的語言裏。「自」或「己」只跟單音節動詞結合，「家己」就沒有這種限制。

值得注意的是同樣是人己代名詞表家己【自己】的舊詞匯「自」「己」無論在台灣話或是普通話裏已經失去獨立詞的地位。只出現在「自由，自卑」等詞匯單位裏的一部分。表「別人」的「人」卻還在句法裏使用。這現象符合愈常用的愈經得起淘汰的力量，也愈容易受語音和語詞簡化的影響的原則。

4. 互相代名詞的詞法現象

互相(reciprocity)的觀念，要在一定的範圍之內，有兩個以上的人或物，才能成立。在漢語的語法裏，範圍的觀念表現在一個特定的大範圍--言談領域(Universe)裏的某範圍。範圍(scope)可能是全面的(1a,c)也可能是部分的(1b)。在語法裏表言談領域的語詞通常出現為主題(Topic),表互相(reciprocity)的語詞的指涉範圍，也在一定的領域範圍內。互相的表現法如下：值得注意的是互相的語意基本上是同樣的論元結構的重複（如：五），但是在語法上可由句法裏的副詞（如一），特列結構裏的副詞（二、三），特列結構裏的代名詞（五），動詞詞尾表達（四），也可由詞匯裏的詞頭（如：六）表達。可見「互相」這個語意和各層面語法之間的複雜性，其句法、詞法、詞匯劃分功能各有不同的結構特點。就上面的特點來說，「互相」和「各自」很類似，都屬於副詞性，並且在語意上

都可以改變為有同樣論元結構的子句所表的情況重複發生，如句d-g。所不同的是「互相」所重複的情況牽涉到不同的人，「各自」所重複的情況是同一個人。請比較上面第3節所討論「各自」的語意。

一)「互相+VP，互相+S」

- 1a 當場的人攏互相真親近。 【在場的人彼此都很親切】
 b 當場的人有一部分互相罵來罵去。【在場的人有一部分彼此對罵】
 c 當場的人攏互相你罵我，我罵你。【在場的人都彼此你罵我，我罵你】

二)【sio+V】

- 2 sio lám, sio 罵, sio協助【互相擁抱，相罵，互相協助】
 【saⁿ+V】／{saⁿ}因方言而有特列結構或詞匯之差。
 3 saⁿ thiàⁿ, saⁿ 辭, saⁿ 協助【相愛，互相告辭，互相協助】

三)【彼此+VP】（限於正式場面）

- 4 彼此寬容。彼此相敬如賓。彼此saⁿ關心，彼此相照顧。

四)【V+來+V+去】

- 5a 當場的人攏大家看來看去。 【在場的人都互相看來看去。】
 b 當場的人有一部分人互相看來看去。【在場的人有一部分人互相看來看去。】

五)【你+V+我，我+V+你】

- 6a 當場的人攏你看我，我看你。
 (=互相看) 【在場的人都你看我，我看你。】
 b 你食我出錢，我食你出錢。
 (=互相出錢) 【你吃我出錢，我吃你出錢。】
 c 家己食別人出錢，別人食家己出錢。
 (=互相出錢) 【自己吃別人出錢，別人吃自己出錢。】
 d 你食你家己出錢，我食我家己出錢。
 (=各自出錢) 【你吃你自己出錢，我吃我自己出錢。】

六){相[siong] V*} 相愛，相助，相親相愛，相敬

7a {相[siang] V*} 相好

注：相親[siong-chhin]的「相」並沒有互相的意義，不在本文討論範圍內。

在台語裏表互相的有新起的「互相」，能跟較複雜的VP或S結合。「互相行一個禮。互相指出互相的缺點。互相容忍對方的過失。互相講話講甲誠歡喜。」單音節舊詞「saⁿ或「sio」在Adv+VP這個大而靈活的結構裏已經被淘汰，但是還是詞法裏的副詞，出現為【sio+V】這個特列結構裏，不是詞匯結構裏造語有限的詞頭，跟新起的副詞「互相」還算是語意、語法類同的共存同義語。（如：～尊敬，～怨妒，～推辭各動詞之前，三者都可以出現）。不像華語裏的【互相+V】是詞組單位，造語力很強；{互+V*}，{「相+V*}」卻是詞匯單位，造語力有限，也有【相信（他）】等個別詞匯語意特別的現象（這現象連金發有很詳細的書面語資料研究）。華語的「互相」與「互、相」還反映著文白語言層次不同而產生的音節數目上的搭配限制：「互相」用於多音節（如：？互相罵），「互」「相」用於單音節（*互尊敬）。（呂叔湘1980《漢語八百詞》引用於鄭良偉1989:2）。在台語裏「互相」跟多音節結合只是一種趨勢，不是一種規律，如：互相尊重，互相罵，？互相拍）

8)	V+NP	AV+VP	V+NP; V+S	AP, NP+AP
	鬥腳手	m 敢講起	心腹看現現	真親近
	行一個禮	有愛beh講和	寬容彼此的過失	有意愛
	敬一杯酒	愛beh訂約	教對方的子弟	關係真bái
互相VP	+	+	+	+
【sio V】	-	-	-	-

9)	看來看去	講來講去	你看我我看你	伊 _m 讓我, 我 _m 讓伊
互相VP	+	+	+	+
【sio V】	-	-	-	-

10)	踢	嚷	牽			
	拍	罵	siòng(相)	容忍	尊敬	怨恨
	chim	忍	報	意愛	和好	幫忙
互相VP	+	+	+	+	+	+
【sio V】	+	+	+	+	+	+

San與sio是小方言融入大方言之後的不同的語言層次的同義語。在閩南語裏有四種不同的理論上的類型。一)只用san為副詞, sio只以個別的詞匯向外移借。二)只用sio為副詞, san只以個別的詞匯向外移借。三)兩者可以自由替換。四)在第一類或是第二類與第三類之間, 可以互相替換的部分相當多, 但是有小部分語詞卻只偏好「san」或「sio」。

第三類可以看成是第一類和第二類, 也就是san與sio小方言融入屬於第四類的大方言的過度類型。第四類在其他的虛詞中有不少例子。如台語的连接詞「及、參、含」華語的连接詞【和、跟、同、hàn】, 台語的必須條件副詞「卡、tah、chiah」(如: 著愛二十歲_會使駛車)。但是由於「互相」造語力的增長, 「sio」(或「san」)的使用範圍和頻率因而降低, 有可能退為第一、二類, 甚至變為詞匯的一部分。

下面是根據一個以「sio」為基礎層次的人的語感。他所常讀的羅馬字書面語是以「san」為副詞的廈門方言。「san」成為他語言中的語層成分之一, 屬於第三類。有一些用「san」的詞匯化語詞, 【sio V】是一種穩固的特列結構, 也有一些獨特的詞匯現象。

11)

	敬	愛	好	辭
互相	+	+	+	+
sio	—	+	+	—
sa ⁿ	+	+	+	+
siang	+	—	+	—
siong	+	—	—	—

可以跟文言層的「相[siong]」結合的動詞很有限，只能看成詞匯單位。「互相」同樣也是文言層的發音，是口語裏很活躍的語詞，已經發展為獨立的詞。相對地同義語的「相[siong]」，遠不如詞法成分的「sio」。

12)

	行禮	敬酒	輪流 替換	約束 寬容	讓手 害著	聽著 看著
互相	+	+	+	+	+	+
sio	—	+	+	+	+	—
sa ⁿ	—	+	+	+	—	—
siong	—	—	—	—	—	—
彼此	?	?	—	+	—	—

語言接觸所產生的不同語言層次的同義語牽涉到詞匯化、詞法化同義語詞之間的淘汰與共存現象。在台語裏「saⁿ、sio」跟新語詞「互相」算是同義語。但是前者已經退居為詞法裏的一部分，和後者各有不同的功能，有它留存的空間。至於句法裏的靈活功能，只由後起的雙音節「互相」獨佔，「sio、saⁿ」已經被淘汰。

5. 結論

本文討論台語代名詞的詞匯與詞法現象：我們將把不符合一般句法、

語音、語意規律的語詞分成兩種：需要個別記憶在詞匯裏的語詞以及用特列結構形式存在長程記憶的語詞。

下面是本文討論過的，牽涉到代名詞的主要特列結構與詞匯結構分析。符合一般規律的詞組單位放在左面。雖然放在同行，有的有語意或語用功能劃分，不一定是同義語。

詞組	特列結構	詞匯
D+一+M	【D*+M】	
	【D*+M】	{Pron}
{D*+N*}	【D*+M】N	
S+的+NP	【S#D*+QNT】	
NP+的+NP	【PPron+N*】	
	【PN#個】	
	【NP#NP*】	
		{pron}
家己+VP		{自+V*}
V+家己		{自+V*}
互相VP	【sio+V】	{sa+V*}
	【sa ⁿ 】	{siong+V*}

詞組	特列結構	詞匯
這一枝	這枝	1.2 「一」的省略
	這個	這 1.3 「一」省略後的合音
別人	別個人	1.4 古代無量詞的指稱語
我愛看#的這本	我愛看#這本	1.5 「這、彼」前「的」的省略
個的老師	個老師	1.6 人稱代名詞的親屬結構
老師及一陣人	老師個	1.6 「個」表【等人】
阮做查某人的	阮#查某人	1.7 同位語
		阮，咱 2 多數代名詞的合音
認為家己真偉大		自大 3. 舊語「自」

家己救家己	自救	4. 舊語「自」
互相怨妒	sio怨妒	5. 舊語sio使用範圍縮小
	sa ⁿ 怨妒	siong好 5. 舊語/ 移借語「siong」

爲甚麼台語的代名詞有很多不符合一般句法規律的語詞？從歷史語言學分析者的觀點看，某特別結構的出現可能後於，也可能先於其詞組同義語，前者的情形不外是因爲代名詞使用頻率特別高，所以特別容易引起各種語詞的省略和語音的簡化（變調分界的省略，輕聲音節產生聲調對立的中立化、傳調、合音）都不均勻地、非全面地影響各語詞，因而產生不規律的現象。（如「NP 的 NP」「我的小弟」在特定的環境下有結構標誌「的」的省略，因而產生特列結構【PPron N*】「阮小弟」。特列結構先於同義詞組的情形是因爲代名詞的使用頻率特別高，所以雖然有新的句法和語詞（如「家己，互相，量詞」）產生，卻有一部分舊語法語詞仍然例外地繼續使用，不按照新的一般規律，只靠詞匯（如：「相愛」{相 V*}「別人，別物，甚物」D* N*}）或特列結構記憶（如【D* M】「別物，別本，別個」）這兩種方式處理。

從心理語言學的角度來看，各種語詞的學習先後，應該是人腦處理語言的策略。有些特列結構或詞匯裏的個別語詞的形成與運用先於一些特列結構或詞匯組合結構的形成與運用。先因爲某種語意特別常用，又有簡短而方便的語詞結構，因而就以儲存於詞匯或詞法這兩種特別模組來記憶、來收發訊息。因爲語言裏已經有語意固定化，又有特別的語音簡化，語詞脫落，語詞搭配僵化的一些詞匯組合形式、詞法特列結構，因而個人能以類比原則形成新語詞。例如因爲先有需要跟「黨外」、「主流派」劃清界限的觀念，「黨外」「主流派」也演變成所屬名詞，也就是【PPron N*】特列結構裏的名詞N*之一，然後「黨外，主流派」【他們黨外】【他們主流派】就比照特列結構【PPron N*】取得特別的語意、語音特點。如果從語言使用人的語言發展過程觀點看，這些語詞並沒有經過語詞的脫落或語音的簡化。又如先學好特列結構【sio+V】處理特定的一些語詞（如sio怨妒，然後學會句法結構的“互相+VP”（如「互相怨妒」），之也不會放棄已經儲存與長期記憶裏的特列結構【sio+V】。

特列結構裏並非沒有規律。其實仍然有一定的規律只是適用範圍不同；一個語詞是否有特別的語音變化決定於它出現在句法裏，或詞法裏。語音、句法，語意規律和詞法之間的關係是互為因果的互動關係。而不是單方向的因果關係。例如：在句法裏按照一般規律修飾關係以「的」標誌，因為「的」的省略和單數形式變多數形式而有【PPron N*】這個特列結構，特列結構也可能帶動類比的新語詞出現，甚至新的語音，語用等變化。D NUM M 句法結構裏的D yi—M和【D* M】之間的因果關係更為複雜，但是不外是有著不斷的互動關係。

我們對特列結構的性質還不是很了解，但是上面的看法可以解釋為甚麼我們無法先解決它的語法上的定義。以後多方地比較其他種類語詞的各個層面之間的互動關係，並多方比較各方言間的詞法現象，以及古今間詞法變化，應該是了解漢語和自然語言需要走的方向。

參考文獻 漢文目錄

- 湯廷池 1988 《漢語詞法句法論集》。學生書局 台北
- 1992 漢語詞的照應詞。發表於第二屆中國境內語言暨語言學國際研討會 清華大學 新竹 1991.7.
- 鄭良偉 1989B 《國語常用虛詞及其台語對應詞釋例》 文鶴 台北
- 1989b 從台灣當代小說看漢語語法演變《新加坡第一次世界華文教育研討會論集》。又刊在《台灣風物》1992年43卷3期 152-194頁。
- 1990MS 台灣話與普通話裏的時態與時段語。將收於王士元、丁邦新所編有關漢語論文集
- 1991MS 互動關係、模組化、詞匯擴散--台語動詞性詞語的連調變化。發表於第三屆北美洲漢語語言學會議，Cornell 大學
- 1991 異形語的共存與淘汰---台灣話的輕聲與數量語。發表於第二屆中國境內語言暨語言學國際研討會 台北 台灣 1991.
- 1993 台灣話人已與異同代名詞--語意與語用。發表於第一屆台灣語言暨語言學國際研討會 台北 師範大學 1993.3
- 黃正德 1988 漢語正反問句的模組語法 《中國語文》4:247-264
- 呂叔湘 1985 《近代漢語旨代詞》 學林出版社 上海
- 梅祖麟 1987 三朝北盟會編裏的白話資料 《中國書目集刊》第十四卷 第二期 27-52.
- 太田辰夫 1958 《中國語歷史文法》 東京
- 蔣紹愚、徐昌華譯 1987 《中國語歷史文法》 太田辰夫 1958 原著。北京大學出版社
- 王 旭 1993 台語變調現象的心理特性。《清華學報》新23卷第2期 175-192頁

興水優 1991 「對疑問數詞的若干疑問」 1991.1 夏威夷大學演講稿

References in English

Chang C. (張郇慧)

- 1991 Interaction between Syntax and Morphology: A Case Study in Mandarin Chinese. Unpublished Ph.D. dissertation at University of Hawaii

Chao, Yuen-Ren. (趙元任)

- 1968 A Grammar of Spoken Chinese. Berkeley: University of California Press.

Chen, Matthew.

- 1987 "The syntax of Xiamen tone sandhi" Phonology Yearbook 4: 109-150 New York: Cambridge University Press.

Cheng, Robert L. (鄭良偉)

- 1967 "Universe-Scope Relation and Mandarin Noun Phrase," POLA (Project on Linguistic Analysis). II:1-186.
1968 "Tone Sandhi in Taiwanese," Linguistics, 41:19-42.
1974 "Causative Construction in Taiwanese." Journal of Chinese Linguistics, 2-3:279-324.
1985 "Sub-syllabic Morphemes in Taiwanese," Journal of Chinese Linguistics, 13-1:12-42.

Cheng, Tsai-fa. (鄭再發)

- 1983 "Tonal Features of Proto-South-Min," Papers in East Asian Languages, I:66-90

Chuang, Li-ling (莊琍玲)

- 1990 "Chinese Disjoint Reference 'Qitaren' ". Proceedings of the First International Symposium on Chinese Languages and Linguistics. 91-115. Taipei, Taiwan.

Her, One-Soon. (何萬順)

- 1990 "Grammatical Functions and Verb Subcategorization in Mandarin Chinese" (A PhD Dissertation, University of Hawaii) . Taipei, The Crane Publishing Co., Ltd.

Hsieh, Hsin-I. (謝信一)

- 1990 "In Search of a Grammatical Foundation for Dialect Subgrouping," Proceedings of the First International Symposium on Chinese Language and Linguistics, 146-67. Taipei, Taiwan: Academic Press.

Huang, Chu-Ren. (黃居仁)

- 1990 "Adjectival Reduplicaiton in Southern Min - a Study of Morpholexical Rules with Syntactic Effects," Proceedings of the First International Symposium on Chinese Language and Linguistics, 188-97. Taipei, Taiwan:

Kao, Rong-Rong (高蓉蓉)

- 1993 Grammatical Relations and Anaphoric Structure in Mandarin Chinese. University of Hawaii PhD dissertation.

Lyons, John.

- 1977 Semantics. Vol. II. Cambrigde University Press. Combridge.

Thomason, S.G & Kaufman, T.

- 1988 Language Contact, Creolization, and Genetic Linguistics. University of California Press.

Wang, William, S-Y (王士元)

- 1969 "Competing Changes As a Cause of Residue," Language 45:9-25.

On Lexical Structure and Syntactic Projection

C.-T. James Huang

University of California at Irvine

Abstract

Donald Davidson's classic argument that action sentences involve an event place in their argument structures receives important evidence from the overt syntax of Chinese genitive agent constructions, possessive object constructions, and sentences with expressions of event quantification that apparently occupy the syntactic position of objectual modifiers. These constructions present syntax-semantic mismatches that are resolved by an analysis according to which the main predicate has moved from its D-Structure position into the position of an abstract higher "light verb". This analysis contributes to the literature on the nature of the "event place" with the claim that the event place is the internal argument of the light verb, rather than a temporal or spatial adjunct of the main predicate. This analysis can be extended to other predicate types along with recent neo-Davidsonian hypotheses. The paper also examines a number of mismatches between objectual quantification in the syntax and event quantification in the semantics that cannot be accommodated under this analysis, but notes that those cases exhibit a high degree of lexical idiosyncrasy and rightly belong to the realm of lexical semantics.

1. Introduction

A central assumption in generative grammar research on the relationship between syntax and the lexicon is that syntax is a projection of

the lexicon. The structure of sentences is a reflection of the lexical properties of the individual lexical items they contain. In the standard view, each lexical item is associated with a lexical entry that contains three kinds of information, as indicated in (1):

- (1) The contents of a lexical entry:
 - a. Morpho-phonological information
 - b. Semantic information
 - c. Morpho-syntactic information:
 - syntactic category
 - subcategorization
 - theta grid (argument array, theta roles, linkings)

In classical theories of lexical structure, the morpho-syntactic component of a lexical entry consisted of a specification of c-selection (or subcategorization) and a theta grid, specifying a given lexical item's argument array, the thematic roles of its arguments and the way these theta roles are linked to the arguments. The lexical entries of *fang* 'put' and *zhidao* 'know' looked like (2) and (3):

- (2) *fang* 'put': [+V, -N]
+ ____ NP PP
{1, 2, 3}
| | |
Agent, Theme, Location

- (3) *zhidao* 'know': [+V, -N]
+ ____ NP/CP
{1, 2}
| |
Perceiver, Theme

In recent years, it has been shown that a lexical entry of this kind suf-

fers from a problem of overspecification, as there is considerable redundancy among the kinds of information provided. It has been observed by Pesetsky (1982), for example, that information about subcategorization (c-selection) is largely predictable from its meaning, which includes s-selection, or the specification of participants of a predicate, in terms of their ontological types. If a verb s-selects a thing, then it c-selects an NP (as in (2)). If a verb s-selects a proposition, then it c-selects an NP or CP. Information about c-selection can be predicted by a principle of Canonical Structural Relation (CSR) from information about s-selection.

There are a few cases where c-selection cannot be fully predicted from s-selection, the best known concerning the difference between *ask* and *wonder* in English, first studied by Grimshaw (1979). Both verbs s-select a proposition, but only *ask* c-selects an NP. A similar point can be made with the difference between *zhidao* 'know' and *renwei* 'think'. Both of these verbs s-select propositions, but whereas a proposition can be expressed in a concealed way as an NP in the case of *zhidao*, this is not possible with *renwei*.

- (4) a. Zhangsan zhidao [Lisi tou-le ta-de shu].
Zhangsan know Lisi steal-Perf his book
Zhangsan knows that Lisi stole his books.

- b. Zhangsan zhidao zhe-jian shi.
Zhangsan knows this-CL matter
Zhangsan knows (about) this matter.

- (5) a. Zhangsan renwei [Lisi tou-le ta-de shu].
Zhangsan think Lisi steal-Perf his book.
Zhangsan thinks that Lisi stole his book.

- b.* Zhangsan renwei zhe-jian shi.
Zhangsan thinks this-CL thing

Pesetsky (1982) proposed that such differences can be captured in a more

meaningful way by whether or not a given verb is lexically specified to be capable of assigning (Accusative) Case.¹ A similar distinction can be made between verbs like *reside* and *inhabit*, both s-selecting a Location but each having a distinct structural realization of it.²

It has also been observed in the literature (Grimshaw (1990) and references cited there) that information about thematic roles, in particular the role labels, need not be specified in the theta-grid (or argument structure) of a given lexical item. The fact that the three arguments of *fang* 'put' are Agent, Theme and Location may be derived from the meaning of the verb, and therefore need not be specified again in the argument structure. What is needed is merely the information that *fang* is a three-place predicate, one that takes 3 arguments, or has 3 places in its argument structure:

- (6) *fang* 'put'
 {x, y, z}

The meaning of the verb should predict that these 3 arguments bear the thematic roles of Agent, Theme, and Location. Given the Projection Principle of Chomsky (1981), all these arguments (with their theta-role information) are projected to the syntactic component. It is further as-

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1. This reverses the assumption made in Chomsky (1981), where assignment of ACC by a verb is attributed to the verb's having the c-selection feature [₊__NP]. In this current account, c-selection for NP is attributed to the verb's having a [₊ACC] feature.
 2. There are other facts, pointed out in Jackendoff (1990, 255-257), that seem to require subcategorization but which cannot be reduced to case assignment properties of a verb. These include cases of "obligatory adjuncts" (*Bill supplied/provided the students with some books* but *Bill supplied/*provided the students.*) Also, although the contrast between *become* on the one hand and *go* and *get* on the other may be reduced to a difference in case properties, the difference between *go* and *get* cannot:
 - (i) Harry became/went/got crazy.
 - (ii) Harry became/*went/*got a raving maniac.
 - (iii) Harry ??became/went/*got out of his mind.

sumed that argument positions in the lexical structure are projected to specific positions in syntax according to the Thematic Hierarchy (cf. Grimshaw (1990), Larson (1988), etc.):

(7) The Thematic Hierarchy

Agent > Experiencer > Goal > Theme > ... > Obligues

so that the argument that bears the thematic role of Agent will appear in the highest argument position of a sentence at D-Structure, the argument that bears Theme will appear in a lower position, and the Location argument will appear even lower.

One version of the theory of syntactic projection takes the argument structure of a lexical item to consist of a flat list of argument places, and the Thematic Hierarchy ensures that these argument places are projected to appropriate positions in the syntactic structure. A more sophisticated theory of argument structure now takes it that the argument structure itself is structured in accordance with the Thematic Hierarchy, and that the D-Structure of a sentence is simply a direct projection of the hierarchically structured argument structure of its verb. This is achieved by the theory of syntactic projection, the strong version of which is Baker's (1987) UTAH:

(8) Uniformity of Theta Assignment Hypothesis (UTAH)

Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-Structure.

Assuming that argument structures are structured according to the Thematic Hierarchy, one question that arises is (9):

(9) Why the Thematic Hierarchy? Why is it as stated in (7) or something like (7)?

A plausible answer to this question lies in the idea that the meanings of lexical items are themselves highly structured and highly constrained. Up to now, we have only mentioned that the lexical entry of a verb must include its meaning. Some "paraphrase" of the lexical item must be given. There is good reason to suppose that the content and form of the "paraphrases" are highly structured. In particular, the meaning of a verb may be decomposed into one or a small number of "pure verb meanings" which it shares with a large number of other verbs, plus other idiosyncratic features that distinguish it from the other verbs. And these component meanings of a verb are structured in a highly constrained manner. The use of lexical decomposition allows certain generalizations to be made across large numbers of lexical verbs of similar semantic types. And the ways these component meanings are structured are also of considerable generality so as to express significant generalizations about the nature of the lexicon and lexical semantics. I refer to the idea, of course, that *kill* is decomposed into [CAUSE [BECOME [DEAD]]] in its underlying representation, as was first proposed by McCawley (1968) and in similar treatments employed by other generative semanticists, and more recently by Dowty and other categorial grammarians. A recent GB approach employing the idea of lexical decomposition is found in Larson (1988) and related work. The idea of treating lexical semantics in compositional terms has also been pursued in a number of recent works by Jackendoff (1990, and the references cited). Jackendoff proposes that the meaning components are organized in a Lexical Conceptual Structure (LCS), in which they serve as functions mapping semantic types to semantic types. For example, the LCS of *run* and *drink* are respectively given in (10) and (11):

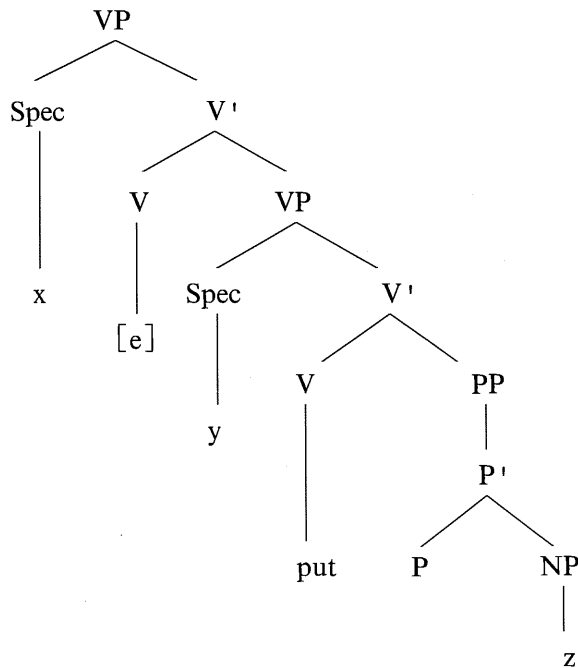
- (10) run
[Event GO [[Thing], [Path]]]

(11) drink

[_{Event} CAUSE ([_{Thing}]_i' [_{Event} GO([_{Thing} LIQUID]_j'
[_{Path} TO ([_{Place} IN ([_{Thing} MOUTH OF ([_{Thing}]_i))]))])]]]

In Hale and Keyser (1990), lexical decomposition is employed in constructing the "Lexical Relational Structure" (LRS) of a lexical item. The LRS may be thought of as an abstraction of the LCS, containing that part of the LCS that is syntactically relevant. Like Jackendoffs LCS, the argument structure (the LRS) of a verb does not just consist of a list of argument positions {x, y, z} that are hierarchically ordered as stipulated by the Thematic Hierarchy. These argument positions are actually placed in a "lexical syntactic structure" defined by the verb's LCS. Thus, the full argument structure of *put* is the Lexical Relational Structure below:³

(12)



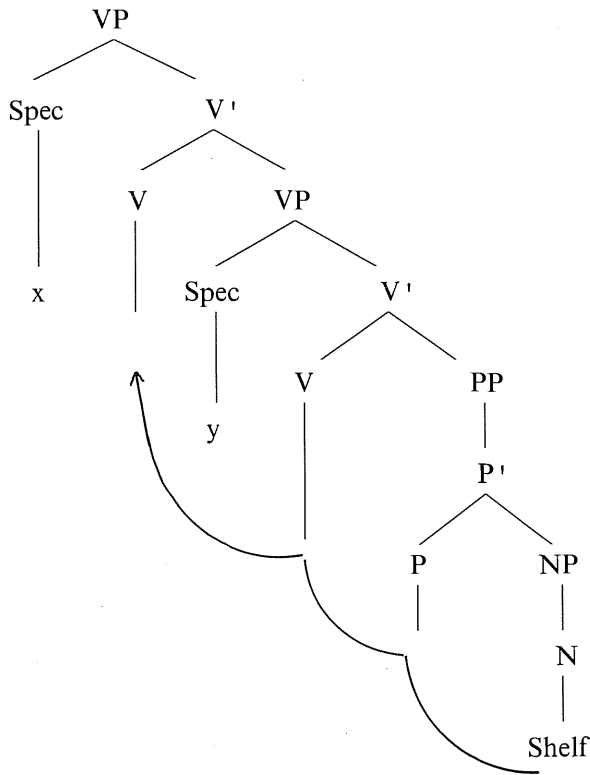
3. This is, strictly speaking, a derived argument structure, since the categories NP, PP, etc., derived from semantic categories like Location, Thing, etc.

In (12), the empty verb, by virtue of taking a VP complement that denotes an event of occurring, has the "pure meaning" of CAUSE. The argument x, by virtue of being the Spec of a causative verb, has the theta-role of Agent (or Causer). The argument y, by virtue of being the Spec of the lower VP, a category denoting an occurring (an inchoative or unaccusative construction), has the role Theme; and the argument z, by virtue of being in the complement position of an unaccusative category, is Location. The theta-role labels of the arguments are thus defined by this structure.

The LRS thus represents a kind of "event structure". An assumption incorporated in such event structures is that in a composite event involving two or more eventualities (a causing, an activity, a becoming, or a state), the causing event is more prominent than (i.e., asymmetrically c-commands) the becoming event, which is in turn more prominent than the state. From here the Thematic Hierarchy follows: Agent is higher than Theme because the eventualities denoted by CAUSE or DO are higher than the eventualities denoted by BECOME and BE. There is also an answer to the question why there are so few theta-roles. This simply arises from the fact that verbs are decomposable into a very small set of "pure verbs". The small number of eventualities explains the small number of possible theta-roles in natural language.

Hale and Keyser propose that the LRS's also define and constrain how certain lexical items may come to be derived in the lexicon. A denominal verb like *shelve* may be derived via Move α applied in "l-syntax" (lexical syntax) to an LRS akin to something like *put x on shelf* in "s-syntax" (syntactic syntax):

(13) Derivation of shelve in LRS:



Unergative verbs like *foal*, *laugh*, *jump*, etc., are treated as denominal verbs, from LRS's that are not unlike the syntactic structures of *had a foal*, *had a laugh*, *did a jump*, etc.

In other words, certain verbs have an event structure in the lexicon in which they are embedded under an abstract "pure verb" of some kind. Although Hale and Keyser are concerned primarily with only causatives and certain denominal verbs, it may be that all verb types may be represented in a similar way, as complements to some abstract verb. Under this hypothesis, all activity verbs (including unergatives and transitives) are complements to a predicate akin to DO. Inchoative predicates are embedded under BECOME or OCCUR. Statives are embedded under BE or HOLD. Causatives, of course, are embedded under CAUSE (in addition to DO). (Here CAUSE, DO, etc. are to be distinguished from *cause*, *do*, etc.)

- (14) a. ku 'cry':
[x DO [x ku]]
b. kan shu 'read books':
[x DO [x kan shu]]
c. pang 'become fat':
[OCCUR/COME ABOUT [x pang]]
d. pang 'fat'
[BE/HOLD [x pang]]
e. xihuan 'like'
[BE/HOLD [x xihuan y]]
f. qi-si 'to anger someone to death'
[x DO [x CAUSE [COME ABOUT [y qi-si]]]]

Under this view, each verb has an event structure associated with it in which it is embedded as the complement of some eventuality predicate. Such eventuality predicates are sometimes called aspectual predicates (Dowty 1979).

We assume that the eventuality predicates may be phonetically empty categories. General principles of grammar require that such empty categories be lexically supported (or licensed) by S-Structure. Thus, the verb of the mostly deeply embedded complement must be raised to the position occupied by an eventuality predicate. Hale and Keyser assume that LRS's like those in (14) may trigger Move α (in particular, head movement) in the lexicon, by which the lexical category in the most deeply embedded complement moves up to combine with one or more eventuality predicates, deriving various lexical verbs. A possibility remains that such structures as those in (14) may be directly projected to D-Structure and that head movement operates as a normal syntactic process, in the mapping between D- and S-Structure. In such cases, we expect to find evidence for the postulation of these event structures at the syntactic level.

In what follows I will show that there is evidence from Chinese that the event structures of the kind postulated in (14) are in fact observable in the syntax. That is, there is syntactic evidence for such event structures

at S-Structure, and therefore that a theory of lexical structure based on lexical decomposition not only provides a plausible answer to the question arising from the existence of the Thematic Hierarchy and the small number of theta-roles, but receives considerable support from its ability to explain interesting phenomena falling in the domain of syntax.

2. Lexical Decomposition and D-Structure in Chinese

Syntactic evidence for the event structures comes from constructions in which the verb appears away from its "expected" position, in a position outside of its maximal VP. In such constructions the verb can be seen to have raised into a position occupied by an abstract eventuality predicate. In Huang (1991) I showed that this can be observed in four kinds of constructions:

- (15) a. Causative constructions
- b. Possessive object constructions
- c. Constructions involving event quantification
- d. Genitive agent constructions

Causative constructions that involve syntactic verb raising are illustrated in (16):

- (16) a. *nei-jian shi ji-dong-de Zhangsan liu-chu-le yanlei.*
 that-CL matter excited-DE Zhangsan came-to tears
 That matter got Zhangsan so excited that he came to tears.
- b. *nei-ping jiu zhui-de Zhangsan zhan-bu-qi-lai.*
 that-bottle wine drunk-DE Zhangsan cannot-stand-up
 That bottle of wine got Zhangsan so drunk that he could
 not stand up.

I have argued elsewhere that in these constructions, the causative verb

originates in a "double-decker" VP structure under an abstract predicate CAUSE in D-Structure, as in:

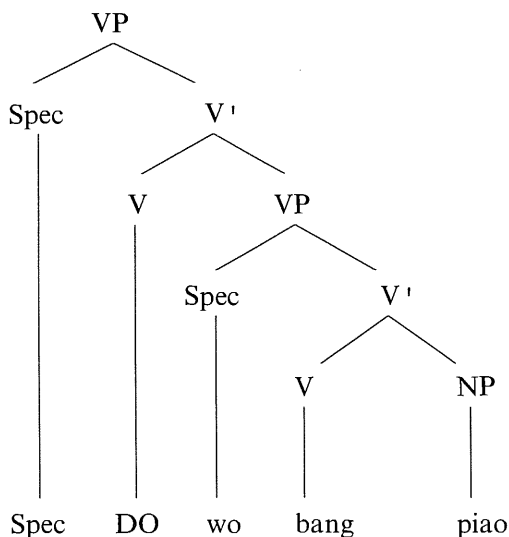
- (17) *nei-jian shi* [_{vp} CAUSE [_{vp} *Zhangsan jidong-de liu-chu-le yanlei*]].
that-CL matter Zhangsan excited-DE came-to tears

The surface form is obtained when the verb raises to take up the position of the abstract predicate CAUSE. This is treated as a case of syntactic causativization, rather than lexical causativization, because verbs like *jidong* 'excited' and *zhui* 'drunk' cannot themselves be used causatively taking a causee argument as its complement. (This property makes them different from causative verbs like *break*, *excite* in English, which could be derived in the lexicon through a lexical operation applying at the level of Lexical Relational Structure. The causative meaning is available only in the presence of an additional resultative predicate (like 'came to tears', 'could not stand up' etc.). This V-result combination clearly exceeds the size of a lexical category and cannot be the result of lexical derivation, so it must be treated syntactically.

Verb movement in the Possessive Object Construction is illustrated in examples like those in (18). The underlying structure for such a sentence involves a "double-decker VP shell" of the sort proposed by Larson (1988). I claim that the upper verb is a non-causative, action predicate which may be symbolized by DO, as in (19):

- (18) a. *tamen bang-le wo-de piao.*
 they tie-Perf my ticket
 They kidnapped me.
 b. *qing ni bie kai Lisi de wanxiao:*
 please you don't make Lisi 's fun
 Please do not joke with Lisi.

(19)



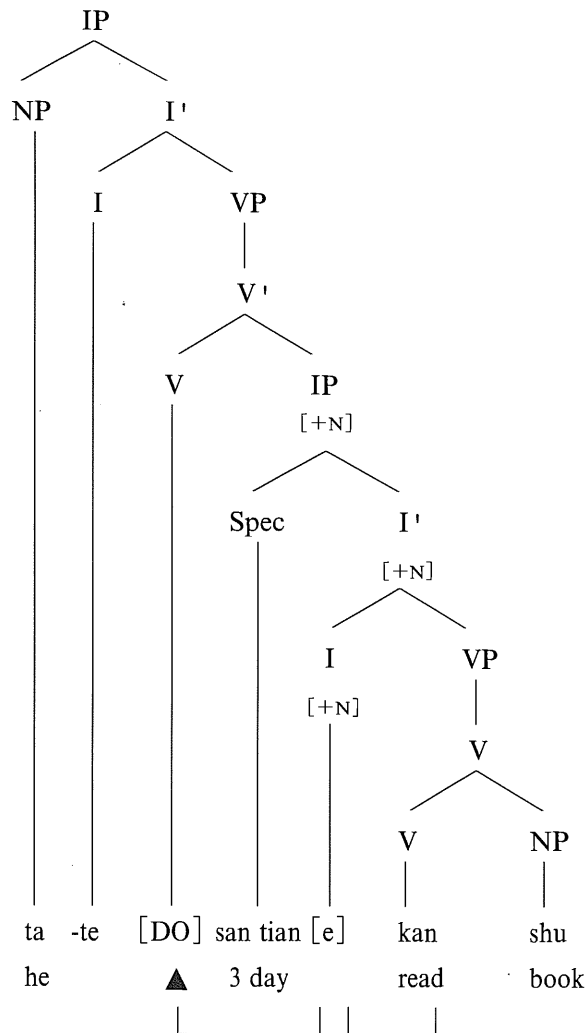
Certain sentences involving event quantification provide strong evidence for the existence of an abstract eventuality predicate DO:

- (20) a. ta kan-le san tian (de) shu.
 he read-Perf three day ('s) book
 He read (books) for three days.
 b. ta chang-le liang ci (de) ge.
 he sing-Perf two time ('s) song
 He sang twice.

The sentences in (20) contain expressions of duration and frequency that are, semantically speaking, quantifications over events expressed by the verb phrases (or the entire sentences), but syntactically these expressions clearly occur in construction with a concrete, non-event-denoting noun, each forming a constituent with the latter, as can be shown by standard constituency tests. In Huang (1991), I argued that this apparent syntax-semantics mismatch in fact does not exist, if sentences like (20) are analyzed as having each been derived from a structure of gerundive nominalization whose verbal head has moved out of the gerund VP, into

the position of the higher eventuality predicate DO, as shown in (21):

(21)



In this structure, the quantity expression *san tian* 'three days' modifies the gerund meaning 'reading book'. Thus this D-Structure is analogous in form to the English sentence "He did three days of reading books". After the verb *kan* moves to the empty verb position, the sentence comes to have the surface form "He read three days of books."

Gerundive nominalization under DO is also involved in sentences

like the following:

- (22) a. ta nian ta-de shu, wo shui wo-de jiao.
he read his book I sleep my sleep
Lit. He read his book and I slept my sleep.
- b. ni haohao jiao ni-de Yingwen ba.
you well teach your English Prt
Lit. You better teach your English well.
- c. ni chang ni de ba
you sing you 's Prt
Lit. You sing yours.
You go on with your singing.

According to my proposed analysis, (22b) would be derived from the underlying structure (23):

- (23) ni haohao [_{vp} DO [_{vp} ni-de jiao Yingwen] ba.
you well your teach English Prt

I have illustrated one construction involving an abstract predicate CAUSE and three constructions involving an abstract action verb DO. I want to point out now that in fact the existence of underlying eventuality predicates is more widespread than meets the eye. In the case of action sentences with DO, sentences like the following also provide important support for our analysis. (For more details, see Huang (1991).)

- (24) ta (de) laoshi dang de hao.
he ('s) teacher serves DE well
He serves well as a teacher.
- (25) zhe-ge xin, ni haishi bie dan.
this-CL heart you better not carry
It's better that you don't do this worry.

- (26) a. ta qi-lei-le ma le.
he ride-tired-ASP horse le.
(i) he went horseback riding and got tired.
(ii) he rode a/the horse tired.
- b. ta qi-lei-le liang-pi ma.
he ride-tired-ASP two-CL horse.
He rode two horses tired.
- c. ta qi-lei-le liang-ci ma.
he ride-tired-ASP two-time horse
He got tired twice from going horseback riding.

Each of these sentences has to do with the existence of a determiner of a concrete noun, which nevertheless quantifies an event semantically. Examples of this sort lead us to realize that the phenomena are widespread, and by no means limited to a few lexical items. Indeed, since our proposed analysis does not depend on the existence of event-quantifying expressions, it is entirely reasonable to assume that the same general analysis also applies to eventive sentences that do not contain expressions of event quantification.

The examples we have given to motivate the underlying predicate DO are primarily those that denote activities, in Vendler's classification. Those that exhibit the properties of underlying CAUSE primarily involve accomplishment predicates. In fact, accomplishment predicates can be analyzed as being embedded under both DO and CAUSE, because in accomplishments there is typically an activity that causes a new event to occur or a new state to come about. Like activity sentences, accomplishment sentences also allow event quantifiers occurring in construction with an object NP:⁴

4. All events can be quantified by frequency expressions, but only activities can be quantified by duration expressions:

- (i) ta ku-le san ci/ban tian.
He cried three times/for half a day.
- (ii) ta ma-le liang nian/ci Zhangsan.
He criticized Zhangsan twice/for two years.

- (27) Zhangsan gan-zou-le liang ci Lisi.
Zhangsan chase-away-ASP two times Lisi
Zhangsan chased away Lisi Twice.

What about predicates that denote achievements and states? Some achievement verbs are unergative or transitive, and it might be possible to postulate the predicate DO, for sentences like (28) and (29):

- (28) Zhangsan ying-le liang ci qiu.
Zhangsan win-ASP two times ball
Zhangsan won twice in ball games.
- (29) Zhangsan chenggong-le liang ci.
Zhangsan succeed-Perf two times
Zhangsan succeeded twice.

Other achievement verbs are unaccusative, however, and clearly cannot be analyzed in the same way. Note that even unaccusatives exhibit event quantification within NP:

- (30) pao-le liang ci fanren le.
escape-ASP two times prisoner ASP
Twice, prisoners have run away.

-
- (iii) ta ti-po-le liang ci/*liang-ge zhongtou chuangzi.
he kick-break-ASP two times/two hours window
He kicked the window broken for two times/*hours.
- (iv) zher pao-le san ci/*san tian fanren.
here escaped-ASP three times/three days prisoner.
Prisoners broke out here three times/*for three days.

It has been proposed by many that the telic/atelic distinction (achievements and accomplishments vs. states and activities) may be understood as being parallel to the count/mass distinction among nominals. Achievements and accomplishments are presumably inherently countable, and like count nouns, can only be modified by numbers (of happenings) but not by amount quantities (i.e., lengths. Cf. **a volume of book (s)*, **three heads of cows*). Activities are open-ended, and can be measured by lengths.

- (31) zheli diu-le san ci shu.
here lost three times books
For three times, books got lost from here.
- (32) waimian gua-qi-le liang ci feng.
outside blow-Asp two times wind
Twice it started to blow outside.

Rather, the underlying predicate is the one-place predicate BECOME or OCCUR. This predicate is itself unaccusative, so that the D-Structure of (30) looks like (33):

- (33) OCCUR [liang ci [pao fanren]]
two times run prisoner

The fact that the frequency expression can occur between the verb and the internal argument in these sentences again shows that the verb has raised, and this is evidence that there is a higher predicate position, marked by OCCUR in this case, to which the verb must raise.

Other inchoative sentences may be similarly represented, with stative predicates embedded under OCCUR (or BECOME).

- (34) Zhangsan pang-le liang bang.
Zhangsan fat-Asp two pounds
Zhangsan gained weight by two pounds.
- (35) taiyang de lian hong-qilai le.
sun 's face red-Inc Asp
The sun's face reddened.

Summarizing, we have seen that the predicates of all event sentences may be analyzed as being embedded under a pure event predicate of some sort at D-Structure. The most interesting syntactic evidence for this analy-

sis comes from sentences in which the verb has moved out of its "expected" position and landed at a higher position outside of the maximal VP. By contrast, there is no similar "overt" evidence for a stative predicate moving out of its maximal projection into a higher pure predicate position:

- (36) Zhangsan hen congming.

Zhangsan very clever

Zhangsan is clever.

- (37) wo xihuan shuxue, bu xihuan Yingwen.

I like math not like English

I like mathematics, but do not like English.

Stative sentences like (36) and (37) do not exhibit the phenomena of event quantification or enter into the genitive agent construction:

- (38) *wo xihuan-le san ci de shuxue.

I like-Asp 3 times 's mathematics

I liked mathematics three times.

- (39) *wo xihuan wo-de shuxue.

I like my mathematics

(Lit: I do my "liking mathematics".)

- (40) *ta de shuxue hen xihuan.

he 's math very like

cf. ta de shuxue jiao de hen hao.

he 's math teach DE very well

The lack of evidence for verb raising in these cases may lead one to the plausible conclusion that statives, unlike eventives, do not have an underlying eventuality predicate. On the other hand, one might assume

that the ungrammaticality of (38)-(40) has an independent explanation. For example, the fact that statives do not take event denoting quantifiers simply follows from the fact that they denote states, and that states cannot be quantified by frequencies or durations, whence (38) is ungrammatical. If the ungrammaticality of (39) and (40) can be likewise attributed to independent factors, then the possibility still remains that statives are embedded under a higher eventuality predicate of an appropriate sort, perhaps the predicate BE or HOLD (see Parsons (1991)).

3. On the Nature of the Eventuality Predicates

We have seen that sentences in Chinese exhibit interesting *prima facie* evidence for lexical decomposition, in that a simple verb may be represented by a combination of two or more verbal positions. In particular, each verb may involve an underlying verb like CAUSE, DO, BECOME, OCCUR, BE or HOLD. The existence of these phonetically empty verbs triggers verb movement, explaining observed surface word order patterns. The idea that verbs move out of their local maximal VP into a higher verbal position has been around for a long time already in the generative literature. More recently, Larson (1988) argues that all transitive verbs originate in a position lower than the theme object and move into a higher "VP shell" at S-Structure. Bowers (1993) proposes that the phrase structure of a sentence includes a projection of Predicate Phrase, which takes a VP as its complement and an external argument as its subject. A similar proposal is made in Tang (1990) for Chinese clause structure. Johnson (1992) argues that all verbs move out of their maximal VP into the head of a higher projection whose identity he did not discuss. One question that this inevitably raises is whether this higher V position has any content, or is just a pure formal entity posited to accommodate the theory of head movement. A natural answer to this is that the head of the VP Shell or the Predicate Phrase is occupied by one of these eventuality predicates, which identifies its complement as an action, a becoming, an occurring, a situation, or a complex event of causation.

That is, the postulation of the eventuality predicates provides semantic content to the higher syntactic positions postulated in the recent literature.

This idea of decomposition is, of course, essentially that of the generative semanticists'. Although one version of the idea was shown to be difficult to maintain, there are alternative versions that are free from the difficulties raised. For example, in "Three reasons for not deriving *kill* from *cause to die*," Fodor (1970) observed the following contrast in grammaticality:

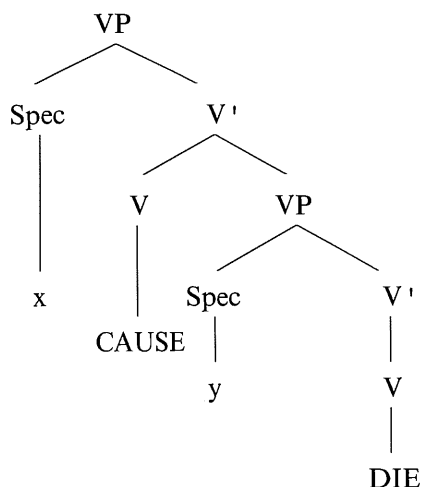
- (41) John caused the man to die on Sunday by shooting him on Saturday.
- (42) *John killed the man on Sunday by shooting him on Saturday.

Furthermore, although the sentence (43) is ambiguous, with the *by* phrase modifying either *cause* or *die*, the sentence (44) is not ambiguous at all:

- (43) John caused Bill to die by swallowing his tongue.
- (44) John killed Bill by swallowing his tongue.

The answer to these problems is that the decomposition analysis does not literally derive the structure underlying (42) or (44) from the structure underlying (41) and (43) respectively. (41) and (43) each involve a structure of sentential complementation at the syntactic level, with two full verbs each of which has its own maximal projection and its own argument structure. In the lexical decomposition analysis of *kill* as indicated in (45), there are several possible ways to explain the differences between *kill* and (the lower-case) *cause to die*. First, we may assume that incorporation takes place in the lexicon in an LRS of *kill* like (45) and that *kill* is directly inserted into a simple verb position at D-Structure.

(45)



Since LRS's are only concerned with positions in a core argument structure, adverbial modifiers are not represented in (45). Rather, the adverbials are generated in appropriate positions at D-Structure, licensed by some appropriate heads (cf. Travis 1988, Tang 1990). Since there is only one verb at D-Structure, no more than one time phrase or by-phrase is allowed.

The same result can be obtained even if syntactic head-movement is posited. The needed assumption is that as a result of incorporation, the argument structures of the two verbs must merge into one. More specifically, the argument structure of the lower verb is absorbed into the argument structure of the higher verb. In case the number of argument positions available in the composite argument structure is less than the sum of argument positions selected by the two verbs, some arguments must be left out, or be "theta-identified" with others in the sense of Higginbotham (1985). (See Li (1990) and subsequent work by him for a detailed study of theta-identification involving V-V compounds.) An extension of a similar mechanism to adjuncts would ensure that, in V-movement structures, any time or manner adjunct, for example, associated with the lower verb must be identified with that associated with the higher verb.

Another way to express this idea is to say that V-movement chains

constitute a single "extended projection" of the lower verb in the sense that it adds an argument place to the argument structure of the lower verb, but does not select any adjuncts or modifiers of its own. (In Chomsky (1992), argument positions associated with a single head-chain are equidistant to a given position. That is, the capitalized CAUSE is different from the lower-case *cause* in that, unlike the latter, it only exists as part of a complex predicate and serves only to extend the argument structure of the lower verb.⁵ In this respect, it behaves like *do* and *occur*, which exhibit the phenomenon of "transfer" even in contexts in which they appear as full main predicates. Reichenbach observed that modifiers of *occur* may transfer to the event that it is predicated of. The four sentences in (46) are equivalent.

- (46) a. A flight occurred over the North Pole in a light aircraft in 1926.
b. A flight over the North Pole occurred in a light aircraft in 1926.
c. A flight over the North Pole in a light aircraft occurred in 1926.
d. A flight over the North Pole in a light aircraft in 1926 occurred.

The same observation can be made of *do* in (47):

- (47) a. John did yesterday's reading of the poem.
b. John did the reading of the poem yesterday.
c. John read the poem yesterday.

These constructions are reminiscent of the "light verb construction"

5. Another way to avoid multiple adjuncts associated with a verb that results from syntactic V-movement is to take the idea, proposed by Lebeaux (1992), that adjuncts are inserted at S-Structure, after syntactic manipulations of argument structures have taken place. (Cf. Chomsky 1992.)

in Japanese discussed by Grimshaw and Mester (1988), Miyagawa (1989), Terada (1990), Kajihara (1992) and others. Japanese uses a large number of "verbal-noun" expressions either of Chinese origin or of Sino-Japanese origin. In Chinese these expressions are often used as verbs, but in Japanese they must occur with the verb *suru* in one of two forms. They can occur as nominals, with the Accusative Case marker, as the object of *suru*. Or they may occur in uninflected form directly preceding *suru*.

- | | | | | |
|------|----|-----------------|---------------|--------------|
| (48) | a. | benkyoo-o suru | benkyoo suru | 'to study' |
| | b. | kaisetsu-o suru | kaisetsu suru | 'to explain' |
| | c. | keikoku-o suru | keikoku suru | 'to warn' |
| | d. | cyuumon-o suru | cyuumon suru | 'to order' |

The "o-suru" construction occurs with sentences with an external argument, i.e., transitive action sentences or unergatives:

- | | | |
|------|----|---|
| (49) | a. | Hanako-wa sensei-ni shitumon-o shi-ta. |
| | | Hanako teacher question suru-Past |
| | | Hanako questioned the teacher. |
| | b. | Hanako-wa [oba-no uchi]-e denwa-o shi-ta. |
| | | Hanako Aunt's house telephone suru-Past |
| | | Hanako telephoned Aunt's house. |
-
- | | | |
|------|----|--------------------------------|
| (50) | a. | Taroo-ga seki-o shi-ta. |
| | | Taroo cough suru-Past |
| | | Taroo coughed. |
| | b. | Taroo-ga kusyami-o shi-ta. |
| | | Taroo sneeze suru-Past |
| | | Taroo sneezed. |

With event-denoting unaccusatives and stative sentences, however, the form "o-suru" is unacceptable:

- (51) a. *atarashii riron-ga tanzyoo-o shi-ta.
new theory birth suru-Past
A new theory was born.
- b. *Tanaka sensei-ga shikyo-o shi-ta.
Tanaka teacher death suru-Past
Professor Tanaka died.
- (52) a. *Tomo-ga kimi-no kansha-o shi-teiru.
Tomo you appreciation suru-Pres
Tomo is very appreciative of your efforts.
- b. *kono NP-wa ano PP-no c-command-o shi-teiru.
this NP that PP c-command suru-Pres
This NP c-commands that PP.

On the other hand, the construction in which *suru* is directly preceded by the uninflected "verbal noun" is acceptable regardless of verb classes. Thus, all of (51)-(52) become grammatical once the Accusative case is deleted, and so are those in (49)-(50):

- (53) a. Hanako-wa sensei-ni shitumon shi-ta.
Hanako teacher question suru-Past
Hanako questioned the teacher.
- b. Hanako-wa [oba-no uchi]-e denwa shi-ta.
Hanako Aunt's house telephone suru-Past
Hanako telephoned Aunt's house.
- (54) a. Taroo-ga seki shi-ta.
Taroo cough suru-Past
Taroo coughed.
- b. Taroo-ga kusyami shi-ta.
Taroo sneeze suru-Past
Taroo sneezed.

- (55) a. atarashii riron-ga tanzoo shi-ta.
new theory birth suru-Past
A new theory is born.
- b. Tanaka sensei-ga shikyo shi-ta.
Tanaka teacher death suru-Past
Professor Tanaka died.
- (56) a. Tomo-ga kimi-ni kansha shi-teiru.
Tomo you appreciation suru-Pres
Tomo is very appreciative of you.
- b. kono NP-wa ano PP-o c-command shi-teiru.
this NP that PP c-command suru-Pres
This NP c-commands that PP.

This array of properties seems to suggest that there are two uses of the verb *suru*. In the "o-suru" construction, *suru* is a two-place predicate akin to the transitive verb *do* in English which s-selects an agentive or otherwise animate being as its subject and an action as its complement. In addition, it c-selects an NP (as a realization of the action it s-selects) and assigns Case to the NP. (Alternatively, it contains [+Case], and hence c-selects an NP, cf. Pesetsky (1982).) In this case *suru* behaves like the empty DO that we posited in connection with sentences involving event quantifying measure phrases and the possessive agent construction in Chinese. The difference is that verb raising has occurred in Chinese, but it has not in Japanese. That is, the *o*-marked complements of *suru* are gerundive constructions, i.e. nominalized verb phrases, which denote actions. Only *suru* with these selectional properties can assign the Accusative Case. Where an unaccusative or stative VP is embedded under it, *suru* (with the meaning of 'occur' or 'be' rather than 'do') is a one-place predicate that has no external argument and does not assign Case. Hence unaccusative or stative VPs cannot occur in the "o-suru" construction. (This analysis is at variance with Grimshaw and Mester (1988), who argue that the *suru* does not have an argument structure of its own. See

Terada (1990) and Kajihara (1992) for alternatives to their analysis.)

The other use of *suru*, the one without the Accusative marker seems to be an overt form of a general eventuality predicate DO, OCCUR, or BE. In this case *suru* s-selects an eventuality (an action, an event, or a state) as its complement, and c-selects a VP as the structural realization of the complement. In other words, in each case we have a Larsonian VP shell with *suru* occupying the higher V position. If *suru* selects an activity, it also selects an agent as its subject, like the verb *do*. If it selects a non-active event (an occurring), or a state, then it does not select a subject, like the raising verbs *occur* and *be*. Since VPs do not need Case, the "verbal noun" need not be marked with the Accusative case. Instead of nominalization, here we have incorporation, by which the lower verb moves up to form a complex predicate with *suru*. Since *suru* selects an eventuality (which can be an action, an event, or a state), all verb types are compatible with this use of *suru*.

Thus the so-called light verb *suru* may be simply regarded as the Japanese counterpart of the empty "eventuality predicate" we have posited. It has been proposed (Grimshaw and Mester (1988), Miyagawa (1989)) that the light verb construction involves a phenomenon of argument transfer. We can understand these to be the result of complex predicate formation. When the eventuality predicate combines with the main predicate of its complement, arguments of the individual predicates become arguments of the composite predicate, or are theta-identified with the latter.

Summarizing, there is evidence for a lexical decomposition approach to lexical semantics. In Chinese the evidence exists in the form of an empty verbal position to which a verb may raise. Similar evidence has been adduced in English in treatments of double-object constructions (Larson (1988)), of object positions (Johnson (1992)), and of other aspects of clausal structure (e.g. Bowers (1993)). In Japanese, evidence comes from the light verb construction in which the main predicates are embedded under a semantically bleached verb.

4. Lexical Decomposition and "Event Talks"

If the lexical decomposition approach to lexical semantics is on the right track, it provides important support for the semantic theory that has been developed in one form or another since the important work of Donald Davidson (1967). Davidson's classical observation is that the logical form of action sentences, but not that of stative sentences, contains an underlying position expressing the existence of an event. Thus, although a simple sentence like (57) appears to contain only a verb and two definite, non-quantificational arguments, a proper representation of its logical form indicates that it involves existential quantification.

- (57) Zhangsan da-le Lisi.
Zhangsan hit Lisi.

The logical form of (57) is not the simple (58), but something along the lines of (59a)-(59c):

- (58) hit (Zhangsan, Lisi)
- (59) a. $(\exists x)(\text{Zhangsan hit Lisi } (x))$
b. $(\exists x)(\text{hit (Zhangsan, Lisi, } x))$
c. $(\exists e)(\text{hitting } (e) \ \& \ \text{Subject } (e, \text{Zhangsan}) \ \& \ \text{Object } (e, \text{Lisi}))$

(59a) is the logical form provided by Reichenbach (1947), according to which the entire sentence is predicated on the event. Davidson takes the event to be an argument of the predicate *hit*, as is shown in (59b). Parsons (1991) takes the event as being defined by the verb itself. Following Davidson's semantics, Higginbotham (1985) proposes that the argument structure of each event predicate contains an "event place":

- (60) hit (x, y, e)

In fact, Higginbotham and Parsons have extended Davidson's theory to sentences of all eventuality types, so that even a stative predicate has a place for a state or situation.

While the Davidsonian semantics is undoubtedly accepted now by many as a central part of mainstream semantic theory, the question has always remained as to how the semantics is to be related to its syntax, in particular, where the event argument can be located within a standard theory of syntactic structure. It is a standard assumption that an argument in syntactic structure corresponds to a variable position in logical form, and conversely. In (60), the variables *x* and *y* correspond to the syntactic constituents *Zhangsan* and *Lisi*, but the event variable appears to correspond to no position in syntax.

One answer to this question that has been proposed is that the event place really does not denote an event per se, but refers to a temporal/spatial location. Davidson himself has observed that an event entails a location and a time, so if John hit Bill, then he hit him at some place and some time. Thus, the variable *e* in (60) might be considered to represent an implicit argument denoting time and place. This answer is not entirely satisfactory, however. For one thing, if the Davidsonian argument is taken to literally denote a temporal/spatial location, then there should be two event places, since time and place are expressed in syntax by two separate constituents. Furthermore, a time/place constituent is generally considered an adjunct but not an argument in syntax, and they behave on a par with other adjuncts, with respect to extraction, theta-marking, optionality, etc. In addition, this interpretation by itself does not account for some of the facts that have been shown to motivate the Davidsonian argument. Consider an argument for the event place, given by Parsons (1991), based on inference patterns like the following:

- (61) In every burning, oxygen is consumed.
- (62) Agatha burned the wood.
- (63) Oxygen was consumed.

The inference from (61) to (63) is clearly valid, even though there is no reference to an event in the second premise. Adding a time or location argument in (62) will lead to existential quantification over temporal/spatial locations, but still does not refer to an event. However, if an underlying event argument is assumed in the argument structure of *burn* in (62), it would be existentially quantified and the inference goes through in standard predicate calculus. Similarly, the assumption of an event place aptly ensures that although (64) entails (65) and (66), the combination of (65) and (66) does not entail (64):

- (64) John saw Bill at the bank yesterday.
- (65) John saw Bill at the bank.
- (66) John saw Bill yesterday.

That (65) and (66) do not jointly entail (64) is not expected if none of these sentences involve existential quantification. But if all these sentences involve existential quantification over events, then the failure of entailment simply follows from the fact that (65) and (66) are bound by independent existential quantifiers.

- (67) (\exists_e) (saw (John, Bill, e) & at the bank (e) & yesterday (e))
- (68) (\exists_e) (saw (John, Bill, e) & at the bank (e))
- (69) (\exists_e) (saw (John, Bill, e) & yesterday (e))

That is, (65) says that there is an event that took place at the bank, and (66) that there is an event that took place yesterday. But the combination of (65) and (66) may well refer to two separate events of seeing, one at the bank last week, and one yesterday in the market. There need not be an event of seeing that took place at the bank yesterday.

If the event place denotes an event per se, rather than a temporal/spatial location, then we are back to the same question: what position does this event place occupy in syntactic structure?

The lexical decomposition analysis provides a ready answer. In Japa-

nese, the event argument directly appears as the complement of the light verb *suru*, in both versions of the light verb construction. In Chinese, the event argument is the complement of the empty eventuality predicate DO, CAUSE, OCCUR or BE. Assuming as I have that the eventuality predicates occupy syntactic positions at D-Structure, then events and states are simply the internal arguments of these predicates. Instead of the logical forms in (59), the logical form of (57) is (70) (assuming restrictive quantification):

(70) $(\exists x \text{ (hitting Lisi (x)) (Zhangsan DO x)})$

Given the verb-raising analysis we gave to it, the sentence (71)

(71) ta xue-le liang ci Yingwen.
he study-Perf twice English
He took up English twice.

has the logical form (72):

(72) $((2_x \text{ (xue Yingwen (x)) (ta DO x)})$

A sentence like (73) is ambiguous:

(73) ta mai-le san-ben shu.
He bought three books.

On the one hand, there is an event in which he bought three books; on the other, there are three books each of which involves an event of buying. In the former reading, there is a single event, and in the latter, there can be a maximum of 3 separate events. This ambiguity is akin to the ambiguity we find with sentences like (74)-(75):

(74) Someone from two areas of social science was nominated for membership in the Academy.

(75) Someone bought every book.

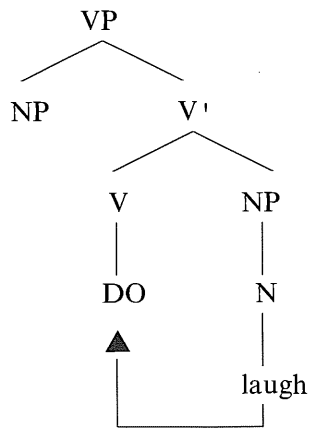
In (74), either someone whose research crosses two areas of social science got nominated (one single nominee), or in each of two areas of social sciences someone got nominated (maximally two nominees). In (75), either one single person bought all the books, or every book was bought by someone or another (maximally 10 buyers for 10 books). The ambiguity of (73) can be treated as one that arises from the interaction of two quantifiers: a quantification of the books by *san ben* and an existential quantification over the event. Under one reading, '3 books' has scope internal to the event argument, and under the other reading, it is "inversely linked" (May (1977)) to the event argument. The LF representations, after QR has applied, are given in (76):

(76) $((3_x: x=\text{shu}) (E_y: y=\text{mai } x) (\text{ta DO } y))$ (Inversely linked)

(77) $((E_y: y=((3_x: x=\text{shu})(\text{mai } x)) (\text{ta DO } y))$ (Internal scope)

Summarizing, in the cases we have seen, the hypothesis that there is an abstract "light verb" above an event-denoting predicate provides a syntactic root for the semantics of events. Although we have seen that this level of representation can be syntactic (e.g., D-Structure), as we have assumed is the case in Japanese and Chinese, it is possible that for some constructions in some languages, this underlying representation exists in the lexicon but not in syntax. That is, as has been suggested by Hale and Keyser for English, it is possible that the event structure exists only in the form of an argument structure, or Lexical Relational Structure, which may be thought of as an abstraction of the syntactically relevant parts of Jackendoff's Lexical Conceptual Structure. Thus, in Hale and Keyser's terms, verb movement takes places in the lexicon, forming a denominal verb like *laugh* from the Lexical Relational Structure (78):

(78)



As a result of this lexical operation, the event argument NP is erased, and the verb is used as an intransitive unergative, having the resulting argument structure (79), which is then projected into syntactic structure as a one-place predicate:

(79) laugh (x)

There are two possible ways to talk about the semantics of events in terms of its syntax even if verb movement is considered a lexical process. One possibility is that semantic interpretation has direct access to lexical structure in addition to syntactic structure. The "L-syntax" (the LRS) may directly provide input to semantic interpretation, where an event is represented as a constituent. Another possibility is that, although the event argument in (78) is suppressed as a result of a lexical operation, it is not entirely deleted, but continues to exist as an "implicit argument" in the sense of Roeper (1984). In some cases the implicit argument does appear, e.g., as a cognate object, in (80):

(80) John laughed a laugh.

As Keyser and Roeper (1984) show, implicit arguments exist in passives

but not ergatives:

- (81) The boat was sunk to collect insurance.
- (82) *The boat sank to collect insurance.

The difference between passives and ergatives is that passives involve suppressed agents but ergatives do not. If it can be assumed that arguments that are suppressed by a lexical operation continue to exist as an implicit argument, then instead of (78) the argument structure (83) is projected to syntax, and the semantics of an event can be directly read off from its syntax:

- (83) laugh (x, e)

5. Conclusion

As a conclusion, I note a few aspects of semantics that have been discussed in Eventlish terms and consider their relation with the underlying event-argument hypothesis. It has been observed (most recently by Krifka (1989)) that sentences like the following exhibit semantic properties that are not directly readable off from their syntax given standard rules of composition:

- (84) a. 4,000 ships passed through the lock last year.
- b. More than 10,000 people travel on USAir each month.
- c. I have already washed 200 dishes today.

A related group of sentences, which have been treated in some detail by Leder (1991), exhibit similar properties:

- (85) a. The occasional sailor who comes in will be shot.
b. You can see an occasional cloud in the sky.
c. An occasional woman in America speaks Finnish.
d. Let's go have a quick cup of coffee.

In the sentences in (84) a numeral quantifier associated with a concrete noun can be interpreted as referring not to the number of ships, people, or dishes, but to the number of ship-passing, traveling, or dish-washing events, so that (84a) can be true even if only 2500 ships actually participated in the passing, as long as some of them pass through the lock more than once to make a total of 4000 passing events. In the sentences in (85), a nominal modifier appears to denote the properties of an event verb below it (as in (85a)) or above it (as in the others), rather than the properties of the head noun. Thus, (85a) does not talk about a sailor who is occasionally a sailor, but one who comes in occasionally. (85b-c) mean that, occasionally, you can find a cloud in the sky or an American woman speaking Finnish.

These cases thus present a kind of syntax-semantics mismatch that are reminiscent of the cases of event quantification in Chinese we discussed earlier. A reasonable question that arises is whether these cases can be treated in the same way that we have proposed, as involving movement out of an event argument into a higher predicate position of the type represented by DO, OCCUR, etc.

While it is not impossible to devise a syntax in such a way that these sentences can be treated in terms of an abstract light verb construction, a number of facts suggest that they should be treated differently. For one thing, the phenomenon illustrated in (85) is not observed at all in Chinese, even though the cases of event quantification involving frequency and duration quantifiers are wide spread. *ouran de* 'occasional(ly)' in Chinese must be directly interpreted with the event noun or verb that it occurs in construction with:

- (86) a. wo pengshang-le yi-chang ouran-de yu.
I meet-Perf one-CL occasional rain.
I encountered an occasional rain.
- b. women pengjian-le yi-ge ouran-de guoke.
we meet-Perf one-CL occasional passer-by
We met an occasional passer-by.
- c. women ouran (de) kanjian yi-ge nüren.
we occasionally see-Perf one-CL woman
We occasionally saw a woman.
- d.* women kanjian-le yi-ge ouran-de nüren.
we see-Perf one-CL occasional woman.

Secondly, the phenomenon illustrated in (85) is extremely limited, subject to lexical idiosyncrasies. Thus although one can use (85c) to mean "occasionally a woman can be found speaking Finnish", one cannot use (87):

- (87) *A frequent woman in Europe speaks more than two languages.

to mean "Frequently, a woman in Europe can be found speaking more than two languages". This lack of generality suggests a lexical treatment. Perhaps for the adjectival *occasional*, one may simply list the reading "occasionally observed" or "a small quantity/number of" (an occasional woman=a few instances of a woman).⁶

The cases illustrated in (84) are likewise subject to limitations that make them difficult to analyze in general syntactic terms. Examples like (84) are acceptable only when the speaker has reason (or excuse) to be vague about the actual number of ships, people, etc., and as such they are probably better dealt with as cases of vagueness, rather than ambiguity. For example, if one knows well that a single person has entered

6. There is no syntax-semantics mismatch in this case, then. In Higginbotham's (1985) semantics, *occasional* can be taken as a modifier of the event place *e* of the noun *woman* (woman (x, e), *e* the event/situation of being a woman), but not as a modifier of the event of speaking Finnish.

the room 200 times, it is simply a lie to say that 200 people entered the room today. Such a sentence may be accommodated if at least, say, 120 different people were involved. On the other hand, it is possible to say that you have washed 200 dishes if you are to be paid by the number of washed dishes, even if the same single dish has been washed 200 times. It seems that in these cases the quantified nouns are being interpreted as different instances of objects at different stages of time. That is, a dish washed today is a different dish from the dish that is made dirty tomorrow. (Cf. *John is not himself today*.) This interpretation is subject to certain pragmatic constraints, and should not be derived syntactically by a general process of verb movement.

One more important case that has been cited in support of an underlying Davidsonian argument has to do with the interpretation of bare plurals in English, studied in depth by Carlson (1977). Carlson observed that bare plurals in English exhibit variable interpretations depending on the kinds of predicates they are associated. With "stage-level predicates", which describe events or some transient properties of their subjects, a bare plural receives an existential interpretation, whereas with an "individual-level predicate," which ascribes a general property to its subject, a bare plural is interpreted generically. The point can be illustrated with bare NPs in Chinese also:

- (88) a. Zhangsan zai gen xuesheng tanhua.
Zhangsan at with student talk
Zhangsan is talking with students.
c. yuyanxuejia you zai chaonao le.
linguists again at quarrel Asp
Linguists are quarreling again.
b. lang lai-le!
wolf come-Perf
Wolves are coming!

- (89) a. Zhangsan hen xihuan youggong de xuesheng.
 Zhangsan very like diligent student
 Zhangsan like diligent students.
- b. yuyanxuejia bu dong kexue.
 linguists not understand science
 Linguists don't understand science.
- c. lang pao-de kuai.
 Wolves run fast.
 Wolves run fast.

To account for bare plurals uniformly without ad hoc devices like empty determiners, Carlson proposed that bare plurals should be treated as names of kinds. Stage-level predicates are assumed to involve existential quantification of some temporal/spatial slices (called "stages") which realize the kinds, but individual-level predicates do not. Thus the logical forms of the sentences in (88) are:

- (90) a. $(\exists_s) (R(xuesheng, s) \& (gen-tanhua(Zhangsan, xuesheng, s)$
 b. $(\exists_s) (R(yuyanxuejia, s) \& chaonao(yuyanxuejia, s)$
 c. $(\exists_s) (R(lang, s) \& lai-le(lang, s)$

(90b), for example, says that some slices of the professional linguistics community are involved in a quarrel. This is equivalent to saying that some linguists are having a quarrel. The existential readings of (88a) and (88c) are also represented in (90). Individual-level predicates, however, do not invoke stages, so bare plurals are interpreted generically, referring to whole kinds. (89a) means that Zhangsan likes the kind of things we call diligent students. (89b) says that the kind of things we call linguists do not know science, etc.

In Carlson's theory, the logical form of stage-level sentences thus includes a position denoting stages. Recently, Kratzer (1989) and Diesing (1989) propose to interpret this position in LF as being filled by the Davidsonian argument, interpreting it as denoting not an event, but a tem-

poral/spatial location. Kratzer further assumes that the temporal/spatial argument is the external argument of the stage-level predicates. Following Williams' theory of syntactic projection, all external arguments are mapped into [Spec, IP] at D-Structure, and all other arguments are mapped into VP. Thus, in the case of stage-level predicates, since the Davidsonian argument is already mapped to Spec of IP, the subject argument is mapped to Spec of VP. The Spec of VP may in turn raise to Spec of IP, presumably due to de-thematization of the latter, which relocates the Time/Place argument to an adjunct position. The resulting S-Structure of a stage-level sentence will have its subject in Spec of IP binding a trace in Spec of VP, as in (91). In the case of an individual-level predicate, however, the subject is the external argument already, and it must be base-generated at Spec of IP at D-Structure, and does not bind a trace in VP in the S-Structure (92):

- (91) [_{IP} yuyanxuejia [_I, [_{VP} t_i you [_V, zai chaojia]]]]
 linguists again at quarrel

- (92) [_{IP} yuyanxuejia [_I, bu [_{VP} [_V, dong kexue]]]]
 linguists not understand science

Assuming the framework of unselective binding proposed by Heim (1982), Kratzer and Diesing treat bare plurals as indefinites which do not have inherent quantificational force but derive their quantificational force from their local binder. Adapting Heim's proposal, all material in Spec of IP is mapped into the restrictive clause of a logical form, where the subject is bound by a generic "adverb of quantification" (Lewis (1975)); whereas all material in VP is mapped onto the nuclear clause, where a plural will be bound by "existential closure". Since the subject of an individual-level predicate appears only in Spec of IP, it is bound in the restrictive clause by the Generic operator, and receives a generic interpretation. In the case of a stage-level predicate, however, the subject may be lowered down to VP (under QR or reconstruction), where it can be

bound by existential closure, thus giving rise to its existential interpretation.

While this theory succeeds in deriving some aspects of the semantics of bare plurals, one crucial aspect of the Kratzer-Diesing account is that they take the stage-individual distinction to represent a parameter between two predicate types with respect to the VP Internal Subject Hypothesis: only stage-level predicates have VP-internal subjects, individual-level predicates do not. As pointed out in Burton and Grimshaw (1992), this makes the powerful prediction that VP coordination can occur only when the conjuncts are uniformly stage-level predicates or uniformly individual-level predicates. A coordinate VP containing a stage-level predicate in one conjunct and an individual-level predicate in another is ruled out by the Coordinate Structure Constraint.

- (93) John liked Bill a lot but often criticized him.

Another problem the Kratzer-Diesing hypothesis encounters has to do with VP fronting and the interpretation of anaphors. Huang (1993) discusses the following contrasts between predicate fronting and argument fronting:

- (94) a. Which pictures of each other do they think we should buy?
b. Criticize each other, they said we should not.
- (95) a. Which pictures of each other did they say that I should buy?
b. *How proud of each other did they say that I should be?

The contrasts between the (a) and (b) sentences indicate that, in a fronting structure, although the anaphor *each other* can be bound by either the matrix or the embedded subject when the fronted phrase is an NP, the ambiguity does not arise if a predicate is fronted. In the latter case the anaphor must be bound by the lowest subject as if no movement had

taken place. It is suggested in Huang (1993) that this follows straightforwardly from the VP Internal Subject Hypothesis, because under this hypothesis a predicate (but not an NP) will contain a trace of the lowest subject, and that this trace will necessarily be the antecedent of the anaphor, as required by Condition A of Binding Theory. When fronting takes place the internal subject trace will be moved along with it, and no other binding possibility for the anaphor will arise. The S-Structure of (94b), for example, is:

- (96) [_{VP} t_i Criticize each other], they said we_i should not [_{VP} e].

In this structure, *each other* is necessarily bound by t_i, which is the trace of *we*. Therefore *each other* must take *we* as its antecedent. In the case of (94a), the fronted NP does not contain a trace of *we*, so *each other* may have different antecedents depending on where the moved phrase is reconstructed to.

Under this account, the Kratzer-Diesing hypothesis predicts that only when a stage-level predicate is fronted will an anaphor contained in it be required to be bound by the lowest embedded subject. Ambiguity may arise if an individual-level predicate is fronted. This prediction is, again, incorrect, as can be seen by comparing (94a), with a stage-level predicate *criticize* fronted, and (95b), with an individual-level predicate *proud* fronted. In both cases *each other* must be bound by the lower subject. The following sentences, with the individual-level predicate *resemble*, illustrate the same point:

- (97) a. ...and resemble each other, they said we surely do.
b. *...and resemble each other, they said I surely do.

A third problem with the Kratzer-Diesing hypothesis is that it predicts that all bare plurals contained in VPs should be existential. As Diesing herself notes, sentences with experiencer verbs like *hate*, *love*, *respect*, *like*, etc. take generic plurals:

- (98) a. I love dogs.
b. They respect diligent scholars.

But generic object plurals are much more widespread:

- (99) a. Lions resemble cats.
b. They discussed human beings.
c. John learned about mammals yesterday.
d. Bill talked a lot about books last Friday.

These problems, taken together, cast doubt on the Kratzer-Diesing hypothesis. Although the hypothesis, derived from Carlson, seems to be correct that only stage-level predicates are associated with a Temporal/Spatial "argument", that fact does not seem to bear on the position of a subject within a clause. Perhaps, as suggested by Chierchia (1992), the stage-individual difference is that whereas stage-level predicates select an existential adverb of quantification (Lewis (1964)) like *sometimes*, *somewhere*, individual-level predicates select a generic operator (e.g., *generally*). And a bare plural acquires its quantificational force from the adverb of quantification which binds it. This would already go a long way towards the semantics of plurals, though sentences like (99b-d) will need further explanation.

Finally, note that the stage-individual distinction of predicates should be distinguished from the difference between events and states. Although event predicates are generally (perhaps always) stage-level predicates, not all stage-level predicates denote events. Adjectives, for example, denote states, but many adjectives are by definition stage-level predicates: *sick*, *available*, *excited*, *angry*, *ready*, etc. Thus it seems that the so-called Davidsonian argument should be considered to denote an event (or an eventuality) in the literal sense, and not a temporal/spatial location.

References

- Baker, Mark (1987) *Incorporation*. Chicago University Press, Chicago.
- Bowers, John (1993) 'The Syntax of Predication,' *Linguistic Inquiry* 24, 591-656.
- Burton, Strang and Jane Grimshaw (1992) 'Coordination and VP Internal Subjects,' *Linguistic Inquiry* 23, 305-313.
- Carlson, Gregory (1977) *Reference to Kinds in English*. Doctoral Dissertation, University of Massachusetts at Amherst.
- Chierchia, Gennaro (1992) 'Individual Level Predicates as Inherent Generics,' ms., Cornell University.
- Chomsky, Noam (1981) *Lectures on Government and Binding*, Foris Publications, Dordrecht.
- Chomsky, Noam (1992) *A Minimalist Program for Linguistic Theory*. MIT Working Papers in Linguistics. MIT, Cambridge, Massachusetts.
- Davidson, Donald (1967) 'The Logical Form of Action Sentences,' in N. Rescher (ed.), *The Logic of Decision and Action*, 81-95. University of Pittsburgh Press, Pittsburgh.
- Diesing, Molly (1989) 'Bare Plural Subjects, Inflection, and the Mapping to LF,' in E. Bach, A. Kratzer and B. Partee (eds.), *Papers on Quantification*, Department of Linguistics, University of Massachusetts, Amherst.
- Dowty, David (1979) *Word Meaning and Montague Grammar*. Kluwer Academic Publishers, Dordrecht.
- Fodor, J. A. (1970) 'Three Reasons for Not Deriving *Kill* from *Cause to Die*,' *Linguistic Inquiry* 1, 429-438.
- Grimshaw, Jane (1979) 'Complement Selection and the Lexicon,' *Linguistic Inquiry* 10, 279-326.
- Grimshaw, Jane (1990) *Argument Structure*. MIT Press, Cambridge, Massachusetts.
- Grimshaw, Jane and Armin Mester (1988) 'Light Verbs and θ -Marking,'

- Linguistic Inquiry* 19, 205-232.
- Hale, Kenneth and S. J. Keyser (1990) 'On the Syntax of Argument Structure,' ms., MIT.
- Higginbotham, James (1985) 'On Semantics,' *Linguistic Inquiry* 16, 547-594.
- Huang, C.-T. James (1991) 'On Verb Movement and Some Syntax-Semantics Mismatches in Chinese,' in *Proceedings of the 2nd International Symposium of Chinese Languages and Linguistics*, Academia Sinica, Taipei.
- Huang, C.-T. James (1993) 'Reconstruction and the Structure of VP: some Theoretical Consequences,' *Linguistic Inquiry* 24, 103-138.
- Jackendoff, Ray (1990) *Semantic Structures*. MIT Press, Cambridge, Massachusetts.
- Johnson, Kyle (1992) 'Object Positions,' *Natural Language and Linguistic Theory* 9, 557-636.
- Kajihara, Satomi (1992) *The Syntactic Nature of Argument Transfer with suru*, M.A. thesis. University of Washington.
- Keyser, S. Jay and Thomas Roeper (1984) 'On the Middle and Ergative Constructions in English,' *Linguistic Inquiry* 15, 381-416.
- Kratzer, Angelika (1989) 'Stage-Level and Individual-Level Predicates,' ms., University of Massachusetts at Amherst.
- Larson, Richard (1988) 'On the Double Object Construction,' *Linguistic Inquiry* 19, 335-391.
- Lebeaux, David (1992) 'Relative Clauses, Licensing, and the Nature of the Derivation,' in S. Rothstein (ed.), *Syntax and Semantics* 25, 209-240, Academic Press, New York.
- Leder, Harry (1991) *Tense and Temporal Order*. Doctoral Dissertation, MIT.
- Lewis, David (1975) 'Adverbs of Quantification,' in E. Keenan (ed.), *Formal Semantics of Natural Languages*, 3-15. Cambridge University Press, Cambridge.
- Li Yafei (1990) 'On V-V Compounds in Chinese,' *Natural Language and Linguistic Theory* 8, 177-207.

- McCawley, James D. (1968) 'Lexical Insertion in a Transformational Grammar Without Deep Structure,' *Proceedings of the 4th Regional Meeting of the Chicago Linguistic Society*, 71-80.
- May, Robert (1977) *The Grammar of Quantification*. Doctoral Dissertation, MIT.
- Miyagawa, Shigeru (1989) "Light Verbs and the Ergative Hypothesis," *Linguistic Inquiry* 20, 659-668.
- Parsons, Terence (1991) *Events and the Semantics of English Sentences*, MIT Press, Cambridge, Massachusetts.
- Pesetsky, David (1982) *Paths and Categories*. Doctoral Dissertation, MIT.
- Roeper, Thomas (1984) 'Implicit Arguments in the Syntax and the Lexicon,' ms., University of Massachusetts, Amherst.
- Tang, C.-C. Jane (1990) *Chinese Phrase Structure and the Extended X-Bar Theory*. Doctoral Dissertation, Cornell University.
- Terada, M. (1990) *Incorporation and Argument Structure in Japanese*. Doctoral Dissertation, University of Massachusetts, Amherst.
- Travis, Lisa (1988) 'The Syntax of Adverbs,' *McGill Working Papers in Linguistics, Special Issue on Comparative Germanic Syntax*, 280-310.

More on Mandarin Chinese Parts of Speech

James D. McCawley

University of Chicago

Abstract

This paper supplements my earlier paper ("Justifying part-of-speech assignments in Mandarin Chinese", *Journal of Chinese Linguistics* 20.211-46), in which I used implicational universals about part-of-speech distinctions as a tool for identifying verbs, prepositions, and nouns in Mandarin Chinese and for arguing that there is no separate category of adjectives. In the present paper I further develop my argument that most so-called "coverbs" are prepositions while some are verbs, identify a distinction between V'-modifying and V-modifying adverbs, and use the latter distinction to bolster my argument that in reduced passives (e.g. *Ta bei sha le*) *bei* is compounded with the verb.

At the Third International Symposium on Chinese Languages and Linguistics, I presented a version of my paper "Justifying part-of-speech assignments in Mandarin Chinese" (McCawley 1992), which had just appeared in the *Journal of Chinese Linguistics*. In this note, I fill in some of the gaps in that paper, presenting both some points that were included in my presentation at the Symposium and some that I have worked out subsequently.

1. On Certain "Coverbs"¹

In the section where I tried to determine which "coverbs" are Vs and which ones are Ps, I exploited two tests for distinguishing Ps from Vs: Vs but not Ps allow their objects to be deleted or extracted, and Ps but not Vs allow their objects to be the antecedent of *dōu* 'all'.

Through oversight, I neglected to apply one or both of these tests to various words whose status as Ps or as Vs is controversial. In arguing that *wèile* is a P, I cited the result only of the *dōu* test; the status of *wèile* as a P is in fact confirmed by the impossibility of extracting or deleting its object:²

- (1) a. Wǒ wèile wǒ de érzi zuòchuguó xīshēng. 'I have made sacrifices for my son'
b. *Wǒ de érzi wǒ wèile Ø zuòchuguó xīshēng. 'My son I have made sacrifices for'
b'. *wǒ wèile zuòchuguó xīshēng de érzi 'the son that I have made sacrifices for'

In a footnote, I conjectured that another *-le* form, namely *chúle* is a P, but left the question unresolved because of the apparent impossibility of constructing semantically coherent examples in which the object of *chúle* was the antecedent of *dōu*. However, I should have invoked the other test, since examples in which the object of *chúle* is extracted or deleted are unacceptable for reasons that presumably must be syntactic, since

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1. I regard the use of the term "coverb" as an act of cowardice: it hints but does not really say that the words in question are not verbs, while making it sound as if they sort of are verbs, thus placating those who, for etymological reasons, wish to class them as verbs, but dodging the issue of what they in fact are.
2. In view of Jiang's (1991) conclusion that the relativized constituent in a Chinese relative clause construction must be a topic, the possibility of topicalizing a constituent and the possibility of relativizing it may amount to the same thing e.g. the unacceptability of (1b'') may simply reflect the restriction on extracting objects of Ps that (1b') illustrates.

they involve no apparent semantic anomaly:

- (2) a. Tā chùle yú dōu chī. 'He eats everything except fish'
b. *Yú tā chùle Ø dōu chī. 'Fish he eats everything except '
b'. *tā chùle dōu chī de cài 'the dish that he eats everything except '

These results confirm my conjecture that *chùle* is a P.

Despite its being the first "coverb" that I took up in my paper, *gěi* did not figure in the passages in which I applied the tests to distinguish between V and P. The results of applying the tests to *gěi* show quite interesting idiolectal and perhaps dialectal variation:

- (3) a. %Zhāngsān wǒ gěi Ø dào-le chá. 'Zhangsan I poured tea for '
a'. %wǒ gěi Ø dào-le chá de rén 'the person that I poured tea for '
b. Wǒ gěi tāmen dōu dào-le chá. 'I poured tea for all of them '
c. *Tāmen wǒ gěi Ø dōu dào-le chá. 'Them I poured tea for all of '

The % indicates variation in degree of acceptability: some of my consultants rate both (3a) and (3a') pretty good to perfect, while others rate them very low in acceptability. For the latter speakers, *gěi* as a "coverb" is simply a P; however, for those who accept (3a-a'), *gěi* is behaving like a verb in (3a-a'), while it is behaving like a P in (3b). I conjecture that for those speakers, the "coverb" *gei* is **both** a verb **and** a preposition. The unacceptability of (3c) (for both kinds of speakers) shows that these two kinds of behavior cannot be combined: one cannot use the object of *gěi* as the antecedent of *dōu* and also extract the object. I note that extraction of the antecedent of *dōu* otherwise results in at most a slight lowering of acceptability:

- (4) Nèixiē xuésheng ta yǐwéi Ø (? dōu) shàng-le kè.
'Those students he thinks (all) have gone to school '

The unacceptability of (3c) for those who accept (3a-a') thus cannot be

attributed to the extraction of the antecedent of *dōu*. I thus tentatively conclude that those who accept (3a-a') have the option of treating *gěi* as either a V or a P, but they cannot have it both ways.

Another word that has figured prominently in discussions of the category status of "coverbs" is *yòng*. The above tests show it behaving like a P.

- (5) a. Wǒ yòng nèixiē máobǐ xiěguo zì. 'I have written with all of those brushes'
b. *Nèizhī máobǐ wǒ yòng Ø xiěguo zì. 'That brush I have written with'
b'. *wǒ yòng Ø xiěguo zì de nèizhī máobǐ 'the brush that I have written with'

Many "coverbs" can also be used as main predicate elements, and in this use most of them are verbs, e.g. when *yòng* is used as the main predicate element, it allows the extraction and deletion that is disallowed in (5) when *yòng NP* was used as a modifier.

- (6) a. Nèizhī máobǐ wǒ yòngguo Ø. 'That brush I have used'
b. wǒ yòngguo de nèizhī máobǐ 'the brush that I have used'

However, there is one coverb that is a P not only when it is used as the head of a modifier but also when it is used as the main predicate element, namely *zài*:

- (7) a. Tāmen zài fángzi-hòumian xiūlǐguo diànshìjī. 'They have repaired TV sets behind the house' (adapted from Li and Thompson 1981: 390)
b. *Nèige dìfang tāmen zài Ø xiūlǐguo diànshìjī.
'That place they have repaired TV sets at'
b'. *tāmen zài Ø xiūlǐguo diànshìjī de nèige dìfang
'the place they have repaired TV sets at'

- c. ?Tāmen zài nèi sānge dìfang dōu xiūlǐguo diànshìjī.
'They have repaired TV sets in all three of those places '
d. Tā zài Shànghǎi. 'He is in Shanghai '
d'. *Shànghǎi tā zài Ø 'Shanghai he is in '
d''. *tā zài Ø de dìfang 'the place that he is at '

When *zài NP* is a modifier, it behaves like a P in allowing the NP to serve as the antecedent of *dōu* (7c) but not allowing it to be deleted or extracted (7b-b'), and the latter P-like behavior of *zài* is repeated when *zài* is the main predicate element (7d'-d''). I thus reject Li and Thompson's (1981:365) assumption that the head of a main predicate phrase in Chinese must be a V and that *zài* as used in sentences such as (7d) accordingly can only be a V.

2. On Adverbs and Reduced Passives

In the section on "coverbs" in McCawley 1992, I noted that "reduced passives" such as (8) appeared superficially to be counterexamples to my claim that passive *bèi* was a P and, as such, did not allow deletion or extraction of its object:

- (8) Wǒ bèi tōu-le qián. 'I had my money stolen '

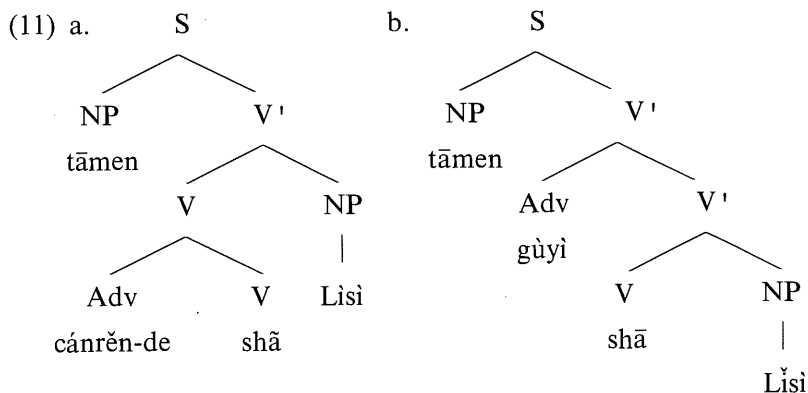
I argued that, notwithstanding the fact that reduced passives have generally been described in terms of deletion of the object of *bèi* in the same sort of structure that underlies a full passive, they do not in fact involve a syntactic deletion but rather the compounding of *bèi* (and a phonologically zero object) with the verb. My argument rested on the generalization that, with an important class of exceptions to be taken up shortly, the various kinds of expressions that can intervene between the *bèi*-phrase and the verb in a full passive cannot separate *bèi* from the verb in a reduced passive:

- (9) a. Wǒ bèi tā cóng shēn-shang tōu-le shǒubiǎo, 'I had my watch stolen off my wrist by him'
 a'. *Wǒ bèi cóng shēn-shang tōu-le shǒubiǎo.
 b. Nèixiē rén bèi Lǐsī dōu qǐnglái-le. 'Those people were all invited by Lisi'
 b'. *Nèixiē rén bèi dōu qǐnglái-le.

The exception to this generalization was a class of items that I identified as verb-modifying adverbs, as in (10):

- (10) Tā bèi cánrěn-de shā-le. 'He was killed cruelly'

If in fact it is only verb-modifiers (as opposed to V'-modifiers and S-modifiers) that are allowed in that position, one can interpret (10) as in fact not conflicting with the generalization that in a reduced passive nothing can intervene between *bèi* and the verb. Specifically, I assume that modifiers are transparent with regard to syntactic category (i.e. when a modifier combines with something of some category X, the resulting combination is of the same category X) and thus that sentences with V-modifiers and with V'-modifiers have the constituent structure and category assignment indicated in (11):



As long as composite verbs such as the *cánrěn-de shā* of (11a) are al-

lowed to fill the V role in the *bèi* V combination of the reduced passive, sentences such as (10) will be allowed but reduced passives in which anything other than a V-modifier intervenes between *bèi* and the simple V will not be.

To establish that conclusion, I need to justify my assumption that Chinese (like English) distinguishes among V-modifiers, V'-modifiers, and S-modifiers (ad-V, ad-V', and ad-S, for short) and that an ad-V' or ad-S is not allowed between *bèi* and the simple verb. What I have just described is a major undertaking: it would require making an extensive survey of Chinese adverbs, applying independent criteria to categorize them as ad-V, ad-V', ad-S, and perhaps other things, and showing that those that passed the test(s) for being an ad-V could occur in a [*bèi* Adv V] combination and the others could not. I will content myself here with something that I ought to have done in the paper itself, namely to identify some ad-V's and ad-Ss, provide an independent test that will distinguish between them and ad-Vs, and show that they are excluded from the [*bèi* Adv V] combination.

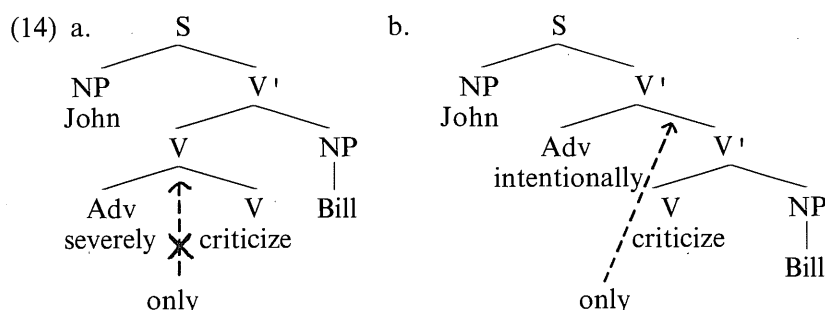
English *only* differs from its Chinese counterpart *zhǐ* in allowing a use in which it is adjacent to its focus ((12a); underlining is used to indicate the intended focus); otherwise *only* and *zhǐ* agree in their syntax, occupying a position immediately before a predicate phrase that contains the focus:

- (12) a. He killed only Lisi.
 a'. *Tā shā-le zhǐ Lisi.
 b. He only killed Lisi.
 b'. Tā zhǐ shā-le Lisi.

The admissible positions of *zhǐ* and of *only* can then be used to test where a predicate phrase begins, and (see McCawley 1988:63-65) facts about the possibilities for *only* confirm that *severely* in (13a) is an ad-V, while *intentionally* in (13b) and *recently* in (13c) are not:

- (13) a. John severely (*only) criticized Bill.
 b. John intentionally (only) criticized Bill.
 c. John recently (only) criticized Bill.

These facts argue that *criticized* is the beginning of a predicate phrase in (13b-c) but not in (13a), in conformity with an analysis in which *severely* modifies a V while *intentionally* and *recently* modify a V' or a larger unit.³



The same grounds can be given for saying that *cánrěn-de* is an ad-V while *gùyì* and *chángchang* are modifiers of higher units (I maintain that *gùyì* is an ad-V' and that *chángchang* is an ad-S that undergoes conversion into an ad-V'), namely that *zhǐ* can separate *gùyì* or *chángchang* but not *cánrěn-de* from a following V:

- (15) a. Tāmen cánrěn-de (??zhǐ) shā-le Lǐsì. 'They cruelly (only) killed Lisi'
 b. Tāmen gùyì (zhǐ) shā-le Lǐsì. 'They intentionally (only) killed Lisi'
 c. Tāmen chángchang (zhǐ) pīping Lǐsì. 'They often (only) criticize Lisi'

3. See McCawley 1988 for arguments that *intentionally* is an ad-V' and *recently* an ad-S, and that an ad-S undergoes optional conversion into an ad-V' (when *recently* precedes the subject, it is a surface modifier of the S, and when it immediately precedes a V' it is a surface modifier of that V').

Chinese shares with English the transformation converting ad-S into ad-V', except that while in English that transformation is almost always optional (*not* is to my knowledge the only ad-S for which it is obligatory), Chinese has many ad-Ss for which it is obligatory, e.g. *chángchang* in (15c).

To return to the point of this digression, my conjecture that only an ad-V can separate *bèi* from a following verb is confirmed; while (as noted above) *cánren-de* can fill that position, *gùyì* and *chángchàng* cannot:

- (16) a. *Tā bèi cánrén-de shā-le.* 'He was killed cruelly' (= (10))
b. **Tā bèi gùyì shā-le.* 'He was intentionally killed'
c. **Tā bèi chángchàng pīping.* 'He is frequently criticized'

3. Some Chinese Elements that Might be Postpositions

In arguing that words such as *yǐqián* and *yǐhòu* are Ns and not Ps, I neglected to check whether expressions of the form *NP yǐqián/yǐhòu* can be the object of a P, beyond giving an example involving the rather atypical P *bǎi*. The following example shows that they can be the object even of a more prosaic P such as *cóng*.

- (17) *Zhāngsān cóng wǔcān yǐqián dào xiànzài yìzhǐ zài hē jiǔ.*
'Zhangsan has been drinking since before lunch'

In quoting examples like (18), in which a P' is the object of a P, with which Li (1990:30) illustrates her claim that "PPs do not occur in Case position", I neglected to say explicitly what class of expressions are an exception to the generalization that Chinese Ps do not allow P' object:

- (18) *Tā cóng (*zài) mén de hòubian lái.* 'He came from behind the door'

The one class of exceptions to that generalization that I know of is comparative phrases, as in example (33a) of my original paper, in which the object of *bǐ* or of *gēn* can be a P':

- (19) a. Zài Jiǔlóng-chēzhàn bǐ zài qítā chēzhàn dōu shūfu.

'It is more comfortable in Kowloon Station than in all other railway stations' (= (33a) of McCawley 1992)

- b. Zài Jiǔlóng-chēzhàn gēn zài Shànghǎi-chēzhàn yíyàng shūfu.

'It is as comfortable in Kowloon Station as in Shanghai Station'

4. Some Earlier Work Worth Taking Note of

I will conclude by noting briefly two important works that I did not read until after McCawley 1992 was already in press and which I thus failed to cite. The criterion that a word whose object can be deleted or extracted can be a V but not a P was in fact made use of in Tang (1978). Most of the facts that I cited in arguing that there is no V-A distinction in Chinese were taken up in Fan (1958), including the unacceptability of examples such as my (42a-d), in which a supposed attributive adjective is combined with negation, degree expressions, or comparative or superlative markers, as well as examples in which the "adjective" is conjoined with another such word, as in (20):

- (20) *yiběn yòu dà yòu hǎo cídiǎn 'a both large and good dictionary'

However, Fan also gives long lists of supposed [A N] combinations, using items of from one to six syllables in both positions, and apparently holds that there is no limit in principle to the length of either of the two parts of such a combination.⁴

4. For constructing and/or providing acceptability judgements for various examples discussed in this note, I am grateful to Jiang Zixin and Lin Fu-Wen.

References

- Fan Jiyan. 1958. Xingming zuhejian "de" zi de yufa zuoyong (The grammatical usage of "de" between noun and adjective). *Zhongguo Yuwen* 71.213-17.
- Jiang Zixin. 1991. Some aspects of the syntax of subject and topic in Chinese. Ph. D. thesis, University of Chicago.
- Li, Audrey Yen-Hui. 1990. *Order and constituency in Mandarin Chinese*. Dordrecht: Kluwer.
- Li, Charles, and Sandra A. Thompson. 1981. *Mandarin Chinese: a functional reference grammar*. Berkeley and Los Angeles: University of California Press.
- McCawley, James D. 1988. *The Syntactic Phenomena of English*. Chicago: University of Chicago Press.
- ...1992. Justifying part-of-speech assignments in Mandarin Chinese, *Journal of Chinese Linguistics* 20.211-46.
- Tang Ting-Chi. 1978. Dongci yu jieci zhijian. ("Between verb and preposition"). *Huawen Shijie* 12.13-19. Reprinted in Tang Ting-Chi, *Studies in Chinese Syntax* (Taipei: Student Book Co., 1979), 169-79.

Metaphorical Extension: The Phenomenon of *lâi* 來 /*khì* 去 'come/go' in Taiwanese

Lilly Lee Chen

Rich University

Abstract

The words *lâi/khì* 'come/go' occur frequently in Taiwanese. Their usages range from independent lexical words to structural morphemes. The characteristics of these two words, either lexically or structurally, and the relationship between them can be accounted for in terms of metaphorical extension. The basic metaphor of the *lâi/khì* phenomenon consists of three crucial elements: (a) an ego-centric deictic notion of proximate/distal, (b) complementary opposition, and (c) dynamicity conceptualized as motion of coming/going. Underlying this analysis is the assumption that the multifarious meanings of *lâi/khì* are not simply a matter of polysemy and that their having the same phonological forms is not a mere accident, but motivated. What the *lâi/khì* phenomenon reveals is an example of the working of a common cognitive process of analogy and metaphor in the language. This cognitive process is responsible for much of what is observed in language as 'relatedness.'

1. Importance of *lâi/khì* 'come/go' in the Language and the Need for Analysis

The words *lâi* 'come' and *khì* 'go' appear very frequently in the

Taiwanese language.¹ They occur not only as independent verbs, similar to *come* and *go* in English (as in *He came/went.*), but more often as a morpheme preceding or following another verb or morpheme to yield a variety of functions ranging from semantic to structural. In many of the latter capacities they often lack the lexical meaning of motion towards or away from the speaker, and, in addition, these constructions are very productive. The fact that the occurrences of *lâi/khì* in some way command the linguistic scene of Taiwanese suggests that this pair of verbs in its multifarious roles captures a sizable chunk or chunks of the conceptual world of the speaker. Or, to put it another way, a sizable chunk or chunks of the speaker's conceptual world are expressed in the language via the use of *lâi/khì* 'come/go'.

