

Adverbs and Light Verbs*

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Chinese allows manner and degree adverbs to occur further to the left than is possible in English and other languages; compare *Amanda will (*loudly) be (loudly) greeting her guests (loudly)* with *Lisi (qingqingde) ba zhuozhi (qingqingde) qiao-le yixia* “Lisi lightly knocked once on the table,” with the manner adverbial to the left of BA. It is proposed here that this results from the two languages having different types of light verbs, with Chinese BA and BEI being “lighter” than English auxiliaries like *be*, and the UG definition of domains for such Low adverbs depending on the nature of light verbs. This result has a number of implications, especially for the analysis of Chinese passives, providing evidence that BEI takes a vP complement rather than an IP, as on some recent analyses.

1. Introduction

After many years with no coherent theory of adverbial adjuncts, formal syntax now has several useful proposals for an overall framework. Though they differ in both their underlying philosophy and specific formal mechanisms, these frameworks (exemplified by Cinque 1999, Frey and Pittner 1999, and Ernst 2002) agree on many facts, such as that certain sequences of adverbs are rigidly ordered, while others are not, and that certain types of adverbs in all languages occur in particular areas of a sentence – very low or very high, for example. And they agree that facts of this sort ought to be encoded in universal grammar (UG) in some way.

1-2 illustrate the fact that adverbs have fairly well defined “zones,” or ranges where they occur, for English and Chinese, respectively:

- (1) a. (Perhaps) Al (perhaps) should (perhaps) be (*perhaps) seeing a doctor (*perhaps).
b. (*Tightly) she (*tightly) would (tightly) grip (*tightly) the handle (tightly).
c. (Wisely,) Karen (wisely) has (wisely) been (wisely) answering questions (wisely).

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- (2) a. Zhangsan (dagai) yinggai (*dagai) kan yisheng (*dagai).
 Zhangsan probably should probably see doctor probably
 “Zhangsan should probably see a doctor.”
- b. (*Jinjinde) Ta (*jinjinde) hui (jinjinde) wo-zhu (*jinjinde) bashou (*jinjinde).
 tightly s/he tightly will tightly grasp tightly handle tightly
 “S/he will grasp the handle tightly.”
- c. Lisi (hen congmingde) huida-le wenti (*hen congmingde).
 Lisi very intelligently answered-PRF question very intelligently
 “Lisi intelligently answered the question.”

1a illustrates that speaker-oriented adverbs, like the modal adverb *perhaps*, occur high in a sentence, to the left of the base positions of all auxiliary verbs. English auxiliaries, including the modal auxiliary *should* in 1a, raise into T, so the third occurrence of *probably* is above the auxiliaries’ base positions. 2a shows the same effect in Mandarin Chinese (henceforth merely *Chinese*), where the modal auxiliary does not raise. In 1b, the manner adverb *tightly* must occur either right before the verb *grip* or at the end of the VP, with the position between the verb and direct object barred. Chinese shows a similar pattern in 2b, though final position is impossible for this sort of manner adverbial. 1c and 2c involve an agent-oriented adverb, which allows two readings. For the clausal (or “sentential”) reading, *wisely* in 1c means that Karen was wise to answer the questions, as opposed to not answering them – though in fact her answers may have been stupid. The first three occurrences of *wisely* clearly have this reading, paralleling the high range shown by *probably*, though the range for agent-oriented adverbs extends a bit lower. Such adverbs also have a manner reading, so that she answered the questions in a wise way; this is expressed by the occurrences just before the verb and the one in VP-final position. The Chinese sentence in 1c shows an ambiguity, with *hen congmingde* “intelligently” having both readings in the immediately preverbal position, where the ranges for the two readings overlap.¹

This paper is about defining and explaining the range for manner adverbs and similar “Low adverbs,” otherwise known as “event-internal adverbs”: basically, this range goes from immediately preverbal position to the right edge of the VP. The relevant adverb subclasses are (a) Manner (e.g. *tightly*, *loudly*, *precisely*), (b) Degree/Measure (*completely*, *partially*), and (c) Restitutive (*again*). I will ignore the restitutive *again* and its Chinese equivalent *you*, to keep things simple – there are a number of complications in this case which we need not address. 3-4 provide further examples: here, the manner adverbs *precisely* and *tightly* can only occur to the right of the last auxiliary verb,

¹Some speakers do not have an ambiguity in this sentence, but given proper additions and context, the indicated position can be shown to allow to readings.

immediately to the left of the main verb:²

- (3) a. The drawing (*precisely) was (precisely) carved onto the copper plate.
 b. The criminal (*tightly) was (tightly) held by the policeman.
- (4) a. The drawing (*precisely) had (*precisely) been (precisely) carved onto the copper plate.
 b. The criminal (*tightly) had (*tightly) been (tightly) held by the policeman.

