

## Do Chinese *Wh*-conditionals Have Relatives in Other Languages?

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Previous studies on Chinese *wh*-conditionals leave several issues unresolved. These studies fail to capture the definiteness effects in *wh*-conditionals, they fail to address apparent violations of the novelty condition, and they overlook some genuine readings. We propose to resolve these issues by analyzing *wh*-conditionals as a special instance of topic-comment structures, with an identity relation between pairs of referring expressions. Chinese *wh*-conditionals can refer to either a single situation or to multiple situations, leading either to a definite interpretation or to a generic interpretation, respectively. The choice between these interpretations is determined by the context/pragmatics. Typologically, Chinese *wh*-conditionals are linked to correlatives, both semantically and structurally.

Key words: Chinese *wh*-conditionals, correlatives, uniqueness, free relatives

### 1. Introduction

The semantics of *wh*-indefinites and *wh*-conditionals in Chinese has been a topic for Chinese linguistics for several decades. In this study, we offer a novel analysis of *wh*-conditionals by setting the phenomenon in a broader typological context. A typical *wh*-conditional—called ‘bare conditionals’ in Cheng & Huang (1996)—always contains a pair of matching *wh*-phrases, one in the antecedent clause and the other in the consequent clause.<sup>1</sup> These conditionals have a matching requirement, namely, the *wh*-

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phrases in the antecedent and consequent clauses must be identical in number, form, and reference. In the present paper, we add the further observation that Chinese *wh*-conditionals can come with some definiteness flavor, akin to free relatives in English.

The most frequently cited account of Chinese *wh*-conditionals, by Cheng & Huang (1996), treats *wh*-expressions in *wh*-conditionals as indefinites. This analysis is somewhat problematic, however, because it appears to violate the novelty condition, which requires each indefinite to introduce a novel entity into the domain of discourse, yet only the first of the pair of indefinites in *wh*-conditionals serves this function. In part to circumvent the problem, Chierchia (2000) proposes that *wh*-indefinites in Chinese are indefinite pronouns (i.e. pronominals). As such, they can appear in both the antecedent and in the consequent of *wh*-conditionals without violating the novelty condition. However, Chierchia's account fails to explain why *wh*-indefinites display Principle C effects, which suggests that *wh*-indefinites are r-expressions rather than pronominals.

We propose to circumvent these problems by making two assumptions. One is that *wh*-indefinites encode *uniqueness*, just as indefinites do in donkey conditionals (a Russellian semantics for uniqueness is adopted to capture the definiteness effect). The second assumption is that *wh*-conditionals constitute identity statements—a special kind of topic-comment structure that is not subject to the novelty condition. The second assumption reconciles the tension between the novelty condition and Principle C. We contend that this novel analysis receives cross-linguistic support. Several similarities between Chinese *wh*-conditionals and correlatives are explained: (i) both structures display definiteness effects; (ii) both are subject to a matching requirement; and (iii) both are open to definite/generic interpretations.

We offer a unified analysis for these apparently unrelated constructions that crop up in historically unrelated languages (e.g. Chinese vs. Hindi). Lacking lexical items like Hindi *bhii* and English *ever*, or an explicit conditional word like *if*, Chinese *wh*-conditionals are a cross between being correlatives and conditionals. On the one hand, when a definiteness flavor is added, *wh*-conditionals strongly resemble free relatives (as well as correlatives in languages such as Russian, Vietnamese, Hungarian, etc.) in that they make reference to a particular (unique) individual in a particular situation. On the

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<sup>1</sup> In Cheng & Huang (1996), conditionals (which they call Chinese donkey sentences) are partitioned into two classes: bare conditionals and *ruguo*-conditionals. While the former requires the presence of a pair of identical *wh*-phrases (one in each clause), the latter only allows a pronominal-anaphor (e.g. overt pronouns, empty categories). We focus on bare conditionals in this paper.

other hand, when the context establishes a plurality of situations, the unique individuals denoted by the *wh*-phrase get relativized to situations, and the identity of the referent is not known, or not relevant. This reading involves a universal quantification over situations and is semantically akin to Hindi correlatives with *bhii*. The major insight in Cheng & Huang (1996) is preserved intact on the current account, namely that *wh*-conditionals are donkey conditionals and are open to a generic interpretation. The cross-linguistic comparison we provide also indicates that all natural languages draw from a basic ontology of pluralities and atoms that are operative for nominal quantification, though its realization is constrained by language-specific factors. This comparison between Chinese *wh*-conditionals, Hindi correlatives and English free relatives provides evidential support for the account of *wh*-conditionals presented in this study and sheds further light on the study of correlatives in general.

The paper is structured as follows. Section 2 discusses the (absolute) *unique* reading and definiteness effect of *wh*-conditionals. Section 3 surveys the problems concerning the novelty condition and Principle C that arose in previous analyses in which *wh*-phrases were analysed as genuine indefinites. A Russellian semantics for uniqueness and *wh*-indefinites is advanced in Section 4, and Section 5 applies this to Chinese *wh*-conditionals to (a) capture the uniqueness/definiteness effects and (b) reconcile the tension between the novelty condition and Principle C. Section 6 investigates the generic interpretations of *wh*-conditionals, taking into consideration certain modal implications (ignorance, indifference, and free choice). Section 7 sketches a unitary account for *wh*-conditionals. A full comparison between Chinese *wh*-conditionals and correlatives (with special reference to Hindi correlatives) is offered in Section 8, and Section 9 points out some residual issues.

## 2. Chinese *wh*-conditionals: definiteness and beyond

The seminal paper by Cheng & Huang (1996) contains a summary of the typical properties of one kind of conditional structure in Chinese. They call these ‘bare conditionals’ because they lack an overt conditional word like *ruguo* ‘if’ or an overt adverb of quantification (Cheng & Huang 1996:132). We shall refer to them as *wh*-conditionals. Here is the summary offered by Cheng & Huang:

- (1) Properties of *wh*-conditionals
  - a. The (donkey) anaphor must take the form of a *wh*-word.
  - b. The (donkey) *wh*-word must be identical to the *wh*-word in the antecedent clause.
  - c. There must be an element in the consequent clause referring back to the *wh*-word in the antecedent clause.

Typologically, Chinese *wh*-conditionals are exceptional because they require an identical *wh*-word in both clauses (sometimes called the ‘matching effect’). Even minor variations are unacceptable. Example (2) below illustrates a typical *wh*-conditional in Chinese, while (3) illustrates violations of the matching effect:

- (2) *Shei* xian lai, *shei* xian chi.  
 who first come who first eat  
 Lit.: ‘If X comes first, X eats first.’
- (3) a. \**Shei* xian lai, *shenme* ren xian chi.  
       who first come what person first eat  
       b. \**Shei* xian lai, *tongyang* de ren xian chi.  
       who first come the same DE person first eat

Cheng & Huang (1996) analyse *wh*-phrases in *wh*-conditionals as variable-denoting indefinites that are bound in *wh*-conditionals by a covert universal necessity operator, which provides universal quantificational force. According to Cheng & Huang, example (2) has the semantic representation in (4), where ‘x’ stands for the variable denoted by the *wh*-indefinites, and the universal quantifier is the semantic spell-out of a covert necessity operator. If the *wh*-conditional has multiple *wh*-indefinites, these are unselectively bound by the quantificational expression, as in Heim (1982) and Kamp (1981).

- (4)  $\forall_x (x \text{ comes first} \rightarrow x \text{ eats first})$  (Cheng & Huang 1996:132)

On the analysis by Cheng & Huang, (2) presumably means *everybody who comes first eats first*. This semantics has a plurality commitment. It is committed to multiple comers and eaters. However, intuitively (2) is true if for one particular situation, say at Ann’s birthday party, there turns out to be *exactly one* individual who comes first and eats first. Notice in this regard that, if there is *exactly one* man in the room, it is semantically odd to say something like *{Everybody in the room studies kangaroos.}* even if the one person studies kangaroos. Yet, as Kadmon (1990) has shown, donkey conditionals typically have a *unique* reading (e.g. *{If there is a doctor in London, he is Welsh.}* = Kadmon’s example (42)).

The *unique* reading of *wh*-conditionals correlates with the definiteness effect. The definiteness effect is illustrated in example (5), which shows that the *wh*-indefinite in the antecedent clause of a *wh*-conditional can be referentially linked to a *partitive* expression in the consequent clause:<sup>2</sup>

<sup>2</sup> Examples like (5) can be found in Google, and we have been found them to be acceptable to the native speakers we have consulted. We thank Hao Yin and Maggie Liao for their judgments.

- (5) *Shenme ban biao xian hao, shenme ban de san fen zhi yi jiu keyi de dao jiang li.*  
 what class perform well what class DE one third then can get  
 reward<sup>3</sup>  
 ‘One third of whatever class that perform(s) well will get a reward.’

Example (5) casts doubt on the idea that *wh*-indefinites in Chinese *wh*-conditionals are genuine indefinites, because the *wh*-phrase is used as the complement of a partitive with the form ‘NP of *wh*-NP’. According to the well-known Partitive Constraint, partitive structures prohibit a singular, ordinary indefinite from being used as the complement DP (cf. Jackendoff 1972, Barwise & Cooper 1981). The constraint is illustrated in (6).

- (6) \*most of *four girls*  
 \*two of *three students*  
 \*none of *some men*  
 \*each of *some professors*  
 \*one third of *some class*  
 \*the top ten of *some class*

The constraint dictates that the complement DP of a partitive must be a plural definite, as in (7).

- (7) all of *the boys*  
 two of *the students*  
 four of *the gifts you gave to Mary on Christmas*  
 many of *my friends*  
 one third of *the class*  
 the top ten of *the class that performs well*

Not surprisingly, ordinary partitives in Chinese show the same contrast, as indicated in (8).

- (8) a. *zhe-ge ban de yixie tongxue*  
 this-CL class DE some student  
 ‘some students of this class’

<sup>3</sup> Abbreviations used in this paper are as follows:

1SG: first person singular; 3PL: third person plural; ACC: accusative; ASP: aspect marker; AUX: auxiliary; CL: classifier; CL<sub>pl</sub>: plural classifier; CL<sub>sg</sub>: singular classifier; DAT: dative; DE: de; DEM: demonstrative; ERG: ergative; HAB: habitual; IMPERF: imperfective; LOC: locative; NEG: negative marker; OBL: oblique; PASS: passive; PERF: perfect; PFV: perfective; REL: relative; TOP-PRT: topic particle.

- b. \**yi-ge ban de yixie tongxue*  
     one-CL class DE some student  
     ‘some student of a class’
- c. \*/? *san-ge ban de qian shiming*  
     three-CL class DE top ten  
     ‘the top ten of three classes’

In view of the Partitive Constraint, the expression *shenme ban* ‘what class’ must be definite in examples like (5) above. Later we shall provide further evidence showing that *wh*-conditionals are semantically akin to free relatives (FRs), which are widely analysed as definite descriptions.

Another observation by Cheng & Huang supports our claim about definiteness. They observe that the existential word *you* ‘have’ can be inserted before the *wh*-phrase in the antecedent clause of a *ruguo*-conditional (*if*-conditional), but not in the antecedent clause of *wh*-conditionals. The following examples are from Cheng & Huang (see also Chierchia 2000).