This raises some questions. The first is, how is this possible-what linguistic mechanism allows this to happen? That is, what kind of cognitive process is invoked to create such a pair of linguistic chameleons? The second is, what's in them that distinguishes them from other verbs that make them such handy and useful conceptual tools (see particularly Section 4.2 on concept of Time)? In essence we are asking what does the use of *lâi/khì* reveal about the language and what kind of implications it has on language in general.

Traditionally the verbs *lâi/khì* 'come/go' have been given the label 'serial verb' or 'verb complement' and treated as such in Chinese grammar.² However, the labeling does not explain the complex relationship between the two verbs and between them and the verbs with which they cooccur, either at the distributional level (cooccurrence restrictions) or on the level of semantic versatility. For exmple, the concept of 'emergence'

1. The author gratefully acknowledges two anonymous reviewers' constructive suggestions, most of which have been incorporated in this revision. Romanization of Taiwanese in this paper is based on Cheng and Cheng 1982 with the following modifications: [ə] → ə, [o] → o, and [u] → u. Pronunciation is according to Tainan variety of Taiwanese.

2. For a description of *lâi/khì* as directional verbs see Cheng 1982. The topic of *come* and *go*, especially as in Mandarin, was treated in a different approach by Huang (1977).

can only occur with *lâi* 'come' but not *khì* 'go' (see Section 4.3.1.2), whereas concepts of negativeness (adversative passive) and deterioration occur with *khì* 'go' but not *lâi* 'come' (see Section 4.3.2.2). In the Western linguistic literature the term 'deictic' has been applied to the verbs *come/go* (e.g. Comrie 1985). However, the property of deictic cannot explain by itself the versatility of this pair of verbs, at least as they are used in Taiwanese. The purpose of this paper is to address these issues and to propose a model of explanation.

2. Proposal

The explanation suggested in this paper is that creation through metaphor is at the foundation of the proliferation of *lâi/khì* 'come/go' in the language. The more spatial meaning of a participant physically moving towards or away from the speaker (or the speaker as participant moving toward/away from the current locus) serves as the basic metaphor from whence other related metaphors are created, each accentuating and playing on certain attributes in the basic metaphor. A cluster or satellite of expressions surrounding the use of *lâi/khì* 'come/go' is thus formed in the terrain of the language. These different uses of *lâi/khì* 'come/go' can also be seen as a gradation of meanings, the weakest (i.e. least concrete) of which bear little immediate resemblance to the basic one.

Furthermore, we are proposing that the basic metaphor for the *lâi/khì* phenomenon consists of three crucial elements: (1) an ego-centric deictic notion of proximate/distal, (2) processual dynamic aspect, and (3) complementary opposition (of *lâi* vs *khì*). All other metaphorical uses of this pair can be said to evolve from these basic concepts, maintaining the same relational (contrasting) meanings contained in this conformation of the metaphor, but not necessarily each of equal weight.

For example these facts of the metaphor can be conceptualized correspondingly as (1) base line → reference point, (2) two opposite directions constituting a totality → exhaustive multiplicity (*siōⁿ lâi siōⁿ khì*

iasĩ m̄ thang bé think come thing go still not should buy 'After thorough thinking, I don't think I should buy it. '), and (3) change of state (*o khi black go* 'to become black '). These dimensions serve to distinguish *lâi/khĩ* from other verbs and nouns. For instance, the deictic nouns (demonstratives, pronouns, etc.) do not have a processual dimension; whereas other verbs do not possess both the attributes of ego-centric deictic and complementary opposition.

Underlying this analysis is the assumption that the many meanings of *lâi/khĩ* are not simply a matter of polysemy and that their having the same phonological shape is not a mere accident, but motivated (following Lakoff's (1987) use of the term). What the *lâi/khĩ* phenomenon reveals is an example of the working of a common cognitive process of analogy and metaphor in the language. This cognitive process is often responsible for much of what is observed in language as 'relatedness'.

3. Organization of Data

In what follows, data supporting the above claims will be provided. The sequence of presentation is arranged to correspond essentially with the degree of concreteness of the use of *lâi/khĩ*, starting with the most spatially prominent (*lâi/khĩ* as directional full verbs); this is taken as the foundation metaphor (Section 4.1) for explaining data of more abstract uses in the subsequent sections. This usage of *lâi/khĩ* statistically may or may not be the highest in actual occurrences, but is the most intuitive for the speaker; in the dictionary this meaning always heads the list of the many definitions of *lâi/khĩ*. Closely related to this is their appearance as verbal complement morphemes to indicate change of location in the action of the main verb.

Following this Space prominent use of *lâi/khĩ* comes the area of how *lâi/khĩ* is used to comprehend Time (Section 4.2): Time is not only dichotomized as uni-directional Past/Present (Arrow of Time), but more importantly it is perceived as a bi-directional entity of coming toward/leaving the ego where Tense is not relevant. The next (Section 4.3) is the

cluster of expressions in which the processual aspect of *lâi/khì* becomes a vehicle for the speaker to navigate and chart the conceptual world of Inception/Egression and Emergence of Being/Death. This facet of *lâi/khì* is further extended to categorize subjective emotions of Adversity/Pleasant Cooperation. Section 4.4 shows how a combination of *lâi* and *khì* in a VP is used for the meaning of multiplicity.

This arrangement of relationships among the various metaphorical uses of *lâi/khì*, from the most literal to the very 'figurative', i.e. abstract, can be captured in one glance by the following Figure 1. In this simplified illustration of the metaphorical extension of the verbs *lâi/khì* the solid lines indicate the direction of motion, dashed lines indicate the direction of extension from more spatial/concrete/lexically meaty usages towards more abstract/arbitrary/lexically weakened functions of *lâi/khì*, and double dashed lines indicate 'correspond to; is conceptualized as'.

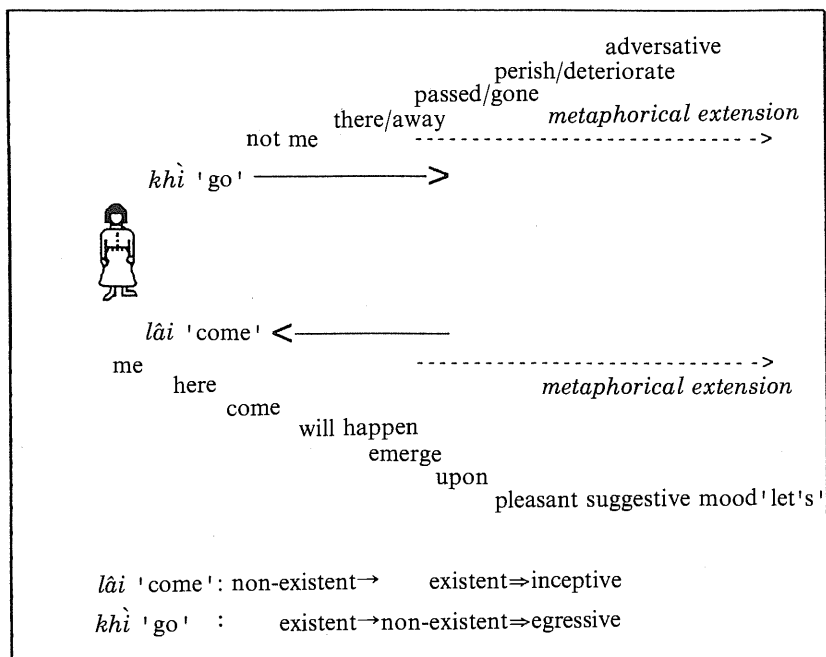


Figure 1 Metaphorical Extension of *lâi/khì* 'come/go'

4. Various Uses of *lâi/khì* in the Language.

The various uses of *lâi/khì*, ranging from lexically meaty (concrete) to the lexically bleached (abstract), can also be represented in terms of gradations along the continuum of spatial prominence and directional process prominence, as seen in Figure 2.

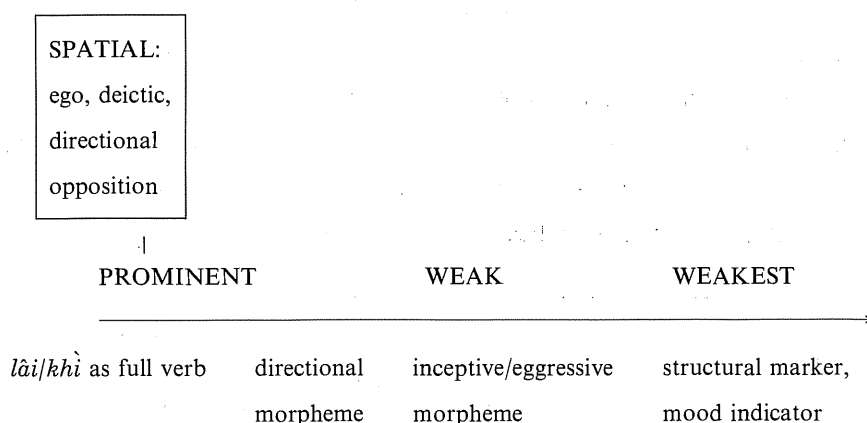


Figure 2 Continuum of Concrete/Spatial Prominence

On one extreme end are the uses of *lâi/khì* as independent lexical verbs; they are also most prominent in speaker oriented distance opposition. Next are the uses of *lâi/khì* as post verbal directional morphemes. Their spatial potency and lexical status are reduced since they are postpositioned to a lexically prominent head verb.

Further down the line in Figure 2 are *lâi/khì* as morphemes with barely a vestigial trace of spatial deixis. Next is the use of *lâi/khì* as inchoative morphemes, with *lâi* having a neutral meaning of 'coming into existence; upon VERBing' and *khì* 'go' having a negative attitude about the state; they are strong on processual sense with zero spatial meaning.

On the other extreme end of the continuum in Figure 2 are the uses

of *lâi/khì* so weak in their lexical characteristics that they only serve as structural markers, e.g. with *lâi* as a command morpheme with a positive attitude.

The relationship among the various uses of *lâi/khì* in terms of degrees of concreteness can also be captured by a 'radial structure' (Lakoff 1987) as shown in Figure 3B, in which the most concrete, i.e. the basic metaphor, is in the center and other, less concrete ones extend from this center. Figure 3A is a better representation, for it emphasizes (1) their centrifugal nature (in terms of concreteness), their biased aspectual nature (emphasizing certain aspect of the basic metaphor) and (3) the overall satellitic phenomenon of the domain of *lâi/khì*.

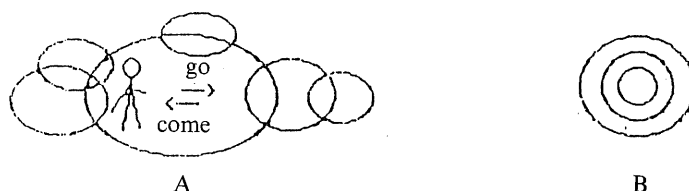


Figure 3 Satellitic and Radial Nature of the Domain of *lâi/khì*

Examples of these uses will be given in the following subsections. Since the concreteness of these uses is a matter of degree rather than contrast, memberships of some examples could overlap.

4.1 Spatial

The most concrete use of *lâi/khì* is their appearances as a full/main verb, as shown in (1-3). As deictic verbs they clearly indicate the direction of movement relative to the speaker's current physical location. When they follow the main verb in a clause they serve to indicate whether the direction of the action is towards, as in (5) and (7), or away from the speaker, (4), (6) and (8).

- (1) I lâi a.
 he come ASP
 'He came already.'

- (2) Lí chittāngsǐ khi?
you when go
'When did you go?'
- (3) I khi kià phue.
he go send letter
'He went to mail a letter.'
- (4) Chít-pún chheh théh khi.
this CL book take go
'Take the book there.'
- (5) tng lâi Bíkok
return come America
'come back to America'
- (6) tng khi Bíkok
return go America
'go back to America'
- (7) Khiā khah lâi.
stand more come
'Stand closer to me.'
- (8) Khiā khah khi.
stand more go
'Stand farther from me.'

It is also possible for the speaker to assume the addressee's location as the base for directional reference in dialogs, (9a). In dialogs a third person's location is rarely used as the base location, unless well supported by context, as in a narrative. If the speaker is not in the scene, sentences like (7) and (8) are not acceptable. Instead of *lâi/khi* one must use

the equivalent of near/far, e.g. *Mary khiā khah kìn John Mary stand more near John* 'Mary stood closer to John.'

(9) *Guá mînáchài lâi/khì lín tau.*

I tomorrow come/go your house

'I'll come/go to your house tomorrow.'

Unless the context establishes a base referent location, *khì* 'go' is the default for direction of motion as the story line develops, to further away from the current point of time and place, thus lending the sense of 'next' and 'future'.

4.2. Time

From the basic mental image of action that involves spatial movement toward or away from the speaker, many Time expressions are created that have nothing to do with physical space except metaphorically. *Lâi* and *khì* are certainly favored ways of categorizing Time in Taiwanese.³

Taiwanese uses *lâi/khì* for both Past, (10-11), and Future, (12-13), and in a very specific way, in the sense that the two are not interchangeable, as shown by the contrast in acceptability between (a) and (b) forms.

- | | | | | |
|------|-----------------------|-------------|---------------|--------|
| (10) | a. <i>kìn lâi</i> | near come | 'recently' | Past |
| | b. <i>*kìn khì</i> | near go | | |
| (11) | a. <i>kuè khì</i> | pass go | 'in the past' | Past |
| | b. <i>*kuè lâi</i> | pass come | | |
| (12) | a. <i>chiông lâi</i> | future come | 'future' | Future |
| | b. <i>*chiông khì</i> | future go | | |

3. For Time categorization in Chinese besides the use of *come* and *go* see Chen 1993.

- (13) a. khah *khi* more go 'later on' Future
 b. *khah lâi more come

Form the way *lâi/khi* is used we can see that Time, although it may be perceived as an arrow moving from Past to Present and onto the Future (Figure 4), as in the Taiwanese saying that 'Time passes fast and once it's gone it'll never return',

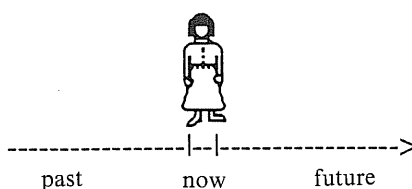


Figure 4 Arrow of Time

is more importantly conceptualized as bi-directional: *coming* and *going*, with the speaker's Here/Now as the center (Figure 5).

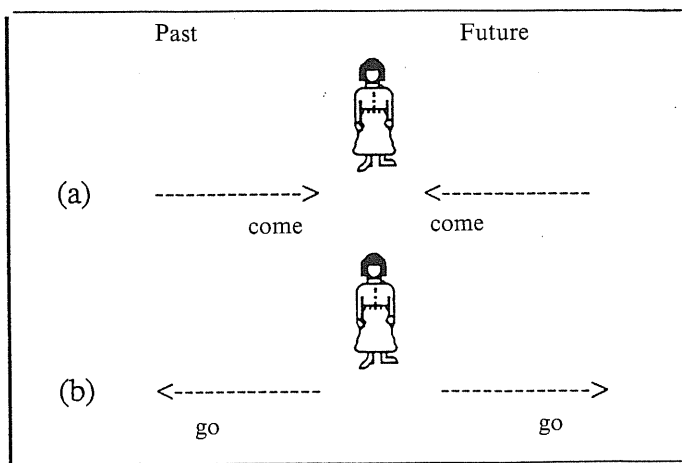


Figure 5 Ego-centered Time

This is evidenced by data in (10-13) above, where *lâi* and *khi* are not for distinguishing Past from Future, rather they are used to distinguish 'to-

ward' and 'away'. Our analysis is: when Time is perceived as decreasing in distance from the speaker, *lâi* is used. On the other hand, when it is perceived as increasing in distance from the speaker, *khi* is used. This conceptualization of Time makes possible the concept of Time flowing forward, Figure 6, and backward, Figure 7. The Forward Time is the same as the Arrow of Time shown in Figure 4.

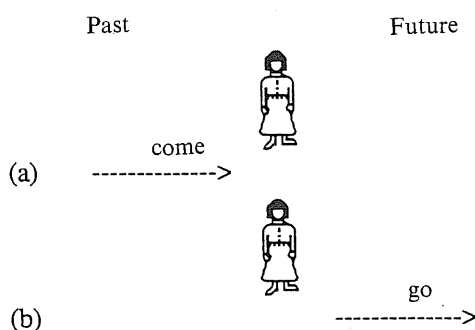


Figure 6 (=4) 'Forward' Time

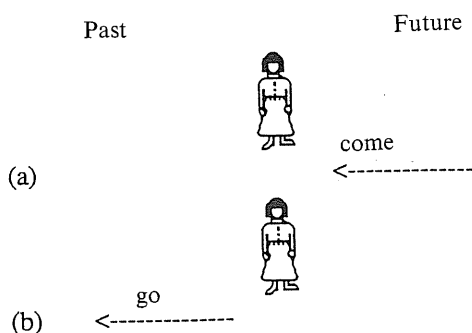


Figure 7 'Backward' Time

Figure 7 shows that the speaker is perceived as being stationary while the future time is moving toward the speaker, passing by her, and disappearing into the past (Cf. English: *the years bygone*, *two years ago* for Past; *in the coming years* for Future; *the cause of this went all the way back to his childhood* for Past).

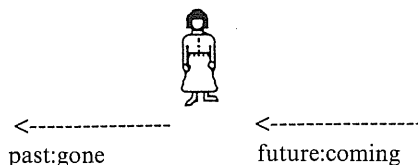


Figure 8 (=7) Backward Time

Our analysis as illustrated in Figure 4 Ego-centered Time accounts for the occurrences of *lâi/khî* as both Past and Future in (10-13) above and those in (14-17).

- | | | |
|------|--|--------|
| (14) | chít-kə guéh <u>lâi</u>
one CL month come
'in the past one month' | Past |
| (15) | khah <u>khî</u> tiəh khah hó.
more go then more good
[It] will be better later on. | Future |
| (16) | kuè <u>khî</u> chít-kə guéh
pass go one CL month
'in the last one month' | Past |
| (17) | kəh <u>khî</u> chít-kə guéh
further go one CL month
'in the future one month' | Future |

The cooccurring morphemes in examples above, *khah* 'more', *kuè* 'pass' and *kəh* 'further', themselves do not necessarily mean Past or Future. Because, in contrast with those in (15-17), we also have *I khah gâu he more smart* 'He is smarter.', *kəh kuè chít-lépài further pass one week* 'in the next one week (Future)', and *kəh khah kóchá further more*

ancient 'in the more ancient time; much earlier (Past)'. These examples indicate that the sense of Past or Future depends on the holistic effect of the components of *lâi/khi* and their respective cooccurrent morphemes. This kind of ensemble strategy of semantic synthesis is common in Taiwanese (Chen 1991).

Other Time expressions include *lâi jî't come day* 'in the future', *lâi sè come world* 'the next life' and *lâi nî come year* 'next year'; most of these came from Classical Chinese.⁴

For non-speaker oriented time, e.g. relative time internal to a story, the language typically uses the contrast *chiêng/āu* 'front/back' or 'before/after', as shown in (18-20). Contrast this with the speaker oriented Present time in (21), in which *lâi* is used.

- (18) íchiông
before
'formerly; longtime ago'
- (19) chhit guéh íchiông
seven month front
'before July [Present irrelevant]'
- (20) chhit guén iāu
seven month back
'after July [Present irrelevant]'
- (21) chhit guéh ilâi
seven month come
'ever since July [including speaker's Present]'

Besides (18-20), the mental image of a person's front and back is also

4. Mandarin retains more *come/go* Time expressions in Classical Chinese than Taiwanese: e.g. *qù nián* 去年 go year 'last year', *qù xià* 去夏 go summer 'last summer' are absent in Taiwanese.

used to categorize many abstract concepts but the metaphor is definitely not as prolific as the metaphor of *lâi/khì*. *Chiêng/āu* 'front/back' only has a stationary/durational/noun type of quality, whereas *lâi/khì* is easily conceived as having the quality of action/directional/verb. The reason is that the latter has processual (i.e. change of space because of the motion of coming/going) attributes that the former lacks.

4.3 Emerging and Disappearing

The processual attribute mentioned above is exploited by the language to categorize conceptual areas associated with inception and disappearing. The former, as expressed by means of *lâi*, is discussed in Section 4.3.1; the latter, as encoded in *khì*, is shown in Section 4.3.2. In all these examples *lâi* and *khì* are necessary morphemes and, furthermore, the two are not interchangeable.

4.3.1 *Lâi*

The process of an object coming to the speaker's presence is likened to (i.e., our mind's eye sees its similarity to) the change of the state from non-existence to existence. Thus *lâi* is used to express, in order of concreteness: (A) come into being, birth (22-25), (B) produce, bring out (26-28), (C) bring into existence, build, establish (29-34), (D) upon Verbing (35-39), (E) obtaining condition (40-41), (F) pleasant imperative mood for urging an action to take place (42-45), (G) origin (46-48), and (H) Causative (49-52).

4.3.1.1 *Lâi as coming into being*

Lâi for the meaning of 'coming into being' occurs in the following conformation.

- (22) **VERB** + *chhut* + *lâi*
 out come

- (23) *gínná seⁿ chhut lâi ê sî*
 baby born out come MOD time
 'when the baby was born'

- (24) seⁿ lâi chiū sī hī¹ hiông
 born come EMPH be that way
 '[He] was born that way = that was in his nature'
- (25) chhiū¹hiōh huat chhut lâi.
 leaf sprout out come
 'New leaves sprouted.'
- (26) I khiām guā chē chíⁿ, sng lâi.
 he owe how much money, calculate come
 'How much did he owe you? Add up! [Produce a figure!]'
- (27) thò/phùi chhut lâi
 throw/spit out come
 'throw up; spit [it] out'
 Cf. thun lōh khi
 swallow down go
 'swallow [it]'
- (28) Phue abuē phah chhut lâi.
 letter NEG type out come
 'The letter hasn't been typed out yet.'

4.3.1.2 *Lâi* as morpheme for emerging of an accomplishment

Lâi cooccurs with *khi* 起 'rise; up' to create the meaning of the new establishment of an accomplishment. It has the function of turning an activity verb into an accomplishment verb. The syntactic environment is as in (29).

- (29) **VERB** + *khi* + *lâi*
 up come

- (30) Siōⁿ khi^í lâi a!
think rise come ASP
'[Now I] remember!'
- (31) Chhù khi^í khi^í lâi a.
house build up come ASP
'The house is up.'
- (32) Chiôⁿ-a ûi khi^í lâi a.
fence encircle up come ASP
'The fence is up.'
- (33) tēpán tièng khi^í lâi ê sî
floor nail up come PART time
'[when the] floor is laid.'
- (34) Khang pó khi^í lâi a.
hole mend up come ASP
'The hole was mended.'

4.3.1.3. *Lâi* as morpheme 'upon VERBing'

- (35) Che [chú khi^í lâi] chin kántan.
this [cook up come] very simple
'[The recipe looks difficult but once you] cook this [it] is
very easy.'
- (36) Hít-hāng kèuē [sīthiêng khi^í lâi] pūthit hókcháp.
that CL project [carry-out up come] quite complicated
'The project is quite complicated if/when carried out.'

- (37) Chit¹-khuán tāichì [siōⁿ khì lâi] chin thâu thiàⁿ.
this CL thing [think up come] head ache
'Things like these make your head ache the minute you think about them.'
- (38) [M̄ng khì lâi] chiah chai.
ask up come then know
'Upon questioning [we] then knew.'
- (39) [Kóng (khì) lâi] pài¹it khah bê iêng.
Speak (up) come, Monday more busy
'[I'll say,] Monday is more hectic.'

4.3.1.4 *Lâi* as morpheme for 'obtaining the condition'

Lâi cooccurs with *anne* 'thus' to mean 'if so'. Its presence emphasizes the shift to a new supposition matrix rather than the supposition itself; it is equivalent to 'with the coming of such condition.'

- (40) Anne lâi, guá tiōh m̄ bién sái chhia.
thus come, I then not need drive car
'In that case, I don't have to drive the car.'
- (41) Anne chē lâi, i khóliêng ē tông¹ i.
thus do come he probably would agree
'If [we] do that way, he probably would agree.'

The verbs *luān lâi*/**khì* disorder come 'act irrationally' and *o pēh lâi*/**khì* black white come 'act irrationally' could also be included in this category.

4.3.1.5 *Lâi* for polite/pleasant mood of command/urging

Lâi mostly teams up with *lân* 'inclusive we' to yield a pleasant camaraderie mood of command similar to English 'let's'.

- (42) Lán lâi siōⁿ khuàⁿmāile.
we come think try
'Let's think about it.'
- (42) Lán iâi/*khi khi kâ khuàⁿ.
we come/*go go PART see
'Let's go visit him.'
- (43) Lán lâi/*khi kóng Tâiuân uē.
we come/*go speak Taiwan language
'Let's speak Taiwanese.'
- (44) Lâi/*khi, lâi/*khi, lâi/*khi, chhiáⁿ iōng!
come, come, come, please use
'Please eat.'
- (45) Lâi/*khi, m̄ thang sèjī.
come NEG should careful
'Come, help yourself.'

The use of *lâi* as a pro-verb 'do' in *guá lâi guá lâi* *I come I come* 'let me do it' could also belong here.

4.3.1.6 *Lâi* for 'origin, source'

These nouns are non-productive frozen lexical items suggestive of Classical Chinese.

- (46) Lâi/*Khi liêk pūt biông
come history NEG clear
'[His] past is unknown/dubious.'
- (47) Lâiguân
come origin
'source'

- (48) *Guānlâi i sî kiānglî.*
 origin-come he be manager
 'So, [now I realize] he was the manager.'

4.3.1.7 *Lâi* as transitive verb or causative morpheme in proper names

Lâi can be used, in a very limited way, as a transitive verb 'cause to come' in a command, e.g. *Lâi chî¹t-*duâ*ⁿ chhâ-mîⁿ* come one plate fried noodles 'Bring here a plate of fried noodles!'. The same sense of 'cause to come' also appears, though not productively, in proper names. It has the meaning of 'bringing in (blessings, etc.)' as used in personal names or old fashioned store names, (49-52). While *lâi* is used as part of a personal name, *khi* as part of a personal name is extremely rare. For *khi* as a causative morpheme has the meaning of 'getting rid of (unwanted calamity, etc.)' (see Section 4.3.2.6); no one would like to incorporate inauspicious elements in one's child's name or store name.

- | | | |
|------|------------------|----------------|
| (49) | <i>Lâi Siū</i> | come longevity |
| (50) | <i>Lâi Hok</i> | come blessing |
| (51) | <i>Lâi Chhun</i> | come spring |
| (52) | <i>Lâi Ōng</i> | come flourish |

Our mentality of wanting something good to come/happen to us, as best exemplified by (49-52), and to get rid of bad things is probably the reason that the over-all characteristics of the abstract notion of *lâi* is that of good, whereas *khi* is associated with adversity (See sections following).

4.3.2 *Khi*

The use of *khi* stemming from the metaphor of coming/going has three consequences. One is that, visually, when an object goes away (the basic meaning of *khi*) it becomes smaller and smaller for the speaker. This aspect is utilized to categorize things or phenomena that involve decrease in physical form or intensity, as shown in Section 4.3.2.1. The second is that the natural process of 'going' eventually becomes 'gone',

out of sight, thus nonexistent. This aspect of the metaphor becomes a tool for capturing the concept of disappearance, death and the natural process of death, that of decaying, deteriorating, thus undesirable, adversative (see Section 4.3.2.1 - Section 4.3.2.6). The relatedness of this cluster of concepts is well-documented in the language - as evidenced by the use of *khì* 'go'. The third is the meaning 'to make disappear', i.e. 'to get rid of' (Section 4.3.2.6).

4.3.2.1 *Khì* for the process of reduction in form

Khì is used in expressing decrease in size, (53)-(56) and probably (57), and it is further extended to reduction in intensity in heat, (58), density, (59), and tightness, (60). Here we have ready linguistic evidence of our ability to see cross-modal (synesthetic) similarities (e.g. children's understanding of cross-modal connections between pitch and brightness (Marks Hammeal & Bornstein 1987:32).

- (53) iôⁿ khì/*lâi
dissolve go
'[ice] melt'

- (54) ta khì/*lâi
dry go
'dry up'

- (55) a. kiu khì/*lâi
shrink go
'to shrink'
Cf. b. chiêng khí lâi/*khí
swell up come
'become swollen'

- (56) khah siau khì/*lâi a
more recede go ASP
'[The swelling] has reduced.'

(57) a. Chē lə̀h khì

sit fall go

'Sit down!'

Cf. b. *khîa* *khí* *lâi*

stand up come

'Stand up!'

(58) *siə* *thè* *khì*

fever recede go

'The fever has gone.'

(59) Kuanchiòng *chiāmchiām* suàⁿ *khì*.

spectators gradually disperse go

'The spectators gradually broke up.'

(60) *liə̀ng* *khì*

loose go

'become loose'

4.3.2.2 *Khì* as 'decaying'

The decrease of physical size is metaphorized to decrease in vitality/ life (61-62), and, thus, decaying and deteriorating (63-67).

(61) *lien* *khì*/**lâi*

wither go

'to wither'

(62) a. *chiāmchiām* *lâu* *khì*/**lâi*

gradually old go

'[people] gradually become old'

Cf. b. **siàulên* *khì*

young go

'become young'

- (63) a. *kū khi*/**lâi*
old go
'[things] become old '
Cf. b. **sin khi*
new go
'become new '

- (64) *ng khi*/**lâi*
yellow go
'[Too bad,] [the green vegetable] became yellowed. '

- (65) *o khi*/**lâi*
black go
'become blackened/rotten '

- (66) *seⁿ ko khi*/**lâi*
grow mold go
'[Too bad,] [it] became moldy. '

- (67) *nuā khi*/**lâi*
decay go
'become rotten '

lāu khi *old go* 'become old', as in (62), has a neutral counterpart in *lāu lâi old come* 'at the old age', which only designates that period of time when one is at an advanced age, therefore, the expression *siàulên siū khó, lāu lâi/*khi hómīā* *young suffer hardship old come good life* '[He] suffered while young but enjoyed a good life when old. '

4.3.2.3 *Khi* as morpheme for 'disappearance'

Another related consequence of an object moving away from the speaker's location of Here/Now is that it is perceived as similar to the change of state from existence to non-existence, i.e., 'lose' (68-70), 'make invisible' (71-72), and 'death' (73-75).

- (68) bē khi¹/*lâi

not remember go

'forgot'

Cf. Siōⁿ khi¹ lâi a! (=28)

think up come ASP

'[Now I] remember!'

- (69) su khi¹/*lâi chitpah kho

lose go one hundred dollar

'to lose \$100 [in betting]'

- (70) liáu khi¹/*lâi chápān kho

lose go hundred thousand dollar

'to lose \$100,000 [in investment]'

- (71) thun lōh khi¹/*lâi

swallow down go

'swallow (the chewing gum)'

Cf. thò chhū^t lâi

vomit out come

'vomit'

- (72) pāngsak khi¹/*lâi

abandon go

'to desert, abandon'

- (73) siau khi¹/*lâi a

recede go ASP

'[The swelling] has gone.'

- (74) sí khi¹/*lâi

die go

'to die'

- (75) I khi¹ a.
he go ASP
'(Euphemistically) He's gone = He is dead.'
- (76) I kiâⁿ khi¹ a.
he walk go ASP
'[Irreverently] The guy's gone = He's kicked the bucket; He's a goner.'
- (77) Hít ê kè¹ uē kiâⁿ khi¹ a.
DEM CL project walk go ASP
'The project has gone up in smoke.'

Other verbs in this class include those associated with the meaning of losing senses (*gông khi¹/*lâi* daze go 'become stupefied', *chùi khi¹/*lâi* drunk go 'become drunken', *khùn khi¹/*lâi* sleep go 'fall asleep') and *hūn khi¹/*lâi* faint go 'to faint' (Cf. *chhéⁿ khi¹ lâi/*khi¹* awake up come 'wake up'). Related to this is the *khi¹* in *pēⁿ hó khi¹* a illness good go ASP 'The illness has gone; [He's] recovered.'

4.3.2.4 *Khi¹* as adversative morpheme

Taiwanese is probably the most systematic among the 'dialects' of the Chinese language family in using *khi¹* for adversity. For instance, in the following examples, Mandarin uses *diào* 掉 as an adversity morpheme instead of *khi¹* in (78), (79), (81) and (83).

- | | | | |
|------|---------------------------------|---------------|-----------------------------------|
| (78) | chih khi ¹ /*lâi | break go | '[The twig] broke.' |
| (79) | Tng khi ¹ /*lâi | sever go | '[The nail] became broken.' |
| (80) | líng khi ¹ /*lâi | cold go | '[Too bad the soup] became cold.' |
| (81) | siə khi ¹ /*lâi | burn go | 'to burn out' |
| (82) | thè siək khi ¹ /*lâi | fade color go | 'to fade' |
| (83) | I iəng khi ¹ /*lâi | he use go | '[Too bad] he used it up.' |

4.3.2.5 *Khi¹* as adversative 'passive'

Not only does *khi* cooccur with an 'undesirable' morpheme to give adversative meaning as shown above, it can also turn a perfectly innocent, neutral meaning word into an adversative expression. As adversative passive *khi* is typically found in the conformation shown in (84).

- (84) *khi* + *hō* (Agent) + **VERB** + *khi*
 go + by (agent) + Verb + go

If the Agent is unidentified, *hō* Agent 'by Agent' can be contracted to *hông* (= *hō lâng* 'by people'). In either case the first *khi* is optional. Of course, with both *khi*'s present the effect of 'out of control' on the part of Patient in a Passive construction is even stronger.

- (85) a. *khi hông iōng khi*
 go by use go
 '[Too bad,] it was used by someone.'
 b. *hông iōng khi*
 by use go
 '[Too bad,] it was used by someone.'

Cf c. *hông lōng*
 by use
 'let people use it'

- (86) *Chheh khi hō chiəh khi.*
 book go by borrow go.
 '[Unfortunately] the book got borrowed [by him].'

- (87) *I theh lâi ê sî, (khi) hông khuàⁿ khi.*
 he take come MOD time, go by see go
 'When he brought it here, [too bad,] he was seen [by someone].'

- (88) Piáⁿ khi hông chiáh khi.
cookie go by eat go
'[Too bad,] cookies got eaten.'
- (89) khi hō laopán thiaⁿ khi.
go by boss hear go
'[Too bad,] it was overheard by the boss.'

An adversity sentence is not a neutral statement; it is not for the truth value but for color and bias. To achieve this, the patient/recipient is usually cast in the subject position (for this, sentences of this nature are easily seen as 'Passive' by Passive 'seekers.') or simply absent (for it usually is not new information) to clear the way for the full play of the verb (typically a complex one). That is why *khi* 'go' is often found at the scene of 'Adversative Passive' - because of its tragic potential acquired from the metaphor of coming/going.

4.3.2.6 *Khi* as causative verb 'to make disappear'

This usage of *khi* is not very productive. It retains more of the original meaning of 'leaving, away from, getting rid of' in *qù* 去 in Classical Chinese.⁵

- | | | | |
|------|-------------|----------|--------------------|
| (90) | khi/*lâi iû | go oil | 'degrease' |
| (91) | khi khak | go shell | 'shelled' |
| (92) | khi sua | go sand | 'devein (shrimps)' |

4.4 *Lâi* and *khi* Cooccur

This construction has the meaning of 'exhaustive multiplicity' or 'after much VERBing'. The construction is as shown in (93).

5. E.g. *qù Qí* 去齊 'left the State of Qi' and, *qù bīng* 去兵 'to get rid of the weapons/military' (Wang 1990:135).

- (93) **VERB_i + lâi + VERB_i + khì**
 come go
- (94) Sng lâi sng khì, bē thàn chíⁿ.
 count come count go, unable earn money
 'After much calculation, [I think I] won't be able to make
 any money.'
- (95) Khuàⁿ lâi khuàⁿ khì bô chit-kiang hó ê.
 look come look go not one CL good NOM
 'After looking at many [houses], I don't think there's any
 that is good.'
- (96) Chiáh lâi chiáh khì íahsī chit-kiang siāng hó.
 eat come eat go still is this CL most good
 'Having eaten in many [restaurants], this one is after all the
 best.'

Reduplication of *lâi* and *khì* has the meaning of travelling back and forth many times, as in (94).

- (97) lâi lâi khì khì
 come come go go
 'to go back and forth many times'

5. Supporting Evidence for the Analysis

5.1 Paradigmatic

In the above discussion we have shown how the seemingly diverse meanings of *lâi/khì* are related, whether they are used as a full verb or merely as a structural marker of inception or causative, by means of metaphoric process. The metaphor has as its basis our living experience in the activities of coming and going. Moreover, the paradigmatic rela-

tionship among them is seen as forming a graded continuum along the parameter of lexicalness (the quality of being an independent verb as opposed to a structural marker) or spatial/concrete prominence (the visualizable action of coming and going). This accounts for not only their meanings but also their activeness (i.e. membership) among various syntactic categories. This leads to the expectation that the posited continuum should have syntactic corollaries.

5.2 Syntagmatic

A piece of syntactic evidence supporting the graded continuum along the parameter of spatial prominence is the fact that the closer towards the concrete/spatial end of Figure 2 one goes the more one finds *lâi* and *khì* interchangeable without resulting in syntactic anomaly, as shown in (98-99).

- (98) a. I lâi he come 'He came here.'
 b. I khì he go 'He went there.'
- (99) a. I sái chhia lâi. he drive car come 'He drove here.'
 b. I sái chhia khì. he drive car go 'He drove there.'

Whereas the further down the line, the more difficult it is to interchange them, as shown in the contrast in the well-formedness between (a) forms and (b) forms in (100-103).

- (100) a. sí khì die go 'die'
 b. *sí lâi die come
- (101) a. Chitma ták'ê lâi kóng Tâiuân uē.
 now every one come speak Taiwanese
 'All of us, let's speak Taiwanese now.'

- b. *Chit¹ma ták'ê khì kóng Tâi¹uân uē.
 now every one go speak Taiwanese
 'All of us, let's speak Taiwanese now.'

- (102) a. o khì black go 'become black'
 b. *o lâi black come 'become black'

- (103) a. Piáⁿ khì hông chiáh khì.
 cookie go by eat go
 '[Unfortunately] the cookies got eaten.'
 b. *Piáⁿ lâi hông chiáh lâi.
 cookie come by eat come
 '[Unfortunately] the cookies got eaten.'

This exchangeability phenomenon, though not a motivating factor for Figure 2, is nevertheless predictable from the hypothesis shown in Figure 2 - the more abstract a morpheme becomes, the lesser its spatial/visual and lexical meaning, and thus the more arbitrary and restricted its use.

Another bit of evidence showing that the usages toward the abstract end have lost their spatial quality is that they cannot be followed by place/destination, (104).

- (104) a. ñg khì yellow go 'become yellow'
 b. *ñg khì hia yellow go there 'become yellow there'

Whereas the *lâi/khì* on the spatial high end can, (105-106). In fact a place (destination) is always implied even if not overtly expressed.

- (105) I khì (hia). he go there ' 'He went there.'
 (106) sái khì (Tâibak) drive go Taipei 'drive to Taipei'

A third syntactic corollary is that, since the more abstract properties of *lâi/khì* as shown in FIGURE 1 are those of change from non-existent

to existent and existent to non-existent respectively, the more abstract/structural uses of them typically do not cooccur with Progressive marker *te/le*, as shown in (107-109).

- (107) a. *sí khi* die go 'die '
 b. **teh* *sí khi* PROG die go
- (108) a. *o khi* black go 'become black '
 b. **teh* *o khi* PROG black come 'become black '
- (109) a. *Piáⁿ khi hông chiáh khi.*
 cookie go by eat go
 ' [Too bad] the cookies got eaten. '
 b. **Piáⁿ teh khi hông chiáh khi.*
 cookie PROG go by eat go

In fact these types of constructions are most comfortable with the Perfective marker *a* (110-111). This suggests that *khi* has the function of turning a verb (even a stative verb) into an accomplishment verb.

- (110) *sí khi a* die go PERF 'died '
(111) *khùn khi a* sleep go PERF 'fall asleep '

5.3 Parallels

Taiwanese, like other Chinese languages, e.g. Mandarin, is full of examples parallel to the *lâi/khi* phenomenon but on a much smaller scale. Take the verb *chiáh* 'eat' for example. It is used metaphorically for several meanings based on the image of a person eating something. In the following examples, (112-114) focus on the positive aspect of eating to sustain life; (115-116) concentrate on the act of consuming; (117-118) play on the adversative aspect of an object being chewed and swallowed; and (119-120) stress on the eater having a hard time eating unpal-

atable food.

(112) I chiáh p̄ng a. he eat rice ASP 'He ate already.'

(113) I teh chiáh thâuō. he PROG eat job 'He's working.'

(114) I chiáh hāuseⁿ.

he eat son

'He lives with and is supported by his son.'

(115) Chit chiah chhia chin chiáh iū.

this CL car very eat oil

'This car is a gas-guzzler.'

(116) Phau khǐ hō chiáh khǐ.

cannon go by eat go

'[In a chess game] my cannon got taken.'

(117) I chiáh lāng kàu.

he eat people enough

'He takes advantage of [you]'

(118) I chiáh lāng sōng.

he eat people ignorant

'He takes advantage of [my] ignorance.'

(119) I chin chiáh khui.

he very eat disadvantage

'He took a beating; He's wronged.'

(120) I chiáh lát a.

he eat strength ASP

'He's going to have a tough time.'

Here again we see clusters of usages of 'eat' with related meanings forming a satellite surrounding the basic easily visualizable image of a person eating, as shown in Figure 9.

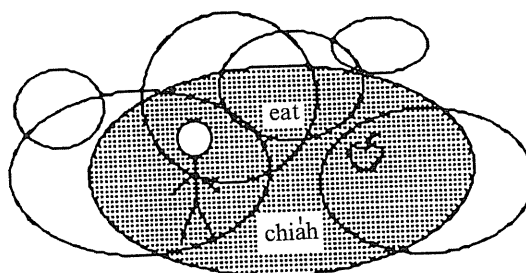


Figure 9 Structure of Different Uses of *chiah* 'to eat'

5.4 Cross-linguistic

Another independent supporting line of evidence comes from translation and teaching of these various usages of *lâi/khî* to the non-native speaker. It is much easier to teach or learn the verbs *lâi/khî* in their more spatial usages than in the usages towards the abstract end of the continuum. The concept encoded in the highly spatial sense is more universal, in the sense that it is easier to find a ready corresponding lexical item in another language, whereas parallels for metaphorical extensions of a lexical item are harder to find in other languages. Even if there are parallelisms in the two languages, the extent (i.e. the degree of productivity) may not be the same. For instance, English occasionally uses *go* for adversative meaning (*He's a goner*) and *come* for emergence (*I think I'm coming down with something*) and future Time (*in the com-ing year*). However, English does not capitalize on this pattern (i.e. does not 'see' or perceive this way) to the extent that Taiwanese does.

Since a lexical item invariably has many facets, language A may take on one particular dimension and develop its path thereon, while Language B may veer along a different direction. However, one can expect to find their common ground in the more spatial/visual usage, i.e. on the

lexical level. The analysis is compatible with the well-known fact that vocabularies are easier to learn than structural usages of the same morpheme. In dialectal comparison, for example, Taiwanese and Mandarin, are practically identical in their uses of 'come/go' (Mandarin equivalents of *lâi/khì* being *lái/qù*) on the more concrete/spatial end of the spectrum, but they differ in some of the more abstract/relational/functional uses of the verbs. For instance Mandarin and Taiwanese differ in the use of 'go' (*qù* in Mandarin, *khì* in Taiwanese) as an adversative morpheme for some verbs (Mandarin: **gān qù* but *gān diào* '[too bad,] got dried up'; cf. Taiwanese *ta khì* but **ta tiāu* '[too bad,] got dried up') and the double presence of 'go' (*khì*) in the Taiwanese Adversative Passive is absent in Mandarin.

6. Concluding Remarks

The term *metaphor* discussed in this paper is only what constitutes a part of the language system itself (in Grice's terminology would be 'conventional' rather than 'conversational'). It is obvious that metaphor in rhetoric is not discussed here. However, these are not completely different things. They are both based on our mind's ability to see similarity in creating expressions. The boundary of 'figure of speech' does not have to stop at rhetoric.

The proposed metaphoric extension need not be taken as having temporal sequential order; the term extension is itself a metaphor. It is one way that our mind sees similarity among diversity, or differently put, creates myriads out of a limited amount of tools, and our way of relating the various uses of *lâi* and *khì*. We emphasize the internal complexity of a metaphor to allow for its multifacetedness so that emphases on different facets would lead to diversity in extension. The result of all this is a conceptual domain represented by clusters in a satellite with the basic metaphor as center. In such a configuration, if the peripherals are construed as extended or derived from the center, it should only be taken as an abstract conception of derivability.

Since *lâi/khì* is active in a vast area of the language, to the extent that the proposed model of explanation (as illustrated in Figure 1 Metaphorical Extension of *Lâi/Khì* 'come/go' and Figure 2 Continuum of Concrete/Spatial Prominence) is correct, it indicates that the proposed features of complementary opposition, ego-centeredness and the concept of obtaining a shift of state (i.e. processual rather than static) as so internally structured in the *lâi/khì* metaphor, are conceptual favorites in Taiwanese. Independent confirmations abound. Take complementary opposition for example. The language heavily uses the contrast of 'front/back' (*chiông sî front world* 'my previous incarnation'; *āu bú back mother* 'stepmother'), 'above/under' (*Siōng tè above emperor* 'God'; *hā liū under current* 'vulgar'), 'black/white' (*o p'eh lâi black white come* 'to behave erratically'), etc. to create a multitude of expressions.

Metaphors are based on our living experience; given the common human physical endowments and living activities, it is not surprising that languages share many basic metaphors (conceptualize similarly) but also diverge greatly, even from the same basic metaphor. It would be interesting, cross-linguistically and cross-culturally, to see what kind of metaphors are shared, how pervasive a shared metaphor is within a language and at what point of the metaphorical extension two languages diverge and toward what directions.

References

- Chen, Lilly L. 1991. Taiwanese negation: a case of semantic synthesis. *CLS 27. Papers from the Parasession on Negation*, 1-16. Chicago: Chicago Linguistic Society.
- Chen, Lilly L. 1993. Iconicity and complementary opposition in conception of time. Paper presented at the Third International Cognitive Linguistics Conference. Leuven, Belgium. July 20.
- Cheng, Robert L. 1982. Directional Constructions in Taiwanese. *The Bulletin of the Institute of History and Philology, Academia Sinica*. Taipei.
- Cheng, Robert L. and Susie S. Cheng. 1982. *Phonological Structure and Romanization of Taiwanese Hokkien*. Taipei: Student Book Co. Ltd.
- Comrie, Bernard, 1985. *Tense*. Cambridge: Cambridge University Press.
- Huang, Shuanfan. 1977. Space, time and the semantics of lai and qu. *Proceedings of the Conference on Chinese Linguistics*. ed. by Robert Cheng et al. Taipei: Student Book Co. Ltd.
- Lakoff, George. 1987. *Women, Fire, and Dangerous Things*. Chicago: University of Chicago Press.
- Marks, L., Hammeal, R., & Bornstein, M. 1987. *Perceiving Similarity and Comprehending Metaphor*. Chicago: University of Chicago Press.
- Wang, Li. 1990. *Gudai Hanyu* [Classical Chinese]. Beijing: Zhonghua Publications.

Phonological Diagnostics of Morphological Structure

Matthew Y. Chen

University Of California San Diego

Abstract

Phonological behavior has been used to diagnose the status of linguistic expressions. One prime example is the left vs. right prominence that characterizes (compound) words vs. phrases (as in Tangxi and other Wu dialects). The distinction between words and phrases also manifests itself in the way syllables are grouped into foot-size units, which circumscribe the domain of obligatory tone sandhi in Mandarin. Furthermore, one can use cyclic tone sandhi rules to probe the internal structure of lexical items.

This paper goes on to examine recent claims about multiple morphological strata in Chinese (two according to Xu 1992, four according to Packard 1990), and to argue that the relevant facts can be better analysed as different morphological processes, including total reduplication (syllable with tone), partial reduplication (segmental material minus tone), and reduplication with prespecified or default values.

The article ends with a cautionary note on making direct inferences about morphological structure from phonological behavior, since mismatches between phonology and syntax are quite common.

In this paper I wish to look at Chinese morphology, the chosen theme

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of this symposium, as it is refracted, so to speak, through the prism of phonology. In particular, I wish to address the questions regarding wordhood (sections 1 and 5), sublexical structure (section 2) and morphological stratification (sections 3,4).

1. Words v. Phrases

One of the most vexing issues in Chinese morphology is the nature and the status of the 'word'. A thin, notoriously fuzzy line lies between a morphological unit like a compound word and a syntactic construction, that is, a phrase or a clause. There are, needless to say, standard syntactic and semantic tests of wordhood based, for instance, on the ability of syntactic rules to access word-internal parts, or on the general principles of word formations vs. phrasal constructions.¹ Phonology provides further diagnostic clues that complement these syntactic tests.

It is well-known that certain languages, notably the Wu dialects, discriminate lexical from phrasal tone sandhi. Take the Tangxi dialect, one of the earliest such documented cases (by Kennedy 1953). Much like English which distinguishes compound from nuclear stress patterns, Tangxi assigns prosodic prominence on the left to lexical compounds, and on the right to phrases, as in (1).

- (1) a. lexical compounds [s w...]
 b. phrases [...w s]
 s, w=strong, weak

All weak syllables lose their underlying tones. The toneless syllables either (a) assume a default low level pitch, in phrases, or (b) are linked with the tone carried by the prominent syllable in lexical compounds, by a tone spread rule like (2).

1. Several of the papers presented at this Symposium address precisely this issue. For an earlier survey with particular reference to Chinese see Zhang 1988 and Chen-Zhang 1990, Packard 1994.

$$(2) \begin{array}{c} [x(x...)]_{wd} \\ \swarrow \\ T \end{array}$$

The right vs. left prominence, together with the attendant tone rules, creates a phonological contrast that encodes the difference in grammatical status of words vs. phrases. This minimal contrast is illustrated in the examples given in (3).²

(3)		BT	ST	Gloss	
a.	ai ren	24-24	2-4	'sweatheart, lover'	(wd)
			n-24	'to love people'	(ph)
b.	chao fan	51-24	5-1	'fried rice'	(wd)
			n-24	'to fry rice'	(ph)
c.	shao jiu	33-51	3-3	'distilled liquor'	(wd)
			n-51	'to warm up wine'	(ph)

BT, ST, n = base tone, sandhi tone, neutral tone (low level)

wd, ph = word, phrase

Tangxi represents a prototype, of which there are many variations especially among the Wu dialects (cf. Qian 1988a, 1988b). But phonological marking of wordhood is not confined to the Wu dialects. Other dialects of Chinese also encode the morphological status of wordhood, though in a less direct and more subtle way. Take Standard Mandarin. Phonetically, the so-called third tone sandhi (henceforth 3TS) is straightforward: 3 → 2 / ____ 3 (where 1,2,3,4 = the four Mandarin tones). What has puzzled linguists to this day is the morphosyntactic condition under which tone sandhi applies. The prevailing school of thought embodied notably in the works of Shih (1986, 1990), Hung (1987), Hsiao

2. In citing dialectal examples where segmental information is not crucial, I resort to the expedient Mandarin-based *pinyin* transcription. In case a dialectal morpheme lacks a Mandarin counterpart, it is given in broad IPA symbols enclosed in < >.

(1991) among others is that tone sandhi applies obligatorily within a prosodic unit called the foot and optionally across feet. The foot is derived from surface morphosyntactic structure by means of a set of Foot Formation Rules (FFR), one version of which is given below:

- (4) Foot Formation Rule (FFR)
- Join immediate constituents into disyllabic feet.
 - Scanning from left to right, join monosyllabic constituents into disyllabic feet.
 - Join any remaining monosyllables to neighboring feet. (from Shih 1990:18)

Now, consider the following facts in Standard Mandarin:

- (5) a. cheng {fan bi-li} 'become inversely related'
(2 3) (3 4) = *
- b. gan [fan man-qing] 'dare to rebel against the Manchus'
(2 3) (3 1) = ok
- (6) a. xiao {kao ru-ge} 'small roast pigeon'
(2 3) (3 2) = *
- b. xiang [kao ru-ge] 'want to roast pigeons'
(2 3) (3 2) = ok
- (7) a. {shui-guo jiu} hao 'fruit wine is better'
(2 3) (2' 3) = *
- b. [[zhe zhong] jiu] hao 'this wine is better'
(4 3) (2' 3) = ok
- { } = word
[] = other morphosyntactic constituents
() = foot
2' = tone 2 derived from tone 3

We derive the sandhi form of (5b) in a straightforward manner illustrated below:

	dare	rebel	Manchus	
(8)	gan	[fan	[man qing]]	'dare to rebel against the Manchus'
	3	3	3 1	base tone
			(3 1)	FFR (a)
	(3	3)	(3 1)	FFR (b)
	(2	3)	(3 1)	Tone sandhi

Since (5a) is isomorphic to (5b) in its tree geometry, FFR predicts an identical prosodic organization consisting of two disyllabic feet. Within the first foot, tone sandhi fails since there is no sequence of two third tones. The predicted reading is ungrammatical, as shown in (9):

	become	anti	proportion	
(9)	cheng	[fan	[bi li]]	'become inversely related'
	2	3	3 4	base tone
			(3 4)	FFR (a)
	(2	3)	(3 4)	FFR (b)
	*(2	3)	(3 4)	Tone sandhi (n/a) = *

Example (6) is similar to (5) and (7) is the mirror-image of the same.

In essence, FFR treats connected speech uniformly as unlabelled tree representations, and therefore is insensitive to the word as a unit (enclosed in { }) v. other constituents (enclosed in []). Hence, FFR cannot discriminate between the (a) and the (b) examples of (5) to (7).

Although the matter requires probing in much greater depth, initial evidence points to a need to recognize some kind of 'lexical prefabs'. That is to say, words are internally organized into rhythmic units such as feet and, more specifically, phrasal phonology respects the rhythmic structures already erected at the lexical level, in the spirit of 'structure pre-

serving' principle (cf. Kiparsky 1982). In this light, example (9) proceeds as follows:

become anti		proportion		
(10)	cheng {fan	{bi li}}		'become inversely related'
	2	3	3 4	base tone
			(3 4)	FFR (a), lexical
		(3	(3 4))	FFR (c), lexical
	(2	(3	(3 4)))	FFR (c), phrasal

			(3 4)	Tone sandhi (n/a)
		(2	3 4)	Tone sandhi
	(2	2	3 4)	Tone sandhi (n/a) = ok

By the time phrasal FFR comes along, the lexical FFR had assigned a trisyllabic $[x [x x]]$ foot to *fan bi li* 'inverse relation/proportion'; therefore there remains only one unfooted syllable, namely *cheng* 'become', which then attaches itself to the existing foot by the equivalent of stray syllable adjunction (FFR (c)), to form a quadrisyllabic unit. Tone sandhi applies cyclically to produce the attested reading. This approach readily accounts for the observed contrasts in (5-7).

This notion of 'lexical prefabs' in essence is equivalent to the principle of 'lexical integrity' that Shih (1986:136ff) had appealed to in the first place.

2. Sublexical Structure

Mandarin TS not only recognizes the syntactic word as a phonological unit, it is also sensitive to the internal structure of the word. As a natural consequence of FFR and the cyclic mode of TS rule application, the output of TS encodes the layering of word-internal structures. Thus TS behavior encodes the morphological as well as the syntactic IC hierarchy, as illustrated by the following examples taken from Shih (1990:7):

(14) Morphological IC Hierarchy

paper tiger

a. zhi [lao hu]

(3 (3 3))

FFR

(2 3)

Tone sandhi

(3 2 3)

Tone sandhi (n/a)

tiger gall

b. [lao hu] dan

'bravery'

((3 3) 3)

FFR

(2 3)

Tone sandhi

(2 2 3)

Tone sandhi (cyclic)

(15) Syntactic IC Hierarchy

wait water cool

a. deng [shui leng]

'waiting for the water to
cool down'

(3 (3 3))

FFR

(2 3)

Tone sandhi

(3 2 3)

Tone sandhi (n/a)

water cool good

b. [shui leng] hao

'It's better if the water is
cool'

((3 3) 3)

FFR

(2 3)

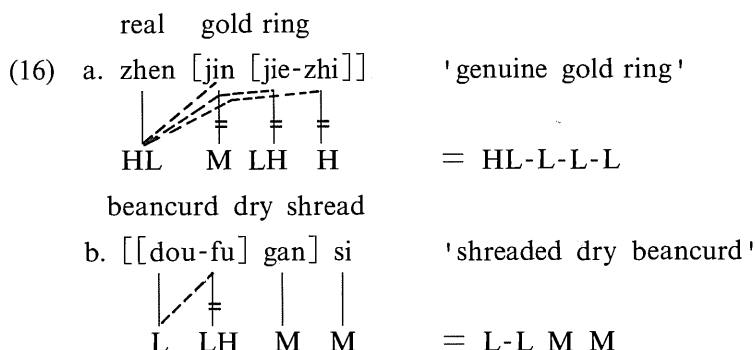
Tone sandhi

(2 2 3)

Tone sandhi (cyclic)

A uniform cyclic application of rules is not the only way phonology reflects morphosyntactic structure. In this respect Danyang, a northern Wu dialect is noteworthy in that it encodes word-internal structures by reference to the notion of c-command. That is, in this dialect, a syllable spreads its tone to all and only the syllables within its c-command domain on the right. Thus, while the L of *zhen* spreads to all subsequent syllables in the compound in (16a), the L of *dou* spreads only to the next

syllable in (16b). Furthermore, neither LH nor M of *fu* and *gan* in (16b) extend rightwards, so that while (16a) constitutes a single prosodic domain for rightward tone spread, (16b) consists of three distinct tonal domains, since neither the third nor the fourth syllable is c-commanded by the syllable to the left.



An analogous (though not identical) c-command relation among word-internal components manifests itself phonologically in Ruicheng, a Northern Mandarin dialects spoken in Shanxi, except that in this case, two tones X and Y undergo sandhi change only if X is adjacent to Y and c-commands Y. (For details see Zhang in this volume and 1992).

3. Morphological Strata in Chinese?

There are other ways in which tone sandhi can interact with word formation. Consider the following types of reduplication as a productive process of word formation.

(17) A. 'Vivid' adjectives	yuan yuan-r (de)	'far away'
	3 1 o	
	hao hao-r (de)	'in perfectly good condition'
	3 1 o	

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B. Kinship terms	jie jie	'older sister'
	3 o	
	nai nai	'grandma'
	3 o	
C. Other reduplicated forms	xiang xiang	'think'
	2' o	
	zhong zhong	'all kinds'
	2' o	

Key: 1,2,3,4 = tones 1,2,3,4 of Mandarin

2' = tone 2 derived from tone 3

o = neutral/zero tone

Type A presents no particular problem. One may posit a rule of morphologically conditioned rule that changes any lexically assigned tone to a first tone in the so-called 'vivid' adjectives when suffixed by [-r]. Let us call this rule High Tone Substitution (HTS). As long as we order HTS before the Third Tone Sandhi (3TS) that changes 3-3 to 2-3, the former will 'bleed' the latter. The problem arises with B and C. Why does 3TS apply to C but not to B? According to one analysis, Xu (1992) hypothesizes that B words are formed at L-1 (Level-1) of morphology, whereas C words are formed at L-2. He further stipulates that 3TS is a L-2 rule. Presumably the rule whereby the tone of a reduplicated form is neutralized (call it Neutral Tone Rule, or NTR) applies at both levels. In other words, Xu (1992) visualizes a model like (18):

(18)	Morphology	Phonology

Level-1	Kinship terms reduplication	NTR

Level-2	Other reduplications	3TS, NTR

In other words, the contrast between *jie-jie* [3-o] 'sister' and *xiang-xiang* [2'-o] 'think' (give it some thought) is derived as follows:

	'sister'	'think'	
(19)	jie-3	xiang-3	

	jie-3 jie-3	--	L-1 Morphology
	jie-3 jie-o	--	L-1 Phonology: NTR

	--	xiang-3 xiang-3	L-2 Morphology
	--	xiang-2 xiang-3	L-2 Phonology: 3TS
	--	xiang-2 xiang-o	L-2 Phonology: NTR

Such an approach would be better motivated and more explanatory if one could show that there are clusters of properties that independently characterize L-1 vs. L-2 words, and that all (or most) thusly diagnosed L-1 words are exempt from 3TS, while all words identified as L-2 formations are subject to it. Otherwise, the designation L-1 or L-2 would amount to little more than a diacritic equivalent to [+/- 3TS].

In this connection let us examine a more elaborate model of stratum-ordered lexical morphology of Chinese first presented in Packard (1990), who also used phonological evidence based on tone sandhi as one of the strongest arguments in support of his analysis (Packard 1992). According to him, Mandarin 3TS is stress-sensitive, statable as (20)

$$(20) \quad 3TS: \quad 3 \rightarrow 2 / \text{ ____ stressed syllable}$$

Now, stress is assigned either to the head or the non-head, depending on the particular level or stratum at which a lexical compound is formed, specifically: head-stress at level L-2 (level 2), non-head-stress at L-1 and L-3. 3TS and the NTR which deletes tones in unstressed positions apply at L-4. In addition, HTS operates at L-1. To illustrate, take reduplicated forms in Mandarin.

(21) Reduplication

	(a)	(b)	(c)	(d)
	sister	well	volume	think
	jie 3	hao 3	ben 3	xiang 3
L1 Non-head St	jie-JIE	HAO-hao-r-de		
	3 3	3 3		
	*	*		
HTS		HAO-hao-r-de		
		3 1		
		*		
L2 Head-St			ben-BEN	
			3 3	
			*	
L3 Non-head St				XIANG-xiang
				3 3
				*
L4 3TS	n/a	n/a	ben-BEN	XIANG-xiang
			2 3	2 3
			*	*
NTR	jie-JIE	n/a	ben-BEN	XIANG-xiang
	3 o		2 o	2 o

key: * = stress
 o = neutral/zero tone
 capital letters = head
 3TS = Third Tone Sandhi
 NTR = Neutral Tone Rule
 HTS = High Tone Substitution

Kinship terms like *jie-jie* 'older sister' (= case (a) in (21)) are formed at L-1. Since L-1 words bear stress on the non-head (assuming nouns to be head-final and verbs and adjectives head-initial), they fail the requisite condition for tone sandhi. Hence the applicable rule, namely NTR, deletes the unstressed third tone, producing *jie-jie* [3-o] as output. *Jie-jie*

[3-o] contrasts with both *ben-ben* [2-o] 'every volume' and *xiang-xiang* 'to give it some thought' [2-o] (cases (c,d)), both of which undergo Third Tone Sandhi as well as Neutral Tone. Packard accounts for this contrast by assuming that *ben-ben* and *xiang-xiang* are formed at L-2 and L-3 respectively, so that both become end-stressed according to the stress rules operating at the different morphological strata. Given the end-stress, both 3TS and NTR apply, in that order, producing the surface tone pattern [2-o]. As for *hao-hao-r-de* [3-1-o-o] (case (b)), since HTS operates at the earliest L-1, it preempts 3TS. Hence tone 3 remains.

Since the syntactic arguments (based, for instance, in A-not-A questions) that had motivated such a complex stratum-ordered lexical morphology have been seriously challenged and examined in great detail by Sproat-Shih (1992a, 1992b), I will merely refer the reader to the above-mentioned articles and restrict myself to the phonological side of the debate. As far as the tone sandhi facts are concerned, Packard's stratum-ordered account is problematic on both empirical and theoretical grounds.

To take the issue of empirical falsifiability first. In many cases assignment to different morphological strata seems to rest on shaky grounds. For instance, Packard assigns what he calls exocentric nouns like *mai-mai* 'business, trade' (literally: buy + sell, case (22-a)) to L-1, while relegating derived nouns like *hao-dai* 'mishap, disaster' (literally: good + bad, case (22-b)) to L-2. There is scant evidence for such a morphological partition. If categorial switch is the defining characteristic of exocentric L-1 compounds, then *hao-dai* is just as exocentric as *mai-mai*. *Hao-dai* functions not only as a de-adjectival noun, but also as an adverbial with the meaning 'anyhow, at any rate, no matter what' as in *ni hao-dai ye dei shi-yi-shi* 'no matter what, you must give it a try'. It seems that the assignment of (exocentric) coordinate compounds to L-1 and L-2 is motivated by nothing other than their sandhi behavior -- which is precisely the 'explanandum' in the first place.

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(22)		(a)	(b)
		buy-sell	good-bad
		mai-mai	hao-dai
		3 4	3 3
L1	Non-head St	mai-MAI	
		*	
L2	Head-St		hao-DAI
			*
L4	3TS, NTR	mai-MAI	hao-DAI
		3 o	2 o

To the extent that morphological stratification in Packard's model is independently motivated, the stratum-ordered model makes empirically false predictions. Consider (23).

(23) Resultatives		(a)	(b)	(c)
		demolish	look-see	kill
		dao-hui	kan-jian	da-si
		3 3	4 4	3 3
L1	Non-head St	DAO-hui		
		*		
L2	Head-St		KAN-jian	DA-si
			*	*
L4	3TS	DAO-hui	n/a	n/a
		2 3		
		*		
	NTR	DAO-hui	KAN-jian	DA-si
		2 o	4 o	3 o

According to Packard (1992), the reason why 3TS applies in case (a) but not in case (b) is because while *dao-hui* 'demolish' is formed at L-1, *kan-jian* 'see' (literally look + see) is assembled at L-2. Since L-1,2 assign stress differently, the former undergoes 3TS, but not the latter. It is important to note that in this case verb + resultative compounds like *dao*

-*hui* and *kan-jian* are assigned to different lexical strata not arbitrarily but according to a number of syntactic tests such as the possibility of inserting *de* 'can' and its negative form *bu* 'cannot' between the verb and the resultative complement. Thus while *kan-de-jian* 'visible, can see' and *kan-bu-jian* 'invisible, cannot see' are both grammatical, neither of their counterparts **dao-de-hui* 'destructible, can be demolished' and **dao-bu-hui* 'indestructible, cannot be demolished' is acceptable. It was precisely for reasons like this that Thompson (1973) distinguished two types of resultative compounds: restrictive compounds, like *dao-hui*, that must be listed in the lexicon, vs. productive compounds, like *kan-jian* that are generated by rule (see Thompson 1973, Appendix A and B for a sample of the two types of compounds). This distinction seems both reasonable and well-founded. If we equate Thompson's restrictive and productive resultative compounds with Packard's L-1 and L-2 words respectively, we predict that productive resultative compounds are head-stressed, and therefore would not undergo 3TS. This prediction is false as seen in case (23c). The so-called potential form *da-de-si* 'can be killed' and its negative counterpart *da-bu-si* 'cannot be killed' are freely rule-generated by inserting *de* and *bu* respectively in *da-si* 'to kill' (literally: strike + die), exactly like *kan-jian*. It belongs, therefore, to L-2 resultative compounds, and therefore head-stressed, hence not susceptible to 3TS. The predicted reading is the ungrammatical * [da-si 3-o], instead of the correct [da-si 2-o].

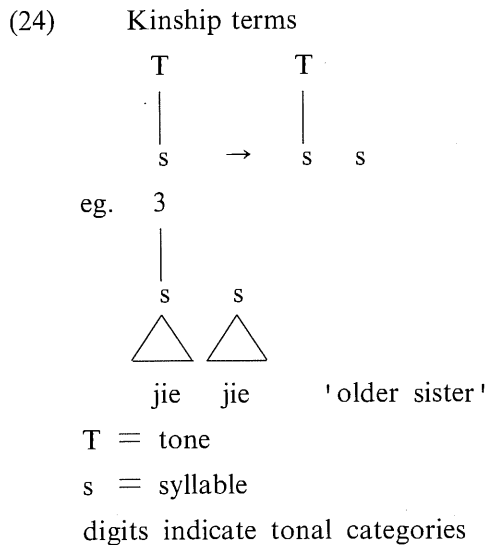
4. An Alternative Analysis

Packard's account rests on a questionable premise, namely that tone sandhi is stress-conditioned.³ The reason why tone sandhi applies to *hao-dai* (22b) and *dao-hui* (23a) but not to *mai-mai* (22a) and *kan-jian* (23b) is transparently phonological in nature, and has nothing to do with morphological stratification: the former, but not the latter, have a se-

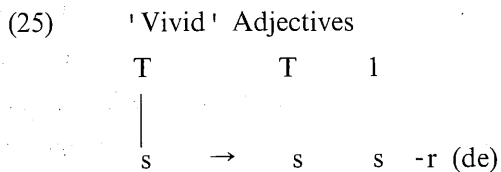
3. This premise, in turn, stems from a misconstrual of Wang-Li (1967), as pointed out by Sproat-Shih (1992b).

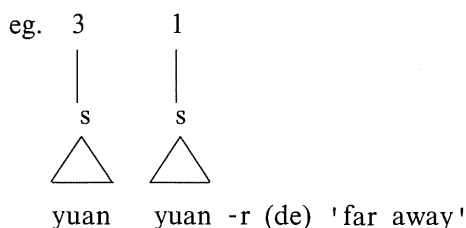
quence of 3-3 tones. His mistaken assumption led him to postulate an admittedly 'abstract' head vs. non-head stress, which serves as little more than a diacritic that triggers or blocks tone sandhi. One could, of course, dispense with the diacritic stress, and restate tone sandhi directly in terms of head vs. non-head. Be as it may, the resulting model is extraordinarily complex and phonologically unmotivated.

Here is an alternative analysis. All we need to say is that kinship terms are created in the lexicon by a morphological rule, whereby only segmental materials are copied, but not the tones, roughly:

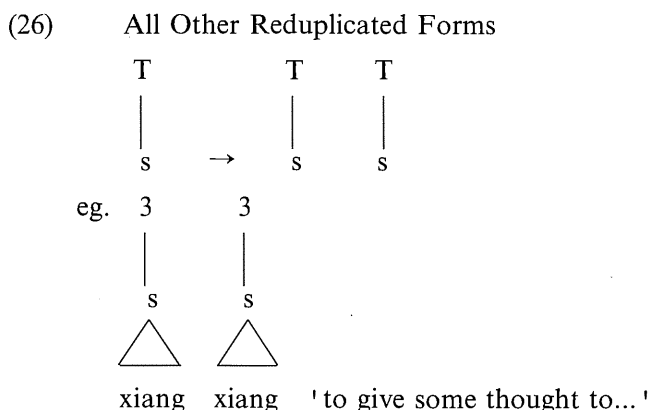


Since the reduplicated form (or template, if you will) does not have a tonal slot on the second syllable, the second syllable remains toneless, hence 3TS fails. In contrast to kinship terms, 'vivid' adjectives have a *pre-specified* high level (= tone 1) as part of the word formation rule. In other words:





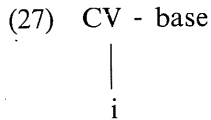
It goes without saying, since in such cases we have a sequence of 3-1 tones, the condition on TS is not met, and TS does not apply. All other reduplicated forms are created by (26), which copies both tonal and segmental material:



As the immediate output of (26) we have a juxtaposition of two third tones, (i.e. 3-3), hence 3TS applies before NTR reduces the second reduplicated tone to zero. There is no need to postulate a multi-level morphology or to restrict 3TS to L-2 or, for that matter, to stipulate that stress falls on the head at L-2 but on non-head at L-1 and L-3, etc. Instead, all the lexical idiosyncracies are part of the word-formation process itself.

It should be noted in passing, that the various types of reduplication as a morphological process have been well attested in the literature. (26) is a garden variety reduplication, while (24) instantiates a case of partial reduplication, whereby only the segmental material is copied, but not the tonal melody. (25) entails pre-specification, a device that was first intro-

duced in the Arabic *binyanim* skeleta (McCarthy 1979), then incorporated as condition C on reduplication (Marantz 1982, cf. McCarthy-Prince 1990). Thus Yoruba deverbal nouns carry a prefix consisting of a CV skeleton, whose V is fixed as *i*, as schematized in (27):



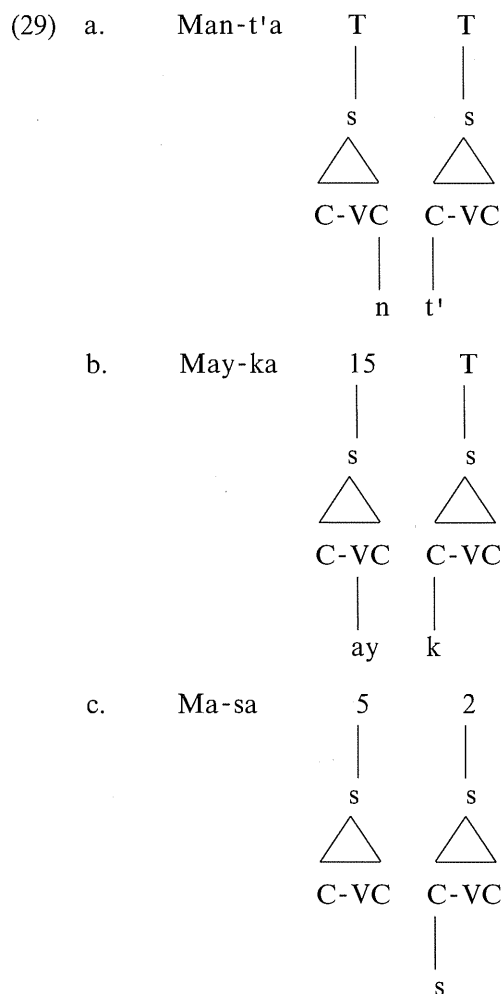
For instance, from *lo* 'to go' and *dun* 'to be tasty, sweet', we derive the nominalized forms *li-lo* and *di-dun* respectively. With respect to pre-specified tones in particular, the phenomenon has been well documented in a number of secret languages of China. The following three varieties will illustrate the point.

(28) a.	Man-t'a	Base	Reduplicated form
		ma 55	man 55 - t'a 55
		p@n 15	p@n 15 - t'@n 15
b.	May-ka	taw 51	tan 51 - t'aw 51
		ma 55	may 15 - ka 55
		p@n 15	pay 15 - k@n 15
c.	Ma-sa	taw 51	tay 15 - kaw 51
		ma 3	ma 5 - sa 2
		ti 5	ti 5 - si 2
		kun 31	kun 5 - sun 2

Key: digits represent Y.R.Chao's tone letters

@ = schwa

(28) represents the intermediate forms, to which certain sandhi processes apply -- which I ignore for expository clarity. The skeleta of the reduplicated forms for these three secret languages are respectively:



Segmental details aside, Man-t'a has two unspecified tonal slots in the template, and therefore copies the base tone onto both syllables. May-ka, on the other hand, pre-assigns a [15] tone on the first syllable; it therefore only copies the base tone onto the second syllable. Finally, Ma-sa displays a fixed tonal template [5-2], with pre-designated tones on both syllables. In short, varying degrees of tonal as well as segmental pre-specification are well attested in the reduplication process (for detailed analyses, see Chao 1931, Yip 1982, Bao 1990).

The analysis presented above, which exploits the various options available to reduplication (whole-sale reduplication, syllable copy only,

syllable copy with pre-specified tone), is extendable to other types of word formation. It is well known (cf. C-Y. Chen 1984) that a number of etymologically third tone suffixes (30a) and grammatical markers (30b) are unstressed and carry a neutral tone [o]. The lexical base of these words surface with the underlying third tone. In addition, there are a handful of lexical compounds ending in a neutral tone, that is traceable to a third tone (30c). These also show up with the [3-o] pattern.

- (30) a. Noun + suffix
 ya zi 'mute' yi zi 'chair'
 3 o 3 o
- b. Verb + asp
 zou le 'left' xing le 'woke up'
 3 o 3 o
- c. Miscellaneous
 ma hu 'careless' er duo 'ear'
 3 o 3 o

In contrast to (30), all other words with underlying /3-3/ tones show up as [2'-o] where the tone on the last syllable is neutralized. A small sample of [2'-o] words are given below.

- (31) a. xiang fa 'ways of thinking'
 2' o
- b. xiao jie 'miss'
 2' o
- c. lao hu 'tiger'
 2' o
- d. da shou 'thugs'
 2' o

Key: 2' = tone 2 derived from tone 3

The coexistence of (30), (31) and the various types of reduplication given

			'sister'		'miss'		'think'
(32)	a.	jie jie	v.	xiao jie		xiang xiang	
		3 o		2' o		2' o	
		'careless'		'tiger'			
	b.	ma hu	v.	lao hu			
		3 o		2' o			
		'father'		'Lao Tzu' (proper name)			
	c.	lao zi	v.	lao zi			
		3 o		2' 3/o			

We can account for all the facts enumerated above by simply saying that a closed class of words come out of the morphological component with a toneless syllable. This class is restricted to basically three subtypes: 1. certain functors like *-zi*, *-le*; 2. reduplicated kinship terms; 3. isolated cases like *ma-hu* and *er-duo*.⁴ All other morphemes are specified for tone. 3TS applies as usual, followed by a low-level phonetic rule that optionally and idiosyncratically delete the tone of a weakly stressed syllable in certain lexical items.⁵ This analysis covers phrasal phonology as well. In particular, object pronouns and directional complements typically are weakly stressed and pronounced with a neutral tone. The same rule order 3TS > NTR is observed.

4. According to C-Y. Chen (1984:306) the entire lexicon of Mandarin Chinese contains exactly two such compounds with a [3-o] pattern. She went on to note that "the etymology of *mahu* is not yet clear; as the second syllable can be represented either by the character for 'tiger' or by the character for 'paste', which has the 2nd tone... As for *erduo*, strictly speaking, the-*duo* here hardly has any semantic load and is more like an enclitic element."

5. Chao (1968:39) had pointed out that the tonal reduction in weakly stressed syllable is unpredictable on phonological or syntactic or semantic (e.g. degree of idiomatization) grounds, and that each lexical entry must be individually marked whether or not to undergo the neutral tone rule. This lexical idiosyncrasy is amply borne out by a recent study. C-Y.Chen (1984:300) observed a high degree of variation and discrepancy among the four pronouncing dictionaries she consulted. Optional or divergent readings account for as many as 72% of the 760 disyllabic items in her corpus.

- hit you
- (33) a. da ni 'hit you'
- 3 3 base tone
- 2 3 3TS
- 2 o NTR
- lift up come
- b. ju qi lai 'lift up'
- 3 3 2 base tone
- 2 3 2 3TS
- 2 o o NTR

5. Asymmetry Between Phonology and Morphosyntax

It is clear that we can and should avail ourselves of phonological evidence as a tool in identifying and probing putative morphological as well as syntactic structures. By way of conclusion, I wish to point out that the diagnostic tool must be handled with care. As a case in point, take Old Chongming for illustration. This Wu dialect distinguishes three types of constructions: (a) lexical compounds, to which lexical tone sandhi (LTS) applies; (b) clitic groups, i.e. a lexical word plus a number of particles and affix-like elements, which undergo a different set of sandhi rules (post-lexical tone sandhi, PTS for short); (c) syntactic phrases, which lie outside of the domain of both LTS and PTS (for details, see Chen-Zhang 1990). With this in mind, let us look at (34-36).

- (34) a. kuai ban 'allegro' (mod-head)
- fast rhythm
- b. *kuai de ban 'fast rhythm'
- DE ⁶

6. de, glossed simply as DE, functions variously as a nominalizer, relative clause marker, complementizer, or 'subordinator'.

- (35) a. chu ban 'to publish' (verb-obj)
produce edition
- b. *ban chu le 'the edition has appeared'
Prt
- c. chu ban yi ben shu 'to publish a book'
one Cl book
- d. *da zuiba ta 'to hit him on the mouth'
hit mouth him
- (36) a. tou teng 'troublesome' (subj-pred)
head ache
- b. hen tou teng 'very troublesome'
very head ache
- c. *hen shou teng 'the hand hurts badly'
very hand ache

Old Chongming treats the (a) examples of (34-36) as lexical items, applying to them LTS. Their lexical status is presumably uncontroversial. For instance, in (34a), *kuai* and *ban* are inseparable; thus they resist the insertion of the subordinator *de* (or its Old Chongming equivalent), as in (34b). The fact that *ban* 'edition' in (35a) cannot be fronted by topicalization (35b) confirms the integrity of *chu-ban* as a single lexical unit. Furthermore, if *chu-ban* remained syntactically transparent as a verb + object construction, one would predict that (35c) would violate the phrase structure of Chinese in the same way that (35d) does. Finally, (36 a) syntactically behaves like an adjective capable of being modified by an adverb *hen* 'very' (36b). This collocation would not be possible, if it were construed as a subject-predicate construction, as shown by the ungrammaticality of (36c). In short, lexical integrity, general principles of phrase structure, and subcategorization etc. converge to characterize (34-6a) as bona fide syntactic words; and they behave like words phonologically as well.

When syntax and phonology go hand in hand, tone sandhi creates

interesting contrasts, as illustrated below. (37a) and (38a) undergo LTS and indeed behave like indivisible compounds, while (37b) and (38b) undergo PTS and behave like complex predicates, allowing for modification or negation of the complement *ping* 'flat' or *wan* 'finish'.

- | | | | | | |
|------|-----|--|----------|-------------------------------|--|
| | | let | go | | |
| (37) | a. | fang | xing | 'to let pass through customs' | |
| | | M | LM | base tone | |
| | | HMH | H | by LTS | |
| | cf. | *fang ta xing 'let him pass through customs' | | | |
| | | | | he | |
| | | | | | |
| | | put | flat | | |
| | b. | fang | ping | 'to lay something flat' | |
| | | M | LM | base tone | |
| | | M | H | by PTS | |
| | cf. | fang de | hen ping | 'lay something perfectly | |
| | | DE very | | flat' | |
| | | | | | |
| | | correct | good | | |
| (38) | a. | gai | liang | 'to improve' | |
| | | HMH | LM | base tone | |
| | | HMH | H | by LTS | |
| | cf. | *gai bu liang 'fail to improve' | | | |
| | | | | not | |
| | | | | | |
| | b. | gai | wan | 'to finish correcting' | |
| | | HMH | LM | base tone | |
| | | HMH | M | by PTS | |
| | cf. | gai bu wan | | 'did not finish correcting' | |
| | | | | not | |

But syntax and phonology do not always work in tandem. Consider the examples of (39) to (41).

- (39) a. dong shen
move body
'to depart'
- b. dong bu liao shen
move not possible body
'unable to depart'
- (40) a. wa ku
dig sore/bitter experience
'to speak sarcastically'
- b. wa ta tongxue de ku
dig his schoolmate DE sore
'to speak sarcastically of his schoolmate'
- c. wa ku ta tongxue
dig sore his schoolmate
'to speak sarcastically of his schoolmate'
- d. *lian ku ye wa le
even sore also dig Prt
'to even speak sarcastically of someone'
- (41) a. bo pi
peel skin
'to peel'
- b. bo juzi de pi
peel orange DE skin
'to peel an orange'
- c. *bo pi juzi
'to peel an orange'
- d. lian pi ye bo le
even skin also peel Prt
'to have peeled off even the skin'

Old Chongming also treats the (a) items in (39-41) as words, as far as the applicability of LTS is concerned. However, (39b) seems to violate lexical integrity. One could say that the process whereby we derive V-de-liao-X or V-bu-liao-X from V-X is a morphological rather than a syntactic process. Thus Thompson (1973:365) characterized this process as a 'lexical potentializing rule' of word formation. Seen in this light (39b) can pass as a syntactic word. As for (40a), the object of the compound verb is inserted in the middle (40b). It is not clear at this point if the notion of noun-incorporation could salvage (40a) as a syntactic word. For instance, incorporated nouns are typically generic and non-referential as in *baby-sit*, *house-hunting*, *debt-ridden* etc. (cf. Mithun 1984, 1986; see however Sadock 1986). With this in mind, it is worth noting that the 'outer' object *ta tongxue* 'his schoolmate' in (40b) demonstrably has a definite referential property in view of the fact that it can serve as the antecedent of the second pronoun *ta* in a sentence like (42a), in contrast to (42b).

- (42) a. Xiao Li jingchang wa ta togxue de ku,
 often dig his schoolmate DE sore
 suoyi ta hen shengqi
 therefore he very angry
 'Xiao Li often speaks sarcastically of his
 schoolmate, so he (= schoolmate) is very angry'
- b. * Kimberly used to babysit when he (= baby)
 was three.

The insertion of the 'outer' object in (40b) is analogous to what goes on in 'phrasal verbs' like *call me up*, *put an idea across*, *turn the light off*, *give the baby up* (for adoption) etc., where the verb and the particle are separated by the object. As the term 'phrasal verbs' (Quirk et al. 1972) suggests, these verb-particle constructions have an ambiguous status between words and phrases.

(41a) is worse in that, first, unlike (40c) which can take an 'outer'

object, its counterpart in (41c) is ungrammatical, and, second, preposing of the 'inner' object is perfectly grammatical in (41d) but unacceptable in (40d). In other words, the internal verb-object construction of (41a) is syntactically transparent in that the internal object precludes an outer object (41c) and is capable of being fronted (41d). From the point of view of both lexical integrity and syntactic collocation, therefore, (41a) looks like a phrase; and yet, phonologically it behaves like a word.

The possible asymmetry between phonology and morphosyntax should serve to caution against inferring from phonological behavior hasty conclusions about issues of morphosyntax that need to be settled on independent grounds.

References

- Bao, Zh-M. 1990. Fanqie languages and reduplication. *LI* 21. 317-50.
- Chao, Y-R. 1931. Fanqie yu ba zhong [Eight varieties of fanqie languages]. *Bulletin of the Institute of History and Philology, Academia Sinica* 2. 320-54.
- Chao, Y-R. 1968. *A Grammar of Spoken Chinese*. University of California Press.
- Chen, C-Y. 1984. Neutral tone in Mandarin: phonotactic description and the issue of the norm. *JCL* 12. 299-333.
- Chen, M. & H-M. Zhang. 1990. Lexical and postlexical tone sandhi in Chongming. To appear in J. Wang & N. Smith (eds), *Studies in Chinese Phonology*.
- Hsiao, Y-C. 1991. *Syntax, Rhythm and Tone: a Triangular Relationship*. Ph. D. dissertation, UCSD.
- Hung, T. 1987. *Syntactic and Semantic Aspects of Chinese Tone Sandhi*. Ph. D. dissertation, UCSD.
- Kennedy, G. 1953. Two tone patterns in Tangsic. *Language* 29. 367-73.
- Kiparsky, P. 1982. From cyclic phonology to lexical phonology. In H. van der Hulst & N. Smith, eds., *The Structure of Phonological Representations, Part I*, 131-177. Dordrecht: Foris.
- Marantz, A. 1982. Re reduplication. *LI* 13. 435-82.
- McCarthy, J. 1979. *Formal Problems in Semitic Phonology and Morphology*. Ph. D. dissertation, MIT
- McCarthy, J. & A. Prince. 1990. Foot and word in prosodic morphology: the Arabic broken plural. *NLLT* 8. 209-284.
- Mithun, M. 1984. The evolution of noun incorporation. *Lg* 60. 847-894.
- Mithun, M. 1986. On the nature of noun incorporation. *Lg* 62. 32-37.
- Packard, J. 1990. A lexical morphology approach to word formation in Mandarin. *Yearbook of Morphology* 3. 21-37.
- Packard, J. 1992. Why Mandarin morphology is stratum-ordered. Paper presented at NACCL-4, University of Michigan.

- Packard, J. (ed.) 1994. Word formation in Chinese. (in press)
- Qian, N-R. 1988a. Wuyu shengdiao xitong de leixing ji qi bianqian [Wu tonal systems: typology and evolution]. *Yuyan Yanjiu* 15. 63-80.
- Qian, N-R. 1988b. Shanghai diqu fangyan yinbian de yufa kuosan [The lexical diffusion of phonological changes in the dialects of metropolitan Shanghai]. Paper presented at the First Symposium on Contemporary Linguistics, Taiyuan.
- Quirk, R., S. Greenbaum, G. Leech & J. Svartvik. 1972. A Grammar of Contemporary English. Longman.
- Sadock, J. 1986. Some notes on noun incorporation. *Lg* 62. 19-31.
- Shih, C-L. 1986. The Prosodic Domain of Tone Sandhi in Chinese. Ph. D. dissertation, UCSD
- Shih, C-L. 1990. Mandarin third tone sandhi and prosodic structure. To appear in J. Wang & N. Smith (eds), *Studies in Chinese Phonology*.
- Sproat, R. & C-L. Shih. 1992a. Mandarin morphology is not stratum-ordered. Paper presented at the LSA meeting, Philadelphia.
- Sproat, R. & C-L. Shih. 1992b. Mandarin morphology still is not stratum-ordered. ms. AT&T and Rutgers University.
- Thompson, S. 1973. Resultative verb compounds in Mandarin Chinese: a case for lexical rules. *Language* 49. 361-379.
- Wang, W. & K-P. Li. 1967. Tone 3 in Pekinese. *Journal of Speech Research* 10. 629-36
- Xu, D-B. 1992. Mandarin tone sandhi in the lexicon: evidence of lexical phonology. ms. Hamilton College.
- Yip, M. 1982. Reduplication and C-V skeleta in Chinese secret languages. *LI* 13. 637-662.
- Zhang, H-M. 1988. On the boundary between word and non-word in Chinese. ms. UCSD
- Zhang, H-M. 1992. Topics in Chinese Phrasal Tonology. Ph. D. dissertation, UCSD

Resultative Compounds and Lexical Relational Structures

Lisa Lai-Shen Cheng

University of California, Irvine

Abstract

This paper explores the theory of argument structure proposed in Hale and Keyser (1991) to account for the various properties of resultative verb compounds in Mandarin Chinese. It is shown that neither a pure lexical approach (Li 1990a), nor a pure syntactic approach (Huang 1992) can account for all the properties of resultative verb compounds. I argue that resultative compounds should be split into two types (lexical and syntactic). Further, I show that the distinct properties of lexical resultative verb compounds can be accounted for using Lexical Relational Structures (Hale and Keyser 1991).

1. Introduction

There are basically two different views of compounding. One derives all compounds in syntax (i.e. morpho-syntax) and the other in the lexicon (i.e. lexical-syntax). A representative of the former theory can be found in Huang (1992). In contrast, Li (1990a), proposes a theory of verb-verb compounding in the lexicon to account for the formation and interpretation of Mandarin verb-verb compounds. In this paper, I further examine resultative verb-verb (RVV) compounds in Mandarin Chinese. I will show that neither a pure lexical analysis nor a pure syntactic analysis

is sufficient in accounting for the data in Mandarin.

I first briefly review Li (1990a) and Huang (1992). I will discuss problems associated with these two analyses. It will be shown that RVV compounds need to be split into two types, lexical and syntactic compounds. Further, I will advocate a theory of lexical compounding based on the theory of argument structure proposed in Hale and Keyser (1991).

2. Previous Analyses

2.1. Li (1990a)

Li (1990a) proposes a lexical analysis of compounding by appealing to the Case theory as well as the assumptions listed in (1), which are related to theta-roles:

- (1) a. A structured theta-grid, following Grimshaw (1992): the theta-roles of a verb are ordered according to their relative prominence.
- b. Theta-identification, following Higginbotham (1985): theta-roles from two different verbs can be identified and assigned to the same NP.
- c. Head-feature percolation, following Lieber (1983) among others: the theta-role prominence of a head of a compound needs to be maintained in the theta-grid of the compound.

Hence, given a compound consisting of two verbs, V1 and V2, the theta-roles of V1 are "identified" with those of V2 yielding a theta-structure with "merged theta-roles". For example, consider the compound *xia-shu* 'play-lose' in (2).

- (2) Both V1 and V2 have two theta-roles.
 baoyu xia-shu-le qi
 Baoyu play-lose-ASP chess
 'Baoyu played (chess and as a result he) lost it.'

Both verbs have two theta-roles $\langle 1,2 \rangle$ and $\langle 1',2' \rangle$ respectively. The only correct output of the theta-identification of the two theta-grids is $\langle 1-1',2-2' \rangle$ (where the "-" notation indicates that the two theta-roles are identified). The other combinations are illegitimate because the prominence the theta-roles has to be maintained.

By using theta-identification and theta-role prominence, Li accounts for a wide range of compounds differing in the number of theta-roles of the verbs, as shown in (3)-(5).

- (3) V1 has two theta-roles and V2 has one.

qi-ku $\langle 1,2-1' \rangle$

baoyu qi-ku-le daiyu

Baoyu annoy-cry-ASP Daiyu

'Baoyu made Daiyu so angry (that Daiyu) cried.'

- (4) V1 has one theta-role and V2 has two.

wan-wang $\langle 1-1',2' \rangle$

ta wan-wang-le zijide zhize

he play-forget-ASP own duty

'He played (in such an absorbed way that he) forgot his duty.'

- (5) Both V1 and V2 have only one theta-role.

xiao-feng $\langle 1-1' \rangle$

- (a) fanjin xiao-feng-le

Fanjin laugh-insane-ASP

'Fanjin laughed to the extent of becoming mad.'

ku-zou $\langle 1,1' \rangle$

- (b) daiyu ku-zou-le henduo keren

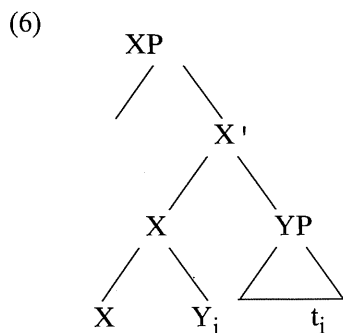
Daiyu cry-leave-ASP many guest

'Daiyu cried (so much that) many guests left.'

In (5), since both verbs have only one single theta-role, there is no relative prominence. Further, the identification of the theta-roles is optional in this case. This is due to Case theory, according to Li (1990a). Li maintains that since there are in general two structural Cases, there is no need to force theta-identification. Hence, for verbs with one theta-role, we will either get a transitive (i.e. without theta-identification) or an intransitive (i.e. with theta-identification) compound. In other words, Case theory determines in some cases whether or not there is theta-identification. Assuming that there are only two structural Cases available to each verb, there are only two possible arguments of a compound. Thus, a compound consisting of verbs with two theta-roles will not be able to take more than two arguments, even though there are more theta-roles available. It should be noted that in the case of verbs such as *xiao-feng* 'cry-insane', Li claims that there are independent pragmatic considerations which rule out a transitive counterpart.

Li considers all of the above kinds of compounds to have involved a causal relation, and for compounds that do not involve a causal relation, theta-identification takes place as well.¹

Furthermore, Li argues that a syntactic approach to compounding in Mandarin Chinese à la Baker (1988) cannot be right. In Baker's account of causativization, incorporation takes place in a structure such as (6).



1. Li notes that even though both kinds of compounds (causal and "AND"-compounds) involve theta-identification, the "AND"-compounds have "obligatory" theta-identification when both members of the compounds have only one theta-role.

The incorporation of Y into X is possible (i.e. without crossing any barriers) because X is lexical and theta-marks YP. However, Li argues that it is quite unlikely that Mandarin compounds are results of such incorporation process because the first member of the compound does not "theta-mark" the second member of the compound. That is, in a compound such as *qi-ku* 'annoy-cry', Li considers it unlikely that *qi* 'annoy' theta-marks a clause headed by *ku* 'cry'. While Li's concern seems to be well-founded, it should be noted that if YP in (6) is an actual clause (i.e. IP or CP), it is certainly the case that no incorporation actually takes place (see also Baker (1988) and Li (1990b)). However, if YP is smaller than a clause (i.e. VP, PP, etc), and that not all XP's are barriers (which seems to have empirical support in recent works), then it is not clear that Li's objection to the syntactic approach can hold. Furthermore, Li's approach has other independent problems.

There are two basic problems with Li's analysis. First, Li claims that a compound of the kind in (3) can be ambiguous. In such a compound, the second verb has only one theta-role and thus there is no relative prominence with respect to this theta-role. Thus, there are two identification patterns allowed: $\langle 1, 2-1' \rangle$ and $\langle 1-1', 2 \rangle$, as shown in (7). However, as Huang (p.c.) points out, even though Li claims that sentences such as (7) are ambiguous, when the object is specific or definite, the ambiguity disappears, as shown in (8).

(7) from Li (1990a)

Baoyu qi-lei-le ma

Baoyu ride-tired-ASP horse

- a. Baoyu rode the horse (and as a result he got) tired.
- b. Baoyu rode the horse (and as a result the horse got) tired.

(8) Baoyu qi-lei-le nei-pi ma

Baoyu ride-tired-ASP that-CL horse

- a. Baoyu rode that horse (and as a result that horse got) tired.
- b. *Baoyu rode that horse (and as a result he got) tired.

In other words, the proper translation for (7) should be "Baoyu went horseback-riding and as a result he/horse got tired". Note that Li's analysis predicts (8) to have the same readings as (7) since definite/specific NPs or referential NPs do not play a role in his analysis. As a result, his analysis overgenerates. Furthermore, it is a curious fact that the referentiality/definiteness of the object NP matters if we have in compounding simply a way of "calculating" and "combining" the theta-roles.

In addition, if *qi-lei* 'ride-tired' can have ambiguous readings in (7), the same ambiguity should arise in (9).²

- (9) Baoyu *qi-lei-le* *che*
Baoyu ride-tired-ASP bike
a. Baoyu rode the bike (and as a result he got) tired.
b. *Baoyu rode the bike (and as a result the bike got) tired.

In (9), there is only one reading available. The only one that can get tired in (9) is *Baoyu* since bikes cannot get tired. So we will need a pragmatic constraint to rule it out bearing in mind examples such as (8) which already render Li's account of the ambiguity questionable.

The second problem with Li's analysis lies in the heart of theta-identification. The mechanism of theta-identification is obligatory when the members of the compound verb have more theta-roles than the available structural Cases. This in fact rules out some possible compound verbs. Consider the following examples discussed in Huang C.R. (1991).

- (10) *ta* (*yingwei tiantian ti qiu*) *ti-puo-le* *ta-de qiu-xie*
s/he (because everyday kick ball) kick-break-ASP her/his sneaker
'(lit.) S/he kicked-broke her/his sneaker (because s/he played soccer everyday).'

2. In this example, *che* is the short term for *jiao-ta che* 'foot-pedal car' and thus is glossed as 'bike'. Normally *che* is glossed as 'car'.

(11) (from Tan 1991, cited in Huang C.R. 1991)

lunwen xie-lao-le ta
 thesis write-old-ASP s/he
 '(lit.) Thesis (writing) aged him/her.'

In (10), the object argument of the compound *ti-puo* 'kick-break' is *ta-de qiu-xie* 'his/her sneaker'. However, the patient argument of the first member of the compound *ti* 'kick' is not the sneaker. Instead, it is the optional argument *qiu* 'ball'. Hence, the second argument of the first verb (i.e. the patient) cannot be identified with the argument of the second verb (the thing that gets broken). In other words, (10) presents a case in which the theta-roles of the verbs in a compound are not exhaustively assigned or identified.³ Furthermore, as shown in (11), if we have a strict theta-identification operation as well as theta-prominence maintenance, the theory undergenerates. In (11), under Li's account, *xie* 'write' has a theta-grid $\langle 1, 2 \rangle$ while *lao* 'old' has the theta-grid $\langle 1' \rangle$. To allow the compound *xie-lao* 'write-old', an output theta-grid $\langle 2-1', 1 \rangle$ is needed. However, in such an output theta-grid, the theta-role prominence of the first verb is not preserved.

2.2. Huang's Syntactic Approach (1992)

Huang (1992) examines resultative constructions and proposes to account for various properties of the constructions in Mandarin by a theory of Control. Furthermore, he considers resultative compounds to be on a par with resultative predicates, with the former exhibiting similar relations as the latter. Consider the sentences in (12) (from Huang 1992):

3. *ti* 'kick' is not like verbs such as *eat* in that it has an optional argument, as we can see in (i):

(i) a. ta xihuan ti qiu
 he like kick ball
 'He likes to kick ball.'
 b. *ta xihuan ti
 he like kick

Bearing in mind that Chinese allows object pro's, (ib) can have a reading "he likes to kick something" with the object dropped.

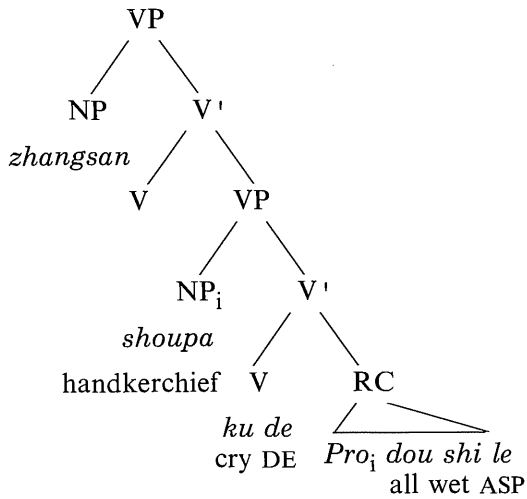
- (12) a. zhangsan ku-de shoupa dou shi le
 Zhangsan cry-DE handkerchief all wet ASP
 'Zhangsan cried so much that the handkerchief got wet.'
 b. zhangsan ku-shi-le shoupa
 Zhangsan cry-wet-ASP handkerchief
 '(lit) Zhangsan cried-wet the handkerchief.'

Assuming the VP-internal subject hypothesis (Hale 1980, Fukui and Speas 1985, Kitagawa 1986, Koopman and Sportiche 1986 among others), the VP of (12a) has the structure in (13).⁴ *ku-de* 'cry-DE' selects and theta-marks the resultative clause [Pro dou shi le] 'all wet-ASP'. The V' compositionally takes *shoupa* 'handkerchief' as an object. Since this external object *shoupa* 'handkerchief' is the closest c-commanding NP to Pro, it is the one which controls Pro in the resultative clause. The verb *ku-de* 'cry-DE' subsequently moves to the higher empty verb (along the lines of Larson (1988)). Similarly, (12b) has the structure in (14). The difference between (12a) and (12b) is that the former has a phrasal resultative clause while the latter has a lexical resultative clause. The compound verb is derived through a reanalysis process, or one can treat it as an incorporation structure.⁵

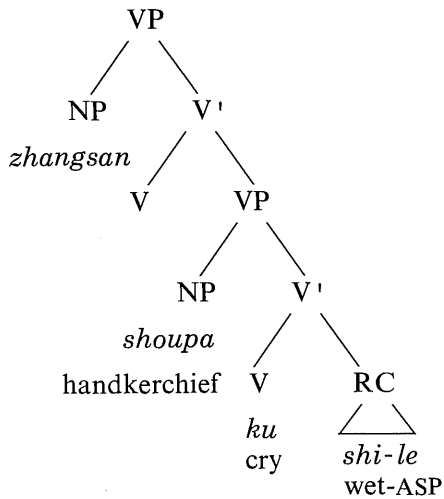
4. See Huang (1993) for arguments for adopting a VP-internal subject analysis in Mandarin Chinese.

5. In Huang (1992), no empty verb is explicitly used. However, it is clear that a version of Larson's VP-shell structure is assumed.

(13) adapted from Huang (1989), ex. (51)



(14)



Moreover, Huang treats transitive vs. intransitive compounds on a par with subject-control vs. object-control structures. For instance, given the transitive and intransitive *ku-xing* 'cry-awake', the intransitive version is simply a subject-control case while the transitive one is similar to *ku-shi* 'cry-wet' discussed above. (15a) and (15b) are examples of the transitive and intransitive *ku-xing* 'cry-awake'.

