

Wh-Expressions in Mandarin Chinese

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1. Introduction

Wh-expressions are typically used to form constituent questions in Indo-European languages by fronting them to the specifier position SpecCP, leaving a co-indexed trace in original extraction-site, as illustrated by (1).

- (1) [_{CP} What_i [_{C'} does [_{IP} John like t_i]]]?
(2) [For which x: x a thing][John likes x]

Once a wh-phrase is in SpecCP, it has scope over the open proposition expressed by IP, expressing a meaning such as (2). However, constituent questions do not involve wh-movement in all languages. For example, the Chinese sentence corresponding to (1) is (3), where the wh-phrase remains in situ in its original object position.

- (3) Yuehan xihuan shenme (ne)?
John like what Q
'What does John like?'

Such in-situ wh-phrases resemble those unmoved wh-phrases in English multiple questions such as the wh-phrase *what* in (4a), whose interpretation remains the same as if it had been moved.

- (4) a. Who likes what?
b. For which x, x a person and for which y, y a thing][x likes y]

In addition to the interrogative usage, Chinese wh-phrases may have non-interrogative interpretations. For example, the wh-phrase in (5) receives an existential interpretation, and the one in (6) has a universal interpretation.

- (5) Yuehan keneng chi-le shenme
John possibly eat-Asp what
'John might have eaten something.'
(6) Yuehan shenme dou chi
John what all eat

‘John eats anything.’

The various interpretations that wh-phrases may have in Chinese raise many interesting syntactic and semantic issues. This chapter provides an overview of linguistic phenomena involving wh-expressions in Chinese as well as various theoretical proposals concerning those phenomena. The chapter is organized as follows: Section 2 presents the major empirical data that have played a central role in the theorizing of wh-phrases in Chinese. Section 3 reviews some current theories of Chinese wh-phrases. Finally, section 4 concludes the chapter with a discussion of issues worth further exploration in the future.

2. The Empirical Data

2.1 Interrogative wh-phrases

2.1.1 Basic facts

Huang (1982a,b) is the first comprehensive study of wh-questions in Chinese generative grammar within the Chomskyan tradition. Assuming that Chinese wh-questions are quantificational, he proposes that wh-in-situ phrases, though not moving at S(urface)-structure, move covertly at L(ogical) F(orm) to indicate scope, producing a quantifier-variable representation such as (2). According to Huang, the scope property of Chinese wh-phrases is supported by the fact that the sentences in (7)-(9) are interpreted differently, though the only difference is the matrix verb. The verb *wen* ‘ask’ in (7) is a [+Wh] verb that requires an interrogative complement. So (7) is interpreted as a statement taking an indirect question. *Xiangxin* ‘believe’ in (8) is a [-Wh] verb that cannot take an indirect question. Therefore, (8) is construed as a direct question not embedding any indirect question. In contrast, the verb *zhidao* ‘know’ has a specification for [\pm Wh] and consequently (9) can be interpreted either as a direct question or as a statement taking an indirect question.

(7) Zhangsan wen wo shei mai-le shu
ask I who buy-Asp book

‘Zhangsan asked me who bought books.’

(8) Zhangsan xiangxin shei mai-le shu
believe who buy-Asp book

‘Who does Zhangsan believe bought books?’

(9) Zhangsan zhidao shei mai-le shu
know who buy-Asp book

a. ‘Who does Zhangsan know bought books?’

b. ‘Zhangsan knows who bought books.’

(Huang 1998, p. 180)

In addition to being constrained by verb requirements, the scope of a wh-phrase is subject to other conditions depending upon what kinds of wh-phrases are involved. As an example, an argument wh-phrase such as *shei* ‘who’ or *shenme* ‘what’ may freely obtain matrix scope in violation of the Wh-island Condition as in (10) or the Complex NP Constraint as in (13), but an adjunct wh-phrase such as *zenme* ‘how’ or *weishenme* ‘why’ may not as (11)-(12) and (15)-(16) show.

(10) Ni xiang-zhidao shei mai-le shenme

you wonder who buy-Asp what

a. ‘What is the thing x such that you wonder who bought x?’

b. ‘Who is the person x such that you wonder what x bought?’

(11) Ni xiang-zhidao shei weishenme mai-le shu?

you wonder who why buy-Asp book

‘Who is the person x such that you wonder why x bought books?’

(12) Ni xiang-zhidao shei zenme mai-le shu

you wonder who how buy-Asp book

‘Who is the person x such that you wonder how x bought books?’

(Huang 1998, p. 372)

(13) [_{NP} [_S Shei xie] de shu] zui youqu?

who write DE book most interesting

‘Books that who wrote are the most interesting?’

(14) [_{NP} [_S ta tanlun shenme] de shu] zui youqu?

he discuss what DE book most interesting

‘Books in which he discusses what are the most interesting?’

(15) *_{NP} [_S ta weishenme xie] de shu] zui youqu?

he why write DE book most interesting

‘Books that he wrote why are the most interesting?’

(16) *_{NP} [_S ta zenme xie] de shu] zui youqu?

he how write DE book most interesting

‘Books that he wrote how are the most interesting?’

(Huang 1998, p. 373)

Huang attributes the argument/adjunct asymmetry to the Empty Category Principle (ECP), which dictates that the trace of a moved item is either lexically-governed or antecedent-governed. The trace of an object wh-phrase is lexically governed by the

verb, whereas the trace of a subject wh-phrase is lexically-governed by Infl on the assumption that Chinese Infl, as opposed to English Infl, is lexical. In contrast, adjuncts may not be lexically governed, so they need an antecedent governor to satisfy the ECP. Antecedent-government, however, is blocked by barriers and islands constitute barriers. For this reason, *weishenme* and *zenmeyang* may not be (covertly) extracted out of an island.

However, Huang notes that when *weishenme* and *zenme* are replaced by the PPs *wei-le shenme* ‘for what’ and *yong shenme* ‘with what’, respectively, the sentences become well-formed, as shown in (17) and (18).

- (17) [NP [S ta wei-le shenme xie] de shu] zui youqu?
 he for what write DE book most interesting
 ‘Books that he wrote for what are the most interesting?’
- (18) [NP [S ta yong shenme xie] de shu] zui youqu?
 he with what write DE book most interesting
 ‘Books that he wrote with what are the most interesting?’

(Huang 1998, p. 374)

Similarly, place and time wh-phrases *zai nali* ‘at where’ and (*zai*) *shenmeshihou* ‘at when’ may appear inside a wh-island or a complex NP, but have matrix scope outside the containing island.

