

Adverbs and Positive Polarity in Mandarin Chinese*

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Speaker-oriented adverbs (SpOAs), such as *yexu* “perhaps” and *xingkui* “fortunately” are positive polarity items (Nilsen 2004): in the normal case, they may not occur after negation, or in questions and the antecedents of conditionals. I show here that their distribution can be nicely predicted on a version of Giannakidou’s (1999) Non-Veridicality (NV) theory, in which SpOAs are taken as expressions of the speaker’s strong commitment to the proposition Q represented by the adverb, requiring that Q be true in all worlds in the speaker’s belief model. Empirically, this NV approach has the advantage of capturing not only SpOAs’ basic distribution, but also cross-linguistic and lexical variation. Theoretically, the results support the NV theory of polarity over scalar approaches (such as Nilsen’s), and provide evidence for a semantically-oriented theory of adverb ordering (contra Cinque 1999).

1. Introduction

Recent attempts to account for the linear order of adverbials primarily in terms of their semantics, such as Ernst 2002, Haider 2004, and others, have had the added benefit that they also help illuminate the syntax-semantics interface, and even contribute to various puzzles in semantic theory. In this paper I will show that speaker-oriented adverbs (SpOAs) offer such an opportunity. SpOAs in Mandarin Chinese include *dagai* “probably”, *xianran* “obviously”, and *xingkui* “fortunately”, as illustrated in 1-2:

- (1) a. Zhangsan {*xianran* / *dagai* / *xingkui*} mashang ba chezi mai-diao-le.
Zhangsan obviously probably fortunately immediately BA car sell-off- PRF
“Zhangsan {obviously / probably / fortunately} sold his car immediately.”
b. *Zhangsan mashang {*xianran* / *dagai* / *xingkui*} ba chezi mai-diao-le.
Zhangsan obviously probably fortunately not will BA car sell-off-PRF
“Zhangsan immediately {obviously / probably / fortunately} sold his car.”

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- (2) a. Zhangsan {xianran / dagai / xingkuai} bu yao ba chezi mai-diao.
 Zhangsan obviously probably fortunately not will BA car sell-off
 “Zhangsan is {obviously / probably / fortunately} (not) going to sell his car.”
 b. *Zhangsan bu {xianran / dagai / xingkuai} yao ba chezi mai-diao.
 Zhangsan not obviously probably fortunately will BA car sell-off

These adverbs must precede aspectual adverbs like *mashang* “immediately,” as shown by the contrast in 1: all three SpOAs are fine preceding *mashang* in 1a, but are ungrammatical when following *mashang* in 1b. As the ungrammatical sentences 2b show, these adverbs also must precede regular, unmarked negation (*bu* “not”).

Most of the ordering facts like those in 1, where pairs of adverbs may only occur in one order, can be handled by the general mechanisms outlined in Ernst 1999, 2002. However, the contrast in 2 poses a problem for any theory that hopes to explain adverb order by means of semantics – that is, a theory in which impermissible orders derive from some sort of semantic ill-formedness. This is because, as 3 illustrates, there is nothing in principle to rule out negation taking wide scope over the notions of obviousness, possibility, good fortune, and the like:

- (3) a. Zhangsan bu keneng yao mashang huilai.
 Zhangsan not possible will immediately return.
 “It’s not possible that Zhangsan will return immediately.”
 b. It’s not {fortunate / probable} that Fred will return immediately.”

So either there is a more nuanced explanation based on semantics, or else the more syntactic accounts for adverb ordering, such as Cinque 1999 in general and Xu 1997 for Chinese, may be correct.

I will argue that there is indeed a nuanced semantic account of sentences like 2b, based on the idea first advanced by Nilsen 2004 that SpOAs are positive polarity items. Nilsen pointed out on the basis of English and Norwegian data that not only do adverbs like those in 4 resist being in the scope of negation, as in 5a, but also are normally barred in questions and conditionals, two other classic negative polarity environments, as in 5b-c.

- (4) George {probably / unfortunately / strangely} has not sold his house.
 (5) a. *George has not {probably / unfortunately / strangely} sold his house.
 b. *Has George {probably / unfortunately / strangely} sold his house?
 c. *If George has {probably / unfortunately / strangely} sold his house, then we should be sure to get his new address.

I will show first that this pattern of SpOAs holds equally in Mandarin, and then outline an analysis of it based not on Nilsen’s “strengthening” theory, but on the (Non)Veridicality

theory of Giannakidou 1999 and other recent work (see Ernst 2008 for more extensive discussion). To the extent that this effort is successful, it will provide evidence both for (i) the semantically-based conception of adverb ordering as in Ernst 2002, 2007, and (ii) for Giannakidou's theory of polarity phenomena, as opposed to scalar theories of polarity, of which Nilsen's is one variety.