(15) from Huang (1989), (63)

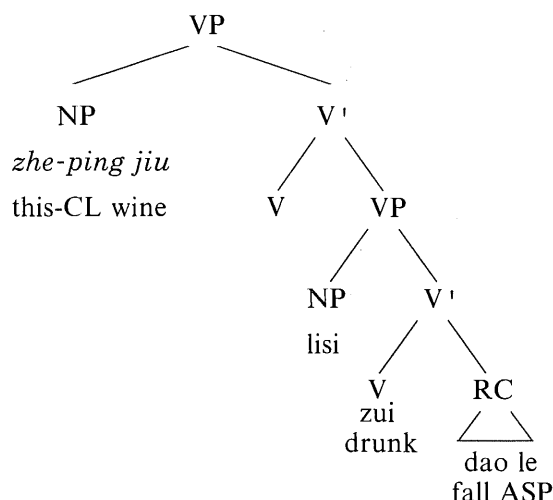
- a. ta ku-xing-le
he cry-awake-ASP
'He cried and became awake.'
- b. ta ku-xing-le lisi
he cry-awake-ASP Lisi
'He cried and awoke Lisi.'

Note that (15b) is not treated strictly as a causative verb. Huang also discusses cases of causative compounds, as shown in (16).

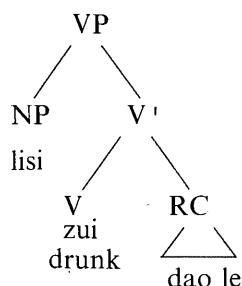
- (16) a. zhe-ping jiu zui-dao-le lisi
this-cl wine drunk-fall-ASP Lisi
'This bottle of wine got Lisi drunk.'
- b. lisi zui-dao le
Lisi drunk-fall ASP
'Lisi got drunk.'

Note that in (16a), *jiu* 'wine' is a causer. From (16b) it is clear that the causer is an "added" argument. In other words, in addition to the typical argument structure of the verb, causation can add an additional argument. Given a compound verb such as *zui-dao* 'dunk-fall' which is an unaccusative, we can derive (16b). If there is a causer, which can be the external argument of the compound, we can derive (16a). The structures corresponding to these two sentences are shown below:

(17)



(18)



The difference between (15b) and (16a) is that the subject NP of (15b) has a direct relationship to the action as well as the object (i.e. Lisi is awoken due to his crying). In contrast, in the case of (16a), the subject NP only contributes as an indirect causer, namely, Lisi got drunk because he drank too much wine but the bottle of wine itself does not contribute either to the act of drinking or to the result of getting drunk.

The analysis given in Huang (1989) is quite attractive because it accounts for the unaccusative/unergative and transitive/causative compounds. However, it should be noted that the causer is treated as an additional argument added on by an empty causative verb. If the addition of a causative argument always comes for free with an empty causative

verb, the question which arises is whether or not this is possible for all cases. Compounds such as *zui-lei* 'chase-tired' show that we cannot freely add a causer argument, as shown in (19).⁶

- (19) *zhangsan zui-lei-le lisi*
Zhangsan chase-tired Lisi
(i) 'Zhangsan chased Lisi and Lisi became tired.'
(ii) 'Lisi chased Zhangsan and Lisi became tired.'
(iii) *'Zhangsan made Lisi tired by getting him involved in the act of chasing.'

In (19) it is not possible to interpret Zhangsan as an indirect causer, in comparison with the wine which makes *Zhangsan* drunk in (16). In other words, *Zhangsan* in (19) has to be a direct causer rather than an indirect one. However, if it is possible to always introduce an indirect causer, using the empty causative verb, why is it not possible in this case? Furthermore, it is not clear that Huang's analysis can account for the two possible readings in (19). If we derive such a compound syntactically, it is rather unlikely that both readings can be obtained.⁷

We have seen that both a lexical account and a syntactic account run into problems with certain compounds and with certain readings of compounds. In the following sections, I will propose an approach which uses both lexical and syntactic aspects of compounding. In particular, I will argue that we need both lexical and syntactic compounding and they do have different properties. Further, I will assume a lexical approach

6. It should be noted that Li cannot account for the second reading in (19) since the prominence of the theta-roles of the first verb is not preserved. Thus, this is comparable to compound *xie-lao* 'write-old.'

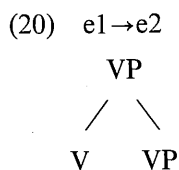
7. A reviewer points out that native speakers don't seem to get the reading in (ii). Rather, they can have a reading 'Zhangsan chased Lisi and as a result Zhangsan got tired.' My own judgement is that reading (ii) does exist, though it is certainly not the preferred reading. However, the reading in which Zhangsan got tired seems quite unlikely to me. Note that this will amount to the same problematic reading in *qi-lei ma* 'ride-tired horse' in (1). We will come back to the (ii) reading in section 3.2.

based on Hale and Keyser's (1991) Lexical Relational Structure.

3. Lexical Relational Structure, an Overview

The proposal discussed here assumes the theory of argument structure proposed in Hale and Keyser (1991) (henceforth H&K). The conception of argument structure in H&K differs from the traditional conception of argument structure. In particular, there are no thematic roles "assigned" by verbs; instead, thematic roles are identified with points in lexical syntactic projections. In lexical syntax (l-syntax), the structure in which lexical relations are represented (i.e. thematic relations) is called "lexical relational structure" (henceforth LRS) (see also Hoffman (1991) for an overview of this theory). The output of LRS serves as the input to D-structure.

H&K notes that we only have a limited number of thematic roles because there are only a number of relations that can be represented structurally. I will briefly discuss the relations examined in H&K. First, a verb represents a dynamic event. In a structure such as (20), there are two events and the event represented by the first verb "implies" the second event, which is represented by the second verb. In other words, we have a causal relation represented in (20).⁸



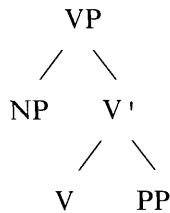
H&K assumes that the presence of a subject in l-syntax is forced by predication (or another way to put it is, the presence of a predicate needs a subject to satisfy full interpretation). In (20), the verb takes a VP as its

8. Note that though we generally think of verbs to be denoting actions, it has been noted in the literature that verbs may have an event argument or they may have an event structure.

complement. In H&K, it is assumed that VP in I-syntax is not a predicate. Hence, in a structure such as (20), the upper VP does not have an NP in the specifier position.

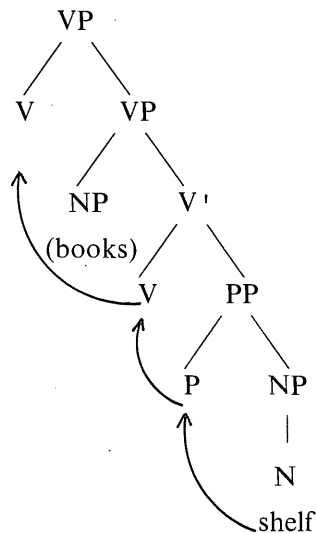
Besides VP, a verb can also take a PP, AP or NP as complements. Prepositions indicate "interrelation", for instance, spatial or locational relations. A structure such as (21) represents a change with a certain spatial or locational relation.

(21) $e \rightarrow r$



An example of such a relation is the verb *shelve* in English. It has the structure below.

(22)

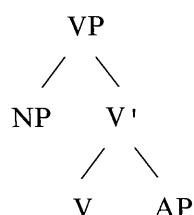


The object noun of P incorporates into P and then the N+P combina-

tion further incorporates up the tree. The output is the verb *shelve*. The meaning of the verb *shelve* is thus accounted for (i.e. X causes Y to put Z on the shelf).

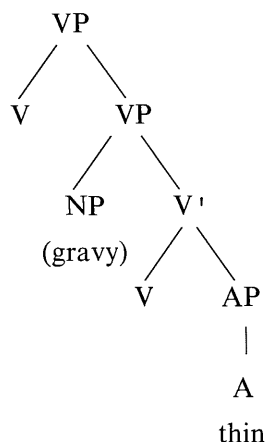
An adjective represents a "state". A structure such as (23) represents an entity undergoing change, or a change resulting in a state. In H&K's words, "a state is achieved as an integral, or defining part of a dynamic event."

(23) $e \rightarrow s$



An example of (23) is the verb *thin*. It has the following structure:

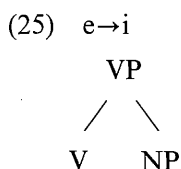
(24)



(24) represents the meaning of *thin*, which is [X causes Y to become thin]. Note that based on these relational structures, it is clear that NP in the specifier position of the inner VP is an affected element.

Furthermore, H&K notes that there are also verbs such as *laugh*,

which can be represented as in (25).



Thus, the verb *laugh* indicates that there is an event which produces an instance of *laugh*.

3.1. The Proposal

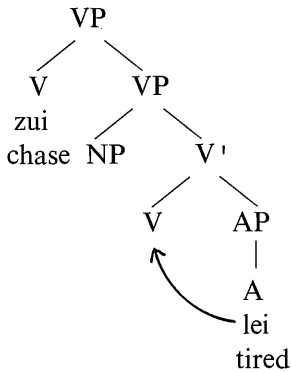
Now let's consider how we can account for the properties of compounding in Mandarin. To recapitulate, the lexical analysis along the lines of Li (1990a) runs into problems with overgenerating readings in cases where the object is referential. Further, it also runs into problems in undergenerating compounds which do not necessarily have argument sharing. On the other hand, the syntactic analysis proposed by Huang (1989) overgenerates causative compounds and it is not clear how it can deal with compounds with no apparent argument sharing as well.

I propose that there are indeed two ways of forming compounds, syntactic and lexical. I will discuss lexical compounding first. Then I will point out which kinds of compounds must have undergone a syntactic process. I propose that lexical compounding in Mandarin Chinese is similar to conflation in English, discussed in Hale and Keyser (1991). Consider first the compound *zui-lei* 'chase-tired'. (19) is repeated below as (26).

- (26) zhangsan zui-lei-le lisi
 Zhangsan chase-tired-ASP Lisi
- (i) 'Zhangsan chased Lisi and Lisi became tired.'
 - (ii) 'Lisi chased Zhangsan and Lisi became tired.'
 - (iii)* 'Zhangsan made Lisi tired by getting him involved in the act of chasing.'

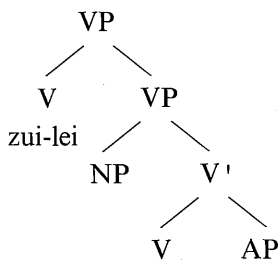
Within the framework of H&K, the LRS of *zui-lei* 'chase-tired' can be represented as in (27).

(27)



As represented in (27), the adjectival verb *lei* 'tired' is predicated of the NP in the inner VP in l-syntax. The LRS in (27) represents the reading of the compound "event of chasing leads to a state of being tired" or "event of chasing leads to a state of becoming tired". Since *lei* 'tired' is predicated of the inner NP, the object NP of the compound in s-syntax will be the element undergoing a change of state "being tired". In l-syntax, the adjectival verb *lei* 'tired' first incorporates into the empty verb, then the V+A complex further moves to the higher verb *zui* 'chase'. The output of the l-syntax incorporation is as shown in (28).

(28)



The representation in (28) shows clearly that the NP in the VP internal

position is the NP that undergoes a change of state. Thus, in this case, *Lisi* is the one who is getting tired. The question which arises here is how we can account for the reading indicated in (26ii), in which the inner NP is also the one that does the chasing.

Now consider again the LRS of *zui-lei* 'chase-tired'. It is clear that *lei* 'tired' is predicated of the inner NP in the LRS. However, the external argument is not specified in the l-syntax.⁹ The relevant question here is: what is the relationship between the verb *zui* 'chase' and the inner NP in the LRS? In H & K, as discussed above, a structure of the type in (27) has the semantic relation [$e \rightarrow s$] (i.e. an action or dynamic event implies a state). Another way of looking at the semantic relationship, as H&K notes, is "a state is achieved as an integral, or defining, part of a dynamic event". When the verb which takes the AP is an empty verb, as in English, it represents an elementary "change of state". On the other hand, when the verb is specified, as in the case of Mandarin Chinese, it indicates that a state is achieved as part of a dynamic event. In this case, the event is the event of chasing.

Based on the LRS of the compound, the inner subject will surface as a sentential object in s-syntax. The difference between the reading in (26i) and (26ii) is that in the former the inner subject is the chasee while in (26ii) the inner subject is the chaser. In an event of chasing, there are two participants. In the l-syntax, there is a variable which can represent one of the participants of the event and since the participant role is not stipulated in LRS, it can be either the one doing the chasing or the one being chased. If the inner NP in l-syntax in this case is "assigned" as the one being chased in the event (i.e. chasee), then the only possible participant left in the s-syntax is the chaser (and hence the reading in (26i)). It should be noted that in s-syntax, the whole VP, containing the inner NP is predicated of the subject NP. It is due to the syntactic predication that the event of chasing can be interpreted properly. On the other hand, if

9. See Hale and Keyser (1991) for a detailed discussion of why there is no subject NP of which VP is predicated in l-syntax. In other words, the output of l-syntax does not have a VP-internal subject.

the inner NP is the chaser in the LRS, the only possible participant of the event of chasing left is the chasee, which is the subject of the "derived VP" at D-structure (and thus the reading in (26ii)).

Now let's turn to examples of the kind noted in Huang C.R., repeated below.

(29) (from Tan 1991, cited in Huang C.R. 1991)

lunwen xie-lao-le ta
thesis write-old-aspp s/he
'(lit.) Thesis (writing) aged him/her.'

The LRS of *xie-lao* 'write-old' is similar to the LRS of *zui-lei* 'chase-tired'. And it is expected that *ta* 's/he' has to be the one being predicated by *lao* 'old' (because it is in the object NP position and thus the inner syntax position in I-syntax). As for the participants of the event of writing, it is clear that if *ta* 's/he' is in the slot in which the AP *lao* 'old' is predicated of, it cannot appear in the syntactic subject position. Assuming that it is "assigned" as the writer of the action of writing, then at S-structure, the subject NP can only be interpreted as the thing being written. On the other hand, if the inner NP in the LRS is "assigned" as the passive participant of the event of writing (i.e. the thing being written), then when the sentence needs to be interpreted, the reading will be contrary to our knowledge of the world (i.e. a thing such as a thesis can not write a person). In other words, it is not any grammatical mechanism which rules out *ta* 's/he' being the thing written by a thesis.¹⁰

Thus, we have here not a typical theta-role assignment phenome-

10. A reviewer notes that the external subject *lunwen* 'thesis' seems to involve indirect causation. Here we need to see how indirect causation differ from direct causation. I think that direct causation requires the causer to be a participant of the event based on the argument structure. In other words, in the example *xie-lao* 'write-old', *lunwen* 'thesis' is a participant of the event of writing. In contrast, for a compound such as *zui-dao* 'drunk-fall' in (3), the subject NP *zhe-pingjiu* 'this bottle of wine' is not a direct participant of *zui* 'drunk' (since there is only one participant in the state of being drunk). Hence, it is an indirect causer.

non: instead, it is based on full interpretation (Chomsky 1986). Based on this approach, it is clear that we do not require "argument-sharing" to form a compound. In compounds such as *ti-puo* 'kick-broken' exemplified in (10), since *puo* 'broken' is predicated of *qiu-xie* 'sneaker', it is clear that the latter does not have to be an explicit participant of the event *ti* 'kick'. Thus, the whole compound *ti-puo* 'kick-broken' can indeed be predicated of a subject NP which is the agent participant of the event of kicking while "ignoring" the "patient" participant of the event. Note that while *qiu-xie* 'sneaker' is not the patient participant of the event, it is an indirect participant.

Consider now the difference between a referential NP and a non-referential NP with respect to compounds such as *qi-lei* 'ride-tired'. Li has indicated that given a compound such as *qi-lei* 'ride-tired', there are two possible interpretations. Examples (7) and (8) are repeated below.

(30) from Li (1990a)

Baoyu *qi-lei-le* *ma*

Baoyu ride-tired-ASP horse

a. Baoyu rode the horse (and as a result he got) tired.

b. Baoyu rode the horse (and as a result the horse got) tired.

(31) Baoyu *qi-lei-le* *nei-pi* *ma*

Baoyu ride-tired-ASP that-CL horse

a. Baoyu rode that horse (and as a result that horse got) tired.

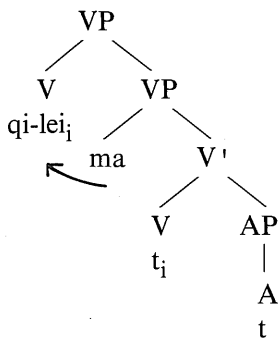
b.*Baoyu rode that horse (and as a result he got) tired.

The question which arises here is why a referential NP will not induce ambiguity. First, we need to deal with the ambiguity in (30). Based on the analysis given so far, we do not expect the ambiguity because *ma* 'horse' is the one being predicated of by the adjectival verb *lei* 'tired'. In other words, the horse is the one which is tired according to this analysis. Before we proceed to discuss how this analysis accounts for the ambiguity, I would like to point out that not all speakers can get the read-

ing indicated in (30a). It appears that there is some dialectal variation with respect to the acceptability of the reading in (30a).

In the dialect which actually allows this reading, how does the reading come about? Intuitively speaking, when the reading in (30a) arises, the object NP *ma* 'horse' is not interpreted as a specific horse. In other words, it is not treated as a referential NP. This is comparable to the phrase *qi-ma* 'lit. ride-horse' which is interpreted as 'horse-back riding', which does not use the 'horse' referentially. Mandarin Chinese has plenty of phrasal verbs of this kind. For instance, *tiao-wu* 'dance, (lit.) jump-dance', *Wu* 'dance' in this case does not refer to a particular dance or a specific dance. In short, the nouns in these cases are all used as part of the verb. A comparable example in English is idiomatic expressions such as 'take advantage of'. I propose that in (30a), *qi-lei-ma* 'ride-tired-horse' is in fact a complex verb, with the object NP incorporated to the verb. After *lei* 'tired' has incorporated into the verb *qi* 'ride' and subsequent movement of *qi-lei* 'ride-tired' to the upper verb, the object NP then incorporates into the whole verbal complex, as shown in (32).¹¹

(32)



11. In Hale and Keyser (1993), examples such as (i) are ruled out by assuming that it is impossible to incorporate an internal subject NP (i.e. NP in Spec of VP) to the upper V.

(i)*They wined into the bottles.

(c.f. He got wine into the bottles.)

However, the example discussed in this paper can be distinguished from (i). In the example discussed here, the N is not incorporated into an empty V. Instead, it is incorporated into a filled V. Based on Hale and Keyser (1993), it appears that in English, V1 is always unfilled.

The incorporated status of the object NP prevents it from being interpreted as the subject of *lei* 'tired'. Thus, the syntactic subject NP, of which the whole verbal complex [qi-lei-ma] is predicated, is interpreted as the subject of *qi* 'ride' as well as the subject of *lei* 'tired'. In contrast, the specificity of the object NP is incompatible with an incorporated NP status. Thus, the only compatible structure to (31) is a non-incorporated object NP analysis. In this structure, the object NP is the only one which can be the logical subject of being tired since the adjectival verb *lei* 'tired' is predicated of this NP.¹²

So far we have only talked about the non-problematic cases of this particular lexical analysis of compounding. It is clear that using lexical relational structure, the problematic examples to Li's analysis can be accounted. The question which arises then is whether or not this analysis can account for all the RVV compounds. To answer this question, we need to consider the examples discussed in Huang (1989). (15)-(16) are repeated below.

- (33) from Huang (1989), (63)
- a. ta ku-xing le
he cry-awake ASP
'He cried and became awake.'
- b. ta ku-xing-le lisi
he cry-awake-ASP Lisi
'He cried and awoke Lisi.'

12. A reviewer points out that the analysis here for *qi-lei* 'ride-tired' cannot be extended to account for compounds such as *chi-bao* 'eat-full', which only allows the external subject to be the affected argument. Note that *chi-bao* 'eat-full' is basically an intransitive compound and there is only a case in which we see a transitive use, namely *chi-bao fan* 'eat rice and become full'. Here, *rice* is used non-referentially. This is clear from the fact that we cannot replace *rice* with for instance, *noodle*. If the analysis presented in this paper is correct, then it is possible to ensure that *chi-bao* comes out as an intransitive verb: the inner subject participates in the event of eating and this event, unless otherwise specified, has no object. Thus, the compound will come out having an NP which will move to the sentential subject position, as in the case of intransitive *ku-xing* 'cry-awake' (see section 3.3).

- (34) a. zhe-ping jiu zui-dao-le lisi
 this-cl wine drunk-fall-ASP Lisi
 'This bottle of wine got Lisi drunk.'
- b. lisi zui-dao le
 Lisi drunk-fall ASP
 'Lisi got drunk.'

As discussed above, Huang (1989) treated (34b) as a transitive use of *ku-xing* 'cry-awake' and (34a) as a causative. Though I will not adopt this particular implementation of the difference, I think that this way of expressing the distinction is quite appealing. Assuming the analysis given above, I will show below how the intransitive vs. transitive distinction in (33) can be accounted for. Further, I will show that the distinction between (33b) and (34b) is in fact a distinction between an "inherent causative verb" and a "surface causative verb", the former being derived lexically while the latter syntactically.

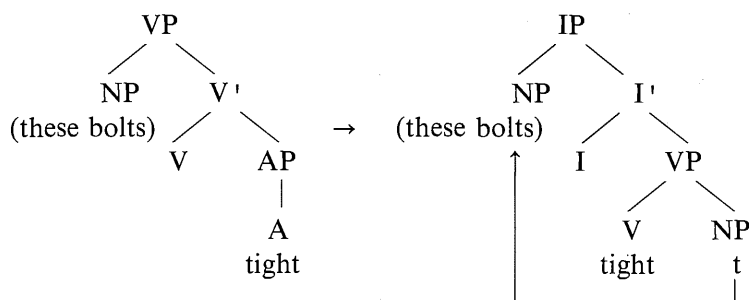
3.2. Lexical and Syntactic Causative

Huang (1989) considers compounds such as *ku-xing* 'cry-awake' to have a transitive counterpart. I argue here that they are similar to verbs such as *tighten* in English in that the latter can also project both transitive and intransitive (inchoative) syntactic verb phrases, as shown in (35).

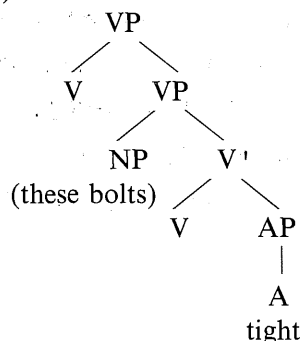
- (35) a. Tom tightened these bolts.
 b. These bolts finally tightened.

H&K argues that the internal subject (the subject of the inner VP) in l-syntax is identified with the "affected argument". In (35b), it is clear that the s-syntactic subject is the affected argument. Thus, H&K posits (36) as the S-structure representation for (35b) and the corresponding LRS of *tighten* is (37).

(36)



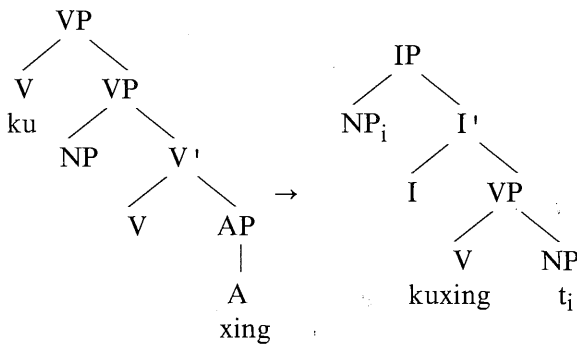
(37)



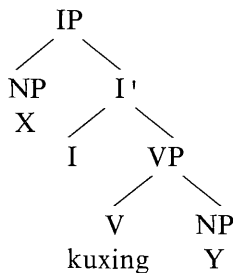
In (36), the s-syntactic subject is literally an internal subject. As we can see from (37), the transitive counterpart of *tighten* is in fact a causative verb while the intransitive/inchoative one is a non-causative.

I propose to account for the RVV compounds like *ku-xing* 'cry-awake' similarly. That is, the intransitive of *ku-xing* 'cry-awake' has an "internal subject" which is the affected element, which moves to the surface subject position at S-structure. On the other hand, the transitive *ku-xing* 'cry-awake' involves no movement. The whole VP is predicated of an external NP. (38) and (39) are representations of these two versions respectively.

(38)



(39)

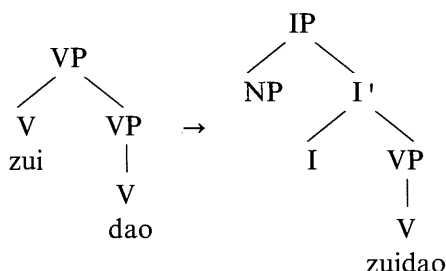


Consider now the difference between *ku-xing* 'cry-awake' and *zui-dao* 'drunk-fall'. From (38), it is clear that *ku-xing* 'cry-awake' is an inherent causative. The s-syntactic subject bears a direct causation relationship with the s-syntactic object (internal subject in l-syntax), which is the affected argument. In contrast, in *zui-dao* 'drunk-fall', the relationship between the causer and the causee is indirect. I suggest here that this type of causation is syntactic causation. Here, I crucially rely on the difference between *xing* 'awake' and *dao* 'fall'. In particular, the former is an adjective in l-syntax whereas the latter is a verb.¹³

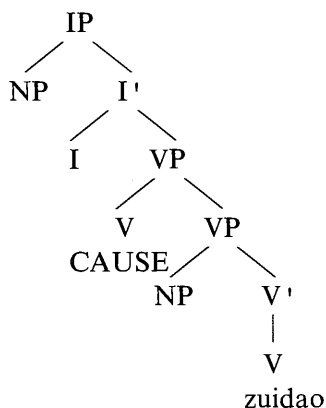
13. One reviewer points out the difference between *ku-xing* 'cry-awake' and *cao-xing* 'disturb-awake': the latter cannot be used intransitively and it can take an inanimate subject. The transitive nature of this compound, under this analysis, appears to be related to the impossibility of moving the object NP to the subject position in *s-syntax*. I do not have an answer as to what prevents it from moving in this case. However, the fact that the compound can take an inanimate subject is related to the fact that the first member of the compound *cao* 'disturb' can take an inanimate subject. Thus, selectional properties remain in a compound.

I propose that the LRS of *zui-dao* 'drunk-fall' is (40). As mentioned earlier, in H&K, VP's are not predicative in I-syntax. Due to the verbal status of *dao* 'fall', the resultative compound *zui-dao* 'drunk-fall' has the lexical structure shown in (40), which is an example of pure causatives, as shown earlier in (20). At S-Structure, the verb phrase headed by *zui-dao* 'drunk-fall' is predicated of an external NP. We thus have the "intransitive" *zui-dao* 'drunk-fall'. In addition, an extra causative projection can be added onto the representation at S-structure and a syntactic causative construction is derived, as shown in (41).

(40)



(41)



This syntactic causative is quite productive, as we can see in examples associated with verbs such as *xiao-si* 'laugh-die' and *qi-si* 'angry-die', as shown in (42)-(43).

- (42) ta xiao-si wo le
 s/he laugh-die I ASP
 'S/he makes me laugh to the extent that I feel dead.'

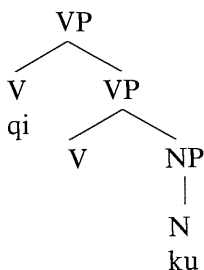
- (43) ta qi-xi wo le
 s/he anger-die I ASP
 'S/he makes me angry to the extent that I feel dead.'

We have noted earlier that Huang's analysis of syntactic causative makes the wrong prediction with respect to verbs such as *zui-lei* 'chase-tired' because this type of compound can never have an indirect causer. We have analyzed such compounds as inherent causative in which the second member of the compound is predicated of an inner subject and the whole compound is then predicated of a syntactic subject at s-syntax. The question which arises here is what prevents the syntactic causative from being added onto the output of the LRS of *zui-lei* 'chase-tired'. In other words, what differentiates *zui-dao* 'drunk-fall' from *zui-lei* 'chase-tired' in that the former can enter into a syntactic causative "frame" while the latter cannot. I think that the answer lies within the participants of events of each member of the compound. In the former case, the surface subject is both the affected argument of *dao* 'fall' and the participant of *zui* 'drunk'. Because of this, it can also enter the syntactic causative frame. On the other hand, in the case with verbs such as *zui-lei* 'chase-tired', if a syntactic causative projection is added onto the structure at S-structure, then the compound verb cannot be predicated of a normal subject, which will be interpreted as a participant of the event indicated in *zui-lei* 'chase-tired'. Due to the number of participants of events and syntactic predication, compound verbs such as *zui-lei* 'chase-tired' cannot have a syntactic causative counterpart.

Lastly, going back to the examples in (3) and (5), we can see that the analysis leads to desirable predictions. First, with respect to the compound *qi-ku* 'annoy-cry', it should be noted that this compound also has an intransitive use, such as *baoyu qi-ku-le* 'Baoyu is annoyed and

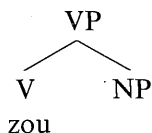
cried.' This is not surprising if we treat the intransitive one to have the LRS in (44), with *ku* 'cry' as a noun (as H&K notes, unergative verbs have the LRS as *laugh*):

(44)

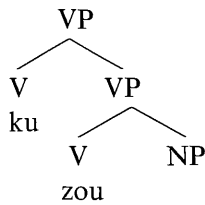


In s-syntax, the compound *qi-ku* can be predicated of an external NP and we have the intransitive version or it can come under the CAUSE verb, which will provide an extra argument and we then have the transitive counterpart. Furthermore, under this account, the compound *xiao-feng* 'cry-insane' in (5a) can be either transitive or intransitive, just like the compound *ku-xing* 'cry-awake'. My judgement coincides with this prediction, though it is the case that the transitive reading is a bit odd. Finally, the transitive nature of *ku-zou* 'cry-leave' will not be related to pragmatics. Instead, it is due to the LRS of the verb *zou* 'leave'. Based on H&K's proposal, it will be reasonable to suggest that *zou* 'leave', being an unaccusative verb, has the LRS in (45) and the LRS of *ku-zou* 'cry-leave' is shown in (46). Thus, *ku-zou* 'cry-leave' always has an object.

(45)



(46)



In sum, I have presented an account of RVV compounds which incorporates a lexical approach based on Hale and Keyser's recent work and a syntactic approach. There are certainly many cases that I have not covered and I believe that if we look further into the LRS of each verb, we will gain a much better understanding of the nature of compounding in Mandarin Chinese.

References

- Baker, Mark (1988) *Incorporation: A theory of Grammatical Function Changing*, Chicago University Press, Chicago.
- Chomsky, Noam (1986b) *Knowledge of Language: Its Nature, Origin and Use*. Praeger Publishers, New York.
- Fukui, Naoki and Margaret Speas (1985) "Specifiers and Projection," in Naoki Fukui, Tova R. Rappoport, and Elizabeth Sagey (eds), *MIT Working Papers in Linguistics* Vol.8, MIT.
- Grimshaw, Jane (1992) *Argument Structure*, MIT Press, Cambridge, MA.
- Hale, Ken and Jay Keyser (1991) *On the Syntax of Argument Structure*, published by the Center for Cognitive Science, MIT.
- Hale, Ken and Jay Keyser (1993) "On the complex nature of simple predicates," ms. MIT.
- Higginbotham, James (1985) "On semantics", *Linguistic Inquiry* 16, 547-593.
- Hoffman, Mika (1991) *The Syntax of Argument Structure-Changing Morphology*, MIT PhD Dissertation.
- Huang, C.R. (1991) "Compounding and Argument Sharing in Mandarin Chinese, an account based on the autonomous morphology hypothesis," paper presented in the Theoretical East Asian Linguistics Workshop, University of California at Irvine.
- Huang, C.T. James (1992) "Complex predicates in control," in (eds) R. Larson et al. *Control and Grammar*, Kluwer Academic Publishers, Dordrecht.
- Huang, C.T. James (1993) "Reconstruction and the structure of VP: Some theoretical consequences," *Linguistic Inquiry* 24, 103-138.
- Kitagawa, Yoshihisa (1986) *Subjects in Japanese and English*. PhD Dissertation, University of Massachusetts, Amherst.
- Koopman, Hilda and Dominique Sportiche (1988) "Subject," ms. UCLA.
- Larson, Richard (1988) "On the Double Object Construction," *Linguis-*

tic Inquiry 19, 335-391.

Li, Ya-fei (1990a) "On V-V compounds in Chinese," *Natural Language and Linguistic Theory*, 8: 177-207.

Li, Ya-fei (1990b) *Conditions on X^0 -movement*, MIT PhD Dissertation.

Lieber, R. (1983) "Argument linking and compounds in English," *Linguistics Inquiry* 14, 251-285.

Tan, Fu (1991) *Notion of Subject in Chinese*, Stanford University, PhD Dissertation.

Syllable Contraction in Chinese*

Raung-fu Chung

National Kaohsiung Normal University

Abstract

Chinese is in general a language in which the morpheme and the syllable are coextensive. However, there are some monosyllabic words composed of two morphemes by a process of syllable contraction. The best known example is retroflexation (R-suffixation) in Mandarin, in which the suffix *ər* and the word to which it is attached are contracted into a syllable, for instance, /*#p'an + ər* #/ → *p'ar* 'plate.' In Southern Min, Cheng (1985) first attempts to generalize the rules for syllable contraction. This paper, however, aims to establish some common principles for syllable contraction in the three Chinese dialects, namely, Mandarin, Southern Min, and Hakka. The principles are concluded to be (i) a prosodic template CVX on an independent tier for each morpheme, (ii) the theory of Edge-in association (Yip 1988), the association between the melodies and the template beginning with both edges of the template, and (iii) association from left to right for the medial parts.

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1. Introduction

The fundamental purpose of this paper is to discuss the principles governing syllable contraction in the three Chinese dialects: Southern Min, Hakka and Mandarin.¹ Though Chinese is in general a language in which the morpheme and the syllable are coextensive, there are some syllables composed of two morphemes, resulting from syllable contraction. Syllable contraction occurs in a word with a suffix (li) or in two independent words when they are used together (lii).²

(1) a. Southern Min

- | | | | | | | | | |
|-----|-----|---------|---|-----|--------------|---|------|-----------|
| i) | gwa | 'I' | + | ten | 'pl. suffix' | → | gwan | 'we' |
| | li | 'you' | + | ten | | → | lin | 'you' |
| | i | 's/he' | + | ten | | → | in | 'they' |
| ii) | ho | 'let' | + | laŋ | | → | hoŋ | 'them' |
| | tsa | 'early' | + | k'i | 'get up' | → | tsay | 'morning' |

1. More specifically speaking, Southern Min refers to the dialect spoken in Taiwan, which is sometimes called Amoy or Taiwanese Hokkien. Hakka refers to the dialect spoken in Pintung, Taiwan. The Mandarin data are mainly based on Cheng 1973, Hsueh 1985, and Ao 1992.

2. To regard *n* as a plural suffix for Hakka and Southern Min is simple, but the view-points vary as to what is the source of *n*. That is, where does *n* come from? The general view is that *n* comes from the plural suffix *mən* in Mandarin, with the elimination of *mə*, for *n* itself cannot be used independently. However, I think the *n* in Southern Min and Hakka derives from *ten*. As suggested in Luo 1933, Hakka is one of the dialects which has kept much of the ancient sound structure (See also Yang 1967). Another argument for the assumption that *ten* is the plural suffixes in Southern Min and Hakka is that *ten*, which is written as 等 in Chinese character, has long been used as a plural suffix in works since 500 B. C. One thing to be noted is that whether the plural form is *n* or *ten*, our analysis here is equally sound. The only possible problem for my analysis here comes from the assumption that the plural form is underlyingly *laŋ* 'person,' as suggested in Cheng 1985. Though there is no convincing evidence for this proposal, my analysis can work by assuming that the unmarked coronal will surface by default in the post-lexical phonology (for the implication, see Chung 1993.)

b. Hakka

- | | | | | | | | | |
|-----|-------|------------|---|-----|--------------|---|-------|-----------------------|
| i) | ɲai | 'I' | + | ten | 'pl. suffix' | → | ɲan | 'we' |
| | n | 'you' | + | ten | | → | nən | 'you' |
| | ki | 's/he' | + | ten | | → | ken | 'they' |
| ii) | pun | 'give' | + | ki | 's/he' | → | pi | 'to give sth. to him' |
| | tə'in | 'relative' | + | ka | 'family' | → | tə'ya | 'relative' |

c. Mandarin

- | | | | | | | | | |
|-----|------|----------|---|-----|--------------|---|-------|-----------------|
| i) | hwa | 'flower' | + | ər | 'dim suffix' | → | hwar | 'flower' |
| | hwaŋ | 'yoke' | + | ər | | → | hwãr | 'yoke' |
| | hway | 'chest' | + | ər | | → | hawr | 'chest' |
| ii) | bu | 'no' | + | yuŋ | 'need' | → | buŋ | 'not necessary' |

I assume that there is a prosodic template for each Chinese syllable: CVX. Furthermore, I adopt the theory of Edge-In association developed in Yip 1988 in associating the template with the melody. The essence of this paper is, therefore, to argue that the principles for Chinese syllable contraction are:

(2)

- a. CVX template
- b. Edge-in Association
- c. Associating from left to right for the medial parts

My concern is mainly with the segmental study, leaving tone in Section 4. For this reason, tone is not transcribed in other sections.

This article is organized as follows. Section 2 discusses theoretical assumptions concerning the template CVX and the theory of Edge-in association. Section 3 justifies the principles governing Chinese syllable contraction. Section 4 shows tonal behaviors with respect to syllable contraction. Section 5 is a brief conclusion.

2. Theoretical Assumptions

2.1 The Prosodic Template

Most Chinese dialects are common in having no more than four segments within a syllable, appearing as CGVX, in which C is a consonant; V, a vowel; G, a glide; and X, a glide or a consonant.³ Thus it has long been taken for granted that there are four skeletal slots for every Chinese dialect (Cheng 1973, Yip 1982, Lin 1989, to name only a few.) However, recent studies (Chung 1989a, 1989b, 1991a, Duanmu 1990, 1994a, 1994b, and Bao 1992) indicate that the four segments in Chinese can be represented by a three-slot skeletal tier. Thus this section will address two issues: (a) How can a three-slot template represent the four segments? (b) How should there be such a template CVX for every syllable?

2.1.1 CVX for four segments

As pointed out in Chung 1989a and 1991a, there are among Chinese dialects three parameters of the prevocalic glide within a syllable. The first one is that the prevocalic glide is part of *Final*, as shown in Hakka and Southern Min.⁴ The second parameter is of the type that the prevocalic glide is part of *Initial*, like Cantonese and Suzhou. The third type is that the prevocalic glide pertains to both *Initial* and *Final*, as revealed in Mandarin.⁵

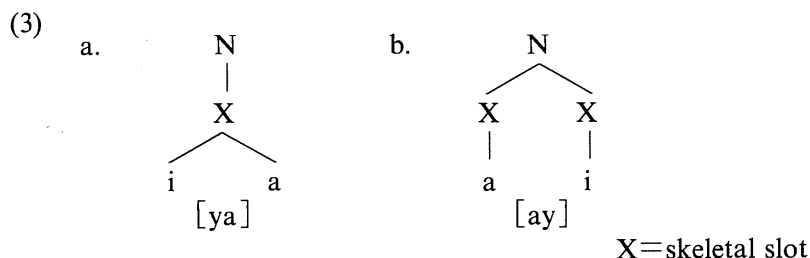
For the three dialects to be discussed here, I assume that a rising diphthong occupies only one single skeletal slot (3a) but a falling diphthong

3. In some dialects, like Fuzhou, the four segments appear as CGVC or CVGC. There is no syllable like *CGVG or *CGVGC. In other words, there are still no more than four segments.

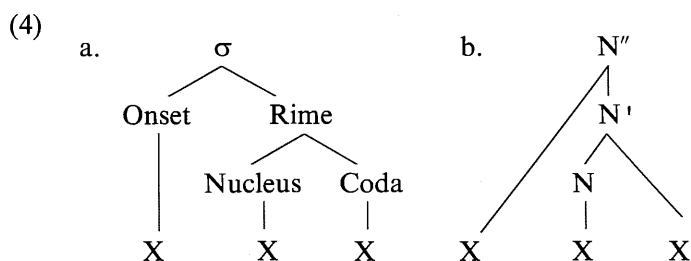
4. *Initial* and *Final* are terms used in the traditional syllable structure, the former being the first consonant, and the latter, the rest of the syllable.

5. Bao 1992 provides the fourth type in which the prevocalic *w* belongs to *Final*, while the *y*, *Initial*, as exemplified in the Taiyuan dialect. However, Bao holds that the behavior of the Mandarin prevocalic glides is still not clear.

occupies two slots on the skeletal tier (3b).⁶ The basic motivation for the representation in (3) comes from the observation that in Chinese, save a few dialects such as Fuzhou, no consonant is allowed to follow a falling diphthong while a rising diphthong can be followed by a consonant.



The internal structure for a syllable is traditionally given in (4a), with a stipulating condition that only the Nucleus is obligatory, while coda and onset, optional.



The stipulating condition is subsequently omitted by assuming that a syllable is projected by the nucleus, as shown in (4b).⁷ One consequence of (4) is that there are no more than two skeletal slots within the rime:⁸

6. In Duanmu 1990, it is assumed that the prevocalic glides in Mandarin are sort of features instead of segments. Thus there are a set of consonants like C^i and C^w added to Mandarin inventory. The problems for this analysis is that there will be two different sets of C^w in Hakka: one rimes with *an* while the other does not. For further discussions, see Chung 1991b.

7. The proposal for (4b) is due to Levin 1985. For a more detailed discussion on the internal structure of a syllable, see Kenstowicz 1994, Ziolkowski, Noske and Deaton 1990.

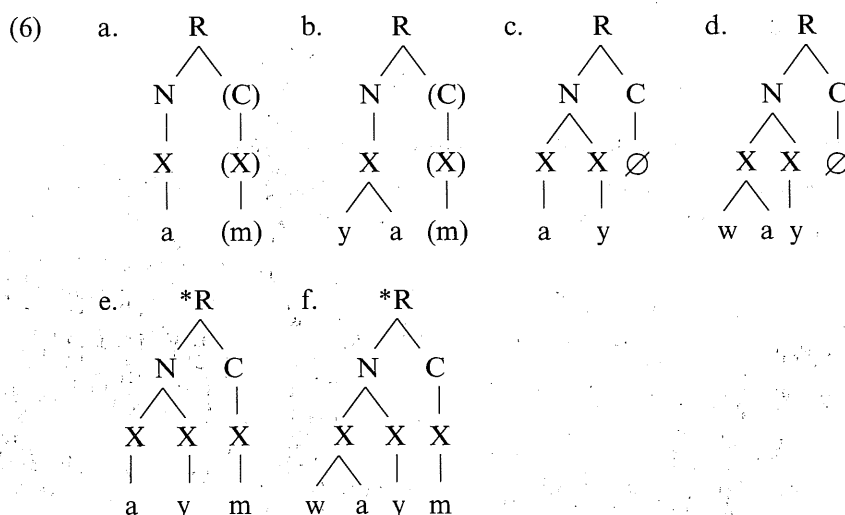
8. This is a positive constraint, meaning that there are no more than two skeletal slots for the rime of a syllable.

(5) Rime Constraint

$$[X \quad \text{---} \quad X]_{\text{Rime}}$$

X=skeletal slot

Under the assumption that a rising diphthong gains only one single skeletal slot, but a falling diphthong has two slots on the skeletal tier, the Rime Constraint allows the generation of the possible syllable types in (6a-d) and rules out the ill-formed in (6e-f):

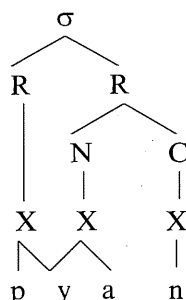


It follows that the three-slot template is adequate for the first type of Chinese dialects. In addition, it predicts GV, VG, and GVG are structurally different from VC, the former being within the N-domain, while the latter the R-domain. The difference has been strongly supported on the empirical grounds (Chung 1989a, 1990a, 1991b, and 1992).

For the second type of dialects, it is obvious that there is no rising diphthong. Instead, there are consonantal phonemes such as C^v and C^w in those dialects. For this reasoning, the assumption in (3) is still valid on the theoretical as well as empirical backgrounds.

The representations in (3) can also be adopted for the syllabification of such dialects as Mandarin in which the prevocalic glides are in between *Initial* and *Final*:

(7)



Limited space precludes full arguments for those representations.⁹ The argument to be discussed here is taken from Chao 1931. With the representations in (3), the differences in the position of prevocalic glides revealed among dialects are straightforward as exemplified below:

(8) *kwa* 'melon'

- | | | |
|---------------------|--------------|-----------------|
| a. Beijing Mandarin | b. Guangzhou | c. Southern Min |
| k w a | k w a | k w a |
| | | |
| C V | C V | C V |
-
- | | | | |
|---------------|----------------|-------------|----------------|
| d. <i>kwa</i> | → <u>k</u> way | <u>l</u> wa | (Beijing) |
| <i>kwa</i> | → la | <u>k</u> wi | (Guangzhou) |
| <i>kwa</i> | → <u>l</u> wa | ki | (Southern Min) |

In addition, it follows from the representations in (8abc) that *kwa* 'melon' in the three distinct secret languages will be as in (8d), as reported in Chao 1931.¹⁰

In sum, the three-slot template CVX can successfully characterize the construction of a syllable with four segments. Further evidence against CGVC will be shown in Section 3.3.

9. The interested readers are encouraged to see Chung 1991b.

10. For (8a) the secret language formation rule is (i), while for (8b) and (8c), it is (ii).

(i) $\begin{array}{c} \sigma \\ / \quad \backslash \\ I \quad F \end{array} \rightarrow \begin{array}{c} \sigma \\ / \quad \backslash \\ I \quad ay \end{array} \quad \begin{array}{c} \sigma \\ / \quad \backslash \\ k \quad a \end{array}$ (ii) $\begin{array}{c} \sigma \\ / \quad \backslash \\ I \quad F \end{array} \rightarrow \begin{array}{c} \sigma \\ / \quad \backslash \\ I \quad F \end{array} \quad \begin{array}{c} \sigma \\ / \quad \backslash \\ I \quad i \end{array}$

2.1.2 The necessity of CVX

Now that the four segments in Chinese can be accommodated into a three-slot representation, we assume that there is a template CVX for every Chinese syllable. To save space, we will base our discussion on the Hakka data.¹¹

The basic motivation for the first C-slot comes from the fact that every syllable starting with a high vowel must have a fricative onset:

(9)

a.	ji	'rain'	b.	*i
	jin	'brilliance'		*in
	vu	'black'		*u
	vun	'warm'		*un

The fricative is derived from vowel spreading (Chung 1990a). For this, we have to assume the presence of a skeletal slot for the onset.¹² This assumption is further supported by vowel-initial suffixes, which get an onset from the word to which they are attached, as illustrated in (10).

(10)

a.	p'an	ni	(←/#p'an i#/)	'plate'
b.	tag	ŋi	(←/#tag i#/)	'nail'
c.	ham	me	(←/#ham e#/)	'salty'

Without the CVX template, we should stipulate that Hakka has two distinct cases in which a floating skeletal slot for the onset is necessary: a high vowel initial syllable and a vowel-initial suffix. Now we come to the realization that the two cases are not different in essence, because every

11. For the arguments based on Southern Min in Taiwan, see Chung (1996).

12. For syllables like *on* 'peace' and *an* 'very', the onset, being unfilled, does not show up in surface. Note that the spreading from the nucleus to the onset is limited to [+high] segments, namely, *i* and *u*. For further discussions, see Chung 1989a and 1991a.

Hakka syllable has a skeletal slot for the onset in underlying representations.

As for the third slot in the template, an X is used because the last segment in a Hakka syllable can be either a glide or a consonant:

(11)

a. Glides

hay	'shoes'
naw	'dislike'

b. Consonants

ham	'salty'
nan	'difficult'

It might be argued that, in line with CV Phonology (Clements and Keyser 1983), a glide or a consonant is associated to a C slot, and hence the template is CVC. However, in Hakka it is of phonological significance to distinguish VG from VC (Chung 1989a, 1989b). Thus the use of X here has two purposes. One is to indicate the existence of a skeletal slot; the other is to show its variable, a glide or a consonant. The necessity to have a third slot in a Hakka syllable template is revealed from the following data.

(12)

- | | | |
|------------|---------------|-------------------------|
| a. man ɳin | ←(/#ma ɳin#/) | 'which one' (animate) |
| b. mak ke | ←(/#ma ke#/) | 'which one' (inanimate) |

In (12), the onset of a word spreads to the coda position of a prefix.¹³ Further evidence indicates that cases in (12) are not accidental, but systematic. For instance, *tsa* 'different' *m* 'not' *to* 'many', put together,

13. The term prefix is used here for the sake that *ma* - in Hakka can form *who* (*man-nin*), *what* (*mak-ke*), *where* (*ma-vi*), *when* (*mak-ke ɛi*). The *v* in *ma-vi* (where) does not occur in the coda of *ma*- perhaps because of the coda condition, which allows only [-continuant] segments.

result in *tsam to* 'making no great difference.' Where should the segment *m* dock if there is no skeletal slot for the coda position?

Another evidence for the coda skeletal slot comes from the following observation. In phonetic realization, the vowel in an open syllable like *vu* 'black' is longer than that in a closed syllable, for instance, *vun* 'warm', because the length in tonal timing is identical. In other words, the vowel in an open syllable is phonetically long:¹⁴

(13)

a. kii	'piece'	cf.	kin	'today'
kee	'chicken'		ken	'they'
kaa	'to add'		kam	'sweet'
ko	'brother'		kon	'dry'
b. kwee	'obligatory'		kwen	'forever'
kaww	'melon'		kwan	'close'
kyaa	'his/her'		kyan	'scared'
k'yoo	'cripple'		kyon	'ginger'

The vowel lengthening phenomenon would be hardly explained without the assumption that there is a skeletal slot right after the nucleus vowel.¹⁵ With the CVX template, the vowel lengthening is borne out because of the spreading rule below.¹⁶

14. Since vowel length is not distinctive, it is not transcribed. Thus our discussion hereafter will not be concerned with vowel length.

15. In fact, this is not a specific phenomenon for Hakka. It is universal in Chinese dialects.

16. One of the anonymous reviewers inquires why a rising diphthong like [ya] is shorter than a falling diphthong like [ay]. The answer to this question is straightforward. The theory developed here predicts that the Hakka diphthongs in *mya* 'to touch' and *may* 'to buy' are not different in length because the spreading will lead the former to [myaa] in phonetics. The different length between rising and falling diphthongs can be realized in the following syllables: *myan* 'a kind of plant' versus *may* 'to buy'. Given the same length in duration of a syllable (Hashimoto 1973), it is not hard to follow that *ya* in *myan* is shorter than *ay* in *may*.

(14) Open Syllable Spreading

[+syllabic]



X' = any empty slot

The vowel lengthening for a Chinese open syllable is confirmed by some observations revealed from the second language acquisition. It has been pointed out that a Hakka student tends to shorten an English long vowel in a closed syllable such as *bean*, but not in an open syllable such as *bee* (Chung 1990b). This external piece of evidence justifies the necessity to have a specific skeletal slot following the nucleus vowel.

In summary, we have to assume that there is a skeletal slot preceding as well as following the nucleus vowel. Given that there is no syllable without a nucleus, it is reasonable to conclude that for every Hakka syllable there is such a template as CVX. But in surface an unfilled skeletal slot disappears by default (Halle and Vergnaud 1980).

Note that Hakka is not the only Chinese dialect lending support for the CVX template. Cantonese, Mandarin, and Southern Min also provide empirical evidence for the necessity of CVX (Chung 1991b, Lin 1992, Duanmu 1994a and 1994b).

2.2 Edge-in Association

The theory of Edge-In association developed in Yip 1988 essentially claims that the association between the morphological template and the melodic segments begins with the two edges of a template. The medial slots and the unassociated melodies are associated by a rule, either one by one and leave the unfilled disappearing in surface or associate from left to right or from right to left. Yip suggests that this theory be able to account for the second (and the fifth as well) binyan in Classical Arabic without any cost. This can be seen below (data taken from Yip 1988).

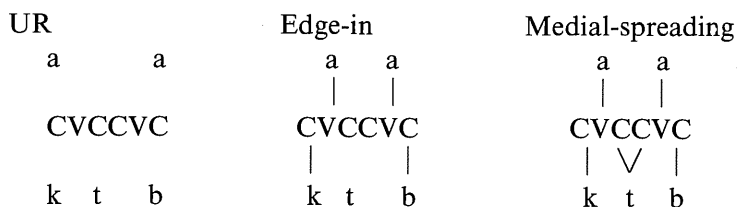
(15)

a. Root : ktb

Template: CVCCVC

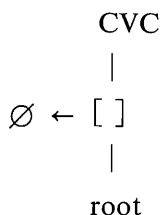
Tense Vowel: a

b.



In McCarthy 1981, which claims that the association is from left to right, the result would be **katbab*, which is not correct. To get the correct result, McCarthy postulates a rule as given in (16), to delete the association between the penultimate C-slot and the melody [b]. Then reassociation of [t] leads to the correct form.

(16)



Within the theory of Edge-in association, the undesirable condition (16) is not necessary, as shown in (15b). In this respect, the theory of Edge-In association is better than LR-association.

3. Chinese Syllable Contraction

3.1. General Properties

In general, there are two environments in which syllable contraction occurs. One is suffixation in personal pronouns (1i); the other is when

two independent words used together (1ii). The former is obligatory, while the latter, optional, because syllable contraction seldom occurs in a slow speech.¹⁷ In this section we will examine the properties of syllable contraction in the three dialects, respectively. Meanwhile, we will briefly review the analyses in the literature.

3.1.1 Southern Min

The first study of syllable contraction in Southern Min is R. Cheng 1985. The rules in (17) below are formulated for the characterization of contraction, where I is for the Initial Consonant, M for the medial glide, V for the nucleus vowel and E for ending (glides or consonants):

(17)

- a. $I_1(M_1)V_1 + V_2 \longrightarrow I_1(M_1)V_1$
 to 'where' uy 'place' \longrightarrow to 'where'
 ka 'with' i 'him' \longrightarrow ka 'let him'
 ka 'with' gwa 'I' \longrightarrow ka 'with'
- b. $I_1(M_1)V_1 + V_2 \longrightarrow I_1(M_1)V_1V_2$
 si 'yes' bo 'no' \longrightarrow syo 'yes or no'
 ka 'with' i 'him' \longrightarrow kay 'with him'
- c. $I_1(M_1)V_1(E_1) + V_2E_2 \longrightarrow I_1(M_1)V_1E_2$
 ho 'let' laŋ 'people' \longrightarrow hoŋ 'let them'
 sɿã 'who' laŋ 'people' \longrightarrow syaŋ 'who'
- d. $I_1(M_1)V_1(E_1) + V_2E_2 \longrightarrow I_1(M_1)V_1V_2E_2$
 si 'four' tsap 'ten' \longrightarrow syap 'forty'
 ho 'let' gwa 'I' \longrightarrow hwa 'let me'

17. The environments in which two successive syllables are contracted are not entirely clear, because syllable contraction is involved with other pragmatic factors such as speech attitudes, casualness, speed, etc. For more discussions, see Chung (1996).

Those rules above need some comment. To begin with, the data in (17a) are rarely treated as contraction, as put in Cheng (P.21):

The *ka* [in (17a)] perhaps should not be regarded as contracted forms, if it is considered that these two prepositions do not require a noun to follow them.

Our position is that the data in (17a) are not contracted forms, which is further supported by the following observations. Consider:¹⁸

(18)

- a. $Li_{53(55)}$ ka_{33} $koŋ_{53}$
you with talk
'You talk with him/them/that man.'
- b. $Li_{53(55)}$ $ka_{33(31)}$ i_{33} $koŋ_{53}$
you with him talk
'You talk with him.'
- c. $Li_{53(55)}$ $kay_{33(31)}$ $koŋ_{53}$
you with him talk
'You talk with him.'

In (18a), the object can be a specific person, a non-definite person, or plurals. It is essentially different from (18b) in semantics, the object of which is specified for a definite third person. In particular, the tones for the ka_{33} in (18a) and those for ka_{31} in (18b) are different in surface. The contraction form for (18b) is (18c) instead of (18a). In fact, (18c) is also recognized in Cheng 1985:22. Likewise, to_{31} is usually realized as toy_{33} (see (17a)) instead of to_{31} . To many informants, the to_{31} in sentences like " $Li_{53(33)}$ $be_{53(55)}$ to_{31} ?" (where are you going?) is either realized as toy_{33} in surface or interpreted as another morpheme. For this reason, we are going to ignore (17a) in our discussion.

Second, though the rules in (17) characterize the general properties

18. Tone is given in (18) for the ease of discussion, since tone plays an important part here.

of syllable contraction in Southern Min, they raise some questions. Why should the same contexts (17a/b) and (17c/d) give rise to different results? What properties make (17a) different from (17b) in contraction? The rules in (17c) and (17d) are essentially similar in that both cases have the coda of the second syllable retained in contraction. In addition, they are identical in getting the prevocalic glide from the first syllable. Above all, the pivotal generalization is that syllable contraction in Southern Min is closely tied with syllable structure in nature. An analysis proposed in Cheng 1985, therefore, needs to be extended such that those generalizations can be brought into light.

We try to approach the nature of Southern Min syllable contraction from a different point of view.

3.1.2 Mandarin

Cheng 1973 first analyzes Mandarin retroflexation in the framework of generative phonology based on SPE. To account for the data in (19) (taken from Cheng 1973: 27), he formulates three rules applying in the order given in (20).¹⁹

(19)

a.	/#pi + əɾ#/ /#yaw + əɾ#/ b.	pyər ya ^w r kur	'pen' 'waist' 'drum'
	/#ku + əɾ#/ /#p'a + əɾ#/ #kə + əɾ#/ c.	p'ar p'ar kər	'rake' 'rake' 'song'
	/#yaŋ + əɾ#/ /#hwaŋ + əɾ#/ /#səŋ + əɾ#/ c.	yār hŵār sər	'shee' 'egg yolk' 'rope'

19. It is claimed in Cheng 1973 and Tung 1965 that the *w*-ending will not be deleted. However Ao 1992 holds that it is deleted. I will assume that it is deleted, but the [+round] feature remains, because it spreads to the back feature of əɾ. See the discussion in (34).

(20)

- a. The syllable boundary and both the vowel and the tone of the suffix are deleted, retroflex liquid becomes part of the suffixed syllable. (Cheng's rule (34))
- b. A schwa is inserted between a high front vowel and the retroflex ending. (Cheng's (36))
- c. The velar nasal ending of a retroflex-suffix final is deleted, and the preceding vowel is nasalized. (Cheng's (41))

It is apparent that (20a) claims in essence that the two syllables are contracted into one, and that the liquid in the retroflex suffix ∂r should be part of the contracted syllable. While Cheng appeals to a rule like (20a) to ensure that the r has to be part of the contracted syllable, we will show that it is a direct result from the theory of Edge-in association.

In addition, (20b) is *ad hoc* in that it is specifically formulated to account for the existence of the schwa in words with a high front vowel suffixed with ∂r , as given in (19a). According to (18a), the schwa of the suffix in the contracted syllable is deleted. Rule (20b) does nothing, therefore, except confirm the existence of a schwa in the data like (19a).

Rule (20c) is not necessary. As will be clear in our analysis, the velar nasal ending is deleted because there is no unfilled slot for it on the skeletal tier. Moreover, the preceding vowel becomes nasalized because the [nasal] feature stays on an independent tier and spreads to the vowel when the nasal consonant finds no slot to dock. Finally, it is rather strange that in Cheng 1973 nothing is said of the consonant ending except (20c), where a velar nasal is specially referred to. In fact, all the endings (in the sense of Cheng, y and w are also endings) get deleted after retroflexation. To illustrate, some examples are given below.

(21)

	word	word + suffix	gloss
a.	p'ay	p'ar	signboard
	kway	kwar	obedience
b.	tyen	tyer	store

Thus we have to get a theory which can naturally predict that all the endings, be they nasals or glides, disappear in surface.

3.1.3 Hakka

So far there is no comprehensive study of Hakka syllable contraction. Yu 1984 is the only works exploring this topic. The properties are summarized as follows:

(22)

a.	IVE	+	CV ₂	→	IV ₂
	t'uŋ		ki	→	t'i
b.	CVE	+	CV ₂	→	CGV ₂
	tɛ'in		ka	→	tɛ'ya
c.	IVE	+	N	→	IVN
	pun		ŋ	→	puŋ

Since the process of contraction is complicated, it is therefore claimed by Yu 1984 that it is very difficult to find a general rule for it. However, we will show that those properties can be fully accounted for in a unitary theory.

To recapitulate, in this subsection we discussed the general properties of syllable contraction in Chinese. Now the question is: How can we characterize those properties?

3.2 Directionality for the Medial Spreading

On the basis of the EI-association and the CVX template for a Chinese syllable, syllable contraction is assumed to be a process occurring on the CV-tier:

(23) Syllable Contraction

$$CVX \quad CVX \quad \longrightarrow \quad CVX$$

Furthermore, the medial spreading is from left to right, as illustrated

below (UR=underlying representations, CTR=Contraction, EI=Edge-in, MS=medial spreading):

(24)

	a.Hakka	b.Southern Min	c. Mandarin
	/#ŋai + ten#/ 'I + suffix'	/#li + ten#/ 'you + suffix'	/#hwai + ər#/ 'chest + suffix'
i) UR	ŋai + ten CVX CVX	li + ten CVX CVX	hwa i + ər CVX CVX
ii) CTR	ŋai + ten CVX	li + ten CVX	hwa i + ər CVX
iii) EI	ŋai + ten \ / C V X	li + ten \ / C VX	hwa i + ər \ / C V X
iv) MS	ŋai + ten // / CV X	li + ten // / C VX	hwa i + ər // / C V X
v) output	ŋan	lin	hwar

If the medial spreading is from right to left, then wrong results arise.

(24') RL Medial

iv) MS	ŋai + ten \ // CV X	li + ten \ // C VX	hwa i + ər \ // C V X
v) output	*ŋen	*len	*hər

There are a lot of cases indicating the difference in diphthong representations. A rising diphthong occupies one single skeletal slot while a falling diphthong occupies two. A contrast can be seen in the following examples on the basis of Southern Min.

(25)

- | | | | | | | | |
|----------|-----------|---|------|----------|---|--------|-------------|
| a. ho | 'let' | + | gwa | 'I' | → | hwa | 'let me' |
| sỹã | 'which' | + | laŋ | 'person' | → | syɑŋ | 'who' |
| b. tsa | 'morning' | + | k'i | 'rise' | → | tsay | 'morning' |
| c. ts'ut | 'go' | + | lay | 'come' | → | ts'way | 'to go out' |
| d. ka | 'with' | + | gwan | 'we' | → | kan | 'with us' |

To be clearer, the process is illustrated as follows.²⁰

(26)

- | | a. | b. | c. |
|-----------|-----------------------|------------------------|-----------------------|
| i) UR | ho + gwa
CVX CVX | ka + gwan
CVX CVX | tsa + k'i
CVX CVX |
| ii) CTR | ho + gwa
CVX | ka + gwan
CVX | tsa + k'i
CVX |
| iii) EI | ho + gwa

C V X | ka + gwan

C V X | tsa + k'i

C VX |
| iv) MS | ho + gwa

C V X | ka + gwan

C VX | tsa + k'i

C VX |
| v) output | hwa | kan | tsay |

As indicated in (26a), *wa* in *gwa* associates with the rightmost V-slot when the rule of Edge-in association applies. The consequence is that no slot in the medial is left unfilled on the skeletal tier, resulting in

20. Note that in (26b), the *i* of the second syllable is associated to the X (the skeletal slot following the vowel) under the Edge-in Association, because high vocoids *i* and *u* are assumed to be underspecified for either [syllabic] or [consonantal] (see Levin 1985). This means that only segments underlyingly specified for [+syllabic] are associated to the V-slot. Thanks to one of the anonymous reviewers for bringing this point to me.

hwa after contraction. This is further confirmed by (26b), where it is the rightmost consonant *n* in *gwan* that is associated with the right edge, namely, the X-slot in this case. Then, the medial association from left to right leads the vowel *a* in *ka* to the medial V-slot, resulting in *kan*.

In contrast, the formation of syllable contraction in (26c) results in a falling diphthong, which apparently occupies two skeletal slots. Likewise, a derived triphthong like *way* as exemplified in (25c) lends more support for the difference in diphthong representations.

The rising diphthongs in contracted syllables can be formed in two possible ways. One results directly from the original rising diphthongs, as seen in (25a). The second way is formed by the glide of the first syllable and the vowel of the second syllable,²¹ as shown below:

(27)

- | | | | | | | | | |
|----|-----|--------|---|------|------------|---|-------|-------------|
| a. | si | 'yes' | + | bo | 'no' | → | syo | 'isn't it' |
| | li | 'two' | + | tsap | 'ten' | → | lyap | 'twenty' |
| b. | tsu | 'just' | + | a | 'particle' | → | tswa | 'just then' |
| | tsu | 'just' | + | an | 'so' | → | tswan | 'jsut so' |

In either way, a rising diphthong behaves exactly like occupying only a single skeletal slot. The case in Mandarin (*key* 'to give' *wo* 'me' → *kwo*) (Hsiau 1986:48) is also in support of the assumption that a rising diphthong is associated with only one skeletal slot. The fact here implies that a rising diphthong is not inherently an absolute unit, but is constructed through association under the requirement of the representation in (3).

3.3 Template Transfer

The three Chinese dialects in question behave the same in the syl-

21. It is very interesting in Southern Min that the mid back vowel *o* acts like *u* in forming a rising diphthong (that is, when the second syllable has a low vowel): *lo?* 'fall' + *lay* 'come' → *lway* 'fall down.' This is attributed to vowel neutralization. For more discussions, see Chung (1996)

lable contraction with respect to the CVX template, Edge-in association, and medial LR association. However, there is a clear discrepancy between Hakka and Southern Min about the docking of the high vowel. It is the case in Southern Min that a high vowel, whether it is syllabified to an X- or a V-slot before contraction, always associates with the right-most edge, an X-slot on the CVX template (28a). In Hakka, however, a high vowel associates with the X (26bi) or the V-slot (28bii) depending on which slot it was syllabified before contraction.

(28)

a. Southern Min

i)	ka	'with'	li	'you'	→	kay
	lay	'come'	k'i	'go'	→	lay
ii)	to	'toward'	uy	'place'	→	toy
	m	'no'	ay	'love'	→	may

b. Hakka

i)	mo	'no'	oy	'love'	→	moy
ii)	t'uŋ	'with'	ki	's/he'	→	t'i
	loy	'come'	hi	'go'	→	li

Since the feature [syllabic] for a high vowel is underlyingly unspecified, it can be projected either into a V-slot or a C-slot. Examination of (28) leads to the generalization that in Hakka, the syllables to be contracted still keep their syllabicity. If a high vowel is projected into a V-slot, it can only be associated with a V-slot on the CVX template after contraction, while in Southern Min, the syllables to be contracted have lost their syllabicity, so a high vowel is regarded as an unspecified element which gets associated either with a V- or with a C-slot. A comparison is given below:

(29)

	Hakka /#loy+hi#/->li	Southern Min /#ho+i#/->hoy
i) UR	loy hi CVX CVX	ho i CVX CVX
ii) Syllabification	l o y h i CV X C V X V O R O R V V σ σ	h o i C VX CVX O R R V σ σ
ii) CTR	loy hi CVX CVX	ho i CVX CVX
iii) EI & Medial	l o y h i CVX CVX C VX	h o i CVX
v) Output	li	hoy

On the other hand, in these two dialects the high vowel of the first syllable to be contracted, even if it is projected into a V-slot, always appears as a glide if the following vowel can form a rising diphthong with the glide y, as shown below.

(30)

a. Southern Min

i) si	'yes'	bo	'no'	→	syo
si	'four'	tsap	'ten'	→	syap

b. Hakka

i)	tɛ'i	'self'	ka	'home'	→	tɛ'ya
	ti	'know'	mo	'no'	→	tyo

The generalization that the high vowel of the first syllable always appears as a glide after contraction reveals that our assumption is correct that a rising diphthong occupies only a single slot on the skeletal tier, because the *i*, having been syllabified as a V before contraction, has good reason to associate with the vowel-slot during the process of contraction. If the glide in contraction cannot form a rising diphthong, then the phonotactic constraint will automatically delete the glide rather than prevent the second vowel from being associated with the V-slot, as shown below:

(31)

a. Southern Min

i)	tsit	'this'	le	'piece'	→	tse
	hit	'that'	le	'piece'	→	he

b. Hakka

i)	ki	's/he'	ten	'pl. suffix'	→	ken
----	----	--------	-----	--------------	---	-----

Neither Hakka nor Southern Min allows *ie* as a rising diphthong (Chung 1989a and 1992), so after contraction, the glide is deleted. Furthermore, the set of data in (31) offers an argument for the template being CVX rather than CGVC (Yip 1982). If the template were CGVC, we would be unable to explain why the glide should not be associated to the G-slot in (31). In addition, if the template is CGVC, then why should a vowel be associated with a G-slot instead of with a V-slot in (30) and (31)? In particular, we have pointed out that in Hakka, the syllabicity remains when contraction applies. Given below is a comparison between the derivations of CGVC and CVX templates for (31a).

(32)	Hakka:	/# ki + ten #/ → ken		'they'	
		CVX		*CGVC	
a.	UR	ki	ten	ki	ten
		CVX	CVX	CGVC	CGVC
b.	Syllabification	k i	t e n	k i	t e n
		CVX	CVX	CGVC	CGVC
c.	Contraction	k i	t e n	k i	t e n
		CVX	CVX	CGVC	CGVC
		CVX		CGVX	
d.	EI & Medial &Phonotactic	k i	t e n	k i	t e n
		CVX	CVX	CGVX	CGVX
		C	VX	C GV	C
	Outputs	ken		*kin	

What is more, as shown in (28) and (29), why should a syllabified high vowel in Southern Min and the glide in Hakka be associated with the final X-slot? This means that the final X-slot can be docked by either a glide or a consonant. In view of this, why do we just have a G in the template CGVC? It is apparent that the assumption of CGVC runs into great difficulties here.

In Mandarin, since syllable contraction mainly occurs to retroflexation, no problem is involved with respect to the syllabified information before contraction. A more specific property in Mandarin is that the feature [nasal] for [ŋ], when lost in association, spreads to the vowel. This can be accounted for within the theory of Autosegmental Phonology (Goldsmith, 1976 and 1990), because the feature [nasal] has its own independent tier. An illustrative derivation for *p'ur* 'basin' from /#p'uŋ + əɾ#/

is given below.²²

(33)

a. UR	[nasal]	c. EI	[nasal]
	p'uŋ ər		p'uŋ ər
	CVX CVX		C V X
b. Contraction	[nasal]	d. MS	[nasal]
	p'uŋ ər		p'uŋ ər
			/
	CVX		CV X

Within this theory, all the data in (19) are accounted for. We do not need a schwa-insertion rule for $/\# pi + ə r\#/\rightarrow pyər$ 'pen', because *i* and schwa are allowed to form a rising diphthong in Mandarin. The reason why schwa does not change into [e] in *pyər* reveals that the contraction occurs in the domain of lexical phonology, where Structure Preservation (Kiparsky 1982 and 1985) prohibits the application of the rule: $ə\rightarrow e/i_$,²³ which gives rise to a non-distinctive segment.

In addition, the theory we propose here also accounts for why all the endings in VG or VC structure are deleted, because within the three-slot framework there is no slot left unoccupied for the ending after EI-association. The only potential problem is the case like $/\# tɕ'yaw + ə r\#/\rightarrow tɕ'ya^w r$ 'bridge' in which the ending *w* does not entirely disappear.

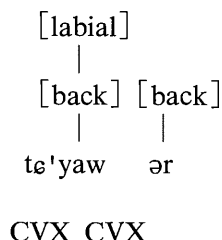
22. For the analysis of Mandarin *r*-suffixation, see Chao 1959, Tung 1965, Cheng 1973, Hsueh 1985, and Lin 1989.

23. The rule is based on Cheng 1973. However, in Chung 1991b, it is considered as back-sharing principle. Since this is not the main concern here, I will not discuss it in detail.

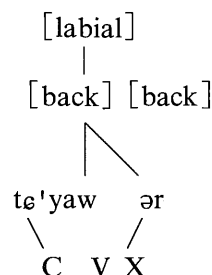
The solution suggests itself is like the following:²⁴

(34)

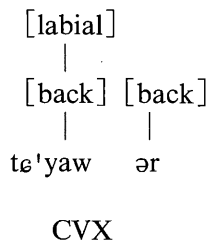
a. UR



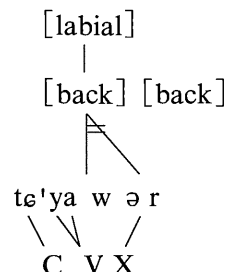
c. EI
&
OCP



b. Contraction



d. MS



Output tɤ'ya^w r

As shown in (34c), the feature [+labial] remains after contraction, because the [+back] it depends on has been fused into part of *r*. This is why there is no segment like *w* in surface, while phonetically, the lip-rounding is still present.

The specific property of labial in Mandarin is also revealed in cases below:²⁵

24. The OCP (Obligatory Contour Principle) (McCarthy 1986) claims that it is not allowed to have identical autosegments on the same tier. As discussed in Chung 1991b, the feature [back] for schwa in Mandarin is underspecified. Accordingly, the [+back] for *w* and *ər*, though segmentally intervened by schwa, are adjacent. Thus when *w* is followed by *ər*, an OCP violation arises. This triggers Fusion.

25. Thank Jim Tai and Chiu-yu Tseng for bringing this point to me.

(35)

- | | | | | | | | |
|----|-----|--------|---|-----|--------------|---|------|
| a. | wo | 'I' | + | mən | 'pl. suffix' | → | wom |
| b. | ni | 'you' | + | mən | | → | nim |
| c. | t'a | 's/he' | + | mən | | → | t'am |
| d. | na | 'that' | + | mə | 'particle' | → | nam |

The Edge-in association leads the ending *n* of the plural suffix to get associated with the X-slot in the process of contraction. However, the left-over [+labial] subsequently spreads to it, resulting in *m* in surface. The process is much like the one illustrated in (34). That the *m* in (34) comes from spreading of [+labial] is further confirmed by the following case: (data taken from Hsiao 1986:48)²⁶

(36)

- | | | | | | | | |
|-----|--------|---|-----|--------|---|-----|---------|
| kən | 'root' | + | bən | 'base' | → | kəm | 'basic' |
|-----|--------|---|-----|--------|---|-----|---------|

Where does the *m* in *kəm* come from? There would be no answer to this question without appealing to the assumption that the [+labial] feature of *b* spreads to *n*, yielding *m* in surface. In this reasoning, the counter-examples for the Edge-in theory in appearance turn out to be good support for it as well as for the spreading of the [+labial] feature.

Another case in Mandarin contraction worth discussion is the data in (37), where the medial spreading seems to be from right to left:²⁷

(37)

- | | | | | | | |
|----|-----|---|------|---|-------|-------------|
| a. | tsə | + | yaŋ | → | tsyaŋ | 'like this' |
| b. | tsə | + | tsuŋ | → | tsuŋ | 'like that' |
| c. | na | + | mə | → | nam | 'then' |

26. It is transcribed as *gən(m)* in Hsiao. My interpretation is that it can be read as *gən* or *gəm*. If it is *gənm*, then one of the last consonants should be considered extrametrical.

27. Hsiao uses *tsei* for 'this'. According to my Back Sharing Principle (Chung 1991a), the *e* comes from schwa. The same analysis can be seen in Cheng 1973.

Why is it *ya* instead of *ə* in (37a) and (37b) appearing in phonetics? The answer to this question lies in the assumption that the Mandarin schwa is a default vowel, which is absent from underlying representations (Lin 1989). As is often the case, a default rule always applies at the last stage. This implies that when the medial association begins to work, there is still no schwa, ensuring the appearance of the vowel of the second syllable in surface.

The schwa in (37c) does not dock onto the rightmost X-slot in CVX when EI-association applies, because the default rule does not apply yet. In other words, there is no schwa when contraction occurs.

To summarize, this section explores the general properties of syllable contraction. The association for the medial segments is from left to right. Some cases, which are problematic at the first sight, turn out to be good arguments for our analysis.²⁸

4. Tone in Syllable Contraction

4.1 Hakka

There are six citation tones in Hakka, the phonetic values of which are given below, to use the five-point scale, in which 5 indicates the highest pitch, while 1 the lowest pitch.

(38)

a.	MM	33	ex.	ei ³³	'poetry'
b.	LL	11		ei ¹¹	'time'
c.	HH	55		ei ⁵⁵	'to make'
d.	HL	51		ei ⁵¹	'things'
e.	M	3		ei ³	'to know'
f.	H	5		ei ⁵	'to eat'

28. There is a problematic case: *na yaŋ* → *nyaŋ* 'like that' found in Hsiau. Why should *ia*, but not *a*, become the nuclei of the contracted syllable? For this, it is assumed to be either a marked case or a case needing other rules. This will be left open here.

Tone is distinctive, as illustrated. (38e) and (38f) are called *checked* tone (or *entering tone*) in that they are of [- legato] (Hashimoto 1973), and that they only occur at syllables ending with one of the stop obstruents *p*, *t*, or *k*.

In general, the tone for the contracted syllable comes from the tone of the syllable whose vowel becomes the nucleus after contraction, as shown below:

(39)

a.	t'uŋ	'with'	+	ki	's/he'	→	t'i
	11			11			11
	ka	'then'	+	ha	'down'	→	ka
	55			55			55
b.	loy	'come'	+	hi	'go'	→	li
	11			51			51
	pun	'give'	+	ki	's/he'	→	pi
	33			11			11
c.	ha	'under'	+	toŋ	'section'		haŋ
	33			55			33

In (39b) it is the second tone, while in (39c) it is the first, that becomes tone for the contracted syllable. The generalization suggests itself here is that the tone goes with the vowel.

4.2 Mandarin

There are four citation tones in Mandarin:

(40)

a.	HH	55	ex.	ma ⁵⁵	'mother'
b.	LH	35		ma ³⁵	'hemp'
c.	L	214		ma ²¹⁴	'horse'
d.	HL	53		ma ⁵³	'to scold'

Tone in Mandarin contraction also indicates that the tone of the contracted syllable comes with the vowel:

(41)

a.	kən	'follow'	+	wo	'me'	→	kwo
	55			214			214
b.	wo	'I'	+	mən	'pl. suffix'	→	wom
	214						214

For the R-suffixation, when əɾ is suffixed to the word, the tone for the contracted syllable is the same as the tone of the word to which əɾ is attached, because əɾ is a toneless syllable.

(42)

a.	tan	əɾ	→	tar	'burden'
	55			55	
b.	pan	əɾ	→	par	'plate'
	35			35	
c.	wan	əɾ	→	war	'bowl'
	214			214	
d.	pan	əɾ	→	par	'half'
	53			53	

The tonal behaviors in Hakka and Mandarin contraction indicate that tone goes with the vowel, contrary to the claim that the Chinese tone is a syllable feature. This is very significant in phonological studies.

4.3 Southern Min

There are seven-citation tones in Southern Min:²⁹

29. The data in this part are basically taken from Cheng 1985.

(43)

a.	HH	55	kun ⁵⁵	'army'
b.	MH	13	kun ¹³	'skirt'
c.	MM	33	kun ³³	'near'
d.	LL	11	kun ¹¹	'stick'
e.	HM	53	kun ⁵³	'boiling'
f.	M	3	kut ³	'bone'
g.	H	5	kut ⁵	'slippery'

The tonal behaviors in Southern Min contraction are very specific in that the tone for the contracted syllable is composed of two edge tonemes from each syllable to be contracted:

(44)

a.	si ⁵⁵	'four'	a	(gɔ)	→	sya (gɔ)	'forty-five'
	55		53			53	
b.	sỹã	'which'	laŋ	'person'	→	syaŋ	'who'
	55		13			53	
c.	lay	'come'	k'i	'go'	→	lay	'to get there'
	33		31			31	
d.	tsit	'one'	taŋ	(si)	→	tsyaŋ	'then'
	5		33			53	

For the application of Edge-in association, the contracted tone allows the tonal inventory which is absent from normal cases.

(45)

a.	tsa	hŋ	→	tsaŋ	'yesterday'
	33	55		35	
b.	ka	gwa	→	ka	'with me'
	31	53		33	

As shown in (43), there is no allowing 35 as a tonal value in Southern

Min. However, the 35 tone in (44a) is not ruled out. The result in (44b) can also be treated identically, for the tonal shape of 35 is not so different from 25.

An exception to the generalization that the contracted tone comes from two edge tones of syllables to be contracted is given below.

(46)

ho	laŋ	→	hoŋ	'let people'
31	33		33	(Cheng's(64))

The hoŋ³³ in (46) is claimed to be phonetically identical with hoŋ³³ 'to scare.' However, in other cases the very combination of ho²¹ 'let' and laŋ³³ 'people' result in hoŋ¹³ (Cheng's (79)). In still other cases, the combination of 21 and 33 leads to 23 (Cheng's (75), (76)). Before more clear data are discovered, we can make the claim that generally a rising shape of tone results from combination of 21 and 33. Consequently, our proposal in tonal contraction can be retained. If this is the case, our analysis makes a significant contribution to phonological theories. For one thing, it is under revision that contour tones in Southern Min are a phonological unit (Wang 1967). For the other, we have to re-consider the suggestion made in Shih 1986 that the tones in Southern Min cannot be represented autosegmentally.

In sum, the tone for the contracted syllable in Hakka and Mandarin systematically comes from the syllable whose vowel becomes the contracted nuclei, implying the tone is associated with the vowel. The important implication revealed from tonal contraction in Southern Min is that contour tones are composed of two level tones.

5. Conclusion

This article examined the properties of syllable contraction in three Chinese dialects: Hakka, Southern Min and Mandarin. In appearance, there are different characteristics in phonology revealed in the process of

contraction in those dialects. However, further investigation implies that there are certain universal principles, which attracts little attention in the literature. Thus this article tries to find out those principles and formalize them.

After analyzing each type of contraction, we reach the conclusion that the principles governing syllable contraction are:

- (44) a. CVX template
 b. Edge-In association
 c. Medial parts: left to right association

Since our goal lies in the discovery of governing principles, we do not pay much attention to the detailed step for syllabification. For instance, it is noted in R. Cheng 1985 that the contracted syllable might be one incompatible with certain phonotactic constraints: *ka* 'with' + *in* 'they' → *kayn*. However, there is no such *Final* as *ayn* in Southern Min. How can we deal with this problem? In fact, it is not so much problematic as is indicated. One possible solution to this problem is to consider it is a nasalized *ãỹ* instead of *ayn*.³⁰

The study of syllable contraction provided in this article is just a beginning. It is expected to have more studies on this issue. Through the study, we have understood more about the nature of the Chinese languages. First of all, the parameters of the prevocalic glides are of three: part of the *Final*, part of the *Initial*, and sharing between *Initial* and *Final*. Secondly, the principles governing syllable contraction are common, as given in (46). Thirdly, there are still differences in terms of contraction among Mandarin, Southern Min, and Hakka. Hakka gets a template transfer, while the other two dialects erase all the information of syllabification in the process of contraction. Finally, the study here is a

30. For this, I have asked some informants for help. Their pronunciation shows my analysis is quite right. However, Paul Li strongly insists on it being *ayn*. If this is the case, the last *n* can be regarded as extrasyllabic segment, which is further licenced the rime.

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good argument for the theory of Edge-in Association developed in Yip 1988.

Once again, the essence of this article is to find out the principles governing syllable contraction. Thus I do not explore on what condition should contraction occur. However, this is an interesting topic worth further exploring.

References

- Ao, Benjamin X.P. 1992. Non-Uniqueness Condition and Segmentation of the Chinese Syllable. NACCL4. University of Michigan. May 8-10.
- Bao, Zhiming. 1992. The Syllable in Chinese: a handout. NACCL4. University of Michigan. May 8-10.
- Chao, Yuen-ren. 1931. "Fan-qie Yu Ba Zhong" ("Eight Varieties of Secret Language Based on the Principle of Fan-qie"), *Bulletin of the Institute of History and Philology*, Academia Sinica II. 320-354.
- Chao, Yuen-ren. 1959. *The Language Problems "Yu-yen Wunti"*. Taipei: Shangwu.
- Cheng, Chin-chuan. 1973. *A Synchronic Phonology of Mandarin*, Hague: The Moutan.
- Cheng, Robert. 1985, "Sub-syllabic Morphemes in Taiwanese", *Journal of Chinese Linguistics*, PP. 12-43.
- Cheng, Robert. 1992. Lexicon and lexical grammar: Implications from Taiwanese pronouns. *Proceedings of the Third International Symposium on Chinese Languages and Linguistics*. 162-188.
- Chung, Raung-fu. 1989a. *Aspects of Hakka Phonology*. Unpublished doctoral dissertation, University of Illinois.
- Chung, Raung-fu. 1989b. On the Representation of Kejia Diphthongs. *Studies in the Linguistic Sciences* 19-1, 63-82.
- Chung, Raung-fu. 1990a. On the Position of the Hakka [v] (in Chinese). *Shengyun Lungchung III (Essays on Chinese Phonology)*. PP. 435-456. Taipei: The Student Book Store.
- Chung, Raung-fu. 1990b. Phonological Knowledge in English Teaching. *Papers from the 7th Conference on English Teaching and Learning in the R. O. C.* PP. 313-326. Taipei: The Crane Publishing Co. Ltd.
- Chung, Raung-fu. 1991a. On Hakka Syllabification. Paper presented at the 3rd North American Conference on Chinese Linguistics. Cornell

University. May 3-5.

Chung, Raung-fu. 1991b. *Contemporary Phonological Theories and Chinese Phonology* (in Chinese). A report of the NSC studies.

Chung, Raung-fu. 1992. The Labial Constraint in Southern Min (in Chinese). Paper presented at the 10th Conference on Chinese Phonology, Sun Yat-shan University, May 12-14.

Chung, Raung-fu. 1996. *The Segmental Phonology of Southern Min in Taiwan*. The Crane Publishing Co. Ltd.

Clements, G. N and J. Keyser. 1983. *CV Phonology*. Cambridge: The MIT Press.

Duanmu, San. 1990. *A Formal Study of Syllable, Tone, Stress and Domain in Chinese Languages*. Unpublished dissertation. MIT.

Duanmu, San. 1994a. Against contour tone unit. *Linguistic Inquiry*, 25: 4, 555-608.

Duanmu, San. 1994b. Syllabic weight and syllabic duration: a correlation between phonology and phonetics. *Phonology* 11: 1-24.

Goldsmith, John. 1976. *Autosegmental Phonology*. Doctoral Dissertation, MIT.

Goldsmith, John. 1990. *Autosegmental and Metrical Phonology*. Cambridge: Basil Blackwell.

Halle, Morris and Jean-Roger Vergnaud. 1980. Three Dimensional Phonology. *Journal of Linguistic Research* 1, 83-105.

Hashimoto, M.J. 1973, *The Hakka dialect*, Cambridge: The Princeton University Press.

Hsueh, F.S. 1980, "The Phonemic Structure of Pekingese Finals and Their R-suffixation," *Bulletin of History and Philology*, Taipei: Academia Sinica.

Hsueh, F. S. 1985. *The Anatomy of Beijing Mandarin* (in Chinese). Taipei: The Student Book Store.

Hsiau, Chi. 1986. A preliminary observation on Mandarin contraction. *The World of Chinese Language*, April, PP. 46-50.

Kenstowicz, Michael. 1994. *Phonology in Generative Grammar*. Cambridge: Blackwell.

- Kiparsky, Paul. 1982. Lexical Morphology and Phonology. In I-S. Yang (ed.) *Linguistics in the Morning Calm*. Seoul: Hanshin.
- Kiparsky, Paul. 1985. Some consequences of Lexical *Phonology*. *Phonology yearbook* 2.
- Li, J.K. Paul. 1985, "A Secret Language of Taiwanese," *Journal of Chinese Linguistics*, PP. 91-121
- Lin, Y. H. 1989. *Autosegmental Treatment of Segmental Processes of Chinese Phonology*. Unpublished doctoral dissertation, University of Texas at Austin.
- Lin, Li-chin. to appear. *Labial Constraints in Chinese*. M.A. thesis. National Kaohsiung Normal University.
- Luo, Hsiang-lin. 1933, *An Introduction to the Study of the Hakka in its Ethnic, Historical, and Cultural Aspects*, Revised, 1981, Taipei: Shong Wen Book Corp.
- McCarthy, John. 1981. A Prosodic theory of nonconcatenative morphology. *Linguistic Inquiry* 12. 373-418.
- Shih, Chi-lin. 1986. *The Prosodic Domain of Tone Sandhi in Chinese*. Doctoral dissertation, UCSD.
- Tung, Tong-ho. 1965. *Chinese Phonology*. Reprinted 1979. Taipei: Wen Shi-che Publishing.
- Wang, S-Y. William. 1967. Phonological features of tone. *International Journal of American Linguistics* 33.2, 93-105.
- Yip, Moira. 1982. "Reduplication and Skeleton in Chinese Secret Language," *Linguistic Inquiry*, Vol.13. PP 637--661.
- Yip, Moira. 1988. "Template Morphology and the Directionality of Association." *Natural language and Linguistic Theory*, 6:4)
- Yang, Paul. 1967. "The Elements of Hakka Dialectology" *Mounmenta Sinica Journal of Oriental Studies*. Vol. XXVI.
- Yu, Shou-min. 1984. *The Mao-li Hakka Phonology*, Fujen University M.A. Thesis, Taipei, Taiwan.

Right-Dislocation or Right Location?

The "Afterthought" Phenomenon in Mandarin Chinese and Markers of Speakers' Intentions¹

Jiansheng Guo²

University of California, Berkeley

Abstract

This study explores the grammatical status and the interpersonal functions of the "afterthought" phenomenon or right-dislocation in Mandarin Chinese, based on data collected from speech of 7-year-old Mandarin-speaking children in natural interactions. Data show that a wide variety of grammatical categories and structures can be right-dislocated to the end of the utterance. The right-dislocated forms have a wider scope than the sentence final particles and receive a unique prosodic contour. Evidence shows that right-dislocated forms are not afterthoughts, but the speaker's metalinguistic comments on the main assertion, which I call speech act operators. The utterance final slot they occupy has been grammaticalized for this special metalinguistic function.

1. The data used for this study were originally collected for a research project on the children's use of modals. International travel for data collection was generously supported by the Institute of East Asian Studies, University of California, Berkeley. Purchase of tapes was funded by a graduate student research grant by the Institute of Human Development, University of California, Berkeley. Computer and copying privileges were provided by the Institute of Cognitive Studies, University of California, Berkeley. The research was supported by the Chancellor's Dissertation Year Fellowship, University of California, Berkeley, NSF grant No. NSF-BNS-8919569, and Ma Hsiang Fang Research Fellowship. Travel for presentation of the paper was kindly funded by The Institute of East Asian Studies, University of California, Berkeley.
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I. Introduction

This paper attempts to explore the grammatical status and the interactional-discourse functions of the long-noted and discussed right-dislocation phenomenon typically found in spoken Mandarin Chinese. A typical example of right-dislocation in Mandarin is shown in (1),

- (1) *bié xiāshuō le, nǐ.*
don't talk-nonsense PART³ you
"Don't talk nonsense, you."

In (1), the word *you* is the logical subject of the sentence and it makes a perfectly grammatical sentence if it is placed to the preverbal position without any change of the sentence meaning, as in (2),

- (2) *nǐ bié xiāshuō le.*
you don't talk-nonsense PART
"Don't talk nonsense".

Chao (1968) first briefly talked about this phenomenon and referred to it as **afterthought**. He defined it as follows, "If an unplanned part is added to a sentence which has already been completed, then it is an afterthought form." Chao claimed that afterthought forms are a characteristic feature of unplanned speech since people do not have enough time to plan their thoughts and speech, and they are thus often in need of adding some desired information that should have been said earlier. Thus, afterthought forms are basically regarded as a form of repair for omission errors made in the prior speech flow under time and psychological pressures.

3. PART= Sentence Final Particles; PEFT= Perfect Marker; POSS= Possessive Marker; REL= Relative Clause Marker; QU= Question Marker.

Afterthought forms are also found in other languages. For example, Hyman (1975) discussed the afterthought phenomenon in German and Niger-Congo, and argued that afterthought forms might be a source of word order change. An underlying assumption made by both authors is that the right-dislocated portion of an utterance is the result of the speaker's effort to repair a speech error or to reorganize the utterance that has already been made.⁴

Packard (1986) gives by far the most detailed structural analysis of afterthought forms. He argues that the afterthought portion is highly structured with respect to the portion to its left, and the two portions together form an complete underlying structure of a sentence. Therefore, the afterthought portion is not a random idea that the speaker wishes to add on, but rather an integrated part of the underlying sentence structure. He also argues that the afterthought portion is not part of the structure that has been moved to the end of the sentence, but rather the afterthought portion is the remaining part of the sentence structure after some portion of the structure has been moved to the beginning (thus left) of the sentence to receive focus prominence. Thus, he claims that the process that produces sentences with "afterthoughts" is left-dislocation, not right-dislocation. And the "afterthought sentences" are not repairs of speech errors, but a syntactic means to serve the pragmatic purpose of information focusing.

Tai and Hu (1991) identified three discourse motivations for utterances containing afterthought forms (*inverted sentences* in their terminology): thematization, repair, and afterthought appendage. Like Chao, they claim that this phenomenon is very typical and pervasive in spoken Mandarin.

Bourgerie (1991) makes a very interesting proposal with examples of

4. At least this is so at the beginning stage of this phenomenon in historical change. Hyman argues that frequent occurrence of the dislocated NP makes the new word order acceptable and conventional, leading to a word order change, in which case it is no longer an afterthought. Packard & Shi (1986) also made a similar suggestion that the afterthought forms might indicate the beginning of a word order change in Mandarin from SVO to SOV.

right-dislocated (he uses the term *postposed*) modal words in Mandarin and Cantonese. He suggests that, by relating the right-dislocated modal words to the Chinese sentence final particles, which are also regarded as expressing a certain kind of modality, the postposition of modal words might indicate that the sentence final slot in Chinese is being grammaticalized for expressing modality.

In what follows, I will argue, through detailed illustration of data from interactional discourse, that all the above accounts contain insights about the phenomenon of afterthought forms, but none of them can satisfactorily explain all the categories of the afterthought utterances found in my data. I will suggest that the afterthought phenomenon cannot be satisfactorily explained if we examine utterances from the viewpoint that only focuses on the relation between the speaker and the utterance. A satisfactory explanation of the afterthought phenomenon found in Mandarin lies in considering utterances from the viewpoint of interpersonal interactions. That is, when the speaker makes an utterance, he or she is not merely passing on some information, but equally important, he or she is performing a social act. Adopting Schifffrin's (1986) framework that regards meanings of utterances as multi-layered and multi-functional, I will argue that data found in interactional discourse indicate that the so-called afterthought phenomenon functions at the interpersonal level of speech as a speech act operator, directing the addressee's interpretation of the propositional content of the assertion. The high frequency of occurrence of afterthought forms in interactive Mandarin speech indicates that the utterance final position is being grammaticalized for expressing the speaker's intentions in performing a verbal action. Then I will hypothesize that this trend in Mandarin might be due to the typological feature of Mandarin that sentence final particles are widely used to express interactional-discourse meanings, such as speech acts, the speaker's evaluation of the information content, the speaker's affect, and so on.

II. Data

The data I will be using in my discussion come from the speech of 7-year-old Mandarin-speaking children in semi-natural interactions. The data were collected in a full-time elementary school attached to a university in Beijing, China, for a study of the children's use of modal auxiliaries. Subjects are three 7-year-old Mandarin-speaking children from that school, one girl and two boys. The three children were invited to a separate room in the school and instructed to play together with the toys provided by the experimenter. The children were engaged in four different activities: Lego construction, doll play, playdough, and puzzle solving. Each session lasted about one hour. The data consist of five hours of video-recording. The recording was transcribed and all utterances containing the so-called afterthought forms have been identified for analysis. A total of 250 utterances made by children containing afterthought forms have been identified from the 5-hour recording. The three children made about 6,400 utterances during the 5-hour recording. Among those utterances, about one third are short utterances such as exclamation expressions, single noun-phrase or verb-phrase utterances, which do not lend themselves to containing afterthought forms. Thus, among the approximately 4,300 utterances that permit afterthought forms, 6% actually contain afterthought forms. Although this figure is lower than the 20% estimate made by Packard and Shi (1986) based on adult speech, it represents a significantly high frequency for a particular grammatical construction. This provides further evidence that the phenomenon should not be trivialized as mere repairs to speech errors. Detailed descriptions of the data will be presented in the next section.

III. Structural Categorization

Among the 250 utterances containing afterthought forms, 8 categories have been identified according to the structural function of the after-

thought forms in the underlying structure of the utterance, 1) dislocated Noun Phrases (NPs) referring to agents, patients, place, time, etc., 2) repeated NPs referring to agents or sentence subjects, 3) explicit speech act markers, 4) implicit speech act markers, 5) vocatives, 6) adverbs and modals, 7) complex structures, and 8) quasi-left-dislocations. Table 1 gives the breakdown of the frequencies of these categories.

<p>Table 1 Breakdown of Frequencies of Right-dislocated Forms by Structural Categories</p>								
Cat.	Dislocated NPs	Repeated NPs	Explicit S.A. Markers	Implicit S.A. Markers	Vocatives	Adverbs & Modals	Complex Structures	Quasi L.D.s
N	53	36	38	24	41	30	5	10

In what follows, I'll describe the forms and the functions of each category.

1. Dislocated NPs

This category represents the classic afterthought phenomenon found in several languages. The right-dislocated components are predominantly noun phrases which may function as the surface subject of the main utterance,⁵ as shown in (3a) and (3b).

- (3a) *cǎi wǒ jiǎo le, nǐ.*
 step my foot PEFT. you
 "Stepped on my foot, you."

5. The definition of subject in Mandarin is problematic and controversial. Here I follow the pre-theoretical definition of subject as discussed in Chao (1968). Li & Thompson's (1981) definition of subject as the noun phrase with a doing or being relation with the verb is too exclusive for the current analysis. For example, the noun phrase *wǒ zhèige* in (4b) will be regarded as topic rather than subject by their definition. However, whether it is treated as the subject or the topic of the sentence does not affect the analysis for this study, since the word order in (4b) is the unmarked one, and the one in (3b) is marked.

- (3b) *tè nán zhǎo, wǒ zhèige*
very difficult find my this
"Very difficult to find, this (thing) of mine."

As shown in (3a) and (3b), the right-dislocated forms could be placed in the preverbal position and form a perfectly grammatical and complete sentence, as show in (4a) and (4b),

- (4a) *nǐ cǎi wǒ jiǎo le,*
you step my foot PART.
"You stepped on my foot."
(4b) *wǒ zhèige tè nán zhǎo,*
my this very difficult find
"This (thing) of mine is very difficult to find."

At first blush, utterances in this category seem to be cases where the speaker forgets to mention the subjects, and realizing this negligence at the end of the utterance, the speaker adds the missing noun phrase, resulting in the right-dislocated afterthought form. However, in addition to the frequent occurrence argument (Packard & Shi, 1986; Bourgerie, 1991), there is a crucial piece of evidence against the claim that these right-dislocated forms are afterthoughts. The right-dislocated forms in this category are all subjects of the underlying sentence structure. Therefore, by definition, they are the topic of the utterance (Li & Thompson, 1976; Givon, 1976; Chafe, 1976), which represent given or known information. Chafe (1976, p. 30) suggests that "given (or old) information is that knowledge which the speaker assumes to be in the consciousness of the addressee at the time of the utterance." Looking at the utterances included in this category, the so-called afterthought noun phrases all refer to physical objects or human participants that have been the focus of the interaction or discourse. For example, in (5),

(5) C3: (holding a naked doll)

zhèi hái'zi zhěngge guāng pì'ǔ.

"This child is completely naked."

C2: *zěnmē bàn? guāng pì'ǔ le, zhèige.*

how do naked bottom PEFT this.

"What (shall we) do? Now naked, this (child)."

From (5), it is obvious that the doll is the focus of the child activity for both Child 3 and Child 2. It is also the focus of attention in the immediate discursive context since Child 3 just mentioned it in the previous turn. It is also evident that the speaker, Child 2, treats the doll as the given information since he used the pronoun *zhèige* (this) instead of the full noun phrase as used by Child 3. Since the doll has been the focus of attention in both the immediate activity and discourse, it is very unlikely that the speaker forgets to mention it in the utterance. Rather, it would be reasonable to assume that the speaker takes it as so obvious that it is unnecessary to mention it explicitly in the utterance. Chafe (1976) claims that given information would almost always be pronominalized with low and weak stresses. This tendency of form reduction for given information has further consequences in languages such as Mandarin, which does not grammatically require a sentence subject. Li & Thompson (1981, p. 658) refer to those noun phrases which are understood from the context and therefore do not come to the surface as *zero pronouns*. Therefore, the unsurfaced noun phrase in C2's utterance in (5) is not an example of forgotten NPs, but rather an example of understood NPs, or *zero pronouns*. Among the examples in this category, 42 (79%) of the right-dislocated subjects either refer to the addressee in imperative sentences or in questions obviously directed to the addressee (e.g. *shuō shénme ne, nǐ?* "What (are you) say(ing)?"), or refer to the physical objects that the interlocutors are playing with, thus being the focus of mutual attention. Therefore, the empirical data support the hypothesis that the so-called afterthought forms represent known and understood information, not components that have been forgotten because they were peripheral in

memory.

The remaining 11 (21%) cases are of special interest in the discussion of information status of the subjects. In these 11 cases, the right-dislocated components do not correspond to the *zero pronoun* in the main part of the sentence, but to the realized pronoun or short phrase in the main part. The anaphoric reference of the right-dislocated component can be a pronoun, as in (6),

- (6) *zhèi shì chū jiā de, zhèige xiǎo jīqìrén.*
 this is out home REL this little robot
 "This is a monk, this little robot."

or it can be a locative phrase, as in (7),

- (7) *zhèi lǐ zhuāng zhe liǎngge guǒguo, shūbāo lǐ.*
 this inside contain PART two fruit bag inside
 "Here there are two fruit, in the bag."
 (In Mandarin, *fruit* is countable.)

or it can be a temporal phrase, as in (8),

- (8) *děng huǐr jiù nòng chū lái le, chā de shíhòu.*
 wait moment then make out come PEFT stick-in REL time
 "In a little while (it will be) made to come out, when (we) stick (it) in."

From (6)-(8), we notice that the right-dislocated forms are further elaborations of their anaphoric referents in the main part of the utterance. What is noteworthy among these 11 cases is that whether they are pronouns, locative phrases, or temporal phrase, they are all treated by the speaker as the subject or topic since they are put at the sentence initial position.⁶ But the difference between these cases and the forms co-

6. Complication in the identity of subjects from topics and the indeterminacy between the two concepts in Mandarin grammar is discussed in Li & Thompson, 1976.

responding to *zero pronouns* in the main part of the utterance is that the right-dislocated forms in these 11 cases primarily refer to third-person objects or people. In cases where the forms refer to physical objects, they are usually being played by the speaker him- or herself previously, and have not been the joint attention of both participants. This is both good news and bad news for my claim. The good news is that it confirms that the child speakers do follow the information hierarchy of givenness by using *zero pronouns* for components that have been the focus of joint attention, and use explicit proforms for components that are not. It is also good news in that the cases where the afterthought forms correspond to proforms in the main part show that the speaker has not neglected or forgotten the relevant part of the utterance, and thus they are not afterthoughts after all in the restricted sense. The bad news is that in a sense those cases may indicate that the right-dislocated forms are a kind of afterthought indicating that the speakers changed their mind and decided to elaborate on the pronominalized component made in the earlier part of the utterance. Later in the discussion, I will argue that they are indeed further elaborations of the pronominalized forms. But they are not a result of accidental afterthoughts, but a special and established grammatical device that helps to guide the addressee in his or her interpretation. Also in later discussions, I will describe examples where the afterthought forms repeat the previous phrases in the utterance and thus do not have the function of elaborating the earlier proforms. Then I will argue that putting all the evidence together, we can be confident that the right-dislocated forms are not afterthoughts resulting from processing constraints in the ongoing discourse.