- (19) Ni xiang-zhidao Lisi zai nali mai-le shenme
 you wonder Lisi at where buy-Asp what
 a. ‘What is the thing x such that you wonder where Lisi bought x?’
 b. ‘Where is the place x such that you wonder what Lisi bought at x?’
- (20) Ni xiang-zhidao Lisi zai shenmeshihou mai-le shenme
 you wonder Lisi at when buy-Asp what
 a. ‘What is the thing x such that you wonder when Lisi bought x?’
 b. ‘When is the time x such that you wonder what Lisi bought at x?’
- (21) [NP [S ta zai nali pai] de dianying] zui hao?
 he at where film DE movie most good
 ‘Movies that he filmed where are the best?’
- (22) [NP [S ta zai shenmeshihou pai] de dianying] zui hao?
 he at when film DE movie most good
 ‘Movies that he filmed when are the best?’

(Huang 1998, pp. 375-376)

On the basis of the above data, Huang (1998, p. 376) suggests that the distinction between ‘how’ and ‘why’ on the one hand and ‘where’ and ‘when’ on the other hand may be that between NPs and non-NPs, or that between arguments and adjuncts.

With regard to Huang’s observations above, Lin (1989, 1992) argues that the proposed distinction is not entirely accurate, because *zenme(yang)* ‘how’ actually can occur within a complex NP or a sentential subject, as attested by (23) and (24).

- (23) [[Zenmeyang ying-de de] shengli] cai suan shi
 how win-gain DE victory Emp count be
 guangmingzhengda?
 just-and-upright
 ‘What is the manner x such that the victory that one wins in x is just and upright?’
 (Lin 1992, p. 295)

- (24) [Wo yinggai zenmeyang zuo] bijiao hao?
 I should how do more good
 ‘What is the manner x such that my doing it in x is better?’
 (Lin 1992, p. 295)

In addition, Lin (1992) observes that the *weishenme/zenmeyang* asymmetry is correlated with another fact: among verbs that can take an embedded direct question, *zenme(yang)* ‘how’ can appear in object complements relatively freely, regardless of the matrix verb types, while *weishenme* ‘why’ can only occur in object complements of “semantically-bleached” verbs such as *shuo* ‘say’, *cai* ‘guess’, *renwei* ‘think’.

- (25) a. Ni shuo/cai/renwei weishenme ta zuotian mei lai?
 you say/guess/think why he yesterday not come
 ‘Why do you say/guess/think he didn’t come yesterday?’
 b. *Ni xiangxin/xiwang/jiading weishenme ta mei lai?
 you believe/hope/assume why he not come
 ‘Why do you believe/hope/assume he didn’t come?’
- (26) a. Ni shuo/xiang/cai/renwei ta hui zenmeyang zuo?
 you say/think/guess/think he will how do
 ‘How do you say/think/guess/think he will do it?’
 b. Ni xiwang/?xiangxin/jianyi/danxin ta (hui) zenmeyang
 you hope/believe/suggest/worry he (will) how
 chuli nei-jian shiqing?
 handle that-CL matter
 ‘How do you hope/believe/suggest/worry that he (will) handle that matter?’

Lin argues that the *zenmeyang/weishshenme* asymmetry is a result of a conjunctive definition of the ECP combined with the assumption that *zenmeyang* is a VP adjunct, whereas *weishshenme* is base-generated in SpecCP.

Tsai (1994) also further refines Huang's (1982a,b) argument/adjunct asymmetry and Lin's (1992) *zenmeyang/weishshenme* asymmetry by looking into their properties of referentiality. Tsai concurs with Lin (1992) that *zenmeyang* may get a wide scope reading even though it is embedded to an island. However, he claims that *zenmeyang* is ambiguous between a means (instrumental) or manner interpretation. The preverbal *zenmeyang* has a means interpretation, in addition to a manner one as in (27), whereas the postverbal *zenmeyang* is interpreted as a manner adverbial, as illustrated in (28).

(27) Nimen zenmeyang da zhe-chang lanqiu?
 you how play this-Cl basketball
 'By what means will you play this basketball game?'

(28) Lanqiu, nimen da de zenmyang
 basketball you play DE how
 'In what manner do they play basketball?'

(Tsai 1994, pp. 125-126)

According to Tsai, it is only the means *zenmeyang* that can be extracted from an island. The manner *zenmeyang* cannot, as attested by (29).

(29) *Ni bijiao xihuan [_{NP} [_S ta zhu de zenmeyang] de cai]?
 you more like he cook DE how DE dish
 'What is the manner x such that you like better the dishes which he cooks in x?'

(Tsai 1994, p. 127)

Hence, the manner *zenmeyang* patterns with the reason *weishheme*.

Moreover, Tsai argues that the distinction between *weishshenme* and its PP counterpart *wei-le shenme* 'for what' is a reason/purpose distinction. A purpose adverbial can be extracted from an island to get wide scope as Huang (1982b) has pointed out, whereas a reason adverbial may not. Tsai takes the distinction between instrumental *how* and manner *how*, and that between purpose *why* and reason *why*, to be one between referential and non-referential adjuncts. Only referential adjuncts can have scope outside of islands; non-referential adjuncts may not.

2.1.2 The controversy over the data

Concerning the data reported in the last section, Chinese linguists are actually not in full agreement regarding certain wide scope readings of embedded wh-phrases. For example, contra Huang (1982a,b), Tang (1988) argues that the embedded wh-phrase *shei* in Huang's sentence (9) cannot be interpreted with wide scope over the whole sentence. According to him, most native speakers take (9) to be ambiguous between a statement with an indirect question and a yes-no question, and cannot interpret it as a wh-question with *shei* having matrix scope as claimed in Huang (1982a,b).

Likewise, Tang doubts the two scope readings of Huang's sentence (10). For Tang, (10) has only one reading according to which the scope of both embedded wh-phrases is restricted to the embedded clause.

Tang's intuitions concerning the potential wide scope reading of Huang's sentence (10) does not appear to be an isolated case. Xu (1990), Lee (1986) and Lin (1992) all express similar concerns. According to Xu, the apparent wide-scope readings are actually echo question readings.

Another controversy over the data is discussed in Shi (1994). Unlike most other analysts, Shi claims that for a large number of native speakers, the reported argument/adjunct asymmetry does not exist at all. He claims that both *zenme(yang)* and *weishenme* behave the same way as argument wh-phrases with respect to scope in direct questions. On his judgment, either *shei* or *weishenme* in (30) can have a wide scope reading (p. 310).

(30) Ni xiangzhidao [shei weishenme mai shu]
 you wonder who why buy book

We thus see that grammaticality judgments may differ to a considerable extent with respect to wh-extraction out of islands and the argument/adjunct asymmetry.