- (9) a. *Ruguo you shei yao jian wo, ni jiu jiao ta deng yi deng.*  
         if have who want see me you then ask he wait a while  
         ‘If somebody wants to see me, please ask him to wait for me for a while.’
- b. (\**You*) *shei xian lai, shei xian chi.*  
         have who first come who first eat

The expression *you* ‘have’ is often analyzed as the overt realization of the existential quantifier in Chinese. Cheng & Huang attribute the oddness of (9b) to a semantic conflict between universal quantification and existential quantification. Since, on their analysis, the *wh*-phrases in *wh*-conditionals are variables bound by a universal necessity operator, examples (9b) and (10b) are both unacceptable for the same reason.

- (10) a. *You yi-ge ren zai huayuan li.*  
         have one-CL person at garden LOC  
         ‘There is a man in the garden.’
- b. \**You mei-ge ren zai huayuan li.*  
         have every-CL person at garden LOC  
         Intended: ‘There is every one in the garden.’
- (11) a. There is/are a man / two men in the garden.  
         b. \*There is everyman in the garden.

However, it should be noted that if *wh*-phrases are treated on a par with definite descriptions, as we have argued, then the oddness of (9b) is also explained. Definites are

incompatible with the existential *you*, as indicated in (12) and (13).

- (12) \*There is the man in the garden.
- (13) \*You zhe-ge ren zai huayuan li.  
 have this-CL man at garden LOC  
 ‘There is the man in the garden.’

To summarize. First, Chinese *wh*-conditionals are open to *unique* interpretations (e.g. *shei xian lai*, *shei xian chi* is true if there turns out to be *exactly one* individual who comes first and eats first). And second, Chinese *wh*-conditionals exhibit *definiteness effects*. These empirical observations suggest that, just like indefinites in donkey conditionals in English, *wh*-indefinites in Chinese *wh*-conditionals are *unique* indefinites. The issue is how the universal interpretation of *wh*-conditionals can be captured and to what extent a unitary treatment (for both the unique reading and universal reading) is possible, granted that Cheng & Huang’s seminal observation holds. Another puzzle is the matching effect. To explain this, Cheng & Huang propose a Parallelism Constraint on Operator Binding (PCOB):

- (14) Revised PCOB (Cheng & Huang 1996:139)  
 In a tripartite structure of quantification Q [A] [B], [X<sub>1</sub>, X<sub>2</sub>, ...X<sub>n</sub>] (where n≥1) are variables in A.  
 For every variable in A, there must be an identical variable in B.

According to (14), the examples (3a) and (3b) (i.e. *who comes first*, *what man eats first*, and *who comes first*, *the same person eats first*) are ruled out because the anaphoric elements in the consequent clauses are not *lexically identical* to the *wh*-indefinites in the antecedent. Later, we attempt to provide a more straightforward account of the matching effect.

### 3. The novelty condition and Principle C

As noted earlier, Cheng & Huang’s analysis of *wh*-phrases does not conform to the novelty condition proposed by Heim (1982). Ordinary indefinites introduce novel entities into the discourse, as example (15) indicates.

- (15) \*If a man<sub>i</sub> comes first, a man<sub>i</sub> eats first.

If *wh*-phrases are ordinary indefinites, then each *wh*-phrase should introduce a novel entity to the discourse. In Chinese *wh*-conditionals, however, the *wh*-phrase in the

antecedent and the one in the consequent are identical in reference. In short, the *wh*-phrase in the consequent of a conditional introduces a familiar referent, rather than a novel one. As Chierchia (2000:17) points out, this makes for an inconsistent semantics for *wh*-indefinites:

- (16) a. *wh*-words must introduce a novel variable in the antecedent of a conditional  
 b. *wh*-words must introduce a non-novel variable in the consequent of a conditional

To solve this paradox, Chierchia proposes that *wh*-indefinites in Chinese are indefinite pronouns (i.e. pronominals). A pronominal can be used as a discourse anaphor. A simple example is (17).

- (17) If a man<sub>i</sub> comes first, he<sub>i</sub> eats first.

This explains why *wh*-indefinites can appear in the consequent clause of *wh*-conditionals without violating the novelty condition. At first glance, this seems to be a reasonable solution. Some issues remain, however. First, if *wh*-phrases in Chinese are indefinite pronouns (i.e. pronominals), we expect them to always introduce a familiar discourse referent in both the antecedent of a conditional and in the consequent. But, a *wh*-phrase in the antecedent of a conditional does not seem to require a linguistic antecedent. On Chierchia's account, moreover, *wh*-phrases are expected to be subject to Principle B (because they are pronominals). However, *wh*-phrases in general appear to display Principle C effects. Consider the following examples:

- (18) a. *Shei<sub>i</sub> shuo ta<sub>i</sub> xihuan wo?*  
           who said he like me  
           ‘Who said he likes me?’ {John<sub>i</sub> said he<sub>i</sub> likes me, Peter<sub>j</sub> said he<sub>j</sub> likes me, ...}  
 b. *\*Ta<sub>i</sub> shuo shei<sub>i</sub> xihuan wo?*  
           he said who like me  
           ‘Who did he say likes me?’ {he<sub>i</sub> said John<sub>i</sub> likes me, he<sub>j</sub> said Peter<sub>j</sub> likes me, ...}

Example (18b) is a case of strong crossover. The contrast between (18a) and (18b) indicates that Chinese *wh*-phrases are r-expressions, rather than pronominals. The following examples adopted from Bruening & Tran (2006) constitute further support:

- (19) a. *\*Ta<sub>i</sub> shuo shei<sub>i</sub> xihuan wo meimei?*  
           he said who like my sister  
           ‘Who did he say like my sister?’  
 b. *Ta<sub>i</sub> zongshi shuo \*shei<sub>i</sub> / ta<sub>i</sub> xihuan wo meimei.*  
           he always said who he/she like my sister  
           ‘He<sub>i</sub> always says \*who<sub>i</sub>/he<sub>i</sub> likes my sister.’



- c. *Shei<sub>i</sub> (yaoshi) shuo ta<sub>i</sub> / \*shei<sub>i</sub> xihuan wo meimei, wo jiu zou ta.*  
 who (if) say he who like my sister I then hit he  
 ‘If somebody<sub>i</sub> says he<sub>i</sub>/\*who<sub>i</sub> likes my sister, I will hit him.’

As the examples in (18) and (19) indicate, we face a dilemma. On one hand, if *wh*-phrases are pronominals, as on Chierchia’s proposal, then we require an explanation of why *wh*-phrases display Principle C effects. On the other hand, if *wh*-phrases are not pronominals, we need to explain why *wh*-phrases in the consequent clause remain anaphorically linked to *wh*-phrases in the antecedent.

This leaves us to address the following unresolved issues.

1. How to capture the uniqueness/definiteness effect of *wh*-conditionals?
2. How to reconcile the tension between the novelty condition and Principle C? On the one hand, *wh*-indefinites in the consequent clause behave like pronominals, but ordinary *wh*-indefinites display Principle C effects like r-expressions.
3. What is the typological status of Chinese *wh*-conditionals?

We shall discuss 1 and 2 next. In discussing 3, we demonstrate some striking similarities between Chinese *wh*-conditionals and correlatives (our focus will be on Hindi correlatives). We contend that Chinese *wh*-conditionals are typologically linked to correlatives. This is the topic of the last section of the paper.

#### 4. Indefinites and uniqueness

The definite reading of *wh*-conditionals is most apparent when a unique referent is being established. The *uniqueness* effect is evident in the example in (20), where the interlocutors A and B are discussing next year’s U.S. presidential election.

- (20) A: *Shei neng huanjie shiye, wo jiu xuan shei.*  
 who can alleviate unemployment I then vote who  
 Lit.: ‘Who can alleviate unemployment, I then vote for whom.’  
 B: *Ni xuan shei?*  
 you vote who  
 A: *Wo xuan Obama.*  
 I vote Obama  
 a. #I will vote for everyone that can alleviate unemployment.  
 b. I will vote for whoever can alleviate unemployment.

In example (20), the particular situation under discussion is the presidential election.

The use of a *wh*-conditional is felicitous in this situation. But notice that A's remark in (20) cannot mean {*I will vote for everyone that can alleviate unemployment.*}. Voters can cast a ballot for *only one* candidate. So, the semantic counterpart of A's remark in (20) is an *-ever* Free Relative (as in (20b)), rather than a structural representation with a universal quantifier (as in (20a)).

Free Relatives (FRs) are definite descriptions that denote maximal entities. FRs can either be singular (e.g. *the thing the babysitter tells you*) or plural (e.g. *the sum of the things that the babysitter tells you*) (cf. Jacobson 1995, Dayal 1997, among others). In (20A), the *wh*-indefinite picks up a singular individual. But *wh*-indefinites can also pick up a maximalized individual. To see this, recall the example *shenme ren xian lai, shenme ren xian chi* 'what person/people first come, what person/people first eat'. Suppose there are three persons, Li Si, Ma Liu, and Zhang Qi, who simultaneously arrive first at the party. Then the sentence in question is true if and only if all the people that come first also eat first. However, not all *wh*-indefinites can pick up a (plural) maximalized individual, just as not all *wh*-indefinites can be anaphorically linked to a partitive. *Wh*-indefinites of some kinds can be, such as ones of the form 'which-CL<sub>PL</sub> NP' (when followed by a collective noun), but other *wh*-indefinites cannot be anaphorically linked to a partitive, such as *shei* 'who'. Witness the following contrast between (21) and (22).

- (21) \**Shei xian lai, shei zhongjian de sanfenzhiyi jiu keyi chi dangao.*  
 who first come who among DE one-third then can eat cake  
 Lit.: 'Who first come, one third of who can eat the cake.'
- (22) *Shenme ren xian lai, shenme ren zhongjian de sanfenzhiyi*  
 what person first come what person among DE one third  
 jiu keyi chi dangao.  
 then can eat cake  
 Lit.: 'What person first come, one third of what person then can eat the cake.'

Whether a *wh*-phrase can be entered into a partitive construction ('NP of *which*-NP') or not depends on the type of classifier (singular or plural) and the type of head noun (collective or atomic). A *which*-phrase with a plural classifier or a collective noun can always enter into a partitive construction.

In Chinese, when the classifier *ge* is used, the whole NP picks out a singular entity, and when *xie* is used, the NP picks out a plural entity. Examples (23)-(24) indicate that the distinction between singularity/plurality of *wh*-phrases is lexicalized to some extent.

- (23) \**Na-ge ren xian lai, na-ge ren zhongjian de sanfenzhiyi*  
 which-CL<sub>sg</sub> person first come which-CL<sub>sg</sub> person among DE one-third  
*jiu keyi chi dangao.*  
 then can eat cake
- (24) *Na-xie ren xian lai, na-xie ren zhongjian de sanfenzhiyi*  
 which-CL<sub>pl</sub> person first come which-CL<sub>pl</sub> person among DE one-third  
*jiu keyi chi dangao.*  
 then can eat cake

Table (25) shows some basic number (singular/plural) typology for *wh*-phrases in Chinese.

- (25) Singular/Plural distinction and Chinese *wh*-phrases

<i>wh</i> -phrases	Plural	Singular	Notes
<i>shei</i> ‘who’	✗	✓	
<i>na-ge</i> ‘which-CL <sub>sg</sub> ’	✗	✓	
<i>na-xie</i> ‘which-CL <sub>pl</sub> ’	✓	✗	
<i>na-li</i> ‘where’	✗	✓	
<i>shen-me</i> ‘what’	✓	✓	Depending on the head noun and context

So, the complement DP of a partitive must be a plural definite. It is reasonable to assume that, for Chinese, the basic ontological distinction between plurality/singularity is operative, despite the fact that Chinese lacks productive number morphology in nominal quantification.

