ON THE SEMANTICS OF MODAL PARTICLE *DE* IN MANDARIN CHINESE

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I argue that the Mandarin modal particle *de* has a temporal presupposition in its ability and epistemic semantics. Hence the two uses are incompatible with past-denoting time adverbials. Elements like the contrastive focus marker *hai* 'still' have a temporal shifting property and can license past-denoting adverbials in modal *de*-sentences.

1. Introduction

1.1 Modal particle *de*

In Mandarin Chinese the particle *de* can be interpreted as a modal when it appears between a verb and a result or phase complement (e.g. *wan* 'finished', *hao* 'well'). Independent empirical evidence suggests that this modal use is not a by-product of the resultative or depictive uses (see Wu 2004). When used as a modal, it allows three readings: ability (1-i), epistemic (1-ii) and circumstantial (2).

(1) zhangsan mingtian zuo de wan naxie zuoye.

    John tomorrow do DE finish those homework

    i. 'John is able to finish those homework assignments tomorrow.' (ability)

    ii. 'Based on my (the speaker's) knowledge, John will finish those homework assignments tomorrow.' (epistemic)

(2) zhe zhong shu zhiyou zai zher cai zhang de jianzhuang.

    this type tree only at here then grow DE sturdy

    'This type of tree can grow sturdy only in this place.' (circumstantial)

The modal use of *de* raises two interesting questions. One has to do with the fact that, in its ability and epistemic uses, it does not allow past-denoting time adverbials (3), whereas the circumstantial use is at least marginally compatible with such adverbials

((4), native judgment shows variation with this example.).

(3) zhangsan (*zuotian) zuo de wan naxie zuoye.   (*zuotian*: yesterday)

(4) (?)dangshi de   tianqi, naxie chaihuo dian de   zhao.

   then MOD   weather, those wood   burn DE on fire

'The weather being what is was then, that wood could (have) burn(ed).'

The other interesting aspect lies in the fact the grammaticality of (3) improves, for example, with the introduction of the contrastive focus marker *hai* 'still' (5):

(5) zhangsan zuotian hai zuo de wan zuoye, (how come he cannot finish today?)

Mandarin Chinese has another modal particle *neng*, which shares the ability, epistemic and circumstantial uses with *de* [1]. However, it is compatible with past-denoting adverbials in all three modal uses, with no need for an external salvage like *hai* 'still'.

1.2 Actuality implication

The ability and epistemic uses of both *de* and *neng* involve the potentiality of accomplishing the result associated with the phase or result complement (Wu 2004, cf. Li & Thompson 1981 for a different suggestion). However, there is a strong actuality implication that the action denoted by the main verb (future) will be or (past) was initiated and the result will or has already come out. For instance, the readings of (1) imply that John will have finished the assignments by tomorrow (if he is trying to do them.[2]). In (6), the claim that our little hero Duoduo just acquired the ability to sit alone for 30 seconds strongly implies that she did perform such a feat the day before.

(6) duoduo zuotian   neng   du   zuo sanshi miao   le.

   Duoduo yesterday NENG alone sit thirty second INCEPTIVE

'D. was able to sit alone for 30 seconds yesterday, (and it was her first time).'

2. Background

In this paper I adopt Kratzer (1981, 1991)'s treatment of modality. Within her approach,

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[1] In addition, *neng* can be used as a deontic modal expressing permission, which does not concern us here.

[2] For some native speakers of Mandarin Chinese, (1) implies (though does not presuppose or entail) that John indeed will work on the assignments.

modality introduces quantification over possible worlds (existential vs. universal), and is doubly relative to a set of accessible worlds (modal base) as well as to an ordering source. The modal base is a function that assigns to an evaluation world a set of propositions describing, e.g., the relevant circumstances, like the evidence available to the speaker (e.g. in the epistemic case 'John must be the murderer'), and what the law provides (e.g. in the deontic case 'John must go to jail'). The ordering source orders the set of worlds in the modal base according to an ideal. It is a function that assigns to an evaluation world a set of propositions whose truth is required by the circumstances, demanded by the law, etc.