2.2 Existential Wh-phrases

As noted in the introduction, wh-phrases in Chinese also have a non-interrogative existential interpretation. Such existential wh-phrases typically occur in negative polarity contexts such as negation, questions and *if*-clauses (see Huang 1982b, Cheng 1991, Li 1992, Lin 1996, 1998a, among others), as the following examples illustrate.

(31) *Wo xihuan shenme
 I like what
 'I like something.'

- (32) Ta mei shuo shenme
 he not say what
 ‘He didn’t say anything.’
- (33) Ni chi-le shenme ma?
 you eat-Asp what Q
 ‘Did you eat anything?’
- (34) Yaoshi/ruguo shei qifu ni,...
 If who bully you
 ‘If anybody bullies you,...’

However, Li (1992) observes that the distribution of existential wh-phrases is much wider than polarity contexts. According to her study, an existential wh-phrase is licensed in “contexts where the truth value of the proposition is not positively fixed in a definite manner” (p. 134). Thus, in addition to typical negative polarity contexts, Chinese existential wh-phrases are also licensed in uncertainty contexts, non-factive complements and sentences with circumstantial *le*, as the following sentences illustrate.

- (35) Ta haoxiang xihuan shenme ren de-yangzi
 he seem like what person seem
 ‘He seems to like somebody.’
- (36) Wo yiwei ni xihuan shenme
 I thought you like what
 ‘I thought you like something.’
- (37) Ta kandao shenme le
 He see what Asp
 ‘(It seems that) he saw something.’

However, even for the above-mentioned licensing contexts, the existential interpretation of a wh-phrase may be infelicitous, this depending on the position of the wh-phrase in the sentence. For example, when a wh-phrase is a subject and followed by negation or in an A-not-A question, the existential interpretation is not possible. Compare (38) with (32) and (39) with (40).

- (38) shei bu xihuan Lisi
 Who not like Lisi
 ‘*Somebody does not like Lisi’
- (39) Ta xi-bu-xihuan shenme?

- he like-not-like what
 ‘Does he like something/anything?’
 (40) *Shenme ren xi-bu-xihuan ta?
 what person like-not-like him
 ‘Does someone/anyone like him?’

These data lead Li to propose that existential wh-phrases must be licensed at S-structure by a c-commanding licensing element such as the question particle *ma*, negation marker *bu*, an A-not-A form, or an uncertainty word.¹

Li (1992, p. 128) also observes that existential wh-phrases are not licensed in a wh-question regardless of their position in the sentence. Thus, neither the subject wh-phrase nor the object wh-phrase in (41) can receive an existential interpretation. (41) must be a multiple question.

- (41) Shei xihuan shenme?
 who like what
 ‘Who likes what?’

However, if (41) is embedded by a non-factive verb, both the subject and object wh-phrase can have an existential interpretation.

- (42) Ta yiwei shei xihuan shenme.
 he think who like what
 ‘He thought somebody liked something.’

However, neither the subject nor the object wh-phrase can be construed existentially when the constituent question particle *ne* is attached to this sentence, even though the matrix verb is a possible licensing element for existential wh-phrases.

- (43) Ta yiwei shei xihuan shenme ne?
 He think who like what Q
 ‘Who(x), what(y), he thought x liked y?’
 *‘Who(x), he thought x liked something?’
 *‘What(y), he thought somebody liked y?’

¹ Huang (1982b) and Cheng (1994) claim that a subject wh-phrase can not be interpreted as an existential quantifier when it occurs within the scope of the question particle *ma*. However, Li (1992) and Lin (1996, 1998a) claim that such sentences are in fact acceptable.

*‘He thought who liked what.’

The situation is the same when the matrix verb selects an interrogative question.

(44) Ta yiwei wo xiang-zhidao shei xihuan shenme.

He think I wonder who like what

‘He thinks that I wonder who likes what.’

*‘He thinks that I wonder what someone likes.’

*‘He thinks that I wonder who likes something.’

According to Li, the above facts suggest that a licenser of an existential wh-phrase will not block the licensing of a higher constituent question licenser, but the lower constituent question licenser will block the licensing potential of a higher existential licenser. Assuming that Huang’s sentence (9) is ambiguous, she also suggests that a lower constituent question licenser does not block a higher constituent question licenser. She captures the above generalizations in terms of a minimality requirement, given below:

(45) The linking of a Wh-element with an operator is subject to minimality.

The linking of A with B [...A...B...] obeys Minimality iff there is no intervening C [...A...C...B] such that C is linked to another element D, $D \neq B \neq A$.

(Li 1992, p. 142)

The minimality requirement in (45) is sensitive to the type of intervening elements in a way very similar to the blocking effects displayed by the binding of long-distance anaphors.

In addition to Li’s (1992) influential work, Lin (1998a) classifies the licensing environments of existential wh-phrases into three groups: typical affective contexts for negative polarity items, epistemic modality environments and some sort of “future environments”. These three groups decrease in their ability to license an existential interpretation with wh-phrases. The weaker the licensing strength is, the more there is the need for the presence of a classifier such as *ge* or *dian* to accompany the wh-phrase, as illustrated below.

(46) wo mingtian hui qu mai *(ge) shenme dongxi song ta de

I tomorrow will go buy Cl what thing give him Par

‘I will go to buy something for him.’

(Lin 1998a, p. 225)

The ultimate licensing condition on polarity wh-items that Lin (1998a) proposes is stated in (47), where the term EPWs is the abbreviation of existential polarity wh-phrases.²

(47) Non-Entailment-of-Existence Condition on EPWs (NEEC)

The use of an EPW is felicitous iff the proposition in which the EPW appears does not entail existence of a referent satisfying the description of the EPW.

(Lin 1998a, p. 230)

Another interesting property of EPWs, discussed in Lin (2004), is the observation that they display a scope ambiguity which extends up to the highest available licenser. For example, in (48), the existential polarity wh-phrase can take either narrow or wide scope with respect to negation, but it cannot take scope over the highest licenser *haoxiang* ‘seem’.

(48) Ta haoxiang mei/bu chi shenme (dongxi) de-yangzi

he seem not eat what thing seem

a. ‘It seems that he did/does not eat anything.’

b. ‘It seems that there is something such that he did/does not eat it.’

(Lin 2004, p. 460)

This scope ambiguity of EPWs raises an important question as to whether they are inherent quantifiers which move (covertly) to obtain scope. The answer here must be negative, because an EPW can appear inside an island but nevertheless have scope outside the island as example (96) to be discussed later shows. This suggests that the scope of EPWs must be determined by some mechanism other than quantifier raising.

2.3 Universal Wh-phrases

When accompanied by the adverbial *dou* ‘all’, wh-phrases can be interpreted as a universal quantifier equivalent to *every* or the free choice *any*, as illustrated below (See Huang (1982b), Cheng (1994), Lin (1996)).