2. Basic Facts

Speaker-oriented adverbs include those in 6 in Mandarin (I will use the term *adverb* here, although strictly speaking some of these are merely adverbials, i.e. not of the syntactic category ADV):

(6) Mandarin Speaker-Oriented Adverb(ial)s:

EVALUATIVE: *buxing* “unfortunately”, *xingkuai* “fortunately”, *hen qiguai de* “strangely”, ...

EPISTEMIC: *dagai* “probably”, *yexu* “possibly”, *kending* “definitely”, ...

EVIDENTIAL: *xianran* “obviously”, *haoxiang* “apparently”, ...

The pattern shown for negation in 2b and 5a is general for this class: that is, SpOAs normally must precede, not follow negation. 7 provides another example:

- (7) *Zhangsan bu {dagai / buxing / haoxiang} hui jia.
 Zhangsan not probably/ unfortunately / apparently return home
 “Zhangsan did not {probably/unfortunately/apparently} return home.”

Note that, although sentences with the perfective *meiyou* are equally unacceptable, as 8 illustrates, this is not a legitimate test, because ungrammaticality could be accounted for on the grounds that SpOAs, which represent propositional modifiers, cannot come into play until the semantic representation of a complete proposition is finished, while perfective aspect is internal to the proposition. That is, the syntactic ordering in 8 directly reflects the independently necessary order of semantic composition: first aspect, then propositional modifiers.¹

- (8) *Zhangsan meiyou {dagai / yiding / haoxiang} hui jia.
 Zhangsan not-PRF probably/definitely/apparently return home
 “Zhangsan did not {probably/definitely/apparently} return home.”

¹See Foley and van Valin 1984, Ernst 2002 for discussion of how this ordering may be accounted for more formally.

Note also that we cannot assume a blanket prohibition on the negator *bu* combining with a directly following adverbial, as implied in the analysis of Huang 1988, since such cases certainly exist (see Ernst 1995 for further discussion):

- (9) Jinrong bu mashang huida.
 Jinrong not immediately answer
 “Jinrong doesn’t answer immediately.”
- (10) Tamen bu huxiang bangmang.
 they not each-other help
 “They don’t help each other.”
- (11) Ta bu tiantian dou jiang de qingchu.
 s/he not every-day speak DE clear
 “He doesn’t speak clearly every day.”

The solution instead must be more oriented towards the semantics of the items in play in the relevant constructions, not just negation but also questions and conditionals. Bellert 1977 first noted, for English, that SpOAs do not fit well in questions. 12-13 illustrate this for Chinese:

- (12) *Jiaozi { haoxiang / buxing } bei gou chi-diao-le meiyou?
 dumpling apparently fortunately by dog eat-up-PRF not-PRF
 “Were the dumplings {apparently/unfortunately} eaten by the dog?”
- (13) *Ta {xianran / dagai / yexu} mai-le yibu xinde Rolls-Royce ma?
 s/he obviously/probably/perhaps buy-PRF a-CL new Rolls-Royce Q
 “Has she {obviously/probably/perhaps} bought a new Rolls-Royce?”

We cannot use the usual A-not-A question pattern as legitimate data, since all “core” adverbials block question formation of this sort, for independent reasons (Ernst 1994). Such questions are crashingly bad, as 14 illustrates. Particle questions with *ma* are often better than the basic A-not-A pattern in 14, as 15 shows, and they are also better than the “tag” version of A-not-A questions seen in 12:

- (14) *Lisi {xianran / buxing / chuhuyiliaode } yao-bu-yao zai chengli gongzuo?
 Lisi obviously / unfortunately / unexpectedly will-not-will at city work
 “Will Lisi {obviously / unfortunately / unexpectedly} work in the city?”
- (15) Lisi {*xianran / ??buxing / ?chuhuyiliaode } yao zai chengli gongzuo ma?
 Lisi obviously / unfortunately / unexpectedly will at city work Q
 “Will Lisi {obviously / unfortunately / unexpectedly} work in the city?”

There is some variation among speakers as to exactly how much better the second two adverbs are in sentences like 15, but at least there is a consistent contrast in the direction indicated, with particle questions yielding better environments for the adverbs.

