Mandarin $wh$-conditionals as interrogative conditionals

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Abstract

This talk examines $wh$-conditionals in Mandarin Chinese. It argues that $wh$-conditionals involve embedding two questions within a conditional, one in the antecedent and one in the consequent. Transition from a Hamblin/Karttunen question meaning to a conditional semantics is achieved by answerhood operators. The meaning obtained in this way is simple and intuitive: answers to the antecedent question already contains information to answer the consequent question.
**Mandarin wh-conditionals as interrogative conditionals**

**Introduction:** The talk discusses Mandarin wh-conditionals. It argues that wh-conditionals involve embedding two questions within a conditional, one in the antecedent and one in the consequent. Transition from a Hamblin/Karttunen question meaning to a conditional semantics is achieved by answerhood operators. The meaning obtained in this way is simple and intuitive: answers to the antecedent question already contains information to answer the consequent question.

**The basics:** (1) illustrates wh-conditionals, the defining property of which is that they contain a pair (or multiple pairs) of co-varied wh-phrases, one in the antecedent and one in the consequent.

(1) **Zhangsan qing shei, Lisi jiu qing shei.**

Zhangsan invite who, Lisi JIU invite who
If Zhangsan invites X, Lisi invites X.

a. **UNSELECTIVE BINDING:** \( \forall x [\text{invite}(Z,x) \rightarrow \text{invite}(L,x)] \)

b. **CORRELATIVE/FREE-RELATIVE:** \( \text{invite}(L, \sigma_x[\text{invite}(Z,x)]) \)

Two very different types of analyses have been proposed for wh-conditionals. One sees them as involving **UNSELECTIVE BINDING** (1a) (Cheng & Huang, 1996; Chierchia, 2000), the other takes them to be kin to **CORRELATIVES/FREE-RELATIVES** (1b) (Huang, 2010; Crain & Luo, 2011).

**Our proposal** takes wh-conditionals to be interrogative conditionals: the wh-words are real question words, and the antecedent and the consequent clauses both embed questions. Specifically, we take jiu to be an indicator of conditionals and adopt a semantics of conditionals/counterfactual that utilizes exemplifying situations (2) (Fine 2012, cf. Heim 1990; Schwarz 1998). We also adopt a Hamblin/Karttunen semantics of questions (Hamblin, 1973; Karttunen, 1977), where a question denotes a set of propositions — the set of its possible answers. Finally, transition from Hamblin/Karttunen questions to conditionals is achieved by answerhood operators (Dayal, 1996; Beck & Rullmann, 1999) (3). Together, these ingredients deliver (4).

(2) \( \llbracket p \text{ jiu } q \rrbracket = 1 \text{ at } s^* \text{ iff } \forall s [s \in \text{MIN}\{s : p(s) = 1 \land C_{ss}(s) = 1\} \rightarrow q(s) = 1] \),

where C is conversational background.

In words: a conditional \([p \text{ jiu } q]\) is true at \(s^*\) iff every minimal situation \(s\) such that \(p\) is true at \(s\), coupled with the conversational background \(C\) obtained at \(s^*\), is also a situation such that \(q\) is true. (A variant of Fine 2012 using Kratzer 1989 situation semantics)

(3) \( \text{ANS}(Q)(s^*) = \{p \in Q[p(s^*) = 1 \land \forall q \in Q[q(s^*) = 1 \rightarrow p \subseteq q]\} \) (Dayal, 1996)

(4) **SEMANTICS OF wh-CONDITIONALS:**

\[ \llbracket \text{ANS}(Q_A)(s^*) \text{ jiu } \text{ANS}(Q_C)(s^*) \rrbracket = 1 \text{ at } s^* \]

iff \( \forall s [s \in \text{MIN}\{s : \text{ANS}(Q_A)(s^*)(s) = 1 \land \text{PRE}(Q_C)(s) = 1\} \rightarrow \text{ANS}(Q_C)(s^*)(s) = 1] \)

In words: every minimal situation that supports the answer to \(Q_{\text{antecedent}}\) in \(s^*\) and the presupposition of \(Q_{\text{consequent}}\) supports the answer to \(Q_{\text{consequent}}\) in \(s^*\).

Different from ordinary conditionals, wh-conditionals have a nearly empty conversational background \(C\) (it has in it only the presupposition of the consequent, an existential presupposition in the case of questions). This is not hard to imagine: conditionals do have different modal flavors, captured by varying choices of the conversational background (Kratzer, 1981). The meaning captured in this way matches our intuition: the answer to the antecedent question (without any other background information) provides enough information to answer the consequent question.

