

# ‘Think’, ‘want’ and ‘may be about to’ - the propositional meanings and the clause-embedding properties of Mandarin Chinese *xiang*

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## 1. INTRODUCTION

In the domain of clause-embedding predicates, the relation between the embedding predicate and the complement is one of the central questions of investigation. For predicates that allow multiple interpretations, it has often been proposed that the meaning of the whole sentence depends mainly on the form of the complement. For example, the English verb *convince* means roughly ‘cause to believe’ when combining with a finite complement clause as in (1a) and means ‘cause to intend’ when combining with an infinitive complement as in (1b) (cf. Dowty 1985, Jackendoff 1985, Klein & Sag 1985, Grano 2019).

- (1) (a) John convinced Mary [that it was raining yesterday].  
(b) John convinced Mary [to leave].

The Mandarin Chinese verb 想 (*xiang*) also displays multiple propositional meanings, including ‘think’ as in (2a) and ‘want’ as in (2b). Some sentences even allow for both readings as in (3). Moreover, *xiang* can also be used as a modal verb, meaning roughly ‘may be about to’ as in (4).

- (2) (a) 我想昨天肯定下雨了。<sup>1</sup>  
Wo *xiang* zuotian kending xiayu le.  
1SG XIANG yesterday must rain PFV  
‘I **think** it must have rained yesterday.’  
(b) 我想离开。  
Wo *xiang* likai.  
1SG XIANG leave  
‘I **want** to leave.’  
(3) 我想张三认识李四。  
Wo *xiang* Zhangsan renshi Lisi.  
1SG XIANG Zhangsan know Lisi.  
‘I **think** Zhangsan knows Lisi.’ or ‘I **want** Zhangsan to know Lisi.’  
(4) 天气阴阴的，想下雨了。(BCC)<sup>2</sup>  
Tianqi yinyinde, *xiang* xiayu le.  
weather overcast XIANG rain PRT.  
‘It’s overcast and **may be about to** rain.’

In contrast to previous accounts that often focused on the decisive role of the complement clause in the interpretation, this paper will show that the meaning of *xiang* is influenced by many factors in the matrix clause as well. For example, the aspect marker in (5a) triggers the ‘think’ interpretation, whereas the negation in (5b) leads to the ‘want’ reading. Nevertheless, factors in the complement clause also play a role. For example, a bare eventive verb in the complement clause triggers the ‘want’ interpretation as in (6a), whereas a perfective complement clause will bring about the ‘think’ reading as in (6b). Moreover, the interpretation shifts again to ‘want’ if the matrix clause contains a degree adverb as in (6c), suggesting that the degree modification of the matrix predicate has a stronger effect than aspect markers in the complement clause.

(5) (a) 我在想张三认识李四。

Wo **zai** xiang Zhangsan renshi Lisi.  
1SG PROG XIANG Zhangsan know Lisi.  
‘I’m **thinking** Zhangsan knows Lisi.’

(b) 我不想张三认识李四。

Wo **bu** xiang Zhangsan renshi Lisi.  
1SG NEG XIANG Zhangsan know Lisi.  
‘I don’t **want** Zhangsan to know Lisi.’

(6) (a) 我想李四离开。

Wo xiang [Lisi **likai**].  
1SG XIANG Lisi leave.  
‘I **want** Lisi to leave.’

(b) 我想李四已经离开了。

Wo xiang [Lisi yijing **likai le**].  
1SG XIANG Lisi already leave PFV.  
‘I **think** Lisi has already left.’

(c) 我多想李四已经离开了。

Wo **duo** xiang [Lisi yijing **likai le**].  
1SG much XIANG Lisi already leave PFV.  
‘I much **want** it to be the case that Lisi has already left.’

This paper aims to propose appropriate semantic representations of the different meanings of *xiang* and to offer a systematic illustration of the influencing factors in sentence interpretation and their hierarchy of strengths. The paper is structured as follows: Section 2 describes the meanings and behaviors of the three clause-embedding readings of *xiang* in detail. Section 3 introduces the previous approach by Grano & Lu (2021), which assumes different covert modal operators in the left periphery of the embedded clause to account for the ‘think’ and ‘want’ alternation. However, I will argue that this approach has several problems. Section 4 suggests a new semantic account for the meanings of *xiang* and

demonstrates the compositional derivation for each reading. Section 5 discusses the influencing factors, illustrates the procedure of sentence interpretation and presents the interactions of the factors via the modeling of *Optimality Theory*.

## 2. MEANINGS OF *xiang*

This section examines the meanings of *xiang* in greater detail. Section 2.1 discusses the ‘think’ reading, Section 2.2 the ‘desire’ reading, and Section 2.3 the ‘may be about to’ reading. The following questions will be addressed: Which complement types can the different readings select? In which contexts are they applicable? What are the differences between them and their English translation counterparts? Answering these questions can help to gain a deeper insight into the meanings of *xiang*.

### 2.1. ‘Think’ reading

The ‘think’ reading of *xiang* (referred to as *xiang<sub>think</sub>*) is similar to English *think* in that it is compatible with both declarative and interrogative complements, whereby ‘think’ has to be eventive/dynamic when combining with interrogative complements (Özyıldız 2021). With declarative complements, *xiang<sub>think</sub>* can be used statively as in (7) and dynamically as in (9). The incompatibility of *xiang<sub>think</sub>* with a manner adverb in (7b) suggests that *xiang<sub>think</sub>* in (7) must be interpreted as stative, since prototypical stative verbs do not allow for manner modifications, cf. (8). (9) suggests that *xiang<sub>think</sub>* can express a dynamic process of thinking, but a dynamic interpretation is inappropriate as an answer to a question as in (7). For further diagnostics of stativity/dynamicity of a predicate see Lakoff (1966), Dowty (1979), Rothstein (2008), Katz (2008), and others.

(7) *Context: A asks who is the murderer and B answers.*

(a) 我想李四是凶手。

Wo xiang [Lisi shi xiongshou].

1SG XIANG Lisi be murderer.

‘I think Lisi is the murderer.’

(b) #我担忧地想: 李四是凶手。

Wo danyou-de xiang: [Lisi shi xiongshou].

1SG WORRY-ADV XIANG Lisi be murderer

#‘I worriedly think that Lisi is the murderer.’

(8) He (\*worriedly) knows that Lisi is the murderer.

(9) *Context: Zhangsan is at the crime scene, people are discussing who the murderer is. The evidence suggests that Lisi is the murderer, although Zhangsan does not hope so.*

张三（在）担忧地想：李四一定是凶手。

Zhangsan (zai) danyou-de xiang: [Lisi yiding shi xiongshou].

Zhangsan PROG worried-ADV XIANG Lisi must be murderer

‘Zhangsan is thinking worriedly that Lisi must be the murderer.’

In the interrogative cases, *xiang<sub>think</sub>* is compatible with all types of questions: wh-questions (10a), A-not-A questions (10b), and sentences with the question marker *ma* (10c). In these cases, *xiang<sub>think</sub>* is always dynamic (Özyıldız 2021), independent of the presence of an aspect marker in the matrix clause. The matrix sentences (10a) and (10b) contain an aspect marker, whereas (10c) does not. They are all compatible with manner adverbs.

(10) (a) 张三在（仔细地）想谁是凶手。

Zhangsan **zai** (zixi-de) xiang [**shei** shi xiongshou].

Zhangsan PROG careful-ADV XIANG who be murderer

‘Zhangsan is thinking (carefully) who is the murderer.’

(b) 张三（仔细地）想过李四是不是凶手。<sup>3</sup>

Zhangsan (zixi-de) xiang **guo** [Lisi **shi-bu-shi** xiongshou].

Zhangsan careful-ADV XIANG EXP Lisi be-not-be murderer

‘Zhangsan has thought (carefully) whether Lisi is the murderer.’

(c) 张三（担忧地）想：李四是凶手吗？

Zhangsan (danyou-de) xiang: [Lisi shi xiongshou **ma**?]

Zhangsan worried-ADV XIANG Lisi be murderer Q

‘Zhangsan is thinking (worriedly): Is Lisi the murderer?’

A notable prosodic difference between the ‘think’ and ‘want’ reading of *xiang* is that there is usually a pause between the matrix and the complement clause with *xiang<sub>think</sub>*, and the accent of a *xiang<sub>think</sub>*-sentence is normally located in the complement clause (see also Tardif & Wellman 2000: 26-27). In written Mandarin, such a pause is presented by punctuation such as colon or comma. This can avoid ambiguity and block the reading of ‘want’. For example, if the colon in (10c) is omitted, the sentence will be interpreted as a question about ‘want’ as in (11).<sup>4</sup> If there are other disambiguating factors such as aspect markers as in (10a/b), the punctuation before the complement clause can be omitted. More disambiguating factors will be discussed in Section 5.

(11) 张三想李四是凶手吗？

Zhangsan xiang [Lisi shi xiongshou] ma?

Zhangsan XIANG Lisi be murderer Q

‘Does Zhangsan want Lisi to be the murderer?’

The punctuation/pause requires the following sentence to be an independent root clause. This is in accordance with the observation in the previous literature that assertive predicates like ‘think’ or ‘say’ allow for complements with root clause

properties, whereas non-assertive predicates like ‘want’ do not (cf. Hooper & Thompson 1973, Anand & Hacquard 2013).

With respect to NP selection, *xiang<sub>think</sub>* differs from English *think* in that it can combine with NPs directly, meaning ‘think about/of’. In such cases, *xiang<sub>think</sub>* is normally dynamic as in (12).<sup>5</sup>

- (12) (a) 我\* (在) 想这件事。  
 Wo \*(zai) xiang zhe jian shi.  
 1SG PROG XIANG this CLF thing  
 ‘I’m thinking about that.’
- (b) 想一想你的家人！他们都很关心你！  
 Xiang yi xiang ni de jia ren! Tamen dou hen guanxin ni!  
 XIANG one XIANG 2SG POSS family 3PL all very care.about 2SG  
 ‘Think of your family! They all care about you!’

*Xiang<sub>think</sub>* cannot occur alone only with a subject as in (13a), but it allows for an intransitive use if it is modified with further manner or temporal adverbials as in (13b) and (13c).

- (13) (a) \*张三想。  
 Zhangsan xiang.  
 Zhangsan XIANG  
 Intended: ‘Zhangsan thinks.’
- (b) 你想得很好，但不现实。  
 Ni xiang de hen hao, dan bu xianshi.  
 2SG XIANG ADV very good but NEG realistic  
 ‘You had a good idea, but it’s not realistic.’
- (c) 张三想了一会儿，说：“我也不知道该怎么办。”  
 Zhangsan xiang le yihuier, shuo: “Wo ye bu zhidao gai  
 Zhangsan XIANG PFV a.while say 1SG also NEG know should  
 zenme ban.”  
 how do  
 ‘Zhangsan thought for a while and said: ‘I don’t know what to do either.’

