

***Nandao*-Question as a special kind of Rhetorical Question ***

Beibei Xu
Rutgers University

Abstract This paper addresses the syntax and semantics of a special kind of Rhetorical Question (RQ) in Mandarin, i.e. questions with *nandao* (*nandao*-Q). *Nandao*-Qs necessarily have rhetorical question readings. To derive this, I propose that *nandao* is a WH-word which takes a question denoting a single proposition and turns it into a set with the complement proposition. This analysis differs significantly from earlier proposals for deriving RQ meanings as asserting the negation of the proposition denoted by its IP (cf. Sadock 1971; Han 2002 a.o.). The degenerate question nature of *nandao*-Q can explain why *nandao*-Q, unlike Ordinary Questions (OQ), cannot be embedded under [+wh] selecting words like *wen* ‘ask’ and *zhidao* ‘know’.

Keywords: rhetorical questions, *nandao*-Q, degenerate questions, Mandarin

1 Introduction

Rhetorical questions have remained under-investigated in the field of linguistics (Sadock 1971; Linebarger 1987; Progovac 1993; Gutiérrez-Rexach 1998; Han 2002 a.o.). Sadock (1971) and other scholars argue that rhetorical questions—though in the form of interrogatives—actually state “an assertion of the opposite from what is apparently asked” (Han 2002: 202). As pointed out by Han (2002), “other studies on rhetorical questions. . . [were] mainly concerned with accounting for the licensing of negative polarity items (NPIs) in rhetorical questions” (ibid.). Different from previous studies, this paper focuses on the syntax and semantics of a special kind of Rhetorical Question (henceforth RQ) in Mandarin. This special kind of RQ involves the expression *nandao* (literally meaning ‘hard say’). Unlike other question forms which are ambiguous between Ordinary Questions (henceforth OQ) and RQs, *nandao*-Questions (henceforth *nandao*-Q) in Mandarin **necessarily have an RQ**

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reading, as shown in (1) and (2).¹

- (1) Nandao zhe jiushi shichang jingji (me)?
Nandao this be market economy Q
'Is this a market economy?' (= This isn't a market economy.)
- (2) Nandao shui bang-guo ni (ma)?
Nandao who help-EXP you Q
'Who helped you?' (= No one helped you.)

In this paper, I focus on the differences between *nandao*-Qs and ordinary questions, especially the special nature of *nandao* which can only combine with polar Yes/No Questions (henceforth Y/N-Qs). In order to explain these interesting facts, I adopt the following three assumptions. First, *nandao* is a [+wh] word like *whether* or *who* which occupies the SpecCP position in a *nandao*-Q. Second, *nandao*, semantically, has a negation-like function defined on a degenerate question denotation containing only a single answer. Last, this degenerate question nature of *nandao* causes *nandao*-Qs to be incompatible with interrogative speech acts and the answer operator, resulting in the unembeddability of *nandao*-Qs under any [+wh] selecting words.

The paper is structured as follows. Section 2 introduces the distribution of *nandao* in Mandarin. Section 3 addresses the puzzle about *nandao*-Qs being necessarily RQs and the shortcomings of two accounts for this puzzle. A syntax and semantics of *nandao* is proposed in Section 4, which is the core of this paper. Section 5 addresses the inability of *nandao* to combine with OQs other than Y/N-Qs. In Section 6, the unembeddable nature of *nandao*-Qs is discussed. The last section concludes the paper.

2 The Distribution of *Nandao* in Mandarin

First of all, in Mandarin, *nandao* cannot appear in direct declarative sentences, as shown in (3).

¹ Several Mandarin speakers reported that in some special cases they can get biased polar question readings with *nandao*-sentences. For example, when a speaker strongly believes a proposition $\neg P$ to be true while there is some implausible evidence indicating that P is true, the speaker can express his/her puzzled feeling via the form *nandao*- P by self questioning. But they acknowledged that there are obvious prosodic differences between *nandao* in RQs and *nandao* in biased OQs: the former has longer duration and stress than the latter does. And they reported that with this special prosody, the question will definitely be an RQ. I regard such prosody as indicating that there are two kinds of *nandao*: one serves as an RQ indicator, while the other acts like the combination of *etwa/nicht* in German which only triggers biased OQs. In this paper, I will only address the first kind and leave the other kind for future research.

- (3) * Nandao Lisi hui lai.
 Nandao Lisi will come
 (Attempted) ‘Lisi will not come.’

Also, *nandao* cannot be embedded under [-wh] selecting verbs, such as *xiangxin* ‘believe’, which take declarative clauses as complements.

- (4) Zhangsan xiangxin Lisi /*shui hui lai.
 Zhangsan believe Lisi who will come
 ‘Zhangsan believes that Lisi/*who will come.’
- (5) * Zhangsan xiangxin nandao Lisi hui lai.
 Zhangsan believe nandao Lisi will come
 (Attempted) ‘Zhangsan believes that Lisi will not come.’

The verb *xiangxin* is a typical [-wh] selecting verb, which can only take declarative clauses as its sentential complements, as we can see from (4). The ungrammaticality of (5) shows that the embedded clause is not a declarative sentence anymore with *nandao* added to it. Both (3) and (5) indicate that *nandao* cannot appear in declarative sentences.