Before we end our discussion about this category of right-dislocated forms, we need to answer one more question. If we take the unsurfaced subject noun phrase in (5) as an instance of *zero pronoun* recoverable from context, why should the speaker mention it at all in the right-dislocated position? Isn't that evidence showing that the speaker didn't treat the subject as known information at all? Or is it possible that the speaker first thought that the noun phrase is understood from context,

but then changed his or her mind at the end of the utterance?

Before we embark on other categories which argue against afterthought as viable account for the right-dislocated components, we can give one piece of evidence to show that an alternative account should be considered. If the right-dislocated forms are in fact afterthoughts, they should receive stresses at least equal to that received by the main part of the utterance, so that the addressee will notice that the missing part is added at the dislocated position. However, all the right-dislocated forms receive very weak stresses, their pitch is low, and the speed is faster than the main part of the utterance. They are all in a rapid, weak and low sound pattern. Lu (1980) also reports that adult Mandarin speakers describe the prosodic features of utterances with afterthought forms as "consisting of two contrasting prosodic segments, the main part is like high plateau and the right-dislocated part is like low land." The rapid and weak prosodic feature of the right-dislocated forms presents some problem for the afterthought explanation.

I proposed that the right-dislocated forms are not afterthoughts at all, but rather a grammatical device that falls somewhere between nondislocated full NPs and zero pronouns on the continuum from most explicit mention to zero mention. The dislocation and the reduced stress and time span of the form indicate that it is a further reduction of the form expressing known information. But it is more explicit than zero pronouns, which makes no explicit mention of the referent and leaves the addressee to contexts and inferences for interpretation. Although the right-dislocated forms are reduced proforms, this form reduction is a syntactic and prosodic one, not a morphological one. That is, the form is reduced by being put to the end of the utterance with reduced prosody, but it still keeps the original morphological form.

2. Repeated NPs

Utterances in this category contain right-dislocated forms that reduplicate the exact forms of their anaphoric referents, as shown in (9),

- (9) *shūshu, zhèi jiǎndāo zěnmē liǎng bàn le, zhèi jiǎndāo?*
uncle, this scissors how-come two half PEFT this scissors
"Uncle, how come that this pair of scissors are in two pieces, this pair of scissors?"

Utterances in this category provide convincing evidence that the right-dislocated forms are not afterthoughts at all, since they neither represent the zero pronoun in the main part of the utterance, nor function as an elaboration of an previous noun phrase. They contribute nothing more informatively than the phrase that they reduplicate. Then what are these right-dislocated forms there for? Before we answer that question, let us examine what components in the main utterance are reduplicated at the right-dislocated position.

In all the utterances in this category, the components that are reduplicated at the right-dislocated position are sentence subjects or topics, despite their thematic role in the semantic structure, ranging from the agent as in (10), patient as in (11), and entities that are being identified or described as in (12),

- (10) *nǐ kuài lái ya, nǐ.*
you quick come PART you
"You come (here) quickly, you."
- (11) *zěnmē bàn yuán de nàge gěi nǐ le, nàge bàn yuán de.*
how-come half round REL that give you PEFT that half round REL
"How come that semicircular one has been given to you, that semicircular one?"
- (12) *zhèi shì shénme ya, zhèige?*
this is what QU this
"What's this, this one?"

Utterances in this category involve several types of speech act func-

tions such as questions (both real and rhetorical), requests, threatening reprimands, constitutive fantasy situation descriptions, and descriptive statements of the current situation. But the majority of these utterances are those that invoke active personal interaction, such as questions, requests, and so on. Table 2 gives the frequency breakdown of the different speech act functions.

Table 2 Breakdown of Speech Act Functions of the Repeated NP Category						
Category	Questions	Rhetorical Questions	Requests	Reprimands	Constitutive Descriptions	Statements
Frequency	15	5	5	3	3	2

All the categories listed in Table 2 except that of Statement are highly interactive in the sense that they require active reaction from the addressee in accordance with what is intended by the speaker by making the utterance in question. For example, questions require the addressee to give an answer, rhetorical questions are generally used to make a disagreement or give reprimand, requests and reprimands require the addressee to respond behaviorally, and constitutive descriptions requires the addressee's consent of the fantasized play situation.

If we look at the components in the right-dislocated positions in this category, we notice that they are either second-person subject *you* referring to the addressee, or third-person subjects referring to objects the children are playing with. The right-dislocated second person subjects typically appear in requests, reprimands, and rhetorical questions, and the right-dislocated third-person subjects typically appear in questions. Since subjects in Mandarin are the default topics where the speaker intends to draw the addressee's attention, I believe that the components that are reduplicated at the right-dislocated position in this category function as an attention pointer. It makes sense that, in a requestive utterance, the addressee, who is the requestee, is the natural focus of attention. And in questions, the concerned objects in the play are naturally the focus of attention.

Then why do the subjects need to be reduplicated to serve the function? Isn't it the case that putting these NPs in the subject position to make it a sentence topic has already done the work of attention assignment? I propose that the sentence subjects and right-dislocated forms serve two different functions at two levels of communication. Sentence subjects function primarily at the propositional level and their distribution is regulated by the information flow. Thus Chafe's (1976) hierarchy of markedness as determined by the degree of givenness of information determines what gets assigned as subjects and how explicitly marked they should be, either by full phrases, proforms, or zero forms. In contrast, the right-dislocated forms function as an attention pointer at the level of interpersonal interaction, guiding the addressee's interpretation of the utterance. Schiffrin (1986) identified three levels of organization in communication that may be realized in an utterance: the representational level, or the propositional level, the actional level, and the exchange level. She also identified the level of participation framework which regulates the relation between the speaker and hearer and between the speaker and message. What the action level, the exchange level, and the participation framework point to are the different factors involved in communication that regulate the relations between the interactants, the speaker and the addressee. It is not concerned about organizing ideas, but about organizing the relationships between the interactants in relation to the utterance. The right-dislocated forms, then, are in a sense discourse markers, directing the addressee how to handle, i.e., interpret, the utterance. In this framework of analysis, the speaker sends out a propositional message to the addressee through the main part of the utterance, and at the same time sends out a discourse message helping the addressee with the interpretation of the message. In the following description of other categories of the right-dislocated forms, I will argue that the sentence final position indeed has become the specialized place for encoding interpersonal discourse messages.

3. Explicit Speech Act Markers

From utterances in this category, we can see clearly that the right-dislocated forms serve interpersonal functions at the level of speaker-hearer exchange. Typical examples of this category are given in (13) and (14),

- (13) *nǐ yīnggāi lǎo diǎnr, wǒ gēn nǐ shuō.*

you should old little I to you say

"You should be older, I tell you."

- (14) *zhèi shì shénme ya, nǐ kàn.*

this is what QU, you look.

"What's this, look."

In (13), the right-dislocated form "I tell you" is an explicit statement of what the speaker is DOING by making the main part of the utterance. In other words, it explicitly states the speech act the speaker performs by way of making the utterance in Searle's sense (1969). In the same spirit, the right-dislocated "you look" in (14) also indicates the speech act of the main part of the utterance "What's this?" This example is of special interest since the right-dislocated form in a sense conflicts with the sentence final particle *ya*. The question marker *ya* in the main part of the utterance formally marks the utterance as a question. But the right-dislocated form marks the utterance as a way of telling the addressee to look, if we do accept the claim that the right-dislocated forms are markers of the speaker's intentions. Then how do we reconcile the conflict between the two speech act markers? The answer lies in the distinction between direct speech acts and indirect speech acts (Searle, 1975).⁷ According to the indirect speech act theory, when the speaker

7. I adopt the indirect speech act theory here only for the purpose of illustration of the phenomenon, with no intention to commit myself to the explanations made by the speech act theory to account for the phenomenon. For detailed discussion of this phenomenon and alternative explanations, see Levinson (1983).

makes the utterance "*Can you pass me the salt?*" at the dinner table, the speaker is making a direct speech act of asking a question, but at the same time, he or she is making an indirect speech act of making a request. The indirect speech act of request is the main intention of the speaker and therefore the primary speech act, while the direct speech act of question is only a means to accomplish that goal. I would like to claim that the right-dislocated forms mark the primary speech act intended by the speaker, equivalent to the indirect speech act described above. And indeed, from the interactional context, we can tell that the child speaker is not mainly interested in getting an answer from the addressee, but rather in drawing the addressee's attention so that he will look. The right-dislocated forms in this category include phrases listed in Table 3.

<p>Table 3 Right-dislocated forms as Explicit Speech Act Markers</p>	
<i>wǒ shuō</i>	"I say."
<i>wǒ gēn nǐ shuō</i>	"I tell you."
<i>wǒ wèn nǐ</i>	"I ask you."
<i>nǐ shuō</i>	"you say."
<i>nǐ kàn</i>	"you look."
<i>nǐ jiào</i>	"you look."
<i>nǐ gěi wǒ shuō shuō</i>	"you tell me."
<i>nǐ bié wàng le</i>	"you don't forget"

4. Implicit Speech Act Markers

Related to the explicit speech act markers category is the category of implicit speech act markers. In this category, the right-dislocated forms do not state the speech act in a direct way, like "I tell you." Rather, they are utterances that are conventionally associated with certain speech acts when uttered by themselves. Examples are given in (15) and (16),

- (15) *xiàcì zánmen gāncuì wánr shuǐ dé le, zěnmé yàng.*

Let us simply play with water next time, how about that?

"Let us simply play with water next time, OK?"

(16) *tánglǎoyā de wěiba zuì hǎo wánr, duì ba?*

Donald Duck POSS tail most good play right QU

"Donald Duck's tail is the most interesting to play with, isn't it right?"

In (15), the utterance-final phrase *zěnmeyàng* marks checking questions where the speaker makes a suggestion and does not know whether the addressee is likely to agree or not. In (16), the utterance-final phrase *duìba* marks confirmation questions with the speaker's expectation of agreement on the part of the addressee. These phrases do not explicitly state the intended speech act of the main part of the utterance, as does the explicit speech act category. They are conventional markers of speech acts. Thus we categorized them as implicit speech act markers. In fact, they are not as implicit as the name of the category suggests. The utterance final phrases have very similar functions as the sentence final particles in Mandarin, except that they are lexical phrases while the sentence final particles are grammaticalized markers. Table 4 lists all the recorded utterance final markers found in the corpus.

<p>Table 4 Utterance-final Phrases as Implicit Speech Act Markers</p>	
<i>zěnmeyàng</i>	"How about that?"
<i>hǎo ma</i>	"Is it OK?"
<i>zěnmeyàng</i>	"What shall we do?"
<i>duìba</i>	"Isn't it right?"
<i>duìma</i>	"Is it right?"
<i>zěnmeyàng</i>	"How come?"
<i>Shìba</i>	"Isn't it?"
<i>zhīdao ma</i>	"Do you know?"

From the phrases listed in Table 4 and the example utterances in (15) and (16), one may argue that the sentence final phrases in this category are not right-dislocated forms at all, since those phrases are located exactly where they belong. There are two points in response to this argument.

First of all, although most of the utterance final phrases in this cate-

gory are not due to the right-dislocation transformation, there is one phrase that is a form of right-dislocation, namely *zěnmē*. That phrase is found in the utterance shown in (17).

- (17) *en? tā bú huì chū qù wánr, zěnmē?*

mm? it not know-how out go play how-come?

"Mm? How come that it doesn't know how to go out to play?"

The normal question form should be like the utterance in (18), where the question word *zěnmē* should be placed immediately after the sentence subject *tā*.

- (18) *en? tā zěnmē bú huì chū qù wánr?*

mm? it how-come not know-how out go play?

"Mm? How come that it doesn't know how to go out to play?"

Second, the reason I have considered utterances in this category to be similar to other utterances containing right-dislocated forms is that I would like to argue that those forms are not results of afterthoughts. Utterances in this category give us strong evidence that the utterance final position in Mandarin is the grammatical slot for indicating speakers' intentions. Thus, whether the forms are a result of a right-dislocation process or whether the forms actually belong to the utterance final position is not the issue. What is at issue is the function they serve in human communication.

5. Vocatives

The fifth category includes utterances containing right-dislocated forms that are vocatives. Normally, vocatives are used primarily as attention getters before the speaker makes the main utterance. But in utterances in this category, the vocatives are put at the end of the utterance instead of the beginning of the utterance. Thus, they have more or less lost their function of securing the addressee's attention. An example is given in (19),

(19) *wǒ qù mǎi fàn qù, bàbà.*

I go buy meal go dad.

"I'm going to buy the dinner, Dad."

The phenomenon of right-dislocated vocatives is not uncommon in English either, as shown in (20),

(20) This is mine, Dad.

Both the Mandarin and English examples indicate that the vocatives no longer serve the communicative function of securing the addressee's attention for the utterance, since the speaker has already finished the main utterance by the time the vocative is produced. And it is not the case that the speaker realized that they misjudged the addressee's attention focus, since they did not repeat the main utterance after producing the vocative. However, the vocative is a form that directly addresses the addressee. I propose that the right-dislocated vocatives are used to explicitly state that the main utterance is addressed to the addressee, who is the referent of the vocative. Its function may be glossed as *I'm making the main utterance to you*. Thus, its function is very similar to that of the explicit speech act markers category except that the vocatives focus on the addressee rather than the speech act.

6. Right-dislocated Adverbs and Modals

The right-dislocated constituents are not restricted to noun phrases or verb phrases. Subcomponents of verb phrases such as modal auxiliaries, adverbs modifying the verb or the whole sentence, sentential adverbial phrases, and affective expressions can also be right-dislocated at the utterance final position. This set of rich varieties of constituents are categorized into one group because they have one thing in common, namely, they all express the speaker's attitude, judgment, evaluation, and affective stance either to the proposition or to the addressee, or both. Examples are given in (21)-(26).

(21) **modals**

wǒ dāng yīcì hàizi le, gāi.

I play once child PART should

"It should be my turn to play the child role."

(22) **adverbs modifying verbs**

tā chī wán fàn le, yǐjīng.

He eat finish meal PART already

"He already finished his meal."

(23) **adverbs modifying sentences**

nǐ jiù shìhé dāng bàbà, qíshí.

Youjust suit play daddy actually

"You are just suitable to play the daddy role, 'actually.'"

(24) **sentential adverbials**

nā wǒ zěnmé lǎo zhǎo bù zháo a, zhǎo bàntiān?

Then I how-come always search not found PART search half-day

"Then how come that I couldn't find (it), (after) having looked for (it) for so long?"

(25) **affective expressions**

shì chā zhèr de, bèndàn.

is insert here REL fool

"(It) is the one to be put here, you fool."

(26) **combination of constituents**

nǐ wánr bù wánr ya, nǐ hái?

you play not play PART you still

"Do you still want to play or not?"

(Note: Sentence subject (*nǐ*) and adverb (*hái*) are right-dislocated together)

From this category, we can see that not only components immediately under the level of sentence can be shifted to the sentence final position, but also a variety of components can be placed at the sentence final po-

sition, including the head of the verb phrase such as modals, modifiers of the verb phrase such as adverbs, and the more independent constituents like sentential modifiers. What is even more interesting is the fact that the components that are not under one superordinate node can also be shifted to the sentence final position, as shown in (26). According to the standard structural analysis, the adverb *hái* should be under the verb phrase constituent, while *nǐ* is the preverbal NP directly under the sentence node. By any of the existing formal linguistic theories, moving one constituent plus part of its sister constituent to a different position constitutes a violation of the theoretical assumptions they are based on. However, this is not the only example found in the corpus. And intuitively, this type of dislocation is not at all odd. This phenomenon presents serious challenges to some of the assumptions of our formal linguistic theories.

Although the right-dislocated constituents violate the formal constraints imposed by the formal theories, they do make sense communicatively. They all express the speaker's communicative stance in relation to the main proposition and the addressee. For example, in (26), the propositional content is expressed by the main utterance "*Are you going to play?*" and the communicative function of the main utterance is to question the addressee's intention for play; by doing this the speaker wants to stop the addressee's naughty behavior at the time that was interruptive to the ongoing play. The addressee was making some funny noises and doing some funny actions at the time when the utterance was made, and what is at issue is whether the earlier cooperative intention of the addressee still held at that time. Therefore, it makes sense to put "*you*" referring to the addressee and "*still*" together. Then why does the speaker put "*you still*" at the end of the utterance, rather than at the normal sentence initial position? In the next section, I will try to argue that although the right-dislocated forms have the same semantic meaning whether they are placed at the normal position or at the right-dislocated position, they serve different discursive and communicative functions. When placed at the normal position, the forms are incorporated into the

propositional content of the utterance and they are expressed by way of assertion, while when placed at the end of the utterance, they are structurally separated from the propositional content and are expressed through the channel that is specialized in expressing the speaker's attitude to the addressee. Thus, at the utterance final position, the speaker is directly addressing the addressee. This point is more clearly illustrated by the word "actually" in (23). "Actually" is the speaker's evaluation of the situation represented by the proposition, and it is put at the end of the utterance as a comment directed to the addressee about the propositional content. This point will be further elaborated later, when we discuss the theoretical significance of this phenomenon. Table 5 lists all the tokens of the right-dislocated forms in this category.

Table 5 Right-dislocated Modals and Adverbs		
Modals	<i>huì</i>	(will)
	<i>néng</i>	(can)
	<i>gāi</i>	(should)
	<i>kěnéng</i>	(possibly)
	<i>hǎoxiàng</i>	(seems)
adverbs modifying verbs	<i>yào</i>	(want/will)
	<i>zài</i>	(again)
	<i>jiù</i>	(then)
	<i>hái</i>	(still)
	<i>yǐjīng</i>	(already)
adverbs modifying sentences	<i>fǎnzhèng</i>	(anyway)
	<i>kànlái</i>	(looks)
	<i>jiǎzhuāng</i> ⁸	(pretend)
	<i>dōu</i>	(even, all)
	<i>gēnběn jiù</i>	(at all)
sentential adverbials	<i>cái</i>	(only)
	<i>zhǎo bàntiān</i>	(after looking for a long time)
affective expressions	<i>bèndàn</i>	(fool)
	<i>shāguā</i>	(idiot)
	<i>shāmàor</i>	(dummy)
	<i>mā ye</i>	(oh my mother)
	<i>nǐ hái</i>	(you still)
combination of constituents	<i>wǒ dōu</i>	(I even)
	<i>hái méi</i>	(still haven't)
	<i>rénjiā huì</i>	(they will)

8. It is arguable that *kànlái* and *jiǎzhuāng* are verbs rather than adverbs. However, although they retain obvious verbal features, they all have a complete sentence under their scope and they primarily express the speaker's subjective stance

7. Complex Structures of Right-Dislocation

In the combination of constituents illustrated in category 6, the right-dislocated forms are linearly adjacent constituents which are placed at the end of the utterance as a whole unit. However, utterances in this category consist of cases where two separate constituents are right-dislocated and put side by side. In (27),

- (27) *nà nǐ dào shuǐ lǐtōu qù, néng ma, mǐ?*

then you reach water inside go can QU you

"Then, you get into the water, can you?"

if the right-dislocated form is taken as one whole unit, then the normal word order should be "*nǐ néng ma?*" The actual order "*néng ma, nǐ?*" indicates that they are not treated as one unit, but as two separate units. This example shows that the utterance final position can accommodate more than one constituent unit. (28) and (29) give more examples of this kind.

- (28) *nǐ yào bù wánr le, shì bù shì ya, nǐ?*

you want not play PART is not is QU you

"You don't want play any more, do you?"

- (29) *zhèi shì wánjù, duì ba, dōu?*

this is toy right QU all

"These are toys, right? All of them."

with respect to the action or event expressed by the following sentence they qualify. Thus, they are more like the English sentence modifiers such as *it seems*, *obviously*, and *I think*, etc. Therefore, they are treated as adverbs modifying sentences.

8. Quasi Left-Dislocations

The last category of right-dislocated forms is called Quasi Left-dislocations because on the surface it seems that it is the noun phrase that is dislocated to the left of its normal position. An example is shown in (30).

- (30) *tài hǎo le. liùshí kuài, wǒ zhèng hǎo yǒu.*
very good PART sixty dollar I happen-to have
"Excellent. Sixty dollars, I happen to have it."

The normal word order of (30) is as in (31),

- (31) *wǒ zhèng hǎo yǒu liùshí kuài.*

In (30), it looks like that the sentence object noun phrase *liùshí kuài* (sixty dollars) is preposed to the left of the sentence. However, if the object is left-dislocated, both the dislocated noun phrase and the main part of the utterance should receive roughly equal prosodic prominence, since they are both propositional assertions. However, in the cases found in the corpus, the seemingly main part of the utterance receives a similar prosodic contour as that for right-dislocated forms in other categories. Namely, they are pronounced at a much faster tempo with a significantly lower pitch in contrast to the "left-dislocated" noun phrases. Thus, I propose that utterances like (30) are only quasi left-dislocations. What actually has happened is that the so-called main part of the utterance ("*wǒ zhèng hǎo yǒu*" in (30)) has been right-dislocated to the end of the utterance. Thus, the asserted part of the utterance is the noun phrase *liùshí kuài* (sixty dollars), while the rest of the utterance on the right is the speaker's comment on the assertion. They are a special kind of right-dislocations.

IV. Discussion

From the above illustration, we have noted that the so-called afterthought forms cover a large variety of formal and functional categories. The right-dislocated forms that were traditionally regarded as afterthoughts include NPs, VPs, modals, adverbs, vocatives, and combinations of components that include defective constituents. The complex structural properties of the right-dislocated forms make generalizations difficult and tempt us to regard them as mere afterthoughts, namely, ways to repair our memory slips. However, the high frequency of these forms makes that explanation unsatisfactory. And those right-dislocated forms that are repetitions of certain constituents in the main utterance constitute evidence for the argument that the right-dislocated forms are not necessarily repairs for errors of negligence. Then what are these forms?

Packard (1986) noticed the structural complexity of the right-dislocated forms, and argued that the so-called afterthought forms are not the result of right-dislocation at all. He noticed that the so-called "main part of the utterance" are all regular constituents that can be governed by a single superordinate structural node. Therefore, he argued that the "main part of the utterance" is the constituent that has undergone a left-dislocation transformation, and the so-called right-dislocated forms are the remaining part of the structure. He argued that the motivation for moving the constituent to the left position is for the constituent to get focus prominence. Tai and Hu (1991) made a similar claim. They argue that one of the motivations for producing afterthought forms is for the main part of the utterance to receive thematic prominence. Although they did not explicitly discuss the structural operation involved, their implicit assumption seems to be similar to that of Packard's. While I agree with the above authors on the proposal that the forms put at the utterance initial position receive prominence in focus or theme, I think the proposal of left-dislocation is problematic. First of all, in cases where the

main part of the utterance is a longer sentence and the afterthought form consists of only a single word, like the modals, pronouns, adverbs, etc., it is odd to think that the major chunk of an utterance is moved to the utterance initial position to receive prominence while leaving only one word behind. Second, for those afterthought forms that include modals or adverbs, the main part of the utterance is not a complete constituent under one structural node, since the modals and the adverbs are part of the verb phrase, and their dislocation will leave the constituent of the "left-dislocated" form defective. Thus, these cases defeat the original purpose of Packard's proposal to postulate the concept of "left-dislocation". What is even more difficult to explain away in the movement model are cases where the afterthought forms are not forms that are missing in the main part of the utterance, but merely repetitions of certain parts. In these cases, the afterthought forms cannot possibly be the remnants of the utterance after the leftward movement transformation. Another strong evidence against the leftward movement explanation is the location of the afterthought forms in relation to the sentence final particles. In mandarin, the sentence final particles are always placed at the end of the sentence and they have the scope over the whole sentence. But Lu (1980) noted that the afterthought forms can only occur after the sentence final particles. It will produce an ungrammatical sentence if the afterthought form (in bold face) is placed before the sentence final particle, as shown in (32),⁹

- (32) A: **lái le, nǐ gēge ma?*
 come PEFT your older-brother QU
 "Has your older brother come?"
 B: **zǒu le, dàgài ba.*
 go PEFT probably PART
 "(He) is probably gone."

This indicates that the afterthought forms are obligatorily placed outside

9. This example is taken from Lu (1980, p. 29).

the scope of the sentence. The leftward movement explanation does not tell us why this has to be so. This distributional constraint also argues against any explanation that the right-dislocated forms are afterthoughts, since if they were an afterthought, then there should not be such distributional constraint.

Bourgerie (1991) proposed that the afterthought forms indicate that the sentence final location in Mandarin is being grammaticalized as a specialized position for expressing modality. He made the claim on the bases that many modal expressions such as modal auxiliaries, verbs, and adverbs are dislocated at the end of the utterance and this position has always been occupied by the sentence final particles, which are regarded as expressions of modality in its broad sense. Given the massive right-dislocation of sentence constituents to the end of the utterance and the sentence final position being used as the privileged position for discourse particles, it is reasonable to be suspicious about the special function of the sentence final position in Mandarin.¹⁰ However, there are two problems with Bourgerie's proposal. First of all, the sentence final position is obviously not restricted to expressions of modality. As we have illustrated earlier, the right-dislocated forms include not only modal expressions, but also many other categories. Second, as we pointed out earlier, the sentence final position occupied by the right-dislocated forms is not the same as that occupied by the established grammatical category of sentence final particles. The right-dislocated forms have to be placed outside the scope of the sentence final particles. Therefore, the right-dislocated forms are not there merely to express modality, and they should be distinguished from the sentence final particles despite their similarities.

Then what are these right-dislocated forms? Before I make my proposal, let us list all the characteristic features typically associated with utterances containing right-dislocated forms that any reasonable explanation of the phenomenon should account for:

10. It may not be restricted to Mandarin, though; Bourgerie (1991) demonstrated that Cantonese has similar phenomena.

1. Semantic prominence of the non-right-dislocated part of the utterance. Packard (1986) claims that this part of the utterance is moved leftward to receive focus prominence. Tai and Hu (1991) claim that this portion is thematized. Lu (1980) claims that the focus of meaning is on the left part of the utterance that contains a right-dislocated form.
2. Prosodic prominence of the non-right-dislocated part of the utterance. Lu (1980) notes that the non-right-dislocated part always receives sentence stress, while the right-dislocated form never receives sentence stress and should be pronounced at a low pitch and fast tempo. This prosodic pattern has been born out consistently throughout the current corpus of data.
3. Right-dislocated forms as integrated part of the utterance. The right-dislocated forms are not add-ons to the main utterance as an afterthought. They are an integrated part of the main utterance. One of the traditional explanations of the right-dislocated forms is that when the speaker finishes the main utterance and the psychological pressure is released, he or she will have time to reflect on what has been said and make repairs for the errors made. Thus, there tends to be a short pause between the main part of the utterance and the afterthought form. However, Lu (1980) reports that his Mandarin-speaking interviewees consistently feel that there is actually no pause at all between the two part. On the contrary, since the right-dislocated part is produced at a fast tempo, the beginning of the right-dislocated form is actually more closely connected to the last word of the main utterance. The comma used in the written form is nothing but an arbitrary convention to indicate that the part after it is a right-dislocated form. The feeling of break between the two parts is due to the sharp contrast between the two parts in terms of pitch and tempo. This is exactly what I also found in the natural speech.
4. The rich variety of formal and functional categories found in the right-dislocated forms, as we illustrated in Section III.
5. Right-dislocated forms that repeat what has already been said in the

main part of the utterance.

To account for all the above various but inter-related characteristics associated with right-dislocations, I propose that right-dislocated forms are used as a way to carry the speaker's message to the addressee about his or her intentions in making the main utterance. The set of intentions may include the interpretive cues for the missing referents in the utterance, the intended speech act the speaker wants the main utterance to convey, the attitudinal or emotive tone the speaker wants to get across through the main utterance, or the speaker's attitude and evaluation of the proposition made in the main utterance. Thus, the sentence final position occupied by the right-dislocated forms functions as a specialized channel for the speaker to make metalinguistic comments about the main utterance to the addressee.

In order to make my point clear, I need to discuss briefly the functions of language and the capability and division of labor of linguistic forms in human communication. The first distinction between functions of language I would like to make is that between the **ideational** function and **interpersonal** function made by Halliday (1973). By ideational function, he meant that language is used to transmit information based on our experiential world between members of societies. For this function, language is used to represent. By interpersonal function, he meant that language is used to establish, maintain, and specify relations between members of society, including the social and speech roles of the interlocutors. Many aspects of the interpersonal function are grammatically coded in language. For example, the grammatical form of imperatives codes the speaker's intention to regulate the addressee's behavior. The interpersonal function of language is a widely known phenomenon. The expressive and vocative functions (Buhler 1934), the conative function (Jacobson 1960), the performative words (Austin, 1962), and speech acts (Searle, 1969) all point to the interpersonal function of language.

Language not only serves interpersonal functions, but also serves the metalinguistic function of making comments on itself. This metalinguistic function is not limited to the obvious cases such as giving linguistic defi-

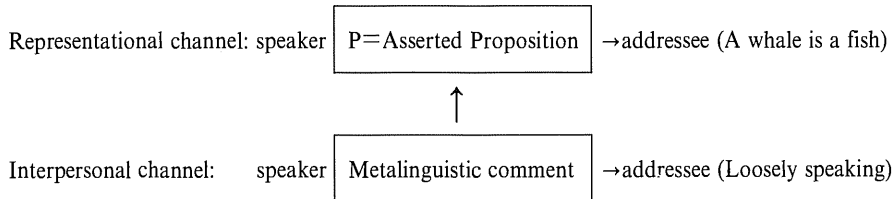
nitions where linguistic forms being commented on are just **mentioned**, such as "*A table is a piece of furniture.*"¹¹ More frequent and pervasive is the metalinguistic function to comment on linguistic forms that are being **used**. Language is very rich in linguistic forms that are specialized in the function of making metalinguistic comments about the linguistic forms being used. For example, the *style disjunctive adverbs* in English (Quirk et al., 1985), such as *frankly*, *honestly*, and *privately* are specialized in serving that function. In his study of the two English hedging adverbs *loosely speaking* and *technically*, Kay (1983) isolated two acts made by the speaker when making the utterance containing the adverbial phrase *loosely speaking*, namely "(i) an act of asserting P; and (ii) an act of warning that (i) is in some way a deviant (loose) act of assertion" (p. 132). Thus, *loosely speaking* tells the addressee the manner in which the speaker makes the assertion. From this analysis, we notice that language may incorporate the primary act of assertion and the secondary act of commenting on the act of assertion into one sentence structure.

To build on Kay's analysis, I propose that utterances like *loosely speaking P* contains two separate but related channels for two different kinds of messages between the speaker and the addressee. The propositional content of *P* is the assertion made by the speaker to the addressee, carried over through the representational (ideational) channel. At the same time, the metalinguistic comment *loosely speaking* is carried through the interpersonal channel. Since the interpersonal channel is used to convey the speaker's comments on the proposition content of the assertive act, instructing the addressee how to interpret the asserted message, it is a speech act performed on another speech act. Therefore, style disjunctive adverbs such as *loosely* or *technically* are speech act markers or operators. In other words, in the same way that normal adverbs modifies verbs, these speech act operators modify speech acts. Figure 1 schematically describes the relation between the two channels and their relation to the interlocutors in making the utterance "Loosely speaking, a

11. For discussions on the distinction between linguistic forms being **used** and those being **mentioned**, see Suppes, 1957, and Searle, 1969.

whale is a fish".

Figure 1. Two Channels of Communication



Speech act modifiers have been found in several different linguistic domains. Horn (1978) discussed the metalinguistic uses of negation; Dancygier (1992) discussed the use of conditionals such as *if* as conditional modifiers of speech acts; and Sweetser (1990) discussed the speech act use of modal auxiliaries. In a developmental study, Kyratzis et al. (1990) found that children develop speech act uses of causal connectives earlier than the content uses, indicating that the speech act uses of causal connectives are in fact more basic and essential to the child as a language learner.

In the same spirit, I would like to suggest that the right-dislocated forms found in Mandarin are also a kind of modifier functioning at the speech act level. They convey the speaker's comments about the major assertion so as to instruct the addressee how to interpret the major assertion. Due to the constraints of the Gricean Maxims of Quantity (say no more than necessary) and Manner (be brief), speakers only select the most newsworthy information into the asserted part of the utterance. The rest of the information may be presupposed, implied, or indexed by certain grammatical markers such as the subject-verb inversion for yes-no questions in English, the honorific markers in Japanese and Korean, and sentence final particles marking the speaker's attitude and information status in Mandarin. These grammatical forms mark and thus index the meta- or extra-linguistic information rather than explicitly asserting it. Some of the information marked or indexed is well constrained and regular, and thus it requires minimum form for marking. Therefore, a syllable would be adequate enough to serve the function. But other kinds of

information are not constrained and regular, and therefore the forms may constantly change and complex forms are needed for the marking. The right-dislocated forms are instances of the latter. In fact, none of the forms we discussed in Section III are grammaticalized forms for speech act modification. These are forms that play their lexical functions in normal assertions. What is claimed to be grammaticalized is the utterance final slot, with a unique prosodic pattern, which is used to carry the speaker's metalinguistic comments to the addressee about the major assertion.

What are the functions the different categories of right-dislocated forms serve? At least, the following 6 functions have been found in the data.

1. **Marking the referent of the assertion.** In the cases of right-dislocated NPs and VPs, the right-dislocated forms serve as an indicator given by the speaker directing the addressee's interpretation. This function might be particularly suitable for languages like Mandarin, which allows omission of most sentence components in a grammatical sentence. But in the case where the NP is present in the asserted proposition, the same NP may still appear in the right-dislocation since it is used as a director of the addressee's attention, not as an argument of the propositional content.¹²
2. **Marking the target of the assertion.** In the cases of the right-dislocated vocatives, the right-dislocated forms are used to mark the target of the assertion being made. In normal communication, the fact that the speaker is talking to the addressee implicitly designates the addressee as the target of the assertion. But that is done by assumption and implication. In situations where this tacit agreement is not clear, the speaker may need certain linguistic means to indicate the addressee. In a situation where the addressee's attention is totally absent from the

12. This function is similar to the "as for" phrase in English, as in *As for my father, he doesn't come very often*, where "father" and "he" are mutually redundant but play different functions in communication. Of course, the English "as for" phrase has a full assertive force, while the Mandarin right-dislocated NPs has a much weaker assertive force.

speaker, the normal vocatives may be used in an asserting way, and the asserted proposition is made after the attention is secured. In a situation where the addressee's attention is not totally unavailable, the vocative may be put in the secondary channel, where the addressee is explicitly marked, but not fully asserted.

3. **Marking the kind of speech act being performed.** In cases where the interpretation of speech act being performed is not clear, or where the speaker wants to emphasize the kind of speech act to the addressee, explicit marking of speech act can be made in the utterance final slot.
4. **Marking the speaker's attitude and evaluation of the assertion.** This function is served by the right-dislocated modal words. Note that the concept of modality intended here is not merely the evaluation of truth value or likelihood of the propositional content. It also includes domains covered by the conventional term "**root modality**" such as permissions, wishes, abilities, and so on.
5. **Marking the speaker's emotions and affects.** The right-dislocated forms may be used to indicate to the addressee the affective motivation for the speaker to make the assertion. For example, in the utterance illustrated in (25) which is restated here,

(25) *shì chā zhèr de, bèndàn.*

Is insert here REL fool

"(It) is the one to be put here, you fool."

the right-dislocated phrase "you fool" indicates that the affective motivation of the assertion "It is the one to be put here" is to show how stupid the addressee is.

6. **Extended uses.** Once the utterance final position with the unique prosodic pattern is established as marking the speaker's metalinguistic message to the addressee about the main assertion, it may extend part of its features to other non-typical cases. One of the features of right-dislocation forms is that they fall between full assertion and entire implication. Thus, in cases where the speaker wants to focus only on a certain part of the utterance, he or she can keep that part in the scope of full assertion, and move the rest part to the secondary channel

location. Thus, we have the Complex Structures and the Quasi Left-Dislocations where the main part of the utterance is shorter and simpler than the right-dislocated form. But this is not the major use of the utterance final position.

In the above discussion, I have smuggled in the term "**marking**" without definition. I intended to use it as an intermediate category between communication by full assertion and communication by indexing.¹³ Thus, the forms used for **marking** information lacks its assertive force compared with assertions, but are much more explicit than indexicals. With the distinction between asserting and marking, I propose that the main part of the utterance that carries the ideational content of information is fully assertive, while the right-dislocated form is very weak in its assertive force. This explains why the main part of the utterance is felt to be under focus (Packard, 1986) and to carry the most important information (Lu, 1980). This also explains why the right-dislocated form consistently receives the reduced, lower-pitched, and fast-tempoed prosodic contour. However, the assertive force is not the only distinction here. An important point advocated in this paper is that there are two types of channels in communication. The representational channel carrying the propositional content is associated with full assertions, while the interpersonal channel carrying metalinguistic comments about the assertion to the addressee is associated with marking or indexing. Marking is a means used for the metalinguistic interpersonal function, which serves as a speech act modifier or operator. Thus, marking tells us how the form carries information, while the speech act modifier tells us what communicative function the form serves. It is the combination of the two different concepts that helps us understand what the right-dislocated forms are, what functions they serve, and why they have the features we have noticed.

There are at least three pieces of evidence to support the claim that right-dislocated forms are speech act operators. First of all, the right-dis-

13. For discussions on indexicality, see Lyons, 1977; Silverstein, 1985; and Ochs, 1990.

located forms are found only in spoken discourse where interlocutors are engaged in face-to-face interactions and constant cues of utterance interpretation are badly needed by the addressee. Once we switch to the written form where there is no direct addressee involved, that form cannot be used. Second, the strict distributional feature of right-dislocated forms also indicates that they operate at the level above the utterance. Since the sentence final particles in Chinese has the whole sentence under its scope, and the right-dislocated forms have to be placed outside the scope of the sentence final particles, the right-dislocated forms must have an even wider scope. According to the classical generative semantics analysis,¹⁴ the speech act node is a sister node of the sentence node, functioning as a sentential modifier. Thus, right-dislocated forms must function at the level higher than the sentence. Hence the term metalinguistic. Third, right-dislocated forms cannot occur in embedded clauses. Thus, it is grammatical to say (33),

- (33) *tā gào sù wǒ tā chī le liǎng ge píngguǒ.*
 she tell me he eat PEFT two apple
 "She told me that he ate two apples."

but it is ungrammatical to say (34),¹⁵

- (34) **tā gào sù wǒ liǎng ge píngguǒ, tā chī le*
 she tell me two apple he eat PEFT

Note that the ungrammaticality is not caused merely by the change of word order which affects the information status in terms of given and new information. The ungrammaticality is caused by **both** the word order and the prosodic contour assigned to it, as indicated by the use of the

14. I do not intend to make any evaluative remarks about Generative Semantics. Its analysis of sentence structures is only informally borrowed here to illustrate the phenomenon and the point.

15. This example is taken from Lu, 1980, p.33.

comma in (34). The utterance will be completely grammatical if we assign the right-dislocated form the assertive prosody (primarily by slowing down and raising the pitch level on *tā* (he) and thereby making it part of the assertion, which is indicated by the deletion of the comma as shown in (35),

- (35) *tā gào sù wǒ liǎng gè píng guǒ tā chī le*
she tell me two apple he eat PEFT

The reason why the right-dislocation cannot be grammatically embedded in the subordinate clause is that speech act operators cannot be placed in the embedded clauses. Speech act operators, along with many other metalinguistic modifiers, cannot be placed in the embedded clause, because they carry the message from the speaker to the addressee about the whole proposition being asserted and they are not part of the assertion. Example (34) has nicely illustrated the point that change of word order is not what right-dislocation is all about. What is crucial about right-dislocated forms is their function as a speech act operator carrying metalinguistic comment.

Before we conclude, let us address briefly two issues mentioned before. The first issue is whether right-dislocated forms will result in a change of word order in Mandarin. Since right-dislocation is not merely a phenomenon of constituent movements, but movements accompanied by change of prosodic features (in low pitch and fast tempo) and communicative functions (as speech act operators), right-dislocated forms are quite clearly marked off from other sentence components in the assertion. Therefore, it is less likely to result in word order changes. In addition, right-dislocated forms are extremely heterogeneous, and the irregularity will not motivate any word order change that requires consistent change of certain specific categories.

The second issue is whether the right-dislocated forms serve the same function as that of the sentence final particles (SFPs). It is well established that the sentence final particles are markers of interpersonal discourse information, for example, the question markers. In this sense,

the right-dislocated forms are closely related to the SFPs. However, the SFPs are highly grammaticalized forms with specialized discourse functions. Although their scope is over the entire sentence, they are more or less incorporated into the clause structure of the sentence. In contrast, the right-dislocated forms have a much wider scope, and the forms are not at all grammaticalized, although the position is more or less stabilized by its predictable association with the unique prosodic pattern. In this sense, they are not the same. Although right-dislocated forms as we have defined them in this paper might have been the result of the typological feature of Mandarin, which utilizes the utterance final position as a privileged slot for carrying interpersonal messages, the grammaticalized slot for right-dislocated forms and the slot occupied by the SFPs are different. Therefore, it is not the case that right-dislocation and SFPs are together making the utterance final position as a single grammaticalized slot, as claimed by Bourgerie (1991).

To summarize, I have illustrated through examples from natural interactive discourse data that so-called right-dislocated forms involve a rich variety of grammatical categories and structures, ranging from simple NPs or VPs to modal auxiliaries, adverbs, and from complete sentential constructions to defective combinations of structures. Data have shown that the right-dislocated forms are not repairs for the speaker's slips of memory, as indicated by the traditional label they receive as afterthoughts. Evidence indicates that the right-dislocated forms reflect a special linguistic device which might be called speech act operators. They function as a carrier of metalinguistic comments by the speaker about the asserted proposition to direct the addressee's interpretation of the assertion. The once regarded error form as indicated by its traditional labels such *afterthought*, *dislocation*, or *extrapolation* in fact turns out to be a semi-grammaticalized position for carrying interpersonal messages. Based on this argument, we are entitled to claim that the "afterthought expressions" are not "right-DISlocations". Rather, the utterance final position where they reside is their RIGHT LOCATION for the communicative function they are intended to serve.

References

- Austin, John, 1962. *How to Do Things with Words*. Oxford: Clarendon Press.
- Bourgerie, Dana, 1991. Postposed modals in Chinese: Evidence for restructuring. Paper presented at the 1991 Meeting of the Chinese Language Teachers Association, November, Washington D.C.
- Buhler, K., 1934. *Sprachtheorie*. Jena: Fischer. (Reprinted Stuttgart: Fischer, 1965.)
- Chafe, Wallace, 1976. Givenness, contrastiveness, definiteness, subjects, topics and point of view. In Charles Li, ed., *Subject and Topic*. New York, NY: Academic Press.
- Chao, Yuen Ren, 1968. *A Grammar of Spoken Chinese*. Berkeley, CA: University of California Press.
- Dancygier, Barbara, 1992. Two metatextual operators: Negation and conditionality in English and Polish. Paper presented at the 1992 Berkeley Linguistics Society Meeting, University of California, Berkeley.
- Halliday, M.A.K., 1973. *Explorations in the functions of language*. London: Edward Arnold.
- Horn, Lawrence, 1978. Some aspects of negation. In J. Greenberg, ed., *Universals of Human Language, Vol. 4: Syntax*. Stanford: Stanford University Press.
- Hyman, Larry, 1976. On the change from SOV to SVO: Evidence from Niger-Congo. In Charles Li, ed., *Word order and word change*. Austin, TX: University of Texas Press.
- Jakobson, Roman, 1960. Linguistics and poetics. In T. Sebeok, ed., *Style in Language*. Cambridge, Mass.: MIT Press.
- Kay, Paul, 1983. Linguistic competence and folk theories of language: Two English hedges. *Proceedings of the Ninth Annual Meeting of the Berkeley Linguistics Society*, 9, 128-37.
- Kyrtziz, Amy, Jiansheng Guo, & Susan Ervin-Tripp, 1990. Pragmatic

- conventions influencing children's use of causal constructions in natural discourse. *Proceedings of the Sixteenth Annual Meeting of the Berkeley Linguistics Society*, 16, 205-214.
- Li, Charles & Sandra Thompson, 1976. Subject and topic: A new typology of language. In Charles Li, ed., *Subject and Topic*. New York, NY: Academic Press.
- Li, Charles & Sandra Thompson, 1981. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley, CA: University of California Press.
- Lu, Jianming, 1980. Hànyǔ kǒuyǔ jùfǎ lǐ de yíwèi xiànxàng (Transpositions in spoken Mandarin grammar). *Zhōngguó Yǔwén (The Chinese Language)*, 1: 28-41.
- Levinson, Stephen, 1983. *Pragmatics*. Cambridge: Cambridge University Press.
- Lyons, John, 1977. *Semantics, Vol. 1*. Cambridge: Cambridge University Press.
- Ochs, Elinor, 1990. Indexicality and socialization. In James Stigler et al, eds., *Cultural Psychology*. Cambridge: Cambridge University Press.
- Packard, Jerome, 1986. A left-dislocation analysis of "afterthought" sentences in Peking Mandarin. *Journal of the Chinese Language Teachers Association*, 21,3: 1-12.
- Packard, Jerome & Ziqiang Shi, 1986. The grammaticalization of a "post-sentential" slot in colloquial Peking Mandarin. Paper presented at the 19th Annual Conference on Sino-Tibetan Languages and Linguistics, Ohio State University.
- Quirk, Randolph, Sidney Greenbaun, Geoffrey Leech, & Jan Svartvik, 1985. *A Comprehensive Grammar of the English Language*. London: Longman Group.
- Searle, John, 1969. *Speech Act*. Cambridge: Cambridge University Press.
- Searle, John, 1975. Indirect Speech Act. In P. Cole & J. Morgan, eds., *Syntax and Semantics, Vol. 3: Speech Acts*. New York: Academic Press.

Jiansheng Guo

- Schiffrin, Deborah, 1987. *Discourse Markers*. Cambridge: Cambridge University Press.
- Silverstein, Michael, 1985. The functional stratification of language and ontogenesis. In J. Wertsch, ed., *Culture, Communication, and Cognition: Vygotskian Perspectives*. Cambridge: Cambridge University Press.
- Suppes, Patrick, 1957. *Introduction to Logic*. Princeton, NJ: D. Van Nostrand Company.
- Sweetser, Eve, 1990. *From Etymology to Pragmatics*. Cambridge: Cambridge University Press.
- Tai, James & Wenzhe Hu, 1991. Functional motivations for the so-called "inverted sentences" in Beijing conversational discourse. *Journal of the Chinese Language Teachers Association*, **26:3**, 75-104.

The Compounding Pattern A X B Y in Mandarin

Ho Chee Lick

National University of Singapore

Abstract

The existence of various types of quaternary expressions in Chinese and many other Sino-Tibetan languages is a well known fact. This paper deals with one particular type in Mandarin—AXBY pattern. Two different hypotheses of its structural representation and formational mechanism are contrasted. One is the Affixation Hypothesis (Lien 1989), which claims that there is a base (a pair of synonyms, X...Y) to which an affix (a pair of antonyms, A...B) is attached. The other, proposed in this paper, is the Compounding Hypothesis, which claims that the A X B Y pattern consists of two structurally lexically and semantically parallel halves, A X and B Y, and that the structural relation between A and X, B and Y is compounding, i.e., syntactic in nature. Three issues are discussed in support of the Compounding Hypothesis, viz. affix-base status, formation, and scrambling.

Introduction: AXBY Expressions

Expressions in Mandarin such as the ones underlined in the follow-

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ing sentences can be called AXBY expressions.¹

- (1) Liǎnggèrén guān mén bì hù mǐtán.
two person close door close door talk secretly
'The two talked secretly, with the door closed.'
(Liu 1985b:257)
- (2) Tā zuòzàiyībīān, yěbù duō yán shǎo yǔ,
he sit alone neither more talk less talk
yěbù ài shǒu ài jiǎo.
nor block hand block foot
'He sat alone, not talking much, not in anybody's way.'
(Liu 1985a:35)

Let me, first of all, explain the label "AXBY" as it is used in this study. The four letters represent only the following: (i) The whole construction comprises four elements; (ii) There is some correspondence relationship between the 1st and the 3rd elements, and between the 2nd and the 4th elements. They do not symbolize any other specific structural or semantic properties. For example, neither "X" and "Y" nor "A" and "B" stand for "base" or "head", "synonyms" or "antonyms", etc.

Here are some major characteristics of the AXBY phenomenon. Firstly, an AXBY expression is not generated as a phrase in the sentence by the general phrase structure principles. Take "(bu) duō yán shǎo yǔ" ((not) more talk less talk) '(not) talking much' in (2). The same meaning expressed by a regularly generated phrase in the sentence will be:

- (3) ...bù zěnmē yányu...
not quite talk

1. This paper deals with A X B Y as a productive compounding pattern. It presents quite a number of novel AXBY expressions, which are unfamiliar but nonetheless producible and comprehensible—in a spirit of non-prescriptivism. In cases where they are actually found, the sources are provided; where they are coined in this paper, sentences showing their usage are given.

The difference is that "yányu" 'to talk' is a compound verb in modern colloquial Mandarin and therefore can take part in normal phrase formation (3), whereas "yán" and "yǔ" separately (in (2)) are now only bound morphemes (although they were both free in Classical Chinese) and thus cannot be used to construct a syntactic phrase (cf. Chao 1968:361,375).

Secondly, the interpretation of an AXBY expression is not governed by the compositional principles which govern regular phrase interpretation. For example, in (2) "...bù duō yán shǎo yǔ" (...not more talk less talk) means simply 'not to talk much', rather than something like 'not to talk (too) much or (too) little-to do just the right amount of talking'. Likewise, "guān mén bì hù" (close door close door) in (1) has a unitary meaning, 'with the door closed'. It does not mean 'to close one door and to close another door', as would be given by compositional rules.

Thirdly, although a great many AXBY expressions are lexicalized, "ǎi shǒu ài liǎo" (block hand block foot) 'to be in the way' (in (2)) being an example, the AXBY pattern is essentially productive—novel AXBYs can always be produced and understood.

The three below, for instance, are novel forms (at least for me):

- (4) Tā sǐ shuō huó quàn, diédié bùxiū.
 he dead talk live persuade chatter without stop
 'He kept chattering, trying very hard to persuade (someone).'
 (Liu 1985b:306)
- (5) Tā zàiwài mián huā shuì liú...
 he outside sleep flower sleep willow
 'He was sleeping around outside...'
 (Liu 1985a:369)
- (6) Liǎnggèrén tiān chà dì bié,
 two person heaven different earth different
 zhǐyǒu lǐhūn.
 have to get a divorce
 'The two are too incompatible, they had to get a divorce.'
 (Liu 1985b:325)

These three characteristics together suggest that the AXBY phenomenon belongs neither in the regular grammar nor in the stock of idiosyncrasies. There has been descriptive study of the various structures of AXBY expressions by scholars of idioms, literary stylisticians and traditional grammarians (e.g. Lu 1975, Xu 1980). Added to the literature more recently are two theoretical accounts attempted independently by Lien Chinfa (1989), the study of Antonymous Quadrinomials, and He Zili (1990), the study of the Formal Idiom "nǐ X wǒ Y".² These two efforts converge on one major aspect: they both tackle the issue of idiomatic interpretation. They diverge in that the former handles derivation, resulting in an "affixation" hypothesis, whilst the latter aims to explore the theoretical conception of "idiomatic construction" (Fillmore et al. 1988). In the present paper, I will discuss the problems posed by the affixation hypothesis; and, based on my view of idiomatic construction, I will propose an alternative hypothesis of AXBY formation—compounding.

Two Analyses: Affixation and Compounding

Lien's paper, *Antonymous Quadrinomials in Chinese*, is a serious attempt to give the derivation and interpretation of AXBY expressions a theoretical account. His concentration is on the type of AXBY which contains a pair of antonyms. That should not affect our quest for generalization across various AXBY types.

His basic assumptions about the AXBY construction are:

- (A) An AXBY consists of two [crisscrossing] pairs of terms: semantically, a synonymous pair and an antonymous pair.

2. Lien's Antonymous Quadrinomial (AQ) (the four elements involving a pair of antonyms) is a type of AXBY. My "nǐ X wǒ Y" is a type of AQ (the antonyms involved being "nǐ" 'you' and "wǒ" 'I'). In this paper we are concerned with the general AXBY pattern.

- (B) Structurally, the synonymous pair (which can be a reduplicate) is the base, to which the antonymous pair is affixed.³

I would call this the AFFIXATION ANALYSIS. It is worth noting that in his paper Lien is mainly concerned with the two pairs, A-B and X-Y, and does not talk particularly about AXBY being composed of two halves, AX and BY. For example, he makes the following observation regarding the syntactic condition of the base:

- (C) The majority of the constituents [of the bases] are in coordinate construction and only in rare cases are they in subordinate construction. No other syntactic relations have been found (Lien p. 265).

But, given the five types of relation commonly found in Chinese syntax/compounding, namely subject-predicate, verb-object, verb-complement, subordination and coordination (Norman 1988), why is the relation between the two elements of the base predominantly coordinative? He does not explain. In fact, I do not think we can find an answer by looking merely at the base. However, when we examine the properties and relation of the two halves, we will see that AX and BY are in coordination and they have the same internal structure (e.g. a-modifier n-head a-modifier n-head, see (D) below). It is therefore a matter of structural requirement that A and B, likewise X and Y, are in coordinate relation.

I have drawn a line between viewing AXBY in terms of pairs or in terms of halves. Let me make this distinction clearer. On the pair view, one looks at the pairs A-B and X-Y, the relation between the two pairs, and the relation within the two pairs. Lien's study exemplifies such a view. He focuses on the antonymous pair and the synonymous pair; he

3. Lien uses the letters "A" and "B" to stand for the "antonyms" which function as the "affix", and the letters "X" and "Y" to stand for the "synonyms" which function as the "base". Therefore an AQ can be either "AXBY" or "XAYB", depending on whether the affix precedes or follows the base (cf. Lien p.291).

postulates an affixation relation between them; he examines the syntactic and morphological conditions of the base-pair (Lien's Section 2), the phonological constraint on the order of the affix-pair and of the base-pair (Section 4), and the semantics of the antonymous pair (Section 5).

In contrast, on the half view, one looks at the halves AX and BY, the relation between the two halves, and the relation within the two halves. Along these lines, I would propose the following set of assumptions as an alternative analysis of AXBY:

(D) In Mandarin morphology, there is COMPOUNDING pattern—

A X B Y—which has the following features:

- i) The whole pattern A X B Y primarily comprises two halves A X and B Y which are in COORDINATE relation and are characteristically PARALLEL, or MUTUALLY ECHOIC;⁴
 - A X and B Y are PARALLEL STRUCTURALLY,⁵ e.g.
a-modifier n-head a-modifier n-head (see ii below);
 - A X and B Y are PARALLEL LEXICALLY, with A and B, X and Y in correspondence-being synonyms, antonyms, "parallels", etc.;⁶
 - A X and B Y are PARALLEL SEMANTICALLY, in the sense that the two halves say essentially the same thing and contribute jointly to a unitary meaning of the whole (which is typically nonliteral).⁷

4. See Bright (1990) for an insightful discussion of the use of parallelism as a device of verbal art. For parallelism in the Chinese tradition, see Kao (1984).

5. In Kao's words, "the basis for a parallelism [is] a repeated syntax" (1984:327).

6. Chao (1968) identifies a special type of lexical relation that exists between terms which are "not near enough to be synonymous, nor so directly opposite as to be antonymous" (p.377), e.g. "shān" 'mountain' and "shuǐ" 'river', or "fēng" 'wind' and "yǔ" 'rain'. He calls it parallel [relation]. Zhang (1985) characterizes sets of terms like these as belonging to the same semantic field. Thus, "chá" 'tea' and "fàn" 'food' are daily food and drink; "jīn" 'gold' and "yù" 'jade' are valuables. Terms in such relation (let us tentatively call them "parallels") are very frequently used in A - B and X - Y pairing. For example:

Shān qióng shuǐ jìn
mountain end river end
'to be in an impasse'

- ii) Within the two halves, the combination of A and X, B and Y is essentially COMPOUNDING, i.e. their structural relation is SYNTACTIC in nature; in fact, all five types of syntactic relation in Mandarin can exist between A and X, B and Y; e.g.

- (7) guǐ shǐ shén chāi S P S P
 devil incite god send
 'to be provoked by some mysterious forces'
- (8) tán tóu suō nǎo V O V O
 stretch head retract brain
 'to act in a stealthy manner'

cū chá dàn fān
 coarse tea simple food
 'simple meal(s)'

7. That the two halves (AX and BY) say essentially the same thing can be tested: The interchange of (especially antonymous) elements does not affect the meaning of the whole (cf. He 1990:155). For example:

guǐ shǐ shén chāi = shén shǐ guǐ chāi
 devil incite god send god incite devil send
 'to be provoked by some mysterious forces'

nǐ dōng wǒ xī = nǐ xī wǒ dōng
 you east I west you west I east
 '(people) to be far apart'

There are AXBYs in which the two halves are NOT parallel semantically, i.e. AX and BY are NOT saying the same thing. (I am not dealing with this type of AXBYs in the present paper.) Here, the opposite result is to be expected when we apply the above test: The interchange of elements alters the meaning of the whole substantively. For example:

xiān lǐ hòu bīng
 first courtesy then force
 'to try fair means BEFORE resorting to force'

vs. xiān bīng hòu lǐ
 first force then courtesy
 'to use force BEFORE any fair means'

mào hé shén lí
 appearance converge heart diverge
 'to be apparently of one accord BUT divided in heart'

vs. mào lí shén hé
 appearance diverge heart converge
 'to be apparently divided but in agreement in heart'

- (9) sǐ qù huó lái V C V C
die go live come
'half dead half alive'
- (10) chóu méi kǔ liǎn SUBORDINATION
distressed eyebrow bitter face
'with dismal looks'
- (11) qīn péng qì yǒu COORDINATION
relative friend relative friend
'relatives and friends'

As opposed to Lien's affixation analysis of AXBY, I would call this the COMPOUNDING analysis. I regard the contrast between these two analyses as reflecting two different ways of viewing. I should point out here that I use "pair" and "half" not so much for what there is to see in AXBY as for how things in it can be viewed. There are indeed two pairs of terms and Lien has made many insightful observations about them, especially with regard to their semantic contribution to the whole. My contention is, however, that their significance lies not in there being two separate pairs per se but in their behavior—the way they are distributed and the way they are interacting—in the two halves, which are the principal frame of structuring of the pattern.⁸

8. I am most grateful to one of the anonymous referees for pointing out the following: (i) Lien's analysis is based on the assumption that even though A and B are discontinuous on the surface they form a semantic unit underlyingly and as a pair of antonyms A does not make sense without B and vice versa. It seems counterintuitive for the compounding analysis to disconnect such a unity by assigning A and B in two halves separately. (ii) The semantic constants of a set of antonyms have been identified as involving iteration, totality, etc. Such a cluster of semantic properties are so intimately related that they can be justifiably summed up as denoting universal quantification. It is incumbent on the compounding analysis to provide a theoretical account to reflect such a semantic generalizations in AQs.

It is my responsibility to respond: The compounding analysis does not neglect the possible use of a pair of antonyms in an AXBY, nor their possible contribution to the idiomatic interpretation of the whole AXBY. In my treatment of "nǐ X wǒ Y", a case of AQ indeed, I have arrived at the idea that "A and B are typically a pair of contrastive terms (functioning like) the two poles of a spec-

In the next three sections, I will discuss three issues, affix-base status, formation, and scrambling, which I think would help us in our evaluation of the two analyses presented above.

The Affix-Base Status Issue

Lien starts with the hypothesis that in an AXBY containing an antonymous pair or terms and a synonymous pair of terms, e.g.

- (12) dōng lín xī zhǎo
east scale west claw
'a fragmentary account of something'

the antonymous pair is affixed to the synonymous pair (the base) ((B) above, cf. Lien p.278-79). But he does not provide convincing justifications for this affix-base relationship.

To see why we should not accept without question the affix status of antonymous terms in AXBY, we need only to consider the general usage/treatment of these terms in the language. Take dōng 'east' and xī 'west' for example. Each of them can be a free word, i.e. can be uttered alone (13) or used in phrase construction (14):

- (13) - Wǒ yīnggāi wàng nǎige fāngxiàng kāi ?
I should toward which direction drive
'Which direction should I go ?'
- Dōng. [or] - Xī.
' East. ' [or] ' West. '

trum, suggesting the inclusion of everything or all possibilities within the range" (He 1990:157), which is essentially the same as that of "universal quantification" (Lien 1989:282). Since I fully agree with Lien on this point, the present paper does not deal with the issue of idiomatic interpretation any more. As to the unity of A and B, on the compounding view it is precisely the A X B Y pattern as a whole (with two mutually echoic halves) that gives all the four elements involved their intricate, organic and holistic interconnection.

- (14) Cóng zhèr yīzhí wàng dōng zǒu. [Prepositional Phrase]
from here straight toward east go
'Go straight east from here.'

They are regarded as bases in normal compound formation, e.g. in (15) and (16) (see Chao 1968:397, Lu 1975:23):

- (15) dōngfēng
'east wind'
(16) xītiān
west sky
[Buddhism] 'Western Paradise'

And they are not among the affixes identified and dealt with in the literature (cf. Chao 1968:211-57, Wan 1989). The same can be said of other antonymous pairs, such as "shén" 'god' "guǐ" 'devil', "tian" 'sky' "dì" 'earth', "cháng" 'long' "duǎn" 'short', etc. Hence the puzzle: If they are not affixes everywhere else in the language, why MUST they be affixes ONLY in the AXBY construction? This certainly requires an explanation. But Lien does not even raise the question.

One important thing that Lien says concerning the affix-base distinction is the following:

- (E) The syntactic category [of the whole AXBY] is the same as that of the base...the affix does not change the syntactic category of the base...whatever syntactic category the base is, that of the derived output will not be changed. (p.265-66)

This seems to suggest that "base" and "affix" in AXBY are functionally distinguishable: The base determines the syntactic category of the AXBY whereas the affix has no effect on the matter. Thus, (B) and (E) together make correct predictions about AXBYs like (17-18):

- (17) lái zōng qù jī affix base affix base [...n...n]n
 come trace go trace
 'traces of somebody's whereabouts'
- (18) rì pàn yè pàn affix base affix base [...v...v.]v
 day hope night hope
 'to be longing for something all the time'

They fail however in (19-21) below, which are cases that can not be simply and lightly deemed as marginal:

- (19) méi lái yǎn qù base affix base affix [...n...n]v
 eyebrow come eye go
 'to make eyes at each other'
- (20) kāi kǒu bì kǒu affix base affix base [...n...n]v
 open mouth shut mouth
 'in everything one says'
- (21) tǎn tóu suō nǎo affix base affix base [...n...n]v
 stretch head retract brain
 'to act in a stealthy manner'

The problem here is obvious. If the base were that which determines the syntactic category of the AXBY and the affix were that which has no effect on the matter (according to (E)), then in (19-21) the antonymous pair would have to be the base and the synonymous pair would have to be the affix (contrary to (B)). If, on the other hand, the synonymous pair were the base and the antonymous pair were the affix (according to (B)), then in (19-21) the base would not determine the syntactic category of the AXBY but the affix would (contrary to (E)). It is a predicament for the affixation analysis: (B) and (E) cannot both be true.

Now let us see what the compounding analysis has to say about all these. It is quite simple: Affix-base relationship is a non-issue throughout. More precisely, we assume that the relations between AX and BY and between A and X, B and Y are all compounding, and not affixa-

tion; hence there is no need at all to postulate and justify any affix-base relation. In fact, if we assume that the compounding of A and X, B and Y involves all kinds of syntactic relation (see (D.ii)), we can account for the syntactic category of the AXBYs in (17-21) satisfactorily:

- (17) lái zōng qù jī
 come trace go trace
 [v-modifier n-head v-modifier n-head]—nominal
 (In Classical Chinese, a verb can be used before a noun as its modifier. (Li & Li 1985:96))
- (18) rì pàn yè pàn
 day hope night hope
 [n-modifier v-head n-modifier v-head]—verbal
 (A time-word noun can be used before a verb as its (adverbial) modifier. (Ibid. p.84))
- (19) méi lái yǎn qù
 eyebrow come eye go
 [n-subject v-predicate n-subject v-predicate]—verbal
 (Exocentric. (see Chao 1968:368))
- (20) kāi kǒu bì kǒu
 open mouth shut mouth
 [v-verb n-object v-verb n-object]—verbal
- (21) tàn tóu suō nǎo
 stretch head retract brain
 [v-verb n-object v-verb n-object]—verbal

We can see that except in the exocentric case (19), the syntactic category of the whole AXBY is basically a function of the syntactic relation involved in the AXBY formation. Under the compounding analysis, this is accountable in terms of the general principles of syntax and regular compounding of the language, with no stipulation of anything ad hoc and problematic like (B) and (E).

Next, let me discuss what I would regard as an unfortunate limita-

tion of the affixation analysis. It is perfectly all right that Lien concentrates on only one class of AXBYs, namely those made up of one antonymous pair plus one synonymous (or reduplicate) pair of terms. But his analysis—the antonyms being the affix, the synonyms being the base—imposes undue restrictions on the range of phenomena which can be covered and the degree of generality which can be reached. Consider the following:

- (22) sǐ qù huó lái
die go live come
'half dead half alive'
- (23) tiān nán dì běi
sky south earth north
'from different places'

They are AXBYs consisting of two pairs of antonyms. Lien includes these in his study; yet these, his affixation analysis cannot actually handle. The two pairs of antonymous terms cannot be affixes of each other, by definition. Nor can it be determined in a principled manner which pair is the base and which pair is the affix, if the affix-base relation still holds.

Moreover, the affixation analysis cannot satisfactorily deal with AXBYs consisting of two pairs of synonyms, e.g.

- (24) chì shǒu kōng quán
bare hand empty fist
'with one's bare hands; to be unarmed'

In our previous examples, (1), (5), (10-11) belong to this class. Here, if the two pairs of synonymous terms are both bases, their combination will be compounding, by definition, rather than affixation. If they are still in affix-base relation, then, again, on what grounds can we decide which is which? Lien stays clear of AXBYs of this class in his paper. But in fact

they are the ones which are most frequently encountered and which are most productive in terms of openness of membership. Their omission from the data would mean a significant loss, in both scope and generalization, for the study.

These three classes of AXBYs can be given a simple unified account if we postulate that the structural organization of AXBY is compounding instead of affixation—that no pair of terms, antonymous or synonymous, plays any affix/base role, but A and X, B and Y, AX and BY are combined by compounding principles (D). Let me use one of the AXBY compounding rules, S P S P, and the three expressions below to illustrate this:

- (25) S P S P [one pair of antonyms, one pair of synonyms]

shén chāi guǐ shǐ

god send devil incite

'to be provoked by some mysterious forces'

- (26) S P S P [two pairs of antonyms]

shén chū guǐ mò

god appear devil disappear

'to act swiftly and mysteriously'

- (27) S P S P [two pairs of synonyms]

yún xiāo wù sàn

cloud vanish mist disperse

'to disappear completely'

As we can see, the structure of AXBY can be represented in compounding terms whether there are one pair of antonyms plus one pair of synonyms, two pairs of antonyms, or two pairs of synonyms involved. The compounding analysis thus captures a very significant generalization by giving the structures of the three varieties of AXBYs a unified treatment.

The Formation Issue

At first sight, the affixation account of AXBY formation looks rather straightforward:

- (F) AXBY formation starts with a disyllabic base, then through a process of affixation two antonymous terms are attached to it (see Lien p. 263-65).

There are however a few major deficiencies. Take, for example, "línshè" 'neighbor' and "zuǒ yòu" 'left right'. Out of them the grammar can produce two different expressions with the same meaning—a phrase (not an AXBY) in the sequence of (28), and an AXBY in the sequence of (29):

- (28) zuǒ yòu línshè
left right neighbor
'the neighbors around'
- (29) zuǒ lín yòu shé [affix base affix base]
left neighbor right house
'the neighbors around'

To construct the affixation rule for AXBY formation, one must therefore spell out explicitly the mechanics that split both the base and the affix and arrange them in a crisscross manner.⁹ In the literature of Mandarin morphology, nothing has been said about "splitting-and-crisscrossing" affixation. If such a conception is useful in the analysis of AXBY, it

9. In this connection Lien's representation of AXBY derivation, [...X...Y] $\xrightarrow{\text{affixation}}$ [A X B Y] (p.265), is quite inadequate.

As a matter of fact, his diagram suggests the forming of some pattern, which is taken as basic in the compounding analysis.

ought to be taken up as one of the central points of inquiry, rather than assumed.

More crucially, the affixation account cannot predict that the result of AXBY formation in this case (to express the meaning of 'the neighbors around') is (29) and not (30).

- (30) *lín zuǒ shè yòu [base affix base affix]
neighbor left house right

Note the difference in affix-base order. Does that decide the acceptability? If yes, why? What is the nature of the affix-base order constraint? Consider two other examples:

- (31) tiān zhū dì miè [affix base affix base]
sky kill earth destroy
'the gods will punish ...'

- (32) tán tiān shuō dì [base affix base affix]
talk sky talk earth
'to talk about everything'

Notice the position of the affix "tiān dì" 'sky earth' in each instance. In the theory of morphology, a basic distinction is drawn between prefix (affix added before the base) and suffix (affix added after the base). Generally, if something (with a unique form-meaning-function) is a prefix in the language it remains a prefix; and the same can be said about a suffix. But here we see that in AXBY formation the same affix can sometimes be used as a prefix and sometimes be used as a suffix (There are many such examples in Lien's paper). Hence the question: What are the guiding principles for the proper positioning of affixes, i.e. for proper affix-base ordering. Again, what is the nature of such principles?

An affixation model of AXBY formation, if feasible at all, cannot be as simple as what Lien proposes. It must represent the splitting and

crisscrossing mechanisms involved. Especially, it must account for the proper ordering of elements, which I believe ultimately requires an explanation in compounding, i.e. syntactic, terms.

Now, let us look at AXBY formation from the point of view of compounding. Our focus this time is on a fully specified A X B Y pattern ((D) above). This includes, particularly, the characterizations that the two halves AX and BY have identical internal structures, and that there is lexical correspondence of A to B, X to Y—in the relation of antonymy, synonymy, etc. "Splitting" and "crisscrossing" are thus built in, as part of the defining features of the pattern. Meanwhile, we assume that the structural relation between A and X, B and Y is compounding, which is syntactic in nature. Therefore "proper ordering" would be guided essentially by principles of compounding/syntax.

Thus, if we represent the order of A and X, B and Y in terms of compounding, we can account for the following contrasts satisfactorily: To express the meanings of (29), (31) and (32), one can use the structures (29.1), (31.1) and (32.1), but not (29.2), (31.2) and (32.2) ("l" for "localizer", cf. Chao 1968:397).

(29) 'the neighbors around'

(29.1)	l-modifier	n-head	l-modifier	n-head
	zuǒ	lín	yòu	shè
	left	neighbor	right	house

(29.2)	n-modifier	l-head	n-modifier	l-head
	*lín	zuǒ	shè	yòu
	neighbor	left	house	right

(31) 'the gods will punish...'

(31.1)	n-subject	v-predicate	n-subject	v-predicate
	tiān	zhū	dì	miè
	sky	kill	earth	destroy

(31.2)	v-verb	n-object	v-verb	n-object
	*zhū	tiān	miè	dì
	kill	sky	destroy	earth

(32) 'to talk about everything'

(32.1) v-verb n-object v-verb n-object

tán tiān shuō dì

talk sky talk earth

(32.2) n-subject v-predicate n-subject v-predicate

*tiān tán dì shuō

sky talk earth talk

Let me sketch a compounding model of AXBY formation:

- (G) With the pattern A X B Y (as spelled out in (D)) as a guide, the process of compounding involves selecting the appropriate syntactic structure and lexical items, based on the meaning to be expressed. The structure to use would generally be the structure that is normally used in phrase or clause construction for expressing similar meanings.¹⁰

I will demonstrate this through creating a few novel AXBYs. In each example below, we see the structure of a phrase/clause, then the same structure being used in AXBY compounding, and a sentence showing how this nonce AXBY expression could be used.

(33)Phrase: n-modifier n-head

liúmáng péngyǒu

'hoodlum friend(s)'

A X B Y: n-modifier n-head n-modifier n-head

yān péng jiǔ yǒu

cigarette friend alcohol friend

'friends who just smoke and drink together'

10. Quite often in AXBY formation, a term is chosen which was a free word in Classical Chinese but is only a bound morpheme in Modern Chinese; or, a structure is used which was fully regular in the past but is irregular now. The use of terms and structures in the classical style conspicuously marks AXBYs as special. Discussions on that are beyond the scope of this paper.

Tā zhěngtiān gēn yībāng yān péng jiǔ yǒu guǎnhùn.
 he whole day with a gang cigarette friend alcohol friend hang around
 'He hangs around with a gang of smoking-and-drinking friends all day long.'

(34) Phrase: n-modifier v-head

zhěngtiān zàiyīqǐ

'all day long being together'

A X B Y: n-modifier v-head n-modifier v-head

rì suí yè bàn

day follow night accompany

'to accompany (someone) all the time'

Fūqī rì suí yè bàn, xíng yǐng bù lí.

couple day follow night accompany body shadow not separable

'The couple kept each other company all day long, inseparable as body and shadow.'

(35) Phrase: v-verb n-object

dùjué fànzui

'eradicate crimes'

A X B Y: v-verb n-object v-verb n-object

qù è chú jiān

remove vice eliminate evil

'to eliminate vice and evil'

Wǒmén yào qù è chú jiān, bǎohù mínzhòng.

we must remove vice eliminate evil protect people

'We must eliminate vice and evil, to protect the people.'

(36) Clause: n-subject v-predicate

shēngyì shībài

'business fails'

A X B Y: n-subject v-predicate n-subject v-predicate

jiā shuāi yè bài

family decline business fail

'(family/business) to decline/fail'

Huáng Jiā nàshí yǐjīng jiā shuāi yè bài.
Huang family then already family decline business fail
'The Huang Family at that point had already declined.'

Thus, on the compounding view, AXBY formation is no mystery—it is only a question of whether one chooses to use the A X B Y pattern and what one wants to say. The order and structural relation of the four terms employed can be adequately explained by making reference to the general principles of syntax/compounding, with no need to stipulate anything ad hoc (Recall that in the affixation analysis, one would have to state the rules for the splitting, crisscrossing, and proper ordering of affix and base). A simpler account as regards formation, the compounding hypothesis does have an edge over the affixation hypothesis.

The Scrambling Issue

The scrambling phenomenon can be exemplified as follows:

- | | | | | | |
|--------|---------|---------|---------|---------|---------|
| (37.1) | cūn | qián | zhuāng | hòu | 1 2 3 4 |
| | village | front | village | back | |
| (37.2) | cūn | hòu | zhuāng | qián | 1 4 3 2 |
| | village | back | village | front | |
| (37.3) | zhūang | qián | cūn | hòu | 3 2 1 4 |
| | village | front | village | back | |
| (37.4) | zhuāng | hòu | cūn | qián | 3 4 1 2 |
| | village | back | village | front | |
| (37.5) | qián | cūn | hòu | zhuāng | 2 1 4 3 |
| | front | village | back | village | |
| (37.6) | qián | zhuāng | hòu | cūn | 2 3 4 1 |
| | front | village | back | village | |
| (37.7) | hòu | cūn | qián | zhuāng | 4 1 2 3 |
| | back | village | front | village | |

- (37.8) hòu zhuāng qián cūn 4 3 2 1
 back village front village

These are all structurally and semantically well-formed AXBYs which have the same four elements in different configurations. (I number the four elements based on their order in (37.1) so we can easily see the different arrangements).

What Lien does and does not say about the scrambling phenomenon illustrates his view of AXBY very well. Here is the background of what he says (below). He discusses the tone constraint on the "linear order" of the "conjoined elements" of the affix and of the base in two separate sub-sections; there he posits a general scheme of precedence, PÍNG > SHǎNG > QU > RÙ (p.274). Then he looks at the configuration of the members of AXBY, and makes these observations (p.279):

- (H) Since AXBY involves two pairs constrained by linear order and AXBX involves one pair so constrained, AXBX stands less chance of violating linear order constraint than AXBY when the order [of the elements] is scrambled.
- (I) The acceptability of [scrambled] AXBYs is in iverse proportion to the numbers of violations of linear order.

Note that not only does he examine the order constraint of the affix and of the base separately, but even when it comes to the configuration of the whole AXBY, he is still thinking in terms of the two pairs—as two separate pairs. Curiously enough, he does not look at the tone constraint on the linear order between A and X, B and Y, considering their being adjacent in the string. But, why should the non-contiguous terms, instead of the contiguous ones, be subject to such tonal (aesthetic, hence surface) requirement? Why must the acceptability of scrambling be affected by the tonal order constraint of the non-contiguous, but not the contiguous, terms? I will not tackle phonological problems in this paper. I would just like to point out here that the way Lien handles the scrambling issue

clearly reflects the way he views AXBY—as two separate pairs of terms.

What Lien does not say (but to me it is the most important thing) is that the eight scramblings of the four elements as illustrated by (37.1-8) constitute two semantically distinct sets: (37.1-4) means 'around the village' whereas (37.5-8) means 'the villages around'. We can take a representative from each set, put them into the same frame and compare them:

- (38) Cūn qián zhuāng hòu dōu zhòngle guǒshù.
village front village back all plant fruit tree

'Fruit trees have been planted all around the village.'

- (39) Qián cūn hòu zhuāng dōu zhòngle guǒshù.
front village back village all plant fruit tree

'All villages around have planted fruit trees.'

As can be clearly seen, the meaning difference is substantive: Why doesn't Lien say anything about it then? Well, I guess there are two reasons. One, this is not his concern. He is interested in the two pairs, as pairs; in the order constraint of them, separately; and in the order violation counts of them in various combinations of the four elements. So he treats all the scramblings as in (37.1-8) as equals, and does not bother to further distinguish them (see his examples and discussion on p.279-80). Two, his analysis does not lead him to. He basically sees AXBY as two pairs of terms in affix-base relation. The scrambling of terms should not change the nature of this relation: The synonymous pair will still be the base and the antonymous pair will remain the affix—thus there should not be a change of meaning.

In fact, whether or not the line is drawn between the two sets, the affixation analysis is in trouble with the scrambling phenomenon. On the one hand, if (37.1) can be scrambled into (37.5), the analysis must allow the affix to change freely between being a suffix and being a prefix. On the other hand, if (37.1) and (37.5) are recognized (correctly) as having two fundamentally different meanings, the analysis must account for the

difference. Why can (37.1) be scrambled into (37.2-4) without a change of meaning, but not into any of (37.5-8)? Does the distinction of suffixing and prefixing matter here? If yes, why? The affixation analysis must provide answers to such questions.

Let us move on to see what the compounding analysis has to say about the scrambling phenomenon. To reiterate, on the compounding view, AXBY is seen essentially as a pattern consisting of two coordinated halves in structural, lexical, and semantic parallelism. The two halves, in other words, are taken to be the major frame of organization of the pattern. This indeed helps to explain a subtle asymmetry in the acceptability of scrambled AXBYs. Consider the following:

(40.1) mó quán cā zhǎng 1 2 3 4
 rub fist rub palm

(40.2) mó zhǎng cā quán 1 4 3 2
 rub palm rub fist

(40.3) cā quán mó zhǎng 3 2 1 4
 rub fist rub palm

(40.4) cā zhǎng mó quán 3 4 1 2
 rub palm rub fist

'to be excited and ready to battle'

Although (40.2-4) are all structurally and semantically well-formed scrambled versions of (40.1) (the original), I have the feeling that (40.4) somehow stands out as special, or as being better. Why? Perhaps because it is scrambled by directly reversing the two halves, i.e. from 1 2 - 3 4 to 3 4 - 1 2. I would speculate that this particular mode of scrambling—the reversal of the two halves—effects a drastic scrambling and at the same time preserves the original A and X, B and Y combination; it strikes a balance of freshness and familiarity; and thus we feel happy with its result. I would also guess that this could be the most frequently encountered and the best received mode of scrambling. In fact I have found documented evidence in support of such a guess. In some dic-

tionaries that contain lexicalized AXBYs, there are occasional mentions of a given expression having an alternative form. According to what I have noticed, the two are mostly variants based on the reversal of the two halves. Here are just a few examples taken from "A Dictionary of Chinese Idioms" (Li & Lu 1985):¹¹

- (41) guǐ shǐ shén chāi [or] shén chāi guǐ shǐ
devil incite god send god send devil incite
'to be provoked to action by some mysterious forces'
- (42) yǐn xìng mái míng [or]
hide family name bury personal name
mái míng yǐn xìng
bury personal name hide family name
'to conceal one's identity'
- (43) wán shuǐ qiān shān [or]
ten thousand river thousand mountain
qiān shān wàn shuǐ
thousand mountain ten thousand river
'a long and arduous journey'
- (44) dì jiǔ tiān cháng [or] tiān cháng dì jiǔ
earth long sky long sky long earth long
'for a long, long time'

It seems that of the three possible scrambled variants of each original, the one here must have been most favored and used, and so have eventually made its way into the dictionary. And this indicates that the mode of scrambling that gives rise to the alternative form, i.e. the reversal of the two halves, must be the most welcome.

11. By the way, Lien's claim that "the acceptability of AXBYs is in inverse proportion to the numbers of violations of linear order (referring to the tone constraint of the affix and of the base)" (p.274-80) runs counter to the fact that the first expressions in (41-44) are fully acceptable.

Although linguists commonly take "irreversibility" of conjoined members as an important criterion for wordhood, I would argue nonetheless that the reversibility of the two halves of AXBY (I am of course not saying that in all instances the two halves can be reversed) is exactly a unique characteristic of the pattern—a characteristic which is inherent in the parallelism of the pattern as I have described in (D).

Finally, let me discuss the issue of meaning difference in scrambling. Formally speaking, the two pairs of elements in an AXBY like (37.1) can be rearranged, in the same crisscross manner, into seven other strings (37.2-8). But in meaning, from what we have seen above, the eight expressions form two distinct sets, (37.1-4) and (37.5-8). (37.1) can be scrambled into (37.2-4), but not (37.5-8), without changing the meaning; likewise, (37.5) can be scrambled into (37.6-8), but not (37.1-4), without changing the meaning. Hence, scrambling is in effect semantically constrained. Our task is to explain: What happens that causes a change of meaning, when (37.1) is changed into (37.5) or vice versa? Let me put them here again:

- (37.1) cūn qián zhuāng hòu
village front village back
'around the village'
- (37.5) qián cūn hòu zhuāng
front village back village
'the villages around'

On the affixation view, one might postulate that the position of the antonymous affix carries a difference of meaning. Therefore a change of affix-base order will bring about a change of meaning. This seems to be true. But, what is the nature of such contrastive ordering? It is exactly here where things can be best illuminated in the light of compounding:

- (37.1') cūn qián zhuāng hòu
village front village back
n-modifier l-head n-modifier l-head
'places around the vilage'
- (37.5') qián cūn hòu zhuāng
front village back village
l-modifier n-head l-modifier n-head
'the villages around'

Hence the compounding account of meaning change in scrambling:

- (J) If we assume that the structural relation between A and X, B and Y is syntactic in nature, the meaning differences arising from structural changes in scrambling can be principally accountable and predictable.

Two more examples will suffice:

- (45) dǎ diē mà liáng
beat dad scold mom
v-verb n-object v-verb n-object
'to treat one's parents very cruelly'
- (46) diē dǎ liáng mà
dad beat mom scold
n-subject v-predicate n-subject v-predicate
'to be badly abused by one's parents'
- (47) shēn qíng hòu yì
deep feelings solid friendship
a-modifier n-head a-modifier n-head
'deep feelings'—nominal
- (48) qíng shēn yì hòu
feelings deep friendship solid
n-subject a-predicate n-subject a-predicate
'having deep feelings (towards someone)'—adjectival

The subtle change in functional meaning between (47) and (48) is brought about predictably by the change in structural relation of A and X, B and Y. In short, the formal changes in scrambling are not mere changes of linear order; they are fundamental syntactic changes which will affect the functions and relations of the elements involved. Hence, scrambling is essentially structurally constrained, which could be adequately accounted for only by the compounding analysis.

Summary

I have contrasted two significantly distinct analyses of the structure of AXBY: Lien's affixation analysis which assumes that there is a base (the pair of synonyms) in an AXBY to which an affix (the pair of antonyms) is attached, and my compounding analysis which assumes that there is a pattern A X B Y, consisting of two structurally, lexically and semantically parallel halves; and that the structural relation of A and X, B and Y is compounding [Points (A and B) vs. (D)]. I have then argued against the former and for the latter through the discussions of three issues: affix-base status, formation, and scrambling.

Lien's claim that in an AXBY the pair of antonyms is the affix and the pair of synonyms is the base [(B)] and his claim that the base determines the syntactic category of the AXBY while the affix has no effect on the matter [(E)] are very often mutually contradictory. His semantically based affix-base distinction also restricts the applicability of his analysis to only one class of AXBY, which contains a pair of antonyms and a pair of synonyms. As for the process of affixation, special ad hoc mechanisms need to be stipulated for the splitting, crisscrossing, and proper ordering of the affix and base. Most critically, there is no way of stating in strictly affixational terms the principles that govern the delicate contrastive ordering of AXBY elements in the formation process and in the scrambling operation.

By contrast, there is no need in the compounding analysis to distinguish affix and base on semantic grounds (or indeed on any grounds);

hence there is no limit to the classes of AXBY, with reference to the combination of synonyms and antonyms, that could be covered by the investigation. What needs to be specified is the essential structural, lexical, and semantic characteristics of the A X B Y pattern, and the compounding, hence syntactic, nature of the combinational mechanisms involved [(D)]. With an explicit model of A X B Y patterning, matters of formation and scrambling can be adequately accounted for by the most general principles of syntax and compounding of the language [(G), (J)].

On the basis of the above consideration, I would argue that the compounding analysis is better than the affixation analysis.

Concluding Remarks

There are constructions in languages which are neither fully regular nor absolutely irregular, in other words, neither governed by the general grammatical principles nor totally random. Fillmore et al. (1988) have theorized these as "special grammatical constructions" (cf. He 1989 for a brief review of some related notions, see also Cheng 1992). I believe that they exist not only at the levels of clause and phrase, but at the level of word as well. The Mandarin compounding pattern A X B Y has hence been conceived as a word-level special grammatical construction.

Finally, I should admit that I have taken AXBY as a morphological phenomenon because my attention has so far been limited to the AXBY expressions which are word-like units. But I contend that the A X B Y pattern is also used for constructing phrase- and clause-like units. A lot more work needs to be done before we can better understand the nature of this fascinating pattern.

References

- Anderson, Stephen R. 1985. Typological distinctions in word formation. Language typology and grammatical description, Vol.3: Grammatical categories and the lexicon, ed. by Timothy Shopen, 3-56. Cambridge: Cambridge University Press.
- Bright, William. 1990. 'With one lip, with two lips': Parallelism in Nahuatl. *Language* 66.437-52.
- Chao, Yuen Ren. 1968. A grammar of spoken Chinese. Berkeley: University of California Press.
- Cheng, Robert L. 1992. Cíhuì yǔ cífǎ xiànxàng: Táiwānhuà de dài-míngcí (Lexicon and morphology: Pronouns in Taiwanese). *Proceedings of IsCLL III*, 162-88.
- Fillmore, Charles, Paul Kay, and Mary O'Connor. 1988. Regularity and idiomaticity in grammatical constructions. *Language* 64. 501-38.
- He, Zili (Ho, Chee Lick). 1989. Idiomaticity in language: Cultural awareness and creative usage. University of Kansas Dissertation.
- _____. 1990. "nǐ X wǒ Y": A formal idiom in Chinese. *Proceedings of the 16th Annual Meeting of the Berkeley Linguistics Society*, 153-62.
- Kao, Karl S.Y. 1984. Rhetorical devices in the Chinese literary tradition. *Tamkang Review* 14.325-37.
- Li, Yihua, and Lu, Deshen. (ed.) Hànyǔ chéngyǔ cídiǎn (A dictionary of Chinese idioms). Chéngdū: Sìchūān Dictionary Publisher.
- Li, zuonan, and Li, Renxiao. 1985. Gǔ jīn Hànyǔ yǔfǎ bǐjiào (A comparative study of Classical and Modern Chinese). Huerhaote: Inner-Mogolian People's Publisher.
- Lien, Chinfa. 1989. Antonymous quadrinomials in Chinese. *Journal of Chinese Linguistics* 17.263-305.
- Liu, Shaotang. 1985a. Púliǔrénjiā. Beijing: Rénmín Wénxué Chūbǎnshè.
- 1985b. Yāncūnsìwǔjiā. Shanghai: Shànghǎi Wényì Chūbǎnshè.
- Lu, Zhiwei et al. 1975. Hànyǔ de gòucífǎ (Chinese morphology). Hong

Kong: Zhōnghuá Bookstore.

Matthew, P.H. 1974. Morphology. Cambridge: Cambridge University Press.

Norman, Jerry. 1988. Chinese. Cambridge: Cambridge University Press.

Spencer, Andrew. 1991. Morphological theory. Oxford: Basil Blackwell.

Wan, Huizhou. 1989. Hànyǐng gòucífǎ bǐjiǎo (A comparison of Chinese and English word-formation). Beijing:

Xu, Zhaoben. 1980. Chéngyǔ zhīshī qiǎntán (An introduction to Chinese idioms). Beijing: Beijing Publisher.

Zhang, Shilu. 1985. cóng cíyì wèntí tán dào Hànyǔ zhōng de "lèiyìcí" (On lexical semantics and Chinese "LETYICI"). Zhōngguó Yǔwén Yánjiū (Research on Chinese Languages) 7. 61-66. Chinese University of Hong Kong.

Mandarin Prosodic Morphology: Evidence from Taboo Words

Yuchau E. Hsiao

National Chengchi University, Taipei

Abstract

A particular type of Mandarin taboo forms, *tamade*, exhibits salient properties of stress assignment in the event of tone loss. The rhythm of *tamade* arises from the notion of a morphological template --a left-headed foot template per se--which serves as the target for prefixation. The distinction between content words and function words are further attested: no adjacent content words are sanctioned in the *tamade* construction, while certain function words may undergo vowel deletion in fast speech. Vowel deletion of the sort motivates the phrasing of the clitic group as a rule domain. The domain mismatch between the foot and the clitic group continues the debate of a single prosodic hierarchy.

Introduction

In the early days of generative phonology, a part of morphology is assigned to phonology and a part to syntax (Szpyra, 1989). With the discovery of new evidence, recent studies have re-employed the traditional perspective that morphology is a separate component. The issues widely debated thus surround the nature of the interface between morphology and other linguistic components: the syntax-morphology connection developed in work by Baker (1985), Corbett (1987), Kiparsky (1987), among

others; the phonology-morphology connection developed in work by Zwicky (1983), Booij (1985), Szpyra (1989) and the like. This paper intends to show that the prefixal variants of the *tamade* forms, a subset of Mandarin taboo words, are not so much attributed to morphosyntactic conditions but appear to be a subject of prosodic morphology. Specifically, the goal of this research is to argue that the relevant morphological changes must make reference to two types of prosodic categories, viz., the foot and the clitic group.

Morphosyntactic Bracketing

The *tamade* construction usually ends in a 'dirty morpheme' (DM); *bi* 'cunt', *niao* 'cock' or *shuang-waiwai* 'deviously happy', etc. The preceding elements exhibit structural properties that are quite different from the DM. Phonologically, the preceding elements, but not the DM, may lose their tones and be imposed a stress pattern.¹ Morphologically, the DM is either a nominal or an adjectival, while what precedes may derive a set of *tamade* variants. The phonological and morphological discrepancy makes it possible to posit the DM as the root to which the various *tamade* forms can be prefixed, and the morphosyntactic bracketing in (1) can be observed: (D = -de construction)

- (1) (a) $[[[ta-ma]^N -de]^D -[bi]^N]^{NP}$
 his-ma -'s -cunt
 (b) $[[ni-[[ta-ma] -de]^D]^D -[dan]^N]^{NP}$
 you- his-ma -'s -egg
 (c) $[[gan-[[ta-ma]^N -de]^D]^D -[shuang-waiwai]^A]^{VP}$
 fuck- his-ma -'s -happy-devious

1. There are, however, competitions between stress and tone such that the tone values of the *tamade* forms are not completely lost, though the imposition of stress renders a popular reading of these taboo words, as will be discussed in the rest of the paper.

The italics indicate the roots, which are frequently too offensive to be spelled out. In that event, the prefixal forms are by nature attached to the empty roots (Rs):

- (2) (a) $[[ta\text{-}ma]^N \text{-}de]^D \text{-}(R)$
 his-ma - 's
 (b) $[ni\text{-}[[ta\text{-}ma]^N \text{-}de]^D \text{-}(R)]^{NP}$
 you-his-ma - 's
 (c) $[gan\text{-}[[ta\text{-}ma]^N \text{-}de]^D \text{-}(R)]^V \text{-}VP$
 play- his-ma - 's

A convenient way to have a good grip of this idea of affixation is to look at some similar morphological bracketing in a couple of other languages: (*italics* = roots)

- (3) (a) $[[[o\text{-}[[slonic]^N \text{-}in]^A \text{-}ij]^V \text{-}aj\text{-}c]^V$ 'shine '
 $[[za\text{-}[rob\text{-}i]]^V \text{-}aj\text{-}c]^V$ 'earn '
 (Polish Complex Verbs; Szpyra, 1989: 110)
 (b) $[[re\text{-}[dis\text{-}[tribut]^V]^V \text{-}ion]^N$
 $[in\text{-}[[sensit\text{-}ive]^A]^A \text{-}ness]^N$
 (English Complex Nouns; Wolff, 1984: 144)

In terms of SPE, phonological rules operate cyclically on morphosyntactic structures; e.g., stress assignment would apply from the innermost bracketed unit outward, etc. What is intriguing about the Mandarin *tamada* forms, however, is that they are 'prosodically constrained'. Namely, they are subsumed under the prosodic template, the prosodic boundary and the prosodic hierarchy.

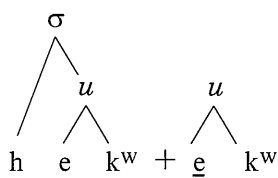
Prosodic Template

Recent linguists have used various types of prosodic templates to explain morphological phenomena. Sloan (1989) and Carlson & Bates

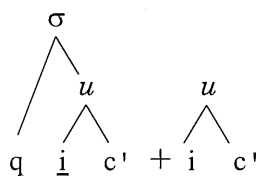
(1990) have proposed that a mora template may constitute the base for affixation. The Spokane data cited in Bates (1990: 2) are reproduced and elaborated below: (σ = syllable, u = mora)

(4) The mora as affix target

(a) Surface form: hek^wk^w 'opened a crack'



(b) Surface form: $qc'ic'$ 'open a crack'

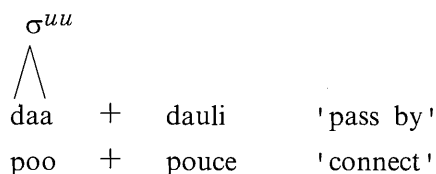


The double-underlines show the deleted vowels, which are unstressed. In either example above, the reduplicative affix copies only the VC mora of the monosyllabic root, followed by the deletion of the relevant unstressed vowel such that the surface forms hek^wk^w and $qc'ic'$ can be derived.

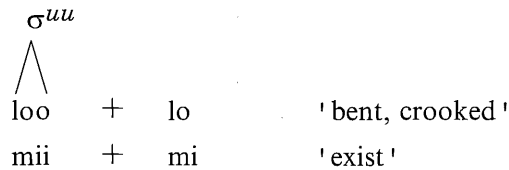
Bates (1990) and others later take seriously the analysis of McCarthy & Prince (1986) that reduplication makes reference to a syllable template: (McCarthy & Prince 1986: 21-24)

(5) The heavy syllable (σ^{uu}) as prefix target

(a) Mokilese



(b) Panopean

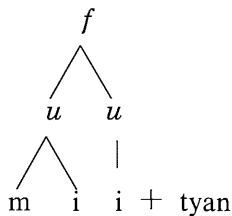


Both the CVG-initial base in (5)(a) and the CV base in (5)(b) give a CVV prefix, which obviously is not a purely segmental matter, but involves a process of filling out the heavy-syllable template. It is the filling of the prefixal σ^{uu} template that guarantees the derivation of *daa* instead of *da*, and that of *loo* instead of *lo*.

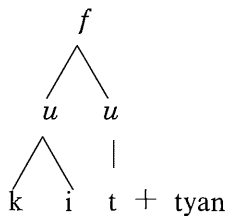
Poser (1990) argues for a template of a higher prosodic category, i.e., a foot template (hereafter, *f*-template), in forming Japanese hypocoristics. As he observed, the base for hypocoristic suffixation must fill out a template of a bimoraic foot, and thus a monomoraic base would have to derive a second mora: (Poser 1990: 87)

(6) The bimoraic *f* as base target

(a) Second mora: obtained by lengthening [i]



(b) Second mora: obtained by gemination of [t]



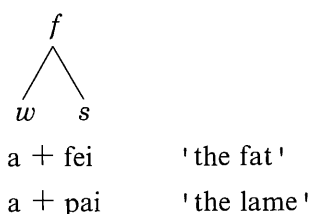
(6) shows that in hypocoristics formation the second mora of the base can be derived either by lengthening the vowel of the base, as in (6)(a),

or by gemination of the first consonant in the suffix, as in (6)(b).

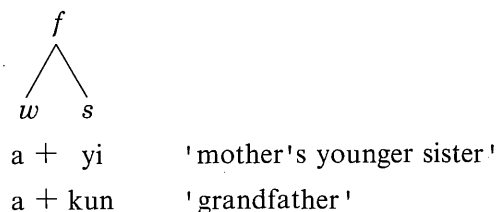
Similar observations are made in Yip's (1992) article, where prefixation to Cantonese kinship terms is found in an attempt to fill a disyllabic and iambic *f*-template: (Yip 1992: 29).² (*w* = weak node; *s* = strong node)

(7) The disyllabic/iambic *f* as base target

(a) Nicknames



(b) Family relations



The prefixal *a*-, accompanied by the derived stress of the second syllable, is considered the result of aligning a monosyllabic input to a disyllabic/iambic output template.³ It is based on the notion of the prosodic template being targeted that I will address the phenomena of *tamade* prefixation.

These taboo forms have a popular reading in which they lose their tones while a left-prominent stress pattern is imposed on them: (H = high tone; L = low tone; N = neutral tone; *s* = strong node; *w* = weak node)

2. These data, cited in Yip (1992), are originally taken from Whitaker (1955-56).

3. For other elaborations of template morphology, cf. Chung (1989), Ito (1989), Kiparsky (1989), Yin (1989), Mester (1990), McCarthy & Prince (1990), and Chiang (1992).

- (8) (a) ma-de + (R)
 H N reading 1
 s w reading 2
- (b) ta-ma-de + (R)
 H H N reading 1
 s w w reading 2

It is the second reading that constitutes the essence of the relevant taboo rhythm, where either a binary left-headed $f(s\ w)$ or a ternary left-headed $f(s\ w\ w)$ is chosen.⁴ In other words, the prosodic f serves as a template target and the 'taboo prefixes' must fill the output template to derive the surface rhythmic structure. Consider now (9):

- (9) (a)
- $$\begin{array}{c} f \\ \swarrow \quad \searrow \\ s \quad w \end{array}$$

+

$$\begin{array}{c} f \\ \swarrow \quad | \quad \searrow \\ s \quad w \quad w \end{array}$$

(R)
- cao-ni-ta-ma-de
 fuck-you-his-ma-'s

- (b)*
- $$\begin{array}{c} f \\ \swarrow \quad | \quad \searrow \\ s \quad w \quad w \end{array}$$

+

$$\begin{array}{c} f \\ \swarrow \quad \searrow \\ s \quad w \end{array}$$

(R)
- cao-ni-ta-ma-de
 fuck-you-his-ma-'s

- (c)*
- $$\begin{array}{c} f \\ \swarrow \quad \searrow \\ s \quad w \end{array}$$

+

$$\begin{array}{c} f \\ \swarrow \quad \searrow \\ s \quad w \end{array}$$

(R)
- cao-ni-ta-ma-de
 fuck-you-his-ma-'s

The fact that only (9)(a) is well-formed indicates a need of certain condi-

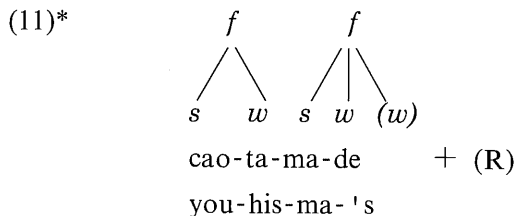
4. The metrical head refers to the constituent marked with s (cf. Hayes, 1982; Hogg & McCully, 1987).

tions for the prefixal forms to satisfy the *f*-template. I propose the principles in (10) to account for cases like (8) and (9):

(10) *f*-Targeting.

- (a) The *f*-template serving as a prefix target must contain at least one left-headed *f*, binary or ternary.
- (b) From left to right, binary *fs* are selected prior to ternary *fs*.
- (c) No stray syllables or unaligned templatic nodes are allowed.

These principles ensure that the prefixal input *cao-ni-ta-ma-de* must fill an output template consisting of a binary foot followed by a ternary foot, as shown in (9)(a). (10)(b) eliminates (9)(b), since ternary *fs* should not be selected before binary ones; (9)(c) is then excluded by (10)(c), which allows no stray syllable -- nor unaligned templatic node like that in (11):

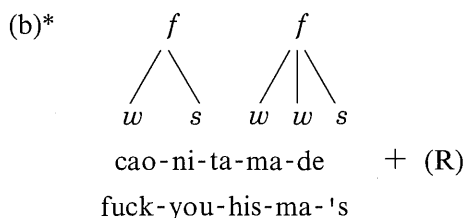
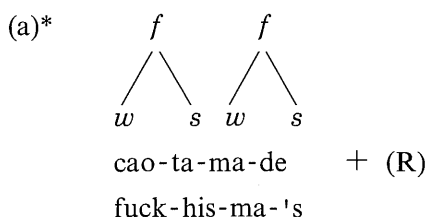


The *f*-template in (11) is not satisfied since the final *w* node remains unaligned; in fact, the ternary foot would never be selected when a binary one could do the job, as (10)(b) dictates.