## 2.2. ‘Desire’ reading

Like English, the embedded subject of the ‘want’ reading of *xiang* (referred to as *xiang<sub>want</sub>*) can be covert or overt. If the subject of the complement clause is covert, it must be co-referential with the subject of the matrix clause as in (14a). If the subject in the complement clause is overt, it is usually different from the matrix subject as in (14b).

- (14) (a) 张三想当宇航员。  
 Zhangsan<sub>i</sub> xiang [<sub>i/\*j</sub>] dang yuhangyuan].  
 Zhangsan XIANG be astronaut  
 ‘Zhangsan wants to be an astronaut.’
- (b) 张三想李四离开这里。  
 Zhangsan xiang [Lisi likai zheli]  
 Zhangsan XIANG Lisi leave here  
 ‘Zhangsan wants Lisi to leave here.’

As a desiderative predicate, *xiang<sub>want</sub>* is anti-rogative. Since in Mandarin wh-elements stay in situ, sentences like (15) appear to indicate that *xiang<sub>want</sub>* can select interrogatives. However, the translation shows clearly that such sentences are matrix questions rather than declarative sentences with an interrogative complement, see also (11).

- (15) 张三想李四送什么给王五?  
 Zhangsan xiang Lisi song shenme gei Wangwu?  
 Zhangsan XIANG Lisi give what to Wangwu  
 ‘What does Zhangsan want Lisi to give to Wangwu?’

Except for the aforementioned similarities, several differences can be observed between the English and Mandarin counterparts: First of all, *xiang<sub>want</sub>* can also be employed in a counterfactual context, especially when combined with a degree adverb as in (16). In English, such cases normally require the use of *wish* rather than *want*. The corpus examples in (15) suggest that *xiang<sub>want</sub>* does not necessarily convey or presuppose any likelihood of its content assumed by the attitude holder. Therefore, it expresses a more general desire than English *want*. To present this, I will label the second reading *xiang<sub>desire</sub>* instead of *xiang<sub>want</sub>* in the following.

- (16) (a) 好想从来都没认识过你! (BCC)  
 Hao xiang conglai dou mei renshi guo ni!  
 very XIANG always all NEG meet EXP 2SG  
 ‘I **wish** I’d never met you.’
- (b) 有时候真想一天有48小时。(BCC)  
 Youshihou zhen xiang yi-tian you 48 xiaoshi.  
 Sometimes really XIANG one-day have 48 hour  
 ‘Sometimes I really **wish** there were 48 hours in a day.’

Another difference between *xiang<sub>desire</sub>* in Chinese and *want* in English concerns NP-selection. *Xiang<sub>desire</sub>* is incompatible with any kind of NPs. In order to express ‘want something’ in Mandarin, one must use the compound verb 想要 (*xiang-yao*, ‘want-want’)<sup>6</sup> instead of single *xiang*, cf.(17).

(17) 我想\*(要)一个苹果。

Wo xiang-\*(yao) yi-ge pingguo.

1SG XIANG-want one-CLF apple

'I want an apple.'

### 2.3. 'May be about to' reading

The third clause-embedding use of *xiang*, which has not been discussed yet in the previous literature, describes the possibility of an event occurring in the near future of the utterance time (therefore referred to as 'possible near future' *xiang<sub>pnf</sub>*). It can be roughly translated as 'may be about to' or 'seem to be going to' as in (18). The near-future orientation is evident from the fact that *xiang<sub>pnf</sub>* cannot describe an event that may have happened previously, be happening at the current time, or will happen in the far future, cf. (19).

(18) (a) 今天阴沉沉的, 似乎想下雨。(BCC)

Jintian yinchenchende, sihu xiang xiayu.

today overcast seemingly XIANG rain.

'It's overcast today and seems to be going to rain.'

(b) 头疼, 想感冒了。(BCC)

Touteng, xiang ganmao le.

headache, XIANG get.a.cold PRT.

'I have a headache and may be getting a cold.'

(19) (a) \*昨天想下过雨了。

Zuotian xiang xia guo yu le.

Yesterday XIANG pour.down EXP rain PRT

Intended: 'It may have rained yesterday.'

(b) \*张三想在做作业。

Zhangsan xiang zai zuo zuoye.

Zhangsan XIANG PROG do homework

Intended: 'Zhangsan may be doing homework.'

(c) 一周后我想感冒。

Yi-zhou-hou wo xiang ganmao.

one-week-after 1SG XIANG get.a.cold.

'I **want** to get a cold in one week.'

NOT: 'I may get a cold in one week.'

Another restriction on *xiang<sub>pnf</sub>* is that it can only describe uncontrollable events such as raining or getting a cold. If the event can be carried out by an animate subject, like leaving in (20a), *xiang* will be interpreted as 'desire'. In such cases, one has to use other expressions like 可能要/会 (*keneng yao/hui*, 'probably will') to describe the possible-future reading as in (20b). Moreover,

*xiang<sub>pnf</sub>* is normally used in affirmative sentences. With negation, *xiang* is usually interpreted as ‘desire’, cf. (21).

- (20) (a) 张三想离开。  
 Zhangsan *xiang* *likai*.  
 Zhangsan *XIANG* leave.  
 ‘Zhangsan **wants** to leave.’
- (b) 张三可能要离开。  
 Zhangsan *keneng* *yao* *likai*.  
 Zhangsan probably will *FUT*  
 ‘Zhangsan will probably leave.’

- (21) 我不想感冒。  
 Wo *bu* *xiang* *ganmao*.  
 1SG *NEG* *XIANG* *get.a.cold*  
 ‘I don’t **want** get a cold.’ NOT: ‘It is not possible that I will get a cold.’

The examples above suggest that the use of *xiang<sub>pnf</sub>* is restricted by the use of *xiang<sub>desire</sub>*. Furthermore, it is reasonable to assume that *xiang<sub>pnf</sub>* was derived from the implication and the metaphorical use of *xiang<sub>desire</sub>*. When people want to do something, it is then possible that this will be carried out in the future. When it relates to an event that people cannot take control of (e.g. raining), the attitudinal meaning of ‘desire’ is lost and only the implication remains, expressing that the event may happen in the future. This metaphorical use is also attested in other languages as in (22).

- (22) (a) Spanish:  
 Quiere llover.  
 wants rain.*INF*  
 ‘It may be about to rain.’
- (b) German:  
 Es will regnen.  
 it wants rain.*INF*  
 ‘It may be about to rain.’

While *xiang<sub>pnf</sub>* originates presumably from *xiang<sub>desire</sub>*, their essential distinction is that *xiang<sub>desire</sub>* expresses an attitude, whereas *xiang<sub>pnf</sub>* functions as a modal verb. As an attitude predicate, *xiang<sub>desire</sub>* takes the matrix subject as its attitude holder. In contrast, *xiang<sub>pnf</sub>* exhibits a raising construction, whereby the subject does not function as a thematic argument of *xiang<sub>pnf</sub>*. In other words, *xiang<sub>pnf</sub>* does not introduce any attitude holder by itself. Rather, the attitude holder of a *xiang<sub>pnf</sub>*-sentence is the speaker of that utterance or the subject of the embedding attitude predicate as in (23).



(23) 我感觉你想感冒了。

Wo ganjue [ni xiang ganmao le].

1SG feel 2SG XIANG get.a.cold PRT

‘I feel like you may be getting a cold.’

This section has discussed the meanings and uses of *xiang<sub>think</sub>*, *xiang<sub>desire</sub>*, and *xiang<sub>pnf</sub>*. Table 1 provides a summary of the presented properties. *Xiang<sub>think</sub>* can embed a declarative or an interrogative complement clause (CC), while the combination with the latter requires the matrix event to be dynamic. It can also select NPs. *Xiang<sub>desire</sub>* is anti-rogative and cannot combine with NPs directly. These two are both attitude predicates, whereas *xiang<sub>pnf</sub>* functions as a modal verb and can only describe uncontrollable events that may occur in the near future of the utterance time.

	<i>xiang<sub>think</sub></i>	<i>xiang<sub>desire</sub></i>	<i>xiang<sub>pnf</sub></i>
verb class	attitude	attitude	modal
declarative CC	✓	✓	✓
interrogative CC	✓	✗	✗
NP complement	✓	✗	✗
dynamicity	✓	✗	✗
restrictions			uncontrollable event

Table 1

<Different readings of *xiang* and their properties.>

Besides the aforementioned meanings, *xiang* can also combine with other verbs or resultative markers and build a verbal complex, such as 想要 (*xiang-yao*, ‘want’), 想象 (*xiang-xiang*, ‘imagine’), 想到 (*xiang-dao*, ‘think of/it occurs’), 想起 (*xiang-qi*, ‘remember/be reminded of’), etc. These expressions can also select various types of complements. Since this paper will only focus on the meanings of the monosyllabic verb *xiang*, the compound meanings of *xiang* are beyond the scope of this discussion and will not be addressed in detail.

### 3. THE PREVIOUS ANALYSIS

This section will discuss the previous analysis by Grano & Lu (2021), who propose a unified account for the ‘think’ and ‘desire’ readings of *xiang*. With the *Zeugma Test*, also known as the *Identity Test* in Zwicky & Sadock (1975), they argue that *xiang* is underspecified rather than ambiguous, cf. (24). Accordingly, the acceptability of (24) should indicate that the lexicon only contains one semantic entry for *xiang*, which is compatible with both ‘think’ and ‘desire’ interpretations.

(24) 我和他想得不一样: 我想离开, 他想我不应该离开。

Wo he ta xiang de bu yiyang: wo xiang likai, ta xiang wo bu  
1SG and 3SG XIANG ADV NEG same 1SG XIANG leave 1SG XIANG 1SG NEG  
yinggai likai.  
should leave.

‘He and I have different ideas: I **want** to leave, but he **thinks** I shouldn’t  
leave.’  
(Grano & Lu 2021: 4, (3))

Grano & Lu (2021) adopt the decompositional approach that has been often applied to the embedding constructions of attitude predicates in recent works (Kratzer 2006, 2013, Moulton 2009, Bogal-Allbritten 2016, 2017, Bochnak & Hanink 2021). While the traditional Hintikkan approach assumes that the modal function of the attitude predicate, i.e. the quantification over possible worlds, is rooted in the semantics of the predicate itself as in (25), the decompositional approach proposes that the modal function is not contributed by the attitude predicate directly. Rather, it is conveyed by a functional head (a covert modal operator) in the left periphery of the complement clause. For example, Kratzer (2013) assumes that there is a covert reportative modal [say] in the embedded clause in (26), whose semantics is given in (27). Accordingly, the covert modal takes a propositional argument expressed by the embedded clause and is anchored to the situation denoted by the embedding predicate (Hacquard 2006), such that for all worlds compatible with the content of the situation  $s$ , there is a situation  $s'$  in which  $p$  is true. The embedding predicate like *sigh* takes only the referential situation argument, while the covert modal together with its propositional argument functions as a modifier of that situation as in (28).