Finally, SpOAs are generally unacceptable in the antecedents of conditional sentences, as shown in 16-17:

- (16) *Zhangsan ruguo {dagai / yexu } hui jia-le, jiu zaogao-le.
 Zhangsan if probably / perhaps return home then mess
 “If Zhangsan {probably / perhaps} went home, that’s a real problem.”
- (17) *Ruguo Zhangsan {xianran / xingkuai } yijing ba gongke zuowan-le,
 if Zhangsan obviously fortunately already BA homework finish-PRF
 women jiu keyi chuqu.
 we then can go-out
 “If Zhangsan has obviously/fortunately already finished his homework, then we can go out.”

All three of the environments just examined, negation, questions, and the antecedents of conditionals, are classic negative polarity environments. This can be seen in 18a-c, where the Chinese WH-word *shenme* takes its normal negative-polarity value of an indefinite pronoun in these three constructions:

- (18) a. Ta meiyou shuo shenme.
 s/he not-PRF say something
 “She didn’t say anything.”
- b. Ta shuo-le shenme mei-you?
 s/he say-PRF something not-PRF
 “Did she say anything?”
- c. Ta ruguo shuo-le shenme, jingcha jiu manyi-le.
 s/he if say-PRF something police then satisfy-PRF
 “If she said anything, the police will be happy.”

While positive and negative polarity environments are not always in exact complementary distribution, they generally are (see Baker 1970 and Ladusaw 1996). Thus the data shown in 12-17 constitute prima facie evidence that SpOAs are positive polarity items. Since this seems to be a robust pattern for SpOAs not only for Chinese and English, but also for Dutch, French (Ernst 2008) and Modern Greek (Anastasia Giannakidou, p.c.), it appears that we have a notable cross-linguistic phenomenon to account for.

3. Speaker-Oriented Adverbs and (Non)Veridicality

3.1. Speaker-Oriented Adverbs as Speakers' Commitment

SpOAs have often been taken as representing a speaker's commitment to the truth of a proposition (e.g. Palmer 2001, Papafragou 2006). Thus, it is often said that a sentence like 19 has a semantic representation roughly like 20, where FORTUNATE makes an evaluation of the following bracketed proposition P, and represents the speaker's commitment to the truth of P:

- (19) Mao xingkui huilai-le.
 cat fortunately return-PRF
 "Fortunately the cat came back."

- (20) FORTUNATE [_P RETURN (cat)]

While this is indeed the case, it is more relevant to the special behavior of SpOAs that they represent the speaker's strong commitment to the truth of the proposition Q, for which the main predicate is the adverb itself – thus in 20, labeled as in 21, Q is "it is fortunate that the cat came back."

- (21) [_Q FORTUNATE [_P RETURN (cat)]]

Similarly, even for non-factive adverbs like *probably* and *possibly* that do not presuppose the truth of their associated proposition, in a sentence like 22, the speaker may still be taken as committed to the larger proposition Q, as in 23:

- (22) Mao dagai huilai-le.
 cat probably return-PRF
 "The cat probably came back."

- (23) [_Q PROBABLE [_P RETURN (cat)]]

3.2. (Non)Veridicality

Given this concept of speaker's commitment, we can see that SpOAs are *veridical*; that is, they require the truth of the proposition Q. This fits precisely into the theory of polarity behavior promoted in a series of recent papers by Anastasia Giannakidou (1999, 2006, 2007), based primarily on data from Modern Greek and English. This (Non)Veridicality (NV) theory holds that both positive and negative polarity find their roots in a set of semantic contexts with different truth-conditional entailments. It is well known, for example, that, cross-linguistically, some NPI's are licensed or forbidden only in the strongest of these contexts, especially negation, while others are more broadly sensitive, such as to "affective" adverbs like *rarely* or to interrogative constructions (see Zwarts

1996, van der Wouden 1997). Thus polarity licensers form the hierarchy in 24, with stronger classes more to the left; each class on the left forms a subset of those to its right (illustrative examples are provided below the class labels):

- (24) a. Antiveridical < Strictly Nonveridical
 b. Antimorphic \subseteq Anti-Additive \subseteq Downward Entailing \subseteq Nonveridical
not *nobody, never* *rarely, no longer, few* questions, conditionals

All of these nonveridical operators – *not*, *never*, and *rarely* in English and their equivalents in other languages, plus question and conditional operators – do not preserve truth value: they are thus *nonveridical*. The strongest of them, on the left, reverse truth value (speaking loosely), so that they are termed *antiveridical*. The central tenet of the NV theory is that NPI’s are licensed in such nonveridical environments. This is stated in 25:

- (25) Main Licensing Condition for Negative Polarity Items
 (adapted from Giannakidou 1999:408)

A negative polarity item A will be licensed in a sentence S iff S is nonveridical.

