

On some mysteries, asymmetries and derivation of potential *de* construction in Chinese

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In this paper, some mysteries and asymmetries of the Chinese potential *de* construction are investigated. It is shown that a morphosyntactic approach is conducive to accounting for these puzzles. First we explore the possibility of taking *de* and its negative counterpart *-bude* as functional heads (cf. Tsai 2001; T. Wu 2004). It is proposed that *bude* could be a functional head with the negative potential (i.e. impossible/impermissible) meaning. This could be evidenced by both empirical data and theoretical deduction. It is argued that *bu* in *V-bu-R*, which is distinct from the normal pre-verbal negative morpheme *bu*, is actually *bude*. This helps to explain why the negative potential meaning is involved in *V-bu-R*. Meanwhile, *V-de/bude* and *V-de/bu-R* are both assumed to be formed through Morphological Merger (cf. Marantz 1988; Embick & Noyer 2001, 2007, etc.). Meanwhile, we have discussed some asymmetries observed between *V-de/bude* and *V-de/bu-R* and some paradigmatic asymmetries between potential *V-de* construction and its negative potential *V-bude* construction. It is assumed that these syntactic asymmetries may be due to some morphological operations related to *de* and *bude*.

Keywords: *de*, *bude*, syntax-morphology interface, morphological merger

1. Introduction

Compared with the extensive discussion on the resultative *V-de* construction and descriptive *V-de* construction, only a few scholars have touched upon the potential *de* construction within the generative grammar circle, including Li (1990), Tsai (2001), Cheng & Sybesma (2003, 2004), T. Wu (2004), Hu (2010), Chung (2012), Xie (2012), Cheng & Xiong (2014), Williams (2014), etc. In this paper, we shall concentrate on the potential *de* construction in Mandarin Chinese, which are exemplified in the two following sub-types:

V-*de/bude*:

- (1) a. zhe ben shu kan-*de*.
 this CL book read DE
 'This book can be read.'
- b. zhe ben shu kan-*bude*.¹
 this CL book readBUDE
 'This book couldn't be read.'
- (2) a. ?*bieren de yijian ting-*de*.²
 other.person *de* advice listen DE
 'Other people's advice can be adopted.'
- b. bieren de yijian ting-*bude*.
 other.person *de* advice listen BUDE
 'Other people's advice can't be adopted.'

V-*de/bu-R*:³

- (3) a. ta kan-*de*-dong zhe ben shu.
 he read DE understand this CL book
 'He can understand this book (from reading).'
- b. ta kan-*bu*-dong zhe ben shu.
 he read BU understand this CL book.
 'He cannot understand this book (from reading).'

Departing a bit different from previous literature, we have included V-*de/bude* as a major type of potential sentence in Mandarin Chinese. The permission reading of *de* is involved in (1)–(2), and ability reading is involved in (3). In this article, we shall follow Li & Thompson (1981), Cheng & Sybesma (2003), and T. Wu (2004) in

 1. The abbreviations used in this article are as follows:

BUDE	negative potential <i>de</i>	Mod(P)	modality (phrase)
CL	classifier	Neg	negative
DE	potential <i>de</i>	NP _T	NP as Theme
<i>de</i>	attributive marker <i>de</i>	NP _P	NP as Patient
DRP	durational phrase	Perf	perfective marker
DUR	durative marker	Q	question marker
FP	frequency phrase	R(ES)	result
inch	inchoative marker	v	verb
MM	morphological merger	voice(P)	external argument introducer (phrase).

2. Thanks go to Yang Shen for discussion related to this example.

3. *-de* and *-bu* in V-*de/bu-R* are traditionally called potential infixes (Chao 1968; Li & Thompson 1981; Thompson 1973; Zhu 1982, etc.). Wang (2010: 37–40) argues against such an infix analysis. In this paper, we shall take them as affixes.

using the broad term “potential” to describe both the ability reading and permission reading of *de* (cf. Xie 2012).⁴

In the literature, the ability/permission modals are often classified into a broader dynamic modality category, which is distinct from epistemic modals (Portner 2009: 135, 140; J. Lin 2012: 154). Following Tsai (2001: 148–149), T. Wu (2004) assumes that *de* has both an ability reading and an epistemic reading and the two interpretations can be teased apart via appropriate contexts. Xie (2012) disagrees with this and proposes that whether or not the modal particle *de* has an epistemic reading is subject to dialectal variation. This can be evidenced by the following example:

(4) Lisi **bu-neng** kan-*de*-dao zhe ke shu.