(25)  $\llbracket \text{believe} \rrbracket^w = \lambda p_{\langle s, t \rangle} \lambda x. \forall w' \in \text{DOX}_{x, w}: [p(w') = 1]$

(26) Ralph sighed  $\llbracket [\text{say}] \text{Ortcun was a traitor} \rrbracket$ .

(27)  $\llbracket [\text{say}] \rrbracket = \lambda p \lambda s. \forall w (w \in f_{\text{content}}(s) \rightarrow \exists s' (s' \leq w \ \& \ (p)(s')))$

(28) (a)  $\llbracket \text{sigh} \rrbracket = \lambda s. \text{sigh}(s)$

(b)  $\llbracket \text{sighed} [\text{say}] \text{Ortcun was a traitor} \rrbracket$   
 $= \lambda s. (\text{sigh}(s) \ \& \ \forall w (w \in f_{\text{content}}(s) \rightarrow \exists s' (s' \leq w \ \& \ \text{traitor}(\text{Ortcun})(s'))))$

(Kratzer 2013: 49-52)

The covert modal approach offers a comprehensible account for attitude predicates that allow for multiple interpretations. In this framework, the embedding predicate is analyzed as underspecified, while the different covert modals in the embedded clauses are responsible for the available readings. Such an analysis has been applied to several concrete cases across languages, see Bhatt (2006) on non-finite constructions in English, Bogal-Allbritten (2016) on *nizin* (‘think’ and ‘want/wish’) in Navajo, and Grano (2019) on *persuade* in English. Analogously, Grano & Lu (2021) assume that *xiang* denotes a fully underspecified attitude event as in (29), whereby the covert belief/desire modal operator in the embedded

sentence contributes to the ‘think/‘desire’ interpretation in (30).

(29)  $[[\text{xiang}]] = \lambda e. \text{ATTITUDE}(e)$

(30) (a)  $[[[_{CP} \emptyset \text{Modal}_{\text{Belief}} \text{ Wangwu hen Lisi}]]$   
 $= \lambda e. \forall w \in \text{BELIEF}(e): \text{Wangwu hates Lisi in } w$

(b)  $[[[_{vP} \emptyset \text{Modal}_{\text{Desire}} \text{ Wangwu hen Lisi}]]$   
 $= \lambda e. \forall w \in \text{DESIRE}(e): \text{Wangwu hates Lisi in } w$

(Grano & Lu 2021: 9, (10)-(12))

Furthermore, Grano & Lu (2021) argue that the ambiguity between ‘think’ and ‘desire’ is structural. In other words, the interpretation of *xiang* is determined by the syntactic structure of the embedded clause. They propose that the ‘think’ reading selects CPs, whereas ‘desire’ selects vPs as in (30), given that vP-external elements in the embedded clause, e.g. aspect markers such as perfective *le* and progressive *zai* in (31) or epistemic/deontic modals such as *yinggai* in (32), will trigger the ‘think’ interpretation.

(31) (a) 张三想李四已经到了。

Zhangsan xiang [Lisi yijing dao-**le**].

Zhangsan XIANG Lisi already arrive-PFV

‘Zhangsan **thinks** Lisi has already arrived.’

NOT: ‘Zhangsan wants it to be the case that Lisi has already arrived.’

(b) 张三想李四在做功课。

Zhangsan xiang [Lisi **zai** zuo gongke].

Zhangsan XIANG Lisi PROG do homework

‘Zhangsan **thinks** Lisi is doing homework.’

NOT: ‘Zhangsan wants Lisi to be doing homework.’

(32) (a) 张三想李四应该在上海。

Zhangsan xiang [Lisi **yinggai** zai Shanghai].

ZHANGSAN XIANG Lisi should be.at Shanghai

‘Zhangsan **thinks** that Lisi should (epistemically) be in Shanghai.’

NOT: ‘Zhangsan wants it to be the case that Lisi should (epistemically) be in Shanghai.’

(b) 张三想李四应该去上海。

Zhangsan xiang [Lisi **yinggai** qu Shanghai].

Zhangsan XIANG Lisi should go Shanghai

‘Zhangsan **thinks** that Lisi should (deontically) go to Shanghai.’

NOT: ‘Zhangsan wants it to be the case that Lisi should (deontically) go to Shanghai.’

(Grano & Lu 2021: 6-7, (4)-(7))

However, their analysis has several problems. First, the zeugma test in (24)

cannot serve as a strong argument for the underspecification of the clause-embedding readings of *xiang*. The intransitive use of *xiang* indeed expresses a very general meaning and is compatible with various other attitudes in addition to ‘think’ and ‘desire’. For example in (33), the intransitive *xiang* can relate to two completely distinct and unrelated meanings (‘worry’ and ‘suspect’). Therefore, the acceptability of (24) can only suggest that the intransitive *xiang* is underspecified, but does not indicate that the clause-embedding *xiang*<sub>think</sub> and *xiang*<sub>desire</sub> belong to one lexical entry.<sup>7</sup>

- (33) 我和他想得不一样：我担心李四不肯说出实情，而他怀疑王五才是知情人。

Wo he ta **xiang** de bu yiyang: wo **danxin** Lisi bu ken  
 1SG and 3SG XIANG ADV NEG same 1SG worry Lisi NEG want  
 shuo-chu shiqing, er ta **huaiyi** Wangwu cai shi zhiqing-ren.  
 speak-out truth while 3SG suspect Wangwu PRT be know.truth-person  
 ‘I and he have different ideas: I was worried that Li Si wouldn’t tell the truth, while he suspected that Wang Wu was the one who knew the truth.’

Second, the assumption that the embedded clause is selected by a covert modal functioning as a modifier of the embedding predicate contradicts the fact that *xiang* does not permit two coordinated complement clauses to have different interpretations as in (34).

- (34) \*张三想李四搬家了并且去看他。

\*Zhangsan xiang [Lisi banjia le] bingqie [qu kan ta].  
 Zhangsan XIANG Lisi move PFV and go see 3SG.  
 Intended: ‘Zhangsan **thinks** Lisi has moved and **wants** to visit him.’

This should be allowed if the modal meanings of *xiang* were indeed contributed by modifiers. For example, in Navajo, the underspecified predicate *nizin* (‘think, want’) can embed two clauses with distinct interpretations as in (35). According to Bogal-Allbritten (2016, 2017), this is possible because the two embedded clauses contain different modal operators, which actually determine the respective interpretations as in (36).

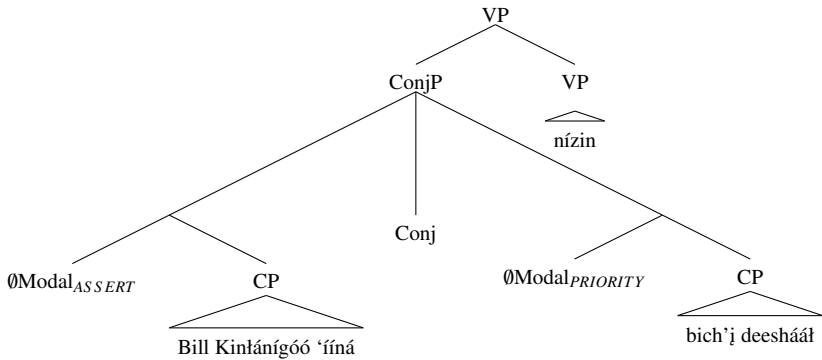
- (35) (a) *Context: Alice thinks Bill moved to Flagstaff. She wants to go visit him some time, but she does not have any definite plans to do so and knows it is very likely it will not happen. I’m telling you about Alice.*

(b) Alice [Bill Kinłánígóó ‘íná] dóó [bich’i deesháát]  
 Alice Bill Flagstaff.to 3SBJ.move.PFV and 3OBJ.to 1SBJ.go.FUT  
**nizin.**  
 3SBJ.ATT.IPFV

‘Alice **thinks** Bill moved to Flagstaff and she **wants** to go see him.’

(Bogal-Allbritten 2016: 145, (25))

(36)



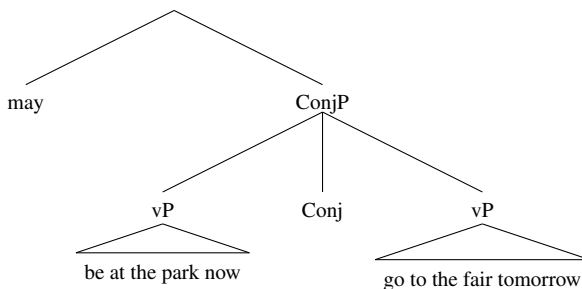
In contrast, conjoining two embedded clauses with distinct meanings is impossible with ambiguous modal verbs like *may* or *can* as in (37) because modal verbs select propositions directly. Consequently, the embedded sentence in (37) must either share a single modal verb as in (38a), with one single modal only being able to convey one single meaning or the modal verb has an ellipsis in the second conjunct as in (38b), whose interpretation must be identical with its antecedent according to the semantic identity conditions (Keenan 1971, Sag & Hankamer 1984, Dalrymple et al. 1991).

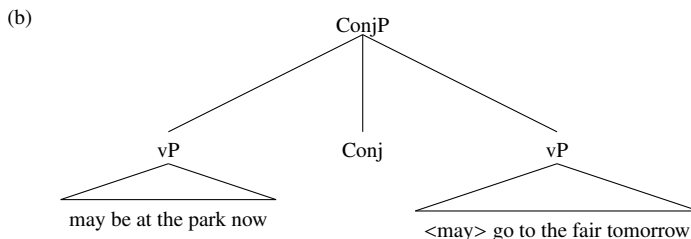
(37) Mary may [be at the park now] and [go to the fair tomorrow].

- (a) Priority (rule-oriented) interpretation: Given the rules, Mary is allowed to be at the park right now, and she is allowed to go to the fair tomorrow.
- (b) Epistemic interpretation: Given my evidence, Mary might be at the park now and she might go to the fair tomorrow.
- (c) #Mixed interpretation: It is possible that Mary is at the park now, and she is allowed to go to the fair tomorrow.