More recent versions of this approach replace 25 with more precise conditions that account for variation among different types of nonveridical operators, and different types of polarity items. For our purposes, we must invoke the reverse licensing condition for positive polarity items in 26, based on 25 and proposed in Ernst 2008:

- (26) Licensing Conditions for Positive Polarity Items
 (adapted from Giannakidou 1999):

- a. A positive polarity item A is blocked in the local scope of a nonveridical operator.
 b. In certain cases, A may be licensed indirectly despite being in the local scope of a nonveridical operator in a sentence S, iff S gives rise to a positive implicature ϕ .

In what follows I will provide a somewhat more precise version of 26a to account for the distribution of SpOAs, and also address the effect of 26b, known as *indirect licensing*.

3.3. The Analysis

At the first stage, it can readily be seen that a simple licensing condition like 26a correctly predicts the data given above, given that SpOAs are positive polarity items. In negative contexts like 27b (=2b), where *bu* is antiveridical and thus the most extreme nonveridical operator, the adverbs *xianran* “obviously”, *dagai* “probably”, and *xingkuai* “fortunately” are all within the scope of negation and thus are blocked:

- (27) a. Zhangsan {xianran / dagai / xingkui} bu yao ba chezi mai-diao.
 Zhangsan obviously probably fortunately not will BA car sell-off
 “Zhangsan is {obviously probably fortunately} (not) going to sell his car.”
 b. *Zhangsan bu {xianran / dagai / xingkui} yao ba chezi mai-diao.
 Zhangsan not obviously probably fortunately will BA car sell-off

The licensing condition works equally well for the somewhat weaker, strictly nonveridical environments represented by questions and the antecedents of conditional sentences; in addition to the data above, examine 28a-b for questions, and 29a-b for conditionals (in all cases, the corresponding declarative sentences are grammatical):

- (28) a. *Lisi {dagai / yexu} cong Deguo huilai-le ma?
 Lisi probably / perhaps from Germany return-PRF Q
 “Has Lisi {probably / perhaps} come back from Germany?”
 b. *Ta {xianran / xingkui} mai-le henduo xinde yifu ma?
 s/he obviously / fortunately buy-PRF many new clothing Q
 “Did she {obviously / fortunately} buy a lot of clothes?”
- (29) a. *Ruguo Lisi {dagai / yexu} cong Deguo huilai-le, women yinggai ding
 if Lisi probably / perhaps from Germany return-PRF we should fix
 shijian gen ta jianmian.
 time with her/him meet
 “If Lisi has {probably / perhaps} come back from Germany, we should fix a
 time to meet with her/him.”
 b. *Ruguo ta {xianran / xingkui} mai-le henduo xinde yifu,
 if s/he obviously / fortunately buy-PRF many new clothes
 na jiu hao-le (zaogao-le).
 so then good-PRF (a mess-PRF)
 “If s/he {obviously/fortunately} bought a lot of new clothes, that’s good
 (a problem).”

At this point, though, it is important to consider how the rough, blanket condition in 26 can be sharpened. There are several reasons to sharpen it, other than the usual desire to be as precise as possible. First, 26b gives no insight into *why* SpOAs should be blocked in nonveridical contexts; given the formulation as it stands, there is no particular reason why nonveridical operators should have this particular effect on them. Second, as noted above, much research has shown that polarity items differ to some extent in their licensing contexts both within languages and cross-linguistically. In this light, it is a virtue of the NV approach that it can account for this variation, by referring to different kinds of nonveridical operators, as laid out in 24, but also by invoking different, specific types of semantic ill-formedness for the different contexts. Thus we must thus show how SpOAs

induce a specific kind of ill-formedness in negative, interrogative, and conditional contexts. Third, there are significant problems for the scalar approaches to polarity, such as those explored by Krifka 1995, Chierchia 2004, and others, including the “strengthening” version proposed by Kadmon and Landman 1993 and adopted specifically for SpOAs by Nilsen 2004. Laying these out would take us too far afield here, but they are discussed (among other places) in Giannakidou 2006. Just to at least mention one salient problem, it is well-known that questions are not uniformly downward-entailing environments (see Ladusaw 1996), as such approaches usually require, yet they clearly license negative polarity items, and block positive polarity items including SpOAs. Therefore, we ought to be able to show that the (Non)Veridicality theory can handle such cases more naturally.