It appears that Cheng & Huang’s semantic representation assigned to *wh*-conditionals only captures half the story. According to Cheng & Huang’s semantic representation in (27), (26) is true in a model where more than one person comes first and eats first. However, Chinese speakers also judge (26) to be true in a model where there is *exactly one* person who comes first and eats first. As we have just shown, this is because *shei* ‘who’ tends to pick out a singular entity rather than a plural one.

- (26) *Shei xian lai, shei xian chi.*  
 who first come who first eat  
 ‘If X comes first, X eats first.’

- (27)  $\forall_x (x \text{ comes first} \rightarrow x \text{ eats first})$

The fact that (26) is true in a model where there is *exactly one* individual indicates that we should include uniqueness into the semantics of *wh*-conditionals, as in (28). This amounts to saying that the definite effect of *wh*-conditionals is related to *uniqueness*.

(28) *Shei xian lai, shei xian chi.*

is true in a model where there is a unique individual who comes first and eats first.

In the literature, it has been reported that *in certain circumstances* an indefinite can have a unique reading (cf. Evans 1980, Kadmon 1990, among others). Kadmon (1990) notices that the uniqueness effect is associated with singular cross-sentential anaphora:

‘suppose I need to borrow a chair [...] Leif has ten identical chairs, and he is willing to lend any of them. You can now say [(29)] to me [...] In this situation, the NP *a chair* does not refer to a unique chair [...] when anaphora is attempted, however, the uniqueness effect always shows up. Consider [(30)] in the same situation, and be sure that you are completely unable to distinguish any one of Leif’s chairs from his other chairs. [...] Many speakers cannot use [(29)] in such a situation [...] [(30)] is only felicitous [...] [if] they are referring to a chair which is uniquely identified by some property’ (Kadmon 1990:279-280).

(29) Leif has a chair.

(30) Leif has a chair. It is in the kitchen.

There are multiple ways to encode uniqueness into the semantic representation. We follow Brasoveanu (2007, 2008), who adopts a Russellian treatment. The Russellian analysis of definites consists in presuppositions of *existence*, *maximality*, and *singleton*. This is demonstrated below:

(31) The chair Leif brought is wobbly.

(32)

$$\underbrace{\exists x (\text{chair}(x) \ \& \ \text{brought}(x, \text{Leif}))}_{\text{existence}} \ \& \ \underbrace{\forall y (\text{chair}(y) \ \& \ \text{brought}(y, \text{Leif}) \rightarrow y=x)}_{\substack{\text{maximality} \\ \text{singleton}}} \ \& \ \text{wobbly}(x)$$

uniqueness

In set-theoretic terms, (32) can be rewritten as (33):

(33)  $\underbrace{\exists X (X \neq \emptyset \ \& \ X = \{y: \text{chair}(y) \ \& \ \text{brought}(y, \text{Leif})\})}_{\text{existence}} \ \& \ \underbrace{\#X=1}_{\substack{\text{maximality} \\ \text{singleton}}} \ \& \ \text{wobbly}(X)$

uniqueness

In (33), the singleton is contributed by the singular morphology. The presuppositions of *existence*, *maximality*, and *singleton* give rise to a uniqueness reading. We propose the *wh*-phrases in *wh*-conditionals are unique indefinites, with two semantic components, existence and maximality. Unlike English, Chinese lacks the morphology to mark number specification in nominal quantification, so whether a *wh*-phrase denotes a singleton or a plurality is left either to the context or to the lexical semantics of *wh*-phrases, as illustrated in (34) and (35).

*A wh-phrase denotes a singleton:*

- (34) Shei xian lai  
 $\exists X [X \neq \emptyset \ \& \ X = \{y: \text{person}(y) \ \& \ \text{first\_comes}(y)\} \ \& \ \#X=1]$   
existence
maximality
singleton  
uniqueness

*A wh-phrase denotes a plurality:*

- (35) Na-xie ren xian lai  
 which-CL<sub>pl</sub> person first come  
 $\exists X [X \neq \emptyset \ \& \ X = \{y: \text{person}(y) \ \& \ \text{first\_comes}(y)\} \ \& \ \#X > 1]$   
existence
maximality
plural

When the *wh*-phrases denote a plurality, a maximality operation turns the plurality into a maximized individual, in the spirit of proposals by Link (1983) and Grosu & Landman (1998). In lattice-theoretic terms, if *a* and *b* are individuals, then the sum of *a* and *b* (written as  $a \oplus b$ ) is also an individual. If *a*, *b*, and *c* are individuals, the sum of *a*, *b*, and *c* (written as  $a \oplus b \oplus c$ ) is also an individual, and so on. The technical details are immaterial here (see Link 1983, Grosu & Landman 1998). For our purposes, we simply propose the following definition of the maximality operation:

- (36) For any poset (partially order set)  $X = \langle X, \leq \rangle$ ,  $\text{MAX}(X) = \text{sup}(X)$ , where  $a \leq b$  iff  $a \oplus b = b$

The  $\text{sup}(X)$  is the least upper bound of *X*. Example:

- (37)  $X = \{a, b, c\}$   
 $a \leq a \oplus b, b \leq a \oplus b, c \leq a \oplus c, a \oplus b \leq a \oplus b \oplus c, a \oplus c \leq a \oplus b \oplus c, b \oplus c \leq a \oplus b \oplus c$   
 $\text{sup}(X) = a \oplus b \oplus c$

The MAX operation always returns a plural individual. In this sense it is still *singular*,

and the *wh*-phrases generate a unique reading. Kadmon (1990) offers examples that show that uniqueness is related to maximal collections. In (38), for example, the plural pronoun *they* refers to the maximal collection of the chairs that Leif owns.

- (38) Leif has *four chairs*. *They / Three of them* are in the kitchen. (Kadmon 1990, ex. (24))

This uniqueness-based account offers a straightforward explanation for the definiteness effect in Chinese *wh*-conditionals. Our analysis predicts that (39) is ambiguous; it allows both the distributive reading and collective reading.

- (39) *Shenme ban biao xian hao, shenme ban de san fen zhi yi jiu keyi de dao jiang li.*  
 what class perform well what class DE one-third then can get reward  
 ‘One third of whatever class(es) that perform well get(s) a reward.’

On the distributive reading, example (39) means for *each* class that performs well, one third of its members will be rewarded. On the collective reading example (39) is compatible with the situation that for some class, none of its members get rewarded, while for some other classes, all of the members get rewarded. It should be noted however that not all Chinese *wh*-conditionals display this ambiguity. When a different *wh*-phrase is used, the ambiguity disappears. Example (40) lacks the ambiguity.

- (40) *Na-ge ban ji biao xian hao, na-ge ban ji de san fen zhi yi jiu keyi de dao jiang li.*  
 which-CL<sub>sg</sub> class perform well which-CL<sub>sg</sub> class DE one-third then can  
 get reward  
 ‘One third of whichever class that performs well gets a reward.’

The difference between (39) and (40) is that the expression ‘what class’ in (39) can be either singular or plural, whereas ‘which-CL<sub>sg</sub> class’ in (40) can only be singular. The difference is not marked by number morphology, but is lexicalized.

## 5. Identity in *wh*-conditionals

We have shown the definiteness effect can be captured by assuming that *wh*-indefinites encode uniqueness, as illustrated in (41). However, two difficulties remain. First, a *wh*-conditional always involves a pair of matching *wh*-phrases. How can we account for the matching effect in Chinese *wh*-conditionals like (42)? Second, indefinites are subject to the novelty condition. Why, then, does the novelty condition fail to apply?

(41) Leif has a chair. *It* is in the kitchen.

(42) *Shei* xian lai,    *shei* xian chi.  
who first come who first eat

We start by dealing with the novelty condition. Consider example (43).

(43) An American president won a Nobel prize in economics and an American president won a Nobel prize in peace.

A natural interpretation of (43) is that there are two distinct American presidents, one who won a Nobel prize in peace and the other who won a Nobel prize in economics. Why cannot one and the same American president have won both prizes? We propose that this is a reflection of the pragmatic Principle of Cooperation and its submaxim of informativeness. First, compare (43) and (44). Notice that if (44) is true, then so is (43).

(44) An American president won a Nobel prize in economics and a Nobel prize in peace.

What links (44) and (43) is an asymmetric entailment, which we shall define as follows:

(45) A proposition *p* asymmetrically entails a proposition *q* iff  $\forall s (s \in p \rightarrow s \in q)$

The definition says that *p* asymmetrically entails *q* iff whenever *p* is true, *q* must be true, but not vice versa. It is easy to see that (44) asymmetrically entails (43).

Now suppose that *exactly one* man came in and sat down. As in the previous examples, this entails (46).

(46) A man came in and a man sat down.

So, if the speaker knows that if the same person performs both actions, the Principle of Cooperation would compel him/her to use (47) instead of (46).

(47) A man came in and sat down.

When the hearer hears (46), he must assume, by virtue of the Principle of Cooperation, that the speaker conveys certain information that is not expressed by (47), otherwise the speaker would use the more *informative* (47) instead. This ‘missing’ information not conveyed is that the second indefinite expression in (46) introduces a novel entity into the discourse. If the second indefinite expression introduces a previously mentioned

entity into the discourse, this violates the Principle of Cooperation. We derive the novelty condition using the implicature of disjointness:

- (48) Implicature of Disjointness  
 ‘[a/some NP<sub>1</sub> Φ, a/some NP<sub>2</sub> Ψ]’ where NP<sub>1</sub> and NP<sub>2</sub> are identical in form and NP<sub>1</sub> does not c-command NP<sub>2</sub> is infelicitous if ‘[A/some NP<sub>3</sub> Φ & Ψ]’ asymmetrically entails ‘[A/some NP<sub>1</sub> Φ, a/some NP<sub>2</sub> Ψ]’ in the case NP<sub>3</sub>, NP<sub>1</sub> and NP<sub>2</sub> are identical in form.

Notice, however, that (48) says nothing about *wh*-indefinites and *wh*-conditionals in Chinese. Obviously, *wh*-conditionals violate (48), since the *wh*-indefinites in the antecedent and consequent clauses are not only identical in form, but also identical in reference.

A straightforward solution to this dilemma is to treat *wh*-conditionals in Chinese as identity statements. This provides us with a way to reconcile the tension between the novelty condition and Principle C. Overt identity statements are immune to the novelty condition, as the examples in (49) illustrate.

- (49) a. *A man* who drinks alcopops is *a man* who gets a hangover.  
 b. Cicero is Tully.  
 c. That is Uncle Bob (pointing to a picture)

In (49a), the first occurrence of the indefinite ‘a man’ does not c-command the second. However, the novelty condition does not apply, and the indefinite expressions assume identity of reference. We assume that in identity statements, the novelty condition is *overridden* because there is an overt identity operation that forces expressions to pick up the same referent. In other words, the novelty condition is an *Elsewhere Condition* (EC) which applies only when it can.

We already proposed that *wh*-indefinites encode uniqueness, just as indefinites do in donkey conditionals. Following Link (1983) and Grosu & Landman (1998), we propose the antecedent *wh*-indefinites are subject to a  $\sigma$ -operation, where  $\sigma$  stands for uniqueness:

- (50) *Shei* xian lai, *shei* xian chi.  
 who first come who first eat  
 The antecedent:  $\llbracket \text{shei xian lai} \rrbracket = \sigma x. \text{person}(x) \ \& \ \text{first\_comes}(x)$

A covert identity operation applies to the *wh*-indefinite in the consequent clause, giving rise to the identity reading, as in (51).