However, Chinese allows manner adverbs to occur further to the left than English does, preceding both BA and BEI, as shown in 5-6.

- (5) a. Tuhua (hen jingquede) bei Wangwu (hen jingquede) ke zai tongban shang.
 drawing very precisely PASS Wangwu very precisely carve at copperplate on
 “The drawing was carved precisely onto the copper plate by Wangwu.”
 b. Fanren (jinjinde) bei jingcha (jinjinde) zhuazhu-le.
 criminal tightly PASS police tightly hold-PRF
 “The criminal was held tightly by the policeman.”
- (6) Lisi (qingqingde) ba zhuozi (qingqingde) qiao-le yixia.
 Lisi lightly BA table lightly knock-PRF once
 “Lisi lightly knocked once on the table.”

I assume the sequence of clausal heads for the two languages shown in 7a-b, though the Tense/Infl and Modal heads will not be crucial here (see Huang et al. 2009 for evidence justifying the head-status of BA and BEI). I assume that for both languages, the main verb moves into v. Given this sequence, we can define the problem for adverb licensing with the difference in bold-facing in 8: English licenses Low adverbs in the range shown in bold in 8a, from just to the left of the main verb and out to the right edge of VP. Chinese, on the other hand, has the range shown in boldface in 8b, including the position just to the left of the passive marker BEI:

- (7) a. English clausal-head sequence: T - Mod - Perf - Prog - Pass - v - V
 b. Chinese clausal-head-sequence: Infl - Mod - Asp - Pass - BA - v - V

²There are occasional examples of pre-auxiliary manner adverbs, especially in passive sentences, although they are often awkward, and not accepted by all speakers (see i-ii). I leave these aside, since they are relatively rare, and English-Chinese contrast seems robust.

- (i) ?Our new proposals had firmly been turned aside during that series of meetings.
 (ii) ?Jim would peacefully be sitting on his porch reading a newspaper if not for his next-door neighbor’s houseguest.

- (8) a. English domain for Low adverbs: T - Mod - Perf - Prog - Pass - [v - V]
 b. Chinese domain for Low adverbs: Infl - Mod - Asp - [**Pass - BA - v - V**]

In 7-8, note especially the difference between the passive heads in the two languages: Low adverbs may appear to the left of the Chinese passive BEI, but not to the left of the English passive *be*.

Many analyses assume that the correct description for Low adverb distribution is that they are licensed in vP, but given the facts shown here, this formulation is not correct, or at least not obviously correct. I will propose here instead that Low adverb interpretation differs in the two languages because it is formulated in UG not in terms of vP per se, but in terms of the types of light verbs that occur above the lexical VP. In English, there is only one such light verb, v, while in Chinese there may be three (v, BA, and BEI). More specifically, the Low range for manner and degree adverbs is relativized to projections headed by non-Auxiliary, functional light verbs, where I take the non-boldfaced heads in 8 including the English passive head *be*, to be auxiliary verbs, while BA and BEI are not.

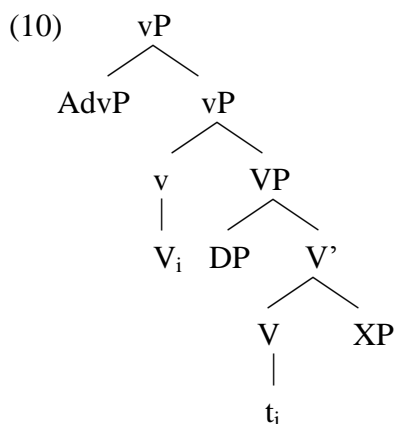
Thus, the questions to be answered here are these: (i) Where is the left edge of the Low Range? (ii) How is this to be stated in UG? (iii) How can cross-linguistic variation be accounted for? And (iv), more specifically for Chinese syntax: What implications do these adverb distribution facts have for the BA and BEI constructions?

2. Outline of the Problem

As noted, in English Low adverbs can go as high as edge of vP, but not to left of any AuxV. 9 provides further examples:

- (9) a. Gretchen (*softly) may (*softly) have (softly) sung a lullaby.
 b. Bob had (*smoothly) been (smoothly) skiing around the obstacles on the course.
 c. The apparatus (*completely) had (??completely) been (completely) dismantled.

I assume the structure shown in 10, with the main verb obligatorily moving up to v, and direct objects in Spec,VP. Adverbs can adjoin to vP, as shown, but if adjoined to the lexical VP they may only adjoin to the right (for reasons discussed in Ernst 2002); this accounts for the usual ban on adverbs between verbs and their DP objects.