It seems at first that *nandao* can appear with both Y/N-Qs and WH-Questions (henceforth WH-Qs).

- (6) Zhangsan chi-le fan (me)?
 Zhangsan eat-PERF rice Q
 ‘Did Zhangsan have a meal?’
- (7) Nandao Zhangsan chi-le fan (me)?
 Nandao Zhangsan eat-PERF rice Q
 ‘Did Zhangsan have a meal?’
 (= Zhangsan did not have a meal.)
- (8) Shui bang-guo ni (me)?
 Who help-EXP you Q
 ‘Who helped you?’
- (9) Nandao shui bang-guo ni (me)?
 Nandao who help-EXP you Q
 ‘Who helped you?’
 (= No one helped you.)

In (6) and (8), both normal question and rhetorical question interpretations are available depending on appropriate contexts, and the prosodic differences between

the two are hard to perceive.² But in (7) and (9) with *nandao*, only an RQ interpretation is available. It seems that the adverb *nandao* is a rhetorical question functor which takes any question and turns it into a rhetorical question.

However, this generalization is not accurate. In Mandarin, there are also A-not-A Questions (henceforth A-not-A-Qs), similar to questions with *whether or not* in English, e.g.:

- (10) Zhangsan chi mei chi fan?
Zhangsan eat not eat rice
'Did Zhangsan have a meal or not?'

This kind of question cannot take *nandao* to make an RQ, as illustrated below:

- (11) * *Nandao* Zhangsan chi mei chi fan?
Nandao Zhangsan eat not eat rice
(Attempted) 'Did Zhangsan have a meal or not?'

We should also note that (10) does not have any rhetorical question interpretations. The fact suggests that *nandao* is not a functor which can transform any questions into rhetorical questions. It is rather like a selector which sifts out any interrogative force from certain kinds of questions and keeps the rhetorical reading.

Sadock (1971) finds a syntactic difference between Y/N-Qs and Y/N-RQs in English: the expression *after all* can only occur in Y/N-RQs as an introductory term but never in Y/N-Qs, as shown below:

- (12) After all, do phonemes have a damn thing to do with language?
(= Phonemes don't have a damn thing to do with language.) (225)

Han (2002) extends this test to include WH-RQs. She finds that similarly *after all* can only occur with WH-RQs but not with WH-Qs.

From the above data, we may conclude that *nandao* in Mandarin and *after all* in English have similar functions. However, if we are more careful about the data, we will discover differences.

Although *nandao* can appear in (2) and (9) which have WH-words in them, we should note that neither (2) nor (9) is a WH-RQ.

In Mandarin, most WH-words can have indefinite pronoun interpretations, as in:

- (13) Shui dou you mimi.
Anyone all have secret
'Everyone has (his own) secret.'

² The issue of prosodic differences between normal questions and rhetorical questions is controversial. Some scholars reported that some difference could be found (cf. Caponigro 2011: fn. 2), while others did not. I will disregard any prosodic differences here and assume they share the same phonology.

The WH-words which may be used as indefinite pronouns include *shui* ‘anyone’, *shenme* ‘anything’, *na* ‘anything’, *nali/nar* ‘anywhere’, etc. (cf. Li & Thompson 1981: 527-531). There is, however, one WH-word which does not have an indefinite pronoun interpretation, i.e. *weishenme* ‘why’.

- (14) Weishenme dou bu qu shuijiao?
 why all not go sleep
 ‘Why don’t you all go to sleep?’
 (N/A: There is no reason for anyone to go to sleep.)

So, any interrogative sentence with *weishenme* will be a true WH-Q,³ like (14). However, *nandao* cannot co-occur with *weishenme* in true WH-Qs.

- (15) * Nandao Zhangsan weishenme qu xuexiao?
 Nandao Zhangsan why go school
 (Attempted) ‘Why does Zhangsan go to school?’
 (N/A: There is no reason for Zhangsan to go to school.)

This incompatibility suggests: (i) (9) is not a WH-RQ, but a Y/N-RQ with an indefinite pronoun (‘Is there anyone who helped you?’); (ii) *Nandao* cannot transform WH-Qs into WH-RQs.

More evidence can be found in the distribution of question particles in Mandarin. In Mandarin, there are two types of question particles. One is designated for Y/N-Qs which includes *me* and *ma* (cf. *ibid.*, 547-554). The other type is designated for “constituent questions” (= WH-Qs) which includes *ne* (cf. *ibid.*, 305-307).⁴ According to this distributional rule, the *ma* in (2) and *me* in (9) show that both sentences are actually Y/N-Qs meaning ‘Is there anyone who helped you?’ but are not WH-Qs with *ne* as shown below:

- (16) Shui bang-guo ni ne?
 Who help-EXP you Q
 ‘Who helped you?’

From what we concluded above, we should expect incompatibility of *nandao* and *ne*. And this is indeed the case in Mandarin.

³ In Mandarin, if *bu* ‘not’ immediately precedes *weishenme*, the new construction will only have an indefinite reading but not interrogative interpretation, meaning ‘for no reasons’. I will avoid such a usage in the data.