- (51) *Shei xian lai, shei xian chi*  
[who first come]<sub>x</sub> λx [first eat [σy [person (y) & y=x]]]<sup>4</sup>

On the proposed account, the antecedent *wh*-indefinite *shei* (*xian lai*) ‘the *unique* person who comes first’ binds the variable *x* by  $\lambda$ -abstraction. The *wh*-anaphor is interpreted as a definite description, introducing variable *x*, that is identical to the one previously introduced in the antecedent.

It has been proposed since Cooper (1979) that donkey anaphors should be interpreted as generalized D-type pronouns (cf. Heim & Kratzer 1998, Elbourne 2005). The D-type pronouns contain both a definite description and a free relation variable R which helps fix the referent of the definite description. Cooper assumes R is provided by pragmatic saliency. This idea has been challenged by Heim (1990), who observes that donkey anaphora is subject to a condition which she dubs the Formal Link Condition. According to this condition, donkey anaphors requires an explicit linguistic antecedent (e.g. *every man who has a wife is sitting next to her* vs. *\*/?every married man is sitting next to her*).<sup>5</sup>

Chinese *wh*-conditionals constitute supporting evidence for the D-type pronoun analysis of donkey anaphors. Instead of looking for **any** linguistic antecedent, the *wh*-anaphor looks for an **identical** antecedent in order to fix its referent. This analysis yields the correct semantics for *wh*-conditionals, as indicated in the following derivation.

- (52) a. the antecedent:  $\llbracket \text{shei xian lai} \rrbracket = \sigma x. (\textbf{person}(x) \ \& \ \textbf{first\_comes}(x))$   
 b. the *wh*-anaphor:  $\llbracket \text{shei (xian chi)} \rrbracket = \sigma y. (\textbf{person}(y) \ \& \ y = x \ \& \ R(y))$   
 c.  $R \rightarrow \lambda x. \textbf{first\_comes}(x)$   
 d. (after identity operation) the *wh*-anaphor:  $\llbracket \text{shei (xian chi)} \rrbracket = \sigma x. (\textbf{person}(x) \ \& \ \textbf{first\_comes}(x))$   
 e. the consequent:  $\lambda z. \textbf{first\_eats}(z) (\sigma x. (\textbf{person}(x) \ \& \ \textbf{first\_comes}(x)))$   
                $= \textbf{first\_eats}(\sigma x. (\textbf{person}(x) \ \& \ \textbf{first\_comes}(x)))$   
 f.  $\llbracket [\text{shei xian lai}, \text{shei xian chi}] \rrbracket = 1 \textit{ iff}$   
     the unique individual who comes first is the unique individual who eats first

On the proposed account, *wh*-conditionals are semantically akin to free relatives in English. Despite the structural differences, Chinese *wh*-conditionals and English free

<sup>4</sup> BE of identity:  $\lambda X \lambda Y [X=Y]$ , where  $\text{type}(X) = \text{type}(Y)$

Leibniz's Law of Identity: 'X = Y' is true iff every predicate that is true of X is also true of Y.

<sup>5</sup> Patel-Grosz & Grosz (2010) distinguish strong pronouns from weak pronouns (e.g. German demonstrative pronouns vs. personal pronouns). According to them, English donkey pronouns are parallel to referential pronouns, and are contextually resolved by means of saliency/accessibility of an antecedent in the sense of Cooper (1979). Only the strong pronouns are subject to a (strict) Formal Link Condition.

relatives share a common semantics. Attesting to this is the fact that English free relatives can be translated as identity statements (cf. Moltmann 2010):<sup>6</sup>

- (53) Whoever comes first eats first  
       = the first comer is the first eater  
 I don't like whatever you bought  
       = the thing(s) you bought is(are) the thing(s) I don't like

There is independent support for this analysis. The pair of *wh*-indefinites in Chinese *wh*-conditionals are not only identical in reference, but they are also identical in form and number. This 'matching requirement' follows for free on the present account. We assume without the copula to mark identity in Chinese *wh*-conditionals, identity of form is a prerequisite to identity of reference. Even minor variations are unacceptable, as shown in (54):

- (54) a. \**Shei* xian lai,    *shenme ren*    xian chi.  
           who first come what    person first eat  
       b. \**Shei* xian lai,    *tongyang de ren*    xian chi.  
           who first come the same Nom person first eat

Not surprisingly, we find the same form-matching restriction is also operative in English identity statements. Consider the following examples:

- (55) a. \*/? *A man* who drinks alcopops is *someone* who gets a hangover.  
       b. \*/? *A man* who drinks alcopops is *the same person* who gets a hangover.  
       c. \*/? *A man* who drinks alcopops is *the man* who gets a hangover.

To summarize, the identity relation is responsible for the identity in reference between the *wh*-indefinites and the inapplicability of the novelty condition in *wh*-conditionals. This identity reading renders *wh*-conditionals semantically akin to identity statements.

This analysis faces potential problems, however. For one thing, *wh*-conditionals do not resemble other identity statements, which typically involve the copula.<sup>7</sup> In Chinese,

<sup>6</sup> A reviewer correctly points out that the structural differences between Chinese *wh*-conditionals and English free relatives may be superficial. Citko (2001) proposes that in a simple free relative like {*John ate what Mary cooked.*}, the single instance of *what* is an argument of both *ate* and *cooked*. However, due to *Deletion under Identity*, the lower copy *what* gets deleted at PF. The difference between Chinese and English, viewed in this light, is unlike English, the two copies of the *wh*-indefinite must stay at PF in Chinese. We thank the anonymous reviewer for bringing this to our attention.

<sup>7</sup> Again, we thank one of the anonymous reviewers for this observation.

a prototypical identity statement is marked by the copular *shi*, as in (56).

- (56) Ta/Nei-ge ren shi Zhang San.  
 he/that-CL person be Zhang San  
 'He/That person is Zhang San.'

However, the expression *shi* (and its ilk, including *jiu-shi*) is generally disallowed in *wh*-conditionals, regardless of the position of the *wh*-anaphors:

- (57) a. \**Shei* xian lai, (jiu) *shi shei* xian chi. (subject *wh*-anaphor)  
           who first come jiu be who first eat  
       b. \**Shei* xian jinlai, (jiu) *shi wo* xian da *shei*. (object *wh*-anaphor)  
           who first come-in jiu be I first beat who

At first glance, this fact may seem to undermine our claim that *wh*-conditionals are identity statements. But there are independent reasons why the copular *shi* cannot be inserted in *wh*-conditionals.

A combination of semantic and syntactic factors conspire to prohibit *shi* from appearing in *wh*-conditionals. Instead of being the marker for identity, Chinese copular *shi* has an additional predicate-creation function. Tham (2008) proposes that in equative copular sentences, *shi* is the lexical realization of the type-shifting *pred* in the sense of Chierchia (1998) and Partee (1986). Its major function is to map entities to their corresponding properties. Tham suggests that in equative copular sentences, both the pre-copular and the post-copular arguments are referential, i.e. of type *e*. When *shi* is combined with an argument of type *e*, this creates a predicate of type  $\langle e, t \rangle$  which can be properly combined with another entity of type *e*. To illustrate:

- (58) [The richest man in the city]<sub>e</sub> [*is* Lee Kar-shing] <sub>$\langle e, t \rangle$</sub> . (Tham 2008:63)  
 (59) Nominal Predicativization (ibid.: 69)

All noun phrases may combine with the copular to form a predicative VP [<sub>shi</sub> NP]<sub>VP</sub> whose denotation is *pred* (NP), where *pred* is a function that takes referential entities to their corresponding properties.

If Tham is on the right track, we have an explanation for why *shi* cannot appear in *wh*-conditionals. The consequent clause of *wh*-conditionals is propositional, not of type *e*. If so, predicate-creation using *shi* is not needed for *wh*-conditionals.

It is also reassuring for our analysis to observe that, across languages, identity statements do not require the copular. For example, den Dikken (2006) proposes that the copula in English performs double duties: it is both a supporter of tense, aspect, and agreement and it is a linker. However, he observes that when an NP occupies a TP-

external topic position, the copula cannot occur. This happens in Hungarian. The following example is den Dikken's example (95) in Chapter 5.

- (60) a. (\*van) Janos (\*van) a legjobb diak (\*van)  
           is Janos is the best student is  
       b. (\*van) a legjobb diak (\*van) Janos (\*van)  
           is the best student is Janos is

As (60) indicates, the third-person singular present-tense form 'be' — that is, *van* — may not surface, no matter where it is placed and regardless of the relative order of subject and predicate. den Dikken attributes this to the fact that, unlike English, Hungarian is discourse-prominent, such that the prime determinants of word order are information-structural properties. Like Hungarian, Chinese is a discourse-prominent language. In a topic-comment construction, when the pragmatics/discourse is clear about the relationship between the topic and comment, the copular *shi* is not needed, even if two referring expressions have the same reference. Here is an illustration.

- (61) Situation: Two students are talking about a particular individual, Zhang San  
       a. Zhang San (a), ta xian chi.  
           Zhang San TOP-PRT he first eat  
           'As for Zhang San, he first eats.'  
       b. \*Zhang San (a), shi ta xian chi.  
           Zhang San TOP-PRT be he first eat  
       c. ?Zhang San (a), jiu SHI ta xian chi.  
           Zhang San TOP-PRT jiu be he first eat

Example (61) indicates that when the referential link between Zhang San and *ta* 'he' is clear from the context, *ta* refers back to Zhang San, and the copular *shi* is not required. If *shi* is inserted, an additional focus effect is introduced, and the copula is stressed. In most such cases, *jiushi*, rather than *shi*, is preferred.

The present considerations have encouraged us to seek a novel syntactic analysis for *wh*-conditionals. Based on a comparison of structures across languages, we have reached the tentative conclusion suggesting that *wh*-conditionals are topic-comment structures, in which the antecedent *wh*-indefinite is the topic, and the comment is included in the consequent clause.<sup>8</sup> We believe this analysis is on the right track, for several reasons. First, treating *wh*-conditionals as topic-comment structures permits us to derive the identity in reference between the *wh*-indefinites, thereby resolving the

<sup>8</sup> This may also help explain the source of uniqueness, i.e. topical elements are always definite in some sense. We leave this issue open in this study.

tension between the novelty condition and Principle C. Second, the analysis provides a motivated explanation for the matching requirement in *wh*-conditionals. On this analysis, the *wh*-indefinite antecedents are *topics*, and indefinites cannot be marked as topics (due to *wh*-morphology): ‘the intuitive idea is that topic-comment sequencing presupposes that the comment is about the topic. It requires ... every topical discourse referent introduced in the topic updated to be picked up by an anaphoric element in the comment update’ (Bittner 2001). This also proves to be the case for *wh*-conditionals, i.e. the anaphoric *wh*-phrase cannot be omitted:

- (62) a. *Shei* xian lai, (\**shei*) xian chi.  
           who first come    who first eat  
       b. *Shei* xian lai,    wo da (\**shei*).  
           who first come I    beat who

This move to treat *wh*-conditionals as topic-comment structures is welcomed by recent crosslinguistic research. Recently, it has been frequently proposed that conditionals in general are topic-comment constructions (cf. Lewis 1973, Bittner 2001, Schlenker 2004, Ebert, Endriss & Hinterwimmer 2008, among others). By treating *wh*-conditionals as topic-comment structures, we are able to link *wh*-conditionals with correlatives, which are widely assumed to be topic-comment structures (Bittner 2001). Correlatives are composed of a left-adjoined relative clause that contains a *wh*-indefinite, and a main clause that contains a demonstrative pronoun. Like Chinese *wh*-conditionals, the *wh*-indefinites and the demonstrative pronoun (a strong pronoun) are identical in reference, and a copula cannot be inserted between the relative clause and the main clause in correlatives. We postpone the remainder of our typological discussion to the final section.<sup>9</sup>

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<sup>9</sup> Analyzing *wh*-conditionals as topic-comment structures also explain the asymmetry between the identity statements ‘X is Y’ and ‘Y is X’. As a reviewer points out, if identity conforms to Leibniz’s Law, then ‘X is Y’ should be logically equivalent to ‘Y is X’. However, this does not seem to be the case for *wh*-conditionals. The following two sentences are not judged to be semantically identical:

- (i) a. *Shei* xian lai, *shei* xian chi.  
       b. # = *Shei* xian chi, *shei* xian lai.