11-13 provide further examples showing that Chinese Low adverbs can go to the left or right of BA and BEI (and their object) (11-12), though not to the left of modals (13):

(11) a. Fanran (hen yonglide) bei jingcha (hen yonglide) tui dao chezi limian.
 Criminal very forcefully BEI police very forcefully push to car in
 "The criminal was forcefully pushed into the car by the policeman."

b. Chezi (zhijie) bei Xiao Wang (zhijie) kaihuiqu-le.
 car directly BEI Xiao Wang directly drive.back-PRF
 "The car was driven straight back by Xiao Wang."

c. Fangjian (wanquan) bei (wanquan) shoushi ganjing le.
 room completely BEI completely pick.up clean PRF
 "The room was completely cleaned up."

(12) a. Lisi (qingqingde) ba zhuozi (qingqingde) qiao-le yixia.
 Lisi lightly BA table lightly knock-PRF once
 "Lisi lightly knocked once on the table."

b. Zhangsan (wanquan) ba qiang (wanquan) ca ganjing le.
 Zhangsan completely BA gun completely wipe clean PRF
 "Zhangsan wiped the gun completely clean."

(13) a. *Jingcha jinjinde neng(gou) zhua-zhu neige fanren.
 police tightly can hold that criminal
 "The policeman tightly can hold the criminal."

b. *Bianlun zhong, duishou dashengde yinggai fanbo.
 debate middle opponent loudly should retort.
 "During a debate, opponents loudly should retort."

In order to address the problem of the English-Chinese difference, we must look briefly at the theory of adverbial distribution that I assume, laid out in 14 (see Ernst 2002 for a fuller exposition):

(14) Properties of the theory

- a. Adverbials are adjoined to XP or X' nodes
- b. For the most part, adverbials may adjoin wherever they receive their proper interpretation (as determined by their lexical requirements, requirements of other lexical items, and principles of semantic composition for adverbials)
- c. There are broad principles of syntax-to-semantics mapping for adverbials, e.g.
 - i. Event-descriptions and proposition-descriptions are built up in layers
 - ii. Low (event-internal) interpretations are barred above vP (to be revised)
- d. A given clausal projection (VP, vP, AspP, etc.) does not necessarily always map to the same semantic entity (event, proposition, etc.).

14a indicates that there are relatively few restrictions on adverb syntax per se – adverbs are adjoined, not in Spec positions as in some approaches,³ and adjunction is free in principle. For the most part, adverbials may adjoin wherever they receive their proper interpretation, determined in part by the lexical requirements of the adverbial in question, by the requirements of other lexical items, and by general principles of semantic composition for adverbials. For example, a speaker-oriented adverb like *xingkui* “fortunately” in 15 must precede negation:

- (15) Zhangsan (*bu) xingkui (bu) yao ba chezi mai-diao.
 Zhangsan not fortunately not will BA car sell-off
 “Zhangsan is (*not) fortunately (not) going to sell his car.”

As shown in Ernst 2008, 2009, this is accounted for because adverbs of this type are positive polarity items, which amounts to a lexical requirement that they not be in the local scope of negation or a similar operator. 16 illustrates the effect of broad principles of semantic composition for adverbials, specifically 14c (i), i.e. event-descriptions and proposition-descriptions are built up in layers (this is as opposed to a very general conjunctive, Neo-Davidsonian mechanism, as in Pietroski 2005, for example):

- (16) a. Xiaoming (haoxiang) jingjingde (*haoxiang) zuozhe.
 Xiaoming apparently quietly apparently sit-Dur
 “Xiaoming is (apparently) quietly (*apparently) sitting.”

(17) PROPOSITION > EVENT > EVENT-INTERNAL

³For discussion of cartographic, “F-Spec” approaches to adverbials, see Cinque 1999, 2004.

Without going into details here (see Ernst 2002: ch. 2), the informal template in 17 shows event-internal modifiers may create new event-descriptions from a basic predicate, which represents an event, as in basic manner modification. A sentence may then have an event-modifier, such as the agent-oriented *wisely* or *hen congmingde* illustrated above, combining with a completed event including event-internal modifiers. Finally, this event becomes “part” of a proposition, which may take propositional modifiers such as speaker-oriented adverbs, like *haoxiang* “apparently” in 16. The ordering in 17 is rigid, so that once you start using event-modifiers you cannot go back and perform event-internal modification; once you start using propositional modifiers, you can no longer do event-modification. This explains why 16 is ungrammatical with the second occurrence of *haoxiang*: once the latter combines with a proposition corresponding to *Xiaoming zuozhe* “Xiaoming is sitting,” it is impossible to add the event-internal modifier *jingjingde* “quietly.”