(49) Shei dou renshi ta
who all know him

² It can be noted that Lin’s NEEC is very close, in spirit, to Giannakidou’s (1998, 2002) independent proposal that the distribution of NPIs is contingent upon whether the environment in which the NPI appears is nonveridical or not.

‘Everyone/anyone knows him.’

Additionally, when the *wh*-phrase is the logical object, it must be fronted to a position preceding *dou* in order to obtain the universal interpretation as shown in (50).

(50) (Shenme) ta (shenme) dou chi
what he what all eat
‘He eats everything/anything.’

This indicates that *dou* can only be associated with an element to its left and this restriction is known as the Leftness Condition (See Lee (1986), Cheng (1995), Lin (1998b), among others).

When the NP associated with *dou* is a non-interrogative plural NP, it can be either the subject or the topic as in (51). However, when a sentence consists of two *wh*-phases preceding *dou*, only the one closest to *dou* can be associated with *dou* as shown in (52).

(51) Neixie shu women dou kan-guo
those book we all read-Asp
a. ‘All of those books, we have read.’
b. ‘We all have read these books.’

(52) Shei shenme dou chi
who what all eat
a. ‘Who eats everything?’
b. ‘*What does everyone eat?’
c. ‘*Everyone eats everything.’

(Cheng 1995, p. 203)

Another observation, made by Cheng (1995), is that the *wh*-phrase associated with *dou* may occur inside an island such as a sentential subject or a relative clause as in (53) and (54).

(53) [Lisi Chi shenme] dou gen wo wuguan
Lisi eat what all to me irrelevant
‘Whatever Lisi eats is irrelevant to me.’

(Cheng 1995, p. 203)

(54) [Shei xie de shu] wo dou kan
who write DE book I all read

‘For all x, x wrote books, I read them.’

(Cheng 1995, p. 204)

She also observes that *dou* can be associated with more than one wh-phrase, as in (55).

(55) Shei chi shenme dou gen wo wuguan
who eat what all to me irrelevant
Lit. ‘Whoever eats whatever is irrelevant to me.’

(Cheng 1995, 222)

In this respect, wh-phrases contrast with non-wh phrases, because *dou* may not quantify over a non-wh plural NP inside an island or a relative clause.

(56) *[tamen chi mian] dou gen wo wuguan
they eat noodle all to I irrelevant
‘That all of them eat noodles is irrelevant to me.’

(57) *[tamen xie de nafeng xin] wo dou kan
they write DE that letter I all read
‘I read that letter which all of them wrote.’

(Cheng 1995, p. 204)

There are two major detailed analyses of *wh...dou* constructions in the literature. One is Cheng’s (1995) binding analysis and the other is Lin’s (1996) elliptical *wulun* analysis, which I summarize and compare below.

To account for *wh...dou* constructions, Cheng (1995) analyzes *dou* as a polarity licenser which must m-command the wh-phrase at S-structure. This is why *dou* in (52) can be associated with the raised object wh-phrase, but not the subject wh-phrase. At the same time, *dou* is also a binder giving universal force to the wh-phrase, analyzed as a variable. To bind a wh-phrase, *dou* is normally assumed to be adjoined to the wh-phrase at LF. In cases where the wh-phrase is embedded inside an island, *dou* is assumed to be adjoined to the island rather than to the wh-phrase itself, because variable binding requires only c-command.

Cheng’s theory assumes that *dou* may perform a dual function of both binder and quantificational marker. In (56) and (57), the function of *dou* is simply to quantify over, not to bind the plural NP *tamen* ‘they’. However, the plural NP *tamen* ‘they’ is inside an island and hence inaccessible to *dou* quantification.

In contrast to Cheng’s non-unified analysis of *dou*, Lin (1996) proposes that

wh...dou constructions are actually elliptical *wulun*-constructions, where *wulun* ‘no matter’ is optionally present and may select either an interrogative *wh*-question or a *wh*-NP as its complement, as is shown below.

(58) (Wulun) shei dou keyi lai
 no-matter who all may come
 ‘Anybody may come.’

(59) (Wulun) ni zuo shenme dou gen wo wuguan
 No-matter you do what all to me no-relation
 ‘No matter what you do, it has no relation to me.’

As for the role of *dou* in this construction, Lin (1996) argues that it is a distributivity operator just like its occurrences elsewhere. In *wh...dou* constructions, its function is to distribute over the generalized union formed by *wulun*, either over a set of entities when the complement selected by *wulun* is a *wh*-NP or over a set of situations when the complement is an interrogative *wh*-clause. This analysis is also adopted by Giannakidou & Cheng (2006) to account for the free choice reading of *wh*-phrases.

On this approach, the ability of *dou* to be associated with multiple *wh*-phrases follows from the fact that the complement clause of *wulun* is an embedded interrogative clause and that an interrogative clause may contain more than one *wh*-expression. That is, (55) is completely identical to (60).

(60) Wulun shei chi shenme dou gen wo wuguan
 No-matter who eat what all to me irrelevant
 ‘No matter who eats what, it is irrelevant to me.’

Likewise, the association of *dou* with a *wh*-phrase inside an island can be ascribed to the fact that *wulun*-constructions allow a *wh*-phrase to appear inside an island as in (61).

(61) Wulun shei xie de shu wo dou kan
 No matter who write DE book I all read
 ‘No matter who is the person *x* such that *x* wrote a book, I will read that book.’

Finally, the adjacency effect seen in (52) is also parallel to *wulun*-constructions in (62). The parallelism, as pointed out by Lin (1996), lends support to the hypothesis that *wh...dou* constructions are strongly connected with *wulun*-constructions.

- (62) a. Shei wulun shenme dou chi
 who no-matter what all eat
 ‘Who eats everything?’
- b. *Wulun shei shenme dou chi
 No-matter who what all eat
 ‘What does everyone eat?’
- c. *Wulun shei wulun shenme dou chi
 no-matter who no-matter what all eat
 ‘Everyone eats everything.’

A test that can be used to differentiate *dou* as a binder from *dou* as a distributor is available with examples such as (63).

- (63) Yi-ge ercifangchengshi zongshi/tongchang/*dou you liang-ge butong-de
 One-C1 quadratic-equation always/usually/all have two-C1 different
 jie
 solution
 ‘A quadrature equation always/usually/all has two different solutions.’

Lewis (1975) has shown that the English counterpart of the Chinese example (63) may not involve quantification over times, because it is impossible for the same quadrature equation to have different solutions at one time and not to have different solutions at some other times. Therefore, the adverb of quantification in (63) must quantify over the variables supplied by the indefinite NP, meaning every/most quadrature equations have two different solutions. However, when *zongshi* and *tongchang* in (63) are replaced by *dou*, the sentence is ungrammatical. This indicates that *dou* does not function as a binder, and if *dou* is uniformly a distributor, it is correctly predicted that it may not be associated with an indefinite description as confirmed by (63), because *dou* requires a plural entity to make distribution possible.

