

Aspect and Modality of *yinggai*

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The paper investigates the semantic constraints on the interpretation of the modal auxiliary *yinggai* in Chinese. It shows that both situation aspect and aspect markers can restrict its interpretation, but temporal adverbials cannot. It argues that the aspect markers can restrict the interpretation of *yinggai* by affecting the addressee's presupposition about the settledness of a relevant situation; temporal adverbials do not necessarily alter the interpretation of *yinggai* because *yinggai* can either scope over or fall within the scope of a temporal adverbial it appears with, depending on the situation aspect of the modal predicate.

1. Introduction

The Chinese modal auxiliary verb *yinggai* can express epistemic possibility and deontic necessity. As an epistemic modal, *yinggai* means that the speaker is almost certain about the occurrence of a situation. The epistemic judgment the speaker arrives at is usually based on relatively objective circumstance or situation which may or may not be explicitly stated (Tsang 1981, Li 2004, and others). For example,

(1) a. Zhe huir ta *yinggai* zai jia ne.
now he should at home NE.
He should be at home now.

b. Taiyang xia shan le, ta *yinggai* dao-LE jia le. (adapted from Li 2004: 145)
sun fall hill LE he should get PERF home LE
The sun has set. He should have got home.

In (1a), the situation, based on which the assessment is made, is not stated but can be assumed as “as far as I know, he is often home at this time”. In (1b), this situation is explicitly expressed that “the sun has set” and it should be case that he got home.

As a deontic modal, *yinggai* expresses necessity arising from certain duty, custom, a body of law, or a set of moral principles, which do not have to be explicitly stated either. For instance,

- (2) a. Ni *yinggai* duo chuan yi jian yifu, waimian kongpa hen liang. (Li 2004: 173)
 you should more wear a piece clothes outside I'm afraid very cool
 You should put on more clothes. It's very cold outside, I'm afraid.
- b. Ta *yinggai* wei zhe jian shi fuze.
 he should for this CL matter responsible
 He should be responsible for this matter.

In (2a), “putting on more clothes” is necessary because it is cold outside; in (2b), the reason for why “he should be responsible” is not stated but can be inferred as “the facts or the situation suggest the necessity”.

While *yinggai* is not ambiguous in (1) and (2), regardless of whether or not the contextual information is provided, it is ambiguous in (3) and (4), as the translations show.

- (3) Zhe ge wenti hen rongyi, xueshengmen *yinggai* hui huida.
 this CL question very easy students should know how to answer
- a. This question is very easy, (so) it is highly probable that the students can answer it.
 b. This question is very easy, (so) the students are supposed to be able to answer it.
- (4) Wo shuo de hua, ni *yinggai* dong.
 I say DE word you should understand
- a. It is highly probably that you understand what I said.
 b. You are supposed to understand what I said.

The different modal meanings expressed by *yinggai* in (1)-(4) raise the question as to what factors other than context, if any, impact the interpretation of the modal. In this paper, I show that aspectual features of the situation within the scope of *yinggai* contribute to its interpretation. I also show that the perfective markers *-le* and *-guo* are always associated with the epistemic *yinggai*, because they can lead to the presupposition in the addressee that the situation within the scope of *yinggai* is settled.

The rest of the paper is organized as follows. Section 2 reviews previous linguistic analyses with regard to the interaction of temporality and modality; section 3 discusses the role of aspect in the interpretation of *yinggai*; section 4 concludes.

2. Temporality and modality

Linguistic analyses of the interaction of temporality and modality show that the interpretation of modal auxiliaries is “uniquely determined” or “at least severely restricted” by relevant temporal configurations (Laca 2008). Condoravdi (2001, 2003), for example, argues that a modal is epistemic when the situation expressed by the modal complement is in the past or present relative to the modal time; it may or may not be

epistemic when the situation is in the future of the modal time. Werner (2006) approaches the issue from a different perspective. He argues that the temporal location of the situation scoped within (English) epistemic modals may be past, present, or future, whereas that of (English) non-epistemic modals (e.g., deontic modals) is future. The relationship between the modality of a modal auxiliary and the temporality of the relevant situation is represented by (5a) and (5b) and exemplified by (6a) and (6b).

- (5) a. Epistemic modals ← Past, Present
 b. Deontic modals → Future

- (6) a. He may have won the game. (Epistemic)
 b. He may win the game. (Epistemic or Deontic)

In (6a), the modal complement with the perfect *have* is understood to express a past event, and so *may* is epistemic. In (6b), the event of winning the game is interpreted to be in the future, hence *may* can be epistemic or deontic.