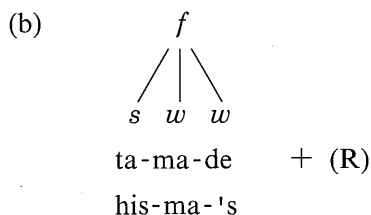
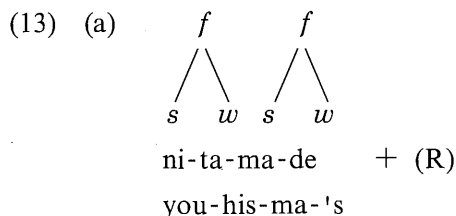
The left-headed *fs* constituting a morphological template are not at all by accident, but they may be related to other morphophonological phenomena. For example, the Mandarin reduplicative *jie-jie* 'sister', displaying a neutral tone on the second syllable, fills a binary left-headed foot; the compound *na-qi-lai* 'pick up' fills a ternary left-headed foot when the resultatives *-qi-lai* carry neutral tones (for further discussions, cf. Hsiao & Wu, 1994). The left-to-right assignment of the *f*-template is by no means an arbitrary stipulation, but it reveals a natural cor-

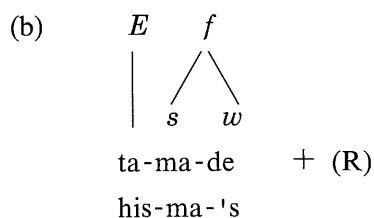
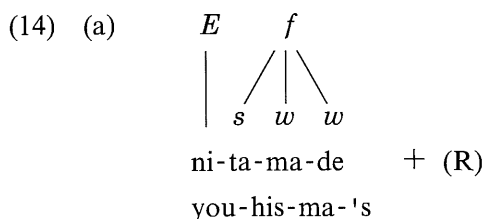
respondence between phonology and morphology, as prefixation is a left-to-right operation as well. (12) shows then that illegal stress patterns would be derived in the surface when right-headed *f*s are targeted:

(12) Right-headed *f*-template



Reviewing (8)(b) and (9)(a), one may find that the third person pronoun *ta* must be stressed, in contrast to the general treatment of function words being a less prominent category (cf. Martin, 1970; Liberman & Prince, 1977; Hayes, 1983; Hogg & McCully, 1987; Goldston, 1990; and Hsiao, 1991). Yet what exactly happens here is that the process of *f*-Targeting does not discriminate between grammatical categories. Compare now (13) and (14): (*E* = extrametrical)





(13) and (14) are alternative readings; *ni* and *ta* in (13) are singly aligned with a strong node, while in (14) they are of **extrametricality**. An extrametrical element is "ignored by the stress rules; that is, treated as if it were not there" (Hayes, 1982; 227), and is outside of the prosodic system (Sietsema, 1989; Ladd, 1990; Goldsmith, 1990). In the case of (14), *ni* and *ta* are invisible to the process of *f*-Targeting; therefore, (14)(a) fills a ternary foot, and (14)(b) a binary one, in conformity with the principles in (10). Following Pierrehumbert & Beckman's (1989) postulation that an extrametrical node pertains to a level immediately higher, *E* in (14) is a sister node of *f*, and thereby outside of the template system. Extrametricality must be assigned to a designated edge, e.g., the right edge in English (Hogg & McCully, 1987; Hayes, 1982), etc. The Mandarin taboo prefixes, on the other hand, illustrate a case of the left edge extrametricality, which can be formalized as follows:

$$(15) \quad \sigma \longrightarrow E / {}^{Pf} [_ \dots$$

where σ = functor syllable, Pf = taboo prefix

What this rule says is that the functor syllable at the left edge of the taboo prefix is an extrametrical element, which is then ignored by the principles of *f*-Targeting. The alternative rhythms in (13) and (14) demonstrate that extrametricality is an optional rule; the initial *ni* and *ta* can be

either stressed or extrametrical. However, *wo* in (16) behaves in a quite restricted way:

- (16) (a)
$$\begin{array}{c} \text{E} \qquad \qquad f \qquad \qquad f \\ | \qquad \swarrow \searrow \swarrow \searrow \swarrow \searrow \\ \text{s} \quad \text{w} \quad \text{s} \quad \text{w} \quad \text{w} \\ \text{wo} \text{ cao-ni-ta-ma-de} \\ \text{I fuck-you-his-ma-'s} \end{array} \quad + \text{ (R)}$$
- (b)*
$$\begin{array}{c} \qquad \qquad f \qquad \qquad f \qquad \qquad f \\ \swarrow \searrow \swarrow \searrow \swarrow \searrow \swarrow \searrow \\ \text{s} \quad \text{w} \quad \text{s} \quad \text{w} \quad \text{s} \quad \text{w} \\ \text{wo-cao-ni-ta-ma-de} \\ \text{I-fuck-you-his-ma-'s} \end{array} \quad + \text{ (R)}$$

(16)(a) establishes that the first person pronoun *wo* must be assigned extrametricality; it cannot be aligned to a strong node, as in (16)(b).

The peculiar nature of *wo* instantiates a three-way relationship between pragmatics, morphosyntax, and morphophonology. Pragmatically speaking, nobody would use his/her mother's sexual organs to curse people. This pragmatic constraint is reflected in the morphosyntax of the *tamade* forms: (V = verb; O = object)

- (17) (a) $[\text{cao}]^V\text{-ta-ma-de-}[\text{bi}]^O$
fuck-his-ma-'s-cunt
- (b) $[\text{cao}]^V\text{-ni-ma-de-}[\text{bi}]^O$
fuck -your-ma-'s- cunt
- (c)* $[\text{cao}]^V\text{-wo-ma-de-}[\text{bi}]^O$
fuck -my-ma-'s- cunt
- (d) $\text{wo-}[\text{cao}]^V\text{-ta-ma-de-}[\text{bi}]^O$
I- fuck-his-ma-'s-cunt
- (e) $\text{wo-}[\text{cao}]^V\text{-ni-ma-de-}[\text{bi}]^O$
I- fuck-your-ma-'s-cunt
- (f) $\text{wo-}[\text{cao}]^V\text{-ni-ta-ma-de-}[\text{bi}]^O$
I- fuck-your-his-ma-'s-cunt

(17)(a) through (c) show that the first person pronoun, *wo*, can not occur within the morphosyntactic V-O scope, while (17)(d) through (f) indicate that it can be found in subject position and behave as an agent outside of the V-O scope. This morphosyntactic condition of *wo* manifests an access to the prosody, as we have observed earlier in (16) that *wo* is outside of the template system and assigned extrametricality; *f*-Targeting operates within the morphosyntactic V-O domain only.

Prosodic Boundary

The basic rationale of positing the *f*-template is drawn from three critical notions developed in the literature: namely, (1) morphological processes (such as affixation and so forth) are frequently required to satisfy a certain prosodic template (McCarthy & Prince, 1986), (2) stress assignment is a matter of determining the relative prominence of syllables (Liberman & Prince, 1977), and (3) the foot may constitute a domain to which stress rules apply (Nespor & Vogel, 1986). In addition to the foot, the clitic group (*C*) serves as another kind of rule domain relevant to the prefixal taboo forms. *C* is generally defined as consisting of a content word joined by a number of function words (Nespor & Vogel, 1986; Hayes, 1989). Prosodic phonologists like Zec (1988) and Kanerva (1989) have argued against the *C* level and characterized it as a postlexical phonological word, but in this section I will put forward the indispensability of the *C* level.

One of the reasons for Hayes (1989) to posit the *C* level arises from the phenomenon of English consonant deletion -- /v/ in particular. His examples are cited in (18) and (19), where the deleted consonants are double-underlined: (Hayes, 1989: 209)

- (18) (a) [Will you save me]^C [a seat?]^C
(b)* [We'll sae]^C [those people]^C [a seat]^C

- (19) (a) [a piece]^C [of pie?]^C
 (b)* [It was thought of]^C [constantly]^C

In English fast speech, a [v] or [f] followed by a [-syllabic] segment is deleted within the domain of *C*, as in the (a)s above, though the consonant deletion does not occur *C*-finally, as in the (b)s. In other words, the *C*-boundary in English is marked at the right edge of the clitic group, and the existence of the *C*-boundary blocks the *v*-deletion rule. Hayes' idea of *C*-formation highly conforms to morphosyntactic bracketings, e.g., *me* in (18)(a) cliticizes to its VP head *save*, while *those* in (18)(b) cliticizes to its NP head *people*. Per contra, Nespor & Vogel draws on data from Greek and finds that a clitic may in fact adjoin syntactically to one direction and phonologically to another direction. The latter notion is in fact central to our analysis of *tamade* forms. Consider (20), where a function word may undergo vowel deletion in fast speech: (the deleted vowels are double-underlined)

- (20) (a) qu-ta-guma-de + chun-tian
 go-his-aunt-'s spring-time
 (b) diao-ni-niang-de + jenzhu-yian
 suck-your-mum-'s pearl-eye

Given the conventional definition of the clitic group as formed by a content word and one or more function words, vowel deletion in these taboo forms may also be sensitive to the domain of *C*. In (21), I propose a pair of *C*-Phrasing principles: (*w* = phonological word)

- (21) *C*-Phrasing.
 (a) The domain of *C* consists of a *w* containing a single content word (*w_c*) and at least one *w* containing a function word (*w_f*).
 (b) *C*s are phrased from left to right, and no single stray *w* is allowed.

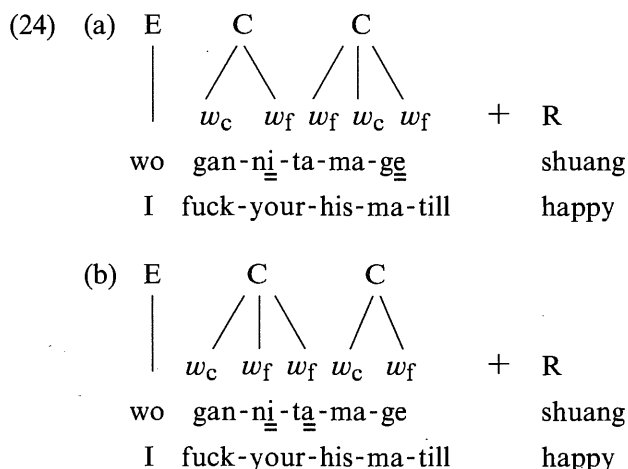
Again, the left-to-right *C*-phrasing is consistent with the rightward directionality of the prefixal operation, indicating a connection between prosody and morphology. Given the principles in (21), either line in (20) can be divided into two *C*s, i.e., [*qu-ta*]^C and [*guma-de*]^C in (20)(a), and [*diao-ni*]^C and [*niang-de*]^C in (20)(b). As a result, the *C*-final function words have their vowels deleted. The next question then is to what extent the *C*-boundary may interact with the vowel deletion rule. (22) discloses the mystery:

- (22)
- | | | | |
|------|---|---|---------|
| | C | | |
| | / \ | | |
| | <i>w_f</i> <i>w_f</i> <i>w_c</i> <i>w_f</i> | + | R |
| (a) | ni-ta-nainai-de | | babikiu |
| | your-his-grandma-'s | | B.B.Q. |
| (b)* | ni-ta-nainai-de | | babikiu |
| | your-his-grandma-'s | | B.B.Q. |

There is only one content word in (22), i.e., *nainai*, which, therefore, groups together the function words *ni*, *ta* and *de* to form a single *C*. Notice that in the case of (22)(a), not only the *C*-final *de* but also the *C*-internal *ta* undergoes vowel deletion. It becomes clear that the rule of vowel deletion applies to any function word which is not in the initial position within the domain of *C*. The formal representation of this rule can be formulated as (23): (V = vowel; C = consonant; *C* = clitic group)

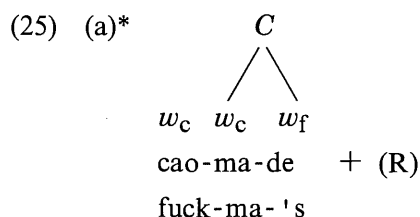
- (23) $V \longrightarrow \emptyset / [w^n [C ___]^{w_f} (X)]^C$ where $n > 0$; X = any *w*(s).

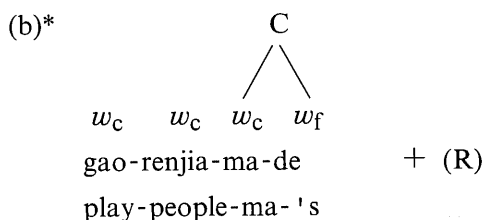
(23) prevents [i] of *ni* in (22) from being deleted, and rules out the (b) pattern. In addition, this rule correctly sanctions the following readings:



In (24), *wo* is assigned extrametricality, aligned to *E* at the level immediately higher as a sister node of *C* (see the discussions of (16) through (17)), while *C*-Phrasing operates from left to right, deriving (a) and (b) as two alternative patterns. In (24)(a), *ta* pertains to the first clitic group and thus is subject to vowel deletion; whereas it adjoins to the second clitic group in (24)(b), for which the rule is not applicable. It should be noted that this w_f vowel deletion rule works merely on an optional basis, and applies only to fast speech. The lines in (24) are in fact very often produced with 'undeleted' vowels.

On the one hand, the boundaries of clitic groups serve to confine the deletion rule; on the other hand, the *C*-Phrasing principles in (21) may act to govern the well-formedness of the *tamade* construction. To be precise, the clitic groups constitute a target template, which must be satisfied by the taboo prefixes. An inevitable consequence of filling the *C*-template is that no adjacent content words can be found in the prefixes, but at least one function word should be distributed in between; both combinations in (25) are thus excluded:

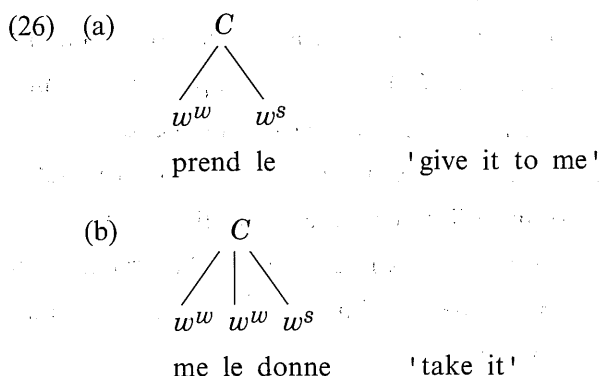




(25)(a) has a stray w_c , *cao*, and (25)(b) has two, *gao* and *renjia*. No individual w_c of the three can form a single clitic group, since the latter must include at least one w_f in addition to the host w_c , as (21)(a) dictates. The existence of the stray phonological words, prohibited by (21)(b), eventually results in the ill-formed patterns of (25).

Prosodic Hierarchy

The domains of C in English and Chinese play a similar role in constraining segmental rules; that is, the applicability of these rules is 'positionally decided'. Nespor & Vogel (1986) propose that suprasegmental rules can also be determined positionally in regard to C -structure. Stress assignment in French, for example: (Nespor & Vogel, 1986: 156)



(26) shows that the rightmost phonological word in a clitic group is the strong node (w^s) while the rest are weak nodes (w^w). Similarly, the positionally assigned stress is also found in Mandarin *tamade* constructions, where stress falls on the phonological word at the left edge of the

clitic group:

- (27) (a)

$$\begin{array}{c} C \\ \swarrow \quad | \quad \searrow \\ w^s \quad w^w \quad w^w \\ \text{qu-ni-de} \\ \text{go-yours} \end{array}$$
- (b)

$$\begin{array}{c} C \\ \swarrow \quad | \quad \searrow \\ w^s \quad w^w \quad w^w \\ \text{gan-ta-de} \\ \text{fuck-hers} \end{array}$$
- (c)

$$\begin{array}{c} C \\ \swarrow \quad | \quad \searrow \\ w^s \quad w^w \quad w^w \\ \text{ta-ma-de} \\ \text{his-ma-'s} \end{array}$$
- (d)

$$\begin{array}{c} C \\ \swarrow \quad \searrow \\ w^s \quad w^w \\ \text{ma-de} \\ \text{ma-'s} \end{array}$$

An legitimate doubt of the motivation of the clitic group and/or the foot could be raised based on (27), since both types of prosodic categories occur to coincide with one another. The contrast between (28)(a) and (b) may serve to clear the doubt:

- (28) (a)

$$\begin{array}{c} f \quad f \\ \swarrow \searrow \swarrow \searrow \\ s \quad w \quad s \quad w \\ \text{ni-ta-ma-de} \\ \text{you-his-ma-'s} \end{array}$$
- (b)

$$\begin{array}{c} C \\ \swarrow \quad \searrow \\ w^s \quad w^w \quad w^w \quad w^w \\ \text{ni-ta-ma-de} \\ \text{you-his-ma-'s} \end{array}$$

Of the examples above, alternative readings are derived when stress assignment is conditioned by different prosodic categories. (28)(a) forms two

binary left-headed feet, exhibiting a $[s\ w\ s\ w]$ pattern, while (28)(b) constitutes a single clitic group, and thereby derives a different reading, $[s\ w\ w\ w]$. Further motivations can be observed from the comparison of (29) and (30):

- (29) (a)
- | | |
|--|--------|
| $\begin{array}{c} C \quad C \quad C \\ \diagdown \quad \diagup \quad \diagdown \quad \diagup \quad \diagdown \quad \diagup \\ w^s \quad ww \quad w^s \quad ww \quad w^s \quad ww \quad ww \end{array}$ | +R |
| cao-ni-ma-de-ta-nainai-ge | shuang |
| fuck-you-ma-'s-his-grandma-till | happy |
-
- (b)
- | | |
|--|--------|
| $\begin{array}{c} C \quad C \quad C \\ \diagdown \quad \diagup \quad \diagdown \quad \diagup \quad \diagdown \quad \diagup \\ w^s \quad ww \quad w^s \quad ww \quad ww \quad w^s \quad ww \end{array}$ | +R |
| cao-ni-ma-de-ta-nainai-ge | shuang |
| fuck-you-ma-'s-his-grandma-till | happy |
-
- (30)
- | | |
|--|--------|
| $\begin{array}{c} f \quad f \quad f \\ \diagdown \quad \diagup \quad \diagdown \quad \diagup \quad \diagdown \quad \diagup \\ s \quad w \quad s \quad w \quad s \quad w \quad w \end{array}$ | +R |
| cao-ni-ma-de-ta-nainai-ge | shuang |
| fuck-you-ma-'s-his-grandma-till | happy |

(29)(a) and (b) are two alternative stress patterns, obtained from different phrasings of the clitic groups, in accordance with the principles in (21). Per contra, the f -Targeting principles in (10) can derive one stress pattern only, as in (30). It should be clear then that the foot and the clitic group can be respectively targeted for different morphophonological purposes.

The prosodic phrasings in (29)(b) and (30), however, poses a problem regarding the relationship between the foot and the clitic group, as structurally described in (31):

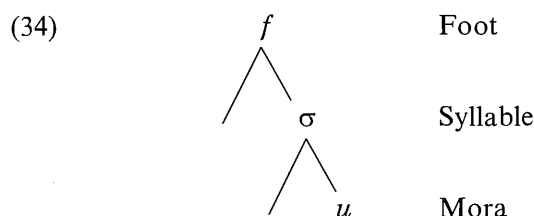
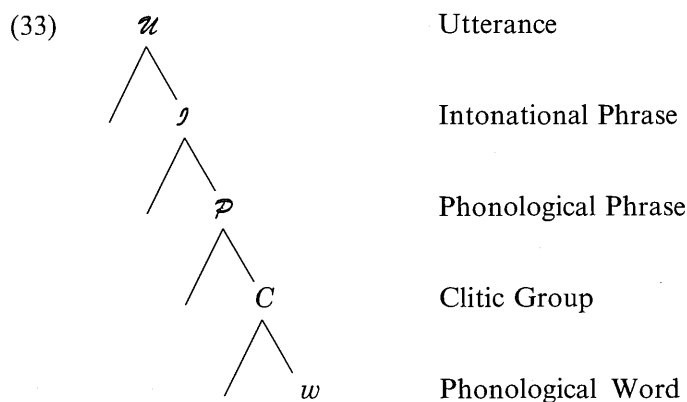
- (31)
- | | | | |
|---------------------------------|--------------------------------|--------------------------------|--------|
| f | f | f | |
| $\swarrow \searrow$ | $\swarrow \searrow$ | $\swarrow \downarrow \searrow$ | |
| $s \quad w$ | $s \quad w$ | $s \quad w \quad w$ | +R |
| cao-ni-ma-de-ta-nainai-ge | | | shuang |
| fuck-you-ma-'s-his-grandma-till | | | happy |
| $w^s \quad w^w$ | $w^s \quad w^w$ | $w^w \quad w^s \quad w^w$ | |
| $\swarrow \searrow$ | $\swarrow \downarrow \searrow$ | $\swarrow \downarrow \searrow$ | |
| C | C | C | |

There is a prosodic mismatch in (31): the third foot straddles the last two clitic groups while the second clitic group crosses the last two feet, in conflict with the theory of a single prosodic hierarchy developed by Nespor & Vogel (1986), etc. This theory proposes a hierarchy that goes downward from the entire utterance at one end, and upward from the syllable at the other, as in schematized in (32):

- (32)
-
- U Utterance
- I Intonational Phrase
- P Phonological Phrase
- C Clitic Group
- w Phonological Word
- f Foot
- σ Syllable

A second violation of this strength hierarchy can also be found in (31), or other examples, i.e., a foot in those data appear to incorporate two or three phonological words. Cases like (31) seriously purport the falsifi-

ability of the well-known Strict Layer Hypothesis (SLH), which states that a constituent at a given level in the prosodic hierarchy is formed only from constituents immediately lower than itself (cf. Selkirk, 1984; Nespor & Vogel, 1986; Hayes, 1989; Ladd, 1990; Hsiao, 1991). In other words, SLH excludes the possibility of foot assignment being applied across phonological words, clitic groups, or categories at any higher level. It is thus imperative to posit two independent prosodic hierarchies such that the conflict with SLH in question can be resolved:



The first prosodic hierarchy, as in (33), consists of categories from the utterance down to the phonological word; the second prosodic hierarchy, as in (34), includes the mora, the syllable, and the foot. The separate prosodic hierarchies reveal different functions in mapping (morpho) phonological output. I have shown earlier that both the foot and the clitic group can be used to account for the prefixal changes of the *tamade* construction. For various elaborations of the separate prosodic hierarchy theory, see also Selkirk (1986), Zec (1988), Inkelas (1989), and Kanerva

(1989). Further evidence from Chinese dialects in support of this theory is observed, for instance, in Hsiao (1991) that tone sandhi in Mandarin and Taiwanese may be conditioned by either prosodic hierarchy to derive a variety of alternative readings.⁵

Concluding Remarks

In the last two decades, taboo words have been a serious subject perused through various linguistic frameworks, formal or informal, such as Siegel (1974), Aronoff (1976), McCawley (1978), McMillan (1980), Jay (1981), McCarthy (1982), H. Chen (1987), Huan & Tian (1990), Chang (1992) and Hsiao (1992), etc. This paper takes a theoretical perspective to look at the diverse forms of *tamade*, and sets forth several criteria for Mandarin prosodic morphology incorporating three pivotal theories in the mainstream of phonology, i.e., the theories of the morphological template, the end-based boundary and the prosodic hierarchy.⁶ As the pre-

5. Mandarin tone sandhi operates either cyclicly on the foot or simultaneously in the intonational phrase; in Taiwanese, the phonological phrase gives a speech tonal reading, while foot-conditioned tone sandhi results in a poetic rendering (cf. Hsiao, 1991, 1993).

6. For other works on the prosodic/metrical template related to Chinese dialects, see M. Chen (1979), Wright (1983), Tso (1990) and Hsiao (1991), among others.

* The following are the symbols and abbreviations used in this paper:

=	deleted segment
σ	syllable
C	clitic group
E	extrametrical node
f	foot
H	high tone
ℓ	intonational phrase
L	low tone
N	neutral tone
P	phonological phrase
s	strong node
R	root
U	utterance
u	mora
w	weak node
w	phonological word
w _c	phonological word containing a content word

sent research unfolds, we observe that the prefixal *tamade* forms must fill an output template, which is defined on a prosodic basis (the foot, and/or the clitic group). I have proposed the principles of *f*-Targeting and *C*-Phrasing to govern the well-formedness of the prefixal structures, and to confine the power of morphophonological rules, suprasegmental and/or segmental. The inevitable overlapping between different prosodic domains then leads to a demand on the separation of prosodic hierarchy. This study of the *tamade* construction reinforces the universal claim of the phonology-morphology interface, analyzing this distinctive set of taboo words in a novel fashion.

w_f	phonological word containing a function Word
w^s	phonological word which is a strong node
w^w	phonological word which is a weak node

References

- Aronoff, M. 1976. *Word Formation in Generative Grammar. Linguistic Inquiry*. Monograph 1. Cambridge: The MIT Press.
- Bates, D. 1990. "Internal Reduplication and Salish Prosodic Morphology." *WECOL*. 20: 1-8.
- Baker, M. 1985. "The Mirror Principle and Morphosyntactic Explanation." *Linguistic Inquiry*. 16: 373-415.
- Booij, G. 1985. "The Interaction of Phonology and Morphology in Prosodic Phonology." *Phono-Morphology: Studies in the Interaction of Phonology and Morphology*. E. Gussmann, ed. Lublin: Katolicki Uniwersytet Lubelski. 23-34.
- Carlson, B. and D. Bates. 1990. "Modeling Out-of-Control Reduplication in Spokane." Paper from ICSNL.
- Chang, T. 1992. "A Morphological and Syntactic Analysis of Chinese Dirty Expressions." National Chengchi University at Taipei, Manuscript.
- Chen, H. 1987. *A study of Chinese Lucky Words and Taboos*. Fu Jen Catholic University. MA Thesis.
- Chen, M. 1979. "Metrical Structure: Evidence from Chinese Poetry." *Linguistic Inquiry*. 10: 371-420.
- Chiang, W. 1992. *The Prosodic Morphology and Phonology of Affixation in Taiwanese and Other Chinese Languages*. University of Delaware. Ph. D Dissertation.
- Chomsky, N. and M. Halle. 1968. *The Sound Pattern of English*. New York: Harper & Row.
- Chung, R. 1989. *Aspects of Kejia Phonology*. University of Illinois at Urbana-Champaign. Ph.D dissertation.
- Corbett, G. 1987. "The Morphology-Syntax Interface." *Language*. 63, 2: 299-345.
- Goldsmith, J. 1990. *Autosegmental and Metrical Phonology*. Basil Blackwell Ltd.

- Golston, C. 1990. "Lexical Ordered Lexical Insertion." *WECOL*. 20: 113-126.
- Hayes, B. 1982. "Extrametricity and English Stress." *Linguistic Inquiry*. 13.2: 227-276.
- _____. 1983. "A Grid-Based Theory of English Meter." *Linguistic Inquiry*. 14: 357-393.
- _____. 1989. "The Prosodic Hierarchy in Meter." *Phonetics and Phonology*. 1: 201-260.
- Hogg, R. and C. McCully. 1987. *Metrical Phonology: A Course Book*. Reprinted (1989). New York: Cambridge University Press.
- Hsiao, Y. 1991. *Syntax, Rhythm and Tone: A Triangular Relationship*. Taipei: Crane Publishing Co.
- _____. 1992. "Tamade! When Morphology Interfaces with Syntax..." Paper presented at ICCL-1.
- _____. 1993. "On the Theories of Mandarin Foot Formation." Paper presented at ICSTLL-26.
- Hsiao, Y. and H. Wu. 1994. "The Morphosyntax, Semantics and Prosody of Mandarin Neutral Tone." National Chengchi University. Manuscript (in preparation).
- Inkelas, S. 1989. *Prosodic Constituency in the Lexicon*. Stanford University. Ph.D. Dissertation.
- Ito, J. 1989. "The Prosodic Theory of Epenthesis." *Natural Language and Linguistic Theory*. 7.2: 217-260.
- Jay, T. 1981. "Comprehending Dirty-Word Descriptions." *Language and Speech*. 24: 29-38.
- Kanerva, J. 1989. *Focus and Phrasing in Chichewa Phonology*. Stanford University. Ph.D. Dissertation.
- Kiparsky, P. 1987. "Morphology and Grammtical Relations." Stanford university. Manuscript.
- _____. 1989. "Compensatory Lengthening in Moraic Phonology." *Linguistic Inquiry*. 20, 2: 253-306.
- Ladd, R. 1990. "Compound Prosodic Domains." University of Edinburg. Manuscript.

- Lieberman, M. and A. Prince. 1977. "On Stress and Linguistic Rhythm." *Linguistic Inquiry*. 8: 249-336.
- Martin, J. 1970. "Rhythm-Induced Judgements of Word Stress in Sentences." *Journal of Verbal Learning and Verbal Behavior*. 9: 627-633.
- McCarthy, J. 1982. "Prosodic structure and expletive infixation." *Language*. 58, 3: 574-590.
- McCarthy, J. and A. Prince. 1986. "Prosodic Morphology." MIT. Manuscript.
- _____. 1990. "Foot and Word in Prosodic Morphology: The Arabic Broken Plural." *Natural Language and Linguistic Theory*. 8.2: 209-284.
- McCawley, J. 1968. *The Phonological Components of a Grammar of Japanese*. The Hague: Mouton.
- _____. 1978. "Where You Can Shove Infixes." *Syllables and Segments*. Bell, A. and J. Hooper, eds. 213-221. Amsterdam: North-Holland.
- McMillan, J. 1980. "Infixing and interposing in English." *American Speech*. 55: 163-183.
- Mester, A. 1990. "Patterns of Truncations." *Linguistic Inquiry*. 21, 3: 478-484.
- Nespor, M. and I. Vogel. 1986. *Prosodic Phonology*. Dordrecht: Foris Press.
- Pierrehumbert, J. and M. Beckman. 1989. *Japanese Tone Structure*. Cambridge: The MIT Press.
- Poser, W. 1984. *The Phonetics and Phonology of Tone and Intonation in Japanese*. MIT. Ph.D. dissertation.
- _____. 1990. "Evidence for Foot Structure in Japanese." *Language*. 66: 78-105.
- Selkirk, E. 1984. *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge: The MIT Press.
- _____. 1986. "On Derived Domain in Sentence Phonology." *Phonology Yearbook*. 3: 371-405. New York: Cambridge University Press.
- Siegel, D. 1974. *Topics in English morphology*. MIT, Ph.D. Dissertation.

tion.

Sietsems, B. 1989. *Metrical Dependencies in Tone Assignment*. MIT. Ph.D Dissertation.

Sloan, K. 1989. "Affixation to the Mora." Paper presented at the West Coast Conference on Formal Linguistics.

Szpyra, J. 1989. *The Phonology-Morphology Interface: Cycles, Levels and Words*. London and New York: Routledge.

Tso, W. 1990. *A Metrical Analysis of Mandarin Stress*. Georgetown University. Ph.D Dissertation.

Whitaker, K. 1955-1956. "A Study of the Modified Tones in Spoken Cantonese." *Asia Major*. 5: 9-36; 6: 184-207.

Wolff, S. 1984. *Lexical Entries and Word Formation*. IU Linguistics Club.

Wright, M. 1983. *A Metrical Approach to Tone Sandhi in Chinese Dialects*. University of Massachusetts at Amherst. Ph.D. Dissertation.

Yin, Y. 1989. *Phonological Aspects of Word Formation in Mandarin Chinese*. The University of Texas at Austin. Ph.D Dissertation.

Yip, M. 1992. "Prosodic Morphology in Four Chinese Dialects." *Journal of East Asian Linguistics*. 1, 1: 1-36.

Zec, D. 1988. *Sonority Constraints on Prosodic Structure*. Stanford University. Ph.D. Dissertation.

Zwicky, A. 1983. "An Expanded View of Morphology in the Syntax-Phonology Interface." *Proceedings of ICL*. 13: 198-208.

Lexicon and Morphology in a Compositional Cognitive Grammar: With Particular Reference to Chinese Verbal Compounds

Hsin-I Hsieh

University of Hawaii

Abstract

This paper discusses the nature of the lexicon and morphology in a Compositional Cognitive Grammar (CCG) by focussing on the treatment of the resultative verbal compounds (RVC's) (e.g. chi1 guang1 'eat up') in Mandarin Chinese. After a detailed discussion of RVC's, we also briefly discuss the verb object compounds (VOC's) (e.g. dan1 xin1 'worry') and the coordinate verbal compounds (CVC's) (e.g. zhui1 qiu2 'chase'). We show that as far as compound-internal cohesiveness is concerned, RVC's are less cohesive than VOC's and CVC's, and that between VOC's and CVC's, VOC's are less cohesive than CVC's. We claim that such distinctions may have psychological realities, subject to experimental proof.

0. Introduction

Compositional Cognitive Grammar (CCG) is a new theory. It aims to provide a descriptive framework that would systematically relate the form and meaning of a sentence without excessive ad hoc postulations. The compositional nature of the parallel syntactic and semantic struc-

tures would assure this aim. In addition, meaning is taken to be the cognitive content of a sentence but not its truth value, although a truth value interpretation based on the cognitive content could in principle be achieved. If form is largely determined by meaning and meaning sufficiently revealed through form, as seems reasonable to assume, then syntactic patterns should correspond closely to semantic ones. The compositional and cognitive nature of a grammatical theory would enable the theory to describe these correspondences in an economical way and would endow its postulated structures with cognitive and even psychological plausibility.

Due to an unfortunate historical twist, formalism and functionalism (now assuming the modern name of 'cognitivism') have long contended with each other for being the only sensible approach toward an understanding of language. Attempts to reconcile and balance these two extremes are as ancient as the conflict. Generative semantics (McCawley 1971, Lakoff 1971, Fillmore 1968) as an attempt to blend syntax and semantics may have failed technically, but its ideal of approaching a grammar simultaneously as a formal structure and a cognitive system has fueled many subsequent undaunted efforts to achieve a balanced description of grammar. CCG is an attempt in that apparently correct direction.

Specifically, CCG tries to provide a formal apparatus of syntactic description which has a built-in parallel scheme of semantic description. Although the semantic component has not been explicitly delineated, and only the syntactic component is being articulated, the parallel compositional nature of CCG between form and meaning ensures that the task of a viable semantic description is merely a matter of getting down to technique and detail, and is in no sense conceptually difficult to achieve.

If CCG is proved a viable theory, it would serve the following two purposes: (1) it would provide a meeting ground for extreme formalists and cognitivists, and beyond that, (2) it would be able to accommodate the insights and results of research from both the formalist and cognitivist schools within a syntactic framework that is justified not merely by the formal features but also by the cognitive properties of language. To

be brief, CCG would provide a common ground for settling some of the important disputes between formalism and cognitivism. Perhaps, the contention would remain perennial, and any attempt at a reconciliation would be mocked by both parties. But such mockery would be cynical. If Hegel was right, the cycle of thesis, antithesis, and synthesis is the only route toward human progress.

Our purpose in this paper is to briefly describe CCG and to show its application to the so-called Resultative Verb Compounds (RVC's) (e.g. chi guang 'eat up') in Mandarin Chinese. We will show that both the behaviors of RVC's that used to puzzle or elude linguists and those that have been adequately understood can have a reasonable and unforced integrated solution within the framework of CCG. After a detailed discussion of RVC's, we also briefly discuss the so-called Verb Object Compounds (VOC's) (e.g. dan xin 'worry') and Coordinate Verb Compounds (CVC's) (e.g. zhui qiu 'chase'). We show that in terms of compound-internal cohesiveness, RVC's are less cohesive than VOC's and CVC's, and that between VOC's and CVC's, VOC's are less cohesive than CVC's. We claim that this difference in cohesiveness is not merely an artificial result of our theory but reflects a psychological reality, which can be proved or disproved by means of the kind of psycholinguistic experiments that Samuel H. Wang (1991, 1992, 1993) has been conducting on Taiwanese tone sandhi. Specifically, we claim that RVC's are syntactically generated and CVC's are lexically provided, with VOC's being sometimes generated and sometimes provided. If this claim is true, then Wang's experiments should show that in Taiwanese and other Chinese dialects having tone sandhi, experiment-subjects (and also children) acquire the correct tone sandhi forms for RVC's faster than for CVC's, since learning RVC's as a uniform syntactic pattern presumably requires less time than learning CVC's individually as separate lexical items.

1. CCG

CCG is an articulate formulation of an integrated theory based on

three key ideas. The first is competition of rules (Wang 1969, Chen and Wang 1975, Chen and Hsieh 1971, Cheng and Wang 1971, Lien 1987, Ogura 1990, Shen 1990) and more generally interaction of grammatical forces (Hsieh 1990, 1991, Cheng 1991a, b, c, Chang 1991a, b, Her 1991a, b, c, Zhu 1991, 1992, M-L. Hsieh 1991, Gai 1991); the second is the continuous conflict and reconciliation between the expressive, iconic need and the economic, mathematical need in a language (Cheng 1991a and personal communication); and the third is the idea suggested by Tai (personal communication) that Chinese and by extension iconically oriented languages like Chinese need only two 'deep' syntactic categories, namely, nouns and verbs. Regarding the third notion, Grimshaw (1991) has recently formalized a universal theory that recognizes only 'deep' NP's and VP's. Much of the technical innovation in CCG is derived from my earlier work on mathematical syntax (Hsieh 1986), which is indebted to Montague grammar for the concept of compositionality.

In CCG, we assume that language mirrors reality through constructed cognitive patterns. These patterns are 'iconic' because they organize objects, actions, and situations naturally according to temporal, spatial, or saliency orders and groupings. Semantics and syntax in a cognitive pattern are both 'compositional,' since two parallel recursive procedures operate, one on form and one on meaning, to combine two iconically proximate elements into a higher-order element. The form-meaning match that originates in the composing elements is preserved in the higher-order composite element, since composition disrupts neither syntactic nor semantic structure.

A fresh expression represents a cognitive pattern whose meaning and form correspond exactly. However, as this expression develops in history, need for speech economy may prevail over need for iconic accuracy to reduce and dislocate some of its elements. Such dislocations disrupt the full syntactic compositionality and distort the exact correspondence (of form to meaning). Languages therefore adopt as many abstract compensatory morpho-syntactic marking devices as possible in order to preserve syntactic compositionality indirectly, and become 'abstract' in

varying degrees. The more iconic type (like Chinese) shows a stricter correspondence but fewer morpho-syntactic devices. The more abstract type (like English) displays a looser correspondence but more morpho-syntactic schemes (Tai 1985, 1989, personal communication). 'Iconic accuracy' and 'speech economy' as two forces perpetually undergo a system-wide interaction, which Jespersen (1965) called 'flux' and Wang (1969) 'competition.'

To achieve a balance between postulations and constraints, CCG blends viable existent concepts and techniques. Like LFG (Kaplan and Bresnan 1982, Bresnan 1982, Bresnan and Kanerva 1989, Her 1991b), CCG has four grammatical components: IS (Iconic/Conceptual Structure), TS (Thematic Structure), FS (Functional Structure), and CS (Constituent Structure). It adds one component: SS (Semantic Structure). SS maps into IS, and IS maps into TS, FS, CS, separately rather than successively like in LFG (Huang 1989). An element in each one of the four structures is a representation in that structure. Hence, SSr, ISr, TSr, or CSr refers to a single such representation, and SSrr, ISrr, TSrr, or CSrr refers to a number of such representations.

Each SSr is compositionally constructed and cognitively motivated (Langacker 1987, 1991, Jackendoff 1983, 1989, 1990, Talmy 1985, Tai 1985, 1989, 1992, Hsieh 1989). The two constituent elements of every composition in an SSr are related as one 'primary' element ('p') to one 'secondary' element ('s'). In general, we preserve the 'p/s' ('p to s') relation in the inter-componential mappings, thereby making these mappings homomorphisms. Where the 'p/s' relation is not preserved, at least the meaning relation is. As a consequence, these mappings preserve sentence meaning, and each non-ambiguous CSr has a unique corresponding SSr, ISr, TSr, and FSr. Understanding a (contextually disambiguated) sentence means constructing its CSr and finding the unique SSr corresponding to this CSr. The content of an SSr (i.e. sentence meaning) can be compositionally computed in terms of cognitive features or in terms of set theory and logic as in Montague Grammar (Dowty et al. 1981, Partee 1987), Categorical Grammar (Oehrle et al. 1988, Moortgat

1988), or situational semantics (Barwise and Perry 1983). This compositional computation is simple because we allow morpho-syntactically induced movements to occur only in an ISr but not SSr, thereby making syntax and semantics match totally in an SSr.

The 'p/s' relation in a CSr is roughly equivalent to the 'h/m' ('head to modifier') relation in GB (Chomsky 1986, Huang 1982, Li 1990, Y. Li 1990, Cole, Hermon, and Sung 1990, Tang 1991, Mei 1991, Rizzi 1990, Cinque 1990, Grimshaw 1991). Word order is predictable: the 'p/s' relation between every two (immediate) constituents in a CSr translates into their linear order.

An SSr is an 'Action' (AC). A more 'complex' Action is composed of two less complex Actions. The least complex Action is a 'simple' Action, which is composed of an 'Initiator' (I) and a 'Complex Act' (A'), which is in turn composed of an 'Act' (A) and a 'Receiver' (R). By taking I, A, R as its inputs, a recursive rule generates an Action, represented as a Tree. An Action Tree has its associated Primacy Tree, generated by another recursive rule, which assigns a 'p' or 's' rank to every node in the Action Tree except the terminal ones I(s), R(s), and A(p), whose ranks are initially stipulated. Sometimes it is necessary to adjust one of the two 'p's' to an 's' so that primacy assignment rule can continue to apply recursively. An adjustment rule is provided for that purpose. (See Appendix, (A), for the needed recursive rules.)

In the lexicon, single (non-compound) items are either 'logical' or 'grammatical'. The logical ones are constants and variables. The grammatical ones are nouns and verbs, which have both abstract and concrete forms. An Abstract Noun (AN) has one associated concrete form, but an Abstract Verb (AV) has various associated concrete forms (whose selection is determined by the SSr of a sentence): verb, adjective, adverb, preposition, etc. A lexical item enters an SSr as an AV if it lexicalizes an Act (A), or as a constant if it refers to an entire 'embedded' Action (AC), or as an indexed variable if it lexicalizes an Initiator (I) or Receiver (R). When an SSr maps onto its ISr, its AV's adopt concrete forms, its constants are kept, and its indexed variables are also kept but

are further 'instantiated' by co-indexed, rule-generated concrete NP's that attach to proper subtrees of the ISr tree. The rules of instantiation vary according to languages (see Appendix, (C)), for rules of instantiation in Mandarin.) If the internal structure of an NP is crucial for the interpretation of an SSr, then the indexed variable lexicalizing I or R will be instantiated twice: once at SSr by an abstract NP, and again at CSr by a concrete NP. An abstract NP is nothing but an AC relabelled as an I(s) or R(s). McCawley (1971:224) anticipated the concept though not the technique of instantiation by suggesting that NP's are initially indexed variables. He also suggested (in a question to me at IsCLL III) that instantiations are basically logical quantifications.

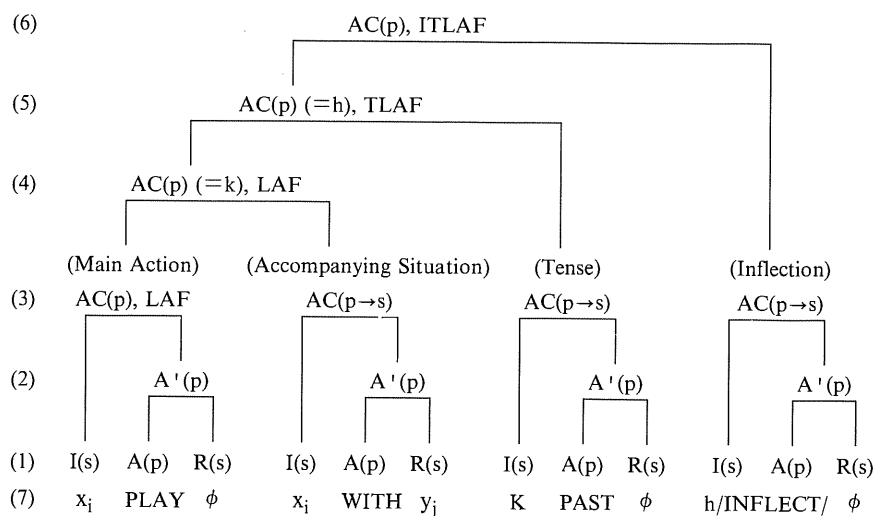
The lexicon lists all simple 'Licensed Action Frames' (LAF's). These are special simple Actions that the lexicon allows to occur virtually freely, in contrast to the ordinary simple Actions that the lexicon forbids to occur freely. Complex LAF's are generated from simple LAF's by a set of rules, which recursively combine two less complex LAF's into a more complex one, or one less complex LAF and one mere AC (Action) into a more complex LAF. Subject to grammatical restrictions which may be elaborate, all the complex LAF's so generated are LAF's except those that are explicitly excluded by the lexicon (in the first step of combination). A LAF, whether simple or complex, combines with an AC expressing tense or aspect to form a 'Tensed Licensed Action Frame' (TLAF). A TLAF can further combine with an AC that induces verbal inflection in connection with tense or aspect, to form an 'Inflected Tensed Licensed Action Frame' (ITLAF). (See Appendix, (B), for formulas.)

In languages that do not have (grammatically expressed) tense or aspect notions, a LAF is the source of a grammatical sentence. In languages that have tense or aspect notions but no verbal inflection, a TLAF is the origin of a grammatical sentence. And in languages that have tense or aspect notions and have verbal inflection, an ITLAF is the root of a grammatical sentence.

Thus grammaticality in terms of syntax and semantics in a CCG is well-defined: if the SSr of a sentence is a LAF, TLAF, or ITLAF, the

sentence is 'basically grammatical' in a language that requires no tense or aspect, or one that requires tense or aspect, or one that requires tense or aspect and also verbal inflection, respectively. This 'basically grammatical' sentence would be fully 'grammatical' if its SSr maps onto its ISr, and whence onto its TSr, FSr, and CSr, in all cases legitimately according to the rules required by the grammar. In other words, a grammatical sentence is one whose SSr is a LAF, TLAF, or ITLAF (as specific languages may require) that legitimately maps onto a corresponding ISr, TSr, FSr, and CSr.

To see a concrete example of how CCG operates, let us consider Figure 1, which gives the SSr of sentence (1) John played with Mary.



(1) John played with Mary.

Lines (1)-(6): SSr form. Line (7): SSr lexically realized. I=Initiator; R=Receiver; A=Act; A'=Complex Act; AC=Action; p=primary; s=secondary; (p-s)=p adjusted to s; x_i , y_j =indexed variables; h, k=constants; LAF=Licensed Action Frame; TLAF=Tensed Licensed Action Frame; ITLAF=Inflected Tensed Licensed Action Frame.

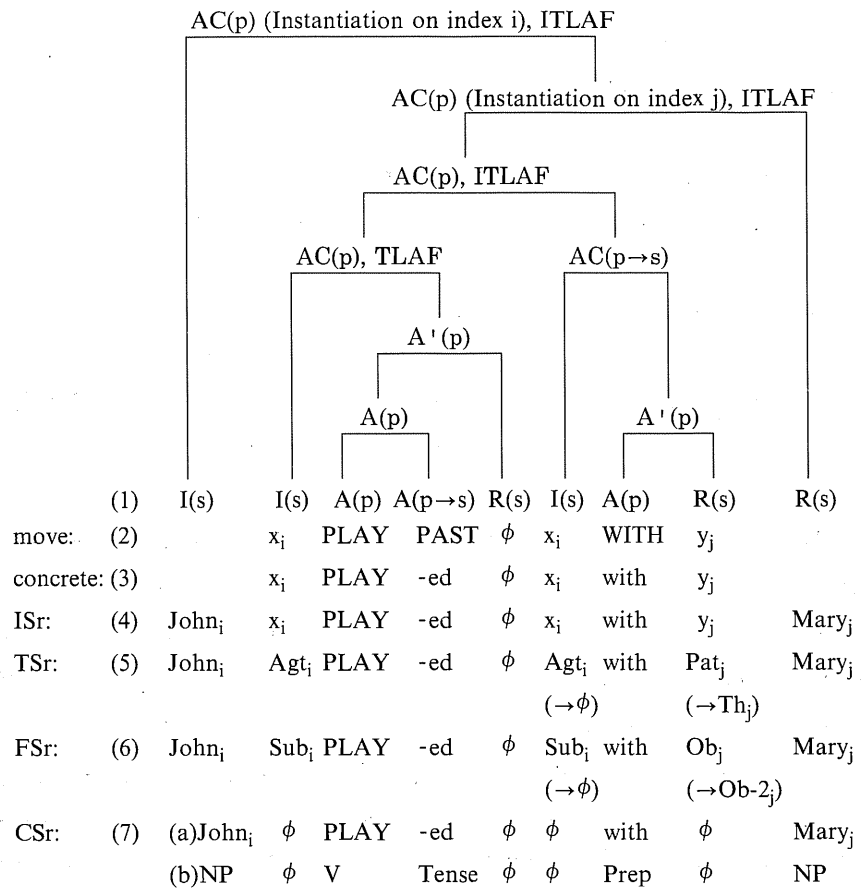
Figure 1. Formation of SSr.

We compose an SSr for (1) by applying the rule of composition (RC in Appendix, part (A)) to obtain the binary tree, the rule of category assignment (RCA) to obtain the categorical structure, the rule of primacy ranking (RPR) to obtain the primacy structure, and the rule of rank adjustment (RRA) to adjust a 'p' to 's' based on lexical stipulations and syntactic and morphological constraints. The LAF ' x_i PLAY ϕ ' is a simple LAF, and it combines with the AC ' x_i WITH y_j ' to form a complex LAF, which has two parts, Main Action and Accompanying Situation. When combined with a Tense AC, this LAF becomes a TLAF, which combines with an Inflection AC to become the final ITLAF. Since the SSr is an ITLAF, it is the source of a grammatical sentence, namely, sentence (1) in English.

Now consider Figure 2. Here we see that the Grammatical Abstract Verb (GAV) '/INFLECT/' of SSr in Figure 1 has induced a dislocation of the AV 'PAST' and, having served this technical purpose, has disappeared. This dislocation places PLAY and PAST in immediate composition, as shown in line (2). Line (3) shows the concrete choices of the AV's, line (4) the ISr (with x_i and y_j instantiated by John_i and Mary_j), line (5) TSr, line (6) FSr, and line (7) CSr. The CSr in line (7) is further elaborated in Figure 3, where the 'p/s' relations become relevant and determine the order of the two composing elements in each sub-tree and consequently the word order in sentence (1).

2. Resultative Verb Compounds

From the perspective of a CCG, RVC's are syntactically generated in three types, as illustrated by sentences (2), (3), and (4) analyzed in Figures 4, 5, and 6, respectively. Illustrating type 1, sentence (2) (in Figure 4) has the SSr which contains the LAF $\langle\langle x_i, \text{CHI}, y_j \rangle, \langle x_j, \text{GUANG}, \phi \rangle\rangle$, in which the first R ($=y_j$) and the second I ($=x_j$) are co-indexed. Illustrating type 2, sentence (3) (in Figure 5) contains the LAF $\langle\langle x_i, \text{CHI}, y_j \rangle, \langle x_i, \text{BAO}, \phi \rangle\rangle$ whose first I ($=x_i$) and second I ($=x_i$) are co-indexed. Illustrating type 3, sentence (4) (in Figure 6) contains the LAF $\langle\langle x_i, \text{CHI},$

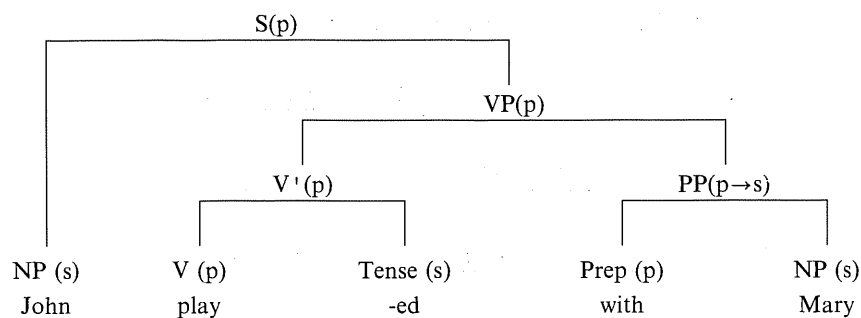


(1) John played with Mary.

Agt=Agent; Pat=patient; Th=Theme; Sub=Subject; Ob=Object;

Ob-2=Object 2.

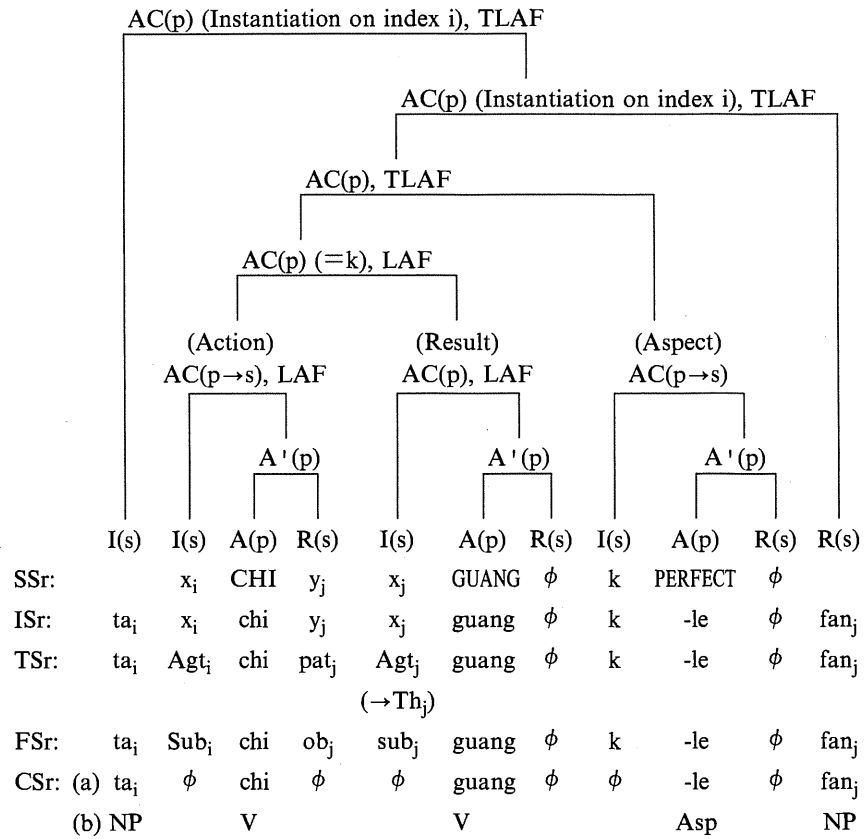
Figure 2. Mappings From ISr into TSr, FSr, and CSr.



(1) John played with Mary.

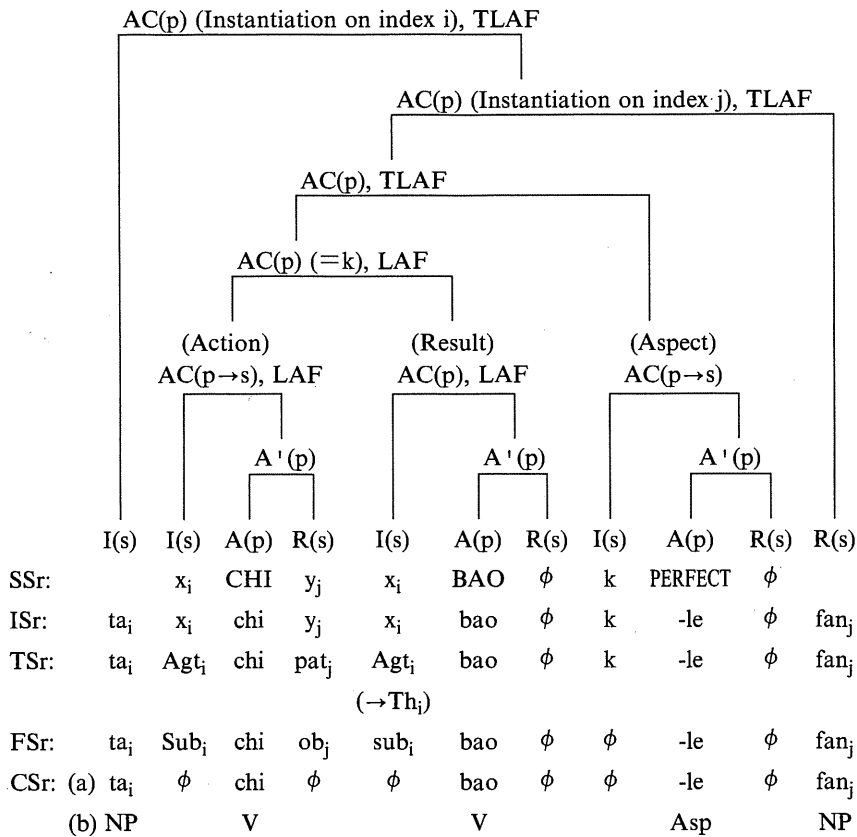
The 'p/s' relations translate into constituent orders, which determine the word order of sentence (1): NP(s) > VP(p); V'(p) > PP(p→s); V(p) > Tense(s); Prep(p) > NP(s).

Figure 3. CSr in Tree Form.



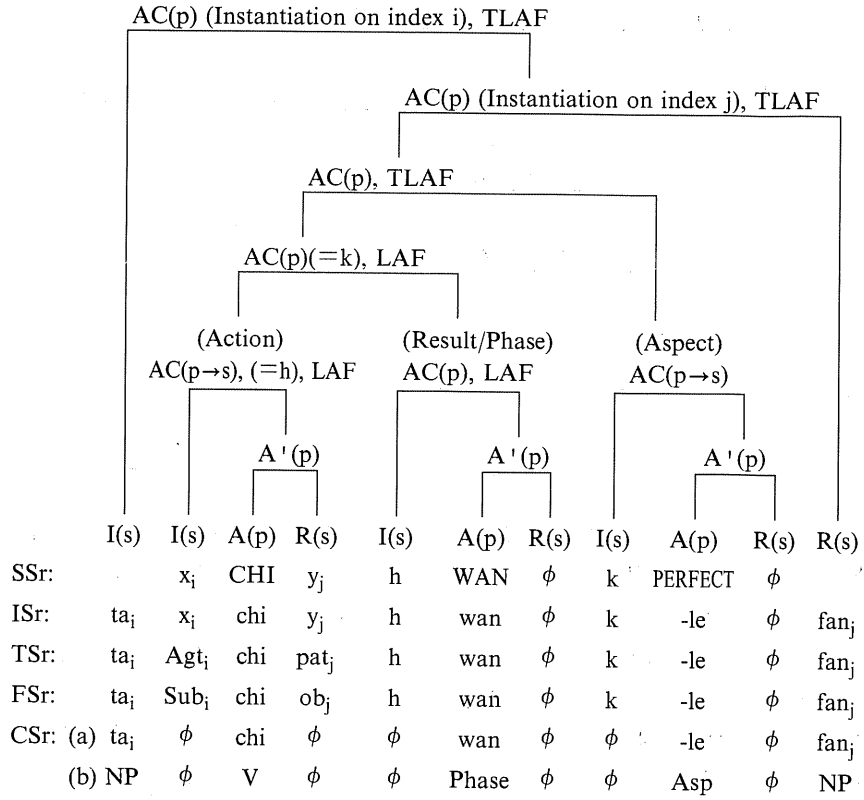
(2) ta chi guang le fan. 'He ate up the rice.'

Figure 4. Resultative Verb Compound, type (1).



(3) ta chi bao le fan. 'He ate full.'

Figure 5. Resultative Verb Compound, type (2).



(4) ta chi wan le fan. 'He finished eating.'

Figure 6. Resultative Verb Compound, type (3).

y_j >, <h, WAN, ϕ >>, in which the constant h in the second AC refers to the entire first AC. Although the second AC is traditionally regarded as a 'result' of the 'action' expressed by the first AC, it is more appropriately a verbal 'phase' comparable to tense or aspect, as Cheng (1991a) is among the first scholars to have suggested.

By further considering whether the R in the first AC (expressing 'action') in an RVC refers to an explicit NP, hence y_j , or an NP that can be inferred only from the discourse context, hence ϕ_j , or an NP that is strictly absent, hence ϕ , we can elaborate the three-type classification of RVC's into a nine-type taxonomy, as illustrated in Figure 7. Specifically, we distinguish nine types of SSr for RVC's, which yield nine corresponding types of ISr. These types are illustrated by (1) chi guang le fan; (2) chi bao le fan; (3) chi wan le fan; (4) chi guang le; (5) chi bao le; (6) chi wan le; (7) ku shi le shou-pa; (8) ku shile (zi-ji); (9) ku wan le.

All nine types share the LAF<Action (s), Result (p)>but form three major patterns based on the types of verbs lexicalizing the A (Act) in the Action (part) and the Result (part). In types (1)-(3), in the Action, the A is an 'accusative' verb (chi) having a specified R (y_j), but in the Result, it is an 'unaccusative' verb (guang) for which no R(ϕ) is allowed. In types (4)-(5), in the Action, the A is an accusative verb (chi) having an unspecified though discourse-determined R(ϕ_j), but in the Result, it is an unaccusative verb (guang) for which no R(ϕ) is allowed. In types (7)-(9), in the Action, the A is an 'unergative' verb (ku) which chooses no R(ϕ), but in the Result, it is an unaccusative verb (shi) for which no R(ϕ) is permitted ('unaccusative' verbs have no potential objects, but 'unergative' verbs have; see Perlmutter and Postal (1984), Rosen (1984)), (see Huang 1984b for 'empty category' in GB).

Within each major pattern, each one of the three distinct types is further characterized by whether the I in the Result shares reference with the R in the Action (types (1), (4), (7)) or not (types (2), (5), (8)), or whether it refers to the entire Action (types (3), (6), (9)) (see Figure 7, columns (4) and(5)).

Hashimoto (1966, 1971) has anticipated our solution in concept,

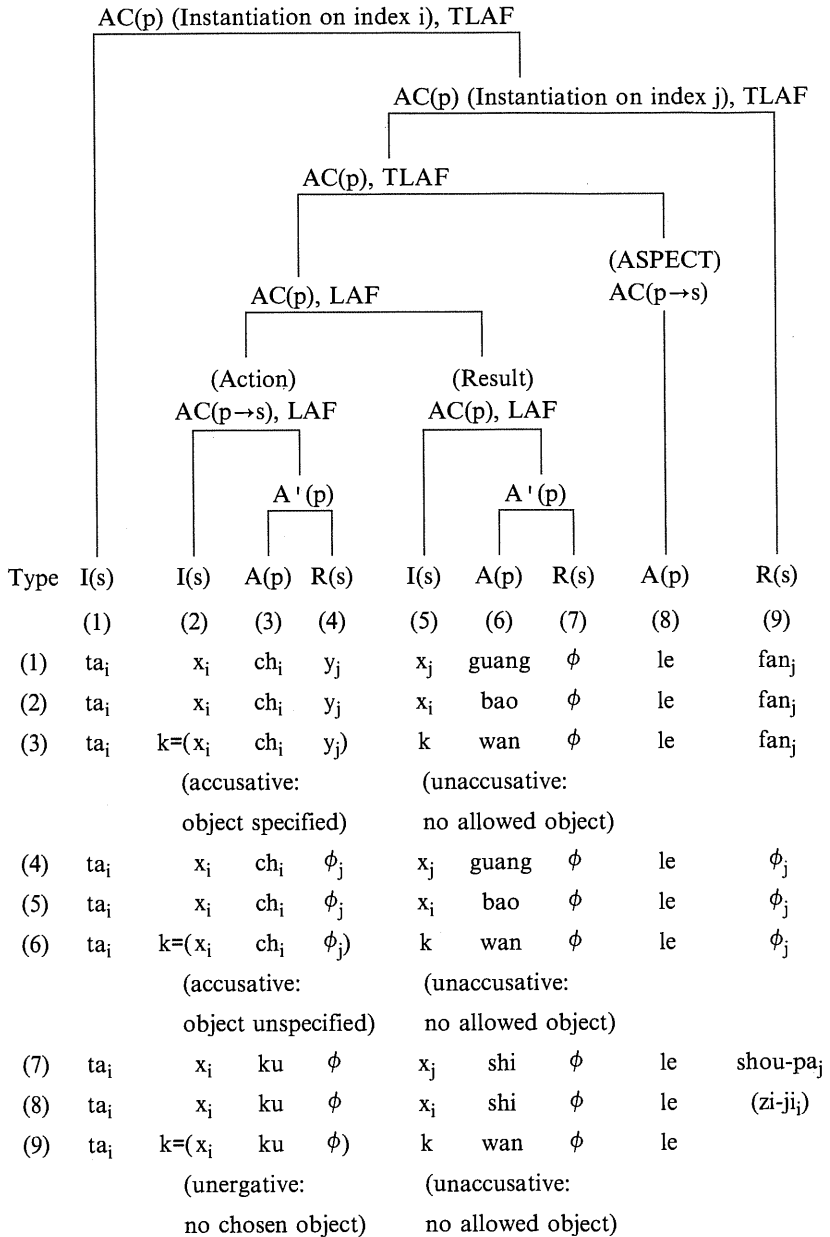


Figure 7. Resultative Verb Compounds: Their Types.

but our technique of instantiation has rendered unnecessary the early-day transformational devices of identity-NP deletion (Tai 1969, Sanders and Tai 1972, Huang 1988) and V-movement that are needed in Hashimoto's pioneering solution. Y. Li (1990) essentially preserves Hashimoto's original idea that an RVC is reduced from two composing full verbs, and he uses the thematic roles assigned by a verb to its associated NP's as a key concept in understanding such a reduction. By contrast, our solution depends on a concept similar to control in GB (Huang 1991). Contrary to Thompson's (1973) influential argument against Hashimoto and in favor of a 'lexical rule' solution, a syntactic-generation solution such as we are offering appears to be the right one. Thompson's solution has the net effect of allowing the lexicon to supply not only the affirmative form of an RVC (chi guang) but, through the operation of lexical rules, also to supply its negative and potential form (chi bu/de guang). Though seemingly convincing at first glance, Thompson's solution did not and probably could not provide a reasonable account for a rather broad range of syntactic and semantic phenomena related to RVC's. Since CCG generates RVC's syntactically and treats syntax and semantics as parallel structures, a systematic account would be well within its reach.

Adopting CCG, we can explain a wide range of phenomena related to RVC's. But first we must recognize the nine types of RVC's and assume an 'a/i' relation between the two elements in an RVC. The 'a/i' relation is the relation of 'assertion' ('a') to 'implication' ('i'), or, more technically, of 'entailment' to 'presupposition' (Levinson 1983, Horn 1985). The 'a/i' relation holding between the two elements of an RVC can be 'intrinsic' or 'extrinsic.' An intrinsic 'a/i' relation is translated from a semantic 'p/s' relation (so that 'p' translates into 'a' and 's' into 'i'). An extrinsic 'a/i' relation is determined in a particular discourse context by the speaker's viewing the whole RVC as 'a' or choosing one element as 'a' and the other as 'i'.

An RVC (chi guang) can be modified by the internal modifiers bu 'cannot' and de 'can', which modify its intrinsic 'a' element (guang). An RVC can also be modified by the external negation morphemes bu '

will not' and mei 'did not', which may negate the entire RVC (chi guang), or its 's' (chi) or 'p' (guang), in each case treating it as an extrinsic 'a'. An RVC (chi guang) can be further modified by a pre-posed 'action-related' external modifier (man-man 'slowly') or by a post-posed 'result-related' external modifier (yici 'once'), or by both. The entire RVC as an extrinsic 'a' may be modified. If only one element is modified, semantic compatibility determines which external modifier modifies which element. Manner adverbs (man-man), for example, are compatible with and modify 'activity' verbs (chi), but frequency adverbs (yici) are compatible with and modify 'state' verbs (guang) (see Vendler 1967 for 'activity' and 'state').

The SSr for an RVC does not carry any information about the extrinsic 'a/i' distinction between the two composing elements of the RVC. This is to be expected, since this distinction is discourse-determined rather than semantically decided. However, in any given discourse context that an RVC sentence such as (2) is used, we can mark the Action part or the Result part as either 'a' or 'i' as the case may require, thus making an SSr also useful for such pragmatic analysis.

A shortened RVC is less preferred than a full RVC, since shortening increases ambiguity. However, if an RVC is shortened, the pragmatically determined extrinsic 'a' element is retained. For types (1)-(3), extrinsic 'a' resides in the Action, for types (4)-(6) and types (7)-(9), it resides in the Result. Therefore, when shortened, the first, 'a' element is retained in RVC's of types (1)-(3) (chi (wan) le fan), but the second, 'a' element is retained in RVC's of types (4)-(6) ((chi) wan le) and types (7)-(9) ((ku) shi le shou-pa).

An ambiguous RVC has two types of SSr as its sources. Thus, chi wan 'eat up/finish eating' has types (1) and (3); tuo guang 'take all off/get nude' has types (1) and (2); <pao, xia-qu> 'run down/continue to run' has types (2) and (3).

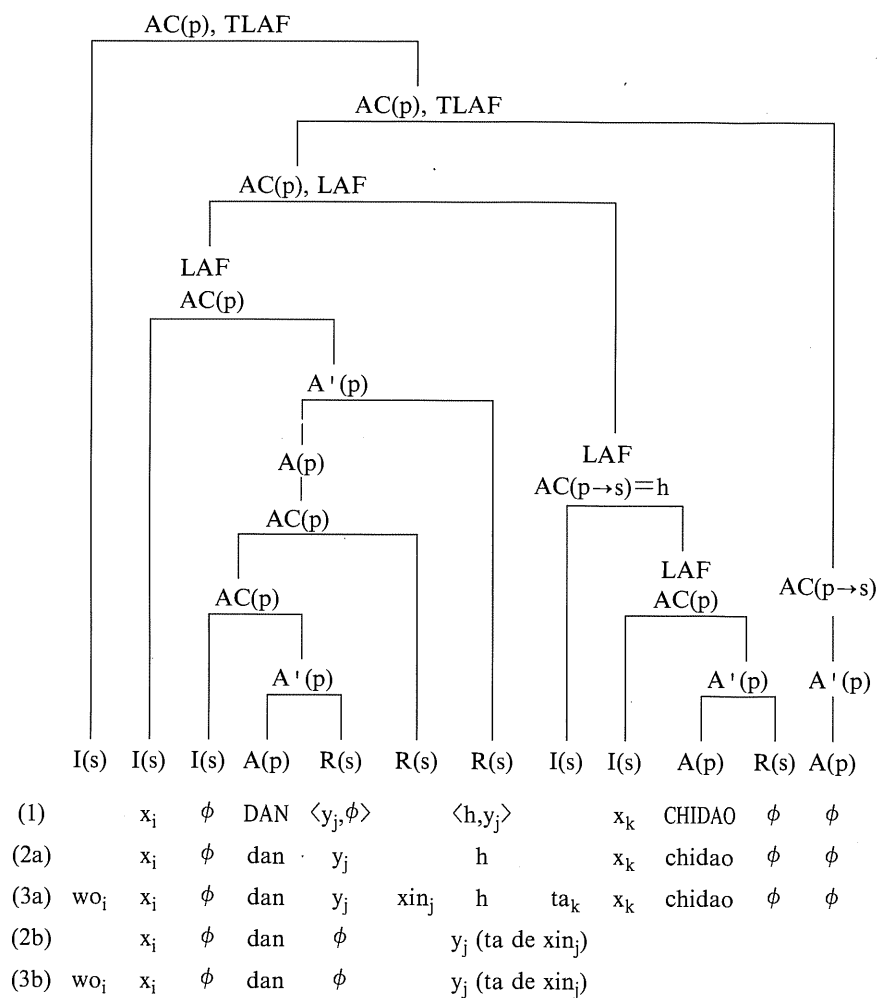
To explain the above wide-ranging phenomena and to compute the meaning of a sentence whose RVC may be extensively modified by both internal and external modifiers, we need to postulate its SSr, which syn-

tactically generates rather than lexically provides the RVC. This solution assumes that some syntactic rules can apply without revision to morphology, and in that sense largely agrees with Tang's (1991) view that essentially identical rules apply in syntax and morphology.

3. Psychological Reality in CCG

Although our main focus is RVC's, we nevertheless also want to briefly discuss VOC's and CVC's, for two purposes. First, we want to further illustrate CCG and show its descriptive power. Second, based on the different behaviors of these three types of verb compounds, we want to claim that CCG has psychological reality, which can be verified by the kind of experiments that Wang (1991, 1992, 1993) conducted (see also Hsu 1992, 1993).

VOC's can be divided into three types, called by Her (1992) (1) word (e.g. shi wang 'be disappointed'), (2) idiom phrase (e.g. chi cu 'be jealous'), and (3) dual status (e.g. dan xin 'worry'). The dual status VOC's such as fang-xin 'feel relieved,' dan-xin 'worry,' bang-mang 'help' are so called because they behave sometimes like words and sometimes like regular VO phrases. Huang (1984a) has proposed to derive the word status of a dual status VOC from a phrasal source, Her (1992) has favored a dual lexical listing, and Jin (1991) has argued for a 'restoration' solution that would allow a word state VOC to restore its phrasal state just in case it is intervened by intruding elements. Interesting though the dispute is, it is not our immediate concern here. Rather we want to show how a dual status VOC like dan xin can be analyzed in a CCG. Consider sentence (5a) wo dan-xin ta chidao 'I am afraid he may be late,' and its SSr in Figure 8. In this SSr, we make use of a relabeling device which allows an entire AC to be relabelled and function as an A. There are two possible positions for the y_j that xin_j instantiates: either under the R(s) within (the minimal) AC(p) ('AC-internal') or under the R(s) outside the AC(p) ('AC-external'). In the first case, dan-xin is treated as a VO compound, and in the second case as a VO phrase.



'I am afraid he may be late.'

' I worry for him. '

Figur 8 VO compounds.

If a VO compound, then dan-xin may be transitive and may take a whole AC $(p \rightarrow s) = h \langle x_k, CHIDAO, \phi \rangle$ as its object, and if a VO phrase, then xin is part of a genuine NP. To be specific, if the AC-internal position is chosen for y_j , then (5a) results, and if the AC-external position instead is chosen, then (5b) results.

A dual VOC thus contrasts with an RVC in internal cohesiveness: an RVC can be intervened by bu and de but a dual VOC can be intervened only if it behaves as a phrase. It would be difficult to decide, based merely on the 'surface' intervention, which one of the two types is more cohesive than the other. However, once we compare the SSr of an RVC and the SSr of a VOC, the decision becomes easy. An RVC is spread in two LAF's, but a dual VOC resides within one LAF (compare Figure 4 with Figure 8). On this basis, a VOC is more cohesive than an RVC. Furthermore, once we adopt this criterion for comparing the cohesiveness degrees among types of verb compounds, we discover that CVC's are even more cohesive than VOC's (see Zhu 1992 for a detailed study of CVC's). To see this, consider sentence (6) Zhangsan zhui-qiu guo Wang-xiao-jie 'ZS has ever chased WXJ,' and its SSr in Figure 9. Here, we see that the CVC zhui-qiu occupies one LAF just like the VOC dan-xin. A closer inspection, however, reveals a difference: while $\langle DAN, y_j \rangle$ may reside either inside the A(p) (relabelled from AC) (as a compound) or outside of it and within A'(p) (as a phrase), $\langle ZHUI, QIU \rangle$ resides only within the A(p) (as a compound). Within the same AC(p) that constitutes a simple LAF, A'(p) is a higher-ranking composition than A(p), and in that sense a larger domain than it. To account for the dual behavior of dan-xin, we must allow dan-xin to occupy both A'(p) and A(p) in the simple LAF. By contrast, an A(p) alone would be sufficient for zhui-qiu. Hence, dan-xin as a VOC occupies a larger domain than zhui-qiu as a CVC. In this sense, a CVC is more cohesive than a VOC.

Although we intuitively feel that RVC's are more productive as a pattern than VOC's, which in turn are more productive than CVC's, we do not use that pre-theoretic fact alone to argue for their corresponding putative cohesiveness difference. That argument would be circular.

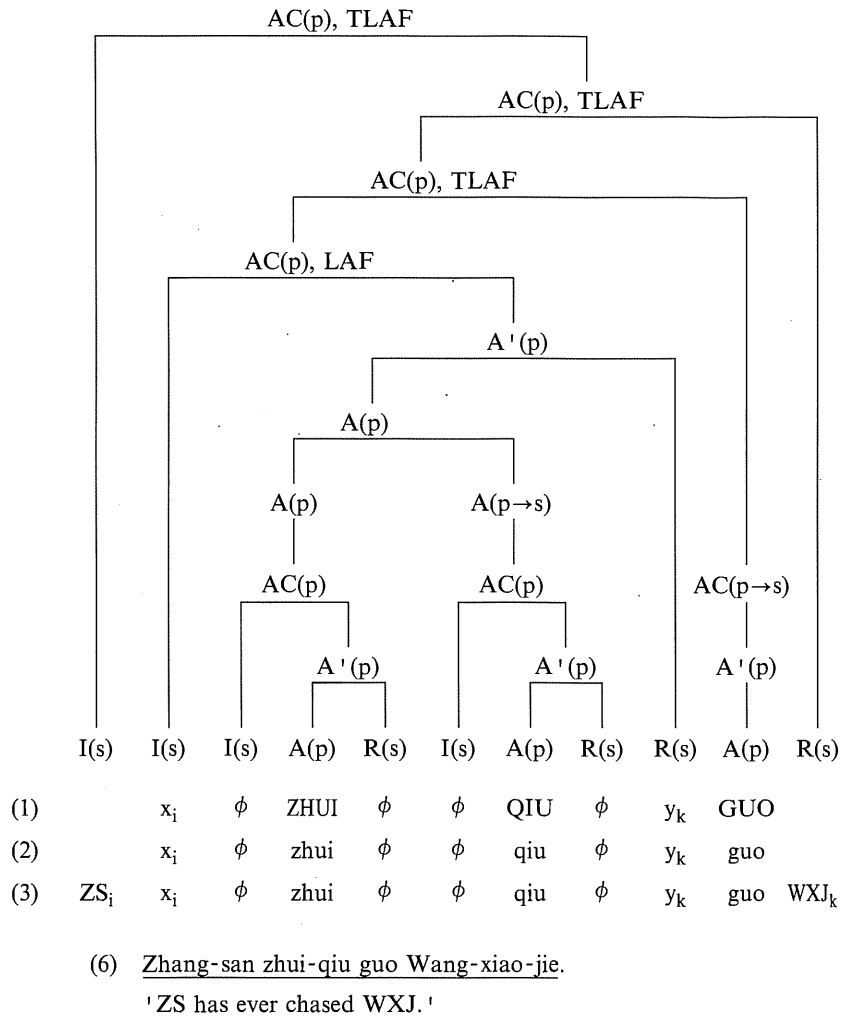


Figure 9. Coordinate Verb Compounds.

Rather, we appeal to their domain difference in the SSr to claim that they are correspondingly different incohesiveness. Specifically, we claim that RVC's occupying two LAF's are more cohesive than VOC's and CVC's, both of which occupy only one LAF, and that between a VOC and a CVC, there is a less significant difference in cohesiveness corresponding to a less significant difference in domain size. We want to ignore the less significant difference between VOC's and CVC's, and concentrate on a comparison of RVC's with CVC's. An RVC is syntactically generated and a CVC is morphologically generated (on account of its A(p) domain). An RVC has a complex LAF which is composed of two simple LAF's. Only the individual composing LAF's (e.g. $\langle x_i, \text{CHI}, y_j \rangle$ and $\langle x_j, \text{GUANG} \rangle$) but not the complex LAF need be listed in the lexicon. Although a grammatical constraint requiring y_j and x_j to be co-indexed is needed, that constraint is not part of the lexical listing. By contrast, each CVC is a simple LAF and for that reason must be listed in the lexicon. If CCG has a psychological reality, this contrast means that speakers of Mandarin obtain an RVC by applying a rule for combining two simple LAF's into one complex LAF, but obtain a CVC by lexical searching. Therefore, if a subject in experiment (or a child) learns two separate simple fake (or real) LAF's, he will be able to produce a complex LAF based on the two simple LAF's. However, if the subject (or the child) learns two separate fake (or potential) CVC elements, he may not be able to produce a CVC based on the two separate elements, since the lexicon has not yet admitted their combination. If the difference is not between an ability to learn (i.e. produce or understand) an RVC and an inability to learn a CVC, then at least it is in the speed or success rate of learning. A subject (or child) should be able to learn a new RVC faster and with greater success than a new CVC. There may be various ways to measure such difference in speed and success-rate, and one way is through the tone sandhi experiments conducted by Wang. In dialects such as Taiwanese that have tone sandhi in the RVC and CVC, a subject (or child) should learn the tone sandhi in an RVC faster than in a CVC, since learning a compound entails learning its phonological properties be-

sides other grammatical properties. If an experiment along the line of Wang should show the expected results, it would prove the psychological reality of CCG. If the experiment yields a contrary result, then we would concede that CCG has doubtful or even no psychological reality.

Of course, it is important to try to theorize about the structure of RVC's and CVC's and other syntactic and morphological patterns. However, it is even more important to make sure that the postulated linguistic structures are not merely in the fanciful imagination of an armchair linguist. A sand castle would have little chance of withstanding the testing tide of time. This is why psycholinguistic experiments must constitute a vital branch of linguistics, if linguistics is to have a true future.

Having proposed a theoretic solution to a problem and having proved its psychological reality, the linguist's task is only half done. He must further investigate how the speaker learns the rules and how, having stored the rules in his brain, he reactivates them in his linguistic performance. A truly innovative and daring feature in Wang's research is to look into the nature of such storage and reactivation. According to Wang (1991:22-23), an abstract linguistic rule, in so far as it is psychologically valid, is learned as a set of sub-structure rules based on its surface concrete patterns. The individual sub-structure rules connect with each other into an analogical chain, which constitutes a prototype. This prototype is the super-structure for the sub-structure rules. A set of first-order super-structures (which are first-order prototypes) can connect with each other to form a second-order super-structure (which is a second-order prototype), and, in general, a set of lower-order super-structures can connect with each other to form a higher-order super-structure. A speaker learns an abstract rule (super-structure) by learning its concrete patterns (sub-structures), but stores in his grammar both the abstract rule and the concrete patterns. In linguistic performance, the speaker can activate a super-structure or its sub-structure rules as the situation may require.

Wang has illustrated his analogical-chain concept with his experi-

mental results from Taiwanese tone sandhi. Another illustrating example may be found in Chang's (1990) treatment of the serial verb construction (SVC) in Mandarin. Chang's research shows that there is no rigid characterization for an SVC, which is more appropriately described as a prototype whose varying elements all satisfy Tai's (1985) PTS (principle of temporal sequence), so that the first verb in an SVC denotes an action and the second verb denotes a subsequent action (see also Hsieh 1990 for an elaboration of Chang's original proposal). Yet another example, also from Mandarin syntax, involves the problem of verb copying made intriguing by Huang's (1984a) initial inquiry. M-L. Hsieh (1991) has suggested that the so-called verb copying construction (VCC) does not allow a rigid characterization but that the various patterns of VCC form a proto-type. The proto-typicality condition, according to M-L. Hsieh, is equivalent to Tsao's (1979, 1990) topic continuity condition. Furthermore, of those VCC's meeting the topic continuity condition, an activity verb, an accomplishment verb, an achievement verb, and a state verb (in the sense of Vendler 1967) can be ranked in that decreasing order with respect to their ability to occur as the first verb in a VCC.

4. Conclusion

We proposed CCG as a new theory of grammar and illustrated its descriptive power with RVC's. By comparing RVC's with CVC's, we found that an RVC is structurally more complex than a CVC. We claimed that RVC's are syntactically generated and CVC's are lexically provided. The claim raised the issue of the psychological reality of such a theoretic distinction and so we suggested that an experiment on Taiwanese tone sandhi could settle the issue one way or the other. In connection with the issue of psychological reality, we discussed how rules may be learned and stored in the brain and reactivated in performance. It has been our intent to impart the hope that a balance between formalism and cognitivism can be achieved if we adopt CCG, and that a balanced grammar can have a better chance of approaching a psychologically real

grammar. Unless the linguist's grammar is in some sense psychologically real, the future of linguistics may be in serious trouble.

Appendix

(A) Recursive Rules

- (a) RC (Rule of Composition): Combine two elements to form a composite element.

$$\{A, B\} \rightarrow \langle A, B \rangle$$

- (b) RCA (Rule of Category Assignment): Assign a category to a composite element according to those of the composing elements.

$$\{A(a), B(b)\} \rightarrow \langle A(a), B(b) \rangle (f(a, b))$$

- (c) RPR (Rule of Primacy Ranking): Rank a composite element 'p' ('primary') if its composing elements are 'p' and 's' ('secondary').

$$\{A(p), B(s)\} \rightarrow \langle A(p), B(s) \rangle (p)$$

- (d) CAR (Combined Rule of Composition, Assignment, and Ranking):

$$\{A(p)(a), B(s)(b)\} \rightarrow \langle A(p)(a), B(s)(b) \rangle (p) (f(a, b))$$

- (e) RRA (Rule of Rank Adjustment): If two 'p's' are composed, change the lexically or grammatically lower-ranking 'p' to 's', so that RPR can apply again.

$$\{P_i, P_j\} \rightarrow \{P_i, S_j\}, \text{ if } P_i > P_j.$$

(B) LAF Formation Rules1.

1. The lexicon divides all Abstract Verbs (AV) into two subsets: Independent Abstract Verbs (IAV) and Dependent Abstract Verbs (DAV).
2. A degree 1 Action (AC(1)) is a Licensed Action Frame of degree 1 (LAF(1)) if its ACT(A) is an IAV.
$$F(\langle AC(1), IAV \rangle) = LAF(1).$$
3. If a degree n Licensed Action Frame (LAF(n)) combines with another degree n Licensed Action Frame (LAF(n)), the result is, subject to possibly elaborate grammatical constraints, a Licensed Action Frame of degree n+1, unless the lexicon explicitly excludes it as a Licensed Action Frame.

$$G(\langle \text{LAF}_i(n), \text{LAF}_j(n) \rangle) = \text{LAF}_{ij}(n+1).$$

4. A licensed Action Frame (LAF) may for convenience be given a name such as $\langle \text{Action}, \text{Result} \rangle$, but such labels are not indispensable, since we can always refer to the Licensed Action Frame (LAF) itself, such as $\langle \langle x_i, \text{CHI}, y_j \rangle, \langle x_j, \text{GUANG} \rangle \rangle$.

$$N(\langle \text{LAF}_i(n), \text{LAF}_j(n) \rangle) = \langle \text{name } f(i), \text{name } f(j) \rangle.$$

5. If a degree n Licensed Action Frame ($\text{LAF}(n)$) combines with a degree n Action ($\text{AC}(n)$) which is not a Licensed Action Frame (LAF), the result is a Licensed Action Frame of degree $n+1$ ($\text{LAF}(n+1)$), unless the lexicon explicitly excludes it.

$$G(\langle \text{LAF}_i(n), \text{AC}_j(n) \rangle) = \text{LAF}_{ij}(n+1).$$

6. (a) If a Licensed Action Frame (LAF) combines with an Action (AC) that expresses a tense or aspectual notion (T), the result is a Tensed or Aspectualized Licensed Action Frame (TLAF).

$$G(\langle \text{LAF}_i(n), \langle \text{AC}_j(n), T \rangle \rangle) = \text{TLAF}_{ij}(n+1).$$

- (b) In languages which have verbal inflection for tense or aspectual notions, a Tensed or Aspectualized Licensed Action Frame (TLAF) must further combine with an Action (AC) expressing verbal inflection (I), and the result is an Inflected Tensed/Aspectualized Licensed Action Frame (ITLAF).

$$G(\langle \text{TLAF}_i(n), \langle \text{AC}_j(n), I \rangle \rangle) = \text{ITLAF}_{ij}(n+1).$$

7. Subject to language-specific choice, a Licensed Action Frame (LAF), or a Tensed/Aspectualized Licensed Action Frame (TLAF), or an Inflected Tensed/Aspectualized Licensed Action Frame (ITLAF), when its abstract verbs are rendered concrete and its indexed variables are instantiated with indexed NP's, becomes a grammatical sentence (GS).

$$H(\text{LAF}_i) = \text{GS}_i; H(\text{TLAF}_i) = \text{GS}_i; H(\text{ITLAF}_i) = \text{GS}_i.$$

(C) Some Rules for Instantiation

1. An y_j in co-verb AC is instantiated by an NP_j right-attached to the co-verb AC (for co-verbs).

e.g. $\langle \text{NP}_i, \langle \langle x_i \text{ BA } y_j \rangle, \text{NP}_j \rangle, \langle x_i \text{ MAI } y_j \rangle \rangle$.

$\langle \text{NP}_i, \langle \langle x_i \text{ BEI } y_j \rangle, \text{NP}_j \rangle, \langle x_j \text{ MAI } y_i \rangle \rangle$.

2. In a complex LAF which is composed of two simple LAF's such that

the $p \rightarrow s$ LAF has y_j and the p LAF has ϕ (for R), then y_j is instantiated by an NP_j right attached to the minimal LAF containing this complex LAF and the Tense/Aspect AC (for RVC's).

e.g. $\langle NP_i, \langle \langle \langle \langle x_i \text{ CHI } y_j \rangle, \langle x_j \text{ GUANG } \phi \rangle \rangle, LE \rangle, NP_j \rangle \rangle$.

3. In a complex LAF which is composed of two simple LAF's such that the $p \rightarrow s$ LAF has y_j and the p LAF has y_k , then y_j and y_k are instantiated individually by NP_j and NP_k each right-attached to its simple LAF. If $j=k$, then only one NP_j is right-attached to the $p \rightarrow s$ LAF (for serial verbs).

e.g. $\langle NP_i, \langle \langle \langle x_i \text{ ZHONG } y_j \rangle, NP_j \rangle, \langle \langle x_i \text{ MAI } y_k \rangle, NP_k \rangle \rangle \rangle$.

$\langle NP_i, \langle \langle \langle x_i \text{ ZHONG } y_j \rangle, NP_j \rangle, \langle x_i \text{ MAI } y_j \rangle \rangle \rangle$.

4. In a complex LAF of the form $\langle LAF_i (2), \langle LAF_j (1), LAF_k (1) \rangle \rangle$, each $y_{j(m)}$ in LAF_m ($m=i, j, k$) is instantiated individually by an $NP_{j(m)}$ right-attached to LAF_m (for 'three-verb' RVC's).

e.g. $\langle NP_i, \langle \langle \langle x_i \text{ ZOU } y_j \rangle, NP_j \rangle, \langle \langle \langle x_i \text{ JIN } y_k \rangle, NP_k \rangle, \langle \langle x_i \text{ LAI } y_h \rangle, NP_h \rangle \rangle \rangle$.

5. An y_j in a TLAF which is composed of a simple LAF and Tense/Aspect AC is instantiated by an NP_j right-attached to the TLAF (for all such general cases).

e.g. $\langle NP_i, \langle \langle \langle x_i \text{ MAI } y_j \rangle, LE \rangle, NP_j \rangle \rangle$.

6. An x_i (and its repeated occurrences) in a TLAF is instantiated by an NP_i left-attached to the maximum LAF containing this x_i (and its repeated occurrences); if this TLAF is 'embedded' by being relabelled as some constant h , the maximum TLAF is this TLAF, not its 'embedding' TLAF (for all constructions).

e.g. $\langle NP_i, \langle \langle \langle x_i \text{ MAI } y_j \rangle, LE \rangle, NP_j \rangle \rangle$.

$\langle NP_i, \langle \langle \langle \langle x_i \text{ BA } y_j \rangle, NP_j \rangle, \langle x_i \text{ MAI } y_j \rangle \rangle, LE \rangle \rangle$.

7. If an x_i is instantiated by an NP_i , that NP_i also instantiates and y_i in the LAF in which both x_i and y_i occur. Conversely, if an y_j is instantiated by an NP_j , that NP_j also instantiates any x_j in the LAF in which both y_j and x_j occur (for all constructions).

e.g. $\langle NP_i, \langle \langle \langle x_i \text{ BEI } y_j \rangle, NP_j \rangle, \langle x_j \text{ MAI } y_i \rangle \rangle, LE \rangle \rangle$.

8. Each instantiation is strictly speaking an operation on particular index

k, but the above statements in terms of x_i and y_j make the rules of instantiation less complex and more concrete.

References

- Barwise, Jon and John Perry. 1983. *Situations and attitudes*. Cambridge: M.I.T. Press.
- Bresnan, Joan. (ed). 1982. *The mental representation of grammatical relations*. Cambridge, MA: M.I.T. Press.
- Bresnan, Joan and Kanerva, Johni M. 1989. Locative inversion in Chichewa: A case study of factorization in grammar. *Linguistic Inquiry* 20.1-50.
- Chang, Claire. 1990. On serial verbs in Mandarin Chinese: VV compounds and co-verbial phrases. Paper presented at The Ohio State University Mini-Conference on Serial Verbs, Columbus, Ohio, May 26-27, 1990.
- _____. 1991a. Interaction between syntax and morphology: A case study in Mandarin Chinese. Unpublished Ph. D. dissertation, University of Hawaii.
- _____. 1991b. Verb copying: Towards balance between formalism and functionalism. *Journal of Chinese Language Teachers Association* 26:1.1-32.
- Chen, Matthew and Hsin-I Hsieh. 1971. The time variable in phonological change. *Journal of Linguistics* 7.1-13.
- _____, and William S-Y. Wang. 1975. Sound change: Actuation and implementation. *Language* 51.225-81.
- Cheng, Chin-chuan and William S-Y. Wang. 1971. Phonological change of Middle Chinese initials. *The Tsing Hua Journal of Chinese Studies* 9.216-70.
- Cheng, Robert L. 1991a. Syntactic complexity and interaction of forces: the case of aspect and phase markers in Taiwanese and Mandarin. Unpublished manuscript, University of Hawaii.
- _____. 1991b. 'Say' and 'see' as complimentizers in Taiwanese and Taiwan Mandarin. Paper presented at the Third International Conference on Teaching Chinese as a Second Language. Taipei, De-

- cember 26-30, 1991.
- _____. 1991c. Interaction, modularization, and lexical diffusion: Tone sandhi in Taiwanese. Paper presented at NACCL III, Cornell University, May 3-5, 1991.
- Chomsky, Noam. 1986. Knowledge of language: Its nature, origin, and use. New York: Praeger.
- Cinque, Guglielmo. 1990. Types of A-bar dependencies. Cambridge, MA: M.I.T. Press.
- Cole, Peter, Gabriella Hermon, and Li-mei Sung. 1990. Principles and parameters of long-distance reflexives. *Linguistic Inquiry* 21:1.1-22.
- Dowty, David, Robert Wall, and Stanley Peters. 1981. Introduction to Montague semantics. Boston: D. Reidel Publishing Co.
- Fillmore, Charles J. 1968. The case for case. Universals in linguistic theory, ed. by E. Bach and R. T. Harms, 1-88. New York: Holt, Rinehart, and Winston.
- Gai, Xin-min. 1991. The contrast of you and zai: A case study of grammatical interactions. Paper presented at NACCL III, Cornell University, May 3-5, 1991.
- Grimshaw, Jane. 1991. Extended projection. Unpublished manuscript. Brandeis University.
- Hashimoto, Anne. 1966. Embedding structures in Mandarin. Ohio State University Ph. D. Dissertation. (Also in Project on Linguistic Analysis, report 12, Ohio State University.)
- _____. 1971. Mandarin syntactic structures. Chi-lin, no. 8. Chinese Linguistics Project and Seminar, Princeton University.
- Her, One-soon. 1991a. Topic as a grammatical function in Chinese. *Lingua* 84:1.1-23.
- _____. 1991b. Grammatical functions and verb subcategorization in Chinese. Taipei: Crane.
- _____. 1991c. Interaction of syntactic changes. Proceedings of the Second International Symposium on Chinese Languages & Linguistics, 238-50. Taipei: Academia Sinica.
- _____. 1992. Interaction of lexicalization and ionization: On the dual

- status of VO compound verbs. MS.
- Horn, Larry. 1985. Metalinguistic negation and pragmatic ambiguity. *Language* 61.121-174.
- Hsieh, Hsin-I. 1986. A system of syntactic computation. Taipei: crane Publishing Co.
- _____. 1989. Time and imagery in Chinese. *Functionalism and Chinese Grammar*, ed. by James H-Y Tai and Frank F. S. Hsueh, 45-94. Chinese Language Teachers Association Monograph Series No.1.
- _____. 1990. In search of a grammatical foundation for dialect subgrouping. Paper presented at the First IsCLL, Academia Sinica, Taipei, Taiwan, July 20-22, 1990.
- _____. 1991. Interaction: Some basic concepts. (Lecture notes). MS.
- Hsieh, Miao-ling. 1991. Analogy as a type of interaction. Paper presented at NACCL III, Cornell University, May 3-5, 1991.
- Hsu, Hui-chuan. 1992. Tonal parsing in idioms. *Proceedings of IsCLL III*, 352-63.
- Huang, C-T. James. 1982. Move wh in a language without wh-movement. *The Linguistic Review* 1.369-416.
- _____. 1984a. Phrase structure, lexical integrity, and Chinese compounds. *Journal of Chinese Language Teachers Association* 19:2.53-78.
- _____. 1984b. On the distribution and reference of empty pronouns. *Linguistic Inquiry* 15.531-574.
- _____. 1988. Modularity and explanation: The case of Chinese A-not-A questions. *Proceedings of the Third Ohio State University Conference on Chinese Linguistics*, ed. by Majorie Chan and Thomas Ernst, 141-69. Bloomington: Indiana University Linguistics Club Publications.
- _____. 1991. Complex predicates in control. To appear in J. Higginbotham and R. Larson (eds.) *Control theory*. Dordrecht: Kluwer Academic.
- Huang, Chu-ren. 1989. Mandarin Chinese and the lexical mapping theory. Paper presented at the 1989 International Conference on Sino-

- Tibetan Languages and Linguistics, University of Hawaii, Honolulu, Hawaii, October 5-7.
- Jackendoff, Ray. 1983. *Semantics and cognition*. Cambridge, MA: M.I.T. Press.
- _____. 1989. *Consciousness and the computational mind*. Cambridge, MA: M.I.T. Press.
- _____. 1990. *Semantic structure*. Cambridge, MA: M.I.T. Press.
- Jespersen, Otto. 1965. *The philosophy of grammar*. New York: Norton.
- Jin, X. 1991. Modularity and Chinese compounds. *Journal of Chinese Language Teachers Association* 26.1, 33-47.
- Kaplan, Ronald M. and Joan Bresnan. 1982. Lexical-functional grammar: A formal system for grammatical representation. *The mental representation of grammatical relations*, ed. by Joan Bresnan, 173-281. Cambridge, MA: M.I.T. Press.
- Lakoff, George. 1971. On generative semantics. *Semantics*, ed. by D. D. Steinberg & L. A. Jakobovits, 232-296. Cambridge: Cambridge University Press.
- Langacker, Ronald W. 1987. *Foundations of cognitive grammar: Vol. 1. Theoretic prerequisites*. Stanford: Stanford University Press.
- _____. 1991. *Concept, image, and symbol: The cognitive basis of grammar*. Mouton: De Gruyter.
- Levinson, Stephen C. 1983. *Pragmatics*. Cambridge: Cambridge University Press.
- Li, Audrey Yen-hui. 1990. *Order and constituency in Mandarin Chinese*. Dordrecht: Kluwer.
- Li, Yafei. 1990. On V-V compounds in Chinese. *Natural Language and Linguistic Theory* 8.177-207.
- Lien, Chinfa. 1987. *Coexistent tone systems in Chinese dialects*. University of California (Berkeley) Ph.D. Dissertation.
- McCawley, James. 1971. Where do noun phrases come from? *Semantics*, ed. by D. D. Steinberg and L. A. Jakobovits, 217-231. Cambridge: Cambridge University Press.
- Mei, Kuang. 1991. *On generalized control*. MS. National Tsing Hua

University.

- Moortgat, Michael. 1988. *Categorial investigations*. Dordrecht: Foris Publications.
- Oehrle, Richard, Emmon Bach, and Dwight Wheeler. 1988. *Categorial grammar and natural language structures*. Boston: D. Reidel Publishing Co.
- Ogura, Mieko. 1990. *Dynamic dialectology*. Tokyo: Kenkyusha.
- Partee, Barbara. 1987. Noun phrase interpretation and type-shifting principles. *Studies in discourse representation theory and the theory of generalized quantifiers*, GRASS 8, ed. by J. Groenendijk et al., 115-143. Dordrecht: Foris.
- Perlmutter, David and Paul Postal. 1984. The 1-advancement exclusiveness law. *Studies in relational grammar 2*, ed. by D. Perlmutter and C. Rosen. Chicago: University of Chicago Press.
- Rizzi, Luigi. 1990. *Relativized minimality*. Cambridge, MA: M.I.T. Press.
- Rosen, Carol. 1984. The interface between semantic roles and initial grammatical relations. *Studies in relational grammar 2*, ed. by D. Perlmutter and C. Rosen. Chicago: University of Chicago Press.
- Sanders, Gerald A. and James H-Y. Tai. 1972. Immediate dominance and identity deletion. *Foundation of Language* 8.161-98.
- Shen, Zhong-wei. 1990. Lexical diffusion: A population perspective and a mathematical model. *Journal of Chinese Linguistics* 18:1.159-200.
- Tai, James H-Y. 1969. *Coordination reduction*. Indiana University Ph.D. Dissertation.
- _____. 1985. Temporal sequence and Chinese word order. *Iconicity in syntax*, ed. by John Haiman, 49-72. Amsterdam: John Benjamins Publishing Co.
- _____. 1989. Toward a cognition-based functional grammar in Chinese. *Functionalism and Chinese grammar*, ed. by James H-Y. Tai and Frank F. S. Hsueh, 187-226. Chinese Language Teachers Association Monograph Series No.1.
- _____. 1992. *Iconicity: Motivations in Chinese grammar*. MS. To appear in *Issues in linguistic theory: Studies in honor of Gerald A.*

- Sanders, ed. by Mushira Eid and Gregory Iverson. Amsterdam: John Benjamins Publishing Co.
- Talmy, Leonard. 1985. Lexicalization patterns: Semantic structure in lexical forms. *Language typology and syntactic description*: vol. 3. Grammatical categories and the lexicon, ed. by Timothy Shopen, 57-149. Cambridge: Cambridge University Press.
- Tang, Tinh-chi. 1991. Incorporation in Chinese syntax. *Tsing Hua Journal of Chinese Studies, New Series* 21:1.1-63 (part I) and 21:2.337-376 (part II).
- Thompson, Sandra A. 1973. Resultative verb compounds in Mandarin Chinese: A case for lexical rules. *Language* 49:2.361-379.
- Tsao, Fen-fu. 1979. A functional study of topic in Chinese: The first step toward discourse analysis. Taipei: Student Book Co.
- _____. 1990. Sentence and clause structure in Chinese: Functional perspective. Taipei: Student Book Co.
- Vendler, Zeno. 1967. *Linguistics in philosophy*. Ithaca, NY: Cornell University Press.
- Wang, H. Samuel. 1991. An experimental study on the psychological reality of Taiwanese tone sandhi rules (in Chinese). MS. National Tsing Hua University.
- _____. 1992. An experimental study on the productivity of Taiwanese tone sandhi. Paper presented at the Third International Symposium on Language and Linguistics. Bangkok, Thailand, January 8-10, 1992.
- _____. 1993. On the psychological status of the tone sandhi phenomenon in Taiwanese. *Tsing Hua Journal of Chinese Studies, New Series* 23:2.175-192.
- Wang, William S-Y. 1969. Competing changes as a cause of residue. *Language* 45. 9-25.
- Zhu, Ji-xiong. 1991. Interaction theory and the distribution of *duoshao* and *ji*. Paper presented at NACCL III, Cornell University, May 3-5, 1991.
- _____. 1992. Interaction theory and Mandarin coordinate verb-com-

Hsin-I Hsieh

pounds. Paper presented at NACCL IV, University of Michigan,
Ann Arbor, May 8-10, 1992.

Morphological Transparency and Autonomous Morphology

A Comparative Study of Tough Constructions and Nominalization

Chu-Ren Huang

Academia Sinica

Abstract

This paper studies the nominalization of tough predicates in Mandarin Chinese, Japanese, and English. The emphasis is on Mandarin Chinese. Mandarin offers one of the most challenging testing grounds for morphological theories because many morpholexical processes in this language lack overt markers and thus the theoretical implications are difficult to tease out.

First, two theories of nominalization based on English and Japanese respectively are outlined in order to explicate the theoretical issues at stake. Next, Huang's (1992 & 1993) arguments that Mandarin *tough* constructions involve lexical operations are summarized. To account for the Mandarin facts, the Autonomous Morphology Hypothesis is defined in terms of morphological transparency. The hypothesis stipulates that a morpholexical rule can only access lexical information encoded on the locus of its application or the morphologically transparent constituents of this locus, regardless of whether the rule is morphologically marked or not. The fourth section shows that neither Rappaport's Thematic Constancy Hypothesis (TCH) nor Saiki's Functional Constancy Hypothesis (FCH) can satisfactorily account for the Mandarin data. Instead, the Autonomous Morphology Hypothesis offers a unified account of the nominalization of tough predicates in all three languages.