Lisi not-can chop DE fall this CL tree

a. ‘It is impossible for Lisi to chop the tree down.’

b. ‘Lisi is unable to chop the tree down.’

c. ‘It is impossible for Lisi to be able to chop the tree down.’

(adapted from e.g. 8, T. Wu 2004: 278)

As a Mainland speaker of Mandarin, I find it difficult to combine the negative *buneng* with potential *-de* to get a negative meaning; so, for me, example (4) is not good. Therefore, we follow Cheng & Sybesma (2003) in assuming that *de* expresses the “potential” reading only; and the epistemic reading, if there is one, is introduced through a covert epistemic modal verb like *keneng* ‘possible’ (cf. J. Lin 2012: 154), as in (5). In the following section, we shall discuss some mysteries and asymmetries observed in the potential *de* construction. We discuss grammaticalization of *de* and *bude* in Section 3 and take them as functional heads in Section 4. We explore the derivation of V-*de/bude* and V-*de/bu*-R respectively in Section 5 and Section 6. In Section 7, we revisit the observed puzzles and asymmetries from

4. Xie (2012) distinguishes the ability reading of *de*, as in (i), from the opportunity reading and the disposition reading, as respectively in (ii) and (iii). The criterion is that agentivity is involved in the ability reading of *de* (cf. Hackl 1998), but not in the other two readings.

(i) Zhangsān yigeren bān-*de*- qilai nà xiàng shū. (ability)

Zhangsan alone lift DE up that CL book

‘Zhangsan can lift up the box of books all by himself.’ (Xie 2012: (1))

(ii) mufa shūnzhè shuǐliú huà -*de*-xiàlái. (opportunity)

wood.raft along current slip DE down

‘The wood raft can slip down (on its own) along the currents.’ (Xie 2012: (6))

(iii) xiǎoxiǎo qiǎnjīng chéng-*de*-qǐ yī liàng dà kǎchē. (disposition)

tiny car jack hold DE up one CL big truck

‘The car jack, though tiny, can hold up a big truck.’ (Xie 2012: (11))

a morphosyntactic perspective. Finally we come to the conclusion and discuss some unsolved problems for future research.

- (5) *ta* (**keneng**) *kan -de/bu-* *dong zhe ben shu.*
 he possible read DE/BU understand this CL book
 ‘It is possible that he can/could not understand this book through reading.’

2. Some mysteries and asymmetries in potential *de* construction

2.1 Adverbial modification

2.1.1 *Manner adverbial restriction*

In discussing adverbial modification of V-*de* constructions, Li (1963[1994]: 16) points out manner adverbials are seldom used in V-*de* construction. One example by Li is in (6).

- (6) *ta men zhe tou zou -de feikuai.*
 he stuffy Dur head walk DE very.fast
 ‘He walked silently with his head low.’

Li assumes that the manner adverbial *men zhe tou* ‘silently with his head low’ in (6) is not a modifier of *zou* in *zou-de*. According to him, there are actually two *zou* ‘walk’ involved in (6) and manner adverbial *men zhe tou* modifies the first verb *zou*, but not the one in *zou de feikuai* ‘walk fast’. Along these lines, (6) should be analyzed as (7).⁵

- (7) *ta men zhe tou zou, zou -de feikuai.*
 he stuffy Dur head walk walk DE very.fast
 ‘He walked with his head low and walked very fast.’

Inspired by Li’s observation on the manner adverbials in sentences like (6), we find manner adverbials (cf. Li & Thompson 1981: 322–323; Ernst 2014: 52) are barred from the potential *de* construction (cf. T. Wu 2004), as in (8)–(9).⁶

- (8) **zhe ben shu manmande kan -de/bude.*
 this CL book slowly read DE/BUDE
 Intended meaning: ‘This book can/could not be read slowly.’