(Bogal-Allbritten 2017: 4, (10))

(38) (a)





With respect to complement coordination, *xiang* behaves similarly to modal verbs rather than *nǐzīn*, suggesting that the embedded clauses are selected by *xiang* directly as arguments instead of as modifiers.<sup>8</sup>

Third, the analysis in (29) and (30) ignores some attested uses of *xiang* presented in Section 2. First of all, the proposal that the ambiguity of *xiang* is purely structural and that the ‘desire’ interpretation only selects vPs overlooks cases like (39), where the embedded clause contains a vP-external element such as the experiential aspect marker *guo* or the future marker *hui* but still licenses the ‘desire’ reading. This suggests that *xiang<sub>desire</sub>* can actually embed a larger sentence structure, especially when modified by a degree adverb such as 好 (*hao*, ‘very’) and 多 (*duo*, ‘much’), see more details about degree modification and other influencing factors in Section 5.

(39) (a) 好想从来都没认识过你! (BCC)

**Hao** xiang conglai dou mei renshi **guo** ni!  
 very XIANG never PRT NEG meet EXP 2SG  
 ‘I wish much I’d never met you.’

(b) 多想有个人会给我一个问候。(BCC)

**Duo** xiang you ge ren **hui** gei wo yi-ge wenhou.  
 Much XIANG exist CLF person FUT give 1SG one-CLF greeting  
 ‘I have a strong desire for the case that someone would give me a greeting.’

In addition, the assumption that the ‘think’ reading of *xiang* is contributed by the belief operator as in (30a) cannot cover all the properties of *xiang<sub>think</sub>*, since ‘believe’ cannot be dynamic, nor can it embed interrogative complements. The NP-selecting behavior of *xiang<sub>think</sub>* was also ignored.

#### 4. A NEW SEMANTIC ANALYSIS

This section presents a comprehensive semantic account for the meanings and properties of *xiang* discussed in Sections 2 and 3. The uses of *xiang* are divided into three lexical entries: Section 4.1 discusses the intransitive and the NP-selecting use *xiang<sub>1</sub>*, Section 4.2 illustrates the attitudinal use *xiang<sub>2</sub>*, and Section 4.3 demonstrates the modal use *xiang<sub>3</sub>*.

#### 4.1. The intransitive and the NP-selecting use *xiang*<sub>1</sub>

It is noteworthy that although the intransitive, the NP-selecting, and the corresponding clause-embedding uses of *xiang* are all normally translated as ‘think’, the former two express actually a more general meaning than the latter. As argued in Section 3, the intransitive *xiang* can relate to different kinds of attitudes, cf. (33). This can also be proved by asking a question like (40). In this case, various answers with different types of attitudes and complement forms such as (40a-c) are all acceptable.

(40) 你怎么想?

Ni zenme xiang?

2SG how XIANG

‘What do you think?’

(a) 我想/相信/希望计划能实现。

Wo xiang/xiangxin/xiwang [jihua neng shixian].

1SG XIANG/believe/hope plan can come.true

‘I think/believe/hope the plan will work out.’

(b) 我好奇谁会从中获益。

Wo haoqi [shei hui congzhong huoyi].

1SG curious who will therefrom benefit

‘I’m curious who would benefit from it.’

(c) 我怀疑数据的可靠性。

Wo huaiyi shuju de kekaoxing.

1SG doubt data poss reliability

‘I doubt the reliability of the data.’

Similarly, the NP-selecting *xiang* is also compatible with diverse attitudes or mental activities. The question in (41) can also be answered with sentences in (40a-c). The only difference between the questions in (40) and (41) is that the latter has a specific theme or topic of thinking whereas the former does not.

(41) 你怎么想这个计划?

Ni zenme xiang zhe-ge jihua?

1SG how XIANG this-CLF plan

‘How do you think about of this plan?’

Moreover, we can compare the meaning of *xiang* when it selects a nominal object with an appositive clause to describe its content as in (42a), and when it selects a declarative clause directly as in (42b). In (42a), the subject is doing mental activities around the claim. One could be considering the claim to be true or false, or thinking about related issues such as the background, the motivation, and the consequences of the claim. In contrast, (42b) only describes the content of thinking. Therefore, the range of thinking in (42a) is much broader than (42b).

In other words, (42a) does not necessarily entail (42b).

(42) (a) 李四在想世界上存在鬼魂这个说法。

Lisi zai xiang [[shijie shang cunzai guihun] zhe ge shuofa].

Lisi PROG XIANG world on exist ghost this CLF claim

‘Lisi is thinking about the claim that there exist ghosts in the world.’

(b) 李四在想世界上存在鬼魂。

Lisi zai xiang [shijie shang cunzai guihun].

Lisi PROG XIANG world on exist ghost

‘Lisi is thinking that there exist ghosts in the world.’

The aforementioned examples suggest that both the intransitive and the NP-selecting uses of *xiang* express a very general meaning compared to the clause-embedding use. Therefore, it is reasonable to assume that the former two contribute to a unified semantic entry  $xiang_1$ , which denotes a general mental eventuality as in (43).

(43)  $[[xiang_1]]^{c,g,w} = \lambda e. \text{MENTAL-EVENT}(e)$

I adopt here the neo-Davidsonian approach (Parsons 1990), according to which the thematic roles are introduced separately from the verb. The subject of a  $xiang_1$ -sentence functions as the attitude holder and thus has the thematic role *experiencer*. I assume that this is introduced via the functional head EXP (Kratzer 1996, Bogal-Allbritten 2016) as in (44). In the NP-selecting cases, I assume that the object has the thematic role *theme*, which is introduced via the operator THEME as in (45).

(44)  $[[\text{EXP}]]^{c,g,w} = \lambda x \lambda e. \text{EXPERIENCER}(x)(e)$

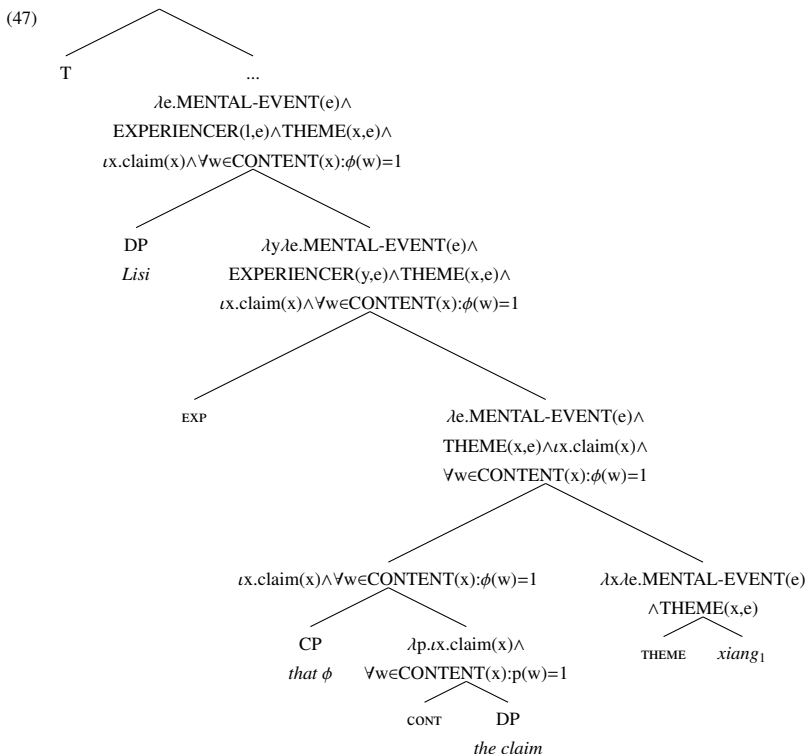
(45)  $[[\text{THEME}]]^{c,g,w} = \lambda x \lambda e. \text{THEME}(x)(e)$

If the object of  $xiang_1$  has an appositive clause as in (42a), it functions as a modifier of the corresponding DP and instantiates its content via the operator CONT as in (46) (Hacquard 2006, Kratzer 2013). CONT relates an individual to a proposition, stating that the proposition is true in all worlds that are compatible with the content of the individual.

(46)  $[[\text{CONT}]]^{c,g,w} = \lambda x \lambda p. \forall w' \in \text{CONTENT}(x) = \{w' \mid w' \text{ is compatible with the content of } x\} \rightarrow p(w')=1$

The whole structure of sentences like (42a) is illustrated in (47). The predicate  $xiang_1$  only has a referential event argument, while the subject, the object, and the appositive clause are all introduced via external operators.





#### 4.2. The attitudinal use *xiang*<sub>2</sub>

In this section, I will propose a semantic entry for *xiang*<sub>2</sub> that covers both readings of ‘think’ and ‘desire’ in the clause-embedding cases, whereby the proposition argument is selected directly by the embedding verb. Moreover, this account will also show the connection between *xiang*<sub>1</sub> and *xiang*<sub>2</sub>.

As argued in Section 3, the zeugma test in (24) can only prove the underspecification of the intransitive *xiang*<sub>1</sub>, but not that of the clause-embedding *xiang*<sub>2</sub>. However, it is still reasonable to integrate the two readings into one lexical entry because they have the same argument structure and similar meaning variations can be observed across languages as in (48)-(51).

#### (48) English

- (a) John was **considering/thinking** whether he should give up linguistics.  
 (b) John was **considering/thinking** about giving up linguistics.

#### (49) Russian (Kasenov 2023)

- (a) Vasja **duma-et** [čto my id-ëm pi-t’ pivo].  
 Vasja think-3SG COMP 1PL go-1PL drink-INF beer  
 ‘Vasja **thinks** that we are going to drink beer.’

- (b) Vasja **duma-et** [vy-pi-t piv-a].  
 Vasja think-3SG PFV-drink-INF beer-GEN  
 ‘Vasja **intends** to drink beer.’
- (50) Kalamang (Visser 2022: 393, 329)<sup>9</sup>
- (a) ma **toni** in se lalat to  
 3SG think 1PL.EXCL I AM dead right  
 ‘She **thought** we were dead, you know.’
- (b) lusi **toni** bara mat konggelem=kin  
 eagle want descend 3SG.OBJ grab=VOL  
 ‘The eagle **wants** to descend and grab him.’
- (51) Japhug (Jacques 2021: 409, 1360)<sup>10</sup>
- (a) χsʰ-rzab ma muu-puu-tsu-a jʰs-suiso ri χsuu-xpa  
 three-day apart.from NEG-AOR-PASS-1SG IFR-think LNK three-year  
 pjʰ-tsu tʰe,  
 IFR-PASS LNK  
 ‘He **thought** that he had spent only three days, but three years had passed.’
- (b) [ku-yuit-a] nuu-suiso-t-a ri jʰs-nuu-jmuit-a  
 IPFV:EAST-bring-1SG AOR-want-PST:TR-1SG LNK IFR-AUTO-forget-1SG  
 ma  
 LNK  
 ‘I **wanted** to bring it but I forgot it.’