3. Different Approaches to In-situ Wh-expressions

In the literature there are four major theories of Chinese wh-expressions: the quantificational theory (Huang 1982a,b), the operator movement theory (Aoun & Li 1993), the unselective binding theory (Cheng 1991, Shi 1994, Tsai 1999) and the alternative semantics theory (Dong 2009). Before reviewing these theories, a brief comment can be made about two properties that have been claimed to correlate with

wh-in-situ languages such as Chinese - the use of question particles such as Mandarin Chinese *ne* and the use of wh-words as indefinites as in Chinese EPWs. It has been suggested in the literature (Cheng 1991, Cole & Hermon 1998) that the occurrence of question particles and wh-words as indefinites is a regular property of wh-in-situ languages, and that this provides support for certain theoretical approaches to wh-in-situ expressions such as the unselective binding approach to be discussed later on. However, by means of a broad typological survey and a detailed comparison of Passamaquoddy and Mandarin Chinese, Bruening (2007) has shown that there actually is no particular correlation of question particles and wh-words as indefinites with wh-in-situ languages, and that the majority of languages have question particles and can use wh-expressions as indefinites, regardless of whether they are overt wh-movement or wh-in-situ languages. This consequently eliminates the special empirical support that such a correlation might have brought for favoring a theoretical approach to wh-in-situ expressions such as unselective binding, as discussed in 3.4 .

3.1 The semantics of wh-questions

A brief introduction to the semantics of questions will help familiarize the reader with some of the notations to be used later on. Hamblin (1958, 1973) proposes that questions denote a set of possible answers corresponding to the question. For example, suppose the domain of discourse contains four individuals, John, Bill, Jane and Mary. Then the question in (64) denotes the set of possible propositions in (65), which is equivalent to the formal representation in (66).³

(64) Who left?

(65) {John left; Bill left; Jane left; Mary left}

(66) $\lambda p \exists x [\text{person}(w)(x) \wedge p = \lambda w'. \text{left}(w')(x)]$

3.2 The quantificational approach to wh-in-situ

As the term “the quantificational approach” suggests, this approach treats interrogative wh-phrases as inherent quantifiers. As a quantifier, a wh-phrase has to move to SpecCP to obtain its scope, and (in a Minimalist analysis) to check against the question feature in the interrogative C, deleting the uninterpretable [+wh] feature carried by the wh-phrase, as is represented in (67).

³ Hamblin’s semantics of questions is later modified by Karttunen (1977) to denote a set of true answers. For another alternative approach to questions, see Groenendijk & Stokhof (1984, 1989).

(67) [CP Who_[+wh] [C' 1 [C' C_[+Q] [IP t₁ left]]]]⁴

As noted earlier, Huang (1982a,b) extended the analysis of English style wh-movement at surface structure to covert movement of wh-in-situ phrases at the level of LF. In such an approach, a Chinese wh-question such as (68) is given the logical representation in (69).

(68) a. Ni kanjian-le shei?

you see-Asp who

'Who did you see?'

(69) a. [Shei_i [ni kanjian-le t_i]]

b. [neige x ; x shi ren] [ni kanjian-le x]]

which is person you see-Asp

According to Huang, such an LF-movement approach accounts for the typological difference between English and Chinese with respect to the scope of questions and selectional restrictions of verbs in a very straightforward manner. That is, in English these requirements must be met in overt syntax, whereas in Chinese, the same requirements are satisfied at LF.

Moreover, if covert LF movement is assumed, the argument/adjunct asymmetry discussed in (13)-(22) can be attributed to the Empty Category Principle (ECP); that is, if in-situ adjunct wh-phrases undergo LF movement, they will yield the same ungrammaticality as overt adjunct extraction in English.

Such a covert movement approach is further supported by Aoun & Li's (1993) observation that in-situ wh-expressions have wide scope over other quantifiers as illustrated in (70), and is also supported by the occurrence of weak crossover effects shown in (71).

(70) Mei-ge ren dou mai-le shenme?

every-Cl person all buy-Asp what

'What did everyone buy?'

(71) a. *Who_i does his mother like x_i?

b. *Xihuan ta_i de ren kandao shei_i?

like he Rel person see who

'Who did the person that likes (him) see?'

In addition, Soh (2005) provides supports for the LF wh-movement approach

⁴ This is Heim & Kratzer's (1998) style of representing the index of a moved item.

with data from antecedent contained deletion (ACD) constructions such as (72).

- (72) Ta neng/gan zuo mei/na-yi-jian wo bu neng/gan de shi
he can/dare do every/which-Num-Cl I not can/dare Rel thing
'He can/dare to do everything that I can't/don't dare to.'
'Which is the thing x such that he can/dares to do x and I can't/don't dare to do
 x ?'

(72) illustrates that, like a universal quantifier, a nominal wh-phrase headed by *na* 'which' can license ACD in Mandarin Chinese; therefore, it can be assumed to undergo covert phrasal movement in order to avoid the problem of infinite regress.

Although the LF movement approach to wh-expressions captures many significant linguistic generalizations, as Cheng (2009) has pointed out, in many cases movement is not the only way to explain the patterning observed. For example, the selectional restrictions and scope-taking property might be fulfilled by a question particle, hence weakening the arguments for LF movement.

The evidence based on ACD is also controversial. This argument is based on the assumption that an empty VP is present from the start of the derivation and is later reconstructed for the sake of interpretation. However, Wyngaerd & Zwart (1999) have argued that the problem of infinite regress arises only under that assumption. If one assumes that an empty VP is derived by deletion, no such problem will arise and the ACD construction is no longer an argument for LF movement.

In addition to such potential criticisms of the LF wh-movement approach, there is also no satisfactory answer to the long-standing question why covert movement is not constrained in the same way as overt movement.⁵ For example, it has been widely acknowledged that covert LF movement appears to be insensitive to certain regular constraints on overt wh-movement such as Subjacency.]

In fact, the literature provides a considerable range of arguments against LF wh-movement. For example, it has been observed that the focus adverb *only* may not be associated with a phrase moving across it in overt syntax as the contrast between (73) and (74) shows (See Tancredi 1990).

(73) Mary_i, he only likes x_i.

(74) *Who_i does he only like x_i?

(Aoun & Li 1993, p. 206)

⁵ Nishigauchi (1986), Choe (1987) and Pesetsky (1987) propose that in-situ wh-phrases embedded to an island can be explained in terms of pied-piping, but this analysis has been argued to lead to problems of semantic interpretation by von Stechow (1996). Further criticisms relating to the predicted availability of answer-forms in a pied-piping analysis are given in Cheng (2009).