In order to achieve this more detailed and more empirically adequate analysis, we may start by focusing on SpOAs’ salient property of expressing a speaker’s strong commitment to the truth of Q, the proposition of which the adverb represents the main, highest predicate, as in 21, repeated here:

(21) [_Q FORTUNATE [_P RETURN (cat)]]

We do this by positing a lexical representation for an adverb like *xingkui* that includes what amounts to specifications of veridicality, a guarantee of the truth of the relevant propositions, along the lines of 30:

(30) [_{*xingkui*} (P)] = a. [P] = 1 in $M_B(s)$
 b. $\forall w \in M_B(s)$, [it is fortunate that P] = 1 in w

$M_B(s)$ refers to the speaker’s belief model, for which I provide Giannakidou’s definition in 31; the technicalities need not concern us here, as what is important is that the analysis be grounded in the set of worlds compatible with what the speaker believes to be true:

(31) Definition of Belief Models (= Giannakidou’s 1999:395 (45)):

Let $c = \langle cg(c), W(c), M, s, h, w_0, f, \dots \rangle$ be a context.

A model $M_B \in M$ is a set of worlds associated with an individual x, representing worlds compatible with what x believes.

30a captures the fact that such adverbs are factive, so that the proposition P that they modify is taken as true, and thus says that the proposition P that *xingkui* combines with is taken as true. The same sort of representation holds for *xianran* “obviously” and other SpOAs of this type. 30b is the crucial part of an SpOA’s lexical representation, that which makes it a positive polarity item: for all worlds in the speaker’s belief model, Q (= it is fortunate that P) is true in that world. This condition requires that Q be true in the speaker’s **entire** belief model. This means complete commitment to its truth: a completely veridical stance.

Now we may identify the specific semantic ill-formedness that accounts for the adverbs' positive polarity behavior: it is a clash between this extreme veridicality requirement and the nonveridicality of negative, interrogative, and conditional contexts. When a speaker negates a proposition Q, there is at least one world in the belief model $M_B(s)$ in which Q is false. Yet the use of an SpOA like *xingkui* requires that Q be true in all worlds in that model. The resulting representation is semantically ill-formed, and sentences like 32 are thus always ungrammatical.

- (32) *Zhangsan bu xingkui hui qu canjia mingtiande huiyi.
 Zhangsan not fortunately will go attend tomorrow's meeting.
 "Zhangsan will not fortunately attend tomorrow's meeting."

The same holds for questions and conditionals, since they allow Q to be true in some worlds and false in others. For example, in a simple question like 33, assuming a standard analysis of questions derived from Karttunen (1977) and Gronendijk and Stokhof (1984), the question's denotation is the set shown in 34: {FORTUNATE (Zhangsan will attend tomorrow's meeting), ~FORTUNATE (Zhangsan will attend tomorrow's meeting)}. Thus Q (FORTUNATE (Zhangsan will attend tomorrow's meeting)) is true in some worlds and false in others, and 33 is bad because, once again, the adverb's lexical requirement is not met.

- (33) *Zhangsan xingkui hui qu canjia mingtiande huiyi ma?
 Zhangsan fortunately will go attend tomorrow's meeting Q.
 "Will Zhangsan fortunately attend tomorrow's meeting?"

- (34) {FORTUNATE (Zhangsan will attend tomorrow's meeting),
 ~FORTUNATE (Zhangsan will attend tomorrow's meeting)}

The same logic holds for conditional sentences, since the antecedent's proposition may be either true or false, in a parallel way.

3.4. A Refinement: Variation

It turns out that the pattern shown above for SpOAs is the most extreme, and that the larger number of them may sometimes occur in some nonveridical contexts. *Xingkui* "fortunately" (as well as *haihao* "luckily") is bad in all contexts, and we can continue to treat it as just outlined, and call it a *strong* SpOA. But others, like *dagai* "probably" and *chuhuyiliaode* "unexpectedly", are sometimes allowed – we can term them *weak* SpOAs. It is revealing, though, that when the weak adverbs are acceptable, or at least more acceptable, this occurs only in strictly nonveridical contexts like questions and conditionals, not in the stronger, antiveridical context of negation. Just as revealing is that, in Mandarin, this typically occurs not in everyday, neutral questions, but rather in questions

where the speaker and context presuppose the truth of the relevant proposition. These are therefore cases of what Giannakidou terms *indirect licensing*; alluded to earlier with 26b, repeated here:

- (26) b. In certain cases, A may be licensed indirectly despite being in the local scope of a nonveridical operator in a sentence S, iff S gives rise to a positive implicature ϕ .

What is crucial for such cases is that, despite the presence of morphological or syntactic negation, there is some sort of positive implicature that the proposition in question is true.