An important implication of this system is that (as stated in 14d) a given projection does not always map to the same semantic object. It is important to emphasize this point, because there is a common background assumption that this is the case, e.g. that vP always maps to some sort of an event-description, IP always maps to a proposition, and so on. I explicitly deny this, and in fact there is evidence to this effect. 18 illustrates the point:

- (18) a. Tim [P had [E cleverly [E frequently [E not [E always [E returned his library
books]]]]]
b. Bob [P has [P not [P obviously [E returned his library books]]]

In 18a, the basic event description represented by the vP *returned his library books* is augmented by the event-modifier *always*, the resulting event description then being modified by *not* – which I take to be either an event-modifier or a propositional operator – and so on upward, until we have the full proposition. In 18b, on the other hand, the adverb *obviously*, which modifies a proposition, adjoins to vP and turns the basic event-description into a proposition, which can then be modified by propositional negation. Crucially, both *always* in 18a and *obviously* in 18b adjoin to vP, though the resulting vP represents an event in the first case and a proposition in the second.

Now we are ready to turn to the main issue: given the schematic adjunction sites shown in 7-8, why is it that English allows Low adverbs only when adjoined to vP, while Chinese allows them in a higher position? In earlier work I proposed, in essence, that vP-adjunction was universally the highest adjunction site for Low adverbs, but given the Chinese facts, this must be revised.

3. Solutions that Will Not Work

We can start by examining several solutions that may seem promising given the

recent literature, but which can be shown not to work. One possibility is to say that vP is indeed the universal domain for Low adverb modification, but that, as illustrated in 19, Chinese phrase structure is such that both BA and BEI are within vP:

(19) [_{vP} v [_{BEIP} BEI [_{BaP} BA [_{vP} DP [_{v'} V XP]]]]]

To some extent, evaluating this proposal depends on precisely what properties one imputes to v, but at least on the most common current assumptions 19 has a number of difficulties. First, if we take the usual stance that the main verb moves to v (as seems necessary on the common assumption that v represents the locus of causative meaning in a lexically decomposed predicate), then 19 clearly gets the wrong word order for Chinese BA and BEI sentences, since the latter two always precede main verbs. Moreover, such raising ought to be impossible by the Head Movement Constraint, which blocks raising of one head over another, as would be the case in 19. But if raising does not occur, then the semantic requirements of at least transitive verbs with Agent subjects are not met. Second, we would have to parameterize, or otherwise explain, the variant order of the passive head and v, which normally occur in the opposite order from that shown in 19. In effect, 19 reduces v to a mere marker of the Low range for adverbs, with no other advantage and plenty of problems.

A second way of approaching the Chinese-English distinction with respect to Low adverb licensing would be to say that the languages differ in which heads license which sort of adverbial modification (see Tang 1990 for an analysis of Chinese adverbials that would be amenable to this). On such an approach, illustrated in 20, one might say that English V and v have features that license manner adverbs but the passive *be* and higher Auxiliaries do not – this would account for why English Low adverbs cannot go to the left of any auxiliaries – while in Chinese the whole set including V, v, BA, and BEI bear such features.

(20) a. English: V, v = [+Manner] b. Chinese: V, v, BA, BEI = [+Manner]
 Passive *be* = [-Manner]

However, aside from being a mere stipulation, with no general value for universal grammar, this presupposes a system of adverb licensing that relies on very specific, often *ad hoc* features that may vary from projection to projection and language to language. As a number of recent works have shown, this sort of theory misses all sorts of generalizations and amounts to little more than lists of adverb positions. So this ought to be rejected as well.

A third group of approaches to the Chinese-English adverb distribution difference involves movement, either of heads around adverbs, or adverbs around heads. The first of these is represented by the well-known theory of Cinque 1999, which is characterized by a rigidly-ordered series of empty functional heads, each of which licenses one class of

adverbs. For the data at issue here, we would need the sequence shown in 21, with manner and degree adverbs indicated by lower case letters and located in Spec positions, licensed by the correspondingly-named heads in capital letters (PASS = BEI):

(21) [_{MannerP} Manner MAN [_{DegP} Degree DEG [_{PassP} PASS [_{BaP} DP BA [_{vP} v VP]]]]]

I and others have extensively discussed the problems with this general type of theory elsewhere, so I will not go into great detail here. But there are two points to make. First, the general word order freedom of manner and degree adverbs with BA and BEI shown above adds weight to a prime argument against this general framework, i.e. there is no general rigidity among adjuncts, as Cinque claims.⁴ This is illustrated further in 22, where *changchang* “frequently” and *guyi* “intentionally” can occur in either order.