3. Analysis

3.1 Quantification force

Both the ability and epistemic uses of *de* have universal, rather than existential, quantification force. Focusing on the ability use, there are a few pieces of evidence supporting this claim. The proposition denoted by a modal *de* sentence cannot be denied by its negative counterpart (7), in contrast to typical existential propositions (8).

> (7) *zhangsan jinwan xie   de   wan lunwen, ye keneng   xie bu   wan.
>
>   John   tonight write DE finish paper, also possible write not finish
>
> Intended: *John is able to finish the paper tonight; also he might not be able to.

> (8) John might go to Italy this December, or he might not.

Second, if the sentence in (1) is followed by 'if he worked on the assignments tomorrow', (9) falls out naturally, which has universal quantification. If the ability modal was existential quantification, we would not expect such a conclusion to follow.

> (9) He would finish them.   (*He (still) might not finish them.)

Third, modifiers like *yiding* 'certainly', which goes with universals rather than with existentials, can modify an ability proposition (10).

> (10) zhangsan mingtian yiding zuo de wan naxie zuoye.

By contrast, the circumstantial use of *de* has existential quantificational force:

> (11) ?zhe zhong shu zai zher zhang de   gao, ye keneng zhang bu   gao.
>
>   this type   tree at here grow   DE   tall, also possible grow NEG tall
>
> '??This type of tree can grow tall here; it is also possible that it cannot.'

3.2 Semantics of *de*

For its semantic interpretation, the ability use of *de* is first restricted by a modal base f(w), which yields a set of worlds w' such that the relevant ability proposition that holds in w also holds in w'. For instance, one such world could contain a set of propositions including ''John can drive three days without rest'; 'John is strong enough to kill a lion'; 'John is able to finish his assignments tomorrow', etc. This set of worlds are then ordered by the ordering source g(w), which is a set of propositions that describe a body of circumstances (e.g. John is (not) sick or dying, there is (no) high-decibel noise around, the weather is (not) good, etc). The relevant *de*-proposition must hold in all possible worlds that satisfy the two conversational backgrounds. (12) gives the semantics of the ability use of *de*. The function $max_{g(w)}$ (adopted from Hacquard 2006) selects the set of 'best worlds' ranked in accordance with the ordering source.

(12) for world w, conversational backgrounds f, g, proposition p, time t

$[[de]]_{ability}$ (w)(f)(g)(p)(t) = 1 iff $\forall$ w' $\in max_{g(w)}$ ($\cap$ f(w)): p(w', t) = 1, where $t \subseteq t_{top}$, $t_{top} \geq t_0$.

Here, the reference time t_0 is defined as the earliest possible time at which a proposition can hold; the topic time t_{top} is the time about which a proposition is made. If there is no overt topic time in a sentence, t_0 is the speech time and t_{top} is the speech time plus all the time following it. In the ability reading of (1), t_0 is the speaker's present time, and t_{top} is the speaker's tomorrow. The sentence says that, in all the best worlds determined by the conversational backgrounds, there exists a time (interval) in the speaker's tomorrow in which John is able to finish his homework assignments.

Crucially, here the temporal presupposition $t_{top} \geq t_0$ explains the ungrammaticality of sentences like (3). The topic time t_{top} *zuotian* 'yesterday' precedes the reference time, that is, the speaker's present time; hence it violates the constraint $t_{top} \geq t_0$.

The epistemic use of *de* has similar semantics, except for that the conversational backgrounds are different. The same temporal presupposition as in (12) exists in its epistemic semantics. The semantics of ability and epistemic *neng*, however, does not have such a temporal presupposition. Therefore it allows for past-denoting adverbials to co-occur with it. At this stage I have no idea as to why there is such a distinction.

The circumstantial uses of both *neng* and *de* are temporality-independent and their semantics can be defined as in (13). It is therefore no surprise that they are compatible with past-denoting adverbials (e.g. (4)). If my analysis is on the right track, it provides evidence that ability modality is not a special case of circumstantial modality or vice

versa. I do not have theoretical justification for why the circumstantial use of *de* does not have the same temporal presupposition that the ability and epistemic uses have.