Examine the contrast between the strong adverb *xingkui* in 35 and the weak adverb *dagai* in 36:

- (35) a. *Zhangsan bu xingkui hui qu canjia mingtian de wuhui.
Zhangsan not fortunately will go attend tomorrow 's dance
"Zhangsan will not fortunately go to tomorrow's dance."
b. *Zhangsan xingkui hui qu canjia mingtian de wuhui ma?
Zhangsan fortunately will go attend tomorrow 's dance Q
"Will Zhangsan fortunately go to tomorrow's dance?"
c. *Zheyang yi lai, Zhangsan bu jiu xingkui hui qu canjia mingtian de
this-way come Zhangsan not then fortunately will go attend tomorrow 's
wuhui ma?
dance Q
"This way, won't Zhangsan fortunately go to tomorrow's dance?"
- (36) a. *Zhangsan bu dagai hui qu canjia mingtian de wuhui.
Zhangsan not probably will go attend tomorrow 's dance
"Zhangsan will not probably go to tomorrow's dance."
b. ?Zhangsan dagai hui qu canjia mingtian de wuhui ma?
Zhangsan probably will go attend tomorrow 's dance Q
"Will Zhangsan probably go to tomorrow's dance?"
c. Zheyang yi lai, Zhangsan bu jiu dagai hui qu canjia mingtian de
this-way come Zhangsan not then probably will go attend tomorrow 's
wuhui ma
dance Q
"This way, won't Zhangsan probably go to tomorrow's dance?"

Suppose we are planning a dance, and are thinking about who might attend. For 35, imagine that Zhangsan is a popular person, so that his attendance would help us by making many other people want to go to the dance. On this scenario, 35a ought to be similarly well-formed; but the negative sentence in 35a is bad, and so are the two ques-

tions in 35b-c, including the second one in which the speaker is expecting it to be true that Zhangsan will indeed, fortunately, be attending the dance. By contrast, in 36, once again the negative sentence (in 36a) is bad, but the questions are better, especially where the biasing context is brought out in 36c – the speaker expects the answer to be positive, i.e. that Zhangsan will probably go to tomorrow’s dance. (Speakers differ in their exact judgments, but all of them report 35a-c to be equally unacceptable, while there is a clear contrast in 36 between negation in 36a and the questions in 36b-c.)

This contrast can be handled neatly on the NV theory, and underscores the analysis based on SpOAs being positive polarity items because they represent the speaker’s commitment to truth. We keep the lexical representation of strong SpOAs, the relevant condition of which is given again for *xingkui* as 37, but posit a less stringent requirement on truth for weak SpOAs like *dagai* “probably” in 38:

(37) $\llbracket \textit{xingkui} (P) \rrbracket : \forall w \in M_B(s), \llbracket \text{it is fortunate that } P \rrbracket = 1 \text{ in } w$

(38) $\llbracket \textit{dagai} (P) \rrbracket : \text{for all } w \text{ in some subset } W \text{ of } M \in M_B(s),$
 $\llbracket \text{it is probable that } P \rrbracket = 1 \text{ in } w$

The most crucial part of 38 is its reference to subsets of worlds (W): with 38, we can appeal to a speaker’s expectations or assumptions, taken as a subset of his beliefs (represented by the worlds in $M_B(s)$). In questions like 36c, what is relevant is the expectation of a positive answer, i.e. that Zhangsan will indeed probably go to the dance. This may not be absolute truth as required for the strong adverbs, but a weaker version by which the proposition is true in worlds that the speaker expects to come true.

The phenomenon shown in 36 with weak SpOAs seems somewhat limited in Chinese, but more robust in English. Weak adverbs occur comfortably in negative questions like 39a, which conventionally implicate the truth of the proposition at issue, as discussed in Romero and Han 2004.

- (39) a. Has the committee not mysteriously ignored its responsibilities by refusing to address this issue?
 b. *Has the committee not oddly ignored its responsibilities by refusing to address this issue?

39b shows that English strong adverbs like *oddly* cannot occur in these contexts, as expected given the strong condition in their lexical representations. It is not clear to me whether or not this represents a stronger effect in English than in the cases like 36b in Chinese, but if so it may be that there is a genuine conventional implicature in English, but a weaker, more contextually-determined effect for cases like 36 in Chinese. More relevantly, perhaps, English also allows weak SpOAs in low-tone metalinguistic negation, as illustrated in 40:

- (40) a. – But they **haven't** mysteriously abandoned their research!
 b. – *But they **haven't** amazingly abandoned their research!

In 40a, imagine that a previous speaker has asserted that they have mysteriously abandoned their research; the speaker of 40a then emphatically denies this, with stress on the negated auxiliary and low tone on the following material, copied from the previous utterance. Again, English speakers generally accept weak adverbs like *mysteriously* in such contexts but reject strong ones such as *oddly* (see Ernst 2008 for discussion).