**An illustration:** Suppose in \(s^*\) Zhangsan invited John and Mary, and Lisi invited Bill and Sue. (1) is false in \(s^*\): the minimal situation \(s\) that supports the answer to \textit{who did Z invite?} in \(s^*\) and the presupposition of \(Q_C\) (an existential presupposition that \(L\) invited someone) consists of \(Z, L,\)
John\(\oplus\)Mary; \(s\) does not support the answer to \(Q_C\) in \(s^*\) — that \(L\) invited Bill and Sue. In general, our semantics using minimal situations guarantees that the short answer to the consequent question is identical to the antecedent-short-answer, thus capturing the ‘co-variation’ of the two \(wh\).

Next, we show puzzles unexpected under previous analyses receive natural explanation in our account.

**Wh-licensing:** non-question \(wh\)-words in Mandarin are polarity items (Lin, 1996; Chierchia & Liao, 2014). It is mysterious under previous analyses (where the \(wh\)’s are treated as non-question \(wh\)’s) how the \(wh\) in the consequent of a conditional (an upward-entailing context) is licensed.

Our proposal provides a ready answer: \(wh\)-words in \(wh\)-conditionals are simply question words, not the type of polarity items that need licensing. Even better, a unified semantics for \(wh\)’s can be achieved, by treating Mandarin polarity \(wh\)’s as Chierchia-existentials (Chierchia, 2013; Chierchia & Liao, 2014) and \(wh\)’s in questions and \(wh\)-conditionals as Karttunen-existentials.

**No quantificational variability:** Consider (5), with an overt quantificational adverb usually.

\[
(5) \quad \text{Tongchang, } Z \text{ qing shei, } L \text{ qing shei} \quad \text{usually, } Z \text{ invt who, } L \text{ invt who} \quad \text{L usually invites who } Z \text{ invites}. \neq \\
\text{MOST}_x(\text{invite}(Z,x), \text{invite}(L,x)) \quad \text{3rd} \quad \{g,h,i\} \quad \{g,h\}
\]

In a context where there were three parties, and the invitees of \(Z\) and \(L\) are as depicted in the table above, (5) is false, unexpected under unselective-binding. For (5) to be true, there has to be a majority of party-situations/events, where \(L\) invited all the people \(Z\) invited. This can be explained under our proposal: assuming quantificational adverbs in \(wh\)-conditionals quantify over pragmatically determined subsitutions of a topical situation (in the case of (5) a set of parties, represented by \(\text{Cov}(s^*)\), cf. Beck 2012), we have (6) as the analysis of (5).

\[
(6) \quad [(5)]=1 \text{ at } s^* \text{ iff } \text{MOST}[\lambda s.s \in \text{Cov}(s^*), \lambda s.[\text{ANS}(Q_A)(s) jiu \text{ ANS}(Q_C)(s)]=1 \text{ at } s]
\]

**Uniqueness presupposition** is shown in (7), where \(who\) in (1) is replaced by *which two persons*.

\[
(7) \quad Z \text{ qing na.liang.ge.ren, } L \text{ jiu qing na.liang.ge.ren.} \quad Z \text{ invite which two CL.person, } L \text{ invite two CL.person}\]

Whichever two persons \(Z\) invites, \(L\) invites them.

(7) presupposes \(Z\) and \(L\) each invite exactly two persons. Unselective binding \(- \forall_X [2.\text{persons}(X) \land \text{invite}(Z,X) \rightarrow 2.\text{persons}(X) \land \text{invite}(L,X)]\) – says nothing about these presuppositions.

Our proposal using Dayal’s answerhood operator (which is designed to capture uniqueness in questions) captures the uniqueness presuppositions. \(\text{ANS}(Q)(s^*)\) presupposes that there is a proposition in \(Q\) that is true at \(s^*\) and entails all the other true-at-\(s^*\) propositions in \(Q\). For quantized question set such as \([\text{which two persons does } Z \text{ invite?}]\), this amounts to uniqueness.