⁴ Unlike Li & Thompson (1981), Noah Constant (p.c.) suggests that *ne* in Mandarin is not a WH-Q discourse particle but a marker of contrastive topics. However, he also acknowledges that *ne* never appears in Y/N-Qs. I will not delve into the nature of the particle *ne* in this paper. At least there is a consensus that *ne* is a marker for non-Y/N-Qs.



Figure 1 Remote structures of positive and negative queclaratives.

- (17) * *Nandao shui bang-guo ni ne?*
Nandao who help-EXP you Q
 (Attempted) ‘Who helped you?’
 (N/A: No one helped you.)

From these data, we can see that *nandao* is quite different from *after all* in English, for the former is only compatible with Y/N-RQs.

In summary, the data lead us to the following generalizations:

- (18) Data generalizations:
- a. WH-words in *nandao*-Qs are indefinite pronouns.
 - b. *Nandao* is incompatible with declaratives, WH-Qs, and A-not-A-Qs.
 - c. *Nandao* can only appear with Y/N-Qs.

3 The Puzzle

Standard theories of RQs treat the RQ reading either as a syntactic-pragmatic result (Sadock 1971) or as a pure pragmatic result (Han 2002). However, neither account can explain the necessary RQ reading of *nandao*-Qs in Mandarin.

- (19) Isn’t syntax easy?
 (= Syntax is easy.) (224)
- (20) Syntax is easy, isn’t it? (with falling intonation)
 (= Syntax is easy.) (227)

By an unstated transformational rule, Sadock regards all the assertive clauses as deleted from the surface form. So, unlike tag questions where both clauses can surface, in queclaratives only the interrogative clause can survive in the surface form.

Applying Sadock’s (1971) proposal for queclaratives to *nandao*-Q, there are two possible places for *nandao* to occur in the remote structure of queclaratives. One position is in the question nucleus *p*. As figure 1 shows, the assertive clause shares with the interrogative clause the same nucleus with opposite polarity, i.e.

Not p. So, there should also be a copy of *nandao* in the nucleus of the assertive clause. However, (3) and (5) tell us that *nandao* is incompatible with declarative clauses. Thus, assuming *nandao* in the question nucleus of queclaratives will lead to a syntactic crash.

The other position for *nandao* is one of the places for higher abstract performatives or speech acts, i.e. “ask” and “declare”. That is to say, under such an assumption, *nandao* is a speech act morpheme. If it is a speech act morpheme, then how can we account for the incompatibility of *nandao*-Q with WH-words? Note that other RQs can combine with WH-words without indefinite readings.

- (21) A: Wo tingshuo fengniubing xianzai hen yanzhong.
 I hear.of BSE now very serious
 ‘I heard that mad cow disease is becoming very serious.’
 Jihu suoyou de niu dou ganran-le.
 Almost all DE cow all infect-PERF
 ‘Almost all the cows got infected.’
 B: Zheme lihai a! Yihou shui hai gan chi niurou ne?
 So serious EXCL after who still dare eat beef Q
 ‘It’s so serious! No one dares to eat beef anymore.’
 B’: Zheme lihai a! *Yihou shui nandao hai gan chi niurou ne?
 So serious EXCL after who nandao still dare eat beef Q
 (Attempted) ‘It’s so serious! No one dares to eat beef anymore.’

In B’s reply, the sentence *yihou shui hai gan chi niurou ne* means ‘no one dares to eat beef anymore’ – a perfect RQ. The question particle *ne* implies that the WH-word *shui* in this sentence is not an indefinite pronoun but a WH-Q word. If *nandao* is really a speech act morpheme of RQ outside of the question nucleus, then it should be predicted that the WH-word will be compatible with *nandao*. However, the opposite is true: *nandao* is incompatible with true WH-Qs. This incompatibility suggests that *nandao* should not be a speech act morpheme.

Departing from Sadock (1971), Han (2002) adopts a pragmatic account. She assumes an RQ to be derived from an OQ instead of the composition of a question clause and an assertive clause. In her proposal, RQs and OQs of the same surface form will have the same syntax and semantics. They only differ in pragmatics or Post-LF semantics, so to speak. She proposes that the reverse assertive interpretation of RQs comes from the negation contributed by the semantics of WH-words. Assuming a covert *whether* in Y/N-Qs, WH-words in questions are defined by a six tuple power set Boolean algebra $\langle B, 1, 0, \cap, \cup, ' \rangle$. B is the domain of the algebra, 1 is the top element, 0 is the bottom element, \cap and \cup are binary functions representing