However, Aoun & Li (1993) observe that a wh-in-situ may be associated with *only* as in (75).

- (75) Ta zhi xihuan shei
 he only like who
 ‘Who does he only like?’

They take such examples as evidence that in-situ wh-phrases do not undergo covert movement to SpecCP.

Another argument against LF wh-movement comes from Wu’s (1999) discussion of patterns of across-the-board interpretation. If covert wh-movement exists, it is surprising why (76) lacks the across-the-board interpretation that is licensed by overt movement in (77).

- (76) Zhangsan xihuan shenme, Lisi bu xihuan shenme?
 Zhangsan like what Lisi not like what
 (i) *What does Zhangsan like but Lisi does not like?
 (ii) What does Zhangsan like and what does Lisi not like?
- (77) Shenme_i Zhangsan xihuan e_i, Lisi bu xihuan e_i
 What Zhangsan like Lisi not like
 (i) What does Zhangsan like but Lisi does not like?
 (ii) *What does Zhangsan like, what does Lisi not like?
 (Wu 1999, p. 16)

A third argument against LF wh-movement is Wu’s (1999) observation that wh-in-situ does not license parasitic gaps whereas overt extraction does, as seen in the contrasts in (78).

- (78) a. *?Zhangsan zai meiyou kanjian shei_i zhiqian jiu aishang-le e_i?
 Zhangsan at not see who before then love-ASP
 ‘Who did Zhangsan fall in love with without seeing?’
 b. Zhangsan zai meiyou kanjian shei_i zhiqian jiu aishang-le tai_i?
 Zhangsan at not see who before then love-ASP her
 ‘Who did Zhangsan fall in love with without seeing?’
- (79) Shei_i Zhangsan zai meiyou kanjian t_i zhiqian jiu aishang-le e_i?
 who Zhangsan at not see before then love-ASP
 ‘Who did Zhangsan fall in love with without seeing?’

In summary, we have seen that there are arguments both for and against LF movement of *wh*-expressions.⁶ Although the movement approach has insightfully accounted for many phenomena, it has also begged many questions which do not seem to have satisfactory answers yet. This leads many linguists to pursue an alternative approach to *wh*-questions in Mandarin Chinese.

3.3 The operator movement approach

The quantificational approach to *wh*-expressions, as discussed above, is to treat *wh*-phrases themselves as operators which move at LF and leave traces. An alternative to this approach is that what is moved is not the *wh*-phrase itself but a covert question operator which binds the *wh*-phrase. The most typical representative of this approach is Aoun & Li's (1993) proposal (also see Watanabe 1992 and Hagstrom 1998). They propose that an interrogative *wh*-phrase is associated with a null question operator base-generated in a *Qu*-projection. This question operator moves to SpecCP, binding the in-situ *wh*-phrase. This then explains why *zhi* 'only' can be associated with an in-situ *wh*-phrase: the *wh*-phrase does not move crossing *zhi* 'only'. On this approach, the argument-adjunct asymmetry is accounted for with the suggestion that an argument does not need a local antecedent in the minimal clause in which it occurs, whereas an adjunct does have such a requirement. Thus, even if a *wh*-phrase itself does not move, the movement of the local question operator is constrained by locality conditions (see Aoun & Li 1993 for details of the analysis).

3.4 The unselective binding approach

A third general approach to Chinese *wh*-questions which has sometimes been adopted is the unselective binding approach, in which in-situ *wh*-phrases, analyzed as indefinite variables without inherent quantificational force, are bound by a base-generated question operator in Comp (Cheng 1991, Tsai 1999), yielding a representation such as (80).

(80) [_{CP} Q₂ [_{IP} Yuehan xihuan shei₂]]

On this approach, since no movement is involved, island conditions become irrelevant.

⁶ For an excellent review of the arguments for and against LF *wh*-movement across languages, the reader is referred to Cheng (2003a, b) and Cheng (2009).

However, according to Reinhart (1998) and Tsai (1999), only wh-nominals which have an N-set, and not wh-adverbs, which are operators themselves, may introduce variables in situ. Consequently, reason adverbs such as *weisheme* ‘why’ do have to move to create variables and hence are subject to island constraints.

Although the syntactic representation of unselective binding is relatively simple, the semantic computation is not straightforward. Reinhart (1998) points out a problem with the unselective binding approach posed by the restriction of the variable. According to her, in (81a), if the wh-phrase *which philosopher* is interpreted in situ as in (81b), then any non-philosopher can make the sentence a true statement, because when the antecedent clause of a conditional is false, the whole conditional is true.

(81) a. Who will be offended if we invite which philosopher?

b. For which $\langle x, y \rangle$, if we invite y and y is a philosopher, then x will be offended.

To avoid this problem, Reinhart suggests that in-situ wh-phrases can be analyzed as introducing a choice function variable. Choice functions are functions which when applied to a non-empty set, i.e., the denotation of a (noun) predicate, yield an individual member of that set. On this approach, the semantics of (81a) is represented as (82):

(82) $\{p: \exists x \exists f [CH(f) \ \& \ p = \lambda w. (we \text{ invite } f(\text{philosopher}) \text{ in } w \rightarrow x \text{ will be offended in } w)]\}$

Similarly, (80) is represented as (83):

(83) $\{p: \exists f [p = \lambda w. CH(f) \wedge \text{John likes } f(\text{person}) \text{ in } w]\}$

Lin (2004) argues that the choice function approach should also be adopted to account for scope of Chinese wh-phrases.

The unselective binding and choice function variable approaches to wh-phrases have a further advantage that they can explain a special type of construction referred to as “bare conditionals” by Cheng & Huang (1996), where a wh-phrase in the consequent clause is anaphoric to another wh-phrase in the antecedent clause. This construction is illustrated below.

(84) (Tongchang) shei xian lai shei xian chi

Usually who first come who first eat
'(Usually), if x comes first, x eats first./Usually whoever comes first eats first.'

According to Cheng & Huang (1996) and Lin (1996), the co-variation reading of the two wh-phrases in (84) can be easily explained if they are analyzed as variables bound by the same operator, which might be implicit or explicit (See Heim 1982). In contrast, if wh-phrases are inherently existential quantifiers as in the quantificational approach, the co-reference relation in "bare conditionals" would be difficult to explain, because under this analysis each of the two wh-phrases in (84) is introduced by its own existential quantifier and therefore no co-reference relation is entailed.⁷ Examples such as (84) thus provide a piece of evidence that at least some usages of Chinese wh-phrases should be analyzed as variables rather than inherent quantifiers.