The colexification of the representational and preferential readings across languages suggests that it is plausible to develop a systematic account for such meaning variations. To allow the reading variation of *xiang*<sub>2</sub>, I assume that *xiang*<sub>2</sub> also contains the general event component MENTAL-EVENT as *xiang*<sub>1</sub>. The difference between *xiang*<sub>1</sub> and *xiang*<sub>2</sub> is that the latter has an additional component that restricts its modal meaning to ‘think’ and ‘desire’. I assume this component is contributed by a morphological functional head MOD, which builds a more complex lexical item together with the root *xiang*<sub>1</sub> as in (52) (cf. Djärv (2023) on the DP-CP variation of *know*). This assumption also decomposes the event meaning and the modal meaning of the embedding predicate but is different from the covert modal approach in that the modal function is rooted in the inner structure of the embedding unit, not in the embedded clause. Consequently, the embedded proposition functions as the internal argument of the embedding predicate instead of serving as a modifier of the embedding event.

- (52)
- $$\begin{array}{c}
 \textit{xiang}_2 \\
 \wedge \\
 \text{MOD} \quad \textit{xiang}_1
 \end{array}$$

Since the ‘think’ interpretation of *xiang*<sub>2</sub> can select both declarative and interrogative clauses, whereby the latter is canonically treated as sets of answers to the corresponding question, i.e. sets of propositions (sets of sets of worlds) as in (53) (Hintikka 1962, Hamblin 1973, Karttunen 1977), I adopt the framework *Inquisitive Semantics* (Ciardelli et al. 2013, 2018, Theiler et al. 2018) to avoid type mismatch. In inquisitive semantics, both interrogative and declarative clauses are treated as sets of propositions. The only difference is that declarative clauses denote singleton sets containing only the single proposition conveyed by the sentence as in (54).

$$(53) \quad \llbracket \text{who came} \rrbracket = \{p \mid \exists x [p = \lambda w.\text{came}(x)]\} \\ = \{\text{John came, Ann came, Lee came, ...}\} \\ = \{\{w \mid \text{John came in } w\}, \{w' \mid \text{Ann came in } w'\}, \{w'' \mid \text{Lee came in } w''\}, \\ \dots\}$$

$$(54) \quad \llbracket \text{John came} \rrbracket = \{p \mid p = \text{John came}\} = \{\{w \mid \text{John came in } w\}\}$$

Consequently, *MOD* selects a set of propositions *P* that is realized by the complement clause. Meanwhile, the function *F* relates the event of *xiang*<sub>2</sub> to a set of propositions, and *P* should be in relation (*r*) to that set of propositions. The preliminary semantic representation of *MOD* is given in (55).

$$(55) \quad \llbracket \text{MOD} \rrbracket = \lambda P \lambda e. F(e) \text{ } r \text{ } P$$

When *xiang*<sub>2</sub> means ‘think’, I assume that *F*(*e*) denotes a thinking state *THK*(*e*). This set of propositions should be a subset of *P* as in (56) so that what one thinks at the event is included by the content/the possible answers of the declarative/interrogative complement clause. Following Özyıldız (2021) on English *think*, I assume that *THK*(*e*) is a kind of *inquisitive state* and adapt the definition of *THK*(*e*) from the definition of inquisitive state in Ciardelli et al. (2018) and Özyıldız (2021) as in (57). Accordingly, the union of the thinking state equals the doxastic state, ensuring that only answers to questions that are consistent with the belief state are considered at the event of thinking.

$$(56) \quad \text{when } \llbracket \text{xiang}_{\text{think}} \rrbracket(P)(e): \text{THK}(e) \subseteq P$$

$$(57) \quad \text{THK}(e) = \{p \mid \text{one would like to believe } p \text{ as an outcome of thinking at } e\}, \\ \text{and } \cup \text{THK}(e) = \text{DOX}(e)$$

When the complement clause is declarative, *P* is a singleton set as in (54). Consequently, ‘think *p*’ entails ‘believe *p*’ as derived in (58). When the complement clause is interrogative, several possible answers to the question are considered. Then it follows that the eventuality of thinking must be dynamic because its sub-events relate to different propositions and are therefore not homogeneous, see Özyıldız (2021) for more details.

- (58) (a) when  $P = \{p\} = \{\{w \mid p=1 \text{ in } w\}\}$ ,  
 then  $\cup P = \{w \mid p=1 \text{ in } w\} = p$   
 (b) since  $\text{THK}(e) \subseteq P$  and  $P = \{\{w \mid p=1 \text{ in } w\}\}$ ,  
 we have:  $\cup \text{THK}(e) \subseteq \cup P$   
 (c) since  $\cup \text{THK}(e) = \text{DOX}(e)$ ,  
 we have:  $\text{DOX}(e) \subseteq \cup P$ , that is  $\text{DOX}(e) \subseteq p$

When *xiang*<sub>2</sub> is interpreted as ‘desire’, a different  $F(e)$  must be involved to account for the desiderative interpretation. I assume that in that case,  $F(e)$  is a set of desirable propositions, referred to  $\text{DES}(e)$ . Similarly to *xiang*<sub>think</sub>, *xiang*<sub>desire</sub> also expresses a subset relation between  $P$  and  $\text{DES}(e)$  as in (59). Following the canonical view that the semantics of desire reports involves a logic of comparison (Heim 1992, Villalta 2008, Anand & Hacquard 2013), the definition of  $\text{DES}(e)$  is given in (60). In contrast to  $\text{THK}(e)$  in (57),  $\text{DES}(e)$  does not necessarily have a relation with the doxastic state, since *xiang*<sub>desire</sub> also allows for unrealistic content as shown in Section 2.2.

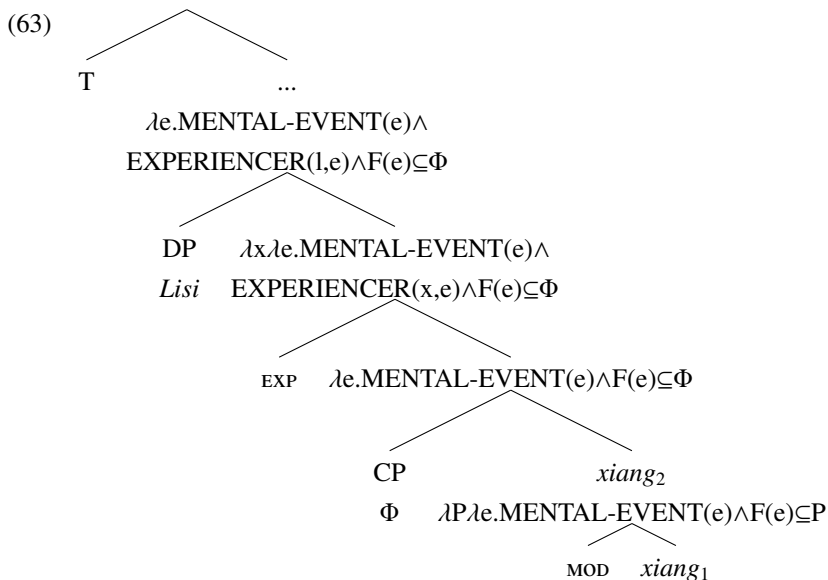
- (59) when  $\llbracket \textit{xiang}_{desire} \rrbracket(P)(e): \text{DES}(e) \subseteq P$   
 (60)  $\text{DES}(e) = \{p \mid p \text{ is more desirable than its alternatives at } e\}$

Note that the definition of  $\text{DES}(e)$  already suggests the anti-rogativity of *xiang*<sub>desire</sub>. *Xiang*<sub>desire</sub> can only select declarative clauses due to its property of comparison. For an interrogative clause such as (53), every proposition in the set is a relevant alternative. Therefore, there should be only one single proposition that is more desirable than others.

Combining the two interpretations ‘think’ and ‘desire’ together, the semantics of  $\text{MOD}$  can be formalized as (61), whereby  $F(e)$  allows for a free variation between the thinking and the desire state. Consequently, the semantic representation of the clause-embedding *xiang*<sub>2</sub> is demonstrated in (62). It contains two components, with one accounting for the metal event and the other for its relation with the propositional argument.

- (61)  $\llbracket \text{MOD} \rrbracket = \lambda P \lambda e. F(e) \subseteq P$ , where  $F(e) = \text{THK}(e) \vee \text{DES}(e)$   
 (62)  $\llbracket \textit{xiang}_2 \rrbracket^{c,g,w} = \lambda P \lambda e. \text{MENTAL-EVENT}(e) \wedge F(e) \subseteq P$ ,  
 where  $F(e) = \text{THK}(e) \vee \text{DES}(e)$

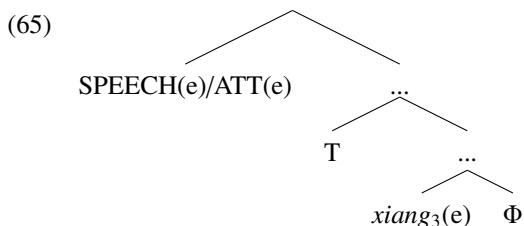
(63) illustrates the structure of a *xiang*<sub>2</sub>-sentence. The subject is again introduced via  $\text{EXP}$  in (44) as experiencer. Furthermore, I assume that the choice of  $F(e)$  is determined at a very late step, namely after the semantic composition of the whole sentence. The late specification is necessary for saving interpretative cost because the reading of *xiang*<sub>2</sub> is influenced by a number of hierarchical constraints concerning the complement clause and the matrix clause. Therefore, the late specification can avoid unnecessary shifts when certain elements are introduced later. This will be discussed in greater detail in Section 5.



#### 4.3. The modal use *xiang*<sub>3</sub>

As described in Section 2.3, *xiang* also has a possible-near-future reading that serves as a modal verb, cf. (18) (repeated in (64)). In that case, *xiang* does not introduce any attitude event and attitude holder. Following Hacquard (2006), I assume that the modal verb *xiang*<sub>3</sub> is anchored to a speech event or an embedding attitude event that is introduced higher as in (65).

- (64) (a) 今天阴沉沉的，似乎想下雨。(BCC)  
 Jintian yinchenchende, sihu xiang xiayu.  
 today overcast seemingly XIANG rain.  
 ‘It’s overcast today and seems to be going to rain.’
- (b) 头疼，想感冒了。(BCC)  
 Touteng, xiang ganmao le.  
 headache, XIANG get.a.cold PRT.  
 ‘I have a headache and may be getting a cold.’