(22) Ta (guyi) changchang (guyi) zao hui-jia.
 s/he purposely often purposely early go-home
 “S/he purposely often goes home early.”

Second, the required head movements are quite problematic, since in a structure like 21, both BA and BEI would have to move up over the degree and manner adverb heads, sometimes both of them in the same sentence, to obtain the orders where the adverbs follow BA and BEI. These movements (i) have no independently motivated triggers or justified landing sites, (ii) violate the usual constraints on head movement (HMC), and (iii) cannot get word order right unless BA’s object DP also moves, which ends up being very stipulative.

An alternative movement approach to the adverb data would involve raising the adverbs, as sketched out in 23, where English represents the base order for both languages, but Chinese allows raising of the manner adverb to either of two higher positions:

(23) a. English: Subject *have* *be* MANNER V
 b. Chinese: Subject *you* MANNER_i BEI t_i BA t_i V

But this suffers from a number of drawbacks as well: (i) it would violate the apparent ban on adverb-specific movements; (ii) it would require ad hoc movements and movement triggers; and (iii) it would have no obvious way to explain why cross-linguistic variation exists.

Thus it seems like the approaches outlined here all have significant problems, and we should seek a more general, less problematic approach.

⁴For further discussion, see Ernst 2002, 2009, Tang 2001, van Craenenbroeck 2009, and references cited there.

4. Proposal

The difference between Chinese and English can be handled if we define the range where Low adverbs are licensed in terms of the lexical VP plus a small number of light verbs above the VP, taking BA and BEI as two of the relevant light verbs. In order to do this, and especially to get the correct left edge of the Low range, we must look at the different types of light verbs.

There is a vast confusion in the literature about what counts as a light verb, as Butt (to appear) makes clear. One common referent for the term *light verb* in the current formal-syntax world is the covert head usually noted *v*, or variants of this, serving as a building block for verbs in a decompositional framework; thus *v* might have the value of CAUSE, as indicated in 25. This type is noted on the scale in 24 as a *decompositional v*:

- (24) Lexical V > *Suru*-LV > Aux V > “Fully Functional V” > Decompositional v
 a. [-----[+overt]-----]
 b. [-----[+light]-----]
 c. [+internal] [-internal] [-----[+internal]-----]

- (25) a. b. Hal shelved the books.
- The syntax tree for (25) a. shows a vP branching into a head *v* (labeled CAUSE) and a VP. The VP branches into a DP (the books) and a V. The V branches into a V (BE(COME)) and a PP ((on) shelf). The PP is shown as a triangle above the text '(on) shelf'.

Another common referent is the original usage of the term, a verb that acts morphologically like a main lexical verb, but which is bleached of meaning and typically combines with some other element to form a predicate. I will refer to these as *suru*-type light verbs, after the well-known Japanese exemplar *suru*; these stand close to lexical verbs on the left of the scale in 24. 26 provides an example from Urdu (Butt, to appear), where the verb in sentence-final position, glossed as “do,” combines with the noun meaning “memory”:

- (26) nadya=ne kahani yad k-i.
 Nadya.Msg-Erg story.Fsg memory.F do-PRFsg
 “Nadya remembered the story.”

In between these two types are auxiliary verbs and what I will call, for lack of a better term, “Fully Functional” light verbs. It must be stressed that there is little agreement across frameworks or even within frameworks about how to draw dividing lines between light verbs, auxiliary verbs, serial verbs, and the like. I will take the stance that auxiliary verbs typically express notions like modality, tense, aspect, and voice, and that they differ from both main verbs and *suru*-type light verbs in a given language in some significant and consistent way. Thus in English, of course, auxiliaries express these notions but also differ from main verb in their position in negative and interrogative sentences (see 27-28), and in their rigid ordering preceding main verbs. In Urdu, using different criteria, light verbs reduplicate as in 29a, while auxiliaries do not (cf. 29b (Butt, to appear)):

- (27) a. Dan has not left.
 b. *Dan left not.

- (28) a. Has Dan __ left?
 b. *Left Dan __ ?

- (29) a. vo so →a-ti (vati) t^hi
 Pron.3.sg.Nom sleep go-Impf.F.Sg go-Redup be.Past-Sg.F
 “She used to go to sleep.”
 b. vo so rah-i (*vahi) t^hi
 Pron.3.sg.Nom sleep Prog-F.Sg Prog-Redup be.Past-Sg.F
 “She used to keep going to sleep (at inopportune moments).”