5. There is another possibility, as suggested by James Huang (p.c.), that *ta men zhe tou* can be an independent clause. Under this situation, *men zhe tou* does not modify the *zou* in *zou de hen kuai* either.

6. T. Wu (2004: 289–290) assumes that there is LF movement from *De*⁰ to covert Modal⁰ in V-*de/bu*-R construction and manner adverbials intervene between this LF movement.

- (9) *Lisi **manmande** kan-*de/bu*-dao zhe ke shu.
 Lisi slowly chop-DE/BU-fall this CL tree
 Intended meaning: ‘Lisi can/cannot slowly chop the tree down’
 (T. Wu 2004: 288 (22d))

It seems that the manner adverbial restriction is not due to semantic incongruity, as the following sentence is fully grammatical.⁷

- (10) Lisi **neng manmande** kan-dao zhe ke shu.
 Lisi can slowly chop-fall this CL tree
 ‘Lisi can slowly chop this tree down.’
 (T. Wu 2004: 288 (21d))

The restriction of manner adverbial modification in the potential *de* construction is an interesting topic; however, as far as I know, it has not received enough attention in the literature except in T. Wu (2004: 289–290).⁸ What is more interesting is that not all adverbs are barred from occurring in potential *de* construction.

7. James Huang points out that (10) is a resultative sentence and a resultative is dynamic, and it can be modified by a manner adverbial. A potential sentence, as in (9) is stative, and therefore cannot be modified by a dynamic adverbial. However, according to me, both the potential reading and the resultative reading are involved in (9)–(10) and it seems hard to distinguish these two readings.

8. Chung (2012) investigates the interaction between manner adverbs and postverbal modal *teh* in Hakka. Specifically she discusses the *V-tet* construction (the counterpart of *V-de* in Chinese) and the *V-tet-R* construction (the counterpart of *V-de-R* in Chinese) in Hakka. Interestingly, she points out that manner adverbials are barred from occurring in *V-det* construction, as in (i), but not in *V-tet-R* construction, as in (ii). The case of *V-tet* is the same with the case of *V-de* in Chinese, while the case of *V-tet-R* is a bit different. According to Chung (2012: 89–94), when a manner adverbial, such as *manmande* ‘slowly’, is placed after *V-tet-R*, the sentence is ill-formed, as in (iia); while when a manner adverbial is placed before *V-tet-R*, the sentence is good, as in (iib). This is quite different from what we have found in *V-de-R*, in which manner adverbials are barred from occurring, regardless of whether they are placed before or after *V-de-R*.

- (i) a. *Amin **siid-tet** *manman-e* ia-von fan.
 Amin eat -TET slowly this-CL rice
 Intended meaning: ‘Amin can [is permitted to] eat this bowl of rice slowly.’
 b. *Amin *manman-e* **siid-tet** ia-von fan.
 Amin slowly eat -TET this-CL rice
 Intended meaning: ‘Amin can [is permitted to] eat this bowl of rice slowly.’
 (ii) a. *Amin **siid-tet-log** *manman-e* ia-von fan.
 Amin eat-TET-RES slowly this-CL rice
 Intended meaning: ‘Amin can [will manage to] eat this bowl of rice slowly.’
 b. Amin *manman-e* **siid-tet-log** ia-von fan.
 Amin slowly eat-TET-RES this-CL rice
 ‘Amin can [will manage to] eat this bowl of rice slowly.’ (Chung 2012: 90 (34a, 35a))

Those adverbs, which are structurally higher than manner adverbs, do not observe such restrictions (Chunhong Shi, p. c.). For instance, perfect-related adverbs like *changchang* ‘often’, *yijing* ‘already’ (cf. Chen 2008; Cinque 1999) in (11) and sentence adverbs, for instance, epistemic modals like *keneng* ‘possible’, *dagai* ‘probably’ (cf. J. Lin 2012; Tang 2001) in (12) can occur in potential *de* construction.⁹

- (11) ta **yijing** ting-*de*-dong wo shuo *de* hua le.
 he already listen-DE-understand I say *de* words INCH
 ‘He has been able to understand what I say (through listening).’
- (12) ta **keneng** ting-*de*-dong wo shuo *de* hua.
 he possible listen-DE-understand I say *de* words
 ‘It is possible that he can understand what I say (through listening).’