In sum, it is shown that linguistic facts in other languages support the proposal of Morphological Transparency. The Transparency condition is shown to apply to other morpholexical processes, such as causativization in Chicheŵa and VR compounding in Mandarin. Additional facts discussed include Japanese case-assigning nominals, and the Bracketing Paradox. The study of a lexical process without morphological markings yields support for the autonomy of morphology.

I. Introduction

The study of nominalization plays a crucial role throughout various stages of the development of generative grammars. Recently, with more and more theoretical work directed towards the interface of morpho-syntax, re-examination of theories of nominalization often brings new insights. My study involves nominalization of tough predicates in Mandarin Chinese, Japanese, and English. The emphasis is on Mandarin Chinese because the language offers one of the most challenging testing grounds for morphological theories. Its morpholexical process is often not marked with any formatives and thus the theoretical implications are difficult to tease out.¹

I will first outline two theories of nominalization based on English and Japanese respectively to explicate the theoretical issues at stake. Next, I summarize the arguments presented in Huang (1992 & 1993) that Mandarin tough constructions involve lexical operations. I will also observe that nominalization is allowed with complex tough predicates in Mandarin. To account for the Mandarin facts, an Autonomous Morphology Hypothesis is defined in terms of morphological transparency. The hypothesis stipulates that a morpholexical rule can only access lexical information encoded on the locus of its application or the morphologically transparent constituents of this locus, regardless of whether the rule is morphologically marked or not. In the fourth section I show that the two previous theories cannot satisfactorily account for the Mandarin data. Instead the Autonomous Morphology Hypothesis offers a unified account of the nominalization of tough predicates in all three languages. Some predictions and theoretical implications are discussed in the conclusion of this study.

1. However, there are a few recent works arguing that Mandarin Chinese indeed does show some interesting morphology. Please see Huang (1993), Dai (1991), and Tang (1989) and references therein.

II. Theoretical Background: Rappaport (1983) and Saiki (1987)

II.A. Rappaport's (1983) Thematic Constancy Hypothesis

Two theories of nominalization are introduced in this section. Rappaport's (1983) theory is one of the earliest to propose that participating arguments in nominalization are governed by thematic structures. On the other hand, Saiki (1987) uses Japanese data to argue for an alternative theory based on the constancy of grammatical function which parameterizes with the (morphological) case-assigning abilities of different languages.

Following previous literature, I will refer to Rappaport's theory as the Thematic Constancy Hypothesis (TCH) and Saiki's theory as the Functional Constancy Hypothesis (FCH). Since both theories were formulated within the theory of Lexical-Functional Grammar (LFG), they offer a convenient contrast for two drastically different approaches to nominalization. It will be clear from our discussion that the two approaches represent two competing premises for theories of nominalization and the implications of the contrast between the two theories apply to any theoretical framework.

Rappaport (1983) observes that all participating arguments in English nominalization are strictly thematic, and that thematic roles of all post-nominal arguments are clearly marked by prepositions, as examples (1) and (2) demonstrate.

- (1) <Theme, Source>
- a. John fled the city.
 - b. John's flight from the city
 - c. *John's flight of the city

- (2) <Theme, Goal>
- a. Jane fled to the city.
 - b. Jane's flight to the city
 - c. *Jane's flight of the city

The above facts prompt Rappaport to adopt the important hypothesis that a verb and its nominalized counterpart share an identical thematic-structure.² This hypothesis captures the semantic correspondence between a verb and a deverbal noun and thus serves as the premise of many subsequent studies of nominalization. The hypothesis of a shared thematic structure not only accounts for the similarity of subcategorization frames of a verb and a deverbal noun but also allows a more elegant account of nominalization in the lexicon, where the morphology of nominalization is determined. However, as shown in the literature, a verb and a corresponding deverbal noun do not necessarily utilize the identical representations of the thematic structure. The surface representations can be different (as in 3), or certain classes of verbs may have no corresponding deverbal nouns (as in 4).

- (3) a. The President commanded (*to) the federal troops to enter Los Angeles.
b. the President's command *(to) the federal troops to enter Los Angeles
- (4) a. The candidate seems to have committed a serious mistake.
b. *the candidate's seemingness (of having committed a serious mistake)

Rappaport proposes the Thematic Constancy Hypothesis to account for

2. This hypothesis has a long history in generative grammar and is in the center of the debate between lexicalism and transformationalism, as observed by a reviewer. Please see references cited in Rappaport (1983) and Grimshaw (1990) for earlier relevant works.

the discrepancy between representations of thematic roles in a VP and a NP. She postulates that deverbal nouns show thematic constancy because the surface representation of an argument of a nominal predicate is determined by semantic relations. In LFG terms, the grammatical functions of these arguments are determined by their thematic roles. Nominals in English allow only two types of arguments, the prenominal POSSessive and the post-nominal OBL(ique)s. Prepositions explicitly assign semantically restricted OBL roles, therefore the GOAL role can be represented as an OBJect in the verbal phrase (3a) but has to be represented as a OBLgoal in the nominal phrase (3b). In addition, the candidate in (4) is a non-thematic argument of the predicate; thus it is impossible to assign the grammatical function to it. Thus the fact that raising verbs do not nominalize is predicted. The hypothesis can also be extended to explain the following English facts.

- (5) a. A linguist knows all the theories.
b. a linguist's knowledge
c. *all the theories' knowledge

In (5), it is shown that the prenominal POSS function can only represent certain thematic roles. In terms of Rappaport's Thematic Constancy Hypothesis, this can be explained by the fact that POSS is a semantically restricted function. And it happens (in English) that a POSS function cannot encode the thematic role of EXPERIENCED.

To sum up, Rappaport's (1983) theory is based on the premise that verbs and corresponding deverbal nouns share identical thematic structures. She suggests that, while a freer mapping between thematic roles and grammatical functions are possible in a verbal phrase, arguments of a nominal predicate have highly marked thematic relations to their governing predicates. Nominal predicates in English can only have either POSS or OBL argument. POSS can only represent a small set of thematic roles, including AGENT, THEME, and PATIENT, while OBLs can only have the thematic roles that the governing preposition marks.

The Thematic Constancy Hypothesis has been suggested to be universal.³ Even though it is formulated in LFG terms, it can be easily translated into other theoretical frameworks. For instance, the premise that verbals and deverbal nouns share thematic structures can be easily formulated in terms of the Theta Criterion in the GB framework. That the nominal argument assignment is determined by semantic/thematic relations can conceivably be captured with certain versions of interaction between the CASE theory and Theta Criterion in GB. Regardless of the universality of the Thematic Constancy Hypothesis, Rappaport's theory anchors the commonly accepted paradigm of theories of nominalization: while lexical rules will stipulate the correct forms of nominal affixes and any semantic changes, the difference in nominal and verbal constructions lies in the nature of nominal and verbal heads, not in the operation of nominalization.

II.B. Saiki's (1987) Functional Constancy Hypothesis

The thematic Constancy Hypothesis as a universal predicts that only thematic arguments can participate in nominalization. This is shown to be false by the Japanese data, observed in Ishikawa (1985) and discussed in Saiki (1987). In particular, Saiki (1987) shows that tough predicates nominalize in Japanese. This is exemplified in (6), from Saiki (1987:284):

- (6) a. John no koogi ga gakusei-tachi ni(totte) rikaishi-yasui
John lecture students for understand-easy
'John's lecture is easy for the students to understand.'
b. John no koogi no gakusei-tachi ni-totte no rikaishi-yasu-sa
John lecture students for understand-easy-NOM
'John's lecture's easiness for the students to understand (literal)'

3. Later works, such as Grimshaw (1990), however, point out that the TCH indeed is not universal.

Japanese tough constructions involve affixation of either -yasui 'to be easy' (in 6) or -nikui 'to be difficult' (in 7) to the predicate. The affixation of -sa marks nominalization. (6) shows that the nominalization of a tough construction is possible regardless of the fact that the SUBJ of the tough construction is non-thematic. Examples (6) and (7) can be contrasted with the unacceptable English (8b), which was correctly predicted by the Thematic Constancy Hypothesis.

- (7) a. S-sya no seihin ga koware-nikui (Saiki 1987:285)
S-company product break-difficult
'It is difficult for the product of company S to break.'
b. S-sya no seihin no koware-niku-sa
S-company product break-difficult-nominalizer
'company S's product's difficulty to break (lit.)'
- (8) a. This book is easy to read.
b. * The easiness of this book to read

Saiki proposes the Functional Constancy Hypothesis to account for the contrast between English and Japanese with regard to nominalization. She hypothesizes that it is the Grammatical Function assignment that remains constant for deverbal nouns. Thus the reason why non-thematic arguments fail to participate in nominalization in English is not because they do not stand in any semantic (thematic) relation with the predicate. Instead, it is because English NPs do not assign the required grammatical functions, such as SUBJ and OBJ. Grammatical functions are structurally encoded in English, and English NP structures are encoded only for two types of grammatical functions: POSS and OBL. Japanese, on the other hand, is a non-configurational language which assigns grammatical functions with case affixation. Since case assignment is allowed in Japanese NP and grammatical function identification is possible (Iida 1989), the Functional Constancy Hypothesis predicts that even non-thematic arguments will be allowed in nominalization as long as

they are assigned the appropriate cases from the case affixes. This hypothesis also predicts that other non-configurational languages will also allow non-thematic arguments in nominalization. This prediction is borne out with Korean data (Saiki and Cho 1987:436-7.5).

- (9) a. Hakcatul-un [hankwuk-i sencinkwuk-ila] ko kacheng-haessta
scholar-TOP Korea-Nom advanced country-Cop comp. hypothesis-did
'Scholars hypothesized that Korea was an advanced country.'
- b. Hakcatul-un hankwuk-ul [sencinkwuk-ila] ko kacheng-haessta
scholar-TOP Korea-ACC advanced country-Cop comp. hypothesis-did
'Scholars hypothesized Korea to be an advanced country.'
- c. Hakcatul-uy hankwuk-uy [sencinkwuk-ilanun] kacheng
scholar-GEN Korea-GEN advanced country-Cop-comp. hypothesis
'scholars' hypothesis of Korea to be an advanced country (literal)'

The verb kacheng-haessta allows the SUBJ of its complement to raise to a OBJ position, as shown by (9b). In (9c), we see that the non-thematic hankwuk 'Korea' is allowed as an argument of the deverbal noun kacheng 'hypothesis'. Since Korean, like other non-configurational languages, assigns grammatical functions in terms of case-affixes, this seems to offer strong support for the Functional Constancy Hypothesis, which predicts that participating arguments of nominals are allowed as long as they are assigned the correct grammatical function by case affixes.

The Functional Constancy Hypothesis, however, has some undesirable implications. Although theories vary as to how they treat grammatical functions (or relations), from primitives in Relational Grammar to structure-dependently defined in Transformational Grammars, it remains accepted that an identical thematic structure may be mapped to many different surface representations of grammatical functions. In other words, in maintaining the Functional Constancy Hypothesis, Saiki would have to assume that each grammatical function has already been linked to a certain thematic role. A Functional Constancy Hypothesis would make incorrect predictions, if, for example, a passive predicate argument

structure is used as the base of deriving nominals. In this sense, the Functional Constancy Hypothesis necessarily assumes a limited version of the Thematic Constancy Hypothesis. Theoretically speaking, it is also observed that LFG has moved towards treating grammatical functions as autonomous but not as primitives. The recent proposal of the Lexical Mapping Theory (Bresnan and Kanerva 1990, Huang 1993) predicts grammatical functions in predicate-argument structures in terms of thematic structures. In addition, Dowty's (1991) recent work also aims to predict the occurrences of grammatical functions in terms of semantic properties. Thus, a hypothesis that gives grammatical functions a primary role over thematic roles would be marked.

III. The Lexical Nature of Tough Constructions in Mandarin (Huang 1992).

Mandarin Chinese, with configurationally defined grammatical functions and without case marking, is typologically very different from either Japanese, Korea, or English. I will show in this section that Mandarin tough constructions offer some interesting contrasts with English and Japanese. Huang (1992) shows that tough constructions in Mandarin Chinese involve both morpholexical processes and syntactic operations. The lexical nature of Mandarin tough constructions is established with four tests. The first is based on lexical integrity. It is observed that a typical tough-V sequence does not allow the insertion of either an agentive PP or any adjunct as in (10). This suggests that the tough-V sequence be treated as a lexical item.

- (10) zhe be shu hen nan (*bei ren) du
 this CLASS book very difficult (BY people) read
 'This book is difficult to read.'

Second, it behaves like a di-syllabic verb in A-not-A question formation (11a & b). On the other hand, it does not allow the reduplication

of the verbal head, a distribution allowed for real VPs such as in (11c).

- (11) a. Cai hao-bu-haochi/haochi-bu-haochi/*haochi-bu-hao
Vegetable/food easy-Neg-easy + eat/easy + eat-Neg-easy + eat/easy + eat-Neg-easy
'How is the food/Is the food good or not?'
- b. ta you-bu-youmo/youmo-bu-youmo/*youmo-bu-you
s/he hu-Neg-humor/humor-Neg-humor/humor-Neg-hu
'Is s/he humorous?'
- c. Zhangsan ti-qiu-bu-ti
Zhangsan kick-ball-NEG-kick
'Does Zhangsan play soccer?'

In other words, these tough-Vs feed the attested question formation lexical rule for di-syllabic verbs but fails to undergo syntactic A-not-A formation. Hence it can only be formed by lexical rules.

Third, a Mandarin tough construction is strictly intransitive and stative, regardless of the valence of the base predicate. Hence, it cannot be accounted for by a typical syntactic rule, which would involve a definite structure with a fixed number of arguments changed.

Fourth, Mandarin tough constructions show both idiosyncratic gaps and suppletive semantic shifts, as in (12).

- (12) a. hao-xiao: easy-laugh 'funny' vs.
 *nan-xiao: difficult-laugh
- b. nan-de: difficult-get 'special, commendable' vs.
 *hao-de: easy-get
- c. hao-shuohua: easy-talk '(of a person) easily imposed upon', but
- d. hao-shuo: easy-say '(of a matter) can be easily solved', but
- e. nan-shuo: difficult-tell 'not predictable'
 vs. *hao-jiang: easy-talk

Both are typical of lexical operations, and will be impossible to account for if syntactic operations are the only source of the formation of these

data.

On the other hand, there are cases of Mandarin tough constructions which violate the above tests for lexical operations. (13), for instance, allows the insertion of an agentive PP between the tough predicate and the embedded predicate.

- (13) xingdong kuaijie de redaiyu hen bu rongyi (bei ren) zhuadao
action swift DE tropical-fish very Neg easy by people catch-reach
'It is not easy (for people) to catch swift tropical fish.'

Thus, Huang (1992) concludes that the Mandarin 'tough constructions' consist of two disparate constructions: one involving morphologically formed complex predicates (10-12) and the other involving 'Raising-to-Subject' (13). I will concentrate on the lexical tough constructions because they involve a somewhat surprising result when nominalized.⁴

IV. The Autonomous Morphology Hypothesis

IV.A. Theory and Motivation

The lexical tough constructions in Mandarin offer an interesting test for both the Thematic Constancy Hypothesis and the Functional Constancy Hypothesis. According to the Thematic Constancy Hypothesis, no

4. That fact that there are both syntactic and lexical tough predicates in Mandarin suggest an explanation for the typology of tough predicates: rongyi is strictly syntactic and hao is strictly lexical. Nan, on the other hand, represents neutralization: The neutralization of nan can be explained because it is the semantically neutral partner of the pair of nan vs. yi 'easy' (as attested by the derived noun of nan-du 'difficulty' but not (rong)yi-du).

On the other hand, the syntactic tough constructions seem to be far from uniform. They involve raising from both object and subject positions. Moreover, they govern both transitive and unaccusative verbs (Gu Yang p.c.). It is observed that the long-distance tough predicates in Mandarin can be reanalyzed as simply a preverbal adverb (W. Baxter p.c.). Mandarin would have only lexical tough constructions if this is the case.

non-thematic arguments can participate in nominalization, and Mandarin should not be an exception. According to the Functional Constancy Hypothesis, Mandarin NPs lack case-marking abilities and can only structurally encode POSS and OBL functions. Thus, the non-thematic arguments cannot receive surface representation and cannot be involved in nominalization either. However, contrary to the prediction of both hypotheses, nominalization of tough-predicates are allowed in Mandarin, as shown in (15) and (16).⁵

- (14) a. [zhe ben shu de nandu]_{np} shi chuming de
this CLASS book DE difficult-read BE famous DE
'That the book is difficult to read is well-known.'
b. [xiti de rongyi zuo]_{np} chuhuyiliao
homework DE easy do out-of-expectation
'That the homework was so easy was totally unexpected.'
- (15) a. ta lian-shang you xie nan-kan
s/he face-top have some difficult-look
'S/He showed some displeasure with his/her expression'
b. Zhe xianran shi ta zhesheng zuida de nan-ren le
this obvious be s/he this-life most-big DE difficult-bear PERF
'This is obviously the most intolerable thing in his/her life.'

5. The examples in (13) and (15) are extracted from the Academia Sinica newspaper corpus (Huang and Chen 1990, and Huang 1994), as opposed to the constructed data in (14). Take note that the data discussed here cannot be treated on par with English gerundives; where the construction arguably involves only a verbal paradigm and no argument-structure changing. An important piece of evidence is that pre-verbal adjuncts are not allowed with the nominalization cases studied here, as in i).

i) a. zhezong yuebing shifen hao-chi
this kind moon-cake very good-eat
'This kind of moon-cake is very delicious.'

b. *zhezong yuebing de shifen hao-chi

Please see J. Tang (1993) for contrastive studies of Mandarin de and English gerundives.

The above data are counterexamples to both the Thematic and Functional Constancy Hypotheses. They show that nominalization is governed neither by the semantic relation between the arguments and the nominal heads, nor by the case-assigning properties of the nominal heads. Thus, both Saiki's and Rappaport's accounts involve unnecessarily rich syntactic information. In Rappaport's case, the thematic structures of local and embedded arguments are not distinguished; while in Saiki's case, the whole NP structure, including the syntactic mechanism of dependency marking, is considered. I will propose a hypothesis that uses only morphological information and makes the correct prediction for all nominalization facts.

The crucial observation of tough constructions in Chinese, English, and Japanese is that both Chinese and Japanese involve complex predicate formation while English involves syntactic long-distance dependency only. We have shown clearly in the last section that Mandarin tough constructions are lexical. We will now show that the formation of tough constructions in Japanese indeed involve a lexical instead of syntactic operation.

First, it can be shown that the affixation of the tough suffixes yasui 'to be easy', nikui 'to be difficult' etc. changes the category of the verb into an (predicative) adjective, as in (16).

- (16) kono hon wa totemo yomi-yasui
this book very read-easy
'This book is very easy to read.'

According to Ikeya (1992), the fact that -yasui turns the whole complex predicate into an adjective is shown by the fact that it is modified by to-temo 'very', a degree adverb that can only modify adjectives. Since a syntactic operation cannot change grammatical categories while morpholexical processes can, this shows that the affixation of -yasui is a morpholexical rule. This argument is also supported by both the inflectional paradigm of the tough predicates and the nominalization facts. The -sa

nominalizer, meaning 'the degree of..', can only be attached to an adjective (Harada p.c. and Ikeya 1992). It has already been shown that tough predicates allow -sa nominalization, as in (17).

- (17) John no koogi no gakusei-tachi nitotte no rikaishi-yasu-sa
(Saiki 1987:284)
=6b John lecture students for understand-easy-NOM
'John's lecture's easiness for the students to understand'

Another piece of evidence to support the lexical status of the formation of tough predicates is given in Saiki (1987:260).

- (18) a. [[suwar-i]v yasu] → [suwariyasu]adj 'easy to sit on'
b. [[aruk-i]v zura] → [arukizura]adj 'hard to walk (lit.)'

Notice in (18) that the verbal stem which ends in closed syllables (suwar and aruk) take the default vowel *i* when affixed with a tough morpheme. In a restrictive theory where all the lexical forms are fully inflected when inserted and where no post-syntax reorganization of phonology is allowed, (18) offers a very strong argument for the lexical status of the tough predicates. Based on the above evidence, I will follow both Ishikawa's (1985) and Saiki's (1987) complex predicate accounts.

Thus, I have shown that both Chinese and Japanese tough constructions involve morpholexical complex predicate formation and that they both allow nominalization of the tough predicates. English does not allow lexical tough and hence does not allow nominalization of tough constructions.⁶ Since nominalization in the three languages seems to share the same semantics, and since the language-specific morphology of nominalization in each language does not rule out the possible derivation, I will

6. As pointed out by an IsCCL III reviewer, English does show similar dependencies with the *-(a) bility* affix, such as in 'this book's readability'. The same reviewer also correctly points out that this would be accounted for by our Autonomous Morphology Hypothesis, as discussed later in this paper.

follow the assumption that it is the extraction of participating arguments that distinguishes English from both Japanese and Mandarin Chinese. This assumption is adopted without argumentation in both TCH and FCH. The most crucial observation is that an embedded participating argument can be extracted from a base predicate if the base predicate is part of a complex predicate (as in Japanese and Mandarin), but no extraction is allowed from within a propositional argument of a simplex predicate (as in English). This observation can be simplified to the locality condition that a morpholexical rule only has access to argument-structures at the locus of its application.

I capture this generalization in terms of The Autonomous Morphology Hypothesis and the concept of Morphological Transparency, stated as follows:

(19) A. AUTONOMOUS MORPHOLOGY HYPOTHESIS:

A MORPHOLEXICAL RULE CAN ONLY REFER TO ELEMENTS WHICH ARE MORPHOLOGICALLY TRANSPARENT AT ITS LOCUS OF APPLICATION.

B. MORPHOLOGICAL TRANSPARENCY

A LINGUISTIC ELEMENT IS MORPHOLOGICALLY TRANSPARENT TO A MORPHOLEXICAL RULE IF AND ONLY IF 1) IT IS THE LOCUS OF THAT MORPHOLEXICAL RULE, OR 2) IT PREVIOUSLY UNDERWENT A MORPHOLOGICAL OPERATION.

The basic premise of the above proposals is that a morpholexical operation is only sensitive to morphological structures and information. This position is long-assumed for operations involving various morphological formatives, under the umbrella term of The Lexical Integrity Hypothesis. My proposal here extends it to morpholexically encoded semantic/thematic information. In other words. Lexical Integrity also governs the morpholexical operations on argument structures. Thus, I am applying the autonomy of morphology to both the 'syntax' and 'semantics' of a morpholexical process, adopting the terms of Alsina (in press

a). My version of the Autonomous Morphology Hypothesis (19a) is a locality condition which is defined strictly in morphological terms. The definition of Morphologically Transparency in (19b) stipulates clearly the kind of morphological relations that sanctions morpholexical operations. In addition to the logically inevitable stipulation that the locus of its application is transparent to any morpholexical rule, I propose that morphological transparency can also be licensed by previous morphological operations. In other words, morphology is autonomous in two senses: first, unlike in syntax, the locality condition in morphology is not limited to a local tree; second, a morpholexical rule is sensitive to formatives of previous morphological rules, but not to formatives of other modules. This theory predicts that a participating argument of a derived nominal must be governed by a predicate-argument structure encoded on a morphologically transparent subpart of that nominal, and that the lexical unit governing the participating argument need not be directly involved in the morphological operation of nominalization.

In the remaining part of this section, I will show how this hypothesis offers a straightforward account of the dilemma posed by the nominalization of Mandarin tough predicates. I will also show how this hypothesis lays foundation to accounts for three different constructions in three different languages: Chichewa causatives, Chinese resultative compounds, and Japanese case-assigning nominals.

IV.B. Predictions

IV.B.1. Nominalization and Tough Constructions

The Autonomous Morphology Hypothesis and Morphological Transparency straightforwardly account for the fact that no raising predicates can be nominalized in English. (20a) is intended to involve nominalization of the tough construction. Take note that locus of the morphological operation of -ness affixation is on the predicate easy. Since easy is a simplex verb, it does not contain any morphologically transparent subparts other than itself. Semantically, easy takes a single propositional argument, as in (20b). Since a proposition is non-referential and thus not a

possible participating argument of nominalization, the morpholexical rule of -ness affixation is ruled out. Take note that Morphological Transparency makes the critical contribution of ruling out the extraction of arguments from the propositional argument of easy, i.e. the arguments of seem in (21a).

- (20) a. *The candidate's easiness to win the election
 b. 'EASY <proposition>'
- (21) a. *Kim's seemingness to be happy
 b. 'SEEM <proposition>'

Even though they are semantically compatible as participating arguments of nominalization, they are governed by a morphologically opaque (i.e. non-transparent) predicate and are therefore not available for extraction. This account differs from the unsuccessful TCH and FCH accounts in that it relies solely on morphological conditions. The unacceptability of (21a) can be explained along the same lines.

The account for the Japanese data lies in the fact that tough constructions involve complex predicates in this language.

- (22) a. kono hon no yomi-yasu-sa
 this book read-easy-NOM
 'this book's easiness to read'
 b. 'EASY <READ <agent, patient>>'

In (22), the critical fact is that the locus of the morphology of nominalization is on the whole complex predicate yomi-yasui 'easy to read'. Thus, since both yomi and yasui are morphologically transparent for the nominalization rule according to the above definitions, nominalization has access to both argument structures. As in English, the propositional argument of the higher predicate yasui 'easy' is not a legitimate candidate for a participating argument. I assume the same independently motivated

semantic principles that select the patient role of the predicate yomi to participate in the tough complex predicate also select it as the participating argument in nominalization.

Similarly, in Mandarin, the morpholexical process of nominalization applies to the whole complex predicate, even though there is no overt morphological mark for nominalization, as in Japanese. My account predicts that the thematic structure of the base predicate du 'to read' will be available for extracting participating arguments in nominalization because it is Morphologically Transparent, as in (23). Its transparency is sanctioned by the fact that du is concatenated with nan 'difficult' to form that complex tough predicate. In other words, that failure of nominalization of the English tough construction is simply because it involves a simplex verb which can neither supply a participating argument of nominalization directly nor through the argument structure of a morphologically transparent subpart.

- (23) a. [zhe ben shu de nandu]_{np} shi chuming de
 =14 this CLASS book DE difficult-read BE famous DE
 'That the book is difficult to read is well-known.'
 b. 'EASY <READ <agent, patient>>'

This account also correctly predicts that Mandarin simplex predicates which have only one propositional argument fail to nominalize too, as in (24).

- (24) a. ni cuo-guo-le zhechang yanjiang hen kexi
 you miss-EXP-LE this-CLASS speech very pity
 'It is a pity that you missed the talk.'
 b. *ni cuo-guo-le zhechang yanjiang de kexi
 you miss-EXP-LE this-CLASS speech DE pity

IV.B.2. Chicheŵa Causative

Alsina (1992) cites the following sentence to support his position that

causative constructions involve three-place predicates in Chicheŵa. I will show that this fact can also be accounted for with the Autonomous Morphology Hypothesis.⁷

(25) a. Zi-ku-onek-a kuti nyani a-na-pony-a mipira pa tsindwi
8s-PR-appear-FV that la baboon 1s-PS-throw-FV 3ball 16 5roof
'It appeared that the baboon threw a ball on the roof.'

b. *Njovu i-ku-onek-ets-a kuti nyani a-na-pony-a mipira pa tsindwi
9elephant 9s-PR-appear-CST-FV that la baboon 1s-PS-throw-FV 3ball 16 5roof
'The elephant makes it appears that the baboon threw a ball on the roof.'

(26) onek, v, 'APPEAR <proposition>'

The English translation in (25b) is grammatical, hence there are no semantical grounds to rule (25b) out. In other words, no theory can rule out *a priori* the possibility that the CAUSEE is fused with an appropriate argument of the propositional argument of the base predicate onek 'to appear'. However, since causativization in Chicheŵa involves affixation of the causative morpheme ets, my theory requires that the fused argument be extracted from a Morphologically Transparent predicate. It is thus predicted that (25b) is ungrammatical. The locus of the application of the causativization morpholexical rule is the verb onek, which has only a propositional argument and has no Morphologically Transparent subparts. Since the lexical rule cannot extract any referential argument to fuse with the abstract CAUSEE argument, its application is blocked and the verb onek cannot have corresponding causative reading. This account also predicts that causativization will be possible when the base predicate has a non-propositional argument. This is borne out with the following example involving the verb ganiz 'to think', which takes a referential subject and a sentential object, as in (27).

7. The gloss of Alsina (1992) is followed here. Arabic numbers represent noun classes. PR stands for PRESENT, FV for Finite Verb, CST for CAUSATIVE, and PS for PAST.

- (27) a. Kalulu a-ku-ganiz-its-a njovu kuti nyani a-na-pony-a mipira pa tsindwi
la hare 9s-PR-think-CST-FV 9elephant that la baboon 1s-PS-throw-FV 3ball 16 5roof
'The hare makes the elephant think that the baboon threw a ball
on the roof.'
b. ganik, v, 'THINK <SUBJ, proposition>'

In this case, the subject of the base predicate, njovu 'the elephant', is extracted by the causativization lexical rule to fuse with the CAUSEE of the higher clause.

IV.B.3. Chinese Resultatives and Japanese Case-assigning Nominals

So far I have discussed the implications of the Automatic Morphology Hypothesis in headed structures. I will now turn to concatenating structures where the existence of a dominant head cannot be established linguistically. The two structures we are going to discuss are the Mandarin VR resultative construction and the Japanese case-assigning nominals.

Huang and Lin (1992) give a proto-argument-based account of the Mandarin resultative compounds. Crucial to their account is that the so-called resultative compounds represent composite event-structures without any clearly defined logical relation between them. They also postulate that either component of the VR compound contributes one argument to the resultative compound and that the mapping between the selected base argument and the resultative argument is ONE-TO-ONE. This is motivated by data such as in (28) and (29).

- (28) a. Zhangsan ku-shi-le shoupa
Zhangsan cry-wet-PERE handkerchief
'Zhangsan cried such that the handkerchief is wet.'
cf. b. Zhangsan ku-le
Zhangsan cry-PERF
'Zhangsan cried.'

- cf. c. shoupa shi-le
handkerchief wet-PERF
'The handkerchief became wet.'
- (29) a. Lisi ti-po-le qiuxie
Lisi kick-break-PERF sneakers
'Lisi broke his/her sneakers (by playing soccer etc)'
b. Mengjiangnu ku-dao-le wanli-changcheng
Mengjiangnu cry-fall-PERF the Great Wall
'Mengjiangnu cried such that the Great Wall fell.'

This approach supports the proposal that a morpholexical rule can refer to information encoded on all Morphologically Transparent subparts at the locus of the rule. Contrary to traditional headed approach to morphology, Huang and Lin's account propose that each of the two predicates in a VR compound contributes an argument to the compound. This is allowed without further stipulation under the Autonomous Morphology Hypothesis as defined in (19) because both base predicates are Morphologically Transparent to the compounding morpholexical rule. This account, however, will be exceptional in any morphological theory which presupposes headed constructions.⁸

Another set of data that may be solved based on the ONE-TO-ONE constraint is the case-assigning properties of Japanese nominals. Iida (1987) observes that compound deverbal nouns and Sino-Japanese nominals can assign verbal cases and govern two arguments, while simplex deverbal nouns behave like non-deverbal nouns and can only have one nominal argument. This is demonstrated below in (30) and (31).

8. The best-known headed account of Li (1990), for instance, both over-generates and under-generates possible resultative compounds and interpretations. In addition, as Li (1990) himself admits, there is no clear-cut linguistic evidence available to indicate which of the components is the head. Please see Huang and Lin (1992) for a detailed arguments against the headed account.

(30) a. (Iida 1987.96(3b))

Soori-daijin no wairo no uketori
prime-minister SUBJ bribe GEN receipt
'the prime minister's receipt of the bribe'

- b. John no Ainu no kenkyuu (comp. Mandarin yanjiu)
John GEN Ainu GEN research
'John's research on the Ainu'

(31) (Iida 1897.125)

- a. John no tsuru (Agent)

'John's fishing'

- b. unagi no tsuru (Theme)

'fishing for eels'

- c. umi no tsuru (Location)

'fishing at the sea'

- d. umi no unagi no tsuru

sea GEN eels GEN fishing

'fishing for eels living in the sea,

fishing for eels at sea'

[i.e. 'fishing for sea eels' CRH.]

(30a) involves a native compound and (30b) involves a Sino-Japanese compound. Both of the deverbal nouns allow two arguments corresponding to the verbs. On the other hand, the non-compound deverbal noun can only have one argument, vividly illustrated by (31d), where the two no marked NPs can only combine to form one NP (literally 'sea's eels') and cannot play two roles.

What is even more striking is that even among Sino-Japanese verbs, the ones that cannot be demonstrated to be compounds (i.e. those that correspond to only one Chinese character) behave like a native Japanese non-compound deverbal noun, too. This is shown in (32).

(32) (Iida 1987.133)

*John no Hamlet no yaku chuu (comp. Mandarin yi)
John GEN Hamlet GEN translation mid
'during John's translation of Hamlet'

Iida's (1987) account of the above facts postulates that the compound-forming process brings in aspectual features. Thus the non-compound deverbal nouns lack verbal aspect and cannot assign verbal cases. This is why they only allow one no marked argument. But this account has problems, such as why the affixation of chuu, a durative suffix supposedly carrying verbal aspect features, fails to save (32).

A straightforward account of the above facts can be composed based on the one-per-argument-structure constraint proposed in Huang and Lin (1992). In addition to the constraint that morpholexical rules can only operate on Morphologically Transparent lexical elements, we hypothesize that nominalization can only extract one participating argument from each argument structure governed by a Morphologically Transparent lexical element. In other words, unless the base predicate is composed of more than one morphologically transparent part governing argument structures, each deverbal noun can have only one participating argument. Thus, the proposed Autonomous Morphology Hypothesis offers a possible solution to an idiosyncratic set of Japanese data. It is again shown that it is unnecessary to invoke the syntactic mechanism of dependency (i.e. case) marking. The number of participating arguments in nominalization can be determined by morphological conditions alone. Since the one-per-argument-structure constraint is also called for by Mandarin VR compounding, it should be treated as a possible language universal or parameter. A complete account would obviously involve a much more detailed analysis of the data.

V. Implications and Conclusion

V.A. The Bracketing Paradox

The nominalization of tough predicates discussed in this paper is reminiscent of the classical problem of the Bracketing Paradox. In nominalization of tough predicates, an argument is extracted from an embedded predicate to be a participating argument of the highest bracketing category, the deverbal noun. This is not unlike some of the bracketing paradoxes discussed in the literature (e.g. Spencer 1991). An instance of the classical Bracketing Paradox is given in (33). The categorization restriction of the affixes (un- precedes an adjective and -ity follows an adjective to turn it into a noun) dictates the bracketing in (33a). However, the level ordering principle deciding the prosodic features of the derived word dictates that -ity, as a group I affix, be combined with the stem before the group II affix un-, as in (33b).

- (33) The Bracketing Paradox
- a. [[un-predictabil]-ity]
(subcategorization requirement of affixes)
 - b. [un-[predictabil-ity]]
(level ordering principles)

If the extraction of participating argument in nominalization is marked by a pair of curly brackets, then the nominalization of Mandarin tough predicates can be represented as the following bracketing paradox.

- (34) a. [[[nan]_v-[du]_v]_v]_n
(categorial change)
- b. [[nan]_v- {[du]_v}]_n
(extraction of participating argument)

What is interesting about this interpretation and representation is how it

relates to the classical Bracketing Paradox. Note that X's unpredictability is X's quality of not being predictable. Thus, the only participating argument of this derived nominal has to be extracted from the predicate predictable, which is in an embedded bracket in both (33a) and (33b).

However, Morphological Transparency suggests that a morpholexical operation can access semantic information encoded on the locus of its application as well as on any constituent of the locus that underwent a morphological process. A consequence is that morpholexical processes can sometimes cross the (syntactically motivated) hierarchy of brackets. For instance, the subcategorization requirements of (33a) deal with the 'semantics' of the morpholexical rule. That is, it defines the way the meanings of all participants of the rule contribute to the meaning of the output of the rule. The nominalizer -ity takes a predicative argument, whose meaning is determined by the negation un- taking an adjectival argument.

Recall that Autonomous Morphology and Morphological Transparency predict that argument linking relations (and thus the subcategorization requirements) in a morpholexical process can always access a morphologically transparent unit regardless of the brackets created by the level ordering principles. Thematic structure of a stem, for instance, can usually be referred to in a morpholexical process regardless of how many brackets embedded it is. This is because a stem necessarily undergoes any previous morpholexical rules and hence is Morphologically Transparent. Thus the (33a) bracketing is superfluous (as is the (34b) bracketing). This is because the subcategorization requirement of the prefix un- can be satisfied in spite of the (33b) bracket since the stem predictable is Morphologically Transparent here. In other words, in spite of the phonologically motivated bracketing of (33b), un- can take either predictability or predictable as its argument because both of them are Morphologically Transparent. The NEG <predictable-ity> semantics is ill-formed and will be ruled out by type-mismatches, leaving the ITY <NEG <predictable>> interpretation available.

Similarly, the facts involving participating arguments in Chinese

nominalization do not contradict the (34a) bracketing since the stem du is transparent in spite of the compounding and the nominalization bracketing. The extraction of participating arguments from either the tough morpheme nan or the base predicate du is allowed even with the (34a) bracketing since both of them are morphologically transparent. However, since a tough predicate only takes a propositional argument, it does not offer any plausible candidate for participating argument in nominalization (even though it itself is the target of the reference created by nominalization). Hence the participating argument has to come from the thematic structure of du, the other Morphologically Transparent element. It is interesting to observe that this account also correctly predicts that nominalization of tough predicates does not work in English. This is because it applies to the simplex tough verb and has no place to extract participating arguments from. To summarize, many bracketing paradoxes are no longer paradoxes since morpho-phonological brackets do not post barriers to morpho-semantic processes which are only sensitive to Morphological Transparency.

V.B. Conclusion

In this paper, I proposed an Autonomous Morphology Hypothesis and the concept of Morphological Transparency. The proposal is motivated by the contrast in nominalization of tough predicates in English, Japanese, and Mandarin. I have shown that neither Rappaport's Thematic Constancy Hypothesis nor Saiki's Functional Constancy Hypothesis can account for the data in these languages. This paper follows and supports the basic TCH assumption that participating arguments in nominalization are extracted from thematic structures. However, Rappaport's version of TCH is too restrictive because it (wrongly) adopts the syntactic locality condition and takes into consideration only the argument structure governed by the predicate being nominalized. Saiki's attempt to account for the Japanese exceptions to TCH is also misleading because her FCH is based on the syntactic mechanism of dependency marking. The premise of my account is an autonomous morphology where conditions

on morpholexical rules are defined strictly in terms of other morpholexical rules. Crucially, I define the Morphological Transparency of linguistic elements in terms of morphology, not syntax or semantics. The simple and straightforward stipulation that a linguistic element is Morphologically Transparent if and only if it is sanctioned by the application of other morphological rules, allows an account where both TCH and FCH failed. Thus, participating arguments in nominalization are determined by whether they are governed by a thematic structure encoded on the locus of the nominalization morphology or on its morphologically transparent constituents, not by syntactic hierarchy or phonological bracketing. Linguistic facts in other languages also support the proposal of Morphological Transparency. I showed that the same condition applies to other morpholexical processes, such as Chicheŵa causativization and Mandarin VR compounding. Additional facts discussed including Japanese case-assigning nominals, and the Bracketing Paradox. Thus, the study of a lexical process without morphological marking yields support for the autonomy of morphology.

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Bibliography

- Alsina, Alex.* In press a. Where's the Mirror Principle? To appear in *W. Chao and G. Horrocks*. Eds. *Levels, Principles and Processes: The Structure of Grammatical Representations*. De Gruyter.
- _____. 1992. On the Argument Structure of Causatives. *Linguistic Inquiry*. 23.4:517-555.
- Bresnan, Joan and Jonni M. Kanerva.* 1989. Locative Inversion in Chicheŵa: A Case Study of Factorization in Grammar. *Linguistic Inquiry* 20.1.1-50. Also to appear in E. Wehrli and T. Stowell eds. *Syntax and Semantics 24: Syntax and the Lexicon*. New York: Academic Press.
- Chao, Yuen Ren.* 1968. *A Grammar of Spoken Chinese*. Berkeley: University of California Press.
- Dai, John X.-L.* 1991. Inflectional Morphology in Chinese. Presented at the Third North American Conference on Chinese Linguistics. May 3-5. Cornell University.
- Dowty, David.* 1991. Thematic Proto-Roles and Argument Selection. *Language*. 67.3:547-619.
- Grimshaw, Jane.* 1990. *Argument Structure*. Cambridge: MIT Press.
- Huang, Chu-Ren.* 1992. Lexical Tough Constructions in Mandarin Chinese. Paper presented at the Fourth North American Conference in Chinese Linguistics. May 8-10, Ann Arbor, Michigan.
- _____. 1993. Mandarin Chinese and the Lexical Mapping Theory--A study of the interaction of morphology and argument changing. *Bulletin of the Institute of History and Philology*. Vol. 62. no. 2. 337-388.
- _____. 1994. Corpus-based Studies of Mandarin Chinese: Foundational Issues and Preliminary Results. In Matthew Y. Chen and Ovid J.-L. Tzeng Eds. *Linguistic Essays in Honor of William S.-Y. Wang*. Taipei: Pyramid.
- _____ and *Keh-jiann Chen.* 1992. A Chinese Corpus for Linguistic Re-

- search. In the Proceedings of the 1992 International Conference on Computational Linguistics (COLING-92). 1214-1217. Nantes, France.
- _____ and *Fu-Wen Lin*. 1992. Composite Event Structures and Complex Predicates: A Template-based Approach to Argument Selection. Proceedings of the Third Annual Meeting of the Formal Linguistic Society of Mid-America (FSLM III). pp. 90-108. Bloomington: IULC.
- Li, Ya-Fei*. 1990. On V-V Compounds in Chinese. *Natural Language and Linguistic Theory*. Vol. 8. 177-207.
- Iida, Masayo*. 1987. Case-Assignment by Nominals in Japanese. In M. Iida, S. Wechsler, and D. Zec Eds. *Studies in Grammatical Theory and Discourse Structure*, Vol. I: Interaction of Morphology, Syntax, and Discourse. CSLI Lecture Notes No. 11. pp. 93-138. Stanford: CSLI.
- Ikeya, Akira*. 1992. Japanese Tough Construction in HPSG. Paper presented at the 1992 Asian Conference on Language, Information and Computation. Seoul. August 1-2.
- Ishikawa, Akira*. 1985. Complex Predicates and Lexical Operations in Japanese. Unpublished Stanford University Ph. D. Thesis.
- Rappaport, Malka*. 1983. On the Nature of Derived Nominals. In L. Levin, M. Rappaport, and A. Zaenen eds. *Papers in Lexical Functional Grammar*. Bloomington: IULC.
- Saiki, Mariko*. 1987. Grammatical Function in the Syntax of Japanese Nominals. Stanford University Dissertation.
- _____ and *Young-mei Yu Cho*. 1987. Verbal Nouns in Korean and Japanese. S. Kuno et al. eds. *Harvard Studies in Korean Linguistics II*. pp. 434-442. Seoul: Hanshin Publishing Co.
- Sheu, Ying-yu*. 1989. A Categorical-Processual Analysis of Xu_zi in Chinese. In Thomas Ernst and Majorie Chan eds. *Proceedings of the First North American Conference on Chinese Linguistics*. Bloomington: IULC.
- Spencer, Andrew*. 1991. *Morphological Theory*. Oxford: Basil Blackwell.
- Tang, Charles T.-C.* 1989. *Guoyu Cifa Yufa Yanjiu Lunji* [Studies on

Chinese Morphology and Syntax]. Taipei: Student.

Tang, Jane C.-C. 1993. Guoyu de DE yu Yingwen de's (Mandarin DE and English's). To appear in Bulletin of the Institute of History and Philology. 63-4:733-757.

Noun Phrase Structure in Mandarin Chinese: DP or NP?

Jo-wang Lin

University of Massachusetts, Amherst

Abstract

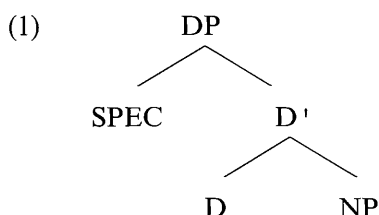
This article examines two competitive analyses of noun phrase structure, the traditional Noun Phrase (NP) analysis and the fashionable Determiner Phrase (DP) analysis. I show that evidence for the DP hypothesis of Chinese noun phrases is not as strong as that adduced for noun phrases in other languages and the traditional NP analysis is still a competitive, or perhaps superior, analysis to the DP analysis.

0. Introduction

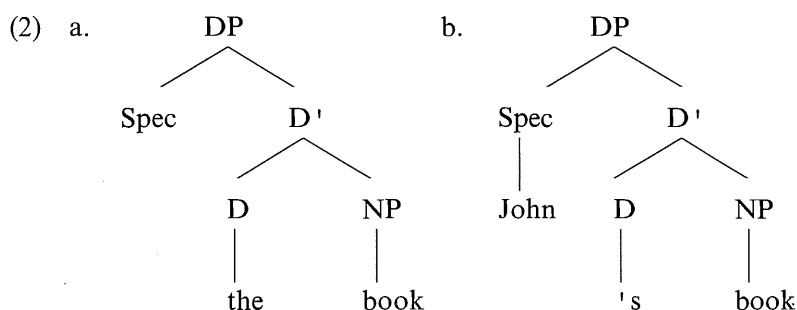
Noun phrases have been traditionally analyzed as NPs with the noun as the head and the determiner or possessor as the specifier. However, in recent years, there is a growing conviction that noun phrases should be considered DPs with the determiner as the functional head of the noun phrase. This is the DP hypothesis (cf. Abney (1987), Fukui (1986), Fukui and Speas (1986), among others). According to this hy-

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pothesis, the internal structure of noun phrases is as follows:



Under this hypothesis, the determiner is no longer the specifier of NP but the head of DP which selects NP as its complement. As for the possessor, it is reanalyzed as the specifier of DP which is assigned genitive Case by the functional feature 's or by an abstract AGR in D. These two possibilities are illustrated in (2).



The DP hypothesis has been applied to a variety of languages (cf. Ritter (1991), among others). In the case of Chinese, C. C. Tang's (1990a, 1990 b) analysis is a representative. However, it seems that evidence for the DP hypothesis in Chinese is rather weak. A survey of the argument types for the DP hypothesis in the literature immediately shows that they are inapplicable to Chinese noun phrases.

The argument types for the DP hypothesis tend to fall into three groups. One type of argument is based on grammatical agreement such as number/gender or Case which the Det elements bear. On the assumption that it is generally heads that enter into agreement, the inflections on the Det elements imply that they are heads. Another type of argument is

based on movement possibilities. In some languages, it can be clearly shown that a nominal construction with the surface NSO order is derived from an underlying SNO order, thus supporting a functional projection above NP. The third type of argument rests on the well-known parallelism between sentences and noun phrases. However, among these three types of arguments, type 1 and type 2 are obviously inapplicable to Chinese. Type 1 argument does not apply to Chinese, because Chinese simply lacks morphological grammatical agreement. As a matter of fact, Chinese even lacks articles. Type 2 argument cannot apply to Chinese, since N can hardly be shown to undergo movement. As for the third type of argument, as will be shown in this article, it is not so clear that noun phrases in Chinese are parallel to sentences.

It should be noticed at the outset that one cannot argue for a DP structure for Chinese noun phrases on the basis of other languages. Although the discovery of DP structure in other languages has a universal implication, there is no *a priori* necessity that Chinese noun phrases are also DPs. To maintain a DP hypothesis for Chinese noun phrases, one has to seek independent empirical evidence from the Chinese language itself. One purpose of this article thus is to examine the linguistic facts in Chinese in order to see how strong the evidence for the DP hypothesis is. I will show that evidence for the DP hypothesis in Chinese is actually very weak. Another goal of this paper is to show that an NP analysis of Chinese noun phrases is still a competitive, or perhaps superior, analysis to the DP analysis.

This article is organized as follows. In section 1, I first review the basic properties of Chinese noun phrases and C. C. Tang's (1990a, 1990 b) DP analysis. Section 2 then demonstrates that arguments for the DP hypothesis in Chinese are not strong. Section 3 shows how the same range of data relating to noun phrases are better accommodated by an NP analysis in which the determiner-numeral-classifier sequence as a whole is analyzed as a single modifying constituent as first suggested by Huang (1982). section 4 discusses Chinese deverbal nominals and argues that the seemingly internal and external arguments of deverbal nominals turn out

to be syntactic modifiers. This result suggests that deverbal nominals in Chinese have no true argument structure as verbs have. Section 5 concludes this article.

1. The DP Hypothesis and Chinese Noun Phrase Structure

C. C. Tang (1990a, 1990b) has observed that Chinese noun phrases have the following basic properties.

First, demonstratives and numerals cannot by themselves modify a head noun;¹ instead they must cooccur with classifiers.

- (3) a. *na shu
 that book
 b. na ben shu
 that Cl book
 'that book'
- (4) a. *san shu
 three book
 'three books'
 b. san ben shu
 three Cl book
 'three books'

According to C. C. Tang (1990b), in (3b), although no numeral appears,

1. Actually, in some cases, a demonstrative may modify the head noun directly on the condition that the referent denoted by the noun phrase is present at the time of the utterance. Consider (i).

(i) Ni zhe haizi shizai hen tiaopi
 you this child really very naughty
 'You are really very naughty.'

In this paper, I will not discuss this deictic use of the demonstrative.

the implicit numeral *yi* 'one' is there. That is why (3b) can only be interpreted as 'that book' rather than 'those books'.

Second, classifiers cannot appear without a numeral.²

- (5) a. *Shu*
book
b. **ben shu*
CL book
c. *san ben shu*
three CL book

2. This observation of C. C. Tang's is not complete. As pointed out by Zhu (1982), when a noun phrase appears as the object of a verb, the numeral need not appear.

- (i) a. *shuo ju hua*
say CL word
'say a word'
b. *xie ge xin*
write CL letter
'write a letter' Zhu (1982, p. 51)

Yet it is true that a Cl-N sequence may not appear in subject position.

- (ii) **Ben shu bei tou-le*
CL book Pass steal-ASP
'A book was stolen.'

Nor can a Cl-N sequence appear as the complement of a preposition as shown in (iii).

- (iii) *Ta gen *(yi) jia chubanshe you heyue*
he with one CL publisher have contract
'He has a contract with a publisher.'

Though (ii) may be explained by saying that an indefinite subject in Chinese is not allowed, it is not clear why (iii) is out. (iii) indicates that C. C. Tang might be right in saying that a numeral is obligatory when the classifier appears. But this requires an explanation of the optionality of the numeral in (i). On the other hand, Lisa Cheng (personal communication) points out to me that in Cantonese, a classifier may modify the head noun by itself and this is a very general pattern. This seems to indicate that numerals are not obligatory elements.

Third, the order of the demonstrative, numeral and classifier is fixed; namely, the demonstrative precedes the numeral, which in turn precedes the classifier. No other word order is allowed.

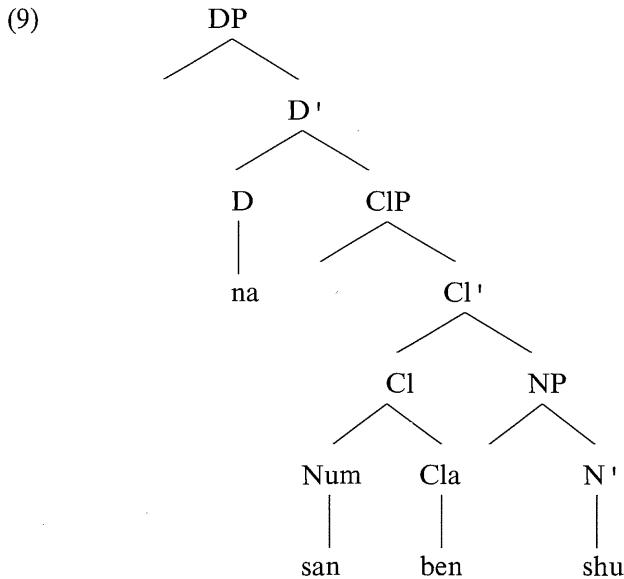
- (6) *na san ben shu*
that three CI book
'those three books'

Fourth, there exists a kind of agreement or selectional restriction between the classifier and the head noun. That is, the classifier varies with different head nouns.

- (7) a. *na san ben shu*
that three CI book
'those three books'
- b. **na san ge shu*
that three CI book
'those three books'

- (8) a. *na san ge ren*
that three CI man
'those three men'
- b. **na san ben ren*
that three CI man
'those three men'

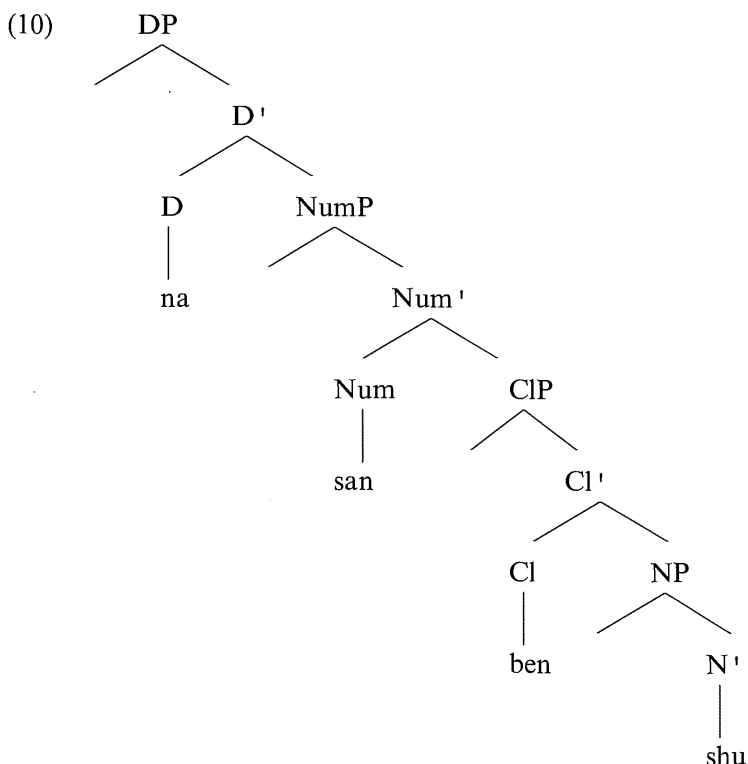
To account for the above facts, following Abney's essential idea that Det elements are the head of the noun phrase, C. C. Tang (1990a, 1990b) has suggested a more intricate DP-analysis for Chinese noun phrases. That is, in addition to DP and NP projections, she posits an intermediate level Classifier Phrases (CIP) between the DP and the NP as in (9). Thus, the phrase structure for noun phrases such as *na san ben shu* 'those three books' looks like the following.



This structure, according to C. C. Tang (1990a), captures the structural parallelism between clauses, i.e., the CP-IP-VP structure, and noun phrases, i.e., the DP-CIP-NP structure. Especially, just as Infl contains a lexical modal and Agr, Cl consists of a lexical numeral and an agreeing classifier.

As an alternative to (9), C. C. Tang (1990b) suggests that the numeral and the classifier might head their own maximal projection, respectively, as represented in (10). She notes that the structure (10) parallels Pollock's (1989) split Infl analysis and actually has the advantage of avoiding the problem of multiple heads that arises under the analysis in (9).³

3. It should be noted that C. C. Tang does not commit herself to either the structure (9) or (10). Actually, though she discusses various possible structures for noun phrases, she doesn't make any strong claim about them.



Now, let us turn to how the data in (3-8) are accounted for under the DP-analysis. In C. C. Tang (1990b), where the structure (9) is most fully discussed, she postulates that under Cl both the numeral and the classifier are obligatory; that is, if a lexical instantiation is given to Cla, both the Num and Cla must be lexically realized. Hence none of the demonstrative, numeral or classifier may modify the head noun by itself. As pointed out to me by C. C. Tang, we may rephrase the above seemingly stipulative statement so that the cooccurrence restriction between the demonstrative/numeral and the classifier may follow from complement selection. In the structure (10), D selects NumP and Num selects CIP, which in turn selects NP. On the assumption that selected elements are obligatory, it follows that when the demonstrative appears, the numeral and the classifier must be present. So the demonstrative and the numeral may not modify the head noun by themselves.

As for the fixed word order of the demonstrative-numeral-classifier

sequence, it also follows from the assumption that D selects NumP and Num, CIP.

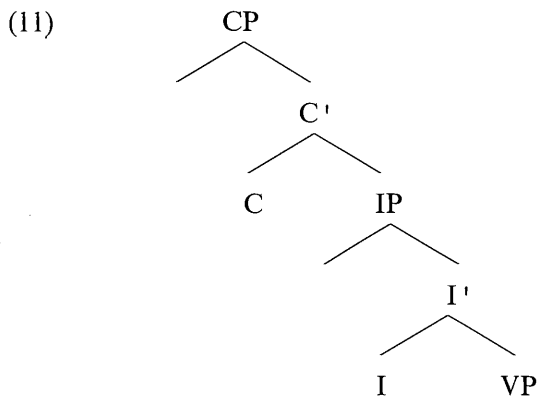
Finally, the agreement relation between classifiers and head nouns can be captured because Cl may impose certain selectional restrictions on its NP complement.

2. Problems with the Arguments for the DP Analysis

Although the DP analysis for Chinese noun phrase structure is interesting, it seems that there are still rooms for discussions and many problems arise when more relevant facts are taken into consideration.

Let us first consider the parallel relationship between CP-IP-VP at the sentence level and DP-CIP-NP at the noun phrase level.

To say that the noun phrase structure (9) captures structural parallelism to the clause structure CP-IP-VP, a tacit assumption is that Chinese has the following clause structure in which the heads C and I are head-initial.



However, this structure is not uncontroversial. In the pre-Barriers framework, where Comp is a position for both complementizers and moved topics and wh-phrases, people tend to take the position of Comp in Chinese to the left of IP, since topics occur in the left periphery. However, in

the post-Barriers framework, where Spec of CP and the head Comp occupy two positions, it is not necessary that Comp and moved topics and *wh*-phrases occur on the same side. Indeed, T. C. Tang (1988a, 1989) has suggested that Comp in Chinese should be in head-final rather than head-initial position. According to his view, Comp is a position for sentence-final particles such as question particles, statement particles, exclamation particles, etc. This hypothesis is rather reasonable, because the scope of these particles is the whole clause and they reflect sentence types. As a matter of fact, more and more linguists now adopt this position. (Aoun and Li (1990), Cheng (1991), Lin (1992a, b), among many others). Given that one of the functions of Comp is to determine sentence types, the existence of sentence-final particles is clear evidence for a structure in which Comp is head-final.

Now consider the position of Infl. Chinese lacks tense and agreement inflections. Thus, in the past decade, the most strong piece of evidence for the hypothesis that Infl precedes VP is the fact that modal auxiliaries, which by assumption are constituents of Infl, precede VP. However, Lin and Tang (1991) has recently argued that modal auxiliaries in Chinese cannot be analyzed as constituents of Infl but are main verbs of the sentence. If modals in Chinese are main verbs, then the evidence no longer holds. If modals are main verbs in Chinese, C. C. Tang's (1990a) statement that both Infl and Cl contain a lexical category does not hold, either. This opens the possibility that Infl may follow VP. Indeed, based on diachronic development of aspect markers and the distribution of VP-final tense/aspect particles, Lin (1992b) has advocated that Infl in Chinese follows VP. In other words, both Infl and Comp are in head-final position.⁴

The upshot of the above discussion is that if Infl and Comp are both in head-final rather than head-initial position as the above authors argue, then D in (9) or (10) will not be parallel to Infl or Comp. This

4. It should be noted that whether Infl precedes or follows VP in Chinese is still controversial. Thus the remark here only represents a point that needs to be considered in talking about Chinese phrase structure.

weakens the argument for the DP-CIP-NP structure based on structural parallelism.⁵ Perhaps one might rebut that the structural parallelism might not refer to "head-initial" or "head-final" but to hierarchical parallelism. I do not deny this. But then, the burden of proof will be on proponents of the DP hypothesis to account for why functional heads in a nominal construction should differ from those in clause structure in head-parameter.

Still, there is a deeper reason to doubt that Chinese noun phrases are parallel to clauses in hierarchical structure. As will be discussed in section 4, deverbal nominals in Chinese might not have argument structure at all and instead have only adjuncts. If the discussion there is correct, then there will be no need to postulate a DP projection above NP, since there is no external argument which needs to be assigned Case by D.

Next, let us consider the argument related to the distribution of the demonstrative, numeral and classifier. As we have seen in section 1, the demonstrative has to cooccur with the numeral and the classifier in order to modify the head noun and under the DP hypothesis this fact is said to be captured in terms of selection. Below I will show that the distribution of the demonstrative, numeral and classifier does not necessarily follow from complement selection, hence weakening the argument for treating them as heads.

Natural languages contain many elements which must cooccur with a specific type of other elements. Negative polarity adverbs in Chinese, for example, always cooccur with a negator and cannot appear without the latter.

- (12) Ta conglai meiyou shuo-guo huang
he ever not tell-Asp lie
'He has never told a lie.'

5. It should be pointed out that Tang (1990b, pp. 85-87) also discusses the possibility of placing Comp in head-final position. Thus, she actually doesn't use the head-initial/head-final parameter to argue for the parallelism between NP and S.

- (13) *Ta conglai shuo-guo huang
 he ever tell-Asp lie
 'He ever told a lie.'

The situation with the negative polarity adverb is thus very similar to that with the demonstrative. More specifically, just as the demonstrative is dependent upon the presence of the classifier, the negative polarity adverb is dependent upon the presence of a negator. Moreover, both the demonstrative and the negative polarity adverb are optional.

To account for the fact that the negative polarity adverb in (12) must cooccur with a negator, one may employ selection property, saying that the negative polarity adverb selects an NegP. Thus, the former cannot modify the following VP by itself. Under this analysis, there are still two possibilities to consider, depending upon whether the negator is treated as a head selecting VP or an adjunct modifying VP.

- (14) [_{IP} Ta [_{AdvP} conglai [_{NegP} meiyou [_{VP} shuo-guo huang]]]]
 (15) [_{IP} Ta [_{VP} [_{AdvP} conglai [_{NegP} meiyou]] [_{VP} shuo-guo huang]]]

However, both structures are very questionable. (14) is not possible, because Infl does not select an AdvP as its complement. (15) is problematic, because if NegP is a complement of the adverb, then it is not clear how the scope of the negator may reach the VP. On the other hand, a quite plausible alternative analysis is that *conglai* 'ever' is an adjunct occurring in the specifier position of NegP and is licensed by the negator in this position. Since the negative polarity adverb is licensed by the negator, the former cannot appear without the presence of the latter. Notice that under this alternative analysis, the problems that (14) and (15) encounter will not arise, whether the negator is treated as a head selecting VP or as a VP adjunct.

By the discussion above, I hope to show that the fact that the demonstrative has to cooccur with the classifier does not necessarily follow from complement selection. Given the similarities between the demon-

strative and the negative polarity adverb as mentioned above, it is also possible that just as the negative polarity adverb is an adjunct licensed by the negator, so is the demonstrative an adjunct licensed by the classifier.

In addition to the above problems, the DP hypothesis faces another complexity. Chinese D-Num-Cl sequences exhibit a very interesting property. In Chinese, prenominal modifiers, irrespective of relative clauses, APs or PPs, may either precede or follow the D-Num-Cl sequence, as exemplified below.

- (16) a. na san ben [wo xie]-de shu
that three Cl I write DE book
'those three books that I wrote'
b. [wo xie]-de na san ben shu
I write DE that three Cl book
'those three books that I wrote'
- (17) a. na san wei gaogaoshoushou-de nanhai
that three Cl tall-and-thin DE boy
'those three tall and thin boys'
b. gaogaoshoushou-de na san wei nanhai
tall-and-thin DE that three Cl boy
'those three tall and thin boys'
- (18) a. na san ben youguan yuyanxue de shu
those three Cl about linguistics DE book
'those three books about linguistics'
b. youguan yuyanxue-de na san ben shu
about linguistics DE those three Cl book
'those three books about linguistics'

However, as observed by Tang, the same prenominal adjuncts may not intervene between the demonstrative and the numeral-classifier sequence as shown in (19); nor can they intervene between the numeral and the

classifier as shown in (20).

- (19) a. *na [wo xie]- de san ben shu
that I write DE three Cl book
'those three books that I wrote'
b. *na gaogaoshoushou-de san wei nanhai
that tall-and-thin DE three Cl boy
'those three tall and thin boys'
c. *na [youguan yuyanxue]-de san ben shu
those about linguistics DE three Cl book
'those three books about linguistics'
- (20) a. *na san [wo xie]- de ben shu
that three I write DE Cl book
'those three books that I wrote'
b. *na san gaogaoshoushou-de wei nanhai
that three tall-and-thin DE Cl boy
'those three tall and thin boys'
c. *na san [youguan yuyanxue]-de ben shu
those three about linguistics DE Cl book
'those three books about linguistics'

According to her, adjuncts are licensed by heads and are assumed to be generated under a recursive XP or X'. Thus, given the phrase structure (9), in each of the (a) examples in (16-18), the prenominal modifier is generated under a recursive NP or N, hence following the classifier; in each of the (b) examples, they are generated under the recursive DP or D', hence preceding the demonstrative. Nevertheless, it is also theoretically possible to generate the same modifiers under a recursive ClP or Cl', a possibility which is not allowed in reality. If the structure (10) is taken to be the correct structure, then prenominal modifiers should be able to be adjoined to NumP or Num', again a wrong prediction. If prenominal modifiers may be generated under a recursive ClP or Cl', then the ill-

formed examples in (19) would all be incorrectly predicted to be grammatical.

C. C. Tang (1990b) has noticed the above problem and suggested two possibilities to prevent this. One possibility is to say that a Cl-to-D movement obligatorily applies in Chinese noun phrases. As a result, at PF, no element may intervene between D and Cl. Another possibility is that Cl (and Num if (10) is taken to be the correct structure) do(es) not license any modifier so that no modifier may be base-generated between D and Cl. If one further assumes that a functional category may project only to an intermediate projection, then the examples in (19) and (20) will not be derived by means of movement, either, since according to Chomsky (1986), adjunction is only to maximal projections.

However, both alternatives seem to be problematic. Consider the first possibility. Why must Cl move to D? What motivates the movement? It should be pointed out here that head-to-head movement is usually motivated by morphological requirement, but it seems clear that numerals and Classifiers are not inflections. Thus, independent evidence has to be found for head-to-head movement in Chinese; otherwise, the Cl-to-D movement would be an ad hoc solution. It is worth while mentioning that Tang (1990a, pp. 344-345) thinks that there is a morphological motivation for the Cl to D movement; namely, classifiers are a kind of agreement elements and hence should be bounded. This reason, however, is not sufficient for the Cl to D movement. Notice that being an agreement element is not equivalent to being a bound morpheme. There are a number of agreement elements in natural languages which are not bound affixes. For example, the infinitival marker *to* in English must agree with the complementizer *for* but is not a bound affix. Thus, to motivate the Cl to D movement, one has to justify the hypothesis that classifiers are bound affixes. It is not enough to say that classifiers are agreement elements.⁶ As a matter of fact, even if we take classifiers to be bound af-

6. C. C. Tang (1990b) gives two more reasons to support the Cl-to-D movement. First, she points out that the D-Num-Cl sequence *na-yi-ben* 'that-one-Cl' and *zhe-yi-ben* 'this-one-Cl' can be contracted as *nei-ben* and *zhei-ben*. However,

fixes, the Cl-to-D movement is still doubtful. According to Tang's analysis, a classifier first moves to Q and then to D. However, after the classifier is moved to Q, the morphological requirement would be satisfied and thus there is no morphological motivation for further movement to D.

A second problem with the Cl-to-D movement analysis is concerned with examples such as (21).

- (21) zheme ji ju hua
so several Cl word
'so few words'

As pointed out by Lü (1984), when *zheme* 'so' is combined with a nu-

phonological contraction does not necessarily mean that head-to-head movement has taken place. It could be the case that two phonological units are contracted simply because they are adjacent to each other. For example, in English, the sequence *do you* is very often contracted as *d'ya* but it is clear that the subject *you* has not undergone head-to-head movement. For a maximal projection cannot move to a head position. Even if one claims that it is only the head pronoun *you* moves, an ECP violation will result. The other supporting evidence given by C. C. Tang is concerned with the impossibility of stranding the demonstrative, as in (i).

- (i) a. Na yi ben shu, wo kan-guo
that one Cl book I read-Asp
'That book, I have read.'
b. *yi-ben shu, wo kan-guo na
one-Cl book, I read-A SP that

Again, the ungrammaticality of (ib) seems to say nothing about the head-to-head movement. (ib) is independently ruled out by other considerations. First, topics must be definite, specific or generic. Since the topic in (ib) is indefinite, (ib) violates this general requirement on topics. Second, consider the contrast below.

- (ii) a. We have already bought those three books.
b. *Three books, we have already bought those.

From the examples in (ii), we can see that English exhibits the same pattern as Chinese. However, there is not much sense to claim that the numeral in (ii) has undergone head-to-head movement. It seems that whatever rules out (iib) might also rule out (ib). Thus, C. C. Tang's supporting evidence for Cl-to-D movement in Chinese is not convincing.

meral-classifier sequence, its semantic function is to denote the scale of largeness or smallness of the numeral. In this sense, *zheme* in (21) is a modifier of the numeral.⁷ This in turn implies that under the DP analysis of noun phrases, it should be attached to an iterated Cl'/Num' or a recursive ClP/NumP, since it should be licensed by the head Num. Now suppose that Cl-to-D movement is obligatory as C. C. Tang proposes. Then the numeral-classifier sequence *ji ju* 'several-Cl' in (21) should be able to move past the degree word *zheme* 'so', yielding example (22).

- (22) *ji- ju zheme hua
 several Cl so word
 'so few words'

Since (22) is ungrammatical, the Cl-to-D movement is not supported.⁸ For the DP analysis to avoid the problem in question, one possible way is to say that *zheme* 'so' hosts the head D. However, if this analysis is taken, one would be forced to admit of two types of *zheme*. As I noted, *zheme* may modify an adjective as in *zheme gao* 'so tall'. However, it seems rather impossible to claim that *zheme gao* 'so tall' is a DP, since its distribution is completely different from that of a normal noun phrase.

As for the solution that Cl and Num do not license any modifier, it is quite obvious that this is at best a stipulation which has no explanatory force. Why should there exist such a gap in the theory of ad-

7. *zheme* 'so' may also modify an adjective as in (i).

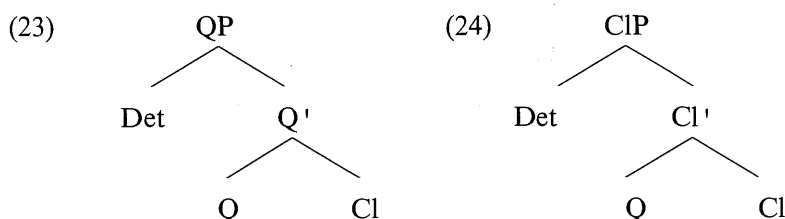
(i) *zheme gao*
 so tall
 'so tall'

8. One reviewer suggests that the problem in question can be avoided if Tang's analysis is revised in such a way that the Cl-to-D movement takes place only when D contains an overt element, thus reducing the movement to a pure matter of morphology. The problem with this is that as I remarked, after a classifier moves to Q, the morphological requirement will be satisfied. Thus, it is not clear at all that the problem in question can be explained away in terms of morphology.

junct licensing? A better theory would account for the same range of facts without such a stipulation.

3. An NP Analysis of Noun Phrases

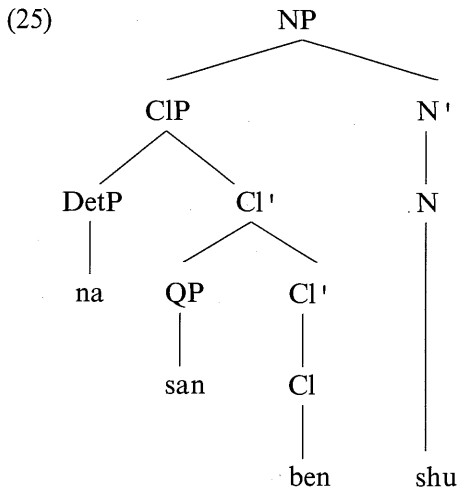
In her discussion, C. C. Tang discusses a third alternative analysis for D-Num-Cl sequence suggested in Huang. Huang (1982) suggests two possible structures for Chinese D-Num-Cl sequences.



In (23), the quantifier/numeral is treated as the head, while in (24), the classifier is treated as the head. In both analysis, the demonstrative is analyzed as the specifier of the containing QP or ClP. According to Huang (1982), the whole QP or ClP is an adjunct or the specifier of the NP. However, (23) and (24) are considered problematic by C. C. Tang (1990b, p. 407) and were not given much attention. On her conception, both structures are problematic, because within Chomsky's Barriers framework, "only maximal projections may be located in the Spec and complement position". However, the theory of grammar must allow maximal projections which contain nothing except the head (cf. Muysken (1983) and Muysken and Riemsjik (1986)). So Det and Q in (23) and (24) can still be taken as maximal projections. In what follows, I will assume this without further discussions.

Now, I can put forward an alternative analysis of Chinese noun phrase structure. Following Huang's (1982) suggestion, I propose that Chinese noun phrases such as *na san ben shu* 'those three books' essentially have the phrase structure (25).⁹

9. Tang (1990b, p. 401) also discusses a noun phrase structure in which the ClP is adjoined to N'. See also Ernst (1991) for a similar proposal to (25).



This structure is very different from the structure under the DP analysis, since it consists of only one maximal projection NP and the demonstrative-numeral-classifier sequence as a whole forms a constituent. In (25), the demonstrative does not head a DP projection but is analyzed as the specifier of the CIP. Another salient feature of (25) is that the whole CIP is taken to be the specifier of the NP. Below, I will first motivate such a structure and then discuss its consequences.

Let us first consider the question why the CIP is analyzed as the specifier. Recall that the demonstrative-numeral-classifier sequence as a whole is optional. If the CIP is treated as the specifier, this fact is predicted. Specifiers are optional elements, so the CIP is optional. This analysis also predicts that if a noun has a CIP as its modifier, the most important and obligatory element of the CIP is the classifier. This is simply a consequence of the analysis that the classifier is the head of the modifying CIP. The final major motivation of treating the CIP as the specifier is that the agreement relationship between classifiers and head nouns can be expressed as an instance of Spec-head agreement. This is also one of Ernst's (1991) arguments for treating CIPs as the specifier of NP which is independently needed in other places of the grammar. In (25), the specifier of the CIP is headed by the classifier *ben*. Since the feature of the classifier *ben* may percolate up via the convention of head feature perco-

lation, the whole CIP bears the feature of the classifier and hence is able to agree with the head noun via Spec-head agreement. The Spec-head agreement thus naturally accounts for the agreement between classifiers and head nouns.

Now let us go into more details about the CIP projection. Recall that in Chinese, the demonstrative and numeral cannot modify the head noun by themselves. This fact is predicted under the NP analysis that I am proposing. In (25), both the demonstrative and the numeral are treated as modifiers of the classifier. Since modifiers are not required elements, the demonstrative and numeral are predicted to be optional within the CIP projection.¹⁰ It also follows as a natural consequence that their distribution depends upon the presence of the classifier. The reason is quite simple: a term must be meaningful for it to be modified. Put another way, since the demonstrative and numeral are licensed by the classifier, they cannot appear without the licensing head. (cf. Travis (1988), Johnson (1991)). The situation here is very similar to one where a manner adverb is projected but the verb is missing. If no verb appears in a sentence, it is pointless to talk about what the manner adverb modifies. Thus, treating the demonstrative as a modifier of the classifier helps explain why their distribution must be sensitive to the presence of the classifier.

Under my analysis, the other properties related to noun phrases also fall out quite naturally. Consider the problem of the fixed word order of

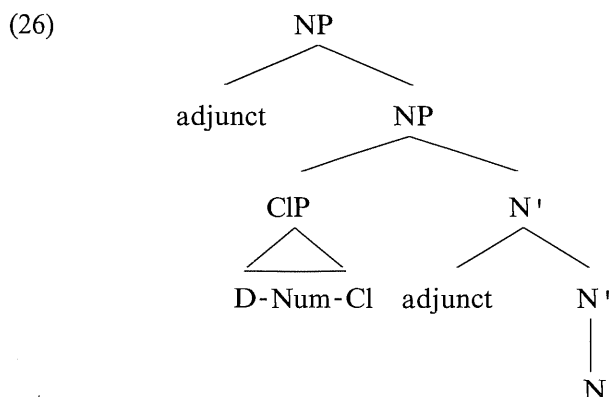
10. If the numeral is always obligatory rather than optional as C. C. Tang claims, then I have to stipulate that Cl obligatorily selects a QP adjunct. Despite this, this should not be counted as a point against the analysis in (25), since the same stipulation would be required by any other theory. For example, under the DP analysis, we have to say that when the head classifier appears, the head numeral cannot be empty. Another thing worth mentioning here is that obligatory prenominal adjuncts are independently motivated in Chinese grammar as we can see from the following example.

(i) Ta xia-le (*yi shen de) nenghan
he scare-ASP one Cl/body DE cold-sweat
'He was sweating with fear'

In light of examples such as (i), the stipulation that Cl obligatorily selects a QP modifier is not as *ad hoc* as it first appears.

the D-Num-Cl sequence. Since the demonstrative is in the highest specifier position within the CIP projection, it should come first. QP is an adjunct which is adjoined to Cl', it thus comes before the head Cl, which is in the lowest position.

Still, a very desirable consequence of the above analysis is that a very simple account can be given without any stipulation to the fact that prenominal modifiers such as relative clauses, APs or PPs may either precede or follow the D-Num-Cl sequence but may not appear after the demonstrative and before the numeral or intervene between the numeral and the classifier. Assume with C. C. Tang (1990b) that adjuncts may be generated under either a recursive XP or X'. Also assume that prenominal adjuncts are licensed by N (cf. Travis (1988)). Then given that Chinese noun phrases consist of only NP projections, it is predicted that prenominal modifiers such as relative clauses may only be attached under a recursive NP or N', as represented below.



This explains why prenominal modifiers may occur either before or after the CIP. Meanwhile, it is also correctly predicted that the prenominal modifiers are banned from occurring after the demonstrative and before the numeral, because they are licensed by N rather than by Cl.¹¹ So we

11. C. C. Tang (personal communication) points out to me that some speakers from Mainland China accept (i) below, where the prenominal modifier does occur between the demonstrative and the numeral-classifier sequence as in (i).

see that an NP analysis, coupled with the assumption that the demonstrative and the numeral are modifiers of Cl, gives a neat account of the distribution of prenominal modifiers without the postulation of the Cl-to-D movement. This constitutes a very strong argument for the structure that I assign to noun phrases in Chinese. It should also be emphasized that the inseparability of the demonstrative-numeral-classifier sequence by other prenominal constituents strongly indicates that the sequence as a whole is a constituent.

4. Nominalization

So far, my attention has been focused on noun phrases involving concrete nouns. This is because they most often cooccur with a D-Num-Cl modifier. In this section, I will shift my attention to deverbal nominals, noting some problems hitherto unnoticed in the literature.

It is well-known that a nominal derived from a verb may inherit subcategorization property or complement selection of the verb. Thus, just as the verb *criticize* may take a subject and an object, so may the deverbal nominal *criticism*.

(27) John criticized Bill.

(28) John's criticism of Bill

Deverbal nominals of this kind are said to have an argument structure and are dubbed complex event nominals. These complex event nominals are contrasted to result nominals which have only adjuncts. (See Grimshaw (1988, 1990), Safir (1987), among others.) In this section, I will

-
- (i) na luyouyou de yi pian daotian
that green DE one Cl paddy-field
'that green paddy field'

This sentence sound quite acceptable to me, too. However, for me, there is still a very clear contrast between the examples in (19) and (i). It is not clear to me what factor is responsible for the grammaticality of (i).

examine the properties of the corresponding deverbal nominal construction in Chinese. In particular, I will address whether deverbal nominals have an argument structure as the corresponding verbs have.

The closest Chinese counterparts to (27-28) are (29-30).

- (29) Zhangsan piping Lisi
Zhangsan criticize Lisi
'Zhangsan criticized Lisi.'

- (30) Zhangsan dui Lisi de piping
Zhangsan toward/to Lisi DE criticism
'Zhangsan's criticism of Lisi'

(29) is a typical active sentence in Chinese, which needs no comment.

(30) is the closest corresponding nominal construction to (28).

The nominal construction (30) has many interesting properties which are very different from English nominal constructions such as (28). First, as is well-known, subjects in noun phrases are optional in English. Thus, in addition to (28), we have (31).

- (31) (the) criticism of Bill

However, the subject in (30) seems obligatory. The omission of the subject always makes the noun phrase sound incomplete.

- (32) ?*dui Lisi de piping
toward/to Lisi DE criticism
'the criticism of Lisi'

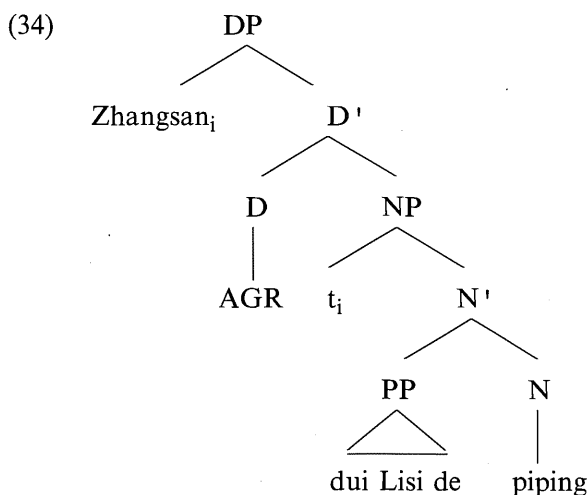
One possible interpretation of this fact is that in Chinese, deverbal nominals have the same argument structure as the corresponding verbs. Hence, by the (extended) projection principle, the subject must be syntactically present.

A second interesting property about (30) is that the subject NP is not marked by anything, not even by *de* as shown in (33).

- (33) ?*Zhangsan de dui Lisi de piping
 Zhangsan DE toward/to Lisi DE criticism
 'Zhangsan's criticism of Lisi'

This is in contrast to the subject of an English noun phrase which must be marked by the genitive Case marker 's.

On the basis of the above primary facts, it is quite possible for one to propose the following analysis for (30).



That is, the noun phrase *Zhangsan* and *Lisi* are seen as the external and internal arguments of the nominal *piping* 'criticism', respectively, and are projected and theta-marked within the projection of N at D-structure; i.e., the internal argument is projected as the sister of the head noun and the external argument is projected in the specifier position of the NP. Since the nominal head does not have the ability to assign Case, the preposition *dui* 'toward, to' is introduced. On the other hand, suppose that Chinese noun phrases are DPs and furthermore D contains an abstract AGR which would assign genitive/nominative Case, then the exter-

nal argument can be moved to the Spec of DP to be assigned Case by D. Thus Case is not a problem with the subject *Zhangsan*, either. Below, I will argue that this analysis is not correct. Instead, I will show that the argument structure is only apparent. The seemingly internal and external arguments are actually adjuncts.

Let us begin with the *dui*-NP phrase. According to the analysis in (34), the NP *Lisi* is the internal argument of the nominal with the preposition *dui* 'toward, to' as the Case assigner. However, there is reason to doubt this analysis. Notice that in (34), the *dui*-NP is obligatorily followed by the clitic *de*. If *de* is omitted, the expression cannot be understood as a nominal construction, as shown below.

- (35) *Zhangsan dui Lisi piping
 Zhangsan toward/to Lisi criticism
 'Zhangsan's criticism of Lisi'

This fact suggests that the *dui*-NP phrase is actually a sort of modifier, for adjuncts licensed by the adjunct licensing theory generally take *de* to modify the head noun. Indeed, there is evidence supporting that the *dui*-NP phrase is not a sister of the deverbal nominal, but must be represented as a modifier. If the *dui*-NP phrase is a sister of the deverbal nominal, i.e., the internal argument of the deverbal nominal, we would expect it to occur after a prenominal adjective. However, the prediction is not borne out.

- (36) *Zhangsan yanli (de) [N' [dui Lisi de] piping]
 Zhangsan severe DE toward/to Lisi DE criticism
 'Zhangsan's severe criticism of Lisi'

But if the *dui*-NP phrase occurs before the prenominal adjective, the sentence becomes perfectly grammatical.

- (37) Zhangsan dui Lisi de yanli (de) piping
Zhangsan toward Lisi DE severe DE criticism
'Zhangsan's severe criticism of Lisi'

(37) clearly shows that the *dui*-NP phrase occurs outside the lowest N' dominating the head noun. In other words, it is syntactically represented as a modifier adjoined to an N' projection.¹² This in turn implies that the *dui*-NP phrase is not a syntactic internal argument of the nominal *pi-ping* 'criticism'. In this connection, it is worth pointing out that a *dui*-NP phrase does occur as a modifier of a non-complex event nominal as in (38)

- (38) Ta dui wo de taidu
he toward me DE attitude
'His attitude toward me'

Now, let us turn to the status of the subject of the noun phrase. As I have pointed out, the subject in nominal constructions such as (30) is

12. A reviewer pointed out that the contrast between (36) and (37) does not show that *dui*-NP is a modifier adjoined to N'. For if this is the case, it is not clear why the relative ordering between *dui*-NP and the other modifier *yanlide* is not free, when both are adjoined to an N' projection. To answer this question, I would like to point out that it is not always the case that two adjuncts have free word order within an NP. For example, in (i) below, it is clear that *zuotian* 'yesterday' and *yanlide* 'severe' are adjuncts. However, only the word order in (ia) is permitted.

- (i) a. Zhangsan zuotian de yanlide piping
Zhangsan yesterday DE severe criticism
'Zhangsan's severe criticism of Lisi yesterday.'
b. *Zhangsan yanlide zuotian de piping
Zhangsan severe yesterday DE criticism
'Zhangsan's severe criticism yesterday'

Thus, the fact that the relative order between *dui*-NP and *yanlide* 'severe' in (36) and (37) is not free does not argue against treating *dui*-NP as an adjunct. It might be the case that the word order of adjuncts within an NP is governed by some semantic factors. To discuss these factors is beyond the scope of this paper.

obligatory and this might be interpreted as supporting the view that the deverbal nominal *pipíng* 'criticism' has an argument structure. In what follows, I will show that this interpretation might be incorrect. The subject of a deverbal nominal as in (30) is very likely to be an adjunct.

Grimshaw (1990) has argued that if a nominal is interpreted as having an argument structure, then complements to the complex event nominal is obligatory. Thus, the presence of a possessive interpreted as a subject will force the appearance of an obligatory object. But if an object does not appear, the possessive can only be construed as a possessive modifier, which is somehow associated with the noun (cf. also Lebeaux (1986), Safir (1987)). Bearing this in mind, now consider (39).¹³

- (39) ta de piping
 he DE criticism
 'his criticism'

In (39), the nominal *pipíng* 'criticism' is not a complex event nominal with an argument structure, since no object appears. Now what is interesting about this type of construction is that when a prenominal modifier is added, then the *de* after the possessive disappears. Furthermore, with the presence of the prenominal modifier, the omission of the possessive would make the expression sound incomplete, again similar to the construction (30).

- (40) Ta zuotian de piping
 he yesterday DE criticism
 'his criticism yesterday'
- (41) ?*Ta de zuotian de piping
 he DE yesterday DE criticism
 'his criticism yesterday'

13. For relevant discussion of Chinese process and result nominals, see also Tang (1990b, p. 450, note 2).

- (42) ?*zuotian de piping
yesterday DE criticism

From the above data, one generalization about Chinese noun phrase emerges: when a prenominal modifier appears, the presence of a subject/possessive tend to be obligatory and the *de* after the subject/possessive is deleted. I have no clear idea of why this should be the case and will leave this to future research. Given this generalization and the fact that the *dui*-NP is syntactically represented as a prenominal modifier, a significant implication can be drawn about the construction (30). That is, the obligatory appearance of the subject in (30) does not necessarily imply that it is the external argument of the nominal. It could be the case that it is a possessive modifier with the deletion of *de* and the nominal is actually a result nominal. Indeed, there is evidence indicating that deverbal nominals in Chinese such as *piping* 'criticism' are not complex event nominals with an argument structure.

Grimshaw (1990) has pointed out that the determiner system is correlated to the interpretation of the nominal. One correlation is that demonstratives as well as indefinite determiners are compatible only with result nominals. Thus (43) is ungrammatical.

- (43) *They observed that assignment of the problem.

In (43), since the object is present, the nominal can only be interpreted as a complex event nominal. Hence it is incompatible with the determiner *that*.

Bearing the above correlation in mind, note that a demonstrative can be placed before the deverbal nominal *piping* 'criticism' as in (44).

- (44) Zhangsan dui Lisi de na san dian piping
Zhangsan toward Lisi DE that three Cl criticism
'those three criticisms of Zhangsan's toward Lisi'

(44) is identical to (30) except that the demonstrative-numeral-classifier sequence is added. Especially worthy of note here is that though in (44), the *dui*-NP is still present, its presence does not force the nominal to be interpreted as a complex event nominal. As we know, classifiers are used to count things. So the appearance of the classifier before the nominal *pipíng* 'criticism' in (44) refutes the claim that the nominal is a complex event nominal. Now what is even more interesting is the fact that the demonstrative-numeral-classifier sequence can be placed before the *dui*-NP phrase and when it is so positioned, *de* reappears after the subject of the noun phrase.

- (45) Zhangsan de na san dian dui Lisi de pipíng
 Zhangsan De that three CL toward Lisi DE criticism
 'those three criticism of Zhangsan's toward Lisi '

Though I do not know what exactly governs the distribution of *de* in Chinese nominal construction, the above facts indicate that *Zhangsan* in (30) is a possessive modifier. The modification marker *de* after *Zhangsan* is only deleted somehow. If this is true, then even the seemingly external argument of the nominal *pipíng* 'criticism' in (30) is actually a prenominal modifier rather than an external argument. More evidence in favor of this thinking can be given on the basis of Grimshaw's (1990) other tests for complex event nominals.

Grimshaw (1990) has shown that the distinction between result and process nominals can be disambiguated by using modifiers such as *constant/frequent* or subject-oriented adjectives such as *intentional/deliberate*. Only process nominals can be modified by such adjectives.

- (46) a. The expression is desirable.
 b. *The frequent expression is desirable.
 c. The frequent expression of one's feelings is desirable.

However, the nominal construction (30) does not allow such modifiers.¹⁴

- (47) a. *Zhangsan dui Lisi de jinchang piping
Zhangsan toward Lisi DE constant criticism
'Zhangsan's constant criticism of Lisi'
b. *Zhangsan jinchang dui Lisi de piping
'Zhangsan's constant criticism of Lisi'
c. *Zhangsan dui Lisi de guyi piping
Zhangsan toward Lisi DE on-purpose criticism
'Zhangsan's intentional criticism of Lisi'
d. *Zhangsan guyi dui Lisi de piping
'Zhangsan's intentional criticism of Lisi'

Another property about process nominals is that they may license an agentive *by*-phrase, as shown below.

- (48) The assignment *(of unsolved problems) by the instructor

However, the deverbal nominal in construction (30) does not license such a phrase.

- (49) *bei Zhangsan dui Lisi de piping
by Zhangsan toward Lisi DE criticism
'the criticism of Lisi by Zhangsan'

Still another difference between result nominals and process nominals is that while the former may occur predicatively, the latter may not.

- (50) a. That was the assignment.
b. *That was the assignment of the problem.

14. It was pointed out to me that if *de* is added after *Zhangsan* and *jinchang* 'constant', the sentence improves. I am not sure about the judgement here.

Yet, nominal constructions like (30) do occur predicatively.

- (51) Yixia zhe-xie jiu shi Zhangsan dui Lisi de
 following this-Cl Emp be Zhangsan toward Lisi DE
 piping
 criticism
 'The following are Zhangsan's criticisms about Lisi'

To sum up this section, as opposed to English deverbal nominals, Chinese deverbal nominals do not seem to have true argument structure. The seemingly internal and external arguments are actually syntactic modifiers. If the above conclusion is correct, then the seemingly internal and external arguments can be projected under a recursive N' or NP. This in turn leads us to the conclusion that the postulation of a DP projection above NP is not necessary.

5. Conclusion

In this article, I have tried to show that evidence for the DP hypothesis in Chinese is very weak. Instead, I demonstrate that an NP analysis of Chinese noun phrases as proposed in this article is still a competitive analysis to the DP analysis. The noun phrase structure that I advocate essentially dates back to Huang's (1982) suggestion that the demonstrative-numeral-classifier sequence forms a single constituent CIP, which occurs in the specifier position of the CIP. In addition, I also discussed deverbal nominals in quite a detail. It seems that deverbal nominals in Chinese do not have true argument structure as their corresponding verbs have. The seemingly internal and external arguments are actually syntactic modifiers. This eliminates the need to postulate a DP projection above NP for Case reason.

References

- Abney, Steven (1987) *The English Noun Phrase in its Sentential Aspect*, Doctoral dissertation, MIT, Cambridge, Massachusetts.
- Aoun, Joseph and Audrey Li (1990) "WH-elements in-situ: Syntax or LF?," ms. University of Southern California.
- Brame, Michael (1982) "The Head-Selector Theory of Lexical Specifications and The Nonexistence of Coarse Categories," *Linguistic Analysis* 10, 321-325.
- Chao, Yuen-Ren (1968) *A Grammar of Spoken Chinese*, University of California Press, Berkeley, California.
- Cheng, Lai-shen (1991) *On The Typology of WH-Questions*, Doctoral dissertation, MIT, Cambridge, Massachusetts.
- Chomsky, Noam (1981) *Lectures in the Theory of Government and Binding*, Foris, Dordrecht.
- Ernst, Thomas (1991) "A Phrase Structure Theory For Tertiaries," in *Syntax and Semantics*, volum 25, Academic Press, pp. 189-207.
- Fukui, Naoki (1986) *A Theory of Category Projection and its Application*, Doctoral dissertation, MIT, Cambridge, Massachusetts.
- Fukui, Naoki and Peggy Speas (1986) "Specifiers and Projection," *MIT Working Papers in Linguistics*, Vol. 8, pp. 128-172.
- Grimshaw, Jane (1988) "Adjuncts and Argument Structure," *Lexicon Project Working Papers*, No 21, MIT.
- Grimshaw, Jane (1990) *Argument Structure*, MIT Press, Cambridge, Massachusetts.
- Hoekstra, Eric (1991), "X-Bar Theory and Licensing Mechanism," *The Linguistic Review* 8, 47-73.
- Huang, Chen-Teh James (1982) *Logical Relations in Chinese and the Theory of Grammar*, Doctoral dissertation, MIT, Cambridge, Massachusetts.
- Jackendoff, Ray (1977) *X' Syntax: A Study of Phrase Structure*, MIT Press, Cambridge, Massachusetts.

- Johnson, Kyle (1991) "Object Positions," *Natural Language and Linguistic Theories* 9, 577-636.
- Lebeaux, D. (1986) "The Interpretation of Derived Nominals," in A. M. Farley, P. T. Farley and K.-E. McCulloch (eds.), *CLS* 22, 231-247.
- Lin, Jo-Wang and Chih-Chen Jane Tang (1991) "Modals in Chinese," paper read at the third North American Conference on Chinese Linguistics, Cornell University.
- Lin, Jo-wang (1992a) "The Syntax of Weishenme 'why' and Zenmeyang 'how' in Mandarin Chinese," *Journal of East Asian Linguistics* 1:3.
- Lin, Jo-Wang (1992b) "Functional INFL in Chinese: Deriving INFL as a Lexical Proper Governor," ms., Tsing-Hua University.
- Lü, Shu-Xiang (1984) *Jindai Hanyu Zhidaici* [Modern Demonstrative Pronouns], Xuelin Publisher, Shanghai, PROC.
- Ma, Qing-Zhu (1990) "Shuci, Liangci de Yuyichengfen han Shulinagjiegou de Yufagongneng," [The Semantics of Numerals and Classifiers and the Grammatical Function of the Numeral-Classifer construction] *Zhongguo Yuwen* 216, 161-173.
- Mei, Zu-Lin (1987) "Tang, Yudai "Zhe, Na" Bu Dan Yongzuo Zhuyi," *Zhongguo Yuwen* 198, 205-207.
- Muysken, Pieter (1983) "Parameterizing The Notion 'Head'," *The Journal of Linguistic Research* 2, 57-75.
- Muysken, Pieter and Henk van Riemsdijk (1986) "Projecting Features and Featuring Projections," in Pieter Muysken and Henk van Riemsdijk (eds.), *Features and Projections*, Foris, Dordrecht, pp. 1-30.
- Ritter, Elizabeth (to appear) "Two Functional Categories in Noun Phrases: Evidence from Modern Hebrew," in Susan Rothstein (ed) *Syntax and Semantics* 26, Perspectives on Phrase Structure: Heads and Licensing, Academic Press, New York.
- Safir, Ken (1987) "The Syntactic Properties of Lexical Thematic Structure," *Natural Language and Linguistic Theory* 5, 561-601.
- Speas, Margaret (1986) *Adjunctions and Projections in Syntax*, Doc-

- toral dissertation, MIT, Cambridge, Massachusetts.
- Speas, Margaret (1990) *Phrase Structure in Natural Language*, Kluwer Academic Publishers, Dordrecht.
- Szabolcsi, Anna (1987) "Functional Categories in the Noun Phrase," in I. Kenesei (ed.) *Approaches to Hungarian*. pp. 167-190.
- Szabolcsi, Anna (1989) "Noun Phrases and Clauses: Is DP analogue to IP or CP?," To appear in J. Payne (ed.) *The Structure of Noun Phrases*. Mouton, The Hague.
- Szabolcsi, Anna (1992) "Subject Suppression or Lexical PRO?: The Case of Derived Nominals in Hungarian," *Lingua* 86, 149-176.
- Tang, Chih-Chen, Jane (1990a) "A Note on the DP Analysis of the Chinese Noun Phrase," *Linguistics* 28, 337-354.
- Tang, Chih-Chen, Jane (1990b) *Chinese Phrase Structure and the Extended X'-Theory*, Doctoral dissertation, Cornell University
- Tang, Chih-Chen Jane (1991), "Hanyu De 'De' yu Yingyu de 's'," [Chinese De and English 's'], paper read at the third World Conference on Chinese Linguistics and Teaching, 1991, Taipei, Taiwan.
- Tang, Ting-Chi (1988a) "Pupian-yufa yu Yin-han Duibi-fenxi" [Universal grammar and contrastive analysis between English and Chinese], paper read at the second International Conference on Chinese Language and Teaching. Taipei, Taiwan.
- Tang, Ting-Chi (1988b) *Hanyu Cifa Jiufa Runji* [Essays on Chinese Morphology and Syntax], Student Books CO, Taipei, Taiwan.
- Tang, Ting-Chi (1989) *Hanyu Cifa Jiufa Xuji* [Essays on Chinese Morphology and Syntax II], Student Books CO, Taipei, Taiwan.
- Travis, Lisa (1988) "The Syntax of Adverbs," *McGill Working Papers in Linguistics*, McGill University (also in NELS 19).

Category Shifts and Word-Formation Redundancy Rules in Chinese

James H-Y. Tai

The Ohio State University & National Chung Cheng University

Abstract

Major patterns of shifts among grammatical categories in Chinese are identified and formulated as word-formation redundancy rules in lexicon. The paucity of denominal verbs is observed and its theoretical implications are discussed. The asymmetry between nominalization and verbalization is treated as one kind of conceptual constraint, reflecting the iconic tendency of Chinese grammar.

0. Introduction.

The lexicon holds a central place in both traditional grammar and

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contemporary syntactic theories. In generative grammar, for example, it is essential to provide lexical items with information about the grammatical category (or categories) to which they belong, in addition to information about subcategorization and thematic relations. The lexicon in generative grammar also contains information on "lexical redundancy", including category shifts and word-formation processes. Thus, a Chinese lexicon, like an English lexicon, must provide information about grammatical categories and category shifts.

The general purpose of this paper is to identify a set of word-formation redundancy rules in the Chinese lexicon. It will focus on the category shifts between nouns and verbs. Thus, verbs that can be derived from nouns, i.e., denominal verbs, and nouns that can be derived from verbs, i.e., deverbal nouns, will be our main concern. The concept of zero derivation will be applied to nominalization and verbalization as well as other types of category shifts in the Chinese lexicon.

A more specific purpose of this paper is to examine the productivity of denominal verbs in Chinese, which has hitherto been largely neglected. Although denominal verbs are abundant in English and many European and non-European languages, they are quite limited in Chinese. It is shown in this paper that denominal verbs are in fact very rare in Chinese; a small group of what seems to be denominal verbs will be shown to have verbal rather than nominal root. Thus, in Chinese, with the exception of *hua*-suffixation, a Europeanized construction analogous to English '-ize', noun verbalization is virtually non-existent, although verb nominalization is productive. Hence, there is an asymmetry in Chinese grammar in that names for concrete objects are rarely used as verbs, whereas the names of activities can often be used as nouns. It will be argued that the asymmetry is another reflection of iconicity of the Chinese language, along-side temporal sequence and other iconic motivations (e.g., Tai 1985, 1993).

In section 1, some theoretical background is provided for the discussion of category shifts. Section 2 presents the major category shift from verbs to nouns, with evidence provided to demonstrate the asymmetry

between nominalization and verbalization in Chinese. Section 3 discusses other minor types of category shifts, including causative verb formation, adverb formation, and *hua*-suffixation as the exceptional case of verbalization. In section 4, the asymmetry between nominalization and verbalization observed in other languages is discussed within the context of universal grammar, where it is argued that the lack of verbalization in Chinese is not due to the paucity of derivational morphology in the Chinese language. The paper concludes with section 5, suggesting that the asymmetry is one kind of conceptual constraint and can be considered as a reflection of the iconic tendency in Chinese grammar.

1. Theoretical Preliminaries.

1.1. Formal Properties of Nouns and Verbs in Chinese.

Despite the paucity of morphology in Chinese, grammatical categories such as nouns and verbs can be defined in terms of their syntactic functions and distribution (cf. Chao 1968; Li and Thompson 1981; Tang 1979, 1989; Tsao 1990; McCawley 1992). Thus, the syntactic and morphological characteristics of nouns in Chinese can be given as in (1) and (2) respectively.

Correspondingly, the syntactic and morphological characteristics of verbs in Chinese can be presented as in (3) and (4).