Why is a modal epistemic when the temporality of the situation it scopes over is non-future? This, according to Condoravdi (2001), is because whether a modal is epistemic depends on whether a relevant issue is presupposed to be settled or not; settledness is always presupposed when the relevant issue is located in the past or present with respect to the modal time. For instance,

- (7) a. He might have the flu (now).
 b. He might have won the game (yesterday).

In (7a), the state of his having the flu is located in the present time. The speaker knows the issue of whether he has the flu is settled, but he/she does not know in which way it is settled. Similarly, in (7b) whether he won the game yesterday is already settled, but the speaker does not know how it is settled. In both sentences, the settledness of the relevant non-future situation leads to the epistemic interpretation of *might*.

The relationship between temporality and modality shown in (5) seems to correctly predict the reading of *yinggai* in (8) and (9), but not that in (10) and (11).

- (8) Ta *yinggai* shi *zuotian* lai de. (Epistemic)
 he should SHI yesterday come DE
 It should be yesterday that he arrived.

- (9) Ni *yihou* *yinggai* shi ge hao haoshi. (Epistemic/Deontic)
 you in the future should be CL good teacher
 You should be a good teacher in the future.

(10) *Zuotian* ta *yinggai* qu xuexiao yi tang. (Deontic)
 Yesterday he should go school one CL
 He should have gone to school yesterday.

(11) Ta *yinggai hui* lai. (Epistemic)
 He should will come
 He should come.

In (8), the event of his coming happened yesterday, so *yinggai* is epistemic. In (9) his being a good teacher is located in the future by the adverbial *yihou* ‘in the future’, so both epistemic reading and deontic reading are possible with *yinggai*, although the epistemic reading is preferred when out of context. (10) contains a past time adverbial *zuotian* ‘yesterday’, but contrary to our expectation, *yinggai* expresses deontic (and counterfactual) modality. In (11), the event of his coming is located in the future by the future modal *hui* ‘will’, and yet *yinggai* only has the epistemic reading rather than both. (10) and (11) suggest that temporality is not the sole factor that decides the interpretation of *yinggai* in a sentence. In next section, I will show that the aspectual information conveyed by the complement of *yinggai* contributes to its interpretation as well.

3. Aspect and the modality of *yinggai*

3.1. Situation types and the modality of *yinggai*

We have seen in (8) and (9) that the temporal location of the situation in the scope of *yinggai* restricts its interpretation. We have also seen that temporality of the relevant situation alone is not sufficient to explain the interpretation of *yinggai* in (10) and (11). In this section, I will show that the interpretation of *yinggai* varies with whether the relevant situation is stative or eventive.

Yinggai can be either epistemic or deontic when it is before a verb phrase expressing a stative situation, even though the epistemic one is often preferred in out of blue context. For instance, *yinggai* in (12) and (13) takes the stative predicates *zhidao* ‘to know’ and *hen mei* ‘very beautiful’ respectively and expresses epistemic modality and deontic modality in both sentences.

(12) ta *yinggai* zhidao zenme chuli zhe jian shi.
 He should know how to handle this CL matter
 He should know how to handle this matter.

(13) Nar de chuntian *yinggai* hen mei.
 There DE spring should very beautiful
 Spring should be very beautiful there.

Yinggai only has a deontic reading when it is before a verb phrase expressing an eventive

situation except in a few cases to be discussed in (20). For instance, in (14) and (15) below, *yinggai* taking an eventive predicate is deontic.

(14) Ta *yinggai* gei mama da ge dianhua.

He should to mum make CL call

He should call his mum.

(15) Wo *yinggai* zao dianr likai.

I should earlier leave.

I should leave earlier.

Adding a temporal adverbial to sentences like (12)-(15) does not alter the reading of *yinggai*: it is still ambiguous with stative predicates, but unambiguous with eventive predicates.

(16) a. *dangshi* ta *yinggai* zhidao zenme chuli zhe jian shi.

At that time he should know how to handle this CL matter

a. He probably knew how to handle this matter at that time.

b. He is supposed to know how to handle this matter at that time.

b. *xianzai* ta *yinggai* zhidao zenme chuli zhe jian shi.

now he should know how to handle this CL matter

a. He probably knows how to handle this matter now.

b. He is supposed to know how to handle this matter now.

c. *yihou* ta *yinggai* zhidao zenme chuli zhe jian shi.