By contrast, Chinese speakers that I have consulted uniformly reject the equivalent sentences in Mandarin:

- (41) – *Zhangsan MEIyou dagai jie(-le) hun!
 Zhangsan NOT probably get-PRF-married
 “Zhangsan **didn't** probably get married!”

41, denying a previous speaker who maintains that Zhangsan probably got married, still seems to be unacceptable. The difference between English and Chinese can be captured if we assume slightly different lexical representations for weak SpOAs in the two languages. *Mysteriously* in 40a, representing weak SpOAs in general, has as part of its lexical entry the expanded condition in 42, where not only is a subset of the speaker's belief model allowed in evaluating the truth of Q, but the *hearer's* belief model ($M_B(h)$) is as well:

- (42) [[mysteriously (P)]] : for all w in some subset W of $M \in \{M_B(s), M_B(h)\}$,
 [[it is mysterious that P]=1 in w

In other words, it does not matter that the speaker uses negation in cases like 40a, because the semantic representation may ascribe the assertion of mysteriousness to the previous speaker, which in this case we may count as the “hearer”. That is, even though the speaker's belief model takes Q (it is mysterious that they abandoned their research) as false, the previous speaker takes Q as true, so the condition in 42 is fulfilled and the sentence is well-formed. Chinese weak adverbs do not allow for this option, no subset of worlds in the speaker's belief model has Q as true, and so 41 is ruled out as ill-formed.

In a way similar to questions, Chinese allows weak SpOAs much more comfortably in conditional sentences than in negative sentences.

- (43) a. Ruguo jiaozi buxing bei gou chidiao-le, women jiu keyi chi
 if dumpling unfortunately PASS dog eat-PRF we then can eat
 mian.
 noodle
 “If the dog has unfortunately eaten all the dumplings, we can eat noodles.”
 b. Ruguo ta chuhuyiliaode mai-le hen duo xinde yifu, na jiu hao-le.
 if s/he unexpectedly buy-PRF very many new clothes so then good
 “If s/he has unexpectedly bought a lot of new clothes, that's good.”

The corresponding sentences with the strong adverb *xingkui* are much worse:

- (44) a. *Ruguo jiaozi xingkui bei gou chidiao-le, women jiu keyi chi
 if dumpling fortunately PASS dog eat-PRF we then can eat
 mian
 noodle
 “If the dog has fortunately eaten all the dumplings, we can eat noodles.”
- b. *Ruguo ta xingkui mai-le hen duo xinde yifu, na jiu hao-le.
 if s/he fortunately buy-PRF very many new clothes so then good
 “If s/he has fortunately bought a lot of new clothes, that’s good.”

The type of formulation provided in 42, applied to weak Chinese adverbs like *buxing* and *chuhuyiliaode*, accounts for cases like 43: as noted in 34, questions involve a partition into two propositions. Since the set of worlds represented by the positive proposition may count as the set *W* invoked in 42, it is correctly predicted that weak adverbs are possible in antecedents of conditionals, while strong adverbs like *xingkui* “fortunately” (requiring truth in all worlds, not just a subset) are unacceptable.²

4. Two Implications: Arguments for the NV Theory

4.1. Variation

Let us summarize the extent of language-specific and cross-linguistic variation we have seen with SpOAs. Within Chinese (as in English), there is a difference between negation on one hand, and the strictly nonveridical context of questions on the other: weak SpOAs are always bad under negation, but may sometimes be acceptable in questions and conditionals. Between languages, we find that Chinese is less liberal than English in the constructions where weak SpOAs are allowed: at the least, English permits them in questions, conditionals, and low-tone metalinguistic negations like 40, while Chinese only permits them in questions and conditionals.

It constitutes evidence for the NV theory that it can easily handle these differences according to the mechanisms discussed here, and do so in a way that taps into the defining semantic characteristic of SpOAs. That is, the difference between weak and strong adverbs corresponds simply to a difference in how strongly committed the speaker is to the truth of the relevant proposition. Strong adverbs allow no chance that the proposition is false; the speaker holds adamantly to its truth, requiring that the proposition be true in all worlds. Weak adverbs also represent a commitment to truth, but it is a weaker commitment, permitting it to hold for a subset of worlds, such as those *expected* to come true, rather than ones firmly believed to be true. The difference between languages can be attributed to variation in how this weaker option plays out: as shown here, for example, Chinese appears to require hewing to the speaker’s belief model, while English additionally allows access to the previous speaker, in low-tone denials like 40a-b.