(1) Syntactic Characteristics of Nouns:

- a. Can be modified by 'number+classifier'
(e.g., *yi-ben shu* 'a book')
- b. Can be modified by subordinative '-de'
(e.g., *ta-de shu* 'his book'; *gui-de shu* 'expensive book',
ta gei wo-de shu 'the book he gave me')
- c. Cannot be modified by negative 'bu'
(e.g., **bu shu* 'not book')
- d. Cannot be the A-component in an A-not-A question
(e.g., **shu-bu-shu* 'book-not-book')

- e. Cannot be modified by 'dou'
(e.g., *dou shu 'all book')
- f. Cannot be modified by other VP modifiers
(e.g., *hen shu 'very book', *ye shu 'also book',
*manmanr shu 'slowly book')

(2) Morphological Characteristics of Nouns:

- a. Can be prefixed by 'a-' and 'lao-'
(e.g., a-yi 'aunt', a-Zhang 'Zhang (surname)'; lao-ban 'boss', lao-Zhang 'old Zhang')
- b. Can be suffixed by '-zi', '-tou', and '-er'
(e.g., zhuo-zi 'table', yi-zi 'chair'; shi-tou 'stone', zhen-tou 'pillow'; xiao hair 'small child', huar 'flower')

(3) Syntactic Characteristics of Verbs:

- a. Can be modified by negative 'bu'
(e.g., bu lai 'not come')
- b. Can be modified by 'dou'
(e.g., dou lai 'all come')
- c. Can be modified by other VP modifiers¹
(e.g., hen/ye xihuan 'very/also like', manmanr zou 'slowly walk')
- d. Can be modified by verb measures
(e.g., lai yi-ci 'come once', ti yi-jiao 'give a kick')
- e. Can occur as the A-component in an A-not-A question
(e.g., lai-bu-lai 'come-not-come')
- f. Cannot be modified by classifiers
(e.g., *yi-ge ti 'one kick', *yi-ge da 'one hit')

1. However, the verb *da* cannot be modified by *hen* 'very', which is a degree adverb that typically modifies stative verbs.

(4) Morphological Characteristics of Verbs:

- a. Can be suffixed by the aspect markers '-zhe', '-le', and '-guo'
(e.g., *chi-zhe* 'eating', *chi-le* 'ate', *chi-guo* 'have eaten (before)')
- b. Can form a resultative verb compound, and can be infixed by -bu- and -de-
(e.g. *da-si* 'hit-die', *da-de-si* 'hit-able-die', *da-bu-si* 'hit-not-die')

It should be noted here that nouns and verbs are not simple, discrete categories; rather, they are cluster concepts like the prototypes of Rosch and her associates (Rosch and Mervis 1975, Rosch 1978). Thus, each of the above sets of characteristics serve as clusters of properties for nouns and verbs in Chinese. Each property is a sufficient condition and not a necessary condition. These sufficient conditions jointly define prototypical nouns and prototypical verbs. Prototypical nouns exhibit all, or most, of the properties listed above in (1) and (2), while prototypical verbs exhibit all, or most, of the properties listed above in (3) and (4). A noun which exhibits all the properties in (1) and (2), for example, is *zhuo-zi* 'table', and a noun which exhibit only the properties in (1) would be *shu* 'book'. A less prototypical noun than 'book' would be *ai* 'love': *ta-de ai* 'his love' is grammatical, *yi-ge ai*, as in *zuo yi-ge ai* 'to make a love (act)' is less grammatical. Moreover, *ai* does not possess all the negative properties listed in (1). In the same vein, a prototypical verb is *da*, 'hit', exhibiting all the properties listed in (3) and (4). Common a-prototypical verbs are *you* 'have, exist', *zai* 'be at', and *shi* 'be'.

From the morphological and syntactic properties listed in (1) through (4) above, one can see that there is a class of words, such as *zhuo-zi* 'table' and *yi-zi* 'chair', which can clearly be identified as nouns. Similarly, there is a class of words, such as *tiao* 'to jump', *jiao* 'to call out', which can clearly be identified as verbs. They can be re-

ferred to respectively as noun class and verb class. Further illustrations are given in (5) and (6) below.

(5) Noun Class:

shu	'book'	pi	'skin'
huar	'flower'	shui	'water'

(6) Verb Class:

da	'to hit'	lai	'to come'
gei	'to give'	mai	'to buy'

The problem arises in the case of words which function both as verbs and as nouns; that is, with respect to the properties given here. This class can be referred to as a 'verb/noun class'. It includes both monosyllabic and disyllabic words as illustrated in (7a) and (7b).²

(7) a. Monosyllabic Verb/Noun Words:

suo	'to lock/lock'	bao	'to wrap/package'
hua	'to paint/painting'	chui	'to hammer/hammer'
bing	'to be sick/sickness'	dian	'to point/point'

b. Disyllabic Verb/Noun Words:

jianyi	'to propose/proposal'	xiwang	'to hope/hope'
baogao	'to report/report'	lingdao	'to lead/leader'
fanyi	'to translate/translation'		
mingling	'to order/order'		

In section 2, I will argue that for the majority of the verb/noun words in this verb/noun class, nominal use is derived from verbal use through nominalization via zero derivation. Only a small minority in this class can

2. It is obvious that there are many more disyllabic verb/noun words than monosyllabic ones. Although the list of monosyllabic verb/noun words in (7a) is not exhaustive, total membership of (7a) is undoubtedly much smaller than that of (7b).

be putatively construed as having the reverse direction of derivation; viz., from nominal use to verbal use. In any case, I propose that each lexical item in the Chinese lexicon will be marked either as a noun or as a verb, and not multiply marked.

1.2. Zero Derivation and the Overt Analogue Criterion.

In English, there are many simple lexical forms which can function as both verbs and nouns. Examples include 'walk', 'talk', 'question', 'answer', 'nail', and 'skin'. In traditional as well generative grammars, linguists have tended to treat one of the functions as more basic than the other, and then using the basic form to derive the other. This kind of morphological process, which uses zero (ϕ) as an identity-element, has been referred to as 'conversion' or 'zero derivation' (cf. Lyons 1977:522ff).

As noted by Sanders (1988:156), "the primary basis for the recognition of zero derivation relations has been the existence of appropriate analogues involving overt morphological marking of the same derivational function". Thus, the verb, 'to answer' in English, is used to derive the noun 'answer'. This derivational process is based on the analogy of deriving nouns from verbs, as in the derivation of the noun 'proposal' from the verb 'to propose', the noun 'creation' from the verb 'to create', etc. This condition for postulating zero derivation on the basis of overt analogues is referred to by Sanders as the 'overt analogue criterion'.³ In English grammar, zero derivation has also been adopted to derive verbs such as 'to water' and 'to skin' from the nouns 'water' and 'skin'.⁴

3. Sanders further argues that zero derivation cannot be justified merely on the basis of the overt analogue criterion. Being based strictly on form, the criterion needs to be supplemented by semantic and pragmatic considerations in determining the postulation of zero derivation and the direction of category shift.

4. Since they are derived from nouns, these verbs are referred to as 'denominal verbs'. While English linguists seem to have a general agreement as to the members of English denominal verbs, Sanders argues that in a number of instances,

It will be argued in section 2 that the overt analogue exists for justifying the use of zero derivation in Chinese, both for deriving nouns from verbs and for deriving verbs from nouns. Zero derivation is further adopted in section 3 for deriving causative verbs and adverbs from adjectives.

1.3. Denominal Verbs.

In English and many other languages including French, German, Spanish, and Indonesian, words naming concrete objects, such as 'nail', 'bottle', 'skin', and 'water', can also be used as verbs. These verbs, 'to nail', 'to bottle', 'to skin', and 'to water', are used to name events associated with the corresponding concrete objects. In the literature on English grammar, these verbs have been referred to as 'denominal verbs' and are derived from the corresponding nouns. This grammatical relation in English has been treated by Jespersen (1942) as a shift in morphological category from noun to verb, and by McCawley (1971) and Green (1974) as derived from a conflation of underlying universal semantic constants, such as 'to cause a nail to hold' and 'to cause something to be in the bottle'.

However, Clark and Clark (1979) have given a different analysis. They argue that denominal verbs should be treated as contextual expressions rather than denotational or indexical expressions. Particularly with respect to innovative denominal verbs, such as 'to porch the newspaper' (meaning 'to put the newspaper on the porch' (as by the newspaper carrier)), they propose that such contextual expressions shifted sense and denotation according to different contexts. These are distinguished from de-

the direction of the derivation cannot be determined conclusively. Different scholars have, in fact, made mutually incompatible claims with respect to their derivational analyses. For example, Quirk and Greenbaum (1973) claim that the English noun 'cover' is derived by zero derivation from the verb 'to cover', while Clark and Clark (1979) claim that the same verb is derived by zero derivation from the noun. Similarly, whereas Clark and Clark consider the verb 'to shampoo' to be derived from the noun 'shampoo', Marchand (1969) considers that same noun to be derived from the verb.

notational expressions, such as 'man' and 'bachelor', which have fixed sense and denotation, and from indexical expressions, such as 'he' and 'the bachelor'.

Based on Lewis' (1969) idea of language use as a convention, Clark and Clark propose a denominal verb convention to treat innovative denominal verbs in English. This convention, the Innovative Denominal Verb Convention (IDVC), patterned after Grice's (1975) cooperative principle, is stated as below:

(8) The Innovative Denominal Verb Convention (IDVC)

In using an innovative denominal verb sincerely, the speaker means to denote

- (a) the kind of situation
- (b) that he has good reason to believe
- (c) that on this occasion the listener can readily compute
- (d) uniquely
- (e) on the basis of their mutual knowledge
- (f) in such a way that the parent noun denotes one role in the situation, and the remaining surface arguments of the denominal verb denote other roles in the situation.

The leading idea in Clark and Clark's theory is that, in using an innovative denominal verb, the speaker intends the listener to come to a unique interpretation of what he has said, not only from the meanings of the words alone, but also from the context as well on the basis of what they mutual know. Thus, as contextual expressions, innovative denominal verbs can have, in theory, an indefinitely larger number of senses.⁵

Clark and Clark's theory appears to account for established denominal

5. Aronoff (1980) accepts the fact of contextuality associated with denominal verbs but argues against the necessity of introducing a denominal verb convention and the semantic category 'contextual'. His solution is to generate denominal verbs from their corresponding nouns by a word formation rule and to use what he has referred to as 'sparse semantics' in conjunction with general pragmatic principles to provide a range of interpretations for denominal verbs.

verbs as well as innovative ones. It explains the phenomenon in English that an established denominal verb can often have a number of conventionalized meanings. For example, 'to water' in English can mean 'to moisten, to sprinkle, to soak with water'; in addition, it has other meanings, including 'to supply with water for drink', 'to supply water to' and 'to dilute by the addition of water'.

It should be noted that the demarcation between innovative verbs and established innovative verbs cannot always be clearly made. Once an innovative denominal verb is introduced, it may become fully established. Alternatively, it may have become established for some speakers but not for others in a speech community; or, it may even fall into disuse completely. For example, 'to parent' is still not acceptable to many speakers even though it is widely used. The denominal verb 'to money' now seems unacceptable in British English even though the *Compact Oxford English* dictionary lists the following meanings: 'to mint money; to supply with money; to furnish money for an undertaking'.

Based on the above discussion, for the Innovative Denominal Convention to be fully adopted in a language, I would like to propose that such a language should exhibit the following four characteristics:

- (9) a. Native speakers are allowed to create denominal verbs from concrete nouns liberally.
- b. The meaning of an innovative denominal verb cannot be computed by compositional rules from the denotation of its parental concrete noun.
- c. Established denominal verbs can have multiple uses created through different historical and social contexts.
- d. Nouns are continuously called into service as verbs, though as verbs they are acceptable to some speakers, but not acceptable to some other speakers.

It appears that modern Chinese does not utilize the Innovative Denominal Verb Convention to create denominal verbs freely and actively,

and hence generally lacks the characteristics listed in (9).⁶ Furthermore, while some instrumental verbs, such as *suo* 'to lock' and *shuan* 'to latch', might be construed as being derived from nouns, there are no putative denominal verbs in Chinese that exhibit the characteristics of (9 c). Unlike Chinese, English has a rich repertoire of established denominal verbs with multiple meanings. (For example, 'to water' has such meanings as 'to sprinkle with water', 'to supply with water', and 'to dilute with water'). The scarcity of established, as well as innovative, denominal verbs in Chinese can be attributed to the dormancy of the Innovative Denominal Verb Convention. Later I will argue that the paucity of denominal verbs in Chinese is another reflection of the iconic constraint in Chinese grammar.

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6. Occasionally, however, one can find some instances of innovative denominal verbs in very colloquial Chinese conversations. For instance, *Bai-gan*, one kind of Chinese wine, has been used as a verb to mean 'to drink Bai-gan' (Lü 1954: 17, cited in Liu 1991:115). One anonymous reviewer also notes that Li (1987) reports a large set of disyllabic denominal verbs in Taiwan Mandarin. Examples include *baobei* 'treasure/to treat like a treasure (as something precious)', *guanliao* 'bureaucrat/to behave like a bureaucrat', *shunü* 'fair maiden/to be like a fair maiden', *a-Q* 'A-Q/to be like A-Q', *tufei* 'bandit/to be bandit-like', and *xiangtu* 'native land/to be of native-like characteristics'. These examples from Li reflect a fairly productive type of innovative denominal verbs in today's Taiwan Mandarin. In S.F. Huang's (1992) paper in which he analyzes Chinese as a metonymic language, he has also provided examples of disyllabic denominal verbs similar to those collected by Li. Huang treats these denominal verbs as a result of taking a sub-property of a thing/person and attributing it to another thing/person. However, they share in common the use of a noun as an adjective (stative intransitive verb) to describe something or someone possessing the properties characteristic of that parent noun. This kind of innovative usage is, in essence, no different from using a noun or noun phrase to describe a subject, with the absence of a copula or other main verb. Take, for instance, a sentence such as *Zhe ben shu shi kuai qian*. 'This book is/costs ten dollars.' *Shi kuai qian* 'ten dollars' is a noun phrase which serves as a predicate with no copula or some other main verb although a verb is required in English. Just as we would not claim that the noun phrase, *shi kuai qian*, has undergone conversion to a denominal verb, we would not want to consider Li and Huang's examples to be nouns that have been converted into verbs via denominal verbalization. It is also worth noting that the above examples from Li can typically be translated into English compounds that include the original noun plus the suffix '-like'.

2. Category Shift.

2.1. Asymmetry in Category Shift Between Nouns and Verbs.

In section 1.1, I identified a class of words in Chinese which can be used both as verbs and nouns. Examples include *suo* 'to lock, lock' and *jianyi* 'to propose, proposal'. In traditional grammar, this type of relation is viewed as involving 'category shift' and is characterized by derivational morphology. Thus, in English grammar, the verb 'to lock' is treated as a denominal verb and is derived from the noun 'lock' by means of zero derivation. In contrast, the noun 'proposal' is derived from the verb 'to propose' by means of overt morphological marking. The shift from noun to verb is referred to as 'verbalization', while the shift from verb to noun is referred to as 'nominalization.'

Two interesting generalizations can be made about category shift between nouns and verbs in Chinese. First, words denoting concrete objects tend to function only as nouns. For example, *diban* 'floor' and *pi* 'skin' can only be used as nouns in Chinese. They cannot be used as verbs, in contrast to English where 'floor' and 'skin' yield the corresponding verbs, 'to floor' and 'to skin'. In Chinese, a separate verb naming the action is needed; for example, in (10) the verb *bo* 'to strip' is needed, and in (11) the verb *pu* 'to pave' is needed.

- (10) a. Ta ba she bo-le *pi*.
'He skinned the snake.'
b. *Ta *pi*-le she.

- (11) a. Ta ba wuzi pu-le *diban*.
'He floored the room.'
b. *ta *diban*-le wuzi.

The second generalization pertains to words denoting actions and events. These words can, in general, function both as nouns and as verbs. For example, *ai* 'to love, love' in (12), and *jianyi* 'to suggest, suggestion' in (13):

- (12) a. Muqin *ai* haizi.
'Mothers love children.'
- b. Muqin dui haizi de *ai* shi bu bian de.
'Mothers' love for children does not change.'
- (13) a. Wo *jianyi* women xiuhui yi tian.
'I suggest that we recess one day.'
- b. Wo fandui ni-de *jianyi*.
'I oppose your suggestion.'

From the two generalizations above, it can be seen that an asymmetry in category shift exists between words denoting concrete objects and those denoting actions and events. This asymmetry calls for an explanation. The asymmetry in category shift cannot be attributed to syllable count, as can be seen from the examples (10) and (11), and from (12) and (13). Nor can the asymmetry be attributed to the lack of zero derivation, since overt analogues do exist in Chinese, as in the cases in (14) through (16), with suffixes *-zi*, *-tou* and *-er*.

(14) *Zi*-suffixation.

VERB		→	NOUN	
=====			=====	
a. ding	'to nail'		dingzi	'nail'
b. shua	'to brush'		shuazi	'brush'
c. chui	'to hammer'		chuizi	'hammer'

(15) *Tou*-suffixation.

VERB		→	NOUN	
=====			=====	
a. chu	'to hoe'		chutou	'hoe'
b. cha	'to plug'		chatou	'plug'
c. zhi	'to point'		zhitou	'finger'

(16) *Er*-suffixation.

VERB		→	NOUN	
=====			=====	
a. suo	'to lock'		suor	'lock'
b. hua	'to draw'		huar	'picture'
c. bao	'to wrap'		baor	'package'

In addition to the above suffixes, the dimorphemic suffix, *-tour*, can be added to most monosyllabic verbs to form corresponding nouns indicating 'having a value of doing the action denoted by the verb'; for example, *chi* 'eat' and *kan* 'look' in the phrase, *you chi-tour*, *you kan-tour* (Chao 1968:243).

Furthermore, it would be of little explanatory value to treat the observed asymmetry in category shift as an accidental gap. To account for this asymmetry, there are basically two different approaches, namely, formal versus functional approach. In the spirit of McCawley's (1971) formal approach, for example, a denominal verb is derived from an underlying abstract predicate associated with a noun carrying a semantic role, with the noun then surfacing as a verb through conflation. Similarly, C.-T. James Huang (1992) adopts Hale and Keyser's theory of Lexical Relational Structure (LRS) to derive a denominal verb from a noun, by incorporating the noun into a non-causative upper verb, symbolized by DO. To apply these variant formal approaches to Chinese, one would have to search for a language-particular constraint to block the surface output of denominal verbs. Such a constraint would then account for the general absence of denominal verbs in this language.

Since I cannot think of any independently-motivated formal constraint for the asymmetry in the category shift between nouns and verbs in Chinese, I am opting for a functional approach. In this approach, the asymmetry is attributable to a conceptual constraint; that is, it is difficult to use words denoting concrete objects as verbs, it is relatively easy to use words denoting actions and events both as verbs and nouns. A more detailed discussion of this conceptual constraint will be provided in section 4, where I will argue for the universality of this constraint.

Meanwhile, a few remarks are in order concerning the two generalizations stated above. With respect to the first generalization, there is a small group of forms that might be construed as exceptions. These forms are listed in (17) and (18). Most of the verb forms in (17) can undergo suffixation when they occur as a noun (e.g., *suor* 'lock', *shua-zi* 'brush', *chu-tou* 'hoe'). Thus, the overt analogue for deriving these nouns from verbs can be justified. In other cases, such as *xiaobian* and *dabian* in (17j) and (17k), they are euphemisms rather than concrete nouns to avoid specific reference to unpleasant object. And in the case of *niao* in (17h), the verbal form occurs only in the reduplicated form, *niao-niao*, in talking to young children. Therefore, in all these cases, they are not genuine exceptions. Many more instrument verbs/nouns can be added to the list in (17). Such additional cases would involve the derivation of nouns from verbs via the overt analogue, namely, suffixation with *-zi*, *-tou*, and *-er*.

(17)	VERB	NOUN
	=====	=====
a. suo	'to lock'	'lock'
b. shuan	'to latch'	'latch'
c. bao	'to wrap'	'package'
d. hua	'to draw'	'picture'
e. shua	'to brush'	'brush'
f. chu	'to hoe'	'hoe'
g. dian	'to dot'	'dot'
h. niao	'to urinate'	'urine'
i. diaoke	'to sculpture'	'sculpture'
j. xiaobian	'to urinate'	'urine'
k. dabian	'to defecate'	'feces'

With respect to the verb/noun forms in (18), they are pronounced identically except for tone:

(18)	VERB	NOUN
	=====	=====
a. bǎ	'to hold'	bà 'handle'
b. bēi	'to carry on the back'	bèi 'back'
c. chēng	'to weigh on a scale'	chèng 'scale'
d. fēn	'to divide'	fèn 'share'
e. liáng	'to measure'	liàng 'quantity'
f. shǔ	'to enumerate'	shù 'number'

Several more verb/noun forms can be added to this list. Observe that the nouns in (18) are in the Qusheng (Mandarin Tone 4). As proposed by Wang Li (1958:213 ff.), Downer (1959), and others, such Qusheng words are derived from non-Qusheng forms. Following a suggestion by Haudricourt (1954), Pulleyblank (1973) further treats Qusheng as a reflex of an earlier *-s suffix, which provides an overt, segmental analogue for the derivation of the nominal form from the verbal form.

The second generalization, that words denoting actions and events can function as both verbs and nouns, also merits a few remarks. Four will be given in the following paragraphs. First, verbs in Chinese can always function as subject or object, and therefore, can always be used as nouns in those positions, as in (19), corresponding to infinitival forms or gerunds in English.

- (19) a. *Chi* zui zhongyao.
'To eat/eating is most important.'
b. Wo ai *chi*.
'I like to eat/eating.'

Second, the nominal use of some verbs are more restricted than others. Thus, while we can say (20a), we cannot say (20b).

- (20) a. Wo wang-bu-liao ta-de *ai/hen*.
'I cannot forget his love/hatred.'
b. *Wo wang-bu-liao ta-de *da/ti*.
'I cannot forget his hitting/kicking.'

It seems that in Chinese, words naming visible actions, such as those of hitting and kicking are more restricted to their verbal status than more abstract concepts, such as love and hate. From another vantage point, visible action verbs are prototypically more verbal than abstract stative verbs. With respect to the verbal status of a word, there also appears to be a continuum, from visible action verbs to abstract stative verbs. This is illustrated in (21), progressing from unacceptable (21a), to marginal or questionable (21b), to acceptable (21c).

- (21) a. *Wo wang-bu-liao ta-de *pao/tiao*.
'I cannot forget his running/jumping.'
b. ?Wo wang-bu-liao ta-de *ku/xiao*.
'I cannot forget his crying/laughing.'
c. Wo wang-bu-liao ta-de *ai/hen*.
'I cannot forget his love/hatred.'

The third remark pertains to those monosyllabic abstract verbs which cannot be used as nouns, such as *yao* 'to invite', and *qiu* 'to beg'. However, when these two monosyllabic verbs combine to form a disyllabic verb, *yaoqiu* 'to request', the disyllabic verb, *yaoqiu* 'to request', the disyllabic form can be used both as a verb and as a noun. This is illustrated in the verbal usage in (22).

- (22) a. Wo *yao* ta lai.
'I invite him to come.'
b. Wo *qiu* ta lai.
'I beg him to come.'
c. Wo *yaoqiu* ta lai.
'I request him to come.'

Notice, however, that in the corresponding nominal usage in (23), only (23c) is acceptable.

- (23) a. *Ta buneng jieshou zheige *yao*.
'He cannot accept this invitation.'
b. *Ta buneng jieshou zheige *qiu*.
'He cannot accept this plea.'
c. Ta buneng jieshou zheige *yaoqiu*.
'He cannot accept this request.'

With the exception of a small group of verbs denoting more abstract activities (e.g., *yao* and *qiu* above, *mai* 'sell' and *mai* 'buy', *lai* 'come' and *qu* 'go'), the majority of verbs denoting abstract activities are disyllabic, and can be used both as a noun and as a verb (e.g., *yaoqiu* above, *jihua* 'to plan/plan', *mingling* 'to order/order').

The fourth and final remark concerns a group of words which can be used both as a noun and as a stative verb, as in the case of *bing* 'sickness/become sick' in (24), and *kunnan* 'difficulty/be difficult' in (25). Verbs such as *bing* and *kunnan* are stative verbs like *ai* 'love' and

hen 'hate'; however, they differ from *ai* and *hen* in that they can also occur as the object of the verb *you* 'have', as illustrated in (24b) and (25b).

- (24) a. Ta-de *bing* hen zhong.
'His sickness is very serious.'
b. Ta you *bing*.
'He has illness.'
c. Ta *bing* le.
'He has become sick.'
- (25) a. Ta-de *kunnan* wo hen liaojie.
'I very much understand his difficulty.'
b. Ta you *kunnan*.
'He has difficulties.'
c. Ta xianzai chujing hen *kunnan*.
'His current situation is very difficult (for him).'

2.2. Verbalization of Nouns.

I have shown that the great majority of the verb/noun class can be construed as having verbal roots, with their nominal forms derived from verbal forms either by zero derivation, or by suffixation. There is, however, a small subset of the verb/noun class which can be appropriately analyzed as undergoing verbalization. In other words, they are denominal verbs. They are illustrated in (26) and (27). In (26), the exact same forms are used for both nouns and verbs. In (27), the verbal forms have undergone tonal derivation from non-Qusheng to Qusheng.

(26)	NOUN	VERB
	=====	=====
a. bīng	'ice'	'to cool with ice'
b. diàn	'electricity'	'to give an electric shock to'
c. dú	'poison'	'to poison'
d. jiào	'cellar'	'to store in the cellar'
e. miàn	'face'	'to face'

(27)	NOUN	VERB
	=====	=====
a. gāng	'steel'	gàng 'to reinforce with steel'
b. gāo	'grease, ointment'	gào 'to lubricate'
c. tāng	'hot water'	tàng 'to heat with water'
d. zhōng	'center'	zhòng 'to hit the target'
e. wǎ	'tile'	wà 'to tile'

2.3. Rules for Nominalization and Verbalization

The nominalization and verbalization processes in Chinese can be characterized in terms of Word-Formation Rules (à la Aronoff 1976). There are four nominalization rules in Chinese, stated in (28). A fifth rule is a verbalization rule for deriving denominal verbs via zero derivation is given in (29). '- ϕ ' indicates zero derivation in the rules below.

(28) Word-Formation Rules in Chinese: Nominalization.

Rule 1. $[_v X] \longrightarrow [_n [_v X] -\phi]$

Semantics: existence of the event denoted by X

Rule 2. $[_v X] \longrightarrow [_n [_v X] -\phi/-er]$

Semantics: participant of action denoted by X

Rule 3. $[_v X] \longrightarrow [_n [_v X] -zi]$

Semantics: participant of action denoted by X

Rule 4. $[_v X] \longrightarrow [_n [_v X] -tou]$

Semantics: participant of action denoted by X

(29) Word-Formation Rules in Chinese: Verbalization.

Rule 5. $[_n X] \longrightarrow [_v [_v X] -\phi]$

Semantics: to perform an activity associated with the object denoted by X

Rule 1 is the most productive of the nominalization rules. However, it only applies to stative verbs and not to activity verbs (except in subject or object position)⁷. In terms of lexical rules, there are two ways to characterize this difference. One is to mark stative verbs, such as *jiānyì*, *yáoqiú*, *ài*, and *hèn* with $[+R1]$ to undergo Rule 1, and activity verbs, such as *dà* and *tí*, with $[-R1]$, to prevent these verbs from undergoing Rule 1. The other way to characterize the difference is by a lexical redundancy rule, which can be stated to the effect that stative verbs imply $[+R1]$. In this manner, we would not need to mark the activity verbs with $[-R1]$. The second approach, which I opt for, has two advantages: one, it recognizes Rule 1 as a productive rule, and two, it leaves unmarked activity verbs, which constitute the bulk of the inventory of the verb class.

Rules 2 through 4 are less productive rules; hence, verbs that undergo these rules will be marked to do so in the lexicon. Thus, the verb *suo* 'to lock', for example, will be marked with $[+R2]$ so that it can either take a zero suffix, or the *-er* suffix. In the case of *shuā* 'to brush', the verb will be marked with $[+R3]$ to derive the noun, *shuāzi* 'brush'. And in the case of *chú* 'to hoe', the verb will be marked with $[R4]$ to generate the noun, *chútou* 'hoe'.

Rule 5 is very limited in productivity. Therefore, nouns that undergo this rule, such as those in (26) and (27), must be marked in the lexicon to undergo it.

In this section, I have focused on the shift between verbs and nouns, the most important category shift in Chinese grammar. In the following

7. Every verb in Chinese can assume nominal status in that they may be placed in subject or object position without overt morphological marking. This is more the case of a systematic, grammatical process than a morphological process, the latter requiring lexical marking, overt or otherwise.

section, some minor types of category shifts will be examined briefly and formalized via Word-Formation Rules.

3. Other Types of Category Shifts.

There are other types of category shifts in Chinese. Three of these will be treated here. One type is verbalization via *hua*-suffixation, another is causative verb formation via zero derivation, and a third type is adverb formation. These will be discussed briefly in turn below.

3.1. Verbalization Via *Hua*-Suffixation.

In section 2, the observation is made that verbalization is quite limited in Chinese. This observation needs to be qualified by the *hua*-suffixation, which comes from Western influence. This verbalization via *hua*-suffixation is a very productive process in modern Chinese (cf. Zhou 1991). Examples are given below, with (30) involving nouns, (31) adjectives, and (32) adverbs.

(30) *Hua*-Suffixation: Noun-to-Verb Shift.

NOUN		→	VERB	
=====			=====	
a. shen	'deity'		shenhua	'to deify'
b. nu	'slave'		nuhua	'to enslave'
c. jixie	'machinery'		jixiehua	'to mechanize'
d. Meiguo	'America'		Meiguohua	'to Americanize'

(31) *Hua*-Suffixation: Adjective-to-Verb Shift.

ADJECTIVE		→	VERB	
=====			=====	
a. lao	'old'		laohua	'to age'
b. nianqing	'young'		nianqinghua	'to rejuvenate'
c. zidong	'automatic'		zidonghua	'to automate'

(32) *Hua*-Suffixation: Adverb-to-Verb Shift.

ADVERB	→	VERB
=====		=====
a. jingchang 'normally'		jingchanghua 'to normalize'
b. juegui 'absolutely'		jueguihua 'to make absolute'

The three cases of *hua*-suffixation can be accounted for via the following three verbalization rules, Rules 6 through 8, respectively, given in (33). Of these rules, Rule 6, which converts nouns to verbs, is the most productive. Less productive is Rule 7, which converts adjectives into verbs, and the least productive is Rule 8, converting adverbs into verbs.

(33) Word-Formation Rules in Chinese: Verbalization via *hua*-suffixation

Rule 6. $[_n X] \rightarrow [_v [_n X] -hua]$

Semantics: to cause a happening of the situation denoted by X

Rule 7. $[_{adj} X] \rightarrow [_v [_{adj} X] -hua]$

Semantics: to cause a happening of the state denoted by X

Rule 8. $[_{adv} X] \rightarrow [_v [_{adv} X] -hua]$

Semantics: to cause a happening of the manner denoted by X

3.2. Causative Verb Formation Via Zero Derivation.

There are many adjectives (i.e., intransitive stative verbs) which can be used as transitive causative verbs without overt morphological marking. Some examples are given in (34).

(34)	ADJECTIVE	→	CAUSATIVE VERB
	=====		=====
a. lei	'tired'		'to make (s.o.) tired'
b. anding	'peaceful'		'to make peaceful'
c. chunjie	'pure'		'to purify'

The rule to account for this causative verb formation is Rule 9, given below:

(35) Word-Formation Rule in Chinese: Causative Verb Formation.

Rule 9. $[_{\text{adj}} X] \rightarrow [_{\text{v}} [_{\text{adj}} X] -\phi]$

Semantics: to cause a happening of the state denoted by X

3.3. Adverb Formation.

Adverbs can be formed from adjectives either by means of zero derivation or by reduplication. The former is illustrated in (36), and the latter in (37), with optional '-de' suffix added.

(36)	ADJECTIVE	→	ADVERB
	=====		=====
a. zhen	'real'		'really'
b. kuai	'quick'		'quickly'
c. tebie	'special'		'especially'

(37)	ADJECTIVE	→	ADVERB
	=====		=====
a. man	'slow'	manman(-de)	'slowly'
b. yuan	'far'	yuanyuan(-de)	'from afar'
c. qingchu	'clear'	qingqingchuchu(-de)	'clearly'
d. qinre	'warm'	qinqinrere(-de)	'warmly'

The rules to account for the above examples are given in (38), with Rule 10 to account for (36), and Rule 11 for (37). In (36), 'X' represents a lexical item as in the previous rules. For Rule 11, 'A' and 'B' represent different syllables. A monosyllabic word 'A' is reduplicated as 'AA', and a disyllabic word, 'AB' is reduplicated as 'AABB'.

(38) Word-Formation Rule in Chinese: Adverb Formation.

Rule 10. $[_{\text{adj}} X] \rightarrow [_{\text{adv}} [_{\text{adj}} X] -\phi]$

Semantics: in a manner of the state denoted by X

Rule 11. $[_{\text{adj}} A(B)] \rightarrow [_{\text{adv}} [_{\text{adj}} AA(BB)] (-de)]$

Semantics: in a manner of the state denoted by A(B)

The rules given in (38) account for two of the most productive adverb formation processes in Chinese. There are many other adverb formation rules which involve much more complicated morphological processes and cannot be captured by Rule 11. Example include deriving such forms as *lengqingqing* 'lonely' from *lengqing* 'isolated' and *hulihutu* 'muddle-headedly' from *hutu* 'muddled-headed'. Since the main concern of this paper is the shift in grammatical category, with or without overt morphological marking, other morphological processes involving adverb formation will not be addressed here.

4. Asymmetry Between Nominalization and Verbalization in Universal Grammar.

In sections 2 and 3, I noted that, with the exception of the Europeanized *hua*-suffixation, nominalization is much more productive than verbalization in Chinese, thereby creating an asymmetry in the language. This asymmetry is not restricted to Chinese, however, but can be found in other languages as well. Nevertheless, Chinese differs from many other languages in exhibiting a much more obvious asymmetry. This conspicuous asymmetry in Chinese needs to be explained. To address this issue, I will turn to Hopper and Thompson (1984) as a point of departure.

In their study on lexical categories in universal grammar, Hopper and Thompson (1984) propose that in every language there are nominal roots whose semantic contents make them more likely to function as nouns than as verbs in discourse; correspondingly, there are verbal roots whose semantic contents make them more likely to function as verbs

than as nouns in discourse. Their proposal is supported by my observation in Chinese: with respect to semantically-based roots, words denoting concrete objects tend to function only as nouns, while words denoting actions tend to function only as verbs. Using English as the primary source of data, Hopper and Thompson (1984:745) also make two generalizations regarding category shifts between nouns and verbs. These generalizations, which they intend as implicational universals, are restated more simply below as (39a) and (39b).

- (39) a. Languages tend to have special nominalizing morphology, but no special verbalizing morphology.
 b. A nominalization interprets an event as an entity but there is no corresponding verbalization which interprets an object as an event.

Generalization (39a) establishes an asymmetry between nominalized forms and verbalized forms, while generalization (39b) establishes a semantic asymmetry between nouns and verbs. Hopper and Thompson's attempt is to explain the morphological asymmetry in (39a) in terms of the semantic asymmetry in (39b). Hopper and Thompson use English to illustrate these two generalizations. Some examples of (39a) are given in (40).

(40) Illustration of (39a):

a. NOMINALIZATION:		b. VERBALIZATION	
VERB	NOUN	NOUN	VERB
=====		=====	
propose	proposal	water	to water
create	creation	skin	to skin
sell	selling	bottle	to bottle
excite	excitement	hospital	to hospitalize

From (40), we can see that in English, nominalization involves rather

elaborate morphology, but verbalization primarily involves zero derivation. As far as semantic shift is concerned, nominalization takes an event as an entity for reference purposes in discourse. The converse, however, does not occur. Verbalization does not make an object an event; it simply uses an object to report an event associated with that object in a discourse context. 'To water', for example, can associate a number of different events involving the use of water on something, whether by pouring, sprinkling, or some other action.

In essence, Hopper and Thompson propose that the morphological asymmetry is motivated by a functional asymmetry between nouns and verbs in discourse. They further suggest that this functional asymmetry is based on a cognitive asymmetry; namely, that it is easier for human cognition to treat an abstract event as an entity than to treat a concrete object as an abstract event.⁸ Hopper and Thompson conclude that, conceptually as well as morphologically, languages have nominalization processes, but no analogous verbalization processes.

While Hopper and Thompson's generalization on conceptual asymmetry (39b) is supported by empirical evidence from Chinese and other languages, the same is not true for their morphological asymmetry given in generalization (39a). Counter to their observations based on English, we have seen that in Chinese, while the most productive rule of nominalization (Rule 1) is accomplished through zero derivation, that of verbalization is via *hua*-suffixation. Other languages also do not support their observations. This can be seen in the examples of verbalization from French, Spanish, German, Turkish, and Indonesian in (41), languages which possess rich morphology in verbalization.

8. In the spirit of Lakoff and Johnson's (1980) ontological metaphor, to treat an abstract event as an entity is an easier ontological commitment than to treat a concrete object as an abstract event.

(41)	NOUN	VERB
	=====	=====
a. French:	clou 'nail'	clouer 'to nail'
	peigne 'comb'	peigner 'to comb'
b. Spanish:	agua 'water'	aguar 'to irrigate'
	martillo 'hammer'	martillar 'to hammer'
	lata 'can'	enlatar 'to can'
c. German:	wasser 'water'	bewässern 'to water'
	nagel 'nail'	festnageln 'to nail'
	haut 'skin'	enthäuten 'to skin'
d. Turkish:	su 'water'	su-la-mak 'to water'
	çivi 'nail'	çivi-le-mek 'to nail'
e. Indonesian:	gergaji 'saw'	menggergaji 'to saw'
	taksi 'taxi'	menaksi 'to taxi'

The above examples from unrelated languages also provide ample evidence to refute Hopper and Thompson's (1984:745) claim of an implicational universal concerning category shift:

- (42) "If a language has category-deriving morphology at all, what we find is that it is noun-deriving, but not verb-deriving processes."

Hopper and Thompson's implicational universal can be further refuted by a language such as Japanese, which has very rich inflectional morphology and yet appears to lack genuine denominal verbs, as illustrated by two Japanese examples in (43).

- (43) a. mizu 'water' *mizu-ru/*mizu-iru/*mizu-eru
 but: mizu o yaru 'to give water'
 mizu o maku 'to scatter water'
- b. kugi 'nail' *kugi-ru
 but: kugi o utsu 'to hit nail'

To use nouns as verbs, Japanese employs the *suru*-construction, a mechanism like the *hua*-suffixation in Chinese, as shown in (44):

- (44) a. denwa 'telephone '
 denwa o suru 'to telephone
 b. kagi 'lock '
 kagi o suru 'to lock '

The sets of examples from various languages given above, including English and Chinese, show that there is no correlation between rich morphology in a language and an abundance of denominal verbs. Thus, even from the point of universal typology, there is no reason to associate the scarcity of denominal verbs in Chinese with a paucity of derivational morphology.

5. Conclusion.

In this paper, I have examined in detail category shift between nouns and verbs in Chinese. Several minor types of category shift have also been examined. These shifts have been characterized in terms of a set of Word-formation Rules. I have shown the paucity of denominal verbs in Chinese. The only exception, as noted earlier, is *hua*-suffixation, a Western inspired morphological process that is patterned after the *-ize* suffix in English. I have also argued that the general lack of verbalization in the native Chinese lexicon is not explainable as being due to a lack of morphology, either from internal evidence in Chinese or from cross-linguistic data.

A more plausible answer may lie in the cognitive asymmetry between nominalization and verbalization. While there is an ontological metaphorization to treat an event as an entity, there is no analogous metaphorization to treat an object as an event or action. This conceptual asymmetry in universal grammar is already observed by Hopper and Thompson. In the case of Chinese, Tai (1985, 1993) has shown that the language

is rich in iconic motivations. On that basis, it is not surprising to find conceptual asymmetry more clearly reflected in Chinese than in other languages, including English. The general absence of denominal verbs in Chinese provides yet another instance of iconicity in Chinese grammar, alongside temporal sequence and other iconic motivations.

It is important to note that Classical Chinese has an abundance of denominal verbs (cf. Liu 1991), contrasting with the paucity of denominal verbs in modern Chinese dialects, including Mandarin, Amoy, and Cantonese.⁹ This contrast presents an enigmatic problem as to why, unlike Classical Chinese and modern English, the modern Chinese dialects reflect a rather strong and obvious conceptual asymmetry between nominalization and verbalization. Chan and Tai (1994) observe that the reduction of denominal verbs in the modern Chinese dialects is, in part, due to the loss of the mechanism for deriving verbs from nouns, namely, via derivation by tone change (to *Qusheng*). At the same time, they also observe the instrumental verbs constitute the most frequently-occurring type of denominal verbs in Classical Chinese as well as in the modern dialects. Interestingly, this distribution pattern also obtains in modern English (cf. Clark and Clark 1979:776). Thus, even in Classical Chinese, verbalization via tone change is not equally productive across all noun categories. I do not have an answer for this skewed distribution. Nonetheless, it is clear that verbalization in Classical Chinese is still subject to the conceptual constraint, although seemingly to a lesser extent than modern Chinese dialects.

A final question regarding the proposed conceptual constraint needs to be raised here. Concrete spatial terms can be easily extended to express abstract time in natural languages (cf. Lyons 1977:690ff, Tai 1989:212ff). Why, then, does one not find a parallel extension from concrete nouns to abstract actions in Chinese and other languages which have a limited repertoire of denominal verbs? One plausible answer can be offered

9. Chan and Tai (1994) provides a detailed account of the differences between modern Chinese dialects with respect to denominal verbalization.

here. Some preliminary observations need to be made before I attempt to answer the question. While actions in human activities are not as tangible as concrete objects, they can be visualized in our mental representation (e.g., jumping, kicking, hitting, crying, etc.). There is no reason to require that these activities be derived from concrete objects. Furthermore, from the functional point of view, for the sake of clarity, a body part such as the hand, can be used for innumerable actions (holding, hitting, cutting, grabbing, etc.). Indeed, one of the reasons for the rich inventory of instrumental verbs is that an instrument is designed for some specific purpose and, hence, there is a more clear-cut, unambiguous, one-to-one relationship between the instrument and the action associated with it (e.g., using a hammer to hammer (a nail)). In contrast, it is far less practical for communication purposes to use concrete nouns such as 'hand' and 'foot' to represent a myriad of activities associated with them. Therefore, in human conceptual structure, concrete objects and activities co-exist and only interact under certain situations, namely, when the context provides clear meaning for interpretation.

The extension of concrete spatial terms to temporal expressions is very different from the denominal verb convention discussed in this paper. Unlike activities such as crying, kicking, jumping, and so forth, which we can see with our eyes, we cannot see time, or time passing, in a similar fashion. As a result, human languages structure time -- the relating of different points in time and the passing of time itself -- in terms of spatial relations so that we can 'virtually visualize' temporal relations and time passing. Static temporal relations are structured in terms of static spatial relations, while time passing is structured in terms of change of location.

The contrast between the extension of spatial terms for temporal reference and that of concrete nouns for activities calls for the need for further research into the intricate relationship between human cognition and grammatical structures.

References

- Aronoff, Mark. 1976. *Word-Formation in Generative Grammar*. Cambridge: MIT Press.
- _____. 1980. "Contextuals." *Language* 56:744-758.
- Chan, Marjorie K. M. and James H-Y. Tai. 1994. "From nouns to verbs: verbalization in Chinese dialects and East Asian Languages" In 6th North American Conference on Chinese Linguistics (NACCL6) Volume 2:49-74. L. A.: GSIL, University of Southern California.
- Chao, Y.R. 1968. *A Grammar of Spoken Chinese*. Berkeley: University of California Press.
- Clark, Eve V. and Herbert H. Clark. 1979. "When nouns surface as verbs." *Language* 55:767-811.
- Downer, G.B. 1959. "Derivation by tone-change in Classical Chinese." *Bulletin of the School of Oriental and African Studies* 22:258-290.
- Green, Georgia M. 1974. *Semantics and Syntactic Regularity*. Bloomington: Indiana University Press.
- Grice, H.P. 1975. "Logic and conversation." In: *Syntax and Semantics, Volume 3: Speech Acts*, edited by Peter Cole and J.L. Morgan. New York: Academic Press. Pp. 41-58.
- Haudricourt, André G. 1954. "Comment reconstruire le Chinois Arch-aïque." *Word* 10:351-364.
- Hopper, Paul J. and Sandra A. Thompson. 1984. "The discourse basis for lexical categories in universal grammar." *Language* 60:703-752.
- Huang, C.-T. James. 1992. "On lexical structure and syntactic projection." In: *Proceedings of the Third International Symposium on Chinese Languages and Linguistics*, edited by H. Samuel Wang and Feng-fu Tsao. National Tsing Hua University, Taiwan. Pp. 288-311.
- Huang, Shuan-fan. 1992. "Lexical innovation and semantic change." Paper presented at the Third International Symposium on Chinese Languages and Linguistics, National Tsing Hua University, Taiwan.
- Jespersen, Otto. 1942. *A Modern English Grammar on Historical Principles*.

- ples. Volume 6: Morphology. Copenhagen: Munksgaard.
- Lewis, David K. 1969. *Convention*. Cambridge, MA: Harvard University Press.
- Li, Chang-hsien. 1987. *Denominal Verbs in Mandarin Chinese: A Perspective from Transitivity*. M.A. thesis, National Taiwan Normal University.
- Li, Charles and Sandra Thompson. 1981. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.
- Liu, Cheng-hui. 1991. *Nouns, Nominalization and Denominalization in Classical Chinese: A Study Based on Mencius and Zuozhuan*. Ph. D. dissertation, The Ohio State University.
- Lü, Shuxiang. 1954. "Guanyu Hanyu cileide yixie yuanzexing wenti, I" [Some principles of word classification in Chinese, Part I]. *Zhongguo Yuwen* 28:16-22.
- Lyons, John. 1977. *Semantics*. Volume 2. Cambridge: Cambridge University Press.
- Marchand, Hans. 1969. *The Categories and Types of Present-Day English Word-Formation*. 2nd edition. Munich: Beck.
- McCawley, James M. 1971. "Prelexical Syntax." In: *Linguistic Development of the Sixties -- Viewpoints for the Seventies*, edited by Richard J. O'Brien. (Monograph Series on Languages and Linguistics 24, Georgetown University) Pp. 19-33.
- _____. 1992. "Justifying part-of-speech assignments in Mandarin." *Journal of Chinese Linguistics* 20.2:211-245.
- Pulleyblank, E.G. 1973. "Some new hypotheses concerning word families in Chinese." *Journal of the Chinese Linguistics* 1.1:110-125.
- Quirk, R., and Greenbaum, S. 1973. *A Concise Grammar of Contemporary English*. New York: Harcourt.
- Rosch, Eleanor. 1978. "Principles of categorization." In: *Cognition and Categorization*, edited by E. Rosch and B.B. Lloyd. Hillsdale, NJ: Erlbaum.
- _____. and C.B. Mervis. 1975. "Family resemblances: studies in the internal structure of categories." *Cognitive Psychology* 3:382-439.

- Rose, James H. 1973. "Principled limitations on productivity in denominal verbs." *Foundations of Language* 10:509-526.
- Sanders, Gerald A. 1988. "Zero derivation and the overt analogue criterion." *Theoretical Morphology*. Pp. 155-175. New York: Academic Press.
- Tai, James H-Y. 1985. "Temporal sequence and Chinese word order." In: *Iconicity in Syntax*, edited by John Haiman. Amsterdam: John Benjamins Publishing Company.
- _____. 1989. "Towards a cognition-based functional grammar of Chinese". In: *Functionalism and Chinese Grammar*, edited by James Tai and Frank Hsueh. Monograph Series of the Journal of the Chinese Language Teachers Association, Number 1. Pp.187-226.
- _____. 1992. "Category shifts and word-formation redundancy rules in Chinese." In: *Proceedings of the Third International Symposium on Chinese Languages and Linguistics*, edited by H. Samuel Wang and Feng-fu Tsao. National Tsing Hua University, Taiwan. Pp. 1-19.
- _____. 1993. "Iconicity: motivations in Chinese grammar." In: *Principles and Predictions in Linguistic Theory*, edited by Mushira Eid and Gregory Iverson. Amsterdam: John Benjamins Publishing Company. Pp. 153-173.
- Tang, Ting-chi. 1979. *Studies in Chinese Syntax*. Taipei: Student Book Co., Ltd.
- _____. 1989. *Studies on Chinese Morphology and Syntax*. Volume 2. Taipei: Student Book Co., Ltd.
- Tsao, Feng-fu. 1990. *Sentence and Clause Structure in Chinese: A Functional Perspective*. Taipei: Student Book Co., Ltd.
- Wang, Li. 1958. *Hanyu Shigao [History of the Chinese Language]*. Beijing: Kexue Chubanshe.
- Zhou, Gang. 1991. "Ye yi dai houzhui 'hua' de ci" [A discussion of the words with the suffix 'hua']. *Hanyu Xuexi* 66:12-15.

A Note on Wh-adjunct Asymmetries

Wei-tien Dylan Tsai

National Tsing Hua University

Abstract

In comparison with other Chinese wh-phrases, *zenmeyang* 'how' behaves very uniquely in regard to its wide-scope interpretation: When construed with the manner reading, it behaves like a typical adjunct, observing island constraints; when construed with the instrumental reading, it patterns with arguments, extracting freely from Complex NP islands such as relative clauses. Interestingly enough, when postverbal *zenmeyang* is further embedded in a relative clause, only the resultative reading emerges. That is, resultative *zenmeyang* patterns with instrumental *zenmeyang* (and arguments) rather than manner *zenmeyang*. The purpose of this paper is to sketch a unified account of the asymmetry between instrumental and resultative *zenmeyang* on the one hand, and manner *zenmeyang* on the other. Based upon Cheng (1991) and Li's (1992) observation that Chinese wh-phrases function like variables, we propose to treat the long-distance construal in question as an instance of unselective binding, which applies to target only nominals, but not intrinsic operators such as adverbs.

1. Zenmeyang Family

In comparison with other Chinese *wh*-phrases, *zenmeyang* 'how' behaves very uniquely in regard to its wide-scope interpretation: when construed with a manner reading, it acts like a typical adjunct, displaying

island effects; when construed with an instrumental reading, it patterns with arguments, lacking any island effect. This point is illustrated by the contrast between (1a) and (1b), where a relative clause construction is involved. Only PPs like *yong xiao huo* 'with low heat' and *yong sha-guo* 'with a sand pot', but not manner adverbs like *xiaoxinyiyi-di* 'very carefully', are possible answers to (1). In contrast, both readings are valid in simple sentences like (2).

- (1) ni zui xihuan [_{NP} [_{CP} Op_i [_{IP} ta zenmeyang duen t_i]] de niurou_i]?
 you most like she how stew PNM beef
 a. What is the means x such that you like best [beef [which she stewed by x]]?
 b. #What is the manner x such that you like best [beef [which she stewed in x]]?
- (2) ta shang-ci zenmeyang dun niurou?
 she last-time how stew beef
 a. By what means did she stew beef last time?
 b. In what manner did she stew beef last time?

Moreover, it is not uncommon for *zenmeyang* to function like a predicate, either intransitive as in (3a) or transitive as in (3b): In (3a), *zenmeyang* questions the current state of the subject; in (3b), it questions the consequence affecting the object:

- (3) a. Lisi zenmeyang le?
 Lisi how Inc
 What happened to Lisi?
 b. nimen neng [_{PP} ba wo] zenmeyang?
 you(pl.) can BA me how
 What can you do to me?

This predicate usage is also responsible for the resultative reading of

postverbal *zenmeyang* in (4a), while the adverbial usage leads to the manner reading in (4b):

- (4) a. ta niurou_i duen-de [_{pro_i} zenmeyang]?
 she beef stew-DE how
 Till what state did she stew beef?
 b. ta niurou duen-de zenmeyang?
 she beef stew-DE how
 In what manner did she stew beef?

Also note that postverbal *zenmeyang* is exclusively introduced by the V-*de* complex, which, for some reason, suppresses the instrumental reading and introduces the resultative reading (see below).

Interestingly enough, when postverbal *zenmeyang* is further embedded in a relative clause, only the resultative reading emerges; i.e., it patterns with instrumental *zenmeyang* (and therefore arguments) rather than manner *zenmeyang*, as shown by the contrast between (5a) and (5b):

- (5) ni zui xihuan [_{NP}[_{CP} Op_i [_{IP} ta t_i duen-de zenmeyang]]] de niurou_i?
 you most like she stew-DE how PNM beef
 a. What is the state x such that you like best [beef [which she stewed till x]]?
 b. #What is the manner x such that you like best [beef [which she stewed in x]]?

This observation is reflected by the fact that the only possible type of answers to (5) is an AP like *lan-yi-dian de* 'a little more mushy', but never a manner adverb like *xixin-yi-dian-di* 'a little more attentively'.¹

1. As noted by a reviewer, non-interrogative manner adverbials are also impossible in relative constructions like (i), which suggests that the wide-scope construals of manner *zenmeyang* is ruled out for independent reasons:

(i) *mei-ren yao chi [[ta zhu-de hen kuai] de niurou].
 nobody want eat he cook-DE very quickly PNM beef
 Nobody wants to eat beef which he cooked very quickly.

The same pattern of contrasts obtain for other instances of strong islands, such as the sentential subject in (6) and the appositive clause in (7):

- (6) [zhe-jian shi, women yao zuo-de zenmeyang] cai ling-ren-manyi?
this-CL matter we need handle-DE how just make-people-satisfied
a. What is the state *x* such that it is just satisfying [for us to handle this matter till *x*]?
b.[#]What is the manner *x* such that it is just satisfying [for us to handle this matter in *x*]?

Similar objections have been raised by Tang (1990) and Lin (1992). In Tsai (1992), I admitted the problem, but pointed out that the above observation cannot be generalized due to the existence of cases like (ii), where the object is topicalized, and cases like (iii), where the relative clause in question contains an intransitive predicate:

- (ii) tamen zhi gu [zi, e_i xie-de hen kuai] de ren_i].
they only hire character write-DE very quickly DE person
They only hire people who write (characters) very quickly.
(iii) wo xihuan kan [yi-chang [e_i jinxing-de hen shun] de bisai_i].
I like watch one-CL proceed-DE very smoothly DE game
I like to watch a game that proceeds smoothly.

Furthermore, there are plenty of data indicating that non-interrogative manner adverbials are allowed in other instances of strong islands such as sentential subjects and appositives, as exemplified by (iv) and (v) respectively:

- (iv) [zhe-jian shi, ni yao zuo-de kuai-yi-dian] cai hao.
this-CL matter you need handle-DE fast-a-little just good
It is just good for you to handle this matter a little bit faster.
(v) Akiu bu xiangxin [[guoniu pa-de hen man] de shuofa].
Akiu not believe snail crawl-DE very slow PNM story
Akiu does not believe the story that snails crawl very slowly.

Nonetheless, wide-scope construals of manner *zenmeyang* are blocked in these constructions, as evidenced by (6) and (7). It follows that there is no genuine correlation between manner *zenmeyang* and its non-interrogative counterparts. For our purpose here, it suffices to assume that (i) is ruled out due to some obscure factor which we do not fully understand at the present stage of research. See Tsai (1992) for further replies to Lin's (1992) objections.

- (7) ni bijiao xiangxin [[na-⁵⁵io cai, tamen zuo-de zenmeyang] de shuofa]?
 you more believe that CL dish they cook-DE how PNM story
 a. What is the state x such that you believe more [the story [that they cooked that dish till x]]?
 b. #What is the manner x such that you believe more [the story [that they cooked that dish in x]]?

What should be further included in this discussion is overt extraction of postverbal *zenmeyang*. Generally speaking, Chinese *wh*-fronting patterns with topicalization to the extent that no control (non-movement) construal is allowed. Namely, it observes Subjacency and the head-government requirement. As we can tell from (8) and (9), the object *shei* 'who' may move as long as Subjacency and the CED are respected; in contrast, preverbal *zenmeyang* cannot undergo *wh*-fronting even in a simple sentence, no matter what reading it is associated with:

- (8) a. *shei_i, ni zui xihuan t_i?*
 who you most like
 Who do you like most?
 b. *shei_i, ni kan [tamen zui xihuan t_i]?*
 who you think they most like
 Who do you think they like most?
- (9) a. **zenmeyang_i, tamen yinggai t_i zuo zhedao cai?*
 how they should cook this-CL dish
 How should they cook this dish?
 b. **zenmeyang_i, ni kan [tamen yinggai t_i zuo zhedao cai]?*
 how you think they should cook this-CL dish
 How do you think they should cook this dish?

On the other hand, overt extraction of postverbal *zenmeyang* is allowed,

with both manner and resultative readings valid:²

- (10) (?)zenmeyang_i (a), ta niurou dun-de t_i?
 how Top she beef stew-DE
 a. What is the state x such that she stewed beef till x?
 b. What is the manner x such that she stewed beef in x?

2. One condition on the presence of ambiguity is that the object NP has to be generic. If a definite NP is substituted, as in (i), only resultative reading survives (cf. Tsai 1992). The real cause of this phenomenon still remains mysterious to me.

- (i) ?zenmeyang_i (a), ni kan [ta zhe-dao cai zuo-de t_i]?
 how Top you think she this-CL dish cook-DE
 a. What is the extent x such that you think [she cooked this dish to x]?
 b. #What is the manner x such that you think [she cooked this dish in x]?

A related issue, as a reviewer brought up, concerns that some speakers do not accept (10) and (11). On the other hand, since overt extraction of non-interrogative manner adverbials is also impossible, as in (iia, b), (10) and (11), when marked as ungrammatical, might as well be accounted for by a general condition on adjunct extraction:

- (ii) a. *[hen lao]_i, ta niurou dun-de t_i.
 very old she beef stew-DE
 S/he stewed the beef till it is very hard (to chew).
 b. *[hen man]_i, ta niurou dun-de t_i.
 very old she beef stew-DE
 S/he stewed the beef very slowly.

To entangle the problem, first I would like to point out that (10) and (11) can be improved by inserting a topic-marker *a* between *zenmeyang* and the rest of the clause. When spelled out in two separate intonation groups, they sound a lot better. I actually found this sort of expressions very common in daily use. Then how do we account for the deviance of (iia, b)? The answer, in my opinion, lies in the focus construal typically associated with this type of overt fronting. That is, to give a contrast set for focus interpretations (cf. Rooth 1985), we have to use *tai* 'too' or emphatic *hao* 'very much' to make the construal work, as exemplified by (iia, b):

- (iii) a. [tai lao-le]_i, ta niurou dun-de t_i.
 too old-Inc she beef stew-DE
 b. [hao man] (a), ta niurou dun-de t_i.
 very slow Top she beef stew-DE

If our observation proves to be a sound one, then interrogative and non-interrogative manner adverbials are indeed under the condition, i.e., the head-government requirement.

- (11) (?)zenmeyang_i (a), ni kan [ta niurou dun-de t_i]?
 how Top you think she beef stew-DE
 a. What is the state x such that you think [she stewed beef till x]?
 b. What is the manner x such that you think [she stewed beef in x]?

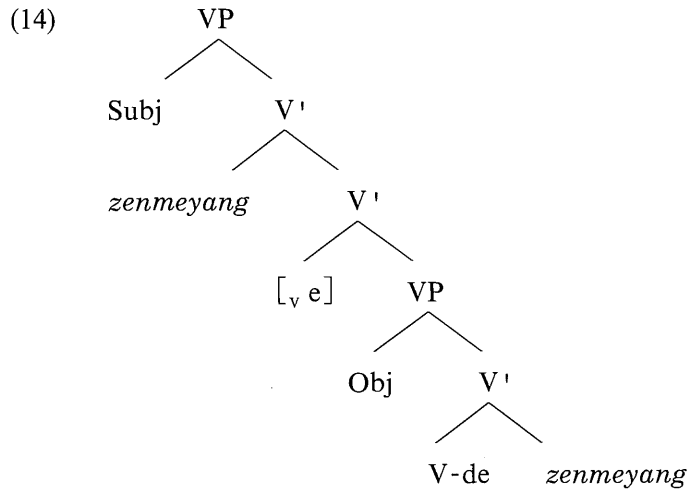
It is quite clear that this asymmetry is a matter of extraction sites in the syntactic projection. An immediate answer comes from Huang (1991), in which an illuminating picture of Chinese postverbal complementation has been sketched in the spirit of Larson (1988). In the relevant discussion, Huang adopts McConnel-Ginet's (1982) distinction between Ad-VP and Ad-Verb, and translates it into a VP-shell-type analysis. Essentially, there are two types of manner adverbs: the "outer" one is a modifier of a verb phrase, while the "inner" one is a stative predicate which may form a complex predicate with the verb. This distinction is reflected by the contrast between the inner Ad-Verb in (12a) and the outer Ad-VP in (12b):

- (12) a. John finished the job quickly/real fast.
 b. John quickly/* fast finished the job.

The distribution of Chinese manner adverbials, as illustrated in (13), fall neatly under the inner/outer pattern:

- (13) a. Zhangsan pao-de hen kuai.
 Zhangsan runs fast.
 b. Zhangsan hen-kuai-di pao le.
 Zhangsan quickly ran away.

Here I will take the null hypothesis that this pattern holds for their interrogative counterparts as well. A specific view of the distribution of *zenmeyang* is thus in order:



As illustrated by (14), preverbal *zenmeyang* is protected by the higher VP node from being governed by any functional head, while postverbal *zenmeyang* is always head-governed by the lower V node. This move provides a straightforward account of the contrast between (9a,b) and (10,11).

The semantics of *zenmeyang* also follows in a natural way: On the one hand, since the inner position is restricted to a stative predicate, there is no way to introduce the instrumental reading for postverbal *zenmeyang*. Accordingly, the resultative reading comes by default due to the predicate usage of *zenmeyang*. On the other, since preverbal *zenmeyang* is in a modifier position, the resultative reading is suppressed and the instrumental reading pops out.

2. *Weishenme* Couple

A parallel to the above asymmetry is found in the contrast between purpose and reason *why* in Chinese: *wei(-le)shenme* 'for what' contrasts with *weishenme* 'why' not only in their readings (i.e., purpose vs. reason), but also in their behavior with respect to strong islands, as shown below:

- (15) a. ni zui xihuan [[wei(-le) shenme gongzuo] de ren]?
 you most like for what work PNM people
 What is the purpose x such that you like best [people [who work for x]]?
- b.*ni zui xihuan [[weishenme gongzuo] de ren]?
 you most like why work PNM people
 What is the reason x such that you like best [people [who work for x]]?
- (16) a. ni bijiao xiangxin [[tamen wei(-le) shenme cizhi] de shuofa]?
 you more believe they for what resign PNM story
 What is the purpose x such that you believe more [the story [that they resigned for x]]?
- b.*ni bijiao xiangxin [[tamen weishenme cizhi] de shuofa]?
 you more believe they why resign PNM story
 What is the reason x such that you believe more [the story [that they resigned for x]]?
- (17) a. [women wei(-le) shenme nianshu] cai you yiyi?
 we for what study just have meaning
 What is the purpose x such that it is just meaningful [for us to study for x]?
- b.*[women weishenme nianshu] cai you yiyi?
 we why study just have meaning
 What is the reason x such that it is just meaningful [for us to study for x]?

(15-17) represent relative, appositive, and subject clause constructions respectively. As we can tell from the contrast between the (a)- and (b)-clauses, only purpose *wei(-le) shenme* gets valid wide-scope readings. Unless we stress the preposition *wei* 'for' or separate *wei* from *shenme* with a suffix *-le*, *weishenme* as a whole counts as a genuine adverb associated with the reason reading. A similar case is found in French. The distinction between *pour quoi* 'for what' and *pourquoi* 'why' is re-

flected in the writing system: only the former is granted the in-situ option and interpreted as purposive (cf. Aoun 1986).

As for *wh*-fronting, both *weishenme* and *wei(-le)shenme* behave exactly like preverbal *zenmeyang*.³ Namely, they never extract overtly. The head-government requirement thus seems to be a promising candidate for blocking Chinese adjunct fronting in general.

3. An Overview

The pattern of contrasts among Chinese *wh*-phrases is summarized in the following two tables. Table 3.1 concerns the asymmetry between head-governed and non-head-governed *wh*-phrases in overt fronting. Table 3.2 concerns the asymmetry between nominal and non-nominal *wh*-phrases (i.e. manner *zenmeyang* and reason *weishenme*) in regard to wide-scope question formation at LF (cf. Tsai 1994).

Table 3.1.

Fronted Wh-Phrase	Simple Sentence	Bridge Verb	Others
<i>who</i>	ok	ok	*
<i>what</i>	ok	ok	*
<i>where</i>	*	*	*
<i>when</i>	ok in the presence of modals	ok in the presence of modals	*
resultative <i>how</i>	ok	ok	*
instrumental <i>how</i>	*	*	*
purpose <i>why</i>	*	*	*
manner <i>how</i>	ok in the postverbal position	ok in the postverbal position	*
reason <i>why</i>	*	*	*

3. For one thing, there is solid evidence showing *weishenme* and *wei(-le)shenme* differs in their syntactic positions. As Lin(1992) observes, *weishenme* appears higher than modals (and sometimes even the subject), whereas *wei(-le)shenme* lower. Also see Lin(1992) for a head-government analysis of LF *zenmeyang/weishenme* asymmetries.

Table 3.2.

Wh-in-situ	Strong/Wh-islands	Non-Bridge Verb	Others
<i>who</i>	ok	ok	ok
<i>what</i>	ok	ok	ok
<i>where</i>	ok	ok	ok
<i>when</i>	ok	ok	ok
resultative <i>how</i>	ok	ok	ok
instrumental <i>how</i>	ok	ok	ok
purpose <i>why</i>	ok	ok	ok
manner <i>why</i>	*	*	ok
reason <i>why</i>	*	*	ok

4. Unselective Binding and Chinese Indefinite *Wh*

From the above observation, it becomes clear that the question we face is two-fold. With respect to overt *wh*-fronting, an asymmetry lies between preverbal *zenmeyang* and postverbal *zenmeyang*, which appears to be a matter of launching sites in syntactic projections. As we have demonstrated in (14), this asymmetry follows directly from the head-government requirement on *Wh*-fronting (cf. Aoun 1986, WAHL 1987, Rizzi 1990). With respect to covert *wh*-movement, the line is drawn between manner *zenmeyang* on the one hand, and instrumental/resultative *zenmeyang* on the other. The curious thing here is why instrumental *zenmeyang* and resultative *zenmeyang* should pattern together in regard to LF Locality: despite their structural difference (and resulting contrast in overt extractability), neither of them displays strong island effects in LF.

Given Huang's (1982) view that Subjacency does not hold in LF, the deviance of manner readings in strong island constructions like (1b) and (5b) can only be attributed to the ECP, in particular to the require-

ment of antecedent-government. This is because the requirement of head (lexical) government, as we have seen, plays no part in LF. Since the launching sites of preverbal and postverbal manner *zenmeyang* are identical to instrumental and resultative *zenmeyang* respectively, we expect that (2a) and (5a) are also blocked by the ECP in the same way. This prediction, however, is not borne out.

In light of recent works on the indefinite usage of Chinese *wh*-phrases (Cheng 1991, Li 1992, among others), I would like to try out a non-movement approach based on the notion of "unselective binding", which can be loosely defined as (semantic) binding between members of an unrelated operator-variable pair. This operation, combined with Existential Closure, is proposed by Heim (1982) to account for quantificational properties of indefinite NPs: as illustrated by (18b), an existential operator is inserted in LF to license the indefinite NPs a *man* and a *donkey* by unselectively binding the variables introduced by them, and no Quantifier Raising (QR) is involved:

- (18) a. A man owns a donkey.
 b. $E_{x,y} (\text{man}(x) \wedge \text{donkey}(y) \wedge \text{own}(x,y))$

Pesetsky (1987) extends this analysis to *which*-NPs by reviving Baker's Q-morpheme analysis: every *wh*-question is headed by an abstract Q-morpheme, which serves as an unselective binder of *wh-in-situ* in LF, as illustrated below:⁴

- (19) a. Which man owns which donkey?
 b. S-S: $[_{\text{Comp}} Q_i \text{ which man}_i]e_i \text{ owns which donkey?}$
 c. LF: $[_{\text{Comp}} Q_{i,j}] \text{ which man}_i \text{ owns which donkey?}$
 d. $Q_{x,y} (\text{man}(x) \wedge \text{donkey}(y) \wedge \text{own}(x,y))$

4. If Karttunen's (1977) approach is on the right track, a Q-morpheme will eventually introduce an existential operator, and translate (19b) into (19d) with the question denoting the set of propositions which are true answers to it (here I adopt Reinhart's (1992) notations without further complication of intensional semantics).

(19) d. $\{\text{PIE}_{x,y} (\text{man}(x) \wedge \text{donkey}(y) \wedge P \wedge \text{own}(x,y) \wedge \text{true}(P))\}$

The subject *which man* moves into Comp at S-structure, and is related to Q by Comp-indexing, as in (19b). The binding between Q and *which man* is thus selective after the subject is restored to its base position in (19c) by reconstruction. On the other hand, the binding between Q and *which donkey* in (19c) is unselective, and no LF movement is involved in assigning scope to the in-situ object.

With this technology in mind, we will look into a number of phenomena which, as observed by Li (1992), suggests that *wh-in-situ* behave like variables rather than operators in Chinese. First of all, indefinite readings of Chinese *wh-in-situ* are licensed in the presence of negation, A-not-A questions, and conditionals, as shown by (20a-c) respectively:

- (20) a. Akiu bu xuyao shenme.
 Akiu not need what
 Akiu doesn't need anything.
- b. Akiu xu-bu-xuyao shenme?
 Akiu need-not-need what
 Does Akiu need something/anything?
- c. Yaoshi Akiu xuyao shenme, (qing gaosu wo.)
 if Akiu need what please tell me
 If Akiu needs something/anything, (please tell me.)

The same type of construals obtains for non-factive complements, as exemplified by (21a). When we replace *yiwei* 'think' in (21a) with a factive verb like *yihan* 'regret', an interrogative reading pops out, as in (21b).

- (21) a. Akiu yiwei Lisi faxian-le shenme.
 Akiu think Lisi discover-Prf what
 Akiu thought that Lisi found out something.
- b. Akiu hen yihan Lisi faxian-le shenme?
 Akiu very regret Lisi discover-Prf what
 What is the thing x such that Akiu regrets that Lisi found out x?

In addition, sentential adverbials like *dagai* 'probably' also license indefinite readings, as exemplified by (22a). In contrast, an interrogative reading emerges in the absence of *dagai*, as in (22b).

- (22) a. Akiu *dagai* faxian-le shenme.
he probably discover-Prf what
He probably found out something.
b. Akiu faxian-le shenme.
Akiu discover-Prf what
What did Akiu find out?

A descriptive generalization we can draw from (20-22) is that the scope assignment of interrogative *wh*'s is blocked by other types of operators such as the conditional operator in (20c) and the adverb *dagai* 'probably' in (22a), which in turn supply universal or existential quantifiers and license the indefinite usage. This kind of construals is reminiscent of Lewis-Heim's observation that existential readings of indefinite NPs disappear in the presence of other types of quantifiers. As shown by (23), Existential Closure employed in (18b) is blocked by the adverb *always* of the main clause, which instead introduces a universal quantifier, unselectively binding all the variables present:

- (23) a. If a man owns a donkey, he always beats it.
b. Always ((*x* is a man & *y* is a donkey & *x* owns *y*), *x* beats *y*)
c. $A_{x,y} ((\text{man}(x) \wedge \text{donkey}(y) \wedge \text{own}(x, y) \rightarrow \text{beat}(x,y))$

Under this view, an indefinite NP does not possess quantificational force of its own. Rather, it is Existential Closure or operators like *always* that contribute to the apparent scopal properties of indefinites. Along the same line of reasoning, a working hypothesis is in order, as stated in (24):

- (24) Chinese *wh*-NPs have no quantificational force, but introduce variables when interpreted in-situ.⁵

It follows from (24) that there must be an abstract question operator (Q-operator) in some scope position when a question is formed, as sketched below (see also Aoun & Li (1993a), Cheng (1991), Li (1992) for similar conclusions):

- (25) $[_{CP} Op_{i[+Q]} [... wh_i...]]$

This point becomes clear when we compare *wh*-question formation in (26) and *dou*-quantification in (27). The relevant island constructions are a derived nominal in (a)-clauses, a relative clause in (b)-clauses, and a derived nominal further embedded in a relative clause in (c)-clauses:

- (26) a. $[_{DP} Akiu [_{PP} dui\ shei] de\ piping] zui\ hendu?$
 Akiu to who PNM criticism most vicious
 Who is the man x such that [Akiu's criticism [of x]] is most vicious?
- b. $[_{DP} [_{CP} Akiu\ de\ piping [_{PP} dui\ shei] zaocheng] de\ shanghai] zui\ da?$
 Akiu PNM criticism to who cause PNM damage most great
 Who is the man x such that [the damage [that Akiu's criticism caused x]] is greatest?
- c. $[_{DP} [_{CP} [_{DP} Akiu [_{PP} dui\ shei] de\ piping] zaocheng] de\ shanghai] zui\ da?$
 Akiu to who PNM criticism cause PNM damage most great
 Who is the man x such that [the damage [that [Akiu's criticism [of x]] caused] is greatest?

5. See also Reinhart(1992) for a discussion of this issue in terms of the interpretability of *wh*-in-situ. The basic claim is that only *wh*-NPs can be interpreted in-situ, in that they contain an N-index (or a role to discharge, cf. Higginbotham 1983, 85). This property allows them to be construed as choice-function variables applying to an N-set, as exemplified below.

- (i) a. Which student bought which book?
 b. $\{PI\exists_f\exists_x (x \text{ is a student} \ \& \ P=\wedge (x \text{ bought } f(\text{book})) \ \& \ \text{true}(P))\}$

- (27) a. $[_{DP} \text{ Akiu } [_{PP} \text{ dui shei}] \text{ de } \text{ piping}] \text{ dou hendu.}$
 Akiu to who PNM criticism all vicious
 For all x, x a person, [Akiu's criticism [of x]] is vicious.
- b. $[_{DP} [_{CP} \text{ Akiu de piping } [_{PP} \text{ dui shei}] \text{ zaocheng}] \text{ de shanghai}] \text{ dou henda.}$
 Akiu PNM criticism to who cause PNM damage all great
 For all x, x a person, [the damage [that Akiu's criticism caused x]] is great.
- c. $[_{DP} [_{CP} [_{DP} \text{ Akiu } [_{PP} \text{ dui shei}] \text{ de piping}] \text{ zaocheng}] \text{ de shanghai}] \text{ dou henda.}$
 Akiu to who PNM criticism cause PNM damage all great
 For all x, x a person, [the damage [that [Akiu's criticism [of x]] caused] is great.

No island effect is detected either for the interrogative readings of (26) or for the universal readings of (27). On the other hand, definiteness effects do show up when we close off projection of DPs by adding a demonstrative *naxie* 'those':

- (28) a. $*[_{DP} \text{ naxie } [_{DP} \text{ Akiu } [_{PP} \text{ dui shei}] \text{ de piping}]] \text{ zui hendu?}$
 those Akiu to who PNM criticism most vicious
 Who is the man x such that [those Akiu's criticism [of x]] is most vicious?
- b. $*[_{DP} \text{ naxie } [_{CP} \text{ Akiu de piping } [_{PP} \text{ dui shei}] \text{ zaocheng}] \text{ de shanghai}] \text{ zui da?}$
 those Akiu PNM criticism to who cause DE damage most great
 Who is the man x such that [the damage [which those Akiu's criticism caused x]] is greatest?
- c. $*[_{DP} \text{ naxie } [_{CP} [_{DP} \text{ Akiu } [_{PP} \text{ dui shei}] \text{ de piping}] \text{ zaocheng}] \text{ de shanghai}] \text{ zui da?}$
 those Akiu to who PNM criticism cause PNM damage most great
 Who is the man x such that [the damage [which [those Akiu's criticism [of x]] caused] is greatest?
- (29) a. $*[_{DP} \text{ naxie } [_{DP} \text{ Akiu } [_{PP} \text{ dui shei}] \text{ de piping}]] \text{ dou hendu.}$
 those Akiu to who PNM criticism all vicious
 For all x, x a person, [those Akiu's criticism [of x]] is vicious.

- b.*[_{DP} naxie [_{CP} Akiu de piping [_{PP} dui shei] zaocheng] de shanghai] dou henda.
 those Akiu PNM criticism to who cause PNM damage all great
 For all x, x a person, [the damage [which those Akiu's criticism caused x]] is great.
- c.*[_{DP} naxie [_{CP} [_{DP} Akiu [_{PP} dui shei] de piping] zaocheng] de shanghai] dou henda.
 those Akiu to who PNM criticism cause PNM damage all great
 For all x, x a person, [the damage [which [those Akiu's criticism [of x]] caused] is great.

This parallelism between *wh*-question formation and *dou*-quantification strongly suggests that they involve the same LF operation, i.e., unselective binding, which is sensitive to conditions on operator-variable dependency, but unbounded in regard to structural barriers. If this observation is on the right track, then (26a-c) and (28a-c) must contain a Q-operator in the matrix CP Spec as the relevant unselective binder.

Now let's see how this theory may work out in the CP system. Based on Baker's insight and the checking theory developed by Chomsky (1992), we propose that each interrogative clause is headed by a $C^0_{[+Q]}$, which somehow has to be checked off by a $[+Q]$ operator through Spec-head agreement. Only $C^0_{[+Q]}$ thus checked serves as an unselective binder in LF. Furthermore, as a typological correlate of (24), the following parameter is turned on for Chinese:

- (30) $[+/-Q\text{-operator in CP Spec}]$

In contrast, parameter (30) is turned off for English. Consequently, for a given $C^0_{[+Q]}$, Chinese satisfies the checking requirement in principle, while English has to employ overt *wh*-movement. To illustrate the idea, we first consider the following Chinese example, where a *wh-in-situ* is embedded in a Complex-NP island:

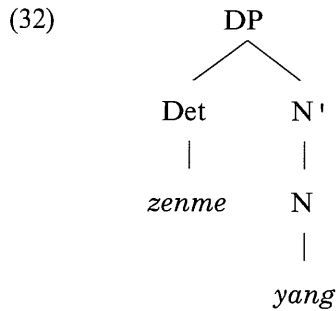
- (31) ni mai-le [_{DP} [_{CP} shei xie e_j] de shu_j]?
 you buy-Prf who write PNM book
 Who is the person x such that you bought [books [that x wrote]]?
 a. D-S: [_{CP} Op_[+Q] [_C⁰_[+Q] [... [_{DP} [_{CP} shei...] ...]]]
 b. S-S: [_{CP} Op [_C⁰_[+Q] [... [_{DP} [_{CP} shei...] ...]]]
 c. LF: [_{CP} [_C Q_i [... [_{DP} [_{CP} shei_j...] ...]]]]

As shown by (31a), a Q-operator is base-generated in matrix CP Spec according to the positive setting of (30). It checks C⁰_[+Q] in a Spec-head configuration, and the [+Q] feature of its own disappears after checking, as in (31b). The operator itself, being null and unindexed, is subject to deletion. C⁰_[+Q], on the other hand, is thereby licensed to bind *shei* 'who', forming a legitimate object at LF, as in (31c).⁶ Throughout the derivation, no *wh*-movement is involved, and hence the lack of island effects.

5. Nominal/Non-nominal Asymmetry

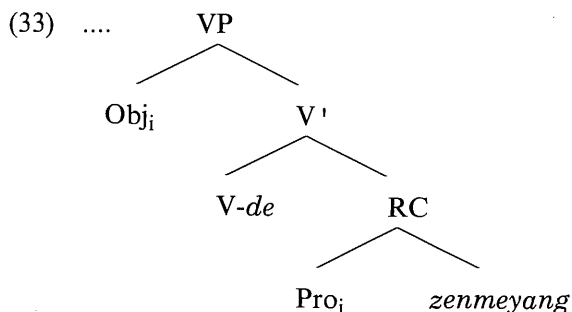
Under the non-movement approach outlined above, the capability of introducing variables becomes essential to the survival of wide-scope readings in a given island construction. A reasonable conjecture is that the *wh*-adjunct asymmetries in question may result from the dichotomy between *wh*-NPs and *wh*-adverbs, with the latter functioning as operators, which do not introduce variables in the absence of movement. For one thing, *zenmeyang* consists of two morphological units: an adverb *zenme* 'how' and a noun head *yang* 'manner/way'. it is thus plausible to assume that instrumental *zenmeyang* projects to an DP, as sketched in (32):

6. The mechanism introduced here is built on the intuition that *wh*-phrases tends to affiliate, rather than interact, with each other in a particular CP domain, which traces back to the absorption rule proposed by Higginbotham & May (1981).



Manner *zenmeyang*, on the other hand, appears to be a genuine adverb, patterning with *zenme* in regard to locality effects.⁷ This sort of category-shifting is not uncommon among languages, as the distinction between *some times* and *sometimes* suggests in English.

Furthermore, given Huang's (1991, 1992) analysis of postverbal complementation (cf. (14)), resultative *zenmeyang* may well be treated as a predicate nominal in a small clause, i.e., the result clause (RC) itself, as illustrated below:



In this way, we are able to relate instrumental and resultative *zenmeyang* in terms of their categorial status. Namely, they all count as *wh*-NPs, and accordingly introduce variables when interpreted in-situ (see above).

7. *zenme* 'how' alone can appear preverbally, displaying the same range of extractability in both overt syntax and LF. But there are two reasons to leave it aside. First, it has no postverbal counterparts. Without comparison, it is impossible to single out the crucial factors as we have done in the previous discussion. Second, *zenme* sometimes means 'how come/why', which hinders speakers' judgement on the asymmetry in question.

The next step is to see if there is any empirical justification of our claim. So far we have made an analogy between *dou*-quantification and *wh*-question formation to describe the scopal properties of Chinese *wh-in-situ*, where the notion of unselective binding plays an important part. By doing so, we commit ourselves to the prediction that the *wh*-adjunct asymmetries should hold for *dou*-quantification as well. In the following discussion, I will show that this is indeed the case:

- (34) [_{DP} [_{CP} ta zenmeyang duen e_i] de niurou_i] *dou* haochi.
 she how stew PNM beef all delicious
 a. For all x, x a means, beef which she stewed by x is delicious.
 b. #For all x, x a manner, beef which she stewed in x is delicious.
- (35) [_{DP} [_{CP} ta e_i duen-de [pro_i zenmeyang] de niurou_i] *dou* you ren chi.
 she stew-DE how PNM beef all have people eat
 a. For all x, x a state, people will eat beef which she stewed till x.
 b. #For all x, x a manner, people will eat beef which she stewed in x.

As evidenced by the contrast between (34a) and (34b), as well as that between (35a) and (35b), the unselective binder *dou* 'all' can only pick up instrumental and resultative *zenmeyang* in regard to universal quantification. The same observation applies to purpose *wei(-le)shenme* and reason *weishenme*:

- (36) a. [_{CP} ni wei(-le)shenme cizhi] *dou* hao, jioshi bu yiao wei(-le)...
 you for what resign all fine just not want for
 You can resign for any/whatever purpose you want, just don't resign for...
 b. * [_{CP} ni weishenme cizhi] *dou* hao, jioshi bu yiao wei(-le)...
 you why resign all fine just not want for
 You can resign for any/whatever reason you want, just don't resign for...

While the long-distance binding between *dou* and purpose *wei(-le)shenme* does not display sentential subject effects, as in (36a), the same construal is not available for reason *weishenme*, as in (36b)

As a matter of fact, it suffices to backup our claim by examining simple sentences.⁸ As illustrated by the contrast between (37a) and (37b), *zenmeyang* can only be interpreted as instrumental in the presence of *dou*-quantification, and the manner reading is ruled out as usual. If we replace *zenmeyang* 'how-manner' with the adverb *zenme* 'how', as in (38), the sentence is totally out, just as we expect.

- (37) Akiu *zenmeyang dou yao lai*.
 Akiu how all want come
 a. Akiu will come by any/whatever means.
 b. #Akiu will come in any/whatever manner.

- (38) *Akiu *zenme dou yao lai*.
 Akiu how all want come

Similarly, it is purpose *wei(-le)shenme* 'for what', but not reason *weishenme*, that survives the unselective binding construal, as shown by the contrast between (39a) and (39b):

8. Thanks to Toshi Oka for bringing up this issue to me. For one thing, it is difficult to test postverbal *zenmeyang* in simple cases like (24), because *dou* has a curious property: it can only license something to its left, and the closer the better (see Haung 1982, Lee 1986, Chiu 1990, Li 1991, and Cheng 1991). Consequently, even if we front postverbal *zenmeyang* to the sentence-initial position, there is still a subject in the way, as shown below:

- (i) ?*zenmeyang_i (a), tamen dou chang-de t_i?*
 how Top they all sing-DE
 a. What is the state x such that they all sang till x ?
 b. What is the manner x such that they all sang in x ?

As shown in (i), both resultative and manner readings are valid in regard to question formation. The only term quantified by *dou* is the subject NP *tamen* 'they'.

- (39) a. Akiu wei(-le) shenme dou yao cizhi.
 Akiu for what all want resign
 Akiu will resign for any/whatever purpose.
- b. *Akiu weishenme dou yao cizhi.
 Akiu why all want resign
 Akiu will resign for any/whatever reason.

Another piece of evidence comes from the fact that all the nominal arguments like *shei* 'who' and *nali* 'where' pattern with instrumental and resultative *zenmeyang* in *dou*-quantification, as exemplified by (40a, b), as well as in *wh*-question formation, as exemplified by (41a, b):

- (40) a. [_{DP} [_{CP} shei dun e_i]] de niurou_i] dou haochi.
 who stew PNM beef all delicious
 For all x, x a person, beef which x stewed is delicious.
- b. [_{DP} [_{CP} Dufu zai nali xie e_i] de shi_i] dou shi yiliude.
 Dufu at where write PNM poetry all be first-rated
 For all x, x a place, poetry which Dufu wrote at x is first-rated.
- (41) a. [_{DP} [_{CP} shei dun e_i]] de niurou_i] zui haochi?
 who stew PNM beef most delicious
 Who is the person x such that beef which x stewed is most delicious?
- b. [_{DP} [_{CP} Dufu zai nali xie e_i] de shi_i] shi yiliude?
 Dufu at where write PNM poetry be first-rated
 What is the place x such that poetry which Dufu wrote at x is first-rated?

In parallel, nominal adjuncts like *ji nian* 'how-many years' and *ji ci* 'how-many times' also cluster together in not displaying strong island effects, either in *dou*-quantification (42) or in *wh*-question formation (43):

- (42) a. [_{DP} [_{CP} Pro_{arb} cang-le ji nian] de jiu] dou xing.
store-Prf how-mang years PNM wine all do
For all x, x a number of years, wine which is stored for x will do.
- b. [_{DP} [_{CP} Pro_{arb} zhengliu-guo ji ci] de jiu] dou xing.
distill-Exp how-many times PNM wine all fine
For all x, x a number of times, wine which is distilled for x will do.
- (43) a. [_{DP} [_{CP} Pro_{arb} cang-le ji nian] de jiu] zui hao?
store-Prf how-mang years PNM wine most good
How many years are x such that wine which is stored for x is the best?
- b. [_{DP} [_{CP} Pro_{arb} zhengliu-guo ji ci] de jiu] zui hao?
distill-Exp how-many times PNM wine most good
How many times are x such that wine which is distilled for x is the best?

To sum up, the parallel on the part of *dou*-quantification confirms our proposal that unselective binding plays a part in Chinese *wh*-question formation. We propose that the *wh*-adjunct asymmetries can be solved by a dichotomy between *wh*-NPs and *wh*-adverb in terms of their capability of introducing variable. Namely, *wh*-NPs can be interpreted in-situ in the presence of unselective binders. Wh-adverbs, on the other hand, have to move to assume their scopes, since they are not subject to unselective binding. This proposal, though far from conclusive, hopefully will shed some light on our understanding of unselective binding constructions.

6. References

- Aoun, J. (1986) *Generalized Binding*, Foris, Dordrecht.
- Aoun, J., Hornstein, N., Lightfoot, D. and A. Weinberg (1987) "Two Types of Locality", *Linguistic Inquiry* 18: 537-577.
- Aoun, J. and Y. -H. A. Li (1993a) "Wh-elements in Situ: Syntax or LF?", *Linguistic Inquiry* 24, 199-238.
- Aoun, J. and Y. -H. A. Li (1993b) "On some Differences between Chinese and Japanese Wh-Elements," *Linguistic Inquiry* 20, 265-272.
- Chiu, B. (1990) "A Case of Quantifier Floating in Mandarin Chinese," paper presented at the second Northeast Conference on Chinese Linguistics, Pennsylvania.
- Cheng, L. L. -S. (1991) *On the Typology of Wh-questions*, PhD Dissertation, MIT.
- Cinque, G. (1991) *Types of A' -Dependencies*, MIT Press, Cambridge.
- Heim, I. (1982) *The Semantics of Definite and Indefinite Noun Phrases*, PhD Dissertation, University of Massachusetts, Amherst.
- Higginbotham, J. (1983) "Logical Form, Binding, and Nominals," *Linguistic Inquiry* 14, 395-420.
- Higginbotham, J. (1985) "On Semantics," *Linguistic Inquiry* 16, 547-593.
- Higginbotham, J. and R. May (1981) "Questions, Quantifiers, and Crossing," *The Linguistic Review* 1, 41-79.
- Huang, C. -T. J. (1982) *Logical Relations in Chinese and the Theory of Grammar*, PhD Dissertation, MIT.
- Huang, C. -T. J. (1991) "More on Chinese Word Order and Parametric Theory," ms., UC Irvine.
- Huang, C. -T. J. (1992) "Complex Predicates in Generalized Control," in Larson, R. K., S. Iatridou, U. Lahiri and J. Higginbotham (eds.) *Control and Grammar*, Kluwer Academic Publishers.
- Kuroda, S. -Y. (1965) *Generative Grammaical Studies in the Japanese Language*, PhD dissertation, MIT.

- Larson, R. (1988) "On the Double Object Construction," *Linguistic Inquiry* 19,335-392.
- Lewis, D. (1975) "Adverbs of Quantification," in E. Keenan (ed.) *Formal Semantics of Natural Language*, 3-15, Cambridge University Press, Cambridge.
- Li, A. (1992) "Indefinite *Wh* in Mandarin Chinese," *Journal of East Asian Linguistics* 1, 125-155.
- Lin, J. -W. (1992) "The Syntax of *zenmeyang* 'how' and *weishenme* 'why' in Mandarin Chinese," *Journal of East Asian Linguistics* 1, 293-331.
- Mei, K. (1978) "Guoyu Yufa zhong de Dongcizu Buyu [On Verb-Phrase Complements in Mandarin Chinese]," in *A Festschrift for Professor Chu Wan-Li*, 511-536, Lianjing Publisher, Taipei.
- Nishigauchi, T. (1986) *Quantification in Syntax*, PhD Dissertation, University of Massachusetts, Amherst.
- Rooth, M. (1985) *Association with Focus*, PhD Dissertation, University of Massachusetts, Amherst.
- Reinhart, T. (1983) *Anaphora and Semantic Interpretation*, Croom Helm, London.
- Reinhart, T. (1992) "Interpreting *Wh-in-situ*," to appear in the Proceedings of the Amsterdam Colloquium.
- Rizzi, L. (1990) *Relativized Minimality*, MIT Press, Cambridge.
- Tang, C. -C. J. (1990) *Chinese Phrase Structure and the Extended X'-Theory*, PhD Dissertation, Cornell University.
- Tang, T. -C. C. (1989) *Studies on Chinese Morphology and Syntax: 2*, Student Book Co., Taipei.
- Tsai, W. -T. D. (1994) "On Nominal Islands and LF Extraction in Chinese," *Natural Language and Linguistic Theory* 12, 121-175.

C-Command Approach to Morphosyntax

Hongming Zhang

University of Wisconsin-Madison

Abstract

This paper centers around the interface between syntax and phonology, and especially around how phonology is sensitive to syntactic or prosodic structure at the morphosyntactic level. Two questions have been fundamental in the study of the syntax-phonology interface: a) what must phonology know about syntax; and b) what makes the phonological behavior of one syntactic phrase different from that of another. In response to these questions, two different leading theories have been developed. One claims that phonological rules are subject to conditions that are stated directly in terms of syntactic domains. The other suggests that the surface syntactic structure is first mapped onto a prosodic structure, consisting of prosodic constituents, which are the domains of phonological rules applying above the level of the word. According to the former, the syntactic information needed to delimit the sandhi domain is defined by the m-command condition (the revised definition proposed by Chomsky (1986)); while by the latter, the prosodic domain is marked at the right or left edge of an X^{head} or X^{max} . On the basis of the evidence from Chinese dialects, I will show in this paper that syntax has direct access to phonology with an analysis of different types of c-command (the preliminary definition given by Reinhart (1976, 1983)). Generally speaking, tone sandhi reacts in three ways to the c-command condition. Specifically, c-command determines what domain a tone will spread to, as in the Danyang Chinese, whether the tone sandhi rule is applied or blocked, as in the Ruicheng Chinese, and what kind of rule application mode will be chosen, as in the Pingyao Chinese. Thus it can be seen that the c-command condition is a key to tone sandhi operation in some Chinese dialects. And the Chinese tone sandhi phenomena discussed here will not only make a challenge to the prosodic theory proposed by Selkirk, but also help to improve the relation-based approach proposed by Kaisse.

1. Introduction

This paper centers around the interface between syntax and phonology as well as makes a detailed analysis of the important role played by the c-command notion in determining the tone sandhi (TS) domains, TS types, and the modes of TS rule application in some Chinese dialects.

Two questions have been fundamental to the study of the syntax-phonology interface. The first has to do with which specific syntactic properties affect the application of phonological rules, and the second has to do with how these syntactic properties should be incorporated into phonology. In response to these two questions, two different approaches have been developed separately. One claims that phonological rules are subject to conditions that are stated directly in terms of syntactic domains (i.e. sandhi rules have direct access to relevant properties of the surface syntactic structure). Following Hyman, et al (1987), we will refer to this approach as the directly syntax-sensitive approach (DSA). The second approach claims that the surface syntactic structure is first mapped onto a prosodic structure, consisting of prosodic constituents. These prosodic constituents are the domains of phonological rules applying above the level of the word. This approach will be referred to as the indirectly syntax-sensitive approach (ISA).

The DSA has been elaborated upon especially by Kaisse (1985), who distinguishes two types of postlexical rules, namely external sandhi rules (P1 rules) and fast-speech rules (P2 rules). P1 rules have direct access to the information contained in the labeled bracketing of syntactic structure and apply only under specific syntactic conditions. What is the type of syntactic information needed to delimit the sandhi domain is defined in terms of the c-command hypothesis with K-condition, and the general idea of this hypothesis is shown as in (1):

(1) a. C-command Condition:

For a rule to apply to a sequence of two words α and β

(i) α must domain-c-command β or

(ii) β must domain-c-command α .

b. Domain c-command:

In the structure $[X^{\max} \dots \alpha \dots]$, X^{\max} is defined as the domain of α . Then α c-commands any β in its domain.

The ISA, supported by Hayes (1984), Selkirk (1986), and Nespor-Vogel (1986), suggests a prosodic structure (P-structure) between syntactic structure and phonetic representation. The prosodic structure consists of different types of domains including the phonological word (PW), the clitic groups (CG), the phonological phrase (PPh), the intonational phrase (IPh), and the utterance (Utt). These domains are hierarchically organized in a number of layers. Thus, a well-formed prosodic representation looks as follows:

(2)	(-----)	Utt
	(-----) (-----)	Iph
	(----) (-----) (-----)	Pph
	(----) (-----) (-----) (-----)	CG
	(----) (-----) (-----) (-----) (-----)	PW

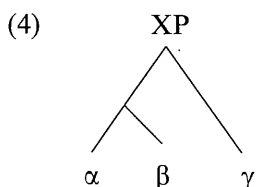
The evidence, obtained from Chinese dialects, both for and against the DSA and the ISA, will be included in this paper; however, it should be pointed out that it is still very unclear what the interface between phonology and syntax should look like. To a certain extent, the situation is just as Kaisse-Zwicky (1987) portray it to be: "the study of postlexical rules sensitive to syntactic or prosodic structure is still in its infancy". For instance, according to Kaisse, the c-command relation is the most important syntactic factor which directly influences phonology, but according to recent work by Chen (1990) and Zhang (1992d), what is accessible to phonology includes at least such types of syntactic information as

functional relations, constituency, c-command, adjacency, and argument/adjunct. Even c-command is not as it is defined by Kaisse. Moreover, some other phenomena have been overlooked by these two approaches. For instance, in some cases there is syntactically based selection of sandhi rules within certain prosodic domains. But in this paper, my discussion is only confined to the c-command condition accessible to phonology.

Since Reinhart (1976, 1983) discussed in detail the notion of c-command, several different definitions concerning c-command have been proposed. Among them only two can be considered to be particularly influential: a) the preliminary definition given by Reinhart, and b) the revised definition proposed by Chomsky (1986), shown respectively as follows:

- (3) a. Preliminary definition:
 α c-commands β iff
every branching node dominating α dominates β .
- b. Revised definition:
 α c-commands β iff
every maximal projection dominating α dominates β .

To differentiate these two different c-command definitions, (3a) is generally called c-command while (3b) is termed m-command, illustrated as follows:



Suppose that structure XP is a maximal projection, then by (3a), α only c-commands β , and not γ ; but γ c-commands both α and β . But by (3b), α m-commands both β and γ . In *Direct Syntactic Approach*, the notion of c-command according to Kaisse is, in nature, the definition of

m-command according to Chomsky. However, this paper will show that tone sandhi in many Chinese dialects is sensitive to c-command rather than m-command. Roughly speaking, Chinese TS reacts in three ways to the c-command condition. C-command determines what domain a tone will spread to, whether the TS rule is applied or blocked, and whether the TS application is in a cyclic mode or not. Now, let us look into these three different c-command cases one by one.

2. Danyang Chinese: Case Study (1)

The first type of c-command refers to the one which determines the domain of spreading. And Danyang Chinese is just such a typical case. Many Chinese linguists have covered in their discussion the tone pattern of Danyang Chinese (Chen 1986; Yip 1989; Chan 1989; Bao 1990; Zhang 1990b; Duanmu 1990). Here the discussion is confined to a simple analysis of particular relevant cases.

Danyang has two tone sandhi rules as shown in (5a) and (5b), where rule (5a) must be applied before rule (5b).

- (5) a. $H \rightarrow \emptyset / __ H$
 b. $H \rightarrow \emptyset / __ LH\#$

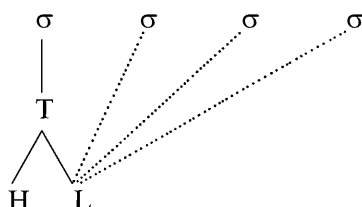
In Danyang Chinese, there are six base melodies and therefore six spreading patterns, shown as follows, where BM stands for 'base melody':

(6)	<u>BM</u>	<u>disyllable</u>	<u>trisyllable</u>	<u>quadrissyable</u>
a.	H	H - H	H - H - H	H - H - H - H
b.	M	M - M	M - M - M	M - M - M - M
c.	L	L - L	L - L - L	L - L - L - L
d.	HL	HL - L	HL - L - L	HL - L - L - L
e.	LH	LH - H	LH - H - H	LH - H - H - H
f.	HLH	HL - LH	HL -HL -LH	HL -HL -HL -LH

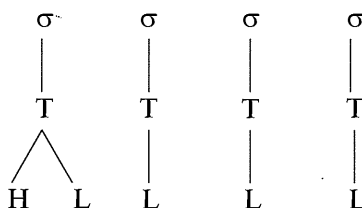
Descriptively, the polysyllabic tone patterns above can be seen as being derived from the corresponding base melodies by left-to-right association and the spreading of the first tone, as illustrated by the derivations of the quadrisyllabic patterns in (6d) and (6f) below.¹

(7) a. Base Melody: HL (= (6d))

1) Association and Spreading (left-to-right):

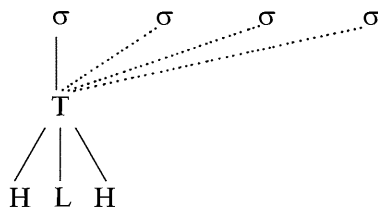


2) Tier Conflation:



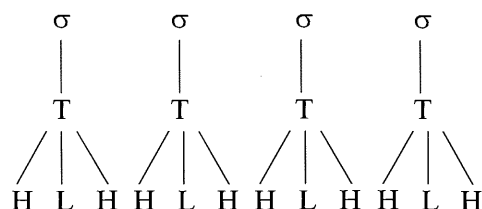
b. Base Melody: HLH (= (6f))

1) Association and Spreading (left-to-right):



1. It should be noted that the spreading tier of (7a) differs from that of (7b). (7a) spreads from the tonemic tier, while (7b) spreads from the tone root tier. The spreading tier in Danyang is very complicated. However, it is not very relevant to the problems under discussion here. What we are concerned with is the spreading domain rather than the spreading tier. For a detailed discussion about the spreading tier, see Bao (1990), Chan (1991), and Zhang (1992b).

2) Tier Conflation:

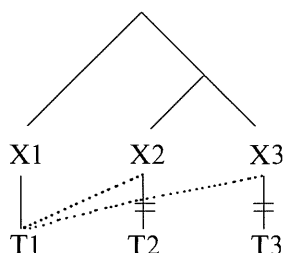


3) Simplification:

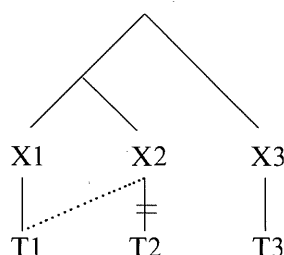
- i. HL HL HL HLH by rule (5a)
- ii. HL-HL-HL-LH by rule (5b)

It should be pointed out that Danyang's spreading domain in right-branching structures differs from that in left-branching structures. The former is the whole phrase structure, as illustrated in (8a), while the latter covers only the first two syllables, namely, immediate constituents (IC), as shown in (8b).

(8) a.





b.



In (8a), the citation tones of X2 and X3 are deleted, but T1 is spread rightward to unlinked tone-bearing units. In (8b), only X2's citation tone is deleted and T1 is spread only to X2, not to X3, which keeps its citation tone without any change. Here are some examples of such

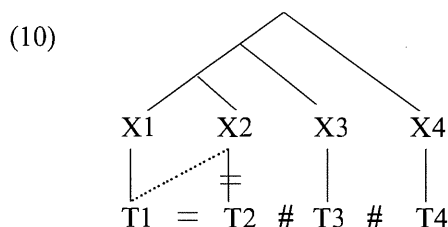
right-branching and left-branching structures.²

- (9) a. [da [yan-jing]]
big eye
'big eye'
CT [L - [LH - M]]
spread 
TS L - L - L
- b. [[ba-wang]gong]
overlord bow
'overlord's bow'
CT [[L - LH] - M]
spread 
TS L - L - M

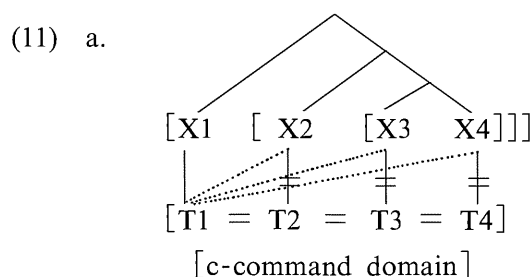
Chan (1989) considers case (8a) to be an initial-stress pattern and (8b) to be a final-stress pattern, since T1 in (8a) determines the tonal pattern of both X2 and X3, it is the stress locus of the whole structure, and since T3 in (8b) remains unaltered and reserves its original citation tone form, the stress locus will be T3. As a matter of fact, both T1 in (8a) and (8b) have the same nature, and the only difference between them is that in the former case, T1 spreads to T2 and T3, whereas in the latter, it only spreads to T2; however, if we follow this analysis, we will have to take exactly this same T1 as the stress locus in (8a) but not in (8b). Moreover, if we consider a tone which keeps its citation tone under tone sandhi to be the stress locus, we will see two stresses in left-branching

2. *CT* stands for citation tone; *TS* for tone sandhi; symbol # for spreading rule blocked, and symbol = for rule applied.

quadrisyllables, as illustrated in (10).