**Minimal \(wh\)-conditionals** involve upward-scalar predicates as in (8) (Beck & Rullmann, 1999).

\[
(8) \quad \text{duoshao qian gou chi kaoyao, wo jiu gei ni duoshao qian} \quad \text{how much money sufficient eat roast duck, I give you how much money} \\
\text{I will give you the (minimal) amount of money that is sufficient to eat roast duck}.
\]

(8) means that I will give you the (minimal) amount of money that is sufficient to eat roast duck. Neither unselective binding nor correlative/free-relative based on standard \(\sigma\) gets this right.

Our proposal using Dayal’s answerhood operator naturally account for minimal \(wh\)-conditionals: \(\text{ANS}\) is informationality-based. Applied to questions with upward-scalar predicates like *sufficient*, it delivers the proposition that involves the minimal \(x\) that is sufficient to eat roast duck.
Existential *wh*-conditionals are cases like (9) where the antecedent is interpreted existentially.

(9) *nar neng maistai jiu, wo jiu qu nar.*
where can buy liquor, I will go where
‘I will go where I can get liquor.’ = I will go to some place where I can get liquor.
≠ I will go to all the places where I can get liquor.
≠ I will go to σx[I can get liquor at x].

Existential *wh*-conditionals have a natural correspondence to mention-some questions in our account. We use a variant of Beck and Rullmann’s ANS3 (10) to analyze existential *wh*-conditionals.

(10) ANS3(Q)(s*) = λP.∃p[P(p)(s*) = 1 \& p(s*) = 1]

A complication: ANS3 requires its *Q*-argument to QR. Since we don’t want QR out of a conditional antecedent, we modify (10) into (11) using choice functions. (12) is the analysis of (9).

(11) ANSsome(Q)(s*) = fCH(λp[Q(p) \& p(s*) = 1])

(12) [[9]] = 1 in s* iff \exists fCH \forall s ∈ MIN{s : fCH(λp[Q_A(p) \& p(s*) = 1]) \& PRE(Q_C)(s) = 1} → ANS(Q_C)(s*)(s) = 1]

Of course, the use of ANSsome should be constrained to avoid over-generation (not every question allows mention-some answers and not every *wh*-conditional allows existential reading), but these constraints are not well understood and we are not going into that either. But at least one prediction is made within our analysis: since *wh*-conditionals are built out of questions, whenever a question cannot receive a mention-some answer, the corresponding *wh*-conditional does not have an existential reading. We will show in the talk this is a correct prediction.

The Exhaustive flavor: *Wh*-conditionals are interpreted exhaustively. Consider (13), where the exhaustive flavor is indicated by the *only/exactly* in the gloss.

(13) *chi duoshao, cheng duoshao.*
eat how much, fill how much

Fill the plate with only/exactly the amount of food that you will eat.

Neither unselective binding nor correlative/free-relative gets this: both of them deliver *fill the plate with the amount of food that you will eat*, weaker than (13). Furthermore, the exhaustive flavor is not due to pragmatic strengthening: it survives in downward entailing contexts, in contrast to other pragmatic strengthening phenomena such as scalar implicatures which usually disappear in such contexts. This suggests a semantic way of capturing it.

Our proposal captures the exhaustive flavor. Suppose in s* Lisi (the addressee) would eat exactly 1 pound of rice but he filled his plate with 1.5 pounds of rice. (13) is false in s* according to our proposal: the minimal situation that supports the antecedent question contains exactly 1 pound of rice, which is unable to support the consequent answer which involves 1.5 pounds of rice. For (13) to be true in s*, Lisi would have to fill his plate with only 1 pound of rice.

**Conclusion:** Embedding one question within a conditional is not an entirely new idea; see for example, Lin 1996; Rawlins 2013 on *unconditionals*. But the option of embedding two questions within a conditional has not been explored. We investigate this theoretical possibility, and show that it can be employed to explain a wide range of puzzling facts concerning *wh*-conditionals.

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1Our account is compatible with other ways of capturing the mention-some reading of questions, such as by appealing to pragmatic principles or partial answers. See Dayal to appear; §3 for relevant discussion.

2Our proposal uses a weak exhaustive answerhood operator to capture the so called strong exhaustiveness. This is due to our use of minimal/exemplifying situations. Within situation semantics, we can say p is a strong exhaustive answer to Q in s* iff the exemplifying situation of p also exemplifies ANS(Q)(s*). This is similar to the position Dayal to appear takes: p is a strong exhaustive answer to Q at w iff p is the proposition expressed by ANS(Q)(w).
References


Huang, Yahui. 2010. *on the form and meaning of chinese bare conditionals: Not just whatever*: The University of Texas at Austin dissertation.