(13) $[[de]]_{circumstantial}$ (w)(f)(g)(p) = 1 iff $\exists$ w' $\in$ $max_{g(w)}$ ($\cap$ f(w)): q(w') = 1.

3.3 Modal bases

The ability and epistemic uses of *de* (and *neng*) are different only in terms of conversational backgrounds. Hacquard (2006) gave modal bases for epistemics and circumstantials along the lines of (14a-b), where, for our purpose, the variable *s* is the potential state or event associated with the *de*-proposition. According to Hacquard, the modal base for epistemic (14a) refers to a mental state which has *CONTENT* – a set of beliefs, hopes, desires, etc. The application of the function CIRC to *s* in (14b) yields all the possible worlds compatible with the relevant circumstances, for instance, the circumstances in which the tree can grow tall in the base world w: suitable soil, tropical climate, enough rainfall, etc. For the modal base with the ability use of *de*, I propose an ABILITY-LIST function, which, when applied to *s*, yields a set of propositions that depict all the abilities that an agent has and that are accessible from w where the ability in question holds of the agent. Interpreting (1a) with the notion of ABILITY-LIST, it says that John can finish the relevant homework assignments in the speaker's tomorrow in every world that is accessible from w where John has the ability to finish the assignments and that is closest to the ideal determined by the relevant conversational background.

(14) a. $f_{EPISTEMIC}(s) = \lambda s.\lambda w.$ w is compatible with CON(s)

b.. $f_{CIRC}(s) = \lambda s.\lambda w.$ w is compatible with CIRC(s)

b.. $f_{ABILITY}(s) = \lambda s.\lambda w.$ w is compatible with ABILITY-LIST(s).

4. Temporal Shifting

Elements like the contrastive focus marker *hai* 'still' can salvage an otherwise ungrammatical *de*-sentence that is modified by a past-denoting adverbial (compare (3) with (5)). This is attributable to the fact that *hai* has the property of being able to shift (or re-value) the reference time (t_0) as defined above towards the past so that the temporality presupposition ($t_{top} \geq t_0$) of the ability and epistemic uses of *de* still holds. I assume the temporal shifting *hai* takes both the *de*-proposition and the overt temporal expression (like *zuotian* 'yesterday' in (5)) as arguments. Its semantics can be spelled out roughly as (15).

(15) $[[hai]](p) (t) (w) = 1$ iff $t \prec t_{now} \wedge t_0 = \text{START-POINT}(t_{top}) \wedge p(w, t)$[3]

Here I propose a function START-POINT which takes a time (interval) as its argument and returns the start point of that time. In the semantics of *hai* 'still', the time interval to which the function applies is the topic time, which is generally overt in *de* sentences in which *hai* is present. The reference time t_0 is (re-)valued to the start point of t_{top}. We can look at the future only before the future really starts to come into reality. The t_{now} in the semantics (15) is the speaker's present time. The $t_0 = \text{START-POINT}(t_{top})$ component in (15) guarantees the $t_{top} \geq t_0$ presupposition in the semantics of the ability and epistemic uses of *de* to hold. This explains why the contrastive focus marker *hai* 'still' salvages otherwise ungrammatical *de*-sentences that contain past-denoting time adverbials.

Although the semantics of ability and epistemic *neng* does not have the same temporal presupposition as their *de* counterpart, it has nothing conflicting with the semantics of *hai* as laid out in (15). Therefore, it allows the co-occurrence of *hai*:

(16) duoduo zuotian   hai   neng   du   zuo sanshi miao.

      'Duoduo still (contrastive) was able to sit alone for 30 seconds yesterday.'

Past-denoting phrases like *benlai* 'originally' can license *de* as well. Presumably they can be analyzed along the same lines as *hai*. I stop here with this tentative speculation.

Acknowledgements

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[3] In addition, *hai* can co-occur with future-denoting adverbials like *tomorrow*. In this case it is not used contrastively and should have a different semantic interpretation.