In the future he should know how to handle this CL matter

a. He probably will know how to handle this matter in the future.

b. He is supposed to know how to handle this matter in the future.

(16a) is modified by the past time phrase *dangshi* ‘at that time’; (16b) is modified by the present time phrase *xianzai* ‘now’; and (16c) by the future time phrase *yihou* ‘in the future’. *Yinggai* in all three sentences takes a stative predicate and expresses the speaker’s epistemic judgment or the deontic necessity of a situation, as the translations illustrate. The reading of *yinggai* with eventive predicates cannot be changed by temporal adverbials either. For example, *yinggai* in (17a)-(17c) below is deontic regardless of the time adverbials it appears with.

(17) a. *Zuotian* ta *yinggai* gei mama da ge dianhua.

Yesterday he should to Mom make CL call

He should have called his Mom yesterday.

b. *Xianzai* ta *yinggai* gei mama da ge dianhua.

Now he should to mum make CL call

He should call his mum now.

c. *Mingtian* ta *yinggai* gei mama da ge dianhua.

Tomorrow he should to mum make CL call

He should call his mum tomorrow.

However, adding an aspect marker or a future modal auxiliary to the modal predicate can change the interpretation of *yinggai* in (12)-(15).

(18) a. ta *yinggai* zhidao *-le* zenme chuli zhe jian shi.

He should know PERF how to handle this CL matter

He should know how to handle this matter now.

b. Nar de chuntian *yinggai hui* hen mei.

There DE spring should will very beautiful

Spring should be very beautiful there.

(19) a. ta *yinggai* gei mama da *-guo/-le* dianhua le.

He should to mum make PERF call LE

He should have called his mum.

b. ta *yinggai zai* gei mama da (*-zhe*) dianhua.

He should PROG to mum make IMPERF call

He should be calling his mum (now).

c. ta *yinggai hui* gei mama da dianhua.

He should will to mum make call

He should call his mum.

In (18a), the perfective marker *-le* suffixing to the stative verb *zhidao* ‘to know’ indicates a change of state. *Yinggai* in (18a) is epistemic, expressing the speaker’s conjecture that the change of state from “not knowing” to “knowing” took place in the past. In (18b), the future modal *hui* appears before the stative predicate *hen mei* ‘very beautiful’, making *yinggai* epistemic only. In (19a), the eventive verb phrase after *yinggai* contains the perfective marker *-guo/-le*. *Yinggai* in this sentence is epistemic not deontic, expressing the speaker’s judgment about the possibility of the occurrence of a past event. In (19b), the verb phrase after *yinggai* takes the progressive marker *zai*, which presents the relevant situation as ongoing. Since the aspectual feature of an ongoing event resembles a state,

both epistemic reading and deontic reading is possible with (19b), with epistemic reading being primary. In (19c), *yinggai* is followed by the future modal auxiliary *hui* ‘will’, only expressing epistemic modality.

It should be pointed out, however, that *yinggai* scoping over a zero-marked eventive predicate expressing a future event may be epistemic when occurring in an epistemic environment that may or may not be overtly marked. For example,

(20) a. ta *yinggai* qu *ba*.

He should go BA.

He probably will go.

b. ta *keneng* bu hui huilia le, *yinggai* zhijie zai Shanghai zuo biye sheji *le*.

She may not will return LE should directly in Shanghai do graduation design LE

She may not come back. She should do her graduation project in Shanghai right away.

c. eluosi *guji* kuai de hua, *yinggai* zai liang nian zhinei rushi.

Russia estimate if soon should two year within join WTO

It is estimated that Russia should join WTO in two years, if not sooner.

d. *An jihua*, ta *yinggai* mingtian dao.

According to schedule, he should tomorrow arrive

According to the schedule, he should arrive tomorrow.

In (20a)-(20d), *yinggai* takes an eventive predicate, which expresses a future event, and obtains an epistemic reading. At the same time, *yinggai* in all four sentences of (20) appears in an epistemic context, which is either overtly marked with the sentence final marker *ba* (20a) or sentence final *le* (20b), both of which can express the uncertainty on the part of the speaker toward a state of affair (Lü 1980, Zhu 1982, Tsang 1981, among others), or with the epistemic modal *keneng* ‘may’ (20b) or the epistemic verb *guji* ‘to estimate’ (20c). The epistemic context in (20d), which expresses a scheduled future event, is not marked by any explicit epistemic expressions. The availability of the epistemic reading of *yinggai* in (20a)-(20d) may due to that the future modal *hui* is assumed in the interpretation, although its presence is not required in an epistemic context. Since *hui* does not actually appear in the modal predicate, the deontic reading is not precluded from the above sentences. For example, (20a) with the particle *ba* can either express the speaker’s uncertainty about whether the event of his going will happen in the future, or about whether the event of his going is necessary. *Yinggai* is epistemic on the first reading but deontic on the second reading.