I propose that BA and BEI belong to a class partway between true auxiliaries and decompositional light verbs, and that they thus contrast with English *have* and *be*, which are true auxiliaries. BA and BEI obviously are overt, and so are not decompositional light verbs. But they are clearly not auxiliary verbs either. First, they lack the typical modal, tense, or aspectual meanings associated with auxiliaries. These meanings are external to basic argument structure, whereas BA and BEI are both internal in some sense, either having effects on argument structure (the passive BEI) or marking a site for a verbal object (BA).

Second, BA and BEI do not have all the morphological properties of either English or Chinese main or auxiliary verbs, nor do they license gaps as main and auxiliary verbs do.

Note first that English auxiliaries, exemplified by *have* in 27-28, not only have external meanings as discussed just above, but also license gaps, as in 30.

(30) Addie hasn't left, but Dan has ___.

31-33 illustrate how BA and BEI differ from Chinese auxiliaries and main verbs. 31-32 show that BA and BEI do not take aspect markers like the perfective *le*; though Chinese modals do not take aspect markers either, they allow the A-not-A question form, while BA and BEI do not, as shown in 31-32. It is true that some speakers accept some cases of the A-not-A form with BA and BEI, but this is rarer and much less productive than with, say *hui* “will” or the perfective *you* (see 33):

- (31) a. *Ta bei-le ren sha.
 s/he PASS-PRF person kill
 “S/he was killed by a person.”
 b. *Ta bei-bu-bei ren sha?
 s/he PASS-not-PASS person kill
 “Is s/he killed by a person?” (Li 1990: 159)

- (32) a. *Ta ba-bu-ba shui fang-zai guo li?
 s/he BA-not-BA water put at pot in
 “Does s/he put the water into the pot?”
 b. *Ta ba-le shui fang-zai guo li.
 s/he BA-PRF water put at pot in
 “S/he put the water into the pot.” (Li 1990: 186)

- (33) a. Ni hui-bu-hui guolai?
 you will-not-will come.over
 “Can you come over?”
 b. Ni you-mei-you chi bingqilin?
 you PRF-not-PRF eat ice.cream
 “Did you eat ice cream?”

Also, 34-35 show that BA and BEI cannot function as one-word answers – that is, they cannot license gaps – in the way that *hui* “will” or the perfective *you* can in 35:

- (34) a. Zhangsan bei ren kanjian-le ma? *Bei.
 Zhangsan BEI person see-PRF Q BEI
 “Was Zhangsan seen by anyone? Was.”
 b. Wangwu ba beibao nazou-le ma? *Ba.
 Wangwu BA backpack take.away-PRF Q BA
 “Did Wangwu take the backpack away? Ba.”

- (35) a. Ta hui mashang guolai ma? Hui.
 s/he will immediately come.over Q will
 “Will s/he come over right away?”
- b. Ta you-mei-you chi bingqilin? You.
 s/he PRF-not-PRF eat ice.cream PRF
 “Did s/he eat ice cream? Did.”

Given these differences, and now taking BA and BEI as an identifiably separate class of light verbs from true auxiliaries, we may formulate the proposal for the Low range in 36:

- (36) Event-Internal Modification is licensed only within [+V, +Internal] projections.

36 seems to make the right cut for the features shown in 24 (I ignore features for *suru*-type light verbs here, as irrelevant to the issue at hand). 36 allows manner and degree adverbs to adjoin to BA and BEI phrases in Chinese, as well as to the vP, while in English such adverbs may only adjoin as high as vP, since English has no overt Fully Functional light verbs (i.e. internal light verbs aside from *v*) – only auxiliaries. Note especially that the rightmost possible English auxiliary verb, the passive *be*, is internal just as BEI is, since it represents Voice and thus relates to the main verb’s argument structure; however, English auxiliary verbs have more properties of main verbs than do BA and BEI, so the passive *be* counts as a true auxiliary verb and therefore does not license Low adverbs. Thus [+internal] must be taken as a partly arbitrary feature, mixing semantic and morphosyntactic criteria.

5. Implications

36 could be seen as defining the Low range as an extended VP excluding auxiliary verbs. BA and BEI are fully functional in the way that decompositional *v* is, as shown by their functional meanings and their lack of any true verbal morphology. The difference between English and Chinese is that English lacks fully functional light verbs of this sort, while Chinese has them.

Does this proposal have any implications for the BA and BEI constructions? For BA, there are no problems if we take the construction to be monoclausal, as illustrated in 37; various analyses are compatible with the adverb facts shown here as long as BA takes some sort of VP complement along these lines. As for BEI (see below), if BA were to take a clause as its complement, then the pattern in 38 (=12a), with manner adverbs above as well as below BA and its object, would be incorrectly predicted ungrammatical.

