Maximalization and the definite reading in Mandarin *wh*-conditionals

Mandarin *wh*-conditionals (or *bare conditionals*) have a conditional-like structure, but the first and second clauses must contain a pair of matching *wh*-phrases. Cheng & Huang (1996) argue that this construction involves default universal quantification over individuals, and both *wh*-phrases are unselectively bound by a (null) adverb of quantification (∀x. P(x)→Q(x)). However, this paper shows that in addition to the universal reading, *wh*-conditionals have a definite reading (1), which is not captured by previous analyses.

(1) *nei* (*yi*) *ben shu dazhe, zhangsan jiu hui mai nei* (*yi*) *ben shu.*
which one CL book on-sale Zhangsan then will buy which one CL book
'Zhangsan will buy the book that is on sale.'/'Zhangsan will buy whichever book that is on sale.'

In a context where a unique reference can be established, (1) picks out the unique on-sale book and is a felicitous answer to a *wh*-question ('which one of these books is Zhangsan going to buy?'). If the uniqueness requirement is not met, the hearer needs to ask for clarification. This reading is different from the universal reading, which describes Zhangsan's book-buying habit in general. Previous accounts that analyze *wh*-conditionals as involving universal quantification over individuals face problems in generating the definite reading. Also, *wh*-conditionals are semantically distinct from *if*-conditionals. *Wh*-phrases in *wh*-conditionals are definite and they are not compatible with existential constructions (2a), while *wh*-phrases in the antecedent of *if*-conditionals are always existential (2b). Unlike *wh*-conditionals, an *if*-conditional (2b) only addresses a *yes-no* question ('is Zhangsan going to buy a book?').

(2a) * *you nei* (*yi*) *ben shu dazhe, zhangsan jiu hui mai nei* (*yi*) *ben shu.*
have which one CL book on-sale Zhangsan then will buy which one CL book
Intended: 'Zhangsan will buy the book that is on sale.'

(2b) *ruguo you nei ben shu dazhe, zhangsan jiu hui mai pro.*
if have which CL book on-sale Zhangsan then will buy
'If there is a book on sale, Zhangsan will buy it.'

Maximalization effects are observed in the definite reading of *wh*-conditionals: the reference of the first *wh*-clause in (3) is a maximal set of plural individuals that contains exactly two atomic parts. The universal reading of *wh*-conditionals comes from universal quantification over situations (rather than individuals). True universals, according to Jacobson (1995), can be modified by 'almost', but English free relatives (which are argued to have the semantics of definite descriptions) are not compatible with 'almost'. The same is true for Mandarin universals (4a) and *wh*-conditionals (4b). Also, using Dayal's (1997) test, we find that negation may take wider scope over a true universal (5a), but no such reading is available in *wh*-conditionals (5b).

(3) *nei liang ge ren tebie gao, nei liang ge ren jiu yao yiqi tai gangqin.*
which two CL person very tall which two CL person then have-to together lift piano
'The two persons that are extremely tall have to lift a piano together.'

(4) a. *wo jibenshang du le suoyou ni jiao wo du de shu.*
I almost read ASP all you ask I read DE book
'I read almost all the books you ask me to read.'

b. *ni jiao wo du nei xie shu, wo (*jibenshang) jiu du le nei xie shu.*
you ask I read which CL-PL book I almost then read ASP which CL-PL book
'I read *almost which(ever) book you asked me to read.'

(5) a. *wo bu xihuan ni jiao wo du de suoyou de shu.*
I NEG like you ask I read DE all DE book
'I don't like all the books that you ask me to read.' (but I like some of them) ¬ > ∀

b. *ni jiao wo du nei xie shu, wo jiu bu xihuan nei xie shu.*
you ask I read which CL-PL book I then NEG like which CL-PL book
'I didn't like the books that you ask me to read.' (*but I like some of them) * ¬ > ∀

Wh-phrases in *wh*-conditionals do not receive question/existential/universal interpretations. Following Berman (1991), I assume *wh*-phrases are free variables. They are bound by a λ-operator in each clause. A σ-operator (6a) associated with the first clause produces the maximal individual that satisfies the property the *wh*-clause denotes (6b). The second *wh*-clause (6c) then takes this maximal individual as its argument.

(6) a. $[[\sigma\text{-Op}]] = \lambda P_{<et>}.\ \sigma x\ P(x)$
b. $[[\sigma\text{-Op}$ *which book is on sale*$]] = \sigma x\ (\lambda 1.\ book(1) \& on\text{-}sale(1))$
$= \sigma x\ (book(x) \& on\text{-}sale(x))$
c. $[[$*Zhangsan bought which book*$]] = (\lambda 2.\ book(2) \& bought(2)(Zhangsan))$

In addition, the adverbial *jiu* in the second clause adds an exhaustivity entailment to *wh*-conditionals. It contradicts with the presupposition of *at least*, as the *wh*-conditional entails that no other people will get apples (7a). In contrast, a relative clause, which carries no such entailment, can be used with *at least* (7b). Also, two *wh*-conditionals do not like to follow each other if the second clauses denote the same property, as each carries an entailment that conflicts with the other (8).

(7) a. *shei zai zuo bian, wo *zhishao jiu hui gei shei pingguo*. (*wh*-conditional)
who at left side I at-least then will give who apple
'I *at least will give apples to the people who are on the left side.'(I may also give apples to other people.)
b. *wo zhishao hui gei zuo bian de nei xie ren pingguo*. (relative clause)
I at-least will give left side DE-REL that CL-PL people apple
'I at least will give apples to the people who are on the left side.' (I may also give apples to other people.)

(8) *shei zai zuo bian, wo jiu hui gei shei pingguo.*
who at left side I then will give who apple
'I will give apples to the people who are on the left side.'
shei zai you bian, wo jiu ye hui gei shei pingguo.
who at right side I then also will give who apple
'I will also give apples to the people who are on the right side.'

The adverbial *jiu* contributes the same entailment to *if*-conditionals and other mono-clausal structures (9). Syntactically, *jiu* marks the attachment site for the adjunct clause in *wh*-conditionals. Word order and reconstruction tests show that the first clause attaches to a position lower than [Spec, IP] and higher than *jiu* (10), though this clause has a tendency to move to a sentence-initial position. *Jiu* plays an important role in the syntax of conditional-like structures but it does not influence the interpretation of *wh*-phrases. The link between *wh*-conditionals and *if*-conditionals is syntactic rather than semantic.

(9) *wo jiu na le yi ge*.
I ≈only pick ASP one CL
'I only picked one.'

(10) Word order: $[_{\text{matrix } wh\text{-clause}}$ Sub adv $[_{\text{adjunct } wh\text{-clause}}$ …*wh*-phrase$_i$…] [Modal/Neg [verb *wh*-phrase$_i$]]]
zhangsan dagai [nei ben shu gui] jiu bu neng mai nei ben shu.
Zhangsan probably which CL book pricey then NEG can buy which CL book
'Zhangsan probably can't buy the book that is pricey.'

This paper shows that Mandarin *wh*-conditionals have both universal and definite readings and are semantically different from *if*-conditionals. Maximalization of a *wh*-clause is possible because the semantic core of the *wh*-clause is a property (λx. P(x)) that can be further restricted by the σ-operator.

Selected reference: **Berman, S**. 1991. *On the semantics and logical form of wh-clauses*. Ph.D. Dissertation. UMass. **Cheng, L., & J. Huang**. 1996. 'Two types of Donkey sentences.' *Natural Language Semantics* 4, 121–163. **Dayal, V**. 1997. 'Free Relatives and Ever: Identity and Free Choice Readings'. SALT 7. **Jacobson, P**. 1995. 'On the Quantificational Force of Free Relatives'. In *Quantification in Natural Languages*, eds. Emmon Bach, Eloise Jelinek, Angelika Kratzer and Barbara Partee, 451-486. Dordrecht: Kluwer.