The manner adverbial restriction can also be evidenced by the way it is questioned, which is the focus of the following subsection.

2.1.2 *Manner zenme and question zenme*

According to Tsai (2008), instrumental/manner *how* and causal *how* have been distinguished in English. The answers to instrumental/manner *how* can be manner, instrumental, or resultative, as illustrated in (13).

- (13) A: How did John handle this matter?
 B: a. Quite skillfully, I think. [manner]
 b. By pulling quite a few strings. [instrumental]
 c. Rather successfully, I would say. [resultative]
 (Tsai 2008: 84 (1))

The causal *how*’s have been exemplified as below:

- (14) a. How come John arrived so late? [causal]
 b. How is it that John arrived so late? [causal]
 c. How can John do this to me? [causal/denial]
 (Tsai 2008: 84 (2))

Similarly, in Chinese two major types of *zenme* have been differentiated in Tsai (2008): manner/instrument *zenme* and causal *zenme*.

9. In the literature, *keneng* ‘possible’ is often analyzed as a raising verb, as in Lin & Tang (1995), Huang, Li & Li (2009), etc. On the contrary, Lin (2011: 64–65) argues that an epistemic modal in Modern Chinese, such as *keneng*, takes a finite TP complement instead of a non-finite TP. He assumes that the raising of the subject out of the finite TP is triggered by the EPP feature of the matrix T.

- (15) a. Akiu zenme qu Taipei? [irrealis: instrumental/manner]
 Akiu how go Taipei
 'How will Akiu go to Taipei?'
 b. Akiu zenme qu-le Taipei? [realis/past: causal]
 Akiu how go-PERF Taipei
 'How come Akiu went to Taipei?' (Tsai 2008: 85 (5))

Based on the distinction between manner/instrumental *zenme* and causal *zenme* in Tsai (2008), it is found that only causal *zenme* is available in potential V-*de*-R construction, as illustrated in (16Bc), whereas manner interpretation of *zenme* (16Ba) and instrumental interpretation of *zenme* (16Bb) are not available.

- (16) A. ta zenme kan *-de*-dong zhe ben shu?
 he how read DE understand this CL book
 'How can he understand this book (through reading)?'
 B. a. *ta manmande kan. (*manner)
 he slowly read
 Intended meaning: 'He reads slowly.'
 b. *ta dai yanjing kan. (*instrumental)
 he wear glasses read
 Intended meaning: 'He reads with glasses.'
 c. shi, ta genben kan *-bu*-dong. (Causal/Denial)
 yes he not.at.all read BU understand
 'No, he couldn't understand at all (through reading).'

Similarly, only causal *zenme* is available in V-*bu*-R construction, as in (17).

- (17) A. ta zenme kan-*bu*-dong zhe ben shu?
 he how read BU understand this CL book
 (*instrumental/*manner, causal)
 'How couldn't he understand this book (through reading)?'
 B. wo bu zhidao weishenme.¹⁰
 I not know why
 'I don't know why.'

10. As noted by Yang Gu (p.c.), *weishenme* 'why' in (17B) reflects a 'why' reading of *zenme* in (17A), but not a causal reading. I understand this 'why' reading of *zenme* refers to the reason-*why*. Of course, there might be a reason-*why* reading involved in (17B); however, we could not deny there might be a causal-*why* reading involved in (17B), as (17B) can also be an answer to (17A). If (17B) is interpreted as an isolated sentence, *weishenme* should be interpreted as the reason-*why*. Generally speaking, the reason reading of *weishenme* may also be interpreted as a kind of weak causal reading (cf. Tsai 2008: 90–91).