So far, we have seen that the modality of *yinggai* varies with the types of situation it scopes over. It is either epistemic or deontic with a stative predicate, with the former

being primary; it is deontic with an eventive predicate. The default interpretation can be overridden by the presence of an aspect marker or a future modal auxiliary in the modal predicate, but not by a temporal adverbial. I will discuss why this is the case in the following sections.

3.2 Temporal adverbials and the modality of *yinggai*

As shown in (16) and (17) above, time phrases do not change the meaning of *yinggai*. In particular, past and present time phrases do not cancel the deontic reading of *yinggai* with stative predicates, as in (16a) and (16b); they do not add epistemic reading to *yinggai* with eventive predicates either, as in (17a) and (17b). At first sight, the facts seem to contradict the relationship between temporality and modality shown in (5) and copied below, but a closer look reveals that they are, in fact, in accordance with them.

- (5) a. Epistemic modals ← Past, Present (i.e., Non-future)
b. Deontic modals → Future

The reason why past and present adverbials cannot change the interpretation of *yinggai* is because the temporal adverbials appearing with *yinggai* can either modify the situation within the scope of *yinggai* or the modal time of *yinggai* itself, depending on the modality of *yinggai*, which is constrained by the situation types expressed by the modal predicates. The temporal adverbial restricts the time of the relevant situation when *yinggai* is epistemic; it restricts the time of *yinggai* when it is deontic. In other words, temporal adverbials scope under epistemic *yinggai*, but scope over deontic *yinggai*. Since *yinggai* can be epistemic or deontic with stative predicates, the past adverbial added to (16a) can either locate the state in the past, leading to the epistemic reading, or locate the modal time of *yinggai* in the past, leaving the deontic reading unchanged. The same is true of the past adverbial in (17a) where *yinggai* takes an eventive predicate. *Yinggai* with an eventive predicate is deontic, so the past time adverbial modifies *yinggai* rather than the eventive predicate. As a result, the relevant event is not in the past but in the future of the deontic *yinggai* that situates in the past with the past adverbial. The same account applies to the present and future adverbials in (16b-c) and (17b-c).

3.3. Perfective markers and settledness

We saw from (16)-(19) that a temporal adverbial is insufficient to change the reading of *yinggai*. A perfective marker or a future modal auxiliary, e.g., *hui* ‘will’, is needed to remove the deontic reading of *yinggai* with stative predicates or make *yinggai* with eventive predicate epistemic. While the imperfective markers *zai* and *zhe* in (19b) allow both readings of *yinggai* by rendering the relevant event into a state-like situation, the perfective markers *-le* and *-guo* in (18a) and (19a) and the future modal *hui* in (18b) and (19c) completely erase the deontic reading. In this study, I will limit the discussion to the function of *-le* and *-guo* in the interpretation of *yinggai*. I show that the perfective

markers in the modal predicate can lead to the presupposition that the situation expressed by the predicate is settled, and so the epistemic reading of *yinggai*.

As Condoravdi (2001) pointed out, whether a modal is epistemic depends on whether the relevant issue is presupposed to be settled or not, and a non-future situation is always presupposed to be settled. Given that *yinggai* can only be epistemic when the eventive predicate contains a perfective marker, we may say that an event marked by a perfective marker is always presupposed to be settled. Such a presupposition is reached via the “relative past” meaning of the perfective markers. Before we move to the function of *-le* and *-guo*, let us briefly review Condoravdi’s (2001) analysis of the English perfect *have* occurring after a modal, since it behaves very much like *-le* and *-guo*.

(21) He may/should *have* won *tomorrow/now/yesterday.

In (21), the event of his winning is in the past when the modal is followed by the perfect *have*. Condoravdi (2001) argues that the backward shifting reading in (21) is ascribed to the semantics of the perfect *have*, which can shift the local time of the situation within its scope to a time interval preceding the interval denoted by the modals, which is [*now*, $_$] by default.