We think, however, that the asymmetry is due to discourse/pragmatic factors of topic-comment structures. Despite identity in reference, there is a temporal ordering between topical and comment expressions. The topical elements are always given information, and the comments provide new information. Conceptually, new information follows given information. Any juxtaposition of these, therefore, leads to a conceptual conflict in information structure, as illustrated by the asymmetry between (ia) and (ib).

## 6. On the generic interpretation of *wh*-conditionals

So far we have looked at cases in which *wh*-conditionals like *shei xian lai*, *shei xian chi* ('who comes first, who eats first') are used to refer to a particular situation. In this case, *wh*-conditionals have the absolute *unique* reading in the sense of Kadmon (1990). However, *wh*-conditionals are also open to a generic interpretation. For example, *shei xian lai*, *shei xian chi* could also refer to a general phenomenon: for each case, the first comer is the first eater and for different cases, there are (presumably) different individuals involved. In this section, we propose that *wh*-conditionals have additional features when used as general statements and that these added features support our claim that *wh*-conditionals should be treated on a par with FRs.

### 6.1 The ignorance implication

*Wh*-conditionals have ignorance implications (i.e. the speaker/agent expresses epistemic uncertainty about the identity of the referent denoted by the *wh*-phrase or, more plainly, the speaker/agent does not know *who* has the property P). This is depicted in (63).

- (63) a. *Shei xian lai*, *shei xian chi*.  
           who first come who first eat  
       b. *The person who comes first eats first, but I don't know who will be the one that comes first.*

Two linguistic tests reveal this ignorance reading: (a) the *namely* test, and (b) the copular test. First consider the *namely* test (cf. Dayal 1997). When a phrase meaning 'namely' (which is to identify the referent denoted by the *wh*-phrase) is being inserted in a *wh*-conditional, the sentence becomes odd, as shown by (64):

- (64) *Shei xian lai*, (\**wo zhidao shi Zhang San*), *shei xian chi*.  
           who first come I know be ZS who first eat

In (64), '*wo zhidao shi Zhang San*' ('I know it is Zhang San') is used to identify the referent denoted by the *wh*-phrase. (64) is bad. The copular test also indicates *wh*-conditionals have some ignorance implication (cf. Condoravdi 2005):

- (65) a. *Huangdi xuanze-le na-ge nühai*, *na-ge nühai jiu hen buxing*.  
           emperor choose-ASP which-CL girl which-CL girl then very unlucky  
           'Whichever girl/whoever that is chosen by the emperor is very unlucky.'

- b. \*Huangdi xuanze-le    *na-ge*    *nūhai*, *na-ge*    *nūhai* jiu    shi Anni.  
 emperor choose-ASP which-CL girl    which-CL girl then be Annie  
 Lit.: ‘Whichever girl/whoever that is chosen by the emperor is Annie.’

This ignorance implication is reminiscent of that of English singular *-ever* FRs. (66) are from Dayal (1997) and (67) are adopted from Condoravdi (2005):

- (66) a. \*Whatever Mary is cooking, namely ratatouille, has tons of onions.  
 b. Whatever Mary is cooking — be it ratatouille, latkes, or goulash — has tons of onions.
- (67) a. The book Mary likes was *Language Acquisition*.  
 b. \*Whatever book Mary likes was *Language Acquisition*.  
 c. Whatever book Mary likes was certainly not *Language Acquisition*.

## 6.2 The indifference implication

*Wh*-conditionals also have implications of indifference. That is, the speaker/agent does not care *who* has the property under consideration. Example (68a) reveals such an implication, as represented in (68b).

- (68) a. *Shei* zuihou lai    wanhui, *shei* xi    wan.  
           who last    come party    who wash dish  
 b. *the person who arrives last for the party washes the dishes*  
     *Counterfactual implication: it could be anyone else that washed the dishes if he*  
     *was the last person for the party.*

Example (69) is suggestive of the semantic similarity between *wh*-conditionals and *-ever* Free Relatives in English:

- (69) a. Whoever arrived last for the party washes the dishes.  
 b. *the person who arrived last for the party washes the dishes*  
     *Counterfactual implication: it could be anyone else that washed the dishes if he*  
     *was the last person for the party.*

## 6.3 Free choice implication

*Wh*-conditionals also have some free choice implication *under certain circumstance*. Consider the following example:

Context: the university requires 50 credits for a bachelor’s degree, and Mary has

already got 47 credits. To fulfill the university's requirement, Mary has to get 3 more credits. There are three courses Mary can register for for this purpose. Each course has 3 credits. The following sentence is felicitous in this situation:

- (70) Ni xuan *na-men kecheng*, *na-men kecheng* jiu keyi rang ni biye.  
you choose which-CL course which-CL course then can let you graduate  
'Whichever course you take can let you graduate.'

Again, English *-ever* FRs also have this semantic feature:

- (71) a. Any course you take can let you fulfill the university's requirement. =  
b. Every course you (may) take can let you fulfill the university's requirement.

To summarize, *wh*-conditionals carry modal implications, as listed in (72).

- (72) a. **ignorance**: the speaker/agent does not know the referent denoted by the *wh*-phrase  
b. **indifference**: the speaker/agent does not care about the referent denoted by the *wh*-phrase  
c. **free choice**: there is freedom of choice over the domain of individuals denoted by the *wh*-phrase

## 6.4 Deriving the generic/universal interpretation

Although *wh*-indefinites still introduce some *unique/exactly one* individual, it seems clear that this *unique* individual is being relativized to worlds/situations in this case. The truth condition of (68a) can be illustrated by (73), for instance:

- (73) For any party, the speaker believes the following holds:  
If, Zhang San arrives last for the party, Zhang San washes the dishes  
Li Si arrives last for the party, Li Si washes the dishes  
Wang Wu arrives last for the party, Wang Wu washes the dishes  
Ma Liu arrives last for the party, Ma Liu washes the dishes  
Zhang San and Li Si arrive last for the party, Zhang San and Li Si wash the dishes  
...

This closely aligns *wh*-conditionals with *-ever* Free Relatives (FRs) in English. Dayal (1997) argues that *-ever* FRs in English always involve some universal quantification over identity alternatives to the worlds of evaluation. She proposes that a typical *-ever* FRs in English have the following semantics:<sup>10</sup>

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<sup>10</sup> von Stechow (2000) proposes a slightly different analysis for *-ever* FRs. He notices that some



- (74) Whatever Mary is cooking uses onions.
- (75) a.  $\text{Whatever}_j [\text{IP} [\dots t_j \dots]] = \lambda Q. \forall i \in f(w)(s) [Q(i) (\lambda x. P(x)(i))]$  where  $P$  is the property derived by abstracting away  $x_j$  in the IP denotation  
 b.  $f(w)(s) = \{w' : \forall p [s \text{ believes } p(w) \rightarrow p(w')]\}$  for a world of evaluation  $w$  and speaker  $s$ ,  $f(w)(s)$  is the set of worlds in which the speaker's beliefs about  $w$  hold  
 c. A world  $w' \in f(w)(s)$  is an identity alternative iff there exists a  $w'' \in f(w)(s)$  such that  $\lambda x. P(w')(x) \neq \lambda x. P(w'')(x)$

According to Dayal, FRs denote the set of properties that their referents have in any relevant world. Without tense or aspect, the world  $w$  remains free. The condition (75b) says that modal base represents the speaker's belief about  $w$ . Assuming that the free relative is used felicitously, every world in the set will have a unique referent for the free relative. This follows from the standard presupposition associated with definites. The condition (75c) makes explicit the notion of identity alternatives (i-alternatives). It characterizes a world as an alternative iff it can be distinguished from another world solely on the basis of the denotation of the free relatives. This is the condition about non-Rigidity and variation on the referent. In this semantics, example (76a) below is semantically represented as (76b):

- (76) a. Mary is cooking something. Whatever she is cooking uses onions. (Dayal 1997, ex. (27))  
 b.  $\forall i\text{-Alt} \in f(w)(s) [\text{uses-onions} (i) (\lambda x [\text{cooking} (i)(x)(m)])]$   
 c.  $i\text{-alt}_1: \lambda x [\text{cooking} (i)(x)(m)] = \text{ratatouille}$   
 $i\text{-alt}_2: \lambda x [\text{cooking} (i)(x)(m)] = \text{lentils}$   
 $i\text{-alt}_3: \lambda x [\text{cooking} (i)(x)(m)] = \text{goulash}$   
 ...

(76b) says that, as far as the speaker's belief is concerned, the dish being cooked by

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*-ever* FRs carry indifference implications, while some carry ignorance implications. To consider the following example (von Fintel's ex. (17))

- (ii) a. I grabbed whatever tool was handy.  
 b. I grabbed the tool that was handy, and if a different tool had been handy, I would have grabbed that.

According to von Fintel, what kind of implication an *-ever* FRs can carry depends on the modal base: when the modal base is epistemic, variation results in the ignorance reading; a counterfactual modal base yields indifference. von Fintel leaves it open how the modal base is linguistically introduced. Chinese *wh*-conditionals may provide a good suggestion. Despite the semantic commonalities between *wh*-conditionals and FRs, *wh*-conditionals have some CONDITIONAL form, which can be interpreted either epistemically or counterfactually. A further bridge between conditionals and free relatives thus is being established. We have to leave this issue to others and future works.

Mary uses onions in all relevant *i*-alternatives (for each world, there is a *unique/exactly one* dish that Mary cooks). The speaker believes the assertion to be held regardless of the identity of the dish. Let the main clause denote *Q*, and the FR denote *P*, where both *P* and *Q* are properties. Property *Q* holds of the entity by virtue of its meeting description *P*, and the relationship between *P* and *Q* is essential, i.e. not accidental. It does not allow an interpretation where the assertion is based on a particular entity, as witnessed by ungrammaticality of (77).

- (77) \*Whatever Mary is cooking, namely ratatouille, uses onions. (ibid., ex. (29))

We adopt this same semantics for Chinese *wh*-conditionals in order to derive the generic interpretation. We assume the unmodified *wh*-conditionals all contain a null generic operator GEN over world variables (that is, definites may acquire universal properties in a generic context). And *wh*-phrases are concepts, i.e. from possible worlds to individuals:

- (78)  $\llbracket \text{shei xian lai} \rrbracket = \lambda i. \sigma x[\text{person}(x) \ \& \ \text{first\_comes}(x)](i)$   
 (79)  $\text{GEN} \Rightarrow \lambda P \lambda Q. \forall i\text{-Alt} \in f(w)(s) \{P(i), Q(i)\}$ , where  
 (i)  $f(w)(s)$  is the set of worlds the speaker's belief hold and  
 (ii) a world  $w' \in f(w)(s)$  is an *i*-alternative iff there exists some  $w''$  such that  
 $\sigma x[P(w')(x)] \neq \sigma x[P(w'')(x)]$

The *unique* referent denoted by the *wh*-phrase is being relativized to worlds, i.e. for each world, there is *exactly one* individual involved in it. And quantification is over the worlds rather than individuals. This semantics derives the generic interpretation of *wh*-conditionals straightforwardly:

- (80) a.  $\llbracket \text{shei xian lai, shei xian chi} \rrbracket = 1$  iff  
 $\forall i \in f(w)(s) \{ \text{first\_eat}(i) (\sigma x (\text{person}(x) \ \& \ \text{comes\_firsts}(x)(i))) \}$   
 b. As far as the speaker's belief is concerned, the first comer is the first eater  
 c. For each world  $w$ , the first comer in it is the first eater in it

What (80) expresses can be illustrated as follows:

- (81) For any dinner/party, the speaker believes the following holds:  
 If, Zhang San comes first, Zhang San eats first  
 Li Si comes first, Li Si eats first  
 Wang Wu comes first, Wang Wu eats first  
 Ma Liu comes first, Ma Liu eats first  
 Zhang San and Li Si arrive come first, Zhang San and Li Si eat first  
 ...