The unselective binding approach relies crucially on the assumption that a question operator binds the variables which are present. However, Dong (2009) argues that no conclusive evidence can be given for the existence of a question particle in Mandarin wh-questions. Adopting Shao's (1996) arguments, he assumes that the question particle *ne*, often assumed to be an indicator of wh-questions, is actually not a genuine question particle, but a speaker-oriented marker emphasizing the wh-phrase and reinforcing the interrogative force of the question. Despite Dong's (2009) arguments against the existence of a question morpheme for Chinese wh-questions, it is still difficult to conclude that the unselective binding theory should be abandoned, because there is always the possibility that the interrogative wh-question morpheme is actually null in every wh-question sometimes with the particle *ne* adding speaker-oriented emphasis and reinforcement of the asking act.

3.5 The Alternative Semantics Theory

Another non-movement approach to indefinite wh-in-situ is Kratzer & Shimoyama's (2002) and Shimoyama's (2006) new semantic proposal in terms of Alternative Semantics framework (cf. Hamblin 1973 and Rooth 1985), which was applied to Chinese wh-phrases by Dong (2009). This theory is based on the assumption that wh-phrases denote sets of individuals as in (85) and the rest of the sentence, in most cases, denotes a singleton set as in (86). These two sets are then composed by Hamblin Functional Application as in (87), resulting in a set of alternatives as demonstrated in (88).

⁷ Chierchia (2000) suggests that the existential quantifiers can be wiped off via "existential disclosure", thus allowing the co-variation reading of bare conditionals.

(85) $[[shei]]: \lambda x. human(x)(w) \Rightarrow \{x: human(x)(w)\}$.

(86) $[[fangpi]]: \lambda x. fart(x)(w) \Rightarrow \{p: p = \lambda x. fart(x)(w)\}$

(87) Hamblin Functional Application (from Kratzer & Shimoyama 2002):

If α is a branching node with daughters β and γ , and $[[\beta]]^{w,g} \subseteq D\sigma$ and $[[\gamma]]^{w,g} \subseteq D_{\langle\sigma\tau\rangle}$, then $[[\alpha]]^{w,g} = \{a \in D\tau: \exists b \exists c [b \in [[\beta]]^{w,g} \& c \in [[\gamma]]^{w,g} \& a = c(b)]\}$.

(88) $[[shei fangpi]]^{w,g}$
 $= \{f(x): f \in [[fangpi]]^{w,g} \wedge x \in [[shei]]^{w,g}\}$
 $= \{\lambda w'. fart(x)(w'): person(x)(w)\}$
 $= \{p: \exists x [person(x)(w) \& p = \lambda w'. fart(x)(w')]\}$

The resulting alternative set is a set of propositions. This happens to be the meaning of a wh-question and this result is obtained without any cost of covert or overt movement. However, a resulting alternative set may normally keep expanding until it meets the first alternative quantifier (operator) on its way. Such quantifiers always turn their input to singleton alternative sets, so they cannot preserve alternatives. For instance, if an additional modality operator such as *keneng* ‘possibly’ is added to (88), the modality operator may introduce an existential operator which associates with the resulting alternative set as represented in (89).

(89) $[[keneng \exists shei fangpi]]^{w,g}$

Suppose the alternative existential quantifier is defined as in (90). Then the denotation of the expression $[[\exists shei fangpi]]^w$ is (91), which is the input of the possibility modality operator given in (92).

(90) $[[\exists]]^w(A) = \{\lambda w'. \exists p \in A \& p(w')\}$, where A is an alternative set.

(91) $[[\exists shei fangpi]]$
 $= \{\lambda w'. \exists p \in \{p: \exists x [person(x)(w) \& p = \lambda w'. fart(x)(w')]\} \& p(w')\}$

(92) $[[keneng \alpha]]^w = \text{For some world } w' \text{ which is epistemically accesbile from } w,$
 $w' \in [[\alpha]]^w.$

In other words, the input of the licenser of an existential wh-indefinite is a proposition rather than a set of proposition alternatives.

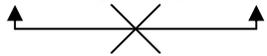
Likewise, according to Dong (2009), on the assumption that *dou* is a universal alternative quantifier, (93) can be treated as in (94) with *dou* closing the alternative propositions.

(93) Shei dou xihuan Lisi
 who all like Lisi
 ‘Everyone likes Lisi.’

(94) a. $[[\forall]]^w(A) = \{\lambda w'. \forall p[p \in A \rightarrow p(w')]\}$, where A is an alternative set.
 b. $[[\text{dou shei xihuan Lisi}]]_w$
 $= \{\lambda w'. \forall p \in \{p: \exists x[\text{person}(x)(w) \ \& \ p = \lambda w'. \text{fart}(x)(w')]\} \rightarrow p(w')\}$

Although the above is a very rough sketch of how the theory of alternative semantics deals with Chinese wh-indefinites, it suffices to see the big picture of the theory and what the theory can buy. On this theory, wh-indefinites have no inherent quantificational force and uniformly denote individual alternatives, no matter whether they are interpreted as interrogative, existential or universal. Existential quantification over the individual variable comes from the definition of Hamblin Functional Application. On the other hand, the existential and universal alternative quantifiers actually quantify over the alternative propositions derived from Hamblin Functional Application. As no movement is involved at all in the association between alternative quantifiers and alternative-inducing expressions, the theory predicts that the association is insensitive to syntactic islands. However, the association with alternative operators is still local, though not in the usual syntactic sense, because alternatives cannot escape the first operator they meet. Therefore, an association of the following kind is not possible.

(95) $[\text{Op}_1 \dots [\text{Op}_2 \dots [\text{wh-indefinite}]]]$



Although the theory of alternative semantics as presented in Dong (2009) yields many desirable results for Chinese wh-phrases, it may encounter a problem regarding the scope of wh-indefinites. As mentioned, when an existential wh-indefinite has more than one potential licenser, it shows scope ambiguity as in (96).

(96) Haoxiang [yaoshi shei bu qu dehua, Zhangsan jiu bu qu] de yangzi
 Seem if who not go if Zhangsan then not go seem
 a. ‘It seems that if anyone does not want to go, Zhangsan won’t go.’
 b. ‘It seems that somebody is such that if he does not want to go, then Zhangsan won’t go.’

(96) has two readings. In reading (a), the existential wh-indefinite has scope internal to the conditional clause. The second reading is that the wh-indefinite is scoped out of

the conditional clause but is within the scope of *haoxiang* ‘seem’. The second reading violates the locality constraint in (95) imposed by the theory of alternative semantics. Notice that it is not sufficient to argue that the licensors of existential wh-indefinites only optionally introduce alternative existential closure as Dong (2009, p. 152) seems to have implied. Recall that the input of an alternative existential closure and that of modality operators are actually different. The former requires a set of propositions as its input, whereas the latter needs a proposition as its argument. Therefore, even if the set of proposition alternatives introduced by the most embedded clause is not caught by the embedded existential closure in the lower clause, it may not serve as the argument of the first modality operator, unless modality operators are assumed to be lexically ambiguous with respect to their input requirements. Under this solution, the burden is only shifted to the lexicon.