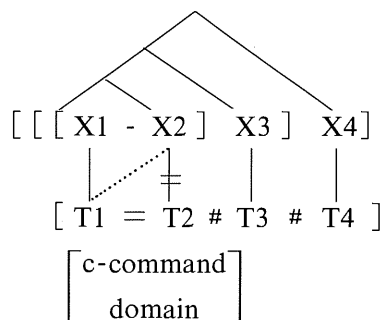
In fact, I do not think that the difference between (8a) and (8b) is that between an initial-stress pattern and a final-stress pattern. I would rather take it as a difference in spreading domains. Domain of rule application is an everlasting topic. According to Selkirk (1984, 1986), TS domain is a prosodic domain, but according to Kaisse (1985), it turns out to be an m-command domain. However, the spreading domain of Danyang Chinese is the domain of a c-command. Here are some examples of quadrisyllabic structures:



a'. [tou [jin[jie-zhi]]]
 steal goldring finger
 'to steal a gold finger ring'

BT	HL - M - LH - H
spread	HL = L = L = L
TS	HL - L - L - L

b.



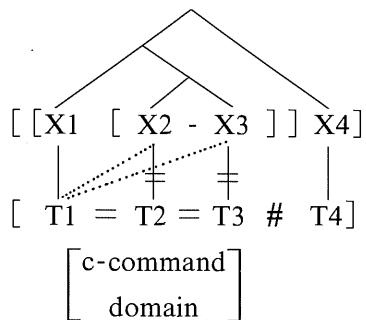
b'. [[[dou-fu] gan] si]
bean-curd dry shred
'shredded dry beancurd'

BT L - LH - M - M

spread L = L # M # M

TS L - L - M - M

c.



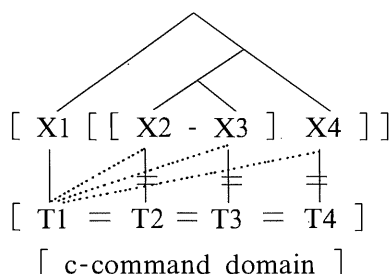
c'. [[hu[luo-bo]]si]
foreign radish radish thread
'shredded carrot'

BT LH - LH - H - M

spread LH = H = H # M

TS LH - H - H - M

d.



d'. [da[[shou-yin]ji]]

big receive sound machine

'the big radio'

BT L - M - M - M

spread L = L = L = L

TS L - L - L - L

As shown in (11), the spreading domain of Danyang Chinese is a c-command domain instead of an m-command domain. In (11a), X1 c-commands X2, X3, and X4, so the spreading domain is from T1 to T4. In (11b), X1 only c-commands X2, not X3 and X4, thus its spreading domain covers only T1 and T2. This conclusion is also borne out by (11c) and (11d). In (11c), X1 c-commands X2 and X3, not X4, so X1's spreading domain is from T1 to T3, not including T4. In (11d), X1 c-commands X2, X3, and X4, thus its spreading domain is from T1 to T4. Thus it can be seen that the TS domain of Danyang Chinese is a typical case of the c-command domain.

3. Ruicheng Chinese: Case Study (2)

The second type of c-command, supported by the evidence from Ruicheng Chinese, is the one which determines whether the tone sandhi rule is applied or blocked. In Ruicheng Chinese, there are two TS rules, shown as follows:

(12) a. $ML \rightarrow LM / _ ML$

b. $HM \rightarrow ML / _ HM$

Although seemingly identical to Danyang Chinese in the sense that Ruicheng Chinese also has the whole phrase structure as the domain in its uniform right-branching structures, but the immediate constituents as the domain in its left-branching structures, Ruicheng differs from Danyang in the fact that the TS of the former is a cyclic case, while the TS of the latter is a spreading case. As far as Ruicheng is concerned, TS applies in every cycle of the right-branching structures, but only in the first cycle of its left-branching structures, and never vice-versa; otherwise, it will only produce the wrong output forms, as seen in the following examples:³

- (13) a.
- ```

 /\
 /\
 /\ /\
 [X1] [X2] [X3 - X4]

```
- [T3 = T4]  
[T2 = T3]  
[T1 = T2]
- [T1 = T2 = T3 = T4]
- a'. [qu xiao [jin - bi]]]  
take small gold pen  
'to take the small golden pen'
- BT HM - HM - ML - ML
- i. [LM ]  
[NA ]  
[ML ]
- OK ML - HM - LM - ML (cycle)  
=====

3. Here *NA* stands for no phonological rules applicable in this environment; *blocked* means that there is a rule can be applied in this environment, but it must be blocked, otherwise the wrong form will be produced; *cycle* means that it is a cyclic case, and *block* refers to the case of block.



ii. [LM ]

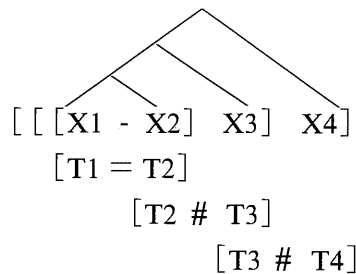
[blocked]

[blocked]

-----

\* HM - HM - LM - ML (block)

b.



-----

[ T1 = T2 # T3 # T4 ]

b'. [ [ [gang-tie]chang]xiao]

steel iron works small

'the steel and iron works is small'

BT ML - ML - HM - HM

i. [LM ]

[NA ]

[ML ]

-----

\* LM - ML - ML - HM (cycle)

=====

ii. [LM ]

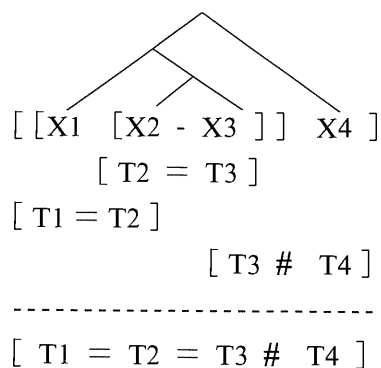
[blocked]

[blocked]

-----

OK LM - ML - HM - HM (block)

c.



c'. [ [xin [ ling-dao] ] hao]

new leader good

'the new leader is good'

BT ML - HM - HM - HM

i. [ML ]

[LM ]

[ML ]

-----

\* LM - ML - ML - HM

=====

ii. [ML ]

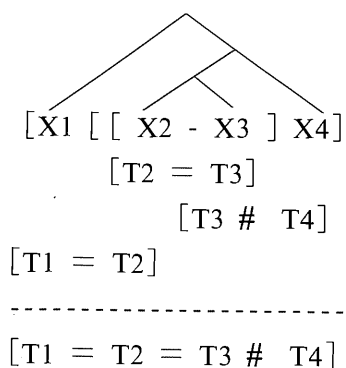
[LM ]

[blocked]

-----

OK LM - ML - HM - HM

d.



- d'. [ai [ [Qing-hai] sheng] ]  
       be next to Qing-hai province  
       'to be next to Qing-hai Province'
- BT   ML - ML -HM - HM
- i.       [NA       ]  
               [ML       ]  
       [LM       ]  
       -----
- \*       LM - ML - ML - HM  
       =====
- ii.       [NA       ]  
                   [ blocked ]  
       [LM       ]  
       -----
- OK     LM - ML - HM - HM

As seen in (13), Ruicheng is a very interesting case. Comparing Danyang with Ruicheng, we see that these two dialects have in fact different sandhi domains. Danyang has a c-command domain as in the original definition, but Ruicheng seems not. In (13a), since X3 and X4 c-command each other, they form the first cycle TS domain; however, since X3 does not c-command X2, and X2 does not c-command X1 in the following second and third cycle while T3 and T2 as well as T2 and T1 form their own cycles respectively, the TS domain in (13a) stretches itself from T1 to T4. It seems that none of the current command hypotheses can offer us a satisfactory explanation of Ruicheng data. In my opinion, however, Ruicheng's TS domain is also the c-command domain as defined by Reinhart, and the only thing which makes it different from all of the others is its left-to-right stipulation in application. And we may call this stipulation in direction the *Directional C-command Principle* (hereafter DCP), stated as follows:

(14) Directional C-command Principle:

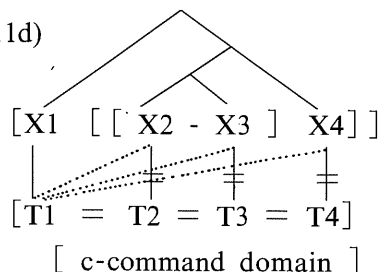
Tone sandhi rule applies cyclically iff

- i.  $\alpha$  c-commands  $\beta$ ;
- ii.  $\beta$  is the constituent adjacent to  $\alpha$  at its right side.

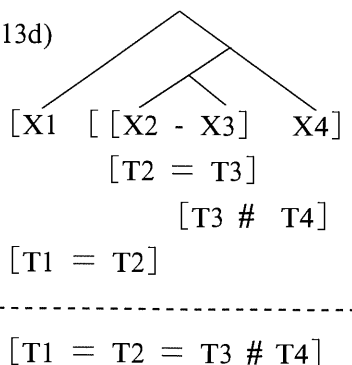
Since the DCP is distinguished from all of the other c-command hypotheses only in its stipulation in application instead of in its definition as a c-command, we, for the sake of differentiating it from the other command hypotheses, may call (14) 'd-command'. The d-command hypothesis is able to account for all of the cases in Ruicheng. In (13a), X1 d-commands X2, X2 d-commands X3, and X3 d-commands X4, thus its TS domain is from T1 to T4. In (13b), X1 d-commands X2, and neither X2 d-commands X3 nor X3 d-commands X4, thus its TS domain covers only T1 and T2. In (13c), X1 d-commands X2 which d-commands X3 but not X4, so its TS domain stretches from T1 to T3, not including T4. In (13d), X1 d-commands X2, and X2 d-commands X3 which does not d-command X4, so its TS domain is from T1 to T3 without including T4.

It should be noted that the Ruicheng case (13d) and the Danyang case (11d) are two crucial examples. With exactly the same syntactic branching structure, (13d)'s TS domain is from T1 to T3 while (11d)'s TS domain stretches from T1 to T4. That is because they have different sandhi domains. Ruicheng has a d-command domain, but Danyang has a c-command domain. In  $[X1[[X2-X3]X4]]$ , X1 c-commands X4, while X3 does not d-command X4. So, in Danyang's (11d), X4 is a TS domain, but in Ruicheng's (13d), X4 is not a TS domain. This shows that the different stipulations for c-command bring about different TS domains in Danyang and Ruicheng, reproduced as follows:

(15) a. = (11d)



b. = (13d)



#### 4. Pingyao Chinese: Case Study (3)

The third type of c-command is the one which determines the modes of sandhi rule application, as typically exemplified by Pingyao Chinese. Pingyao has five citation tones, shown as follows:<sup>4</sup>

(16) a. LM b. HM c. MH d. LMq e. HMq

In connected speech, what tonal sequences actually emerge depends both on the combination of the base tones as well as the functional relations holding between the tone-bearing units across the sandhi site. There are two classes of functional relations, namely type A and type B, in Pingyao. All of the argument structures belong to type A, while all of the others fall under type B. This argument/non-argument dichotomy in TS

4. *q* here stands for the glottal ending of the syllable.

patterns can be seen as follows:

| (17) | BT         | TSA        | TSB        |
|------|------------|------------|------------|
|      | LM(q) - MH | ML(q) - MH | LM(q) - LM |
|      | MH - LM(q) | LM - LM(q) | MH - HM(q) |
|      | HM - LM    | LM - LM    | MH - HM    |
|      | MH - MH    | ML - MH    | MH - HM    |

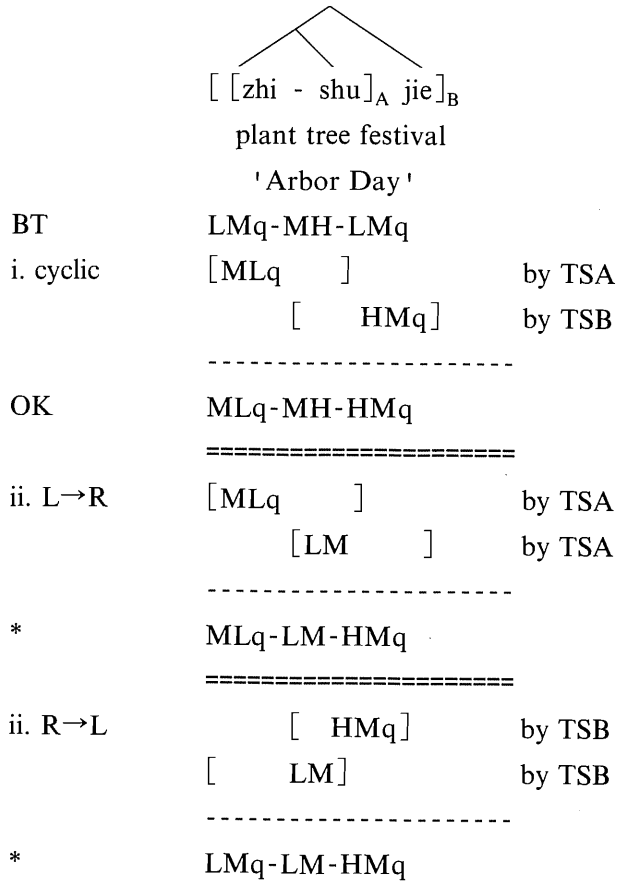
TSA and TSB in fact comprise two sets of rules, which combine to produce the outputs shown in (18). I do not want to go in details with the rules (for the discussion of these rules, see Hou 1980; Shen 1988; Chen 1990; and Zhang 1992d), but I would like to assume that these rules have been applied in the derivations given below.

|                   |                  |                    |
|-------------------|------------------|--------------------|
| (18)              | a. geng di       | b. jiang dou       |
|                   | 'till soil'      | 'cowpea'           |
| functional type   | argument         | non-argument       |
| syntactic type:   | verb-object (VO) | modifier-noun (MH) |
| tone sandhi type: | type-A           | type-B             |
| base tone:        | LM - MH          | LM - MH            |
| surface tone:     | ML - MH          | LM - LM            |

The above examples show that the base tone for type A and type B are exactly the same, but the surface tones are different because of the difference in functional relations.

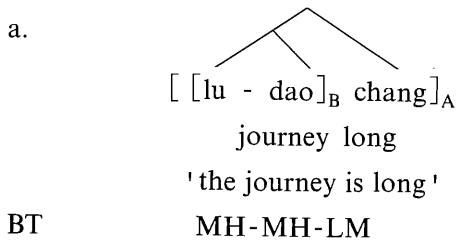
The fact becomes even more intriguing when we consider the effect of TS on more complex structures exhibiting hierarchical structure and allowing for possible interaction between TSA and TSB. Some examples show that the internal structure is visible for rule application, since TS rules apply cyclically, and the rule selection (TSA or TSB) depends on the functional relation that holds on each cycle, seen as follows:

(19)



As shown in (19), only cyclic mode will bring about the correct output form. In the derivations above, labeled brackets [...]<sub>A</sub> and [...]<sub>B</sub> stand for functional units of type A or type B, which select for TSA or TSB respectively on each cycle. Some other examples, however, suggest a noncyclic mode, seen as follows:

(20) a.



i. cyclic      [      HM ]      by TSB  
                  [NA      ]      by TSA

-----

\*      MH-HM-LM

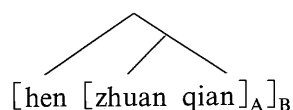
=====

ii. R→L      [LM      ]      by TSA  
                  [LM      ]      by TSA

-----

OK      LM-LM-LM

b.



very make money

'very lucrative'

BT      HM-MH-LM

i. cyclic      [LM      ]      by TSA  
                  [NA      ]      by TSB

-----

\*      HM-LM-LM

=====

ii. L→R      [NA      ]      by TSB  
                  [      HM ]      by TSB

-----

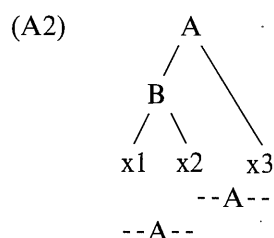
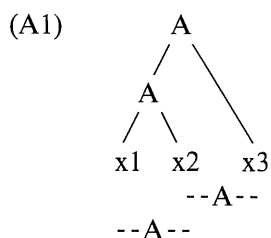
OK      HM-MH-HM

In the above cases, the functional information of internal structures is ignored by TS. Moreover, TS rules apply iteratively, with the functional relation holding on the outer structures determining both the applicable rule (TSA or TSB) and the direction of application (right-to-left or left-to-right). Without going into the details, the overall pattern of Pingyao TS can be laid out as follows (cf. Shen 1988; Chen 1990):

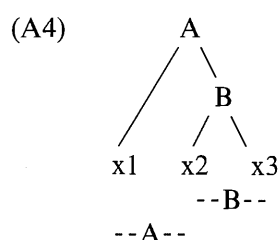
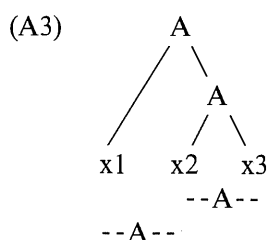


(21) Type A:

a. left-branching

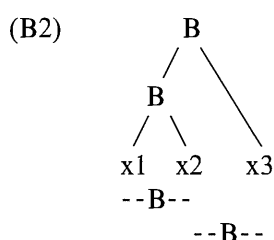
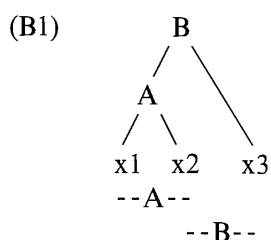


b. right-branching



(22) Type B:

a. left-branching



b. right-branching

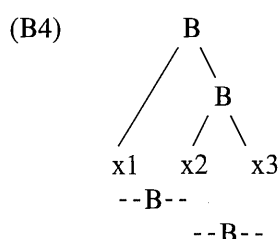
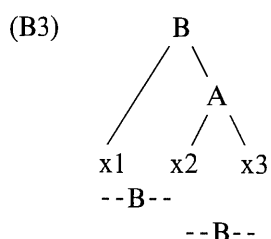


Figure (21) and (22) exhausts all logical possibilities: right/left-branching structures, and A- or B-type grammatical constructions on the inner/outer cycle. The trees represent the IC hierarchy in the usual manner,

with node labels A/B indicating the argument structure types (argument / others), and x's standing for the syllables. --A-- and --B-- indicate which TS applies to which pair of adjacent syllable.

The detailed analyses of (21) and (22) have been made by Shen (1988) and Chen (1990). Shen proposes the *Prosodic Domain Formation Principle* for Pingyao TS and her principle is reproduced as follows:

(23) Prosodic Domain Formation Principle:

a. Scanning Direction:

Scanning SP and VO from right to left, elsewhere left to right.

b. Minimal Prosodic Domain:

Scanning the largest construction in accordance with (a), if the first two syllables constitute a morphosyntactic unit, then they constitutes the minimal prosodic domain; otherwise, the whole trisyllabic string is the minimal prosodic domain.

As a matter of fact, the principle laid out in (23) is mainly concerned with the formation of TS domains instead of the application of TS rules. Therefore, Chen (1990) proposes the *Directional Cyclicity Principles* concerning the application of Pingyao TS rules, seen as follows:

(24) Principles of Directional Cyclicity:

a. TS applies to 2-3 syllable feet.

b. Directionality:

TS scans A constructions from right to left;

TS scans B constructions from left to right.

c. IC constraint:

TS applies between ICs.

d. Rule selection:

TSA/B applies to A/B constructions, respectively.

e. Bracket erasure:

When TS fails on account of (c), try the next larger construction (erasing inner structures in the process).

The result of my recent work on Pingyao turned out to be completely different from that of Shen and Chen. First of all, Pingyao's TS domain is a functional/syntactic domain. In Pingyao, type A and type B constructions are two different types of functional structures, determined by functional categories (argument vs. non-argument). And second, the analysis in (24) can not explain why principle (24c) fails in some cases, or why principle (24e) is needed. According to my reanalysis, it is the syntactic factors with functional relations that determine the application of TS rules in Pingyao. Hence, I put forward here a new hypothesis for Pingyao TS, which I name the *Edge C-command Principle*, stated as follows:

(25) Edge C-command Principle:

Within argument structure, TSA applies iteratively right-to-left if X3 c-commands both X2 and X1; and in non-argument structure where X1 c-commands both X2 and X3, TSB applies iteratively left-to-right. Otherwise, TSA/B applies cyclically.

It should be noted that TSA applies right-to-left, therefore it takes the rightmost element X3 as the dominant element, which then determines the mode of rule application by virtue of the c-command condition; similarly, TSB works in the same way as TSA, but in a different direction. Now let us use the new hypothesis in (25) to test all of the patterns illustrated in (21) and (22).

In both (A1) and (A2) of (21), TSA applies iteratively right-to-left because X3 c-commands both X2 and X1, illustrated by (26a). In (A3) and (A4), since X3 does not c-command X1, TSA and TSB apply cyclically, seen as (26b). In (B1) and (B2), TSA/B applies cyclically because X1 does not c-command X3, as shown in (26c). In (B3) and (B4), since X1 c-commands both X2 and X3, TSB applies iteratively left-to-right, as presented in (26d).

(26) a.=(A2)[ [lu dao]<sub>B</sub> chang ]<sub>A</sub>

journey long

'the journey is long'

X1 - X2 - X3

BT MH-MH-LM

[LM ]

by TSA

[LM ]

by TSA

-----

OK LM - LM - LM (iterative right-to-left)

b.=(A4) [ban[pu gai]<sub>B</sub> ]<sub>A</sub>

move bed-roll

'to move bed-roll'

X1 - X2 - X3

BT LM-LM-MH

[ LM ]

by TSB

[NA ]

by TSA

-----

OK LM-LM-LM (cycle)

c.=(B1) [zhi - shu]<sub>A</sub> jie]<sub>B</sub>

plant tree festival

'Arbor Day'

X1 - X2 - X3

BT LMq - MH - LMq

[MLq ]

by TSA

[ HMq ]

by TSB

-----

OK MLq - MH - HMq (cycle)

d.=(B3) [hen[zhuan qian]<sub>A</sub>]<sub>B</sub>  
           very make money  
           'very lucrative'  
           X1 - X2 - X3  
 BT      HM-MH-LM  
           [NA      ]          by TSB  
           [      HM]          by TSB  
           -----  
 OK      HM - MH - HM (iterative left-to-right)

Thus it can be seen that the hypothesis in (25) can explain all of the cases in (21) and (22), which show that the functional categories (argument) choose the direction of rule application, and the c-command condition chooses the mode of rule application (iterative or cyclic). So, it is obvious that Pingyao uses a typical functional/syntactic condition, instead of a foot condition claimed by Shen and Chen.

## 5. Conclusion

On the basis of the evidence from Chinese dialects, I have shown that syntax has direct access to phonology with an analysis of different types of c-command. Generally speaking, TS reacts in three ways to the c-command condition. Specifically, c-command determines what domain a tone will spread to, as in the Danyang case, whether the TS rule is applied or blocked, as in the Ruicheng case, and what kind of rule application mode will be chosen, as in the Pingyao case. Thus it can be seen that the c-command condition is, in fact, a key to TS operation in some Chinese dialects. And the Chinese TS phenomena discussed in this paper not only makes a challenge to the prosodic theory proposed by Selkirk, but also helps to improve the relation-based approach proposed by Kaisse.

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## Bibliography

- Bao, Z-M. 1990. *On the Nature of Tone*. Ph.D. dissertation, MIT.
- Chan, K. M. 1991. *Contour-Tone Spreading and Tone Sandhi in Danyang Chinese*. Phonology Yearbook, vol. 8.
- Chen, M. 1986, 1991. *An overview of Tone Sandhi Phenomena across Chinese Dialects*. In Languages and Dialects of China, Monograph Series of Journal of Chinese Linguistics, ed. by William S-Y. Wang, No. III. 111-158, Berkeley: University of California. (An earlier version presented at the Conference on Languages and Dialects of China, Berkeley, California.)
- 1990. *What must Phonology Know about Syntax?* paper presented at the Phonology-Syntax Connection Workshop, Stanford University. To appear in Inkelas-Zec (1990).
- Chen, M. & H-M. Zhang. (forthcoming). *Lexical and Postlexical Tone Sandhi in Chongming*. To appear in N. Smith and J. Wang (eds.) Studies in Chinese Phonology (in press), Foris, Dordrecht.
- Chomsky, N. 1986. *Barrier*, MIT Press.
- Chung, R-F. 1987. *Aspects of Ke-jia Phonology*. Ph.D. dissertation. University of Illinois.
- Duanmu, S. 1990. *A Formal Study of Syllable, Tone, Stress and Domain in Chinese Languages*. Ph.D. dissertation, MIT.
- Hayes, B. 1984. *The Prosodic Hierarchy in Meter*. In Kiparsky & Youmans (eds.), Rhythm and Meter, New York: Academic Press.
- Hou, J-Y. 1980. *Pingyao Fangyan de Liandu Biandiao*. [*Tone Sandhi in Pingyao*]. Fangyan.
- Hsiao, Y-C. 1991. *Syntax, Rhythm and Tone: A Triangular Relationship*. Ph.D. dissertation, UCSD.
- Hsu, H-C. 1992. *Domain of Tone Sandhi in Idioms: A Tug of War between the Foot Formation Rule and the Tone Group Formation*. Presented in North America Conference on Chinese Linguistics, 4. Michigan.

Hongming Zhang

- Huang, J. 1984. *Phrase structure, lexical integrity, and Chinese compounds*. Journal of Chinese Language Teachers Association, vol. 4.
- Hung, T. 1987. *Syntactic and Semantic Aspects of Chinese Tone Sandhi*. Ph.D. dissertation, UCSD.
- Hyman, L., F. Katamba & L. Walusimbi. 1987. *Luganda and the Strict Layer Hypothesis*, Phonology Yearbook, vol. 4.
- Inkelas, S. & D. Zec (eds.). 1990. *The Phonology-Syntax Connection*, Stanford: CSLI.
- Kaisse, E. 1985. *Connected Speech*, New York: Academic Press.
- Ladd, D. R. 1986. *International Phrasing: the Case for Recursive Prosodic Structure*, Phonology Yearbook, vol. 3.
- Nespor, M. & I. Vogel. 1986. *Prosodic Phonology*, Foris.
- Odden, D. 1987. *Kimatuumbi phrasal phonology*, Phonology Yearbook, vol. 4, 13-36.
- Reinhart, T. 1976. *The Syntactic Domain of Anaphora*. Ph.D. dissertation, MIT.
- 1983. *Anaphora and Semantic Interpretation*, London: Croom Helm.
- Selkirk, E. 1984. *Phonology and Syntax: the Relation between Sound and Structure*. MIT Press.
- 1986. *On Derived Domain in Sentence Phonology*, Phonology Yearbook, vol. 3.
- Shen, Y. 1988. *A tentative hypothesis regarding trisyllabic tone sandhi in Pingyao*. Ms, UCSD.
- Shih, C. 1986. *The Prosodic Domain of Tone Sandhi in Chinese*. Ph.D. dissertation, UCSD.
- Yip, M. 1989. *Contour Tones*, Phonology Yearbook, vol. 6.
- Zhang, H-M. 1989. *Syntactic Domain or Prosodic Domain?* To appear in The Proceedings of Mid-America Linguistics Conference, 25. Kansas.
- 1990. *Chongming Phrasal Phonology*. To appear in Proceedings of Western Conference on Linguistics, 20. Texas.
- 1992a. *Syntactic Branching Asymmetry: Note on Interface between*



*Syntax and Phonology*, presented in North America Conference on Chinese Linguistics, 4. Michigan.

-----1992b. *Topics in Chinese Phrasal Tonology*. Ph.D. dissertation, UCSD.

Zhang, H-M. & M. Y. Chen. (1995). *Morphosyntactic Diffusion Hypothesis*. To appear in *New Asia Academic Bulletin*, vol. XI: *Studies of the Wu Dialects*, The Press of Chinese University of Hong Kong.

Zwicky, A. & E. Kaisse, eds. 1987. *Syntactic Conditions on Phonological Rules* (= Phonology Yearbook, vol. 4).



# The Ba-Construction in Chinese: A Morpho-Syntactic Analysis<sup>1</sup>

Ke Zou

California State University,  
Dominguez Hills

## Abstract

This paper offers a morpho-syntactic analysis of the Chinese BA-construction: a) BA is the head of a functional category and it selects an aspect or resultative particle phrase as its complement, b) the aspect and resultative particle phrases are also functional categories and their heads select VP as their complement; and c) the preverbal and postverbal NPs form a single noun phrase at D-structure if there is an INHERENT relation between the two NPs. Under this analysis, the BA-construction is simply derived by NP-movement and verb-raising. The NP-movement is forced by the Cass Filter, and the verb-raising is driven by the morphological requirement that both aspect marker and resultative particle need a verbal host. As a consequence of this morpho-syntactic analysis, the possessive and partitive relations between the preverbal NP and postverbal NP are captured by the spec-head and head-complement relations under X'-theory. Other consequences of this analysis are that it leads to principled accounts of the selectional restriction, the functional interpretation of the preverbal NP, and the presence and absence of specificity effects in the BA-construction.

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## 1. Introduction

The BA-construction is an often-discussed topic in Chinese grammar and has drawn a great deal of attention in recent Chinese linguistic studies. For example, Wang (1954), Lü (1955) and Chao (1968) analyze it as the disposal construction; Frei (1956) treats it as an ergative construction; Hashimoto (1971) regards it as the executive construction; Teng (1977) considers it an accusative construction; and others simply take it as the BA-construction (e.g. Cheung 1973, Li 1974, Li and Thompson 1981, Tsao 1987, Wang 1987). The fact that the BA-construction has been so interesting to many Chinese linguists is partly due to its structural difference from the canonical SVO word order in Chinese, and partly attributable to certain syntactic and semantic constraints imposed on its verb and other components. In current generative linguistic studies, there are a number of notable analyses of BA-constructions, as proposed by Cheng (1986), Goodall (1987, 1990), Huang (1982, 1988), Li (1985, 1990), and Sijbesma (1992) respectively.

The purpose of this paper is to discuss some typical BA-constructions and their properties and constraints, and to argue for a morpho-syntactic analysis of the BA-constructions within the theory of Principles and Parameters (Chomsky and Lasnik 1991). I will show how this morpho-syntactic analysis incorporates and captures the properties and constraints of the BA-constructions. I will also provide some empirical evidence and theoretical motivation for this morpho-syntactic analysis. Finally, I will present three important consequences of this morpho-syntactic analysis: i.e. the selectional restriction, the functional interpretation of preverbal NPs, and the presence of specificity effects in the BA-construction.

## 2. The Objective and Causative Ba-Constructions<sup>2</sup>

The BA-construction can be divided into four types in terms of the syntactic and semantic relations between its preverbal NP and verb, and between its preverbal NP and postverbal NP: i.e. *Objective*, *Causative*, *Locative and Instrumental* (Lu and Ma 1985, Lü 1984, Tsao 1987). Of these four types of BA-constructions, only the Objective and Causative ones will be addressed here, simply because they are much more frequently used in Mandarin Chinese (Wang 1987).

### 2.1. The Objective Ba-Construction.

One type of objective BA-constructions consists of a subject, BA, a preverbal noun phrase, a transitive verb (either a single verb or a V-V compound), and an aspect marker. The preverbal NP is the logical object of the verb but the surface object of BA:

- (1) **wo ba juzi bo-le.**

*I BA orange peel-ASP*

'I peeled the orange.'

- (2) **ta ba na jian chenxi xi-le.**

*he BA that CL shirt wash-ASP*

'He washed that shirt.'

- (3) **Lisi ba fan chi-wan-le.**

*Lisi BA rice eat-finish-ASP*

'Lisi ate and finished his meal.'

---

2. The following special abbreviations are used in this paper:

**ASP(P)** ---- aspect marker (phrase)

**BAP** ---- BA-phrase

**CL/K** ---- classifier, i.e. measure word

**RC** ---- resultative clause

**PAR(P)** ---- resultative particle (phrase)

Another type of objective BA-constructions is composed of a subject, BA, a preverbal noun phrase, a transitive verb, an aspect marker, and a postverbal noun phrase. Both the preverbal NP and the postverbal NP are the logical objects of the verb, as the former is what the verbal action affects and the latter is the direct target of the verbal action. But in the surface form, the preverbal NP is the object of BA while the postverbal NP is still the object of the verb. Moreover, there exists an INHERENT possessive or partitive relation between the preverbal and postverbal NPs: that is, either the preverbal NP is a possessor and the postverbal NP is a possessee, or the preverbal NP denotes a whole and the postverbal NP refers to its part:<sup>3</sup>

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3. The INHERENT possessive and partitive relations between the preverbal and postverbal NPs imply that the two NPs are related to each other before the verbal action takes place. For example, in (4b) the skin is part of the orange whether one peels it or not. These INHERENT relations are reflected in syntax as well, as shown by the movement relation between (4a) and (i) below (cf. Cheung 1973):

- i) **wo ba juzi-de pi bo-le.**  
*I BA orange's skin peel-ASP*  
 'I peeled the skin of the orange.'

However, the relations between the preverbal and postverbal NPs in the BA-construction are not limited to the INHERENT ones. There may also exist NON-INHERENT relations between the two NPs (cf. Cheung 1973): that is, the preverbal and postverbal NPs may not be related to each other until the verbal action takes place, as shown by the following examples:

- ii) **ta ba na ben shu gei-le pengyou.**  
*he BA that CL book give-ASP friend*  
 'He gave his friend that book.'
- iii) **Lisi ba zhuozi da-le yi ceng la.**  
*Lisi BA table apply-ASP one CL wax*  
 'Lisi painted the table with a layer of wax.'
- iv) **wo ba yifu bao-le yi ge xiaobao.**  
*I BA clothes pack-ASP one CL bundle*  
 'I packed the clothes into a bundle.'
- v) **Lisi ba xinfeng tie-le youpiao.**  
*Lisi BA envelope paste-ASP stamp*  
 'Lisi pasted a stamp on the envelope.'

For these NON-INHERENT relations between the preverbal and postverbal NPs in the BA-construction, please see Zou (1993) for a detailed discussion.

- (4) a. **wo bo-le juzi-de pi.**  
*I peel-ASP orange's skin*  
 b. **wo ba juzi bo-le pi.**  
*I BA orange peel-ASP skin*  
 'I peeled the skin of the orange.'
- (5) a. **ta bang-le Lisi-de liang zhi jiao.**  
*he tie-ASP Lisi's two CL foot*  
 b. **ta ba Lisi bang-le liang zhi jiao.**  
*he BA Lisi tie-ASP two CL foot*  
 'He tied up Lisi's two feet.'
- (6) a. **Wangwu reng-diao-le yi jian yifu.**  
*Wangwu throw-lose-ASP one CL clothes*  
 b. **Wangwu ba yifu reng-diao-le yi jian.**  
*Wangwu BA clothes throw-lose-ASP one CL*  
 'Wangwu threw away one piece of the clothes.'

## 2.2. The Causative Ba-Construction.

One type of Causative BA-constructions consists of a subject, BA, a preverbal noun phrase, an intransitive verb (either a single verb or a V-V compound), and an aspect marker. The preverbal NP is the logical subject of the verb phrase, and the sentence subject has no thematic relation with the verb. There exists a causative relation with the sentence subject and preverbal NP: that is, the former causes something to happen to the latter:

- (7) **na ge kanshou ba yi ge zei pao-(diao)-le.**  
*that CL warden BA one CL thief run-(lose)-ASP*  
 'That warden let a thief run away.'
- (8) **mei xiangdao, na ci yundong ba yi ge da jie si-le.**  
*not expect that CL campaign BA one CL old sister die-ASP*  
 'It is not expected that the campaign made an old sister die.'

- (9) **zhe jian shi      zenme ba ni   pa-cheng-le      na   ge yang?**  
*this CL matter how BA you fear-become-ASP that CL shape*  
'How did this matter make you fear like that?'

Another type of Causative BA-constructions is made up of a subject, BA, a preverbal noun phrase, an intransitive verb, the resultative particle **-de**, and a resultative clause (RC). The preverbal NP is the logical subject of both the matrix verb phrase and the resultative clause, and the subject of the matrix clause has no thematic relation with its verb phrase. The relation between the preverbal NP and the subject of the matrix clause remains a causative relation:

- (10) **zhe jian shi      ba wo ji-de      shui bu hao.**  
*this CL matter BA me anxious-PAR sleep not well*  
'This matter made me so anxious that I couldn't sleep well.'
- (11) **na chang xue   ba ta dong-de   zhi      duosuo.**  
*that CL snow BA he cold-PAR constantly shiver*  
'The snow made him so cold that he shivered constantly.'
- (12) **zhe ping jiu   ba Lisi zui-de      zhan-bu-qilai.**  
*this CL wine BA Lisi drunk-PAR stand-not-up*  
'This wine got Lisi so drunk that he couldn't stand up.'

A third type of Causative BA-constructions is also composed of a subject, BA, a preverbal noun phrase, an intransitive verb, the resultative particle **-de**, and a resultative clause. However, in this type of Causative BA-constructions, the preverbal NP only acts as the logical subject of the resultative clause, and the subject of the matrix clause, unlike the ones mentioned above, is the logical subject of its verb phrase. And their relation remains a causative relation:

- (13) **Zhangsan ba shoupa      ku-de      hen shi.**  
*Zhangsan BA handkerchief cry-PAR very wet*  
'Zhangsan cried so much that his handkerchief got very wet.'



- (14) **ta ba houloung han-de dou ya-le.**  
*he BA throat shout-PAR even hoarse-ASP*  
 'He shouted so much that even his throat got hoarse.'
- (15) **Lisi ba women xiao-de mo-ming-qi-miao.**  
*Lisi BA we laugh-PAR confused*  
 'Lisi laughed to such an extent that we got all confused.'

### 2.3. The Properties and Constraints.

According to the previous studies of BA-constructions (cf. Chao 1968, Cheung 1973, Ding 1963, Hashimoto 1971, Li 1985 and 1990, Li and Thompson 1981, Liu 1992, Lü 1984, Lu and Ma 1985, Mei 1978, Smith 1991, Teng 1977, Wang 1970, Wang 1987), the major properties and constraints of BA-constructions can be adapted and summarized as follows:

A) The verb in the BA-construction is either a single verb or V-V compound, and it takes the perfective aspect marker **-le**, the progressive aspect marker **-zhe**, or the resultative particle **-de**:

- (16) a. **\*wo ba ta ma.**  
*I BA him scold*  
 b. **wo ba ta ma-le.**  
*I BA him scold-ASP*  
 'I scolded him.'
- (17) a. **\*ni ba jieshao-xin dai!**  
*you BA introduction-letter carry*  
 b. **ni ba jieshao-xin dai-zhe!**  
*you BA introduction-letter carry-ASP*  
 'You carry this introduction letter!'
- (18) a. **\*ta ba fan chi-bao.**  
*he BA rice eat-full*  
 b. **ta ba fan chi-bao-le.**  
*he BA rice eat-full-ASP*  
 'He had the meal and got full.'

- (19) a. \***zhe ping jiu ba Lisi zui zhan-bu-qilai.**  
*this CL wine BA Lisi drunk stand-not-up*  
b. **zhe ping jiu ba Lisi zui-de zhan-bu-qilai.**  
*this CL wine BA Lisi drunk-PAR stand-not-up*  
'This wine got Lisi so drunk that he couldn't stand up.'

B) Stative verbs cannot appear in the BA-construction, but they are not prohibited from the corresponding sentences without BA.<sup>4</sup>

- (20) a. \***wo ba shu you-le.**  
*I BA book have-ASP*  
b. **wo you shu.**  
*I have book*  
'I have books.'  
(21) a. \***ta ba baba xiang-le.**  
*he BA father resemble-ASP*  
b. **ta xiang baba.**  
*He resemble father*  
'He resembles his father.'  
(22) a. \***wo ba zhe jian shi zhidao-le.**  
*I BA this CL matter know-ASP*  
b. **wo zhidao zhe jian shi.**  
*I know this CL matter*  
'I know this matter.'

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4. According to Liu's (1992) study of BA-constructions in terms of situation types, the BA-construction can only be used in a situation with a natural final point indicating a change of state resulting from a completion of process. Since stative verbs only describe stable situations without showing any change of state or completion of process, they are not able to occur in the BA-construction, as confirmed by the previous studies.

Notice that *-le* can be a perfective aspect marker or a marker of currently relevant state. Their major differences are: a) the perfective aspect marker is attached to a verb while the marker of currently relevant state always occurs at the end of a sentence; b) the perfective aspect marker indicates the completion of an action while the marker of currently relevant state signifies a currently relevant state (Li and Thompson 1981).

C) Perception and psychological verbs cannot appear in the BA-construction if they express perceptions or psychological states. But they are not barred from the corresponding sentences without BA. Thus, perception and psychological verbs can be classified into stative verbs (cf. Note 4):

- (23) a. \***ta ba na ke shu kanjian-le.**

*he BA that CL tree see-ASP*

- b. **ta kanjian-le na ke shu.**

*he see-ASP that CL tree*

'He saw that tree.'

- (24) a. \***wo ba qiang-sheng tingjian-le.**

*I BA gun-shots hear-ASP*

- b. **wo tingjian-le qiang-sheng.**

*I hear-ASP gun-shots*

'I heard the gunshots.'

- (25) a. \***wo ba Lisi hen-le.**

*I BA Lisi hate-ASP*

- b. **wo hen Lisi.**

*I hate Lisi.*

'I hate Lisi.'

However, if a perception or psychological verb forms a V-V compound with a resultative or directional verb to indicate a completion of process or a change of state, it can appear in the BA-construction. Therefore, these V-V compounds are not stative verbs any longer but are accomplishment verbs (Dowty 1979, Cheng 1989).<sup>5</sup>

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5. Li (1990) observes that thought **ai** 'love' and **hen** 'hate' are psychological verbs, the resultative verb **tou** 'through' can only form a compound with **hen** but not with **ai**. This may be attributed to the lexical idiosyncrasy of psychological verbs regarding their selectional restriction, as **ai** cannot form a compound with the same resultative verb in the corresponding sentence without BA:

i)\* **wo ba ta ai-tou-ASP.**

*I BA him love-through-ASP*

- (26) **wo ba Mali kan-shang-le.**

*I BA Mary see-up-ASP*

'I have fallen love with Mary.'

- (27) **Lisi ba zhe duan quzi ting-wan-le.**

*Lisi ba this CL music hear-finish-ASP*

'Lisi listened to this music from the beginning to the end.'

- (28) **ta ba wo hen-tou-le.**

*he BA me hate-through-ASP*

'He hated me thoroughly.'

D) **BA** cannot be 'stranded' with the preverbal NP dropped or with the preverbal NP moved away:

- (29) a. \***wo ba  $\phi$  bo-le.**

*I BA peel-ASP*

- b. \***juzi<sub>i</sub> wo ba t<sub>i</sub> bo-le.**

*orange I BA peel-ASP*

- (30) a. \***wo ba  $\phi$  bo-le pi.**

*I BA peel-ASP skin*

- b. \***juzi<sub>i</sub> wo ba t<sub>i</sub> bo-le pi.**

*orange I BA peel-ASP skin*

E) In the negative BA-construction, the negator usually precedes the BA-phrase. But it may also follow the BA-phrase:

- 
- ii) \***wo ai-tou-le ta.**

*I love-through-ASP him*

For the same reason, the directional verb **shang** 'up', which can form a compound with **ai**, may not form a compound with **hen**:

- iii) **Lisi ba Mali ai-shang-le.**

*Lisi BA Mary love-up-ASP*

'Lisi fell in love with Mary.'

- iv) \***Lisi ba Mali hen-shang-le.**

*Lisi BA Mary hate-up-ASP*

- (31) **ta mei-you ba zhe ben shu reng-diao.**  
*he not have BA this CL book throw-lose*  
 'He has not thrown away this book.'
- (32) **ta ba Lisi mei-you fang zai yan li.**  
*she BA Lisi not-have put at eye in*  
 'She looked down upon Lisi.'

In addition to the properties and constraints discussed above, there is an important constraint on the BA-construction which might not be addressed in the previous literature. This constraint seems to be reminiscent of the specificity effect observed in WH-movement in English (Fiengo and Higginbotham 1981).<sup>6</sup>

F) Specificity effects are displayed when the NP complement of classifier in the postverbal definite noun phrase appears after BA.<sup>7</sup>

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6. What is shown by (33) through (36) is parallel to the presence and absence of specificity effects in the following two English sentences, which involve WH-movement out of a definite NP in (i) and out of an indefinite NP in (ii):

- i)\* **Who did you buy this picture of?**  
 ii) **Who did you buy a picture of?**

7. However, specificity effects will not be exhibited if there is no INHERENT relation between the preverbal and postverbal NPs, even if the postverbal NP is definite:

- i) **ta ba na ben shu gei-le wo-de pengyou.**  
*he BA that CL book give-ASP my friend*  
 'He gave my friend that book.'
- ii) **Lisi ba zhuozi da-le zhe ceng la.**  
*Lisi BA table apply-ASP this CL wax*  
 'Lisi painted the table with this layer of wax.'
- iii) **wo ba yifu bao-le zhe ge xiaobao.**  
*I BA clothes pack-ASP this CL bundle*  
 'I packed the clothes into this bundle.'
- iv) **Lisi ba xinfeng tie-le na zhang youpiao.**  
*Lisi BA envelope paste-ASP that CL stamp*  
 'Lisi pasted that stamp on the envelope.'

For the lack of specificity effects in these cases, please see Zou (1993) for a detailed discussion.

- (33) a. wo mai-le zhe ben Luxun-de shu.  
*I sell-ASP this CL Luxun's book*  
 'I sold this copy of Luxun's books.'  
 b. \*wo ba Luxun-de shu mai-le zhe ben.  
*I BA Luxun's book sell-ASP this CL*
- (34) a. ta na-le na yi ge nainai-de yandai.  
*he take-ASP that one CL grandma's pipe*  
 'he took away that one of grandma's pipes.'  
 b. \*ta ba nainai-de yandai na-le na yi ge.  
*he BA grandma's pipe take-ASP that one CL*

However, such specificity effects disappear when the NP complement of classifier in the postverbal indefinite noun phrase follows BA:

- (35) a. wo mai-le yi ben Luxun-de shu.  
*I sell-ASP one CL Luxun's book*  
 b. wo ba Luxun-de shu mai-le yi ben.  
*I BA Luxun's book sell-ASP one CL*  
 'I sold one copy of Luxun's books.'
- (36) a. ta na-le yi ge nainai-de yandai.  
*he take-ASP one CL grandma's pipe*  
 b. ta ba nainai-de yandai na-le yi ge.  
*he BA grandma's pipe take-ASP one CL*  
 'he took away one of grandma's pipes.'

The properties and constraints described above clearly demonstrate that it is BA that selects the category of verbs and other elements in the BA-sentence and determines the semantic and syntactic properties of BA-constructions. For a satisfactory analysis of the BA-construction, this fact must be incorporated or captured in any attempt. In what follows, I am going to propose a morpho-syntactic analysis of the objective and Causative BA-constructions, and to show how this analysis captures and incorporates the above properties and constraints.

### 3. A Morpho-Syntactic Analysis of the Objective and Causative Ba-Constructions

#### 3.1. Theoretical Background.

The discussions in the above sections suggest the following two generalizations about the BA-construction:

(A) BA is not an inserted dummy Case marker because there is no evidence that BA is inserted (cf. Li 1985, 1990). The selectional restrictions, and semantic and syntactic properties of BA-constructions cannot be captured if BA is treated as an inserted Case marker.<sup>8</sup>

(B) The preverbal NP in the objective BA-construction containing a postverbal NP is not base-generated in the object position of BA, but forms a constituent with the postverbal NP at D-structure, if there exists an INHERENT possessive or partitive relation between the two NPs.<sup>9</sup>

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8. If BA were an inserted Case marker, it could not select the category of verb and other elements or determine the semantic and syntactic properties of BA-constructions. In other words, the selectional restriction and the semantic and syntactic properties would have to be decided by the lexical properties of verb and other elements in the sentence and be realized under X'-theory. If this were the case, we would have no account for the distinction between BA-sentences and corresponding non-BA sentences regarding the constraints described in (A), (B) and (C) of Section 2.3. Thus, the selectional restriction and syntactic and semantic properties of BA-constructions require BA to be base-generated.

9. One piece of evidence for base-generating these preverbal and postverbal NPs within a single noun phrase is from the movement relation between the two NPs (cf. Note 3):

i) a. *wo ba juzi bo-le pi.*  
I BA orange peel-ASP skin  
b. *wo ba juzi-de pi bo-le.*  
I BA orange's skin peel-ASP  
'I peeled the skin of the orange.'

Given that only the constituents of the same phrase can undergo movement together (Radford 1988), the well-formedness of (ib) strongly argues for treating the pre-verbal and postverbal NPs as two members of the same noun phrase at D-structure. Another piece of evidence comes from the specificity effect observed in

In order to capture these two generalizations and the other properties and constraints depicted in the above sections, I would like to suggest the following three postulations:

- (37) a. BA is the head of a base-generated functional category which may select an aspect phrase (ASPP) or a resultative particle phrase (PARP) as its complement.<sup>10</sup>  
 b. ASPP and PARP are also functional categories and their head selects a VP as its complement.<sup>11</sup>  
 c. In the Objective BA-construction, the preverbal and postverbal NPs form a single noun phrase at D-structure if there is an INHERENT relation between the two NPs; and both the preverbal noun phrase and the noun phrase formed by the preverbal and postverbal NPs are base-generated as complements of V.

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(33) and (34); that is, if these preverbal and postverbal NPs did not form a single noun phrase at D-structure, we would not expect the display of specificity effects, given that specificity effects are derived by the extraction out of definite noun phrases (Chomsky 1981, Fiengo and Higginbotham 1981).

10. Lü (1955) points out that BA was originally a verb in the ancient Chinese, but has become a functional category in the modern Chinese, as evidenced by the fact that it fails the tests of lexical verb identification (cf. Li 1990):

- i) Aspect marker attachment:

\*Ta ba-le shui fang-zai guo-li.  
*he BA-ASP water put-at wok-in*

- ii) Simple answer to a question:

A: Ta ba shenme fang-zai guo-li?  
*he BA what put-at wok-in*  
 'What did he put in the wok?'

B:\* ba shui.  
*BA water*

11. The evidence for treating the resultative particle -de as a functional category or as a kind of "aspect" marker comes from its overlapping distribution with an aspect marker, as exemplified below (Dai 1992):

- a. Lisi chi-le (fan), binggie chi-de hen bao.  
*Lisi eat-ASP (rice), and eat-PAR very full*  
 'Lisi had the meal, and is full.'

- b.\* Lisi chi-le-de hen bao.  
*Lisi eat-ASP-PAR very full*



(37a) captures the generalization given in (A) and the property described in (A) of Section 2.3 (that is, a verb in the BA-construction takes an aspect marker or a resultative particle).<sup>12</sup> (37b) incorporates the fact that aspect marker and resultative particle in Chinese are inflectional and bound morphemes and they must be phonologically and morphologically attached to verbs (cf. Chao 1968, Dai 1992, Lü 1984).<sup>13</sup> And (37c) captures the generalization in (B) and the verb-object relation between the

12. Li (1990:189) treats BA as a preposition, based on a marginal case of coordination between a BA-phrase and a PP:

- i) ?*ni you wei ta you ba ta qiang qian, shi shenme yisi?*  
*you and for him and BA him rob money be what meaning*  
 'You forced away money for him and from, what do you mean?'

This treatment is not very convincing, as the coordination of a BA-phrase with another PP would make a sentence unacceptable:

- ii) a. *wo ti Zhangsan bang-le liang zhi jiao.*  
*I for Zhangsan tie-ASP two CL foot*  
 'I tied up two feet for Zhangsan.'  
 b. *wo ba Lisi bang-le liang zhi jiao.*  
*I BA Lisi tie-ASP two CL foot*  
 'I tied up Lisi's two feet.'  
 c. \**wo ti Zhangsan you ba Lisi bang-le liang zhi jiao.*  
*I for Zhangsan and BA Lisi tie-ASP two CL foot*

In addition, the NP following a preposition has a thematic relation with the preposition, while the NP following BA has a thematic relation with the verb rather than with BA (Cheng 1986):

- iii) a. *wo wei ni zuo-le zhe jian shi.*  
*I for you do-ASP this CL matter*  
 'I have done this thing for you.'  
 b. \**wo wei zhe jian shi zuo-le.*  
*I for this CL matter do-ASP*  
 iv) a. *wo ba zhe jian shi zuo-le.*  
*I BA this CL matter do-ASP*  
 b. \**wo ba ni zuo-le zhe jian shi.*  
*I BA you do-ASP this CL matter*

13. The postulations in (37a) and (37b) are also supported by the cross-linguistic properties of functional categories (Abney 1987, Ouhalla 1990b): that is, BA, aspect marker and resultative particle, like other functional categories across languages, select only non-argument complements, have categorial-selectional properties specifying what syntactic category they select, and have morphological selectional properties regarding the categorial nature of the item they can attach or adjoin to.

verb, preverbal NP and postverbal NP in the Objective BA-construction (cf. Section 2.1).

With these three postulations in hand, I now proceed to provide a morpho-syntactic analysis of the objective and Causative BA-constructions and their negative forms, which is presented in the following seven sections.

### 3.2. The Objective Ba-Construction (1).

First, let us consider the Objective BA-construction containing a preverbal NP but no postverbal NP, as shown by (1), (2) and (3). Assuming the VP-internal subject hypothesis (Kuroda 1988, Huang 1993), an objective BA-construction like (1) may have the following structural representation under X'-theory and the postulations suggested in (37):

$$(1') \quad [_{BAP} [_{BA} \text{ba}] [_{ASPP} [_{ASP} \text{-le}] [_{VP} [_{NP1} \text{wo}] [_{V'} [_{V} \text{bo}] [_{NP2} \text{juzi}]]]]]] \\ \text{BA} \qquad \qquad \text{-ASP} \qquad \qquad I \qquad \qquad \text{peel} \quad \text{orange}$$

In (1'), the verb **bo** is raised to the position of ASP to amalgamate with the aspect marker **-le**. NP<sub>1</sub> **wo** receives a  $\theta$ -role from V' by virtue of its internal subject status and moves to the spec-position of BAP to get Case from BA by the spec-head "agreement". NP<sub>2</sub> **juzi** receives a  $\theta$ -role from the verb **bo** and moves to the spec-position of ASPP to get Case from ASP also by the spec-head "agreement". Thus, (1) is simply derived by verb-raising and NP-movement, as shown below:

$$(1'') \quad [_{BAP} \text{wo}_i [_{BA} \text{ba}] [_{ASPP} \text{juzi}_j] [_{ASP} \text{bo}_k \text{-le}] [_{VP} [_{NP1} \text{t}_i] [_{V'} [_{V} \text{t}_k] [_{NP2} \text{t}_j]]]]]] \\ I \qquad \text{BA} \qquad \text{orange} \quad \text{peel-ASP}$$

The motivation and argument for this morpho-syntactic analysis are presented as follows. First, raising the verb **bo** to ASP is morphologically driven, because the aspect marker **-le**, being a bound morpheme, requires a verb host. Otherwise the ban against 'unhosted' bound morphemes would be violated (Chomsky 1991). The verb-raising is also licit under

the Head Movement Constraint (Chomsky 1986:71): that is, the verb is moved from V to ASP that  $\theta$ -governs VP which is the maximal projection of V.

Second, the movement of NP<sub>1</sub> **wo** to the Spec of BAP is forced by the Case Filter, and it is legitimate under Subjacency and Binding Principle A, due to the verb-raising; a) it crosses only the ASPP barrier, as VP, which is L-marked by the amalgamated element **bo<sub>k</sub>-le**, does not form a barrier;<sup>14</sup> and b) its trace **t<sub>i</sub>** is A-bound by its antecedent **wo<sub>i</sub>** in BAP which is the smallest maximal projection containing **t<sub>i</sub>**, its governor **bo<sub>k</sub>-le** and its accessible SUBJECT **wo<sub>i</sub>**, satisfying Binding Principle A.<sup>15</sup>

Third, the movement of NP<sub>2</sub> **juzi** to the Spec of ASPP is forced by the ban against BA-stranding, as evidenced by (29) and (30).<sup>16</sup> This NP-

14. In fact, ASPP may not be a real barrier because it has the same functional role as IP, which is not a barrier by definition (Chomsky 1986:14).

15. It appears that ASPP might be a governing category for the NP-trace **t<sub>i</sub>** (in which **t<sub>i</sub>** is not A-bound), since ASPP is a maximal projection smaller than BAP and contains **t<sub>i</sub>**, its governor **bo<sub>k</sub>-le** and the SUBJECT **juzi**. However, the SUBJECT **juzi** is not accessible to **t<sub>i</sub>** because coindexing **juzi** with **t<sub>i</sub>** would lead to a violation of Binding Principle C: namely, by transitivity of indexing, **juzi** would share the same index with **wo<sub>i</sub>**, which is the antecedent of **t<sub>i</sub>**, and **juzi** would then be A-bound by **wo<sub>i</sub>**, violating Binding Principle C. Hence, ASPP is not a governing category for **t<sub>i</sub>**, as it lacks an accessible SUBJECT for **t<sub>i</sub>**.

16. This is supported by Huang's (1982:45) analysis that the real motivation for this NP movement is not due to the satisfaction of the Case Filter. If all that matters were the Case Filter, NP<sub>2</sub> **juzi** could be assigned Case in situ by the raised verb **bo**, just as it gets Case from the same verb in (i):

i) **wo bo-le juzi.**  
*I peel-ASP orange*  
 'I peeled the orange.'

Unfortunately, the resulting sentence is not grammatical, as shown by (ii):

ii)\* **wo ba bo-le juzi.**  
*I ba peel-ASP orange*

Thus, the ungrammaticality of (ii) renders this NP movement a "last resort" (Chomsky 1991), or the ban against BA-stranding would be violated. In fact, the ban against BA-stranding corresponds to the \**for-to* Filter in English (Chomsky 1981). Like the English complementizer **for**, which is a functional category and introduces an infinitival clause, **ba** in Chinese is also a functional category and introduces an aspect clause. Like the English **for**-infinitival construction, in which the subject of the infinitival clause cannot be dropped or moved away, the

movement is also legitimate under the constraints on NP-movement. It crosses no barrier, thus no Subjacency violation (VP is L-marked by the amalgamated element **bo<sub>k</sub>-le** is ASP). Its trace **t<sub>j</sub>** is A-bound by **juzi** in ASPP which is the smallest maximal projection containing **t<sub>j</sub>**, its governor **bo<sub>k</sub>-le** and its accessible SUBJECT **juzi<sub>j</sub>**, satisfying Binding Principle A. It also meets with the Shortest Movement Condition (Chomsky 1992) in the following manner: a) as the verb **bo** is raised from V to ASP to form the chain (**bo<sub>k</sub>-le**, **t<sub>k</sub>**), its minimal domain is {Spec of ASPP, Spec of VP, NP<sub>2</sub>}; and b) since the Spec of ASPP and the Spec of VP are in the same minimal domain, they are equidistant from NP<sub>2</sub>, thus permitting NP<sub>2</sub> to move to the Spec of ASPP by crossing the Spec of VP which is filled with NP<sub>1</sub> or its trace.

### 3.3. The Objective Ba-Construction (2).

The above analysis also accounts for the Objective BA-construction which contains both a preverbal NP and a postverbal NP, between which there exists an INHERENT possessive relation, as shown by (4b) and (5 b). Let us take (4b) for example, which may have the following structural representation under X'-theory and the postulations in (37):

$$(4b') \left[ {}_{\text{BAP}} \left[ {}_{\text{BA}} \text{ba} \right] \left[ {}_{\text{ASPP}} \left[ {}_{\text{ASP}} \text{-le} \right] \left[ {}_{\text{VP}} \left[ {}_{\text{NP1}} \text{wo} \right] \left[ {}_{\text{V}'} \left[ {}_{\text{V}} \text{bo} \right] \left[ {}_{\text{NP2}} \left[ {}_{\text{NP3}} \text{juzi} \right] \left[ {}_{\text{N}} \text{pi} \right] \right] \right] \right] \right] \right]$$

BA                      -ASP                      I                      peel                      orange skin

In (4b'), the verb **bo** is raised to ASP to amalgamate with the aspect

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subject of the aspect clause in the Chinese BA-construction cannot be dropped or moved away either, as shown by the following parallelism:

- iii) a. I want very much [<sub>CP</sub> for [<sub>IP</sub> John to stay]]
- b. \*I want very much [<sub>CP</sub> for [<sub>IP</sub>  $\phi$  to stay]]
- c. \*Who<sub>i</sub> do you want very much [<sub>CP</sub> for [<sub>IP</sub> t<sub>i</sub> to stay]]
- iv) a. wo [<sub>BAP</sub> ba [<sub>ASPP</sub> juzi bo-le]]
- I                      BA                      orange peel-ASP
- b. \*wo [<sub>BAP</sub> ba [<sub>ASPP</sub>  $\phi$  bo-le]]
- I                      BA                      peel-ASP
- c. \*juzi<sub>j</sub>, wo [<sub>BAP</sub> ba [<sub>ASPP</sub> t<sub>i</sub> bo-le]]
- orange I                      BA                      peel-ASP

marker **-le**. NP<sub>1</sub> **wo** receives a  $\theta$ -role from V' and moves to the Spec of BAP to get Case from BA. NP<sub>2</sub> **juzi pi** receives a  $\theta$ -role from the verb **bo**, and NP<sub>3</sub> **juzi** is assigned a 'possessional  $\theta$ -role' by N (Chomsky 1985). NP<sub>3</sub> **juzi** moves to the Spec of ASPP to get Case from ASP, and the raised verb **bo** assigns Case to NP<sub>2</sub> in situ. Thus, (4b) is also derived by verb-raising and NP-movement, as illustrated below:

$$(4b'') \left[ {}_{\text{BAP}} \text{wo}_i \left[ {}_{\text{BA}} \text{ba} \right] \left[ {}_{\text{ASPP}} \text{juzi}_j \left[ {}_{\text{ASP}} \text{bo}_k\text{-le} \right] \left[ {}_{\text{VP}} \left[ {}_{\text{NP1}} \text{t}_i \right] \left[ {}_{\text{V}'} \left[ {}_{\text{V}} \text{t}_k \right] \right. \right. \right. \right. \\ \left. \left. \left. \left. \left. \left. \begin{array}{c} I \qquad BA \qquad \text{orange peel-ASP} \\ \left[ {}_{\text{NP2}} \left[ {}_{\text{NP3}} \text{t}_j \right] \left[ {}_{\text{N}} \text{pi} \right] \right] \right] \right] \right] \right] \right] \right] \\ \qquad \qquad \qquad \text{skin} \end{array} \right.$$

The motivation and argument for raising the verb **bo** and moving NP<sub>1</sub> **wo** are the same as the ones presented in the above section. As for the movement of NP<sub>3</sub> **juzi**, it is also driven by the ban against BA-stranding,<sup>17</sup> and it is legitimate under Subjacency, Binding Principle A and the Shortest Movement Condition, due to the verb-raising. It crosses no barrier, as NP<sub>2</sub>, which is L-marked by V, is not a barrier, and VP, being L-marked by **bo<sub>k</sub>-le**, does not form a barrier either. Its trace **t<sub>i</sub>** is A-bound by **juzi<sub>j</sub>** in its governing category ASPP, thus satisfying Binding Principle A. As the verb **bo** is raised from V to ASP to form the chain (**bo<sub>k</sub>-le**, **t<sub>k</sub>**) with the minimal domain {Spec of ASPP, Spec of VP, NP<sub>2</sub>}, the Spec of ASPP and the Spec of VP are equidistant from NP<sub>2</sub> and any element it contains. Thus, NP<sub>3</sub> **juzi**, as an element contained by NP<sub>2</sub>, may move to the Spec of ASPP by crossing the Spec of VP which is filled

17. This is evidenced by the fact that **juzi** cannot stay in situ, even though it could get Case there from N under the Uniformity Condition proposed by Chomsky (1985): that is, N **pi** assigns a 'possessional  $\theta$ -role' to **juzi** and Case-marks **juzi** by affixing the inserted-**de** to **juzi**. Compare the BA-sentence in (i), where **juzi** is in-situ, with the corresponding sentence without BA in (ii):

- i)\* **wo ba bo-le juzi-de pi.**  
*I BA peel-ASP orange's skin*  
 ii) **wo bo-le juzi-de pi.**  
*I peel-ASP orange's skin*  
 ' I peeled the skin of the orange. '

with NP<sub>1</sub> or its trace, meeting with the Shortest Movement Condition.

As a consequence of this analysis, the inherent possessive relation between the preverbal NP **juzi** and postverbal NP **pi** in (4b) is captured by the spec-head relation under X'-theory without further stipulation.

### 3.4. The Objective Ba-Construction (3).

The above analysis further accounts for the Objective BA-construction in which there exists an INHERENT partitive relation between the preverbal NP and postverbal NP, as shown by (6b), (35b) and (36b). Take (6b) for example, which has the following representation under X'-theory, a DP/KP analysis of Chinese noun phrases and the postulations in (37):<sup>18</sup>

- (6b') [<sub>BAP</sub> [<sub>BA</sub> **ba**] [<sub>ASPP</sub> [<sub>ASP</sub> -le] [<sub>VP</sub> [<sub>NP1</sub> **Wangwu**] [<sub>V</sub> [<sub>V</sub> **reng-diao**]]]  
           BA                  -ASP          Wangwu          throw-lose  
           [<sub>KP</sub> [<sub>K</sub> **yi** **jian**] [<sub>NP2</sub> **yifu**]]]]]]  
           one CL          clothes

In (6b') the verb **reng-diao** is raised to ASP to amalgamate with the as-

18. The need for a DP/KP analysis of Chinese noun phrases is supported by the following facts: a) classifiers are obligatory in Chinese noun phrases and there is a selectional relation between a classifier and an NP; b) the co-occurrence of a possessive NP and a determiner is allowed in Chinese noun phrases; and c) more than one possessive NP may appear in a single Chinese noun phrase:

- i) **na san ben shu** / \***na san shu** / \***na san ge shu**  
     that three CL book   that three book   that three CL book  
     'those three books'   (CL is missing)   (CL is not correct)
- ii) **Lisi-de na san ben shu**  
     Lisi's that three CL book  
     'those three books of Lisi's'
- iii) **Lisi-de san ben Zhangsan-de shu**  
     Lisi's three CL Zhangsan's book  
     'Lisi's three copies of Zhangsan's books'

For the obligatory co-occurrence of numeral and classifier under the K-node in (6b'), see Tang's (1990) arguments.

pect marker-*le*.<sup>19</sup> NP<sub>1</sub> *Wangwu* receives a  $\theta$ -role from V' and moves to the Spec of BAP to get Case from BA. The KP *yi jian yifu* receives a  $\theta$ -role from the verb *reng-diao*, and NP<sub>2</sub> *yifu* receives a complement  $\theta$ -role from K.<sup>20</sup> NP<sub>2</sub> *yifu* moves to the Spec of ASPP to get Case from ASP, and the raised verb *reng-diao* assigns Case to KP. The derivation of (6b) is shown below:

(6b'') [<sub>BAP</sub> *Wangwu*<sub>i</sub> [<sub>BA</sub> *ba*] [<sub>ASPP</sub> *yifu*<sub>i</sub> [<sub>ASP</sub> *reng-diao*<sub>k</sub>-*le*] [<sub>VP</sub> [<sub>NP1</sub> *t<sub>i</sub>*]  
*Wangwu BA clothes throw-lose-ASP*  
 [<sub>V'</sub> [<sub>V</sub> *t<sub>k</sub>*] [<sub>KP</sub> [<sub>K</sub> *yi jian*] [<sub>NP2</sub> *t<sub>i</sub>*]]]]]  
*one CL*

The motivation and argument for the verb-raising and NP<sub>1</sub>-move-

19. The verb *reng-diao* is actually a resultative V-V compound rather than a single verb, which may involve more complex grammatical function changes in the BA-construction. Though the analysis proposed here does not crucially hinge on this, the representation in (6b) can, in fact, be expanded to accommodate the resultative V-V compounds in the BA-construction. Since the discussion of this issue will go far beyond the scope of this paper, interested readers can refer to Zou (1994) for the same morpho-syntactic analysis of resultative V-V compounds in the BA-construction.

20. The evidence for the noun phrase status of KP comes from the following facts: a) any nouns which denote measure or quantity can be used as classifiers (Chao 1968, Li and Thompson 1981); and b) when classifiers are used alone, they behave exactly like nouns rather than adjectives:

- i) a. *ta shihu hen xin.*  
*it seems very new*  
*'it seems very new.'*  
 b. \**ta shihu yi ben shu.*  
*it seems one CL book*  
 c. \**ta shihu yi ben.*  
*it seems one CL*
- ii) a. *you yi ben shu zai nali.*  
*have one CL book over there*  
*'there is a book over there.'*  
 b. *you yi ben zai nali.*  
*have one CL over there*  
*'there is a copy over there.'*  
 c. \**you hen xin zai nali.*  
*have very new over there*

ment in (6b) are the same as the ones presented in Section 3.2. As for the movement of NP<sub>2</sub> **yifu**, it is also driven by the ban against BA-stranding.<sup>21</sup> This NP-movement is also legitimate under the constraints on NP-movement. It crosses no barrier, as KP, being L-marked by V, does not form a barrier, and VP is not a barrier either by the argument in above sections. Its trace **t<sub>j</sub>** is A-bound by **yifu<sub>j</sub>** in its governing category ASPP, satisfying Binding Principle A. It also meets with the Shortest Movement Condition: that is, as the verb **reng-diao** is raised from V to ASP to form the chain (**reng-diao<sub>k</sub>-le, t<sub>k</sub>**) with the minimal domain {Spec of ASPP, Spec of VP, KP}, the Spec of ASPP and the Spec of VP become equidistant from KP and any element it contains, thus allowing NP<sub>2</sub> **yifu**, being an element contained by KP, to move to the Spec of ASPP by crossing the Spec of VP.

As a consequence of this analysis, the inherent partitive relation between the preverbal NP **yifu** and the postverbal K **yi-jian** in (6b) is captured by the head-complement relation under X'-theory without further stipulation.

### 3.5. The Causative Ba-Construction (1).

The morpho-syntactic analysis presented in the above sections can be extended to the Causative BA-construction, based on their shared properties and constraints. Let us first consider the Causative BA-construction in which the preverbal NP is the logical subject of VP and Causee and the sentence subject is Causer, as shown by (7), (8) and (9). As mentioned in Section 2.2., there is no thematic relation between the sentence subject and its verb phrase, because the former is an additional

21. This is supported by the fact that NP<sub>2</sub> **yifu** could not stay in situ, even though it could get Case there from K, as shown by the comparison of the BA-sentence in (i), where **yifu** is in situ, with its corresponding sentence without BA in (ii):

i)\* **Wangwu ba reng-diao-le yi jian yifu.**  
*Wangwu BA throw-lose-ASP one CL clothes*

ii) **Wangwu reng-diao-le yi jian yifu.**  
*Wangwu throw-lose-ASP one CL clothes*

'Wangwu threw away one piece of clothes.'



argument added by causation (Huang 1992). So the sentence subject can be treated as the specifier of a higher VP-shell along the lines of Larson (1988). Assuming this treatment, a Causative BA-construction like (7) may have the following representation under X'-theory and the postulations in (37):

$$(7') \left[ {}_{\text{BAP}} \left[ {}_{\text{BA}} \text{ba} \right] \left[ {}_{\text{ASPP}} \left[ {}_{\text{ASP}} \text{-le} \right] \left[ {}_{\text{VP1}} \left[ {}_{\text{NP1}} \text{na ge kanshou} \right] \left[ {}_{\text{V1}} \left[ {}_{\text{V1}} \right] \right] \right] \right] \right. \\ \text{BA} \qquad \qquad \text{-ASP} \qquad \qquad \text{that CL warden} \\ \left. \left[ {}_{\text{VP2}} \left[ {}_{\text{NP2}} \text{yi ge zei} \right] \left[ {}_{\text{V2}} \left[ {}_{\text{V2}} \text{pao} \right] \right] \right] \right] \right] \\ \text{one CL thief} \qquad \qquad \text{run}$$

In (7'), the verb **pao** is raised through the empty  $V_1$  to ASP to host the aspect marker **-le**.  $\text{NP}_1$  **na ge kanshou** receives a  $\theta$ -role from  $V'_1$  by virtue of its "outer subject" status, and moves to the Spec of BAP to get Case from BA.  $\text{NP}_2$  **yi ge zei** receives a  $\theta$ -role from  $V'_2$  by virtue of its "inner subject" status, and moves to the Spec of ASPP to get Case from ASP. Thus, (7) is also derived by verb-raising and NP-movement, as shown below:

$$(7'') \left[ {}_{\text{BAP}} \text{na ge kanshou}_i \left[ {}_{\text{BA}} \text{ba} \right] \left[ {}_{\text{ASPP}} \text{yi ge zei}_j \left[ {}_{\text{ASP}} \text{pao}_k \text{-le} \right] \right] \right. \\ \text{that CL warden} \qquad \text{BA} \qquad \text{one CL thief} \qquad \text{run-ASP} \\ \left. \left[ {}_{\text{VP1}} \left[ {}_{\text{NP1}} \text{t}_i \right] \left[ {}_{\text{V1}} \left[ {}_{\text{V1}} \text{t}'_k \right] \right] \left[ {}_{\text{VP2}} \left[ {}_{\text{NP2}} \text{t}_j \right] \left[ {}_{\text{V2}} \left[ {}_{\text{V2}} \text{t}_k \right] \right] \right] \right] \right] \right]$$

Both the verb-raising and NP movement in (7) are obligatory and legitimate by the arguments presented in the above sections. As a consequence of this analysis, the logical subject-verb relation between the preverbal NP **yi ge zei** and the verb **pao** is naturally captured by the spec-head relation under X'-theory.

### 3.6. The Causative Ba-Construction (2).

The above analysis also applies to the Causative BA-construction in which the preverbal NP is the logical subject of both the matrix verb phrase and the resultative clause and maintains a Causer-Causee relation

with the matrix subject, as shown by (10), (11) and (12). Notice that the matrix subject in (10), (11) and (12) has no thematic relation with its verb phrase either, as it is also an additional argument added by causation. Thus, (10), as an example of this type of Causative BA-constructions, may have the following representation under X'-theory, the VP-shell hypothesis, and the postulations in (37) (cf. Huang 1992):

$$\begin{array}{l}
 (10') \quad [_{\text{BAP}} [_{\text{BA}} \text{ba}] [_{\text{PARP}} [_{\text{PAR}} \text{-de}] [_{\text{VP1}} [_{\text{NP1}} \text{zhe jian shi}] [_{\text{V1}} [_{\text{V1}} \\
 \qquad \qquad \qquad \text{BA} \qquad \qquad \qquad \text{-PAR} \qquad \qquad \text{this CL matter} \\
 [_{\text{VP2}} [_{\text{NP2}} \text{wo}] [_{\text{V2}} [_{\text{V2}} \text{ji}] [_{\text{RC}} \text{pro shui bu hao}]]]]]]]] \\
 \qquad \qquad \qquad \text{I} \qquad \qquad \qquad \text{anxious} \qquad \text{sleep not well}
 \end{array}$$

In (10'), the verb **ji** is raised through the empty  $V_1$  to the position of PAR to host the resultative particle **-de**.  $\text{NP}_1$  **zhe jian shi** gets a  $\theta$ -role from  $V'_1$  by virtue of its "outer subject" status, and moves to the Spec of BAP to get Case from BA.  $\text{NP}_2$  **wo** receives a  $\theta$ -role from  $V'_2$  by virtue of its "inner subject" status, and moves to the Spec of PARP to get Case from PAR by the spec-head "agreement". The **pro** in the resultative clause is obligatorily controlled by the preverbal NP **wo** or its trace. The derivation of (10) is illustrated below:

$$\begin{array}{l}
 (10'') \quad [_{\text{BAP}} \text{zhe jian shi}_i [_{\text{BA}} \text{ba}] [_{\text{PARP}} \text{wo}_j] [_{\text{PAR}} \text{ji}_k \text{-de}] [_{\text{VP1}} [_{\text{NP1}} \text{t}_i] [_{\text{V1}} \\
 \qquad \qquad \qquad \text{this CL matter BA} \qquad \qquad \text{I} \qquad \qquad \text{anxious-PAR} \\
 [_{\text{V1}} \text{t}'_k] [_{\text{VP2}} [_{\text{NP2}} \text{t}_i] [_{\text{V2}} [_{\text{V2}} \text{t}_k] [_{\text{RC}} \text{pro}_i \text{shui bu hao}]]]]]]]] \\
 \qquad \qquad \qquad \text{sleep not well}
 \end{array}$$

Both the verb-raising and NP-movement in (10) are obligatory and legitimate under the arguments presented in the above section. Given that the preverbal NP **wo** or its trace is the closest nominal that c-commands **pro**, **pro** must be obligatorily controlled by **wo** (Huang 1992). As a consequence of this analysis, the logical subject-verb relation between the preverbal NP **wo**, the matrix verb **ji** and embedded verb **shui** is naturally captured by the spec-head relation and the Control Principle.

### 3.7. The Causative Ba-Construction (3).

The analysis presented in the above sections further applies to the Causative BA-construction in which the preverbal NP is the logical subject of the resultative clause, and the matrix subject is the logical subject of the matrix verb phrase, as shown by (13), (14) and (15). Let us take (13) for example, which has the following representation under X'-theory and the postulations in (37):

$$\begin{array}{l}
 (13') \quad [_{\text{BAP}} [_{\text{BA}} \text{ba}] [_{\text{PARP}} [_{\text{PAR}} \text{-de}] [_{\text{VP}} [_{\text{NP}_1} \text{Zhangsan}] [_{\text{V}'} [_{\text{V}} \text{ku}]] \\
 \qquad \qquad \qquad \text{BA} \qquad \qquad \text{-PAR} \qquad \text{Zhangsan} \qquad \text{cry} \\
 \qquad \qquad \qquad [_{\text{RC}} [_{\text{NP}_2} \text{shoupa}] \qquad \text{hen} \quad \text{shi}]]]] \\
 \qquad \qquad \qquad \text{handkerchief} \quad \text{very} \quad \text{wet}
 \end{array}$$

In (13'), the verb **ku** is raised to PAR to adjoin to the resultative particle **-de**. NP<sub>1</sub> **Zhangsan** receives a  $\theta$ -role from V' by virtue of its internal subject status and moves to the Spec of BAP to get Case from BA. NP<sub>2</sub> **shoupa** receives a  $\theta$ -role from the embedded verb phrase, and moves to the Spec of PARP to get Case from PAR. The derivation of (13) is shown below:

$$\begin{array}{l}
 (13'') \quad [_{\text{BAP}} \text{Zhangsan}_i [_{\text{BA}} \text{ba}] [_{\text{PARP}} \text{shoupa}_j [_{\text{PAR}} \text{ku}_k \text{-de}] [_{\text{VP}} [_{\text{NP}_1} \text{t}_i] \\
 \qquad \qquad \qquad \text{Zhangsan} \quad \text{BA} \qquad \text{handkerchief} \text{cry-PAR} \\
 \qquad \qquad \qquad [_{\text{V}'} [_{\text{V}} \text{t}_k] [_{\text{RC}} [_{\text{NP}_2} \text{t}_j] \text{hen} \quad \text{shi}]]]] \\
 \qquad \qquad \qquad \text{very} \quad \text{wet}
 \end{array}$$

The motivation and argument for the verb-raising and NP<sub>1</sub>-movement in (13) are the same as the ones presented in the above sections. As for the movement of NP<sub>2</sub> **shoupa**, it is driven by the ban against BA-stranding too.<sup>22</sup> This NP-movement is also legitimate under the constraints

22. This is evidenced by the fact that NP<sub>2</sub> **shoupa** could not stay within the resultative clause, even though it could get Case there somehow, as shown by the comparison of (i), where **shoupa** sits in the resultative clause of the Causative BA-

on NP-movement. It crosses no barrier, as RC, being L-marked by V, does not form a barrier, and VP is not a barrier either by the argument in the above sections. Its trace  $t_j$  is A-bound by **shoupa<sub>j</sub>** in its governing category PARP, satisfying Binding Principle A. It also satisfies the Shortest Movement Condition: that is, as the verb **ku** is raised from V to PAR to form the chain (**ku<sub>k</sub>-de**,  $t_k$ ) with the minimal domain {Spec of PARP, Spec of VP, RC}, the Spec of PARP and the Spec of VP become equidistant from RC and any element it contains, thus permitting NP<sub>2</sub> **shoupa** to move to the Spec of PARP by crossing the Spec of VP which is filled with NP<sub>1</sub> or its trace.

As a consequence of this analysis, the logical subject-verb relation between NP<sub>1</sub> **Zhangsan** and the matrix verb **ku**, and the same logical relation between the preverbal NP **shoupa** and the embedded verb phrase **hen shi** are both captured by the spec-head relations under X'-theory without further stipulation.

### 3.8. The Negative Ba-Construction.

Parallel to the negation of non-BA sentences (cf. Chao 1968, Li and Thompson 1981, Lü 1984, Sheng 1985, Teng 1973 and 1974, Wang 1965), the negation of BA-constructions exhibits a similar constraint with respect to the negative item **mei-you** 'not-have': that is, **mei-you** does not co-occur with the perfective aspect marker **-le**:

- (38) a. **Lisi mei-you ba gebo shen-zhi.**

*Lisi not-have BA arm stretch-straight*

'Lisi did not stretch his arm straight.'

- b.\***Lisi mei-you ba gebo shen-(zhi)-le.**

*Lisi not-have BA arm stretch-(straight)-ASP*

---

construction, with (ii), which is the corresponding sentence without BA:

- i)\* **Zhangsan ba ku-de shoupa hen shi.**

*Zhangsan BA cry-PAR handkerchief very wet*

- ii) **Zhangsan ku-de shoupa hen shi.**

*Zhangsan cry-PAR handkerchief very wet*

'Lisi cried so much that his handkerchief got very wet.'

Wang (1965) argues that the morpheme **you** is the suppletive alternant of the perfective aspect marker **-le**, based on their complementary distribution and synonymous relation, and that the negative item **mei-you** is a combination of a negative marker and an aspect marker. Assuming Wang's analysis of the morpheme **you** and the negative item **mei-you**, a negative BA-construction like (38a) would have the following representation under the proposed morpho-syntactic approach:

$$(38a') \left[ \begin{array}{c} \text{[BAP [BA ba] [NEGP [NEG mei] [ASPP [ASP you] [VP [NP1 Lisi] [V} \\ \text{BA} \quad \text{not} \quad \text{have} \quad \text{Lisi} \\ \text{[V shen-zhi] [NP2 gebo]]]]]} \\ \text{stretch-straight} \quad \text{arm} \end{array} \right]$$

In (38a'), the negative marker **mei**, which selects the aspect phrase headed by **you**, is treated as the head of a functional category NEGP, along the lines of Chomsky (1991), Ouhalla (1990a) and Pollock (1989). The NEGP is, in turn, selected by BA.<sup>23</sup> With this representation, (38a) can be also derived by "verb"-raising and NP-movement. First, the aspect marker **you** is raised to the position of NEG to fuse with the negative marker **mei**. Second, NP<sub>1</sub> **Lisi** gets a  $\theta$ -role from V' and moves to the Spec of BAP to get Case from BA. Third, NP<sub>2</sub> **gebo** receives a  $\theta$ -role from the verb **shen-zhi** and moves to the Spec of NEGP to get Case from the fused NEG-ASP element **mei-you** by the spec-head "agreement". Finally, the fused NEG-ASP element is optionally raised to adjoin to the head of BAP. The derivation of (38a) is illustrated below:

$$(38a'') \left[ \begin{array}{c} \text{[BAP Lisi}_i \text{ [BA (mei-you}_k \text{)}_i \text{-ba] [NEGP gebo}_j \text{ [NEG t}_i \text{] [ASPP [ASP t}_k \text{]} \\ \text{Lisi} \quad \text{not-have-BA} \quad \text{arm} \end{array} \right]$$

23. This analysis complies with the parametrization theory of functional categories regarding their head-complement relation (Chomsky 1991, Borer 1984, Laka 1990): that is, the selectional properties of **mei** and **ba** are their lexical properties as functional categories, which may be idiosyncratic and differ from one another accordingly (cf. Note 13).

[<sub>VP</sub> [<sub>NP1</sub> t<sub>i</sub>] [<sub>V</sub> [<sub>V</sub> **shen-zhi**] [<sub>NP2</sub> t<sub>j</sub>]]]]]]]  
*stretch-straight*

The motivation and argument for the raising of aspect marker and the NP-movement are as follows. First, the evidence for raising the aspect marker **you** to NEG to fuse with **mei** is from the fact that **mei** and **you** can together serve as a *sentence-fragment*:

- (39) SPEAKER A: **ni ba wo-de shu na-zou-le ma?**  
*you BA my book take-go-ASP Q*  
 'Did you take away my book?'
- SPEAKER B: **mei-you**  
*not-have*

Since only the elements of the same phrasal category can serve as a sentence fragment (Radford 1988), **mei** and **you** must stay in the head position of NEGP. The raising of **you** to fuse with **mei** is also licit under the Head Movement Constraint, and it is "facilitated" by the illicitness of raising the verb **shen-zhi** to ASP to amalgamate with **you**, due to the fact that **you**, unlike its suppletive alternant **-le**, is not a bound morpheme and cannot have a verb host, as shown by the contrast below:

- (40) a. **Lisi shen-zhi-le gebo.**  
*Lisi stretch-straight-ASP arm*  
 'Lisi stretched his arm straight.'
- b. \***Lisi shen-zhi-you gebo.**  
*Lisi stretch-straight-have arm*

Second, the plausibility of the adjunction of **mei-you** to **ba** comes from the fact that nothing can really intervene between **mei-you** and **ba** in the negative BA-construction, as shown below:<sup>24</sup>

24. There are two kinds of apparent counterexamples against the adjunction of **mei-**

you to **ba** in the BA-construction. First, some adverbs do occur between **mei-you** and **ba**, such as manner adverbs and frequency adverbs:

- i) a. **Lisi mei-you qiao-qiao-de ba Zhangsan jiao-xing.**  
*Lisi not-have quietly BA Zhangsan call-awake*  
 'Lisi didn't quietly awaken Zhangsan.'  
 b. **Lisi mei-you jinchang ba Zhangsan jiao-xing.**  
*Lisi not-have often BA Zhangsan call-awake*  
 'Lisi didn't often awaken Zhangsan.'

However, in these cases, the negator **mei-you** negates only the manner and frequency adverbs, but not the BA-sentence, because the meanings of the two sentences are 'Lisi did awaken Zhangsan, but not *in a quiet way/quite often*'. Therefore, such negation is only a phrasal negation rather than the sentential negation of the BA-construction. Thus, it is irrelevant regarding the adjunction of **mei-you** to **ba** in the sentential negation of BA-constructions. Second, a few 'co-verb' phrases (cf. Li and Thompson 1981) may also appear between **mei-you** and **ba**, as exemplified below:

- ii) **Lisi mei-you yong shou ba mianbao ya-bian.**  
*Lisi not-have use hand BA bread press-flat*  
 'Lisi didn't use his hands to press the bread flat.'

Like the negation of manner and frequency adverbs, the negator **mei-you** may negate only the co-verb phrase **yong shou**, as the sentence has the implication 'Lisi did press the bread flat, but without using his hands'. Even if **mei-you** may negate the whole predicate, intervening between **mei-you** and **ba** in the BA-construction will still not happen. That is to say, when the whole predicate is negated, **mei** and **you** have to be base-generated in the positions higher than the coverb phrase rather than within the BA-construction. This is because the co-verb **yong** is a lexical verb in this case, and the Spec of the co-verb phrase base-hosts **Lisi**, as shown by the following derivation:

- ii') [<sub>NEGP</sub> **Lisi** [<sub>NEG</sub> **mei-you<sub>k</sub>**] [<sub>ASPP</sub> [<sub>ASP</sub> **t<sub>k</sub>**] [<sub>VP</sub> [<sub>NP1</sub> **t<sub>i</sub>**] [<sub>V'</sub> **yong shou**  
*Lisi not-have use hand*  
 [<sub>BAP</sub> **ba mianbao ya-bian**]]]]]

Thus, the occurrence of a co-verb phrase between **mei-you** and **ba** is irrelevant with respect to the adjunction of **mei-you** to **ba** within the BA-construction. The evidence for treating co-verb **yong** as a lexical verb comes from the fact that it passes the tests of lexical verb identification:

- iii) Aspect marker attachment:  
**Lisi yong-le shou ba mianbao ya-bian-le.**  
*Lisi use-ASP hand BA bread press-flat-ASP*  
 'Lisi used his hands to press the bread flat.'  
 iv) Simple answer to a question:  
 A: **Lisi yong shenme ba mianbao ya-bian-le?**  
*Lisi use what BA bread press-flat-ASP*  
 'What did he use to press the bread flat?'  
 B: **yong shou.**  
*use hand*

- (41) a. **Lisi zhuotian mei-you ba gebo shen-zhi.**  
*Lisi yesterday not-have BA arm stretch-straight*  
'Yesterday, Lisi didn't stretch his arm straight.'  
b. \***Lisi mei-you zhuotian ba gebo shen-zhi.**  
*Lisi not-have yesterday BA arm stretch-straight*
- (42) a. **Lisi xianran mei-you ba gebo shen-zhi.**  
*Lisi obviously not-have BA arm stretch-straight*  
'Obviously, Lisi didn't stretch his arm straight.'  
b. \***Lisi mei-you xianran ba gebo shen-zhi.**  
*Lisi not-have obviously BA arm stretch-straight*

The adjunction of **mei-you** to **ba** is also licit under the Head Movement Constraint, and its optionality crucially allows us to account for the fact that **mei-you** may also follow the BA-phrase, as evidenced by (32), which is repeated below:

- (32) a. **ta ba Lisi mei-you fang zai yan li.**  
*she BA Lisi not-have put at eye in*  
'She looked down upon Lisi.'

As for the motivation and argument for the movement of NP<sub>1</sub> **Lisi** and the movement of NP<sub>2</sub> **gebo** in (38a), they are almost the same as the ones presented in the above sections, due to the raising of the lexical aspect marker **you** to NEG.

## 4. Three Consequences of the Morpho-Syntactic Analysis

### 4.1. The Selectional Restriction.

As mentioned in Section 2.3, stative verbs cannot appear in the BA-construction, neither can perception and psychological verbs if they express perceptions or psychological states. But if a perception or psychological verb forms a V-V compound with a resultative or directional verb



to indicate a completion of process or a change of state, then it can appear in the BA-construction. These constraints can now be captured by the 'semantic selectional' restriction of BA along the lines of Chomsky (1985); that is, BA 's-selects' only a predicate denoting a change of state or a completion of process (cf. Note 4). This s-selectional restriction then rules in accomplishment verbs (including perception and psychological V-V compounds) and achievement verbs, as they both describe telic events which have natural final points indicating change of state or completion of process (cf. Tai 1984). This s-selectional restriction also rules out stative verbs, as they only describe stable situations without indicating any change of state or completion of process.

Moreover, the co-occurrence restriction on the negative item **mei-you** and the perfective aspect marker **-le** in the negative BA-construction is also captured by the selectional property of **mei**; namely, **mei** lexically selects the perfective marker **you** but not **-le**.

#### 4.2. Functional Interpretation of the reverbal NP.

Though the preverbal NPs in the objective and Causative BA-constructions get Case from ASP or PAR in the same manner, their functional interpretations are quite different from each other. These differences should be captured by  $\theta$ -theory because grammatical functions are linked with the  $\theta$ -role assignment. In other words, each argument must fill one  $\theta$ -role position as determined by its grammatical function in the sentence (Chomsky 1981). To our expectation, these functional differences are captured by  $\theta$ -theory in our morpho-syntactic analysis, as presented below:

A) In the Objective BA-construction discussed in Section 3.2, V assigns a theme  $\theta$ -role to the preverbal NP. So the preverbal NP is naturally interpreted as the logical object of V.

B) In the Objective BA-construction discussed in Section 3.3, the preverbal NP gets a possessional  $\theta$ -role from the head of postverbal NP, and the postverbal NP receives an theme  $\theta$ -role from V. Thus, the preverbal NP is interpreted as the logical 'possessor' of the postverbal NP,

and the postverbal NP is interpreted as the logical object of V — a correct prediction.

C) In the Objective BA-construction discussed in Section 3.4, the preverbal NP receives a complement  $\theta$ -role from the head of KP, and KP receives a theme  $\theta$ -role from V. Hence, the preverbal NP is interpreted as the logical complement of K, and KP is interpreted as the logical object of V.

D) In the Causative BA-constructions discussed in Section 3.5 and 3.6, the matrix V' assigns a  $\theta$ -role to the preverbal NP. Thus, it is interpreted as the logical subject of the matrix VP in these Causative BA-constructions.

E) Finally, in the Causative BA-construction discussed in Section 3.7, the pre-verbal NP receives a  $\theta$ -role from VF in the resultative clause. Hence, this pre-verbal NP is interpreted as the logical subject of the resultative clause.

### 4.3. The Specificity Effect.

As shown by (33) and (34), specificity effects are displayed when the NP complement of classifier in the postverbal definite noun phrase appears right after BA. However, such specificity effects will not show up when the NP complement of classifier in the postverbal indefinite noun phrase follows BA, as in (35) and (36). Take (33b) and (35b) for example. They should have the following representations under the morpho-syntactic analysis proposed above:

(33b') \* $[_{BAP} \text{ wo}_i [_{BA} \text{ ba}] [_{ASPP} [\text{Luxun-de shu}]_j [_{ASP} \text{ mai}_k\text{-le}]]$   
*I BA Luxun's book sell-ASP*  
 $[_{VP} [_{NP1} \text{ t}_i] [_{V'} [_{V} \text{ t}_k] [_{DP} [_{D} \text{ zhe}] [_{KP} [_{K} \text{ ben}] [_{NP2} \text{ t}_j]]]]]]]$   
*this CL*

(35b')  $[_{BAP} \text{ wo}_i [_{BA} \text{ ba}] [_{ASPP} [\text{Luxun-de shu}]_j [_{ASP} \text{ mai}_k\text{-le}]]$   
*I BA Luxun's book sell-ASP*  
 $[_{VP} [_{NP1} \text{ t}_i] [_{V'} [_{V} \text{ t}_k] [_{KP} [_{K} \text{ yi ben}] [_{NP2} \text{ t}_j]]]]]$   
*one CL*

Assume a generalized version of the Specificity Condition proposed by Fiengo and Higginbotham (1981): '*\*... $x_i$ ..., if  $x_i$  is free in a specific noun phrase*' ( $x_i$  is interpreted here as an NP-trace or as a variable). The presence of specificity effect in (33b') and its absence in (35b') can be accounted for in the following manner: a) in (35b') the NP<sub>2</sub>-trace  $t_j$ , A-bound by its antecedent [**Luxun-de shu**]<sub>j</sub> in ASPP, is free in KP which is a non-specific noun phrase, thus no violation of the Specificity Condition; and b) in (33b') the NP<sub>2</sub>-trace  $t_j$ , also A-bound by [**Luxun-de shu**]<sub>j</sub> in ASPP, is free in DP which is a specific noun phrase, thus violating the Specificity Condition (see Zou (1992) for a detailed analysis of the specificity effects observed in both the Chinese NP-movement and WH-in-situ).

## 5. Conclusion

In this paper, I have discussed the Objective and Causative BA-constructions in Chinese and their major properties and crucial constraints. To capture these properties and constraints, I have proposed a morpho-syntactic analysis of these BA-constructions within the theory of Principles and Parameters, and offered both motivation and argument for such an analysis. As presented in the paper, this morpho-syntactic analysis not only accounts for these Objective and Causative BA-constructions and the corresponding negative BA-constructions, but also captures many of their properties and constraints as natural consequences of general principles. Given its empirical evidence and theoretical motivation, this morpho-syntactic analysis does deserve serious consideration. At least, it makes a step in the right direction toward a more principled account of BA-constructions.

## References

- Abney, S. (1987). The English noun phrase in its sentential aspect. Unpublished doctoral dissertation, MIT.
- Borer, H. (1984). *Parametric Syntax*. Dordrecht, Foris.
- Chao, Y.-R. (1968). *A Grammar of Spoken Chinese*. Berkeley: University of California Press.
- Cheng, L.-S. L. (1986). Clause structures in Mandarin Chinese. M.A. thesis, University of Toronto.
- Cheng, L.-S. L. (1989). Transitivity alternations in Mandarin Chinese. *Proceedings of the Third Ohio State University Conference in Chinese Linguistics*, 81-94. Bloomington, IN: Indiana University Linguistics Club.
- Cheung, H. N. (1973). A comparative study in Chinese grammars: the BA construction. *Journal of Chinese Linguistics* 3, 343-382.
- Chomsky, N. (1981). *Lectures on Government and Binding*. Dordrecht: Foris.
- Chomsky, N. (1985). *Knowledge of Language: Its Nature, Origin, and Use*. New York: Praeger.
- Chomsky, N. (1986). *Barriers*. Cambridge, MA: MIT Press.
- Chomsky, N. (1991). Some notes on economy of derivation and representation. In Robert Freidin (ed), *Principles and Parameters in Comparative Grammar*. Cambridge, MA: MIT Press.
- Chomsky, N. (1992). A minimalist program for linguistic theory. *MIT Occasional Papers in Linguistics* 1.
- Chomsky, N. & H. Lasnik (1991). Principles and parameters theory. To appear in J. Jacobs, A. van Stechow, w. Sternefeld, and T. Vennemann (eds.), *Syntax: An International Handbook of Contemporary Research*. Berlin: Walter De Gruyter.
- Dai, X.-L. (1992). Inflectional morphology in Chinese Ms., Ohio State University, Columbus, OH.
- Ding, S.-S., et al. (1961). *Hanyu Yufa Wenti Jianghua* (Lectures on

- contemporary Chinese grammar). Beijing: Chinese Linguistics Publishers.
- Dowty, D. (1979). *Word meaning and Montague grammar*. Dordrecht: Reidel.
- Fiengo, R. & J. Higginbotham (1981). Opacity in NP. *Linguistic Analysis* 7, 395-421.
- Frei, H. (1956). The ergative construction in Chinese: theory of Pekinese BA. *GENGO KENKYU* 31, 22-115.
- Goodall, G. (1987). On the argument structure and L-marking with Mandarin Chinese *ba*. In J. McDonough and B. Plunkett (eds.), *Proceedings of NELS 17*, 232-242. Amherst, Mass: GSLA.
- Goodall, G. (1990). X-bar-internal word order in Mandarin Chinese and universal grammar. *Linguistics* 28, 241-261.
- Hashimoto, A.-Y. (1971). Mandarin syntactic structures. *Unicorn* 5.
- Huang, C.-T. (1982). Logical relations in Chinese and the theory of grammar. Unpublished doctoral dissertation, MIT.
- Huang, C.-T. (1988). WO PAO DE KUAI and Chinese phrase structure. *Language* 64, 274-311.
- Huang, C.-T. J. (1992). Complex predicates in control. In J. Higginbotham and R. Larson (eds.), *Control and Grammar*, 109-147. Dordrecht: Kluwer.
- Huang, C.-T. (1993). reconstruction and the structure of vp: some theoretical consequences. *Linguistic Inquiry* 24, 103-138.
- Koopman, H. (1990). The position of subjects. Ms., University of California, Los Angeles, CA.
- Kuroda, S.-Y. (1988). Whether we agree or not: A comparative syntax of English and Japanese. *Linguisticae Investigationes* 12, 1-47.
- Laka, M. I. (1990). Negation in syntax: on the nature of functional categories and projections. Ph.D. dissertation, MIT.
- Larson, R. (1988). On the Double Object Construction. *Linguistic Inquiry* 19, 355-391.
- Li, C. and S. Thompson (1981). *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.

- Li, Y.-C. (1974). What does 'disposal' mean? features of the verb and noun in Chinese. *Journal of Chinese linguistics* 2. 200-218.
- Li, Y.-H. (1985). Abstract case in Chinese. Unpublished doctoral dissertation, University of Southern California, Los Angeles.
- Li, Y.-H. (1990). *Order and Constituency in Mandarin Chinese*. Dordrecht: Kluwer Academic Publishers.
- Liu, F.-H. (1992). Aspect and the BA Sentences in Chinese. *Proceedings of the Third Formal Linguistic Society of Mid-America*. Northwestern University.
- Lü, S.-X. (1955). *The Papers on the Chinese Grammar*. Beijing: Science Press.
- Lü, S.-X., et al. (1984). *Xiandai Hanyu Babai Ci* (Eight hundred words of contemporary Chinese). Beijing: Commercial Press.
- Lu, J.-M. and Z. Ma (1985). *Xiandai Hanyu Xu Ci Shianren* (Papers on modern Chinese functional categories). Beijing: Beijing University Press.
- Mei, K. (1978). The BA sentences in modern Chinese. *WEN SHI ZHE XUEBAO* 27 (Taiwan University), 145-180.
- Ouhalla, J. (1990a). Sentential negation, relativised minimality and the aspectual status of auxiliaries. *Linguistic Review* 7, 183-231.
- Ouhalla, J. (1990b). Functional categories and parametric variation. Ms., Queen Mary and Westfield College, London University.
- Pollock, J.-Y. (1989). Verb movement, universal grammar and the structure of IP. *Linguistic Inquiry* 20, 365-424.
- Radford, A. (1988). *Transformational Grammar*. New York: Cambridge University Press.
- Sheng, K.-M. (1985). The domain and focus of negation in connection with *bu*. In the Chinese Language Journal (eds), *Grammar Research and Inquiry*. Beijing University Press.
- Sijbesma, P.-E. R. (1992). *Causatives and accomplishments: The case of Chinese ba*. Doctoral Dissertation, Leiden University.
- Smith, C. (1991). *The Parameter of Aspect*. Dordrecht: Kluwer Academic Publishers.

- Tai, J. (1984). Verbs and times in Chinese: Vendler's four categories. In D. Testen, V. Mishra, and J. Drogo (eds.), *Papers from the Parasession on Lexical Semantics*. Chicago: Chicago Linguistic Society.
- Tang, C. C. (1990). A Note on the DP analysis of the Chinese noun phrase. *Linguistics* 28, 337-354.
- Teng, S. H. (1973). Negation and aspects in Chinese. *Journal of Chinese Linguistics* 1, 14-37.
- Teng, S. H. (1974). Negation in Chinese. *Journal of Chinese Linguistics* 2, 125-140.
- Teng, S. H. (1977). *A Semantic Study of Transitivity Relations in Chinese*. Taipei: Student Books.
- Thompson, S. (1973). Transitivity and the BA construction in Mandarin Chinese. *Journal of Chinese Linguistics* 1, 208-221.
- Tsao, F. (1987). A topic-comment approach to the BA-construction. *Journal of Chinese Linguistics* 15, 1-52.
- Wang, H. (1987). *Ba zi ju he bei zi ju* (The BA & BEI Construction). Shanghai: Educational Publishing House.
- Wang, L. (1954). *A Chinese Modern Grammar*. Beijing: Zhonghua Press.
- Wang, P. (1970). A transformational approach to Chinese BA and BEI. Ph.D. Dissertation, University of Texas, Austin, Texas.
- Wang, S-Y. (1965). Two aspect markers in Mandarin. *Language* 41, 457-470.
- Zou, K. (1992). Specificity effects in the Chinese NP-movement and WH-extraction. *Proceedings of WECOL 92*, Tucson, Arizona: University of Arizona.
- Zou, K. (1993). The preverbal and postverbal NP objects in the Chinese BA-construction. To appear in the *Proceedings of WECOL 93*, Seattle, Washington: University of Washington.
- Zou, K. (1994). V-V compounds and the BA-construction in Chinese. To be presented at the *68th Annual Meeting of Linguistic Society of America*, Boston, MA.





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