- (37) [_{IP} DP Infl [_{BaP} BA [_{vP} DP [_{v'} v VP]]]]

- (38) Lisi (qingqingde) ba zhuozi (qingqingde) qiao-le yixia.
 Lisi lightly BA table lightly knock-PRF once
 “Lisi lightly knocked once on the table.”

The implications for BEI are more significant. Consider the analysis of long passives in Huang 1999 (cf. Ting 1998): its main points are schematized in the tree in 39 (reformatted from Huang et al. 2009: 120):

- (39) [IP NP ... [_v' V [IP NOP [IP NP ... [_v' V NP]]]]
 Zhangsan_i bei OP_i Lisi da-le t_i
 “Zhangsan was hit by Lisi.”

Without going into all the data and justifications for this structure, what is important for present purposes is that BEI takes an IP complement, and this IP contains a null operator NOP, representing the direct object, which has been A'-moved to the beginning of that IP. This operator is in turn identified with the subject of BEI, *Zhangsan* in 39, so that even though *Zhangsan* has not actually moved from object position as is usually assumed for passives, it is interpreted as the verb's object. I accept the evidence that (a) BEI is a clausal head, not a preposition taking its object inside a PP, and that (b) movement of the direct object has the properties of A'-movement (see Ting 1998, Huang 1999 or Huang et al. 2009).

What is at issue here is the identity of BEI's complement: given the adverb facts discussed above, it is difficult to see how a coherent theory of adverb licensing could take this category as an IP, because if it is, then Low adverb interpretation should be impossible. To see this, consider 40a, a version of 39:

- (40) a. Zhangsan bei [_{IP} OP_i Lisi INFL [_{vP} da-le t_i]]
 b. Zhangsan bei [_P OP_i Lisi INFL [_E da-le t_i]]

As noted earlier, adverbial modification proceeds by building up event-descriptions and proposition-descriptions. If we take Infl as finite, with some sort of world-time index to which the perfective marking in this sentence relates, then the IP must represent a proposition, as indicated in 40b by the subscripted P on the IP bracket; regardless of the precise semantic reasoning, it is uncontroversial that an IP normally represents a proposition. This being so, adverbs to the left of BEI should not be able to modify the verb in the lower clause. Yet clearly they can; for example, in 41b, *jinjinde* “tightly” modifies *zhuazhu* “hold”; on Huang's analysis, where the meaning of BEI is something like “to be affected by”, then 41b would have to mean “The criminal was tightly affected by being held by the policeman.”

- (41) a. Tuhua (hen jingquede) bei Wangwu (hen jingquede) ke zai tongban shang.
drawing very precisely PASS Wangwu very precisely carve at copperplate on
“The drawing was carved precisely onto the copper plate by Wangwu.”
b. Fanren (jinjinde) bei jingcha (jinjinde) zhuazhu-le.
criminal tightly PASS police tightly hold-PRF
“The criminal was held tightly by the policeman.”

As others have pointed out in the literature (e.g. Li 1990, Kuo 2010), there are further indications that BEI does not take an IP. For example, neither modals nor negation can occur to the right of BEI, as shown in 42a-b:

- (42) a. Zhangsan (dei) bei Lisi (*dei) jiaoxun yiduan.
Zhangsan must BEI Lisi must scold once
“Zhangsan must be scolded once by Lisi.”
b. Zhangsan bei Lisi (*bu) xuan-wei duizhang.
Zhangsan BEI Lisi not choose-be captain.
“Zhangsan was(*n’t) chosen as captain by Lisi.”

Note in particular that meaning cannot be used to rule such sentences out; again, on Huang’s proposal, 42b with negation (for example) ought to mean that Zhangsan was affected by not being chosen as captain – a perfectly coherent proposition. Similarly, time adverbials do not go comfortably after BEI:

- (43) a. *Zai bianlun zhong, Lisi bei duishou gangcai fanbo-le.
at debate in Lisi BEI opponent just-now rebut-PRF
“In the debate, Lisi was rebutted just now by his opponent.”
b. *Zhangsan bei Lisi zuotian xiao. (Li 1990: 161 (14c))
Zhangsan BEI Lisi yesterday laugh
“Zhangsan was laughed at by Lisi yesterday.”

Some cases of this order do seem to be acceptable, but the fact that they are not fully productive is in fact better handled if they are more deeply embedded in vP than adjoined to IP, since there are heavier restrictions on time adverbials in more deeply embedded positions (see Ernst, to appear).