The semantic representation of *xiang*<sub>3</sub> is given in (66). To keep it consistent with the analysis in Section 4.2, the internal argument of *xiang*<sub>3</sub> is also treated as a set of propositions P. The underlined content illustrates the selectional condition that P must be declarative, containing only one proposition p, and that p must describe an uncontrollable event. The function NEAR-FUT(e) relates the event e that *xiang*<sub>3</sub> is bound with to a set of propositions, in which the corresponding event e' happens minimally later than e.<sup>11</sup> Therefore, *xiang*<sub>3</sub> states that the intersection of P and NEAR-FUT(e) is not an empty set, i.e. there exists a world in which the event described by p happens in the near future of the embedding event that *xiang*<sub>3</sub> is anchored to.

- (66)  $[[xiang_3]]^{c,g,w} = \lambda P \lambda e. \exists! p: P = \{p\}. \exists e': [p(e') \wedge \text{uncontr}(e')].$   
 $\text{NEAR-FUT}(e) \cap P \neq \emptyset,$   
 where  $\text{NEAR-FUT}(e) = \{p \mid \exists e'. p(e') \wedge \tau(e') >_{\text{MIN}} \tau(e)\}$

The alternation between attitudinal and modal use is not an exception in Mandarin and in other languages. For example, 要(yao) in Mandarin can mean both 'should' and 'request' as in (67). In European languages, predicates like 'threaten' or 'promise' often have a commissive speech-act reading as well as a (semi-)modal reading, see the German example in (68) and Heine & Miyashita (2008) for further examples in other languages such as Portuguese, Slovak, Hungarian, etc. In (67b), the speech-act meaning of the predicate is lost, and the predicate functions as a temporal-aspectual marker, expressing that the proposition is future-oriented and that the reported threaten-situation contains the initial state of the occurrence of the proposition (Reis 2005).

- (67) (a) 同学们要认真听讲。  
 Tongxue men yao renzhen tingjiang.  
 student PL YAO careful listen  
 'Students **should** listen carefully.'
- (b) 老师要同学们认真听讲。  
 Laoshi yao tongxue-men<sub>i</sub> [<sub>i</sub> renzhen tingjiang].  
 teacher YAO student-PL careful listen  
 'The teacher **requests** the students to listen carefully.'
- (68) German:  
 (a) Karl<sub>i</sub> **droht** seinem Chef, [<sub>i</sub> ihn zu verklagen].  
 Karl threatens to.his boss him to sue.INF  
 'Karl threatens his boss with a lawsuit.'
- (b) Das Hochwasser **droht** die Altstadt zu überschwemmen.  
 the flood threatens the old.town to flood.INF  
 'The high water threatens flooding the town.'

(Heine & Miyashita 2008: 55, (4))

For a systematic account for such alternations, it could be assumed that these predicates have a complex lexical structure which contains an attitudinal component as well as a modal component, whereby the attitudinal component is optional. A detailed analysis is left to future research.

## 5. INFLUENCING FACTORS AND HIERARCHICAL CONSTRAINTS

As mentioned in Section 1, certain sentences are compatible with both readings ‘think’ and ‘desire’, cf. (69), see also (69). However, not all sentences allow for a free interpretation. For example, (70) only has a ‘desire’ reading, which will be explained in Section 5.1.

(69) 我想张三喜欢李四。

Wo xiang [Zhangsan xihuan Lisi].

1SG XIANG Zhangsan like Lisi.

‘I **think** Zhangsan likes Lisi.’ or ‘I **want** Zhangsan to like Lisi.’

(70) 我想张三去上海。

Wo xiang [Zhangsan qu Shanghai].

1SG XIANG Zhangsan go Shanghai

‘I **want** Zhangsan to go to Shanghai.’

Therefore, the aim of the section is to explore which factors can influence the interpretation and cause meaning shift or blocking. Interestingly, the meaning shift may happen more than once when new elements are added, suggesting that the factors have hierarchical influential strengths. Section 5.1 will present the possible influencing factors and the observations of meaning shifts. Section 5.2 will derive the corresponding constraints and their hierarchy according to the presented data. Moreover, the procedure of sentence interpretation will be illustrated.

### 5.1. *Influencing factors*

Comparing (69) and (70), the first impression would be that the lexical aspect of the predicate in the complement clause plays a role in the interpretation of *xiang*<sub>2</sub>. If the predicate is stative, such as *xihuan* (‘like’) in (69), the sentence is ambiguous. If the predicate is eventive, such as *qu* (‘go’) in (70), the sentence only allows for the ‘desire’ reading. However, (71) shows that it is not solely the predicate, but the complement clause as a whole that determines the validity of the ‘think’ interpretation.

(71) 我想张三经常去上海。

Wo xiang [Zhangsan **jingchang** qu Shanghai].

1SG XIANG Zhangsan often go Shanghai

‘I **thinks/want** Zhangsan goes/to go to Shanghai frequently.’

It is notable that the complement clauses that license the ‘think’ reading must also be able to serve as independent assertions alone. (72a) and (72c) are grammatical as root clauses. Correspondingly, (69) and (71) allows for the ‘think’ interpretation. In contrast, (70) does not permit the ‘think’ reading because (72b) is ‘incomplete’.

- (72) (a) 张三喜欢李四。  
 Zhangsan xihuan Lisi.  
 Zhangsan like Lisi.  
 ‘Zhangsan likes Lisi.’
- (b) \*张三去上海。  
 \*Zhangsan qu Shanghai.  
 Zhangsan go Shanghai  
 Intended ‘Zhangsan goes to Shanghai.’
- (c) 张三经常去上海。  
 Zhangsan jingchang qu Shanghai.  
 Zhangsan often go Shanghai  
 ‘Zhangsan goes to Shanghai frequently.’

The property that a sentence cannot stand alone as an independent assertion in Chinese is termed as *incompleteness* (Kong 1994, Huang 1994). Linguists have proposed diverse theoretical explanations for the conditions of being ‘complete’ from the syntactic, semantic, or pragmatic perspective.<sup>12</sup> I stay neutral with the theoretical accounts, while follow the proposal that incompleteness is only an effect occurring in root clauses and clauses with root clause properties (Sun 2023). Consequently, only the complement clause of ‘think’ must be complete, since ‘think’ selects a complement with root clause properties whereas ‘want’ does not (Hooper & Thompson 1973, Anand & Hacquard 2013).

As mentioned in Section 3, the interpretation of *xiang*<sub>2</sub> is also influenced by the size of the complement clause: vP-external elements such as aspect markers or modal verbs trigger the interpretation of ‘think’ (Grano & Lu 2021). Consequently, adding such elements in sentences like (70) will cause a meaning shift as in (73). This is in accordance with the cross-linguistic observation that complement clauses of assertive verbs like ‘think’ tend to have a more complex syntactic and semantic structure than those of desiderative verbs like ‘want’ (Givón 1980, Wurmbrand & Lohninger 2023).

- (73) (a) 我想张三已经去上海了。  
 Wo xiang [Zhangsan yijing qu Shanghai le].  
 1SG XIANG Zhangsan already go Shanghai PFV  
 ‘I **thinks** Zhangsan has already gone to Shanghai.’



- (b) 我想张三应该去上海。

Wo xiang [Zhangsan **yinggai** qu Shanghai].

1SG XIANG Zhangsan should go Shanghai

'I **think** Zhangsan should go to Shanghai.'

However, it has been pointed out as well that the degree modification of *xiang*<sub>2</sub> will permit the 'desire' reading to embed a larger complement, cf. (39). Moreover, if a degree adverb is added into sentences like (73), the interpretation will shift to 'desire' again as in (74).

- (74) (a) 我多想张三已经去上海了。

Wo **duo** xiang [Zhangsan yijing qu Shanghai **le**].

1SG much XIANG Zhangsan already go Shanghai PFV

'I have a strong **desire** for the case that Zhangsan has already gone to Shanghai.'

- (b) 我多想张三应该去上海(而不是去北京)。<sup>13</sup>

Wo **duo** xiang [Zhangsan **yinggai** qu Shanghai (er bushi qu

1SG much XIANG Zhangsan should go Shanghai but not go

Beijing)].

Beijing

'I have a strong **desire** for the case that Lisi should go to Shanghai (instead of going to Beijing).'

Degree adverbs force the 'desire' interpretation because the desiderative reading is based on a logic of comparison (Heim 1992, Villalta 2008, Anand & Hacquard 2013) as assumed in Section 4.2. This is the presupposition for degree modifiers to operate on eventuality descriptions (Baglini 2015). In contrast, 'think' lacks such a semantic component and is therefore incompatible with degree adverbs.

Another factor that can influence the interpretation is negation. The negation of *xiang*<sub>2</sub> tends to trigger the 'desire' reading as shown in (75). The reason might lie in the information structure of the 'think'/'desire' reading. In the case of 'think', the content of the complement clause is normally semantically prominent. Therefore, adding new information in the matrix clause such as negation is disfavored.

- (75) (a) 我想张三认识李四。

Wo xiang [Zhangsan renshi Lisi].

1SG XIANG Zhangsan know Lisi.

'I **think** Zhangsan knows Lisi.' or 'I **want** Zhangsan to know Lisi.'

- (b) 我不想张三认识李四。

Wo **bu** xiang [Zhangsan renshi Lisi].

1SG NEG1 XIANG Zhangsan know Lisi.

'I don't **want** Zhangsan to know Lisi.'

- (c) 我没想张三认识李四。
- <sup>14</sup>

Wo **mei** xiang [Zhangsan renshi Lisi].

1SG NEG2 XIANG Zhangsan know Lisi.

'I don't **want** Zhangsan to know Lisi.'

Negated *xiang<sub>desire</sub>* occurs rarely with complement clauses containing vP-external elements. However, this is not completely ruled out. The examples in (76) suggest that the effect of negation in the matrix clause is stronger than vP-external elements in the complement clause since the latter would trigger the 'think' interpretation.<sup>15</sup>

- (76) (a) 我不想一天都睡过去了。(BCC)

Wo **bu** xiang [yi-tian dou shui guoqu **le**].

1SG NEG1 XIANG one-day all sleep away PFV

'I don't **want** it to be the case that I have slept all day.'

- (b) 你阿爹不想任何人见过我。(BCC)

Ni adie **bu** xiang [renhe ren jian **guo** wo].

2SG father NEG1 XIANG any people see EXP 1SG

'Your father doesn't **want** it to be the case that someone has seen me.'

Meanwhile, the effect of negation can also be suspended by some others. For example, certain elements such as aspect markers will force the eventive interpretation of *xiang<sub>2</sub>*, see also Zheng (2023). In that case, the 'desire' reading is ruled out because it is always stative. This effect is still valid even when *xiang<sub>2</sub>* is negated, cf. (77) and (75c).