The generic readings of *wh*-conditionals have been captured, as desired, on this approach.

## 7. Are Chinese *wh*-conditionals ambiguous?

The previous discussion unambiguously invites the inference that Chinese *wh*-conditionals are ambiguous. Semantically, Chinese *wh*-conditionals are akin to English FRs, which have two varieties: plain FRs and *-ever* FRs. English plain FRs are argued to have a *prima facie* definite/unique interpretation, while *-ever* FRs have some universal quantification interpretation. Dayal (1997) proposes the universal quantificational force of *-ever* FRs is contributed by *ever*, which adds some modality to the semantic representation and renders FRs to be interpreted *attributively*.<sup>11</sup> A plausible assumption extending to Chinese *wh*-conditionals is that Chinese *wh*-conditionals conflate this distinction (between plain FRs and *-ever* FRs) and are always open to two interpretations. Chinese lacks a lexical item like *ever* for the generic interpretation, and sometimes only the context/pragmatics can tell which reading is the most salient one.

In a neutral context, a *wh*-conditional might be open to two interpretations. The following (82) can be semantically represented either by (83a) and (83b). (83a) is about the definite reading, while (83b) is the reading involving universal quantification over possible worlds. Semantically, (83a) is akin to plain FRs, while (83b) to *-ever* FRs:

- (82) *Shenme ren xian lai, shenme ren xian chi.*  
 what person first come what person first eat  
 ‘Who comes first eats first.’  
 ‘Whoever comes first eats first.’
- (83) a. eats-first ( $\sigma x$  [**person** (x) & **comes\_firsts** (w)(x)])  
 b.  $\forall i \in f(w)(s) \{ \text{eats-firsts } (i)(\sigma x (\text{person } (x) \ \& \ \text{comes\_firsts } (x)(i))) \}$
- (84) a. Who comes first eats first.  
 b. Whoever comes first eats first.

We again credit Cheng & Huang (1996) with the relevant insight. As noted earlier, they analyze *wh*-conditionals on a par with donkey conditionals in English. The ambiguity between definite and generic readings of *wh*-conditionals is also present in English donkey conditionals. As Kadmon (1990) also observes, donkey conditionals have both an absolute unique (definite) reading and a universal reading. She distinguishes *one-*

<sup>11</sup> Donnellan (1966) distinguishes two uses of definites: referential vs. attributive. According to Dayal, the primary semantic function of *ever* is to force the FRs to be read attributively. Otherwise, FRs always receive a referential /absolute unique reading.

*case* conditionals from *multi-case* conditionals. The following examples in (85a-b) are Kadmon's (1990) examples (36) and (37) respectively, and (86a-b) are her examples (35) and (41) respectively.

*One-case conditionals*

- (85) a. If there is a doctor in London and he is Welsh, then we are all set.  
 b. If it is true that a man walked in and that he decided to stay, then Sally will be pleased.

With stative antecedent clauses, (85a-b) say that if the state described in the antecedent is true (85a), or that it is a fact that certain events have already taken place (85b), the consequent is also true. These *one-case* conditionals contrast with *multi-case* conditionals:

*Multi-case conditionals*

- (86) a. If a man walks in and he sits down, Sally is pleased.  
 b. If a semanticist hears of a good job, she applies for it.

For instance, example (86a) has simple present tense and a non-stative verb in the antecedent clause, so it can be used to quantify over multiple cases of instances of a man walking in and sitting down; i.e. it means that Sally is pleased about each instance (Kadmon 1990:297). Example (86b) can also be used as a general statement; i.e. whenever a semanticist hears of a good job, she applies for it. The semanticists and the jobs involved (simultaneously) can be multiple, since no absolute uniqueness is being implicated. However, the *uniqueness* is relativized to situations (see Heim 1990).

We propose that the choice between a definite reading and a generic reading is regulated by the context in Chinese. When the context is unspecified about the fixation of the referent, it has a generic reading and involves universal quantification over the speaker's belief worlds. When the context imposes some absolute uniqueness requirement of the referent, it has a definite reading. Consider the following example:

- (87) Wo wangji ni jie-le ji-ben shu gei wo le,  
 I forget you lend-ASP how-many-CL book to me ASP  
 danshi, ni jie-le shenme gei wo, wo jiu huan gei ni shenme le.  
 but you lend-ASP what to me I then return to you what ASP  
*I don't remember how many books you lent me, but*  
 a. *I've returned to you whatever books you lent me.*  
 b. ✓ *I've returned to you the books you lent me.*  
 c. ✓ *I've returned to you all the books you lent me.*

In (87), when the antecedent specifies a particular case/situation (i.e. book-lending case

by you to me), the generic reading is no longer the salient one. And the ignorance and indifference implications also disappear. (87) can be used to simply express the speaker has returned all the books the addressee lent to him.

By patterning *wh*-conditionals with donkey conditionals, we manage to preserve Cheng & Huang's (1996) insight. We leave the studies on the deeper links between free relatives and donkey conditionals for some future work.

## 7.1 A comparison with Lin (1996)

As pointed out in the literature, a pronoun (or definite description) in the consequent clause of *wh*-conditionals can refer back to the *wh*-phrase in the antecedent. To explain the distribution of *wh*-phrases and pronouns, Lin (1996) takes inspiration from Kadmon's distinction between *one-case* conditionals and *multi-case* conditionals. Lin argues that a *wh*-indefinite can occur in the consequent clause in *wh*-conditionals if the antecedent clause denotes a *multi-case* situation. When the antecedent denotes a *one-case* situation, a pronoun is used. He proposes the following condition for the distribution of pronouns in *wh*-conditionals:

- (88) Condition on donkey pronouns in *wh*-conditionals  
 A donkey pronoun in a *wh*-conditional is felicitous only if it picks out a unique referent (Lin 1996:250)

We agree that when an overt pronoun is used in the consequent clause of *wh*-conditionals, it picks out a unique referent. But we remain dubious about the distinction between *one-case* and *multi-case*. According to Lin, a *wh*-indefinite should not appear in the consequent clause of example (89), where the antecedent denotes a *one-case* situation. To the contrary, it has been pointed out that both a *wh*-indefinite and an overt pronoun can appear in the consequent clauses (cf. Pan & Jiang, to appear):

- (89) *Shei* shang xueqi na di-yi-ming, *shei/ta* zhe xueqi jiu keyi dang  
 who last semester got top-one who he/she this semester then may serve  
 banzhang.  
 monitor  
 'If who got the first last semester, he may serve as the monitor for the class this semester.'  
 'Whoever got the first last semester may serve as the monitor for the class this semester.'

The reason that (89) equally allows a *wh*-indefinite and an overt pronoun in its consequent clause is that (89) is indeed equivocal about the fixation of the referent. In a situation

where there is only one class and only one student who got the top-first, a uniqueness requirement (i.e. existential presupposition that there is *exactly one* student who got the top-first last semester) is established, so a pronoun can be used. In a situation where there are several classes, and each class has one who got the top-first, the identification of the referent is unspecified, and the conditional makes a general statement. The use of a *wh*-indefinite is licensed in that situation. Since the intralinguistic information is insufficient to identify the referent, the context is open to both interpretations. Therefore, both the pronouns and *wh*-indefinites can occur in the consequent clause. This is not surprising. As Kadmon (1990) admits, ‘many conditionals have both *one-case* and *multi-case* interpretations’ (Kadmon 1990:297).

## 8. *Wh*-conditionals and correlatives: some typological consequences

### 8.1 Correlatives: a first look

The Chinese *wh*-conditionals we have studied have three features: (a) they have a strict matching requirement; (b) they have some definite flavor; (c) they are open to both the definite and universal interpretations. Are these features *unique* to Chinese? Correlatives appear to have these features. Correlatives are widely attested in most Indo-Aryan languages (Hindi, Sanskrit, Nepali, Bangla, Hittite, etc.), Slavic, and some East-Asian languages, such as Korean and Vietnamese). Correlatives compose of a left-adjoined free relative (RC) and a main clause. The left-adjoined free relative is referentially linked to a nominal correlate (which always takes the form of a demonstrative pronoun) (COR) in the main clause. In the Indo-Aryan languages, this is shown by a demonstrative requirement. Schematically, most correlatives have the following structure:

$$(90) \quad [_{RC} \dots wh(x) \dots]_i [_{COR} \dots (DEM)-y_i \dots] \text{ (Lipták 2009)}$$

The similarities between Chinese *wh*-conditionals and correlatives are hard to miss even at first glance. Consider the following correlative examples (from Leung 2009):

- (91) a. [**Wie** jij uitgenodigd hebt], **die** wil ik niet meer zien. [Dutch]  
           who you invite have that-one want I no-longer see  
           ‘I don’t want to see the one you have invited any longer.’
- b. [**Kogo** ljublj], **togo** poceluju. [Russian]  
           whom love that.one will.kiss.1SG  
           ‘I will kiss who I love.’

- c. [Aki Koran jot], **azt** ingyen beengedtek. [Hungarian]  
 who early came that.ACC freely pv.admitted.3PL  
 ‘Those who come early were admitted for free.’
- d. [Khyodra-s gya **gare** njos yod na], **nga-s** de bsad pa yin. [Lhasa Tibet]  
 you-ERG yak what buy AUX if I-ERG that kiss past AUX  
 ‘I killed whatever yak you bought.’
- e. [Ai nau], **nay** an. [Vietnamese]  
 who cook that-person eat  
 ‘Whoever cooks eat.’
- f. ...[terra pulli **qui** nascentur], **eos** in terram deprimito [Latin]  
 earth scions who will.spring these in Earth press.IMPERF  
 ‘...press into the earth scions that will spring from the ground’

The examples in (91) are all correlatives (from a bunch of languages that are historically unrelated to each other and to Chinese). They share the same structure as (90). The RC contributed by a free relative is anaphorically linked to a definite expression in the COR. As the Vietnamese example (91e) indicates, they have the same truth condition as an identity statement (*whoever cooks eat = the person who cooks is the person who eats*).

Hindi correlatives occupy an important position in the study of correlatives (cf. Dayal 1996, Grosu & Landman 1998, Lipták 2009 and references therein). A typical correlative in Hindi contains a left-peripheral relative clause, which is anaphorically linked to a (possibly phonetically unrealized) definite nominal correlate in the clause that follows the relative clause. The following well-cited illustrative example is from Srivastav (1991):

- (92) [Jo laRkii khaRii hai] **vo** lambii hai.  
 wh girl standing is that tall is  
 Lit.: ‘The girl who is standing there is tall.’  
 ‘Whichever girl is standing there is tall.’