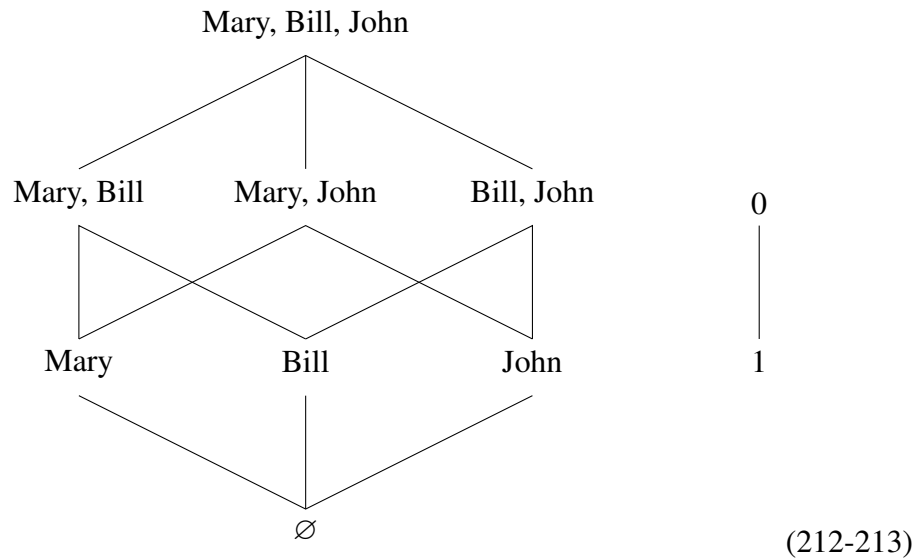


Figure 2 Algebraic structures for *who* and *whether*.

intersection and union. Algebraic structures for *who* and *whether* are illustrated in figure 2.

In OQs, WH-words can denote any elements in the denotational domains as in figure 2. While in RQs, WH-words can only denote the bottom element in their denotational domains: (i) In Y/N-RQs, the covert *whether* denotes the negative polarity; (ii) In WH-RQs, WH-words denote the empty set (214). This effect results from the pragmatic principle of informativeness (taking a Y/N-RQ as an example):

“If a speaker believes that it is very likely that p holds in c , the most informative proposition in c is $\neg p$. . . When a speaker is formulating a question to find out whether p or $\neg p$, s/he formulates the question in the form of the proposition that would be the most informative if it turned out to be true. . . This in turn means that in such a context, the speaker believes that it is likely that p holds.” (215)

For RQs without *nandao*, those which share a surface structure with corresponding OQs, Han’s (2002) framework seems to work fine. But, it cannot explain why *nandao* is incompatible with WH-Qs. In her framework, the polarity reversal reading of *weishenme* ‘why’ in (15) can be perfectly derived from the WH-word denoting the bottom element in its denotational domain, i.e. ‘no reason’. However, (15) turns out to be ungrammatical.

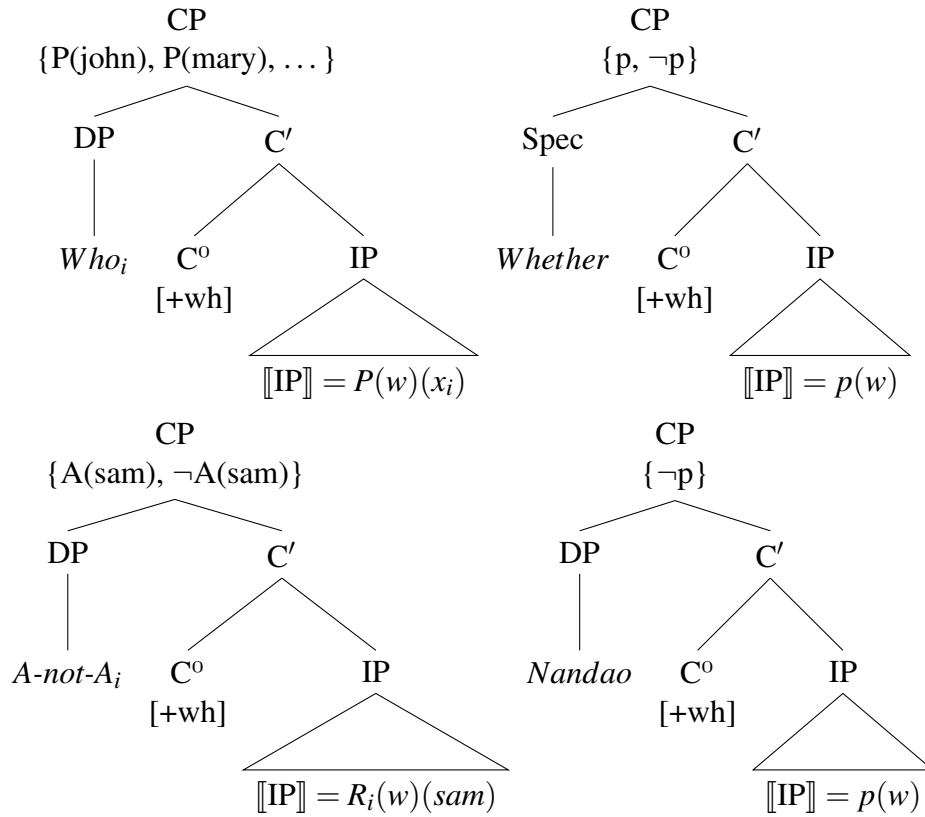


Figure 4 Comparison of four WH-structures.

positive/negative polarities in standard first-order predicate logic.