- (77) 我没想过张三认识李四。

Wo **mei** xiang-**guo** [Zhangsan renshi Lisi].

1SG NEG2 XIANG-EXP Zhangsan know Lisi.

'I haven't **thought** that Zhangsan knows Lisi.'

Another factor that has been mentioned in the previous sections is the type of the complement clause. While 'think' can select interrogative complement as in (78), 'desire' is only compatible with declarative clauses, see more details in Section 2.2 and 4.2.

- (78) 张三想: 谁是凶手?

Zhangsan xiang: shei shi xiongshou?

Zhangsan XIANG who be murderer

'Zhangsan thinks: Who is the murderer?'

So far, several factors from the matrix clause (MC) and the complement clause (CC) have been presented. Table 2 provides a summary of them. There exist also further factors such as prosody (see Section 2.1) and epistemic modals in

the complement clause (see footnote 13), but this paper will only focus on the following six due to space limitation.

<b>Factors from MC</b>	<b>Triggered reading</b>	<b>Examples</b>
degree modification	‘desire’	(74)
negation	‘desire’	(75), (76)
eventivity	‘think’	(77)
...		
<b>Factors from CC</b>	<b>Triggered reading</b>	<b>Examples</b>
incompleteness	‘desire’	(70)
vP-external elements	‘think’	(73)
interrogative CC	‘think’	(78)
...		

*Table 2*  
<Influencing factors in the reading of *xiang*<sub>2</sub>.>

### 5.2. Constraint hierarchy and interpretation procedure

As shown in Section 5.1, the influencing factors in Table 2 have different strengths. If several factors that would trigger distinct readings play a part in one sentence, there will be only one ‘winner’, cf. (74), (76) and (77). To present such interactions elegantly, I will utilize the modeling of *Optimality Theory* (OT) (Prince & Smolensky 1993). The illustration in this section is however only a preliminary sketch specific to Mandarin Chinese *xiang*<sub>2</sub>. Further investigation into a universal modeling of similar alternations across languages is left to future research.

In Optimality Theory, a grammar consists of conflicting constraints which are ordered hierarchically. Languages may differ in the ranking of the constraints. The OT modeling provides mappings from inputs to outputs. Each input has several potential outputs and the optimal one that best satisfies the constraints will be chosen. In OT semantics, the input is typically a well-formed syntactic structure, while the outputs are the possible interpretations (Hendriks & De Hoop 2001). Concerning the interpretation of *xiang*<sub>2</sub>, I derive the following constraints according the observations in Section 5.1:

- (79) (a) *Constraint 1: Degree Modification*, cf. (74):  
Interpret an attitude predicate as preferential (desiderative) if it is modified with degree adverbs.
- (b) *Constraint 2: Negation*, cf. (75), (76):  
Do not interpret a predicate as ‘think’ if it is negated.

- (c) *Constraint 3: Eventivity*, cf. (77):  
Do not interpret a predicate as desiderative if certain elements force an eventive interpretation of that predicate.
- (d) *Constraint 4: Incompleteness*, cf. (70):  
Do not interpret a predicate as assertive if its complement clause is incomplete as an independent assertion.
- (e) *Constraint 5: Small-CC*, cf. (73):  
Do not interpret a predicate as desiderative if the complement clause contains vP-external elements such as aspect markers, modal verbs, etc.
- (f) *Constraint 6: Anti-rogativity*, cf. (78):  
Do not interpret a predicate as desiderative if it embeds an interrogative complement.

In (79), most constraints relate to the universal properties of desiderative ('desire') and assertive ('think') predicates. For example, the constraints *Degree Modification*, *Eventivity*, *Anti-rogativity*, and *Small-CC* correspond to the cross-linguistic observations that desiderative predicates are gradable, stative, anti-rogative and tend to embed a relatively less complex clause type, see the detailed discussion in Section 5.1, see Heim (1992), Villalta (2008), Anand & Hacquard (2013), Uegaki & Sudo (2019), Wurmbrand & Lohninger (2023), a.o. for relevant literature. Therefore, these constraints are potentially applicable to predicates with relevant alternations across languages. Meanwhile, the constraints *Incompleteness* and *Negation* seem to relate to the language-specific properties of Mandarin Chinese. Further research is needed to see whether similar patterns can be found in other languages.

The examples in Section 5.1 have already suggested some hierarchical relations between the constraints. In (74), the *Degree Modification* constraint forces the 'desire' reading, whereas the *Small-CC* constraint would trigger the 'think' reading. The result is that the former wins and *xiang<sub>2</sub>* is interpreted as 'desire'. Therefore, it is reasonable to assume that the *Degree modification* constraint is higher ranked than the *Small-CC* constraint. Similarly, (76) indicates that the *Negation* constraint also overrides the *Small-CC* constraint. Moreover, (77) suggests that the *Eventivity* constraint is even higher than the *Negation* constraint. Accordingly, the following hierarchy can be derived:

- (80) (a) *Eventivity* >> *Negation* >> *Small-CC*
- (b) *Degree Modification* >> *Small-CC*

It is still necessary to examine the hierarchy between *Degree Modification* and *Eventivity/Negation*. Since both *Degree Modification* and *Negation* trigger the 'desire' reading, it is impossible to compare them directly. (81) shows the interaction between *Degree Modification* and *Eventivity*, whereby the sentence is ungrammatical. I assume that this is because the two constraints are equally strong

and both are inviolable. Consequently, violating both constraints leads to the result that both readings are ruled out, and the sentence is therefore uninterpretable.

(81) \*我多想过张三认识李四。

Wo **duo** xiang **guo** [Zhangsan renshi Lisi].

Wo much XIANG EXP Zhangsan know Lisi

Intended: ‘I have much thought that Zhangsan knows Lisi / I have much wanted Zhangsan to know Lisi.’

Similarly, the constraints *Anti-rogativity* and *Incompleteness* also cause a clash when interacting with *Degree Modification/Eventivity* as in (82) and (83). I therefore assume that the four constraints are all inviolable. Combining this conclusion with (80), the complete ranking of the six constraints is derived as in (84).

(82) \*张三多想李四爱王五吗。

Zhangsan **duo** xiang [Lisi ai Wangwu **ma**].

Zhangsan much XIANG Lisi love Wangwu q

Intended: ‘Zhangsan much think/wants whether Lisi loves Wangwu.’

(83) \*张三在想李四离开。

Zhangsan **zai** xiang [Lisi **likai**].

Zhangsan PROG XIANG Lisi leave.

Intended: ‘Zhangsan is thinking that Lisi leaves / Zhangsan is wanting Lisi to leave.’

(84) Ranking of the constraints:

*Eventivity/Degree Modification/Incompleteness/Anti-rogativity* >> *Negation* >> *Small-CC*

Figure 1 illustrates the procedure of the interpretation of a *xiang*<sub>2</sub>-sentence. First, the meaning of the sentence is computed compositionally as in (63), deriving an underspecified semantic form (SF). Then, the possible interpretations (‘think’ and ‘desire’) will be evaluated according to the relevant hierarchical constraints. This step has three possible results: i) the sentence does not violate any constraint and therefore allows for both readings; ii) the sentence is only compatible with one reading because the other reading violates one (or more) higher-ranked constraint; and iii) the sentence is interpreted as ungrammatical due to a clash of two (or more) highest-ranked constraints. Finally, the contextual information will test whether the reading(s) is appropriate for the context.

In the following, I will present the procedure of constraint checking via OT-modeling with concrete examples. (85) gives an example of the case i). The sentence does not violate any constraint in (79), which is shown in (86). In (86), the four inviolable constraints *Eventivity* (EVT), *Degree Modification* (DEG), *Incompleteness* (INC), and *Anti-rogativity* (ARG) are ranked equally high (separated with dotted lines). The constraints *Negation* (NEG) and *Small-CC*

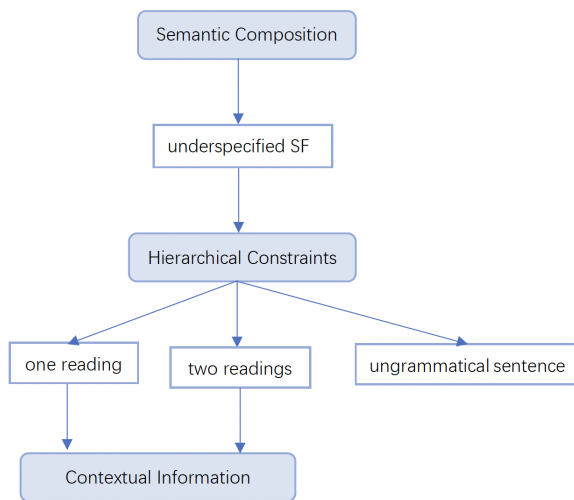


Figure 1  
 <Procedure of the interpretation of *xiang*<sub>2</sub>>

(SCC) are ranked low gradually (separated with solid lines). The input is the sentence with an underspecified SF, whereby  $F(e)$  allows for a variation between  $THK(e)$  and  $DES(e)$ . Output candidates are specified semantic forms with a ‘think’ or ‘desire’ interpretation. Since no constraints are violated in (86), both readings are potentially allowed as shown by the pointing fingers. To determine the final interpretation, we need further contextual information.

(85) 王五想张三认识李四。

Wangwu xiang [Zhangsan renshi Lisi].

Wangwu XIANG Zhangsan know Lisi.

SF:  $\exists e. \text{MENTAL-EVENT}(e) \wedge \text{EXPERIENCER}(w,e) \wedge F(e) \subseteq \{\exists e'. \text{KNOW}(z, l)(e')\}$ , where  $F(e) = \text{THK}(e) \vee \text{DES}(e)$

Input: (85)	EVT	DEG	INC	ARG	NEG	SCC
(86) ☞ ...F(e)=THK(e)						
☞ ...F(e)=DES(e)						

(87) presents an example of case ii). The interpretation ‘think’ would violate the *Degree Modification* constraint, and the interpretation ‘desire’ would violate the *Small-CC* constraint. Since violating the former is more crucial than violating the former (marked by \*!), the ‘desire’ reading is finally chosen as a valid interpretation.

(87) 王五多想张三已经到了。

Wangwu **duo** xiang [Zhangsan yijing dao **le**].

Wangwu much XIANG Zhangsan already arrive PFV.