What is interesting here is the referential link between the correlate DP ‘that girl’ and the left-peripheral relative clause led by a *wh*-expression. In (92), *vo* ‘that’ picks out the same referent as the relative clause and occupies the same argument slot. There is some independent evidence that the correlatives are different from headed relatives (please refer to Lipták 2009 for more details).

In a correlative, the correlate DP always follows the left-peripheral relative clause. This contrasts with headed relatives. Headed relatives either occur next to the nominal head they modify or they occur to the right of it at some distance. Unlike correlatives, however, a relative clause that originates from a headed construction can never precede the modified nominal. The following examples are Lipták’s (6a-c):

- (93) a. John called somebody [who he knows from school] yesterday.  
 b. John called somebody yesterday [who he knows from school].  
 c. \*[Who he knows from school] John called someone yesterday.

Hindi correlatives contrast with Hindi headed relatives. In Hindi headed relatives, the relative occupies a clause-internal position, which is necessarily right-adjacent to the head noun (cf. 94a). Such relative clauses cannot be non-adjacent to their head in sentence-internal positions (cf. 94b):

- (94) a. Vo laRkii [jo khaRii hai] lambii hai.  
           that girl wh standing is tall is  
           ‘The girl who is standing is tall.’  
 b. \*Vo laRkii lambii [jo khaRii hai] hai.  
           that girl tall wh standing is is

This contrasts with correlatives. In correlatives, the relative clause can be non-adjacent to the nominal it modifies, as shown in example (95):

- (95) [Jo vahaan khaRii hai] raam us laRii-ko jaantaa hai. (Lipták 2009, ex. (4))  
       wh there standing is Ram that girl-ACC know is  
       Lit.: ‘Ram knows the girl who is standing there.’

Another notable difference between correlatives and headed relatives concerns the distribution of the nominal element they modify. In correlatives, the nominal element can be spelled out either inside the relative clause, as shown in (92), or inside the correlate, as shown in (96a) below, or both inside the relative clause and in the correlate phrase simultaneously, as shown in (96b):

- (96) a. [Jo khaRii hai] vo laRkii lambii hai. (Lipták 2009, ex. (9))  
           wh standing is that girl tall is  
 b. [Jo laRkii khaRii hai] vo laRkii lambii hai.  
       wh girl standing is that girl tall is  
       Lit.: ‘Which girl is standing, that girl is tall.’

Headed relatives do not have the option of allowing the nominal element to appear both in the head position and in the relative clause, as shown by the contrast between (97a) and (97b) below:

- (97) a. Vo laRkii [jo khaRii hai] lambii hai  
           that girl wh standing is tall is



- b. \*Vo laRkii [jo laRkii khaRii hai] lambii hai  
       that girl wh girl standing is tall is

## 8.2 Definiteness in Hindi correlatives

Hindi correlatives also have some definiteness flavor. The definite nature of correlatives can be demonstrated by the fact that the correlate DP must be definite or universal (92b) (Dayal 1996, Grosu & Landman 1998, Lipták 2009). Numerals, ordinary indefinites are not allowed to introduce the correlate DP:

- (98) a. [Jo laRkii khaRii hai] vo lambii hai.  
           wh girl standing are that tall is  
           ‘Which girl is standing, that is tall.’ (‘Whoever standing there is tall.’)  
       b. [Jo laRke KhaRe haiN], ve/dono/sab/\*do/\*kuch/\*adhikam lambe haiN.  
           wh girl standing are those/both/all/\*two/\*few/\*most tall are  
           ‘Which boys are standing, they/both/all/\*two/\*few/\*most are tall.’

As (98b) illustrates, the relative can only be anaphorically linked to a definite or universal DP (like ‘those’, ‘both’, ‘all’) but not an indefinite DP (like ‘two’, ‘few’, etc.). Also like Chinese *wh*-conditionals, the correlate DP can be a partitive:<sup>12</sup>

- (99) [Jo laRke KhaRe haiN], unme se do / unme se kuch lambe haiN.  
       wh boys standing are among them two / among them some tall are  
       ‘The boys are standing there, {two of them, some of them} are tall.’

Grosu & Landman (1998) take this fact to argue that there is a maximalization operation applying to the relative clause of the correlative. The maximalization operation generates a maximal individual, which can only be referred back by a definite or a universal, but not by an indefinite. The notion ‘maximalization’ is sort of descriptively misleading, however; note that the correlate DP can be a partitive. But if we treat the referential link between the RC and the correlate DP as a result of semantic identity, this maximalization effect follows for free.

## 8.3 The matching requirement in Hindi correlatives

Another commonality between Hindi correlatives and Chinese *wh*-conditionals is the matching requirement. The Hindi correlatives are subject to a matching requirement, which requires the relative morphemes in the relative clause and the demonstrative

<sup>12</sup> We thank Yatin Mahajan for the judgment.

morphemes in the main clause to be identical in number and reference. Leung (2009) states this matching requirement as follows:

- (100) Matching requirement for correlatives
- a. The number of relative morphemes in the correlative equals the number of demonstrative morphemes in the main clause.
  - b. The mapping between the set of relative morphemes within the correlative clause and the set of demonstratives within the main clause is bijective, i.e. for every relative morpheme within the correlative clause, there is exactly one demonstrative morpheme within the main clause such that relative morpheme and demonstrative morpheme are coindexed.

In other words, the correlate DP must be identical to RC in reference, in addition to being identical in number:

- (101) A Rel that bears an index  $i$  maps onto a Dem that bears an index  $i$ , a Rel that bears an index  $j$  maps onto a Dem that bears an index  $j$ , and so on.

This matching requirement can be illustrated by the following examples (Leung 2009: 317-318). (102a) below is out because there is no Dem in the correlate, and (102b-c) is out because the Dem and Rel are not identical in number:

- (102) a. \*[Jis larke-ne sports medal jiiit-aal], academic medal-bhii jiiit-aa.  
           wh boy-ERG sports medal win-PFV academic medal-also win-PFV
- b. \*[Jis larke-ne jis larki-ko dehka], us larki-ko piitaa gayaa.  
           wh boy-ERG girl-ACC saw DEM girl-ACC beaten was  
           ‘A girl who a boy saw was beaten.’
- c. \*[Jo laRkii jis laRke-ke saath khelegii], vo jiiit-jaayegii.  
           wh girl wh boy-OBL with play she win-PERF  
           ‘A girl who plays with a boy will win.’

Chinese *wh*-conditionals also have this requirement, as we have already discussed in the previous sections. The matching requirement says the *wh*-expressions in the antecedent and consequent must be identical in number, form, and reference. The Chinese *wh*-conditionals counterparts of (102) are all unacceptable, as expected:

- (103) a. \**Na-ge nanhai de-le yundong jinpai, de-le xueshu jinpai.*  
           which-CL boy get-ASP sport medal get-ASP academic medal
- b. \**Na-ge nanhai kanjian na-ge nühai, na-ge nühai jiu bei da.*  
           which-CL boy saw which-CL girl which-CL girl then PASS beat

- c. \**Na-ge nūhai he na-ge nanhai wan, na-ge nūhai jiu neng ying.*  
 which-CL girl and which-CL boy play which-CL girl then will win

## 8.4 The definite and universal readings of correlatives

Correlatives permit both definite and universal interpretations. The following example (104) in Hindi has a definite reading:

- (104) *definite reading*- Hindi correlative (the example is from Dayal 1996)  
 Jo laRkii lambii hai, vo khaRii hai.  
 wh girl tall is that standing is  
 ‘The girl that is standing is tall.’

Some correlatives (especially ones with multiple *wh*-indefinites) have mixed definite/universal readings:

- (105) *mixed definite/universal readings*- Hindi correlatives (ibid.)  
 Jis laRkii-ne jis laRke-ke saath khel-aa, us-ne us-ko haraa-yaa.  
 wh girl-ERG wh boy-with together play that-one-ERG that-one-ACC defeat  
 ‘Every girl that played against a boy is such that (she played against exactly one boy and) she defeated the one boy she played against.’  
 ‘The girl that played against the boy defeated the boy.’

Dayal (1995) notes that correlatives always receive a universal interpretation when we switch from episodic to habitual morphology:

- (106) *universal reading with habitual morphology*- Hindi correlatives (Dayal 1995)  
 Jo laRkii lambii ho-tii hai, vo khaRii ho-tii hai.  
 wh girl tall be-HAB is that-one standing be-HAB is  
 ‘A tall girl (generally) stands; e.g. on buses with very little leg room between seats.’

Example (106) has a reading that generalizes over situations in which there is *exactly one* girl who is tall. About each such situation, the tall girl in it stands. So, for different situations, there are (possibly) different tall girls involved. The habitual morphology forces the sentence to be read as involving some quantification over situations/cases (rather than over individuals).

More needs to be said about Hindi correlatives. There are two types of correlatives in Hindi; one with the morpheme *bhii* and one without it. The correlatives with *bhii* readily allow the universal interpretation while the correlatives without *bhii* are subject to a salient definite reading (without habitual morphology). Dayal (1997) analyzes *bhii* on par with English ‘ever’ in *-ever* FRs. That is, *bhii* introduces some modality dimension

to the semantic representation. Also unlike Chinese, Hindi correlatives have internal heads and the verbal morphology is transparent with respect to number marking, so correlatives in Hindi come out either with a definite reading or a quasi-universal reading. The following examples with *bhii* are from Dayal (1997):

- (107) [Jo bhii laRkii mehnat kar rahii] vo fafal hogii.  
 wh ever girl effort making is she successful will be  
 ‘Whichever girl that is making an effort will be successful.’  
 ‘Any girl who makes an effort succeeds.’

So, Hindi is more like English, which has some overt quantificational strategies (it has a habitual morphology to force a reading as involving quantification over situations, see (106); it has a lexical item *bhii* that contributes modality to semantic representation, like English *ever*, which contributes to a reading where the referent denoted by the *wh*-phrase is unknown, or not relevant, see (107)). Chinese lacks these strategies, and the choice between the readings is left largely to context/pragmatics. Cross-linguistically, Romanian is more like Chinese. Brasoveanu (2007) notes that, in Romanian, which reading (definite or universal) is available for a particular correlative depends on world knowledge and pragmatic factors (e.g. accidental/sporadic vs. non-accidental/habitual nature of the situations under discussion). The following Romanian example (108) has a salient definite reading while (109) has a salient universal reading (both examples are from Brasoveanu 2008):

- (108) *Definite interpretation* – Romanian  
 Care fata si-a-uitat ieri haina, pe aceea o-cauta hata-l ei.  
 wh girl her-DAT-forgotten yesterday coat-the PE that-one her-look-for father her  
 ‘The father of the girl that forgot her coat yesterday is looking for her.’
- (109) *Universal interpretation* – Romanian  
 PE care om l-a-interogat securitate-a in acela nu-mai-am incredere.  
 PE wh person him-ACC-inter. security-the in that-one not-any more trust  
 ‘I don’t trust any person interrogated by the secret police anymore.’

Semantically, the difference between the definite vs. universal readings of correlatives (and Chinese *wh*-conditionals) boils down to a difference in *granularity level* of the quantification (see Brasoveanu 2007). The quantification can be *coarse-grained*, i.e. we ‘collectively’ quantify over topical cases/situations, which boils down to quantifying over topical individuals—and the correlative clause (the consequent clause in the case of Chinese *wh*-conditionals) is predicated about these individuals. This yields the definite/unique reading. Alternatively, the quantification can be *fine-grained*, i.e. we ‘distributively’ quantify over the topical cases/situations introduced in the relative

clause—and the correlative clause (or the consequent clause) is predicated of each of such cases/situations. This yields the universal interpretation. (Presumably), some languages (like Hindi, English) lexically (or morpho-syntactically) specifies which granularity level in quantification is being adopted, while some other languages (like Chinese, Romanian) turn to pragmatics/discourse to decide the granularity level in quantification. The accidental/sporadic vs. non-accidental/generic nature of the situations/cases under consideration also matters. We leave a fuller implementation of this idea to future works.