It would take us too far afield to show that scalar models in general, and Nilsen’s 2004 “strengthening” model for SpOAs in particular, cannot easily handle this sort of variation (see discussion in Giannakidou 2007 and Ernst 2008). However, we can at least

²I have avoided the question of precisely how the relevant subset of worlds invoked for weak SpOAs in conditional sentences is to be defined. It appears that conditionals may not have as strong a requirement as questions that there be a positive implicature (see Ernst 2008 for discussion), so that 26b may eventually have to be modified to reflect this.

note that they do not make reference to belief models as does the NV theory. It is the possibility of variation within these models, between different belief models and between defined subsets of the worlds within them, that allows the NV theory to explain the data here. Since it is unclear what resources the scalar theories have to match this, it seems that the NV is a better theory of SpOAs' distribution.

4.2. Syntactic vs. Semantic Theories

The account proposed here explains why SpOAs always precede negation in Chinese, and also explains why, most of the time, they are unacceptable in questions and antecedents of conditionals. This is meant as part of the much larger, semantically-based attempt to explain all of linear ordering of adverbs in Ernst 2002. Compare this to the more syntactically-oriented theory of Xu 1997, Alexiadou 1997, and Cinque 1999. This theory holds that each class of adverb occurs in its own dedicated Spec position, licensed by its corresponding head in an empty functional projection. The same is true for negation, so, for example, these theories posit a Neg head licensing a negative adverb like *not* or *bu* (or positing that these are the actual Neg heads; this does not affect the point at hand), and, above this, there is a head (POSS) that licenses SpOAs. This is illustrated in 45 for a modal adverb:

(45) [POSSP possibly [POSS [NEGP not [NEG ...]]]]

This theory thus predicts the obligatory ordering of the adverb first and negation second by simply positing a universally mandated order of functional heads.

Again, without being able to make a full-scale comparison of theories here, we can at least see the argument against this approach and for the semantically-based NV approach. First, consider cases like 36c, as well as 39a and 40a in English, where the adverb *follows* negation. These show that the rigid ordering of heads shown in 43 cannot account for all the data as outlined, in Ernst 2007. The Cinque-style theory in 43 does have ways to cover the alternate ordering, but in doing so must add considerable complexity to the account, and weaken its basic claim of rigid adverb ordering. Perhaps more importantly, both Chinese and English show us that the semantically-based, NV approach accounts for aspects of distribution beyond mere linear ordering. As laid out in Ernst 2007, analyses like 43 need to block SpOAs in questions and conditionals in ways that represent a complete, unrelated add-on, while the NV theory accounts for these facts neatly and in a unified way. Finally, the NV approach offers a well-grounded explanation for why it is precisely *these* adverbs that behave as they do with respect to negation, questions, and conditionals. For all these reasons, there seems to be good reason to adopt the NV approach to linear order over the head-licensing one.

5. Summary and Conclusion

In this paper I have shown that Mandarin Chinese speaker-oriented adverbs are in general positive polarity items, and are thus normally blocked from occurring in nonveridical environments. All of them are barred from occurring in the scope of negation. A small number, such as *xingkui* “fortunately” are strong speaker-oriented adverbs, being barred in all nonveridical contexts, including not only negation but also questions and the antecedents of conditional sentences. Others – probably most of them – are weak adverbs and can sometimes occur felicitously in the strictly nonveridical contexts of questions and antecedents of conditionals.

I have proposed a semantically-based account of these facts, grounded in a theory of speakers' belief models. Strong speaker-oriented adverbs require the truth of Q (=ADV(p)) for all worlds in the speaker's belief model, as shown in 37; as a result, they are blocked in all nonveridical contexts – because these contexts always involve at least one world in the speaker's belief model where Q is true. Weak speaker-oriented adverbs, on the other hand, require the truth of Q (=ADV(p)) only for a subset of worlds in the speaker's belief model, as in 38, and they may therefore sometimes occur in strictly nonveridical contexts.

I have also suggested that this (Non)Veridicality theory approach has two advantages. First, it allows explaining language-specific and cross-linguistic variation in a simple and straightforward way. Within Chinese, the distinction between strong and weak adverbs in terms of their truth requirements for worlds in the speaker's belief model, combined with the different properties of antiveridical contexts (negation) and strictly nonveridical contexts (questions and conditionals), accounts for the different adverbs' patterns of distribution. Cross-linguistically, the theory proposed here allows capturing at least one difference between English and Chinese by invoking for metalinguistic negation not only the belief model of the speaker, but that of the hearer. Second, this (Non)Veridical approach handles the distribution of speaker-oriented adverbs better than either "scalar" semantic theories (as in Nilsen 2004) or syntactic theories along the lines of Cinque 1999.

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