Chinese *-le* and *-guo* can express “past” relative to a reference time (Ross 1994, Lin 2006). Following Condoravdi’s analysis, we can say that the perfective markers in the modal complement of (18a) and (19a), just like English perfect *have*, can locate the situation (or the change of situation) expressed by the complement in a time interval before the modal time “now”. As a result, the relevant situation, which is located in the past by *-le* / *-guo*, is presupposed to be settled, so *yinggai* is epistemic. However, this account needs modification to handle *yinggai* in (22), in which it is epistemic even though the situation marked by *-le* is in the future of the modal time “now”.

(22) *Mingtian zhe ge shihou*, ta *yinggai* dao *-le*.
 Tomorrow at this time he should arrive PERF
 He should have arrived at this time tomorrow.

In (22), the event marked by *-le* is after the speech time and before the future time “this time tomorrow”, yet *yinggai* only has the epistemic reading. This contradicts the claim that a modal can be epistemic or deontic when the relevant situation is in the future. We can save the account by claiming that a situation marked by *-le* or *-guo* is presupposed to be settled as long as the situation is located in the past relative to a reference time, which does not have to be the speech time. That a situation marked by *-le* or *-guo* is presupposed to be settled is also supported by the fact that *-le* and *-guo* do not appear with non-epistemic modals, as shown in (23).

(23) a. Ni dei qu (*-*le*/*-*guo*) tang Beijing.
 You have to go (PERF) CL Beijing.
 You have to make a trip to Beijing.

b. wo xiang kan (*-*le*/*-*guo*) dianying.
 I want to watch (PERF) movie
 I want to watch movie.

(23a) contains the deontic modal *dei* ‘have to’; (23b) contains the dynamic modal *xiang* ‘want to’. Both sentences are ill-formed when a perfective marker is suffixed to the verb after *dei* and *xiang*. This is because the non-epistemic modals require the situation within their scope to be unsettled, whereas *-le* and *-guo* make the same situation settled. However, (24) below seems against the proposal, where *yinggai* with stative predicates marked with the perfective *-le* can be deontic.

(24) a. tamen zhijian *yinggai* you *-le* yixie liaojie.
 They between should have PERF some understanding
 a. They probably got to know each other (already).
 b. They are supposed to know about each other (now).

b. Xiangshan de hong ye *yinggai* hong *-le*.
 Xiangshan DE red leave should red PERF
 a. Red leaves in Xiangshan probably turned red (already).
 b. Red leaves in Xiangshan are supposed to be red (now).

In (24a) and (24b), the stative verbs after *yinggai* take the perfective marker *-le*, and therefore obtain an inchoative reading, indicating a change of state. Given the above analysis of *-le*, we would expect that *yinggai* in both sentences cannot be deontic. However, this is not the case, as the translations illustrate. (24a) and (24b) are, in fact, not counterexamples. Take (24b) for example. *-le* indicates that the change of state from “not red” to “red” is in the past and is settled, thus the epistemic reading (a). At the same time, the resulting state of the change is located at the present time, i.e., “leaves are red now”. Focusing on the current state of leaves’ being red rather than the state change itself makes the deontic reading (b) possible.

One remaining question is why the imperfective markers *zai* and *-zhe*, in contrast with the perfective markers *-le* and *-guo*, cannot mark the settledness of a situation, even though they can locate a situation in a time interval overlapping a reference time. For example, in (19b) the complement of *yinggai* contains *zai* and *-zhe*, which can locate the situation expressed by the modal complement in the present time. Therefore, the relevant situation should also be presupposed to be settled, resulting in the epistemic reading only. However, *yinggai* can be epistemic or deontic in the sentence. This shows that

imperfective markers and perfective markers behave differently in the modal environment. I will leave this topic to future research.

4. Conclusion

The modality of *yinggai* is largely restricted by the aspectual features of the situation within its scope. *yinggai* is epistemic or deontic with stative situations; it is deontic with eventive situations. The deontic interpretation of *yinggai* can be canceled by the perfective markers *-le* and *-guo*, but not by temporal adverbials. This is because the perfective markers can lead to the presupposition in the addressee that the situation expressed by the modal predicate is settled by locating the situation in the past of a reference point, which is not necessarily the modal time, removing the deontic reading. In contrast, a time adverbial does not necessarily modify the situation within the scope of *yinggai*. It either modifies the situation or the modal time, depending on the situation type of the relevant situation.

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