In contrast with the theory of alternative semantics, the theory of unselective binding with the help of choice functions does not seem to have a similar problem. The wide scope reading of an existential wh-phrase can be easily obtained by the choice function analysis of wh-phrases.

Another point worth mentioning about alternative semantics has to do with wh-islands. As discussed, when there are two argument wh-phrases embedded under a matrix verb requiring an interrogative wh-clause such as *xiang-zhidao* ‘wonder’, it is often claimed that one of the wh-phrases may scope out of the wh-island. However, the theory of alternative semantics only allows embedded scope for all embedded wh-phrases. The issue is complicated, however, because as mentioned there is still considerable disagreement with respect to speakers’ intuitions concerning such data.

4. Concluding Remarks

In this chapter, several approaches to wh-expressions in Mandarin Chinese have been reviewed, showing how the interrogative, existential and universal interpretations of such elements are licensed, as well as how their scope is determined. For each approach, it was seen that there are both arguments for and against certain aspects of the approach. This is especially true with regard to the analysis of interrogative wh-phrases. There is no consensus regarding whether the licensing and interpretation of such elements involves covert wh-movement, overt wh-operator movement or no movement at all. Similarly, no agreement has been reached with regard to whether all adjunct wh-phrases are equally restricted by locality constraints. Even the reason adverbial wh-phrase *weishenme* ‘why’, which most studies claim cannot be LF-extracted from an island, is claimed by Shi (1994) to have no such a restriction. Given that empirical data are the foundations of theory formation, a more scientific

method—one which does not rely on speakers’ intuitions, is needed to clarify what the truth of the empirical facts are; otherwise, it will be difficult to compare different theories. This is most definitely an area in need of further clarification in the study of Chinese *wh*-phrases.

In spite of the disagreement about the data, there is no denying that the reason adverb *weishenme* is truly different from other adjuncts. Donkey anaphora provides a very good test. All speakers accept *zenme* ‘how’ but not *weishenme* ‘why’ as a donkey anaphor, as the contrast below shows.

- (97) Ni zenme shuo, wo zenme zuo
 you how say I how do
 ‘Lit. you say in x way, I will do in x way.’
- (98) *Ni weishenme cizhi, wo weishenme cizhi
 you why resign I why resign
 ‘Lit. you resign for x reason, I resign for x reason.’

The ungrammaticality of (98) clearly shows that unlike other *wh*-phrases *weishenme* is never used as a variable.

Another important issue about the various interpretations of Chinese *wh*-phrases is whether they have a uniform semantics. Here there are two possibilities: either *wh*-phrases are all inherently quantificational or they do not have inherent quantificational force. Let us assume that interrogative *wh*-phrases are indeed inherent existential quantifiers as Huang’s (1982b) framework assumes. Then the question is whether universal and polarity *wh*-phrases are also inherent existential quantifiers. This assumption is plausible for *wh...dou* constructions if such constructions are elliptical *wulun* constructions as Lin (1996) proposes. Polarity *wh*-phrases have existential interpretations and hence it is also plausible to assume that they are inherent existential quantifiers.

A problem with treating all Chinese *wh*-phrases as inherent existential quantifiers, however, has to do with the fact that unlike true quantifiers, their scope is often not restricted to the clause in which they are embedded. Another difficulty is that it is not able to explain the co-reference reading of donkey anaphoric *wh*-phrases. If *wh*-phrases are inherent quantifiers, then they will not be able to co-refer in “bare-conditionals”.

In comparison with the quantificational approach, the unselective binding approach is immune from the above problems. However, both the quantificational and the unselective binding theories encounter a problem concerning the Novelty Condition, which dictates that an indefinite not have the same index as any NP

preceding it (Heim 1982).

The alternative semantics theory, on the other hand, has a problem with respect to flexible scope. So we see that each approach has its own, albeit different, problems. At this stage though no firm conclusion can be reached regarding which theory should be definitely favored over the others, overall considerations suggest that the unselective binding approach to wh-phrases in Chinese does look very attractive.

Apart from the above two issues, two other remarks are in order regarding the analysis of polarity wh-phrases and the interaction between *dou* and interrogative wh-phrases. I believe that the syntactic distribution of polarity wh-phrases has been neatly captured by Li's (1992) and Lin's (1996, 1998) descriptive generalizations though their details are slightly different. However, their studies still left it as a puzzle why existential polarity wh-phrases are restricted to those contexts in which they occur. Is this due to the meaning of wh-phrases themselves or because of something else? This question, as Lin (1998a) has already noted, needs to be further explored by future works before it can be claimed that there is a full understanding of the nature of polarity wh-phrases. A recent attempt to address this question is Liao's (2011) dissertation, which approaches this topic within the framework of Chierchia's (2010) implicature theory. However, to discuss this work is beyond the space availability of this chapter.

One issue that was not touched in the above discussion is the interaction between *dou* and interrogative wh-phrases. As noted, *dou* is subject to the Leftness Condition when the wh-phrase associated with it is non-interrogative. However, when the wh-phrase is interrogative, the Leftness Condition does not play a role. An illustrating example from Li (1995) is (99).

- (99) Zhangsan dou renshi shei?
Zhangsan all know who
'Who are all the people Zhangsan knows?'

The issue of the Leftness Condition is particularly striking when we compare interrogative wh-phrases with standard universal quantifiers such as *mei-ge ren* 'everyone'. Compare (99) with (100a).

- (100) a. *Lisi dou renshi mei-ge ren
Lisi all know every-Cl person
b. Mei-ge ren Lisi dou renshi
every-Cl person Lisi all know
'Lisi knows everyone.'

Note that it is implausible to suggest that Chinese interrogative wh-phrases must remain in situ in overt syntax. In (101) below, the object wh-phrase is fronted to the sentence-initial position, and this is perfectly acceptable

- (101) Shei ni zui xihuan
who you most like
'Who do you like most?'

However, when the sentence contains *dou*, fronting an interrogative wh-phrase makes the interrogative meaning disappear, as illustrated by (102).

- (102) Shei Zhangsan dou renshi
who Zhangsan all know
(i) 'Zhangsan knows everybody.'
(ii) '*Who are all the people that Zhangsan knows?'

As far as I know, very little, if any, attention has been paid to the asymmetry between interrogative and non-interrogative wh-phrases with respect to their interaction with *dou*. This is another area of wh-expressions which needs to be examined in future research.

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