The facts just reviewed can be accommodated by saying instead that BEI takes a vP, or a BaP when the two cooccur (cf. Li 1990, Kuo 2010). The rest of Huang’s analysis may stand, giving the structure shown in 44:

- (44) [_{IP} NP ... [_{v'} V [_{vP} NOP [_{vP} NP ... [_{v'} V NP]]]]]
Zhangsan_i bei OP_i Lisi da-le t_i
“Zhangsan was hit by Lisi.”

Similarly, the advantages of this style of analysis are preserved, such as the anaphor-binding facts in 45 (which depend on *Lisi* being a subject, as it still is in 44, given the generation of VP-internal subjects in Spec,vP), and the constituency facts illustrated in 46 (Huang et al. 2009: 117), with BEI being a clausal head taking a clause-type complement, not a preposition taking a nominal complement:

(45) Zhangsan_i bei Lisi_j dai-hui ziji_{i/j} de jia.
 Zhangsan BEI Lisi take.back self 's home
 "Zhangsan was taken back to self's home."

(46) (?) Zhangsan bei Lisi ma-le liang sheng, Wangwu ti-le san xia.
 Zhangsan BEI Lisi scold-PRF two time Wangwu kick-PRF three time
 "Zhangsan was scolded twice by Lisi and kicked three times by Wangwu."

Finally, and most important for present purposes, we account for the facts of adverbial distribution. The manner and degree adverbials are of course expected adjoined to vP, or to BaP, given the fact that BaP does not require mapping to a specific type of semantic entity. Additionally, as expected given that vP also allows event-modification by participant PPs like locative and instrumental phrases, both of these types are possible to the right of BEI, as shown in 47a-b:

(47) a. Zai bianlun zhong, Lisi bei duishou zai wutai shang fanbo-le.
 at debate middle Lisi BEI opponent at stage on retort-PRF
 "In the debate, Lisi was rebutted on stage by the opponent."
 b. Wangwu bei tade pengyou yong shengzi bangqilai-le.
 Wangwu BEI his friend use rope tie.up-PRF
 "Wangwu was tied up with a rope by his friend."

There is at least one remaining problem: that of the so-called short passives, which have BEI without a following nominal. The adverb distribution facts for short passives are not entirely clear, and show certain complications, but it is at least certain that they are different from the long passive patterns. So, for example, while the long passive allows both locatives and instrumentals after BEI, the short passive seems only comfortable with instrumentals, as 48 shows. As might be expected, it allows manner adverbials after BEI (as in 49) but not time adverbials (as in 50).

(48) a. *Zai bianlun zhong, Lisi bei zai wutai shang fanbo-le.
 at debate middle Lisi BEI at stage on retort-PRF
 "In the debate, Lisi was rebutted on stage by the opponent."

b. Wangwu bei yong shengzi bangqilai-le.
 Wangwu BEI use rope tie.up-PRF
 “Wangwu was tied up with rope by his friend.”

(49) Lese bei (Zhangsan) buxiaoxin(de) diu zai dishang.
 garbage BEI Zhangsan carelessly throw on floor
 “The garbage was carelessly thrown on the floor by Zhangsan.”

(50) *Zhangsan bei (Wangwu) zuotian ma-le yi-dun.
 Zhangsan BEI Wangwu yesterday scold-PRF one time
 “Zhangsan was scolded yesterday by Wangwu.”

So it does not seem straightforward to treat both kinds of passive as taking the same sorts of vP. More work needs to be done to account for these facts.

6. Conclusions.

In this paper I have tried to account for the distribution of Mandarin Chinese Low adverbs, especially the fact that they can occur to the left of BA and BEI. The goal was to contribute to a universal theory of adverbial licensing, and also to account for the difference between Chinese and English in this regard, as schematized in 8:

- (8) a. English domain for Low adverbs: T - Mod - Perf - Prog - Pass - [v - V]
 b. Chinese domain for Low adverbs: Infl - Mod - Asp - [Pass - BA - v - V]

The crucial proposal was given in 36 (repeated here). It says, in essence, that rather than define the left edge for Low adverbs simply in terms of vP, we should define it in terms of projection of fully functional, internal light verbs.

(36) Event-Internal Modification is licensed only within [+V, +Internal] projections.

I also tried to show that, if this sort of analysis is correct, then BEI takes a vP complement (or some other constituent smaller than a full clause), as opposed to the IP that is often assumed.

It must be admitted that 8 (especially the feature [+internal]) represents little more than a description as it stands, and one would certainly hope for something more principled and integrated into a universal system of both light verbs and adverbial licensing. Perhaps this will serve as a starting point.

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