## 9. Chinese *wh*-conditionals as correlatives

Cheng & Huang (1996) offer three arguments against Chinese *wh*-conditionals as genuine correlatives. We shall examine these arguments one by one in light of the new evidence gathered in this study. According to Cheng & Huang, first, *wh*-conditionals are not *typical* relatives. They argue that a *typical* relative clause in Chinese is marked by the relative marker *de*, while this is not the case for *wh*-conditionals:

- (110) Wo mai-le [Jinyong xie \*(de) shu] (Cheng & Huang 1996, ex. (78))  
 I buy-ASP Jinyong write REL book  
 ‘I bought books that Jinyong wrote.’

Example (110) is a typical headed relative (‘books that Jinyong wrote’). As shown earlier, correlatives are not like headed relative clauses. It does not follow from the fact that Chinese *wh*-conditionals differ from typical relatives to the conclusion that they are not similar to correlatives. On the present account, Chinese *wh*-conditionals are more like headless free relatives than headed relatives. Interestingly, Cheng & Huang themselves also comment on the commonality between headless free relatives and *wh*-conditionals. The following example (111b) is their example (80).

- (111) a. What you see is what you get.  
 b. Ni kandao *shenme*, ni jiu dedao *shenme*.  
 you see what you then get what  
 ‘If you see X, then you get X.’

The second argument Cheng & Huang offer concerns tense/aspect specifications. They argue that *wh*-conditionals are restricted to certain tense/aspectual specifications that make them different from Hindi correlatives. The verb in the consequent clause cannot bear completive aspect in Chinese *wh*-conditionals, but it can in Hindi correlatives. They provide the following examples (the sentences under (112) are their (81), while (113) is their (82)):

- (112) a. *Shei lai, shei jiu hui zhong jiang.*  
 who come who then will win prize  
 ‘Whoever comes, she/he will win a prize.’  
 b. \**Shei lai, shei jiu zhong-le jiang.*  
 who come who then win-ASP prize
- (113) *Jis laRkiiNe ji laRkeKO dekhaa usNE usKO passand kiya.*  
 wh girl-ERG REL boy-ACC saw DEM-ERG DEM-ACC liked  
 ‘Which girl saw which boy, she liked him.’

Why do Chinese *wh*-conditionals disallow a completive aspect marker in the consequent clause? According to Cheng & Huang, Chinese *wh*-conditionals are genuine conditionals, and the consequent clause of a conditional always express a situation posterior to, rather than an anterior to the situation expressed by the antecedent clause. So a future marker *hui* is OK, while a completive marker is out. Typical relatives do not have this requirement. This is the contrast between (112) and (113). (Note: in (113), the main clause contains a verb with past tense.)

We think Cheng & Huang’s example (112b) is odd is because of a disagreement in aspect between the antecedent clause and consequent clause, not due to tense/aspect restriction on conditionals. In their example, the antecedent bears a default present tense, while the consequent bears a completive aspect. This mismatch in tense/aspect agreement is responsible for the oddness of the example, as in the following English example:

- (114) \*Whatever you bring didn’t please Mary.

If the antecedent clause and the consequent clause match in tense/aspect, the sentence becomes grammatical, just like Hindi correlatives, even if both clauses bear past tense/aspect markers. When the antecedent clause bears completive aspect, the consequent clause also needs to bear the same aspect in order to ensure agreement, and the sentence is fine. Consider (115):

- (115) An old man is recounting his life:  
*Rensheng jiushi zheyang,*  
 life just-be like this  
*ni xuanzhe-le shenme shenghuo, ni jiu xiguan-le shenme shenghuo.*  
 you choose-ASP what life you then accustom-ASP what life  
 Lit.: ‘Life is always like this, you choose what life, you grow accustomed to what life.’  
 ‘You have been accustomed to whatever life you have chosen.’

Further supporting observations are due to Huang (2008). She also observes that *wh*-conditionals (which she calls Chinese Bare Conditionals (CBS)) can admit non-future

tense/aspect in the consequent clause, contrary to Cheng & Huang's claim. She remarks 'if uttered to describe a past event, CBS can bear a perfective/completive aspect which can be overtly or covertly indicated by a perfective morpheme'. Consider her example (17) (repeated here as (116) below; cf. Huang 2008:698-699):

- (116) *Zuotian, shei zai xuanpiao shang, Dawei jiu tou-le shei.*  
 yesterday who is ballot on-top David then vote-PERF who  
 'Yesterday, David voted for whoever appeared on the ballot.'

As (116) indicates, in the presence of time adverbials such as *zuotian* 'yesterday' and *natian* 'that day', *wh*-conditionals freely allow the verb in the consequent to be modified by the perfective morpheme.

The third argument by Cheng & Huang is about the proportional problem of donkey conditionals. According to them, ordinary donkey conditionals have both a symmetric reading and an asymmetric reading, while Hindi correlatives reportedly do not have this ambiguity. Chinese *wh*-conditionals, resembling English donkey conditionals, have this ambiguity. The following (117) is their original (75) (the glosses and English translation are also theirs):

- (117) *Shei yan shei, shei tongchang jiu hui xiang shei.*  
 who play who who usually then will resemble who  
 'If X plays the role of Y, then usually X will resemble Y.'

In a neutral context, the most salient reading for (117) is the subject asymmetric reading. Suppose there are ten actors. Suppose also that, while nine of the actors each play one role and resemble that role, the tenth plays ten roles and does not resemble any of those roles. The sentence is true in this scenario. But the symmetric reading (namely, actor-role pairs) would predict it to be false. The symmetric reading is possible, according to Cheng & Huang, only when a topic is being specified. If the speaker first says 'with respect to the actors and characters (roles) in the play', then the sentence will be true. Topic choice plays an essential role here.

In our view, Chinese *wh*-conditionals are ambiguous because of discourse factors. In a neutral context, when the topic is not being specified, the *wh*-conditionals are unambiguous. Recall that this discourse prominence is an important feature for Chinese. We attribute the lack of ambiguity in Hindi to the fact that Hindi is not as discourse-prominent as Chinese. If topic choice were as easily accomplished in Hindi as it is in Chinese, we would expect Hindi correlatives to be *ambiguous*. And this seems to be the case, as attested by the Hindi example (105).

To summarize, we have re-examined the three arguments offered by Cheng & Huang (1996) that argue against Chinese *wh*-conditionals as correlatives. We have tried to deflect the force of their arguments using new evidence we have gathered in the course of the present study.

## 10. Concluding remarks

Previous studies treat *wh*-conditionals as a proper instance of universal donkey conditionals and derive the generic reading via unselective binding. We argue *wh*-conditionals encode uniqueness, and are open to both generic and definite interpretations. We adopt a Russellian semantics to capture the definiteness/uniqueness effect, and derive the generic reading via generic quantification over possible worlds, where the (unique) identity of the referents denoted by the *wh*-phrases is not known, or not relevant. This analysis brings *wh*-conditionals close to unique donkey conditionals as discussed in Heim (1990) and in Kadmon (1990) and close to free relatives and correlatives as discussed in Dayal (1997) and in von Stechow (2000). Despite being conditional in form, Chinese *wh*-conditionals turn out to be semantically akin to correlatives (and free relatives) generally. Typologically, they may appear to be *strange* relatives of a third kind (Grosu & Landman 1998). But the many commonalities in form and meaning between Chinese *wh*-conditionals and Hindi correlatives speak out for a common analysis.

Even granting the similarities between *wh*-conditionals and correlatives, however, differences between them need to be explained. In correlatives, anaphoric expressions (e.g. pronouns, demonstratives, even epithets) appear in the consequent, whereas a *wh*-phrase always appears in *wh*-conditionals. We must admit that we do not have a definitive account of this difference. Solutions, however, are on the table. After discussing the commonalities between *wh*-movement and correlative proforms, Izvorski (1996) contends that correlative proforms should be treated as *wh*-phrases in the syntax. It has been proposed that the ordering (clause-initial or not) of the correlative proforms in correlatives is correlated with the same parametric variation about the overt vs. covert movement of *wh*-phrases. In languages with overt *wh*-movement, the correlative proform is always fronted to the highest Spec of CP (i.e. clause-initial). The following Bulgarian example is from Izvorski (1996, ex. (34)):

- (118) a. [Kolkoto pari iska]<sub>i</sub>, tokkova<sub>i</sub> misli ce ste i dam.  
           how-much money wants that-much thinks that will her give-1SG  
           ‘She thinks I will give her as much money as she wants.’  
       b. \*[Kolkoto pari iska]<sub>i</sub>, misli ce ste i dam tokkova<sub>i</sub>.  
       c. \*[Kolkoto pari iska]<sub>i</sub>, misli ce tokkova<sub>i</sub> ste i dam.



The overt movement of the correlative proforms is subject to island constraint (see Izvorski 1996, ex. (35)):

- (119) [Kakto im kazah]<sub>i</sub>, taka<sub>i</sub> cuh (\*sluha) ce sa postapili.  
 how them told-1SG that-way heard-1SG the-rumor that are done  
 ‘I heard (the rumour) that they had acted the way that I had told them to do.’

In languages with no overt *wh*-movement, by contrast, the correlative proform can stay in-situ and does not have to appear clause-initial. The following Hindi example is due to Srivastav (1991):

- (120) [Ram-ne Sita-ko jo kitaab dii]<sub>i</sub>, Bill-ne Sara-ko vo<sub>hi</sub> dikhaa-ii.  
 Ram-ERG Sita-DAT wh book give-PERF Bill-ERG Sara-DAT DEM show-PERF  
 ‘Bill showed to Sara the book that Ram gave to Sita.’

As Izvorski contends, in addition to the covert/overt movement distinction between languages, further variations in *wh*-movement (i.e. extraction from indicative vs. subjunctive clauses, possibility vs. prohibition of left-branch extraction, whether or not topics are allowed to precede the *wh*-word) obtain in the case of correlative proforms. These facts provide further support for the position that the correlative proform is treated as a *wh*-phrase by the syntax. Also, the fact that in Chinese-type correlatives (i.e. *wh*-conditionals), the *wh*-words always remain in-situ may not turn out to be so typologically surprising. But we must leave this possibility for future research.

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## 漢語 Wh-條件式在別的語言中 可否有（從句）親屬？

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本文討論了當前對 Wh-條件式的研究中的幾個問題：(1) Wh-條件式的“有定性”現象；(2) 把 Wh-詞處理為無定項與“新穎性”條件的矛盾；(3) Wh-條件式真正的語義解讀。本文認為：(1) Wh-無定項位於條件式中時，它們是“獨一”的無定項；(2) Wh-條件式是一種特殊的“話題-陳述”結構，並且在兩個指稱項中存在“等同”的關係；(3) Wh-條件式可以描述單數或者複數的情景，並導致兩種不同的解讀：有定性解讀或者全稱性解讀。這兩種解讀由語境/語用決定。從類型學的角度來看，漢語 Wh-條件式和關聯關係從句 (correlatives) 在句法和語義上存在諸多相似之處。

關鍵詞：漢語 Wh-條件式，關聯關係從句，獨一現象，自由關係從句