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Learning Subcategorization Properties of Attitude Verbs in *Wh*-in situ Languages

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1. Introduction

In learning a verb, children must master various facts about its form and meaning, such as what frames the verb can appear in. English learners must learn that the attitude verb *know* can be used in both (1a) or (1b), but *think* can only be used in (1a).

(1) a. Xiaoxiao VERB Dad likes cakes. *Declarative complement*
b. Xiaoxiao VERB what Dad likes. *Interrogative complement*

This property is commonly referred to as the subcategorization property of a verb. "Responsive" verbs like *know* select both declarative and interrogative clausal complements, while "antirogative" verbs like *think* cannot select interrogatives (Lahiri 2002).

For English learners, the word order difference between (1a) and (1b) provides clear evidence that *know* and *think* have different subcategorization requirements. This paper, however, is interested in how learners of a *wh*-in situ language like Mandarin Chinese might learn the equivalent subcategorization difference between *zhidao* "know" and *juede* "feel/think." Abstractly, these verbs have the same subcategorization as their English counterparts. However, word order is far less useful as a cue in Mandarin: Mandarin *wh*-phrases appear in situ, instead of being fronted to positions corresponding to their scope. As a result, Mandarin interrogative complement clauses are string-identical with non-interrogative complements that happen to contain an in-situ *wh*-phrase. For ease of reference, we call such ambiguous complements "potentially interrogative."

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(2) Potentially interrogative complements in Mandarin Chinese
Xiaoxiao *gorp* [baba xihuan shenme]
Xiaoxiao *gorp* Dad like what
a. "Xiaoxiao gorps what Dad likes." *Interrogative complement*
b. "What does Xiaoxiao gorp Dad likes?" *Declarative complement*

In principle, one could determine the scope of a *wh*-phrase in a potentially interrogative complement by referring to the matrix verb: if *gorp* is a *know*-like verb that selects interrogative clauses, the *wh*-phrase can take narrow scope; if *gorp* is a *think*-like verb that selects declarative clauses, the *wh*-phrase must take matrix scope. Such a strategy is, of course, not feasible for learners, since it presupposes that they already know the subcategorization of the matrix verb: a chicken-and-egg problem.[1]

How learners of *wh*-in situ languages disambiguate potential interrogatives potentially has consequences beyond the acquisition of verb syntax. Several researchers have linked whether an attitude verb is responsive (selecting interrogatives and declaratives) to whether it has factive semantics (3) (e.g. Hintikka 1975; Ginzburg 1995; Egré 2008; cf. Lahiri 2002, White & Rawlins 2018).

(3) a. Xiaoxiao knows Dad likes cakes.
"Dad likes cakes" is necessarily true *Factive*
b. Xiaoxiao thinks Dad likes cakes.
"Dad likes cakes" is not necessarily true *Non-factive*

From a verb learning perspective, this correlation could be valuable. Since attitude verbs like *know* and *think* describe abstract mental states, children cannot readily infer their meanings from physical contexts alone. Furthermore, children often lack opportunities to observe discourse cues indicating that *know* is factive and *think* is not (Dudley 2017; Dudley et al. 2017). One solution to this problem with learning semantics is syntactic bootstrapping: children might exploit the subcategorization difference between *know* and *think* and the link between responsivity and factivity to infer that *know* is factive (Dudley 2017, Dudley et al.

[1] For thoroughness, we wish to note that Mandarin *wh*-phrases in certain contexts also can have an indefinite reading, comparable to English *something* or *anything* (i) (Huang 1982, Cheng 1991, Lin 1996 a.o.). In principle, this complicates the learning problem even more: learners have to also learn how to disambiguate between the indefinite and interrogative readings. Having said that, this is not as severe an issue as it seems in our case. We noticed only one indefinite *wh*-phrase with the attitude verbs included in our study (see Footnote 3). Other corpus studies confirm that the indefinite use is extremely rare in child-directed speech (around 3% of all uses of *wh*-phrases, Fan 2012).

(i) Xiaoxiao juede [baba kanjian-le shenme].
Xiaoxiao think Dad see-PFV something
"Xiaoxiao thinks Dad saw something."

2017; see also Gleitman 1990; Gleitman et al. 2005; Papafragou et al. 2007; Hacquard & Lidz 2019; Harrigan et al. 2019; Huang et al., to appear; among many others). However, this strategy critically assumes that the subcategorization difference can be reliably observed in the input. While this is the case for English, one could reasonably question this assumption for a *wh*-in situ language like Mandarin.

In this paper, we examine attitude verbs and potential interrogatives in Mandarin child-ambient speech. We find that this kind of ambiguous configuration is prevalent in the input. However, we also find ample non-word order cues – speech act and question particles – that could be very informative for Mandarin learners for learning the subcategorization differences and the scope of *wh*-phrases.

This paper is organized as follows. We elaborate on the learning problem and our hypotheses about non-word order cues in Section 2, testing the hypotheses with a study of four CHILDES corpora in Section 3. We discuss areas for future work in Section 4, before concluding in Section 5.

2. Learning the subcategorization properties and *wh*-scope

2.1. Subcategorization and *wh*-scope

In Mandarin, as in other languages, attitude verbs can be classified based on whether they select interrogative complements. Antirogative verbs, like *juede* "feel/think" or *shuo* "say," do not (4a); responsive verbs like *zhidao* "know" can either take interrogative or non-interrogative complements (4b); rogative verbs, like *wen* "ask, inquire" only take interrogative complements (4c).

(4) a. Xiaoxiao juede baba xihuan {dangao/*shenme}. *Antirogative*
Xiaoxiao think Dad like cake what
OK: "Xiaoxiao thinks Dad likes cake."
Not OK: "*Xiaoxiao thinks what Dad likes."

b. Xiaoxiao zhidao baba xihuan {dangao/shenme}. *Responsive*
Xiaoxiao know Dad like cake what
OK: "Xiaoxiao knows Dad likes cake."
Also OK: "Xiaoxiao knows what Dad likes."

c. Xiaoxiao wen mama baba xihuan {shenme/*dangao}. *Rogative*
Xiaoxiao ask Mom Dad like what cake
Not OK: "*Xiaoxiao asked Mom Dad likes cake."
OK: "Xiaoxiao asked Mom what Dad likes."

This paper is specifically concerned with the subcategorization difference between antirogative and responsive verbs (4a, b). As mentioned in the introduction, from a Mandarin learner's perspective, this difference is obscured by the fact that Mandarin *wh*-phrases generally appear in situ, consistent with the canonical word order in declarative sentences. This word order fact produces

string ambiguity between interrogative complements (5a) and non-interrogative complements containing an in-situ *wh*-phrase (5b).

(5) a. Xiaoxiao zhidao [baba xihuan shenme].
Xiaoxiao know Dad like what
"Xiaoxiao knows what Dad likes." *Interrogative complement*

b. Xiaoxiao juede [baba xihuan shenme]?
Xiaoxiao think Dad like what
"What does Xiaoxiao think Dad likes?" *Declarative complement, but* shenme *"what" takes wide scope*

The issue with potential interrogatives applies more generally, beyond *wh*-phrases. Embedded polar interrogatives, which are either marked with *haishi* (6) "or" or A-not-A morphology (7), can receive either wide or narrow scope, just like *wh*-phrases. One consequence, then, is that polar interrogative complements are just as uninformative about attitude verb subcategorization as *wh*-interrogatives.

(6) a. Xiaoxiao zhidao [baba xihuan dangao **haishi** mianbao].
Xiaoxiao know dad like cake or bread
"Xiaoxiao knows whether Dad likes cakes or bread." *Narrow scope*

b. Xiaoxiao juede [baba xihuan dangao **haishi** mianbao]?
Xiaoxiao think dad like cake or bread
"Does Xiaoxiao think that Dad likes cakes, or does Xiaoxiao think that Dad likes bread?" *Wide scope*

(7) a. Xiaoxiao zhidao [baba **xihuan-bu-xihuan** dangao].
Xiaoxiao know dad like-not-like cake
"Xiaoxiao knows whether Dad likes cakes." *Narrow scope*

b. Xiaoxiao juede [baba **xihuan-bu-xihuan** dangao]?
Xiaoxiao think dad like-not-like cake
"Does Xiaoxiao think Dad likes cakes?" (More precisely: "Does Xiaoxiao think that Dad likes cakes, or does Xiaoxiao think that Dad does not like cakes?") *Wide scope*

To summarize what we have seen so far: Mandarin word order presents a challenge for learning attitude verb subcategorization, because there are no word order cues that overtly indicate whether a *wh*-phrase (or *haishi* or A-not-A) scopes over the entire sentence or merely over the complement clause. Compounding the issue is that Mandarin, unlike certain *wh*-in situ languages like Japanese, lacks particles like *ka* that obligatorily mark the scope of these interrogative markers, so Mandarin learners cannot count on such syntactic cues either. For thoroughness, we note that a classic strategy for learning verb syntax – by bootstrapping with verb semantics (e.g. Pinker 1984) – is also unlikely to be useful here. This strategy would require learners to first master verb semantics, a

significant hurdle in itself in the case of attitude verbs, as is well-documented in the syntactic bootstrapping literature.

2.2. Non-word order cues

If potentially interrogative complements pose a problem for the learning of attitude verb subcategorization, what alternative strategies might be available for learners? We suggest that one possibility is to take advantage of the speech act information of the utterance. Wide scope *wh*-phrases (or *haishi* or A-not-A) inside complement clauses are generally associated with questions, and narrow scope ones, i.e. interrogative complement clauses, are associated with non-questions (assertions or orders/commands). These correlations between scope and speech acts can be useful for learning verb subcategorization, in the following way:

Suppose learners observe a sentence like (8a) where the complement clause contains a *wh*-phrase, and can infer that the sentence is a *wh*-question, due to the presence of a *wh*-phrase and the absence of polar question markers, like the question particle *ma*, A-not-A morphology, or *haishi* "or." They might infer from these observations that the *wh*-phrase, even though in situ, scopes over the entire sentence. This would further indicate that the complement clause of *gorp* is not an interrogative.

In contrast, suppose learners observe a non-question speech act with essentially the same syntactic frame, like (8b). This observation would suggest that the *wh*-phrase scopes over *blick*'s complement clause and not the entire clause. Learners can then conclude that the complement clause is an interrogative.

(8) a. Xiaoxiao *gorp* [baba xihuan shenme]?
Xiaoxiao *gorp* Dad like what
"What does Xiaoxiao gorps Dad likes?"
b. Xiaoxiao *blick* [baba xihuan shenme].
Xiaoxiao *blick* Dad like what
"Xiaoxiao blicks what Dad likes."

To the extent that the first scenario (8a) applies exclusively to a certain verb, learners might conclude that the verb does not take interrogative complements, i.e. is antirogative. Conversely, if both scenarios in (8) apply regularly to a verb, learners should conclude that the verb is responsive.

This learning strategy rests on a few key assumptions. First is the assumption that learners can identify question speech acts in their input and can use this knowledge to infer the clause type (interrogative) of the sentence. This is not unreasonable: much research has shown that children can understand questions and associate interrogative clauses with questions around three years old, and possibly as early as 18 months old (Shatz 1978, Tamir 1980, Grosse et al. 2010,

Grosse and Tomasello 2012, Soderstrom et al. 2011, Casillas and Frank 2017, Perkins and Lidz 2020, among many others).[2]

A second speech act-related cue, specific to Mandarin, is the distribution of the polar question particle *ma*. As a generalization, *ma* is incompatible with *wh*-interrogatives (9a) or interrogatives with *haishi* (9b) or A-not-A (9c); it appears next to an otherwise declarative sentence (10a), turning that sentence into a polar question (10b).

(9) a. Shei hui tiaowu (*ma)?
who can dance Q
Intended: "Who can dance?"

b. Xiaoxiao hui tiaowu haishi changge (*ma)?
Xiaoxiao can dance or sing Q
Intended: "Can Xiaoxiao dance or sing?"

c. Xiaoxiao hui-bu-hui tiaowu (*ma)?
Xiaoxiao can-not-can dance Q
Intended: "Can Xiaoxiao dance?"

(10) a. Xiaoxiao hui tiaowu.
Xiaoxiao can dance
"Xiaoxiao can dance."

b. Xiaoxiao hui tiaowu ma?
Xiaoxiao can dance Q
"Can Xiaoxiao dance?"

In the context of attitude verbs, the appearance of *ma* in a frame like (11) indicates that its prejacent (*Xiaoxiao gorp baba xihuan shenme*, lit. "Xiaoxiao gorps Dad likes what") is a declarative sentence and therefore the *wh*-phrase must take narrow scope; the same remark also applies to *haishi* "or" and A-not-A constructions. This in turn provides positive evidence that the matrix verb allows interrogative complements. Conversely, if learners observe that a verb consistently fails to appear in a frame like (11), they might conclude that the verb is antirogative (disallows interrogative complements).

(11) [$_{\text{Declarative}}$ Xiaoxiao *gorp* [baba xihuan shenme]] **ma**?
Xiaoxiao *gorp* Dad like what **Q**

[2] A related strategy is for learners to use prosodic cues to help disambiguate the two underlying structures of potentially interrogative frames. More specifically, suppose that sentences with wide-scope *wh*-phrases (*wh*-questions) are prosodically distinct from sentences with narrow-scope *wh*-phrases, and learners can use this prosody-scope correlation to draw inferences about scope and subcategorization. While previous studies suggest that Mandarin *wh*-phrases might receive prosodic prominence when used as a question word in the matrix clause (e.g. Dong 2009, Yang et al. 2020), it is unclear what kind of prosody *wh*-phrases might be associated with in embedded clauses. Since there is relatively little work that validates these assumptions, we will for now remain agnostic about the usefulness of prosody.

Of course, for these learning strategies to work, utterances like (8b) and (11) need to appear relatively frequently in the input for responsive verbs and ideally not at all for antirogative verbs, so that children can use this difference in distribution to draw the appropriate conclusions. To test this assumption, we ran an analysis of Mandarin child-ambient speech. As a preview, we find that the distribution of speech acts and the polar question particle *ma* covaries with the type of attitude verb.

3. Corpus studies

3.1. Methods

We use the same dataset as Huang et al. 2018, a closely-related project interested in the acquisition of Mandarin attitude verbs (see also Huang et al. 2022). This dataset consists of utterances containing the most prominent attitude verbs in four Mandarin Chinese corpora from the CHILDES database (MacWhinney 2000): Beijing (Tardif 1993, 1996), Context (Tardif et al. 1999), Chang1 (Chang 1998), Zhou1 (collected by Jing Zhou). The age of target children in these corpora ranged from 1;9.3 to 6 years. We excluded all utterances by the target children. We refer interested readers to Huang et al. 2018, 2022, for details on the annotation process.

For this analysis, we focused on the subset of attitude verbs that can have belief semantics. These verbs fall into two distinct classes based on whether they allow interrogative complements. By definition, the antirogatives, like *xiang* "think," *juede* "feel/think," *yiwei* "mistakenly believe," do not, while the responsives, like *zhidao* "know" and *faxian* "discover," do (Table 1). Altogether, there were 468 tokens of these verbs co-occurring with a complement with the form of a clause or a VP (287 antirogatives; 181 responsives).

For thoroughness, we note that *xiang* is ambiguous between having belief ("think") or desire ("want") readings (see Huang et al. 2022 for more discussion). However, neither reading is canonically associated with interrogative complements. We also note that our analysis excludes communicative verbs like *shuo* or *jiang* (both "say"). We do so because these verbs, while not allowing interrogative complements, can be used in our datasets to introduce direct speech that have interrogative syntax. However, the corpora do not always clearly mark whether the clauses following these verbs are complement clauses or direct speech. Out of an abundance of caution, we exclude these verbs for now, so that we do not conflate these two very different types of clauses.

For each of the 468 tokens of interest, Huang et al. had manually coded whether the clause-like complement contained a *wh*-phrase, *haishi* or A-not-A morphology. For our purposes, we consider complements with these elements as potentially interrogative clauses.

To test our hypotheses, the two first authors, both native speakers of Mandarin, further coded each token for its speech act, while using Huang et al.'s annotations, which also indicated the presence/absence of the polar question

particle *ma*. In the rare event when there was uncertainty over annotation, the first authors resolved the issue by discussion.

Table 1: Verbs with clause-like complements in the CHILDES dataset

Antirogative verbs	Count	Responsive verbs	Count
xiang "think" (also "want")	260	*zhidao* "know"	180
yiwei "mistakenly believe"	17	*faxian* "discover"	1
juede "feel/think"	9		
renwei "think"	1		
Total	287	Total	181

3.2. Results

3.2.1. Prevalence of potentially interrogative frames

We begin by discussing the distribution of potentially interrogative frames. Altogether, as Table 2 shows, we observed potential interrogatives occurring with three of the most frequent verbs: *xiang* "think" (also "want"), *yiwei* "mistakenly believe," and *zhidao* "know." These complement clauses appear regularly with each of these verbs (96 out of 260 tokens or 37% of the time for *xiang* "think, want"; 2/17 or 12% for *yiwei* "mistakenly believe"; 121/180 or 67% for *zhidao* "know").

Table 2: Distribution of potential interrogatives and other types of complement clauses

Verb	Potential interrogatives	Others	Total
Antirogative verbs			
xiang "think" (also "want")	96	164	260
yiwei "mistakenly believe"	2	15	17
juede "feel/think"	0	9	9
renwei "think"	0	1	1
Responsive verb			
zhidao "know"	121	59	180
faxian "discover"	0	1	1
Total	219	249	468

This finding lets us rule out the following naive (and improbable) scenario of learning subcategorization: unlike responsive verbs, antirogative verbs never appear with potentially interrogative complements in the input, and so children conclude that antirogative verbs are incompatible with interrogative complements. The infeasibility of this account also underscores the need for an alternative account for learning subcategorization, such as the one being proposed in this paper. We turn to this account in the following sections.

3.2.2. Speech acts

As mentioned in Section 2, the speech act of a sentence with a potentially interrogative complement clause can be informative for a learner. For illustration, consider a potentially interrogative clause containing a *wh*-phrase. If the speech act is a question, that would suggest that the *wh*-phrase scopes out of the complement clause over the entire sentence, in which case the complement clause is declarative/non-interrogative. Conversely, if the speech act were an assertion or command/request, that would indicate that the *wh*-phrase only scopes over the complement clause, i.e. the complement clause is interrogative. Learners could then exploit this correlation to determine verb subcategorization: verbs where potential interrogatives are consistently associated with questions most likely select non-interrogatives, while verbs where potential interrogatives are regularly associated with non-questions are likely to be responsive, if not rogatives.

Our corpus results provide partial support for this learning strategy (Table 3). The vast majority of sentences containing antirogative verbs and potential interrogatives are questions (98%, 96 out of 98 tokens[3]). In contrast, sentences containing a responsive verb and potential interrogatives are associated with questions less frequently (76%, 92 out of 121 tokens) ($\chi^2(1)=19.7$, $p<.001$).

Table 3: Distribution of potential interrogatives and speech acts

Verbs	Questions	Non-questions (e.g. assertions)	Total
Antirogative verbs	96	2	98
xiang "think" (also "want")	95	1	96
yiwei "mistakenly believe"	1	1	2
Responsive verbs			
zhidao "know"	92	29	121
Total	188	31	219

At first glance, one might conclude from Table 3 that *zhidao* "know" selects declarative complements much more frequently than interrogative ones, on the assumption that question speech acts indicate the presence of declarative complements, even for *know*-like verbs. However, further inspection shows that these figures actually overestimate the rate at which *zhidao* selects declaratives. Of the 92 questions featuring *zhidao* and potential interrogatives, a number of them are actually questions like (12), wian interrogative complement clause. For these questions, the speaker's intent was to ask a *wh*-question represented by the complement clause (e.g. "What is this?" in (12)), but the form of the entire sentence is that of a polar interrogative, prominently marked by the particle *ma*.

[3] In the one non-question *xiang* token, the speaker appears to intend for the *wh*-phrase to scope over the clause. As for the non-question *yiwei* token, the *wh*-phrase is actually the only instance of a *wh*-indefinite that we encountered. See also Footnote 1 for remarks about how the availability of this reading may or may not pose complications for Mandarin learners.

(12) Zhei zhidao [zhe shenme] ma?
this know this what Q
"This, [do you] know what this [is]?" (from Beijing Corpus, "tt" subcorpus)

In the next section, we consider the usefulness of *ma* as a cue. As mentioned in Section 2, *ma* requires that its prejacent be a declarative clause. To the extent that the prejacent contains a potentially interrogative complement, like (12), learners might be able to apply this fact about *ma* to infer that the *wh*-phrase scopes over the complement clause and not the whole sentence. This in turn would provide evidence that the matrix verb allows interrogative complements.

3.2.3. The question particle *ma*

For this fact about *ma* to be truly useful to a learner, *ma* should appear in the input with potential interrogatives only when the matrix verb is responsive, like *zhidao* "know" (13a, also 12). With antirogative matrix verbs like *juede* "feel/think" or *xiang* "think, want," the *wh*-phrase in the potentially interrogative must take wide scope, resulting in a *wh*-question, which is grammatically incompatible with *ma* (13b).

(13) a. Xiaoxiao zhidao [baba xihuan shenme] ma?
Xiaoxiao know Dad like what Q
"Does Xiaoxiao know what Dad likes?"

b. *Xiaoxiao juede [baba xihuan shenme] ma?
Xiaoxiao think Dad like what Q
Intended: "What does Xiaoxiao think Dad likes?"

Our corpus results show that this is indeed the case in the input: *ma* appears with responsive *zhidao* 30% of the time (36 out of 121 tokens), and never with antirogatives ($\chi^2(1)=32.8$, $p<.001$). It is therefore possible for learners to exploit the distribution of *ma* in the input to determine whether an attitude verb allows interrogative complements.

Table 3: Distribution of potential interrogatives and the polar question particle *ma*

Verbs	*Ma* present	*Ma* absent	Total
Antirogative verbs	0	98	98
xiang "think" (also "want")	0	96	96
yiwei "mistakenly believe"	0	2	2
Responsive verbs			
zhidao "know"	36	85	121
Total	36	183	219

4. General discussion

Our corpus analysis shows that potential interrogative complements appear frequently in child-directed speech in Mandarin across responsive and antirogative (*know*- vs. *think*-like) attitude verbs. At the same time, our results also reveal that speech act information and the distribution of the polar question particle *ma* provide cues for disambiguating the complements (interrogative vs. declarative). In turn, these cues might help children figure out attitude verb subcategorization properties and *wh*-scope.

Although our focus has been on Mandarin, we note that this proposal has broader implications. Specifically, since the correlation between potential interrogatives and speech acts is likely to hold across *wh*-in situ languages in general, speech acts should be a useful cue in these languages as well. To the extent that other *wh*-in situ languages have polar question particles similar to *ma*, these particles can be an additional source of information for disambiguating potentially interrogative complements.

In highlighting the relevance of these speech act-related cues, our study also adds to our understanding of how pragmatics can support the acquisition of attitude verbs. Recent work, such as Hacquard & Lidz 2019, Harrigan et al. 2019, and Huang et al. 2018, 2022, has argued that learners can make use of the correlation between assertions and declarative syntax to learn the semantic difference between belief and desire verbs. Our study here suggests a broader role for pragmatics: it is relevant not only to the acquisition of attitude verb semantics, but also to the acquisition of attitude verb syntax.

Finally, we wish to point out some areas for future research. One question that this study does not address is whether there are cues beyond speech act-related ones that learners could use for learning this subcategorization difference. One plausible candidate is prosody, as noted in passing in Footnote 2. However, the methods used in this project – the analysis of transcripts of child-ambient speech – means that we cannot definitively evaluate the role of prosody here. Second, corpus evidence in itself is insufficient for demonstrating that Mandarin learners actually use speech acts to learn verb subcategorization, a far stronger claim than what is being proposed here. Experimental evidence would be needed to establish this point.

5. Conclusion

This study was interested in how learners of a *wh*-in situ language like Mandarin might acquire a subcategorization difference between attitude verbs – whether the verb allows interrogative complements or not. Across languages, this is a distinction that separates some of the most common attitude verbs, such as "know" and "think." It is also a theoretically important distinction; various proposals have linked it to whether a verb has factive semantics, with potential consequences for syntactic bootstrapping (Grimshaw 1979, Lahiri 2002, Egré

2008, among others). Important as it may be, in languages like Mandarin, this distinction is in principle obscured by the fact these languages do not overtly mark the scope of *wh*-phrases and other markers of interrogativity, like A-not-A morphology or *haishi* "or". As a result, a complement clause containing an in situ *wh*-phrase, A-not-A, or *haishi* is ambiguous: the complement clause can be analyzed as either an interrogative, where these elements scope over the complement clause, or a declarative, where these elements scope over the entire sentence.

Our analysis of four Mandarin child-ambient speech corpora shows that the string ambiguity problem is real. At the same time, our analysis also shows that there is clear non-word order information available in the input, namely, speech act information and the polar question particle *ma*. Learners sensitive to the distribution of these cues can exploit them to resolve the ambiguity problem. Doing so in turn would allow learners to track the extent to which an attitude verb appears with interrogative complements and determine what its subcategorization properties might be.

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