The causal reading can also be expressed with *weishenme* ‘why’, which is assumed to be structurally higher than manner *zenme(-yang)*, as in Lin (1992), Tsai (1994), Ko (2005), etc.¹¹ The following is such an example.

- (18) ta weishenme kan -de/bu -dong zhe ben shu?
 he why read DE/BU understand this CL book
 ‘Why could/couldn’t he understand this book (through reading)?’

The same contrast between manner *zenme* and causal *zenme* can be observed in the V-*de/bude* construction:

- (19) zhe ben shu zenme kan -de/bude? (*manner/*instrumental, casual/denial)
 this CL book how read DE/BUDE
 ‘How can/couldn’t this book be read?’
- (20) zhe ben shu weishenme kan-de/bude?
 this CL book why read DE/BUDE
 ‘Why can/couldn’t this book be read?’

Tsai (2008) points out that a lexical modal such as *keyi* ‘may’ can separate manner/instrumental *zenme* from causal *zenme*: premodal *zenme* forms a causal question, as in (21b), while postmodal *zenme* forms a manner/instrumental question, as in (21a). Meanwhile, there is a morphological difference between the two: postmodal *zenme* can alternate with a complex form *zenmeyang* ‘how-manner’, while premodal *zenme* cannot.

- (21) a. Akiu keyi zenme(-yang) qu Taipei? [manner/instrumental]
 Akiu can how(-manner) go Taipei
 ‘How can Akiu go to Taipei?’
- b. Akiu zenme(*-yang) keyi qu Taipei? [causal/denial]
 Akiu how(-manner) can go Taipei
 ‘How come Akiu can go to Taipei?’
 ‘Akiu can’t/shouldn’t go to Taipei.’ (Tsai 2008: 85–86 (6))

Using a modal *keyi* as a test, it is found that only premodal *zenme* is grammatical in potential -*de* construction, as shown in (22b), which bears a causal/denial reading. This can also be shown by the way it is questioned, as the causal *zenme* can be questioned by *weishenme* ‘why’ as in (23b), in which *weishenme* can only occur before *keyi* instead of following it, as in (23a).

11. Lin (1992) investigates the syntactic behaviors of *zenmeyang* ‘how’ and *weishenme* ‘why’ in Mandarin Chinese and the asymmetries involved in these two adjuncts.

- (22) a. *ta keyi zenme kan-*de*-dong zhe ben
 he may how read DE understand this CL
 shu? (*instrumental/*manner/*causal)
 book
 ‘In which manner/way can he understand this book (through reading)?’
- b. ta zenme keyi kan -*de*-dong zhe ben shu? (causal/denial)
 he how may read DE understand this CL book
 ‘How can he understand this book (through reading)?’
- (23) a. *ta keyi weishenme kan -*de*-dong zhe ben shu? (*causal)
 he may why read DE understand this CL book
 ‘Why can he understand this book through reading?’
- b. ta weishenme keyi kan -*de*-dong zhe ben shu? (causal)
 he why may read DE understand this CL book
 ‘Why can he understand this book through reading?’

One thing interesting is that when *cai* ‘only’ is introduced in a V-*de*-R construction, the generalization made by Tsai on modals (i.e. *keyi*) and *zenme* seems to be nullified. Under such conditions, what we get is not the *causal* reading, but something like a manner/instrumental reading, as in (24), in which *zenme* can be substituted by *zenmeyang*.

- (24) ta zenme(-yang) cai keyi kan-*de*-dong zhe ben shu?
 he how (-manner) only may read DE understand this CL book
 a. ‘Only in which manner can he understand this book (from reading)?’
 (manner)
 b. ‘*How can he understand this book (from reading)?’ (*causal)

Actually, sentences like (24) are not counterexamples to Tsai’s generalization, as *zenme*, like *zenmeyang*, can be a predicate itself (Tsai 1994: 113), as in (25). Along these lines, *zenme(yang)* in (24) does not modify *keyi* directly, but is a predicate itself. This explains why there is no casual meaning of *zenme* in (24).

- (25) Lisi zenme(