$$(22) \quad \llbracket who \rrbracket = \lambda P_{\langle e,t \rangle}. \exists x_e [person(x) \text{ and } P(x) = 1] \approx \text{which person}$$

$$(23) \quad \llbracket whether \rrbracket = \lambda f_{\langle \langle t,t \rangle, t \rangle}. \exists h_{\langle t,t \rangle} [[h = \lambda p.p \text{ or } h = \lambda p.\neg p] \text{ and } f(h) = 1] \approx \text{which of 'yes' or 'no' (Guerzoni 2003: 72)}$$

$$(24) \quad Who: \lambda w_s \lambda S_{\langle e,t \rangle} \lambda x_e (person(w)(x) \wedge S(x)) \text{ (George 2011: 50)}$$

$$(25) \quad Q_t: \lambda \alpha_{\langle s, \langle t,t \rangle \rangle} \lambda p_{\langle s,t \rangle} \exists \beta_t (p = \lambda w_s' (\alpha(w')(\beta)))^5 \text{ (ibid., 180)}$$

Comparing *nandao*-Q with Y/N-Q in figure 4, we find that the two questions only differ in the WH-words and respective denotations. In terms of semantics, *nandao* is similar to *whether*. But, unlike *whether* in the Y/N-Q which denotes a set of two propositions with opposite truth values, *nandao* is a WH-word which takes a question of a single proposition and turns it into a singleton set with the proposition

⁵ β is the truth value here, i.e. $\beta = 0$ or 1 .

$$\begin{aligned}
 C^0: & \lambda q \lambda p [p = q](\neg \text{raining}(w)) \Rightarrow \lambda p [p = \neg \text{raining}(w)] \\
 CP: & \lambda Q \lambda h \exists r (r = 0 \wedge h = \lambda w' (Q(w')(r))) (\lambda w \lambda p [p = \neg \text{raining}(w)]) \\
 & \Rightarrow \lambda h \exists r (r = 0 \wedge h = \lambda w' [r = \neg \text{raining}(w')]) \\
 & \Rightarrow \lambda h (h = \lambda w' (\neg \text{raining}(w') = 0)) \\
 & \Rightarrow \{\lambda w' (\neg \text{raining}(w') = 0)\} \text{ or} \\
 & \{\text{It is not true that it is not raining}\}, \text{ i.e. } \{\text{It is raining}\}
 \end{aligned}$$

As *nandao* is a [+wh] word, it is both syntactically and semantically incompatible with declarative clauses. Syntactically speaking, *nandao* needs to check a [+wh] feature at SpecCP in LF, so it cannot appear in declaratives which only have a [-wh] feature. With an unchecked [+wh] feature, the structure will crash. Semantically speaking, there will also be a semantic type mismatch when *nandao* combines with declaratives.⁶ By the definition of *nandao*, *nandao* needs to take an argument of $\langle s, \langle t, t \rangle \rangle$ type, but declaratives are of type $\langle s, t \rangle$. Considering the structures of (3) and (5), there is no C^0 with a [+wh] feature to type-shift declarative clauses. So, those sentences are ungrammatical with *nandao* in declarative clauses.

5 Multiple WH-feature Question Restriction: An Explanation of the Incompatibility of *Nandao* with Questions other than Y/N-Qs

Not only is *nandao* incompatible with declaratives, it is also incompatible with questions other than Y/N-Qs. In this section, I propose that such incompatibility is due to a constraint on multiple WH-Questions.

As stated earlier, *nandao*—like WH-words in WH-Q (e.g. *who*)—has a [+wh] feature. Syntactically speaking, multiple WH-words can co-occur in the same clause.

- (29) Who ate what? (English)
 (30) Shui mai-le shenme? (Mandarin)
 Who buy-PERF what
 ‘Who bought what?’

According to Dayal (1996), a normal multiple WH-Q requires functional dependency between/among WH-words. For *nandao*-Q with true WH-words, e.g. (17), we can find a functional dependency between WH-word *nandao* and the other WH-word *who*, as shown in (31).

$$(31) \quad C^0: \lambda Q \lambda Y \lambda X \exists f [\text{Dom } f = Y \wedge \forall y [X(f(y))] \wedge p = \cap \lambda p' \exists y [Y(y) \wedge p' = \wedge Q(y)(f)]]$$

⁶ Thanks to an anonymous reviewer who pointed this out to me.

AP: $\{0\}$ or $\lambda q(q = 0)$ ⁷

CP: $\lambda p \exists f [\text{Dom } f = \text{person}' \wedge \forall y [f(y) = 0] \wedge p = \cap \lambda p' \exists y] \text{person}'(y) \wedge p' = \wedge [f(y) = (\text{helped}'(\text{you})(y))]$

Dayal 1996 assumes an ambiguity between the normal meaning of C^0 ($\lambda p'[p = p']$) and the functional meaning of C^0 . The functional dependency of multiple WH-Qs is realized by the semantics of C^0 in (31). Applying the meanings for C^0 and WH-phrases, and adding the proposed meaning of *nandao* given above, we end up with the above representation for *nandao*-Q with *who* as a multiple WH-RQ.

The semantics shows that we can create a negative identity function via the semantics of the functional C^0 between the two WH-words *who* and *nandao* for (17). The domain of this function is the set of individuals denoted by *who*, and the range of the function is a set of truth values containing only 0. This negative identity function can be understood as: given an individual in the domain set, the individual does not belong to the target set, i.e. all the members in the domain do not have the property of *helped you* in the given context.

Although we can create a functional dependency between *nandao* and *who* in (17), such a dependency is a necessary but not sufficient condition for multiple WH-Qs. In fact, (17) is unacceptable in Mandarin. Such ungrammaticality suggests that we need a further restriction on normal multiple WH-Qs.

Multiple WH-feature Question Restriction (MWHQR):

x and its functional dependent element $f(x)$ should be constituents (either arguments or predicates) within the question nucleus denoted by the IP.

Under this constraint, (29) and (30) are grammatical as *who* and *what* are both IP constituents. On the other hand, *nandao* is an IP adjunct operating on propositional/truth value level, so it will be predicted that (17) is ungrammatical due to an unsatisfied requirement of MWHQR. MWHQR can also explain why Y/N-operators or *why* cannot co-occur with other WH-words like *who*, as in (32) and (33).

⁷ The semantics for *nandao* here is a basic extension of the lexicon. The one I proposed in (26) is a type-lifted intensional version of *nandao*. Such a type-shifting operation enables *nandao* to take C' as its argument but not the other way round. The type shifter for the basic form is $\lambda Q \lambda Q' \lambda h \exists r (r \in Q \wedge h = Q'(r))$.

Nandao type-shifting operation:

$$\begin{aligned} & \lambda Q \lambda Q' \lambda h \exists r (r \in Q \wedge h = Q'(r)) (\lambda q (q = 0)) \\ & \Rightarrow \lambda Q' \lambda h \exists r (r \in (\lambda q (q = 0)) \wedge h = Q'(r)) \\ & \Rightarrow \lambda Q' \lambda h \exists r (r = 0 \wedge h = Q'(r)) \end{aligned}$$

(32) *Did who go to China?

(33) *Why did who go to China?

As both Y/N-operator and *why* are IP-level operators, which do not satisfy MWHQR, they cannot combine with other WH-words.

As for (11), following Huang (1991), I regard *A-not-A* as a WH-phrase denoting a set of complementary properties, e.g. $\{\lambda w\lambda xA(w)(x), \lambda w\lambda x\neg A(w)(x)\}$. Although *A-not-A* seems to be a constituent abstracted from the IP, we can decompose *A-not-A* into *X-not-X* and the property *A* being extracted from the IP. In this way, *A-not-A* is actually a pied-piped WH-phrase having a WH-phrase of *X-not-X* which is not a constituent within the question nucleus. As both *A-not-A* and *nandao* do not satisfy MWHQR, they cannot form a multiple WH-Q either. Hence, the combination of *nandao* with *A-not-A-Q* is ungrammatical too.

6 Unembeddability of *Nandao-Q*: A Degenerate Question and its Unanswerable Nature

Having the syntactic form of OQs and the semantics of declaratives, *nandao*-Qs are neither like questions nor like declaratives. Interestingly, they cannot be embedded.

(5) shows that *nandao*-Qs cannot be embedded under [-wh] selecting verbs, e.g. *xiangxin* ‘believe’. This can be explained by the incompatibility of the [+wh] feature of *nandao* with the [-wh] requirement of the predicate, or a semantic type mismatch between *nandao*-Q and the predicate. But, surprisingly, *nandao*-Q cannot even be embedded under [+wh] selecting words like *wen* ‘ask’, as shown in (34).

(34) * Zhangsan wen Lisi nandao chi fan le me.

hangsan ask Lisi nandao eat rice PERF Q

(Attempted) ‘Zhangsan asks Lisi if Lisi did not have a meal.’

Pragmatically, a [+wh] selecting verb needs the embedded clause to denote multiple answers: there is no reason to inquire about a degenerate question that has only a single answer (Veneeta Dayal, p.c.). Following Krifka (2012), this pragmatic intuition about the inquiring nature of *wen* can be encoded in the speech act of interrogatives.

Krifka (2012) distinguishes the denotational meaning of questions, i.e. sets of possible answers, from the illocutionary meaning of questions. According to him, there is a speech act operator for questions, *QUEST*, leading a functional projection higher than CP,⁸ i.e. ForceP. This question speech act requires the addressee to

⁸ Krifka builds the syntax of questions on Rizzi (1997). However, Rizzi (1997) assumes a split CP, so rather than being higher than CP, ForceP is merely the highest projection in the CP layer.

choose true answers from the answerhood set and reply to the question with them. An example of such a speech act is illustrated below.