SF:  $\exists e \exists d. \text{MENTAL-EVENT}(e) \wedge \text{EXPERIENCER}(w, e) \wedge d > !! \text{Min}_5(e)^{16} \wedge F(e) \subseteq \{\exists e'. \text{ARRIVE}(z)(e') \wedge \tau(e') < \tau(e)\}$ , where  $F(e) = \text{THK}(e) \vee \text{DES}(e)$

Input: (87)	EVT	DEG	INC	ARG	NEG	SCC
(88) ...F(e)=THK(e)		*!				
☞ ...F(e)=DES(e)						*

This example also shows why it is better to specify the reading (the choice of F(e)) after the semantic composition of the whole sentence. If we made the decision too early, e.g. after the introduction of the complement clause, we would choose the ‘think’ interpretation first due to the *Small-CC* constraint. Then, the interpretation has to shift to ‘desire’ after the introduction of the degree adverb because the *Degree Modification* constraint is stronger than *Small-CC*. This shift would cause unnecessary interpretive efforts and can be avoided by a later specification of F(e). Correspondingly, the OT implementation adopted in this paper is a parallel one, i.e. all ultimate possible outputs are contemplated at once (Prince & Smolensky 1993).

(89) gives an example of case iii). The ‘think’ reading is blocked by the *Degree Modification* constraint, and the ‘desire’ reading is ruled out by the *Anti-rogativity* constraint. The result is an ungrammatical sentence with no acceptable output, which is described as *ineffability* in OT (Pesetsky 1997). The solution is to allow the ‘null parse’ (Prince & Smolensky 1993). In the case of (89), this means that the sentence is interpreted as ungrammatical. The corresponding constraint is given in (89). This constraint is ranked immediately below the highest constraints. Consequently, if all possible readings are ruled out because of the violation of the highest-ranked constraints, the null-interpretation will be the optimal output as shown in (91).

(89) \*王五多想张三来不来。

Wangwu **duo** xiang [Zhangsan **lai-bu-lai**].

Wangwu much XIANG Zhangsan come-not-come.

SF:  $\exists e \exists d. \text{MENTAL-EVENT}(e) \wedge \text{EXPERIENCER}(w, e) \wedge d > !! \text{Min}_5(e) \wedge F(e) \subseteq \{\exists e'. \text{COME}(z)(e'), \nexists e'. \text{COME}(z)(e')\}$ , where  $F(e) = \text{THK}(e) \vee \text{DES}(e)$

(90) *Ungrammaticality* (UNG): Do not interpret any sentence as ungrammatical.

Input: (90)	EVT	DEG	INC	ARG	UNG	NEG	SCC
(91) ...F(e)=THK(e)		*!					
...F(e)=DES(e)				*!			
☞ UNG					*		

## 6. CONCLUSION

This paper focuses on the multiple meanings of the Mandarin Chinese predicate *xiang* and offers a comprehensive account for its different uses. The meanings are classified into three lexical entries: i) *Xiang*<sub>1</sub>, which denotes a general mental eventuality and is compatible with various specific attitudes. In that case, the thematic roles *experiencer* and *theme* are introduced via external heads, whereby the latter is optional. ii) *Xiang*<sub>2</sub>, whose lexical structure involves a functional modal component that is added to the root *xiang*<sub>1</sub>. The modal element selects sets of propositions and allows for a ‘think’-‘desire’ variation. iii) *Xiang*<sub>3</sub>, which only denotes a modal function and expresses the possibility of an uncontrollable event happening in the near future.

A greater attention was paid to the influencing factors in the ‘think’-‘desire’ alternation of *xiang*<sub>2</sub>. It has been proposed that the interpretation of *xiang*<sub>2</sub> is determined by a number of hierarchical constraints. The constraints should be checked after the sentence composition, and the reading(s) that violates the least important constraint(s) will win and then be tested with contextual information. This will lead to three results: i) Sentences that do not violate any constraint will allow for both readings; ii) Sentences that violate two (or more) contradicting inviolable constraints will be ungrammatical; iii) Other sentences will have only one optimal reading.

The picture of *xiang*<sub>2</sub> shows that the procedure of sentence interpretation with an underspecified clause-embedding predicate can be complicated. Not only elements in the complement clause, but also those in the matrix clause can influence the interpretation. Each reading’s semantic compatibility with other sentence members, the preferred syntactic form of the complement clause, the prosody of the sentence, as well as the contextual information should all be considered. Moreover, these factors may have different strengths and their interactions may lead to different results.



## FOOTNOTES

<sup>1</sup>The glossing in this paper follows the Leipzig glossing rules. Cited examples that violate the Leipzig glossing rules will be revised. For glosses that the Leipzig glossing rules do not cover, the original abbreviations from the literature will be adopted.

<sup>2</sup>The Chinese corpus examples in this paper come from the *BLCU Chinese Corpus*: <https://bcc.blcu.edu.cn>, accessed 04.03.2025.

<sup>3</sup>The experiential marker 过 (*guo*) expresses that an event has happened at least once before. For the difference between *guo* and other aspect markers such as perfective *le* see Yeh (1996), Pan & Lee (2004), Lin (2006), a.o.

<sup>4</sup>Obviously, (10c) and (11) have different sentence structures: in (10c), the question marker *ma* belongs to the complement clause, whereas *ma* in (11) is located in the matrix clause. The two sentences are also distinct in the intonation: (10c) has its accent on the complement clause (e.g. on the copula verb *shi*), whereas the accent of (11) lies on the matrix clause (e.g. on the predicate *xiang*).

<sup>5</sup>Besides the ‘think of/about’ meaning, *xiang* can also combine with certain relational nouns, meaning ‘miss’ as in (92).

(i) 我想妈妈/家。

Wo xiang mama/jia.

1SG XIANG mother/home

‘I miss my mom/my home.’

<sup>6</sup>要 (*yao*) also has multiple meanings such as ‘want’, ‘demand’, ‘should’, ‘will’, etc. For further discussion about *yao* see Ren (2008), Wu & Kuo (2010), Li & Hsieh (2016), Huang et al. (2020), a.o.

<sup>7</sup>Actually the intransitive *think* in English also expresses a general attitudinal meaning. (24) can also be translated as ‘He and I think differently: I want to leave, while he thinks I shouldn’t’. Obviously, the sentence does not suggest that *think* and *want* belong to one lexical item.

<sup>8</sup>One may argue that (34) is weird because coordinating two clauses with different sizes, e.g. vP and CP, is generally ungrammatical in Mandarin Chinese. Although such constructions are indeed rare in the corpus, it was attested by several native speakers that (92a) is much better than (92b). This difference suggests that it is not the syntactic structure of the coordination but the semantics of the embedding predicate that determines whether such constructions are allowed.

(ii) (a) 张三提醒李四注意安全并且他已经被犯罪团伙盯上了。

Zhangsan tixing Lisi [zhuyi anquan] bingqie [ta yijing bei  
Zhangsan remind Lisi pay.attention.to safety and 3SG already PASS

fanzui-tuanhuo ding-shang le].

crime-gang stare-up PFV

‘Zhangsan reminds Lisi to pay attention to safety and that he has been targeted by a criminal gang.’

(b) \*张三想李四注意安全并且他已经被犯罪团伙盯上了。

Zhangsan xiang [Lisi zhuyi anquan] bingqie [ta yijing bei  
Zhangsan XIANG Lisi pay.attention.to safety and 3SG already PASS

fanzui-tuanhuo ding-shang le].

crime-gang stare-up PFV

Intended: ‘Zhangsan wants Lisi to pay attention to safety and thinks that he has been targeted by a criminal gang.’

<sup>9</sup>The following abbreviations are adopted from Visser (2022): IAM: iamitive (‘already’), VOL: volitional.

<sup>10</sup>The following abbreviations are adopted from Jacques (2021): AOR: aorist, AUTO: autive, EAST: eastwards, IFR: inferential, LNK: linker.

<sup>11</sup>The minimal interval between the two events depends on the context. In a context like (64a), the event of raining may happen after several minutes. In (64b), getting a cold may be affirmed after several hours.

<sup>12</sup>For example, syntactic approaches such as the zero-marked verb must project high via functional

heads such as tense or focus (Tang & Lee 2000, Tsai 2008); semantic approaches such as the zero-marked verb cannot denote a proposition and needs further covert operators to introduce tense/aspect (Klein et al. 2000, Sun 2014); pragmatic approaches such as the sentence is not informative enough or violates the quantity maxim of Grice (1967) (Kong 1994, Smith 1994, Sun 2022).

<sup>13</sup>(74b) might be odd for some native speakers, which I attribute to pragmatic reasons instead of the complement size. It is less common to imagine a context in which the attitude holder only wants it to be the case that someone should do something, rather than wanting the person to do so directly. Such a situation becomes more acceptable if a contrast is added as in (74b). If the modal verb has an epistemic interpretation, sentences like ‘I have a strong desire for the case that Zhangsan should (epistemically) be in Shanghai’ are even odder. I also assume that this is not due to the syntactic structure of the complement clause, but due to the semantic incompatibility. In other words, desire reports are semantically incompatible with epistemic expressions in general, see Anand & Hacquard (2013).

<sup>14</sup>The difference between the negation forms *bu* and *mei* is that *bu* cannot occur with aspect markers, whereas *mei* usually combines with progressive/experiential/durative aspect, serves as a negative perfective marker, or denies the existence of certain stage-level states (Wang 1965, Xiang 2013). Moreover, Xiang (2013) points out that *bu* triggers a neg-raising interpretation of *xiang<sub>desire</sub>*, whereas *mei* does not.

<sup>15</sup>*Bu xiang* can also mean ‘haven’t thought’ as in (92). In that case, I assume that there is a covert aspect marker that forces the ‘think’ reading.

(iii) 我一直觉得要认识她真是难上加难，不想今天她却已成了驯服的野兽。(BCC)

Wo yizhi juede yao renshi ta zhenshi nanshangjianan, **bu xiang** [jintian ta que  
 1SG always feel want know 3SG really very.hard NEG1 XIANG today 3SG but  
 yijing cheng le xunfu de yeshou].  
 already become PFV tame ATR beast

‘I always thought it would be very hard to get to know her, but **haven’t thought** that today she has become a tamed beast.’

<sup>16</sup>I assume that ‘much’ states that the degree of the modified event is much greater than its minimum-standard (Kennedy & McNally 2005, Baglini 2015).

## ABBREVIATIONS IN GLOSSES

1/2/3	first/second/third person
ADV	adverbial
AOR	aurist
AUTO	autive
ATR	attributive
ATT	attitude
CLF	classifier
COMP	complementizer
CONT	continuous
EAST	eastwards
EXCL	exclusive
EXP	experiential
FUT	future
GEN	genitive
IAM	iamitive ('already')
IFR	inferential
INF	infinitive
IPFV	imperfective
LNK	linker
NEG	negation
OBJ	object
PASS	passive
PFV	perfective
PL	plural
POSS	possessive
PROG	progressive
PRT	particle
PST	past
Q	question
SBJ	subject
SG	singular
VOL	volitional

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