- (35) Who did you see?

$$\begin{aligned} & \lll[\text{ForceP } who_3 [\text{Force}' [\text{Force}^0 \text{ did}_2 - \text{QUEST}] [\text{CP } t_3 [\text{IP } you_1 [\text{I}' [\text{I}^0 t_2] \\ & [\text{VP } t_1 [\text{V}' [\text{V}^0 \text{ see}] t_3]]]]]]]]]] \\ & = \lambda c \lll[\text{QUEST}]](c) (\lll[\text{CP } who_3 [\text{IP } you_1 [\text{I}' [\text{I}^0 \text{ did}] [\text{VP } t_1 [\text{V}' [\text{V}^0 \text{ see}] t_3]]]]]]]](c)) \\ & \text{with } \lll[\text{CP } who_3 [\text{IP } you_1 [\text{I}' [\text{I}^0 \text{ did}] [\text{VP } t_1 [\text{V}' [\text{V}^0 \text{ see}] t_3]]]]]](c) \\ & = \lambda p \exists x [\text{PERSON}(i) \wedge p = \lambda i' [\text{SEE}(i')(x)(c_a)]] \\ & = \lambda c \lambda y \lambda x \lambda S \lambda i' \in S [ti[\sqrt{S} \leq i [\text{QUEST}(i) (\lambda p \exists x [\text{PERSON}(i) \wedge p = \\ & \lambda i' [\text{SEE}(i')(x)(c_a)]])(y)(x)]] \leq i'] \text{ (13)} \end{aligned}$$

Krifka (2012) argues that speech acts are index changers or option space changers. In (35), we can see that the speech act operator *QUEST* involves four arguments, namely indices *i*, question denotation *Q*, addressee *y* and addresser *x*.

The reason to ask a question is that the speakers do not know or are unsure of the true answers among possible answers, so they inquire and expect addressees to reply with or confirm true answers. This sense of uncertainty is part of the nature of the inquiring speech act which should be encoded in the semantics/pragmatics of questions. If the set of possible answers only contains one answer, there is no need to ask such a question, for the answer is certain. Meanwhile, the nature of inquiring requires addressees to reply with true answers, for addressers aim to seek answers.

We can put the multiple answers requirement in the speech act operator. So, I modify the meaning of *QUEST*(*i*)(*Q*)(*y*)(*x*) proposed by Krifka (2012) as follows:

- (36) At *i*, there is an obligation of the addressee *y* towards the speaker *x* to assert all and only those propositions *p* in the **non-singleton** set of propositions *Q* that are assertable, according to the usual rules.

Nandao-Q, however, lacks two essential elements of the inquiry speech act: uncertainty and reply. The semantics of *nandao-Q* shows that it denotes a degenerate question which has only a single possible answer in the answerhood set. This single answer is the only answer available to addressees, i.e. the answer is obvious and certain. The “non-singleton set” requirement of the inquiry speech act prohibits the combination of the inquiry speech act and *nandao-Q* radical. Moreover, RQs under most circumstances do not require replies; in fact, it is even infelicitous to reply with the answer. With these two points, we can see that RQs, esp. *nandao-Qs*, do not satisfy (36), which suggests that the speech act for RQs is different from the inquiry speech act.

Basically, in the speech act of RQs, the speaker intentionally provides evidence for the answer to the question to the addressee, and expects no answers from them (Manfred Krifka, p.c.). In this paper, I propose a speech act operator *R-QUEST* for RQs, i.e. *R-QUEST*(*i*)(*Q*)(*y*)(*x*) and the following definition of speech act for RQs.

- (37) At *i*, there is no obligation of the addressee *y* towards the speaker *x* to assert all and only those propositions *p* in the set of propositions *Q* that are assertable, as the speaker *x* intentionally (lexically, contextually or etc.) provides the answer to *Q* to the addressee *y*.

Since *nandao*-Q denotes a degenerate question with a single answer, even without any contexts or relevant knowledge, the addressee will get to know the answer to the *nandao*-Q together with the speaker's intention. This special semantics of *nandao*-Q complies with the definition of *R-Quest*, which suggests that *nandao*-Q always carries a rhetorical question speech act.

Now, for the ungrammaticality of (34), I propose that *wen* 'ask' or other similar lexical items, e.g. *xiang zhidao* 'wonder' can only embed the inquiry speech act. Because *wen* and *xiang zhidao* lexically express uncertainty and require replies. A lexical entry for *wen* can be formulated as (38), mimicking the definition of *ask* by Krifka (2012).

- (38) $Wen(i)(A)(y)(x) \Leftrightarrow$ at *i*, the person *x* performs a question act of the type *A* with *y* as addressee, where *A* is a question speech act.

As (38) shows, the lexical semantic requirement of *wen* prohibits *nandao*-Q (as an *R-Quest* speech act) to be embedded.

Another problem to address is the unembeddability of *nandao*-Q under *zhidao* 'know', as in (39).

- (39) * Zhangsan zhidao Lisi nandao qu-le Xianggang.
Zhangsan know Lisi nandao go-PERF Hongkong
(Attempted) 'Zhangsan knows Lisi did not go to Hongkong.'

At first glance, *zhidao* seems to be both a [+wh] and a [-wh] selecting word.

- (40) Zhangsan zhidao Lisi shifou qu-le Xianggang.
Zhangsan know Lisi yes.no go-PERF Hongkong
'Zhangsan knows whether Lisi went to Hongkong.' (*zhidao* + Y/N-Q)
- (41) Zhangsan zhidao shui qu-le Xianggang.
Zhangsan know who go-PERF Hongkong
'Zhangsan knows who went to Hongkong.' (*zhidao* + WH-Q)
- (42) Zhangsan zhidao Lisi qu-mei-qu Xianggang.
Zhangsan know Lisi go-not-go Hongkong
'Zhangsan knows whether Lisi went to Hongkong or not.' (*zhidao* + A-not-A-Q)
- (43) Zhangsan zhidao Lisi qu-le Xianggang.
Zhangsan know Lisi go-PERF Hongkong
'Zhangsan knows Lisi went to Hongkong.' (*zhidao* + Assertion)

If *zhidao* is really unselective, then we should expect (39) to be grammatical. But, is *zhidao* really unselective? The answer is negative. First, both question complements and propositional complements can be co-ordinated as one complement of *zhidao*.

- (44) Zhangsan *zhidao* Lisi *qu-le* Xianggang *he* shui *qu-le* Meiguo.
 Zhangsan know Lisi go-PERF Hongkong and who go-PERF America
 ‘Zhangsan knows that Lisi went to Hongkong and who went to the U.S.’

Like the conjunction *and* in English, *he* in Mandarin can only co-ordinate constituents of the same type. It can be interpreted as logical conjunction when two propositions are co-ordinated, or as a set-theoretical union when two question clauses are co-ordinated.

- (45) Zhangsan *wen* Lisi *shifou qu-le* Xianggang *he* shui *qu-le*
 Zhangsan ask Lisi yes.no go-PERF Hongkong and who go-PERF
 Meiguo.
 America
 ‘Zhangsan asked whether Lisi went to Hongkong and who went to the U.S.’
- (46) Zhangsan *xiangxin* Lisi *qu-le* Xianggang *he* Wangwu *qu-le*
 Zhangsan believe Lisi go-PERF Hongkong and Wangwu go-PERF
 Meiguo.
 America
 ‘Zhangsan believes that Lisi went to Hongkong and Wangwu went to the U.S.’

On the other hand, co-ordination of different types of clauses is unacceptable under either other [+wh] selecting words or [-wh] selecting words.

- (47) * Zhangsan *wen* Lisi *qu-le* Xianggang *he* shui *qu-le* Meiguo.
 Zhangsan ask Lisi go-PERF Hongkong and who go-PERF America
 (Attempted) ‘*Zhangsan asks that Lisi went to Hongkong and who went to the U.S.’
- (48) * Zhangsan *xiangxin* Lisi *qu-le* Xianggang *he* shui *qu-le*
 Zhangsan believe Lisi go-PERF Hongkong and who go-PERF
 Meiguo.
 America
 (Attempted) ‘*Zhangsan believes that Lisi went to Hongkong and who went to the U.S.’

All these evidence suggest that the two embedded clauses in (44) are of the same type. Comparing (44) with (47), the only difference lies in the semantics of the main

predicates. Although *zhidao* and *wen* can both take question complements in syntax, the complements they take are different in semantics. *Wen* can be interpreted as ‘ask a question of’, which means it takes a question-type complement, i.e. a set of possible answers. On the other hand, *zhidao* can be interpreted as ‘know the true answer to the embedded question’, which means the complement it takes is an answer to the embedded question but not the question itself (see also Lahiri 2000). So, the complement to *zhidao* is of type $\langle s, t \rangle$ rather than type $\langle t, t \rangle$. There is a covert answer operator for the question complement provided by the semantics of *zhidao*. Following Dayal (1996), the definition of this answer operator is:

$$\text{Ans}(Q) = \iota p[p \in Q \wedge \forall p' \in Q[p' \rightarrow p \subseteq p']] \quad (116)$$

As the definition shows, the answer to a question is the unique maximal proposition that is true. This says that the answer complement of *zhidao* is of propositional type and can be co-ordinated with other propositions, as shown by (44).

Back to the ungrammaticality of (39), as we have mentioned before, *nandao*-Q denotes a degenerate question which cannot be answered. This unanswerable nature of *nandao*-Q suggests that the answer operator cannot be applied to degenerate questions like *nandao*-Q, for *nandao*-Q does not denote a real choice. So, the same reason that rules out *wen*+*nandao*-Q will rule out *zhidao*+*nandao*-Q.

7 Conclusion

In this paper, I provided a syntax and semantics of *nandao* in Mandarin, and treated it as a [+wh] expression which has a negation-like function. Denoting a singleton set of answers, *nandao*-Qs confirm what we know about RQs: they are interrogative in form but assertive in force. The analysis of *nandao* given here explains its interesting distributional patterns. It also locates the switch from question to assertion in the meaning of *nandao*: if the set of possible answers is necessarily a singleton, the *nandao*-Qs cannot represent the state of uncertainty and the act of inquiry that ordinary questions do. The special state of *nandao* being incompatible with OQs other than Y/N-Qs leads us to the proposed Multiple WH-feature Question Restriction, which in turn provides us with insights into the nature of multiple WH-Qs. The degenerate question nature of *nandao*-Qs also explains explicitly why *nandao*-Qs, unlike OQs, cannot be embedded under [+wh] selecting words like *wen* and *zhidao*.

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Beibei Xu
 Department of Linguistics, Rutgers University
 18 Seminary Place
 New Brunswick, NJ 08901, U.S.A.
billyxu@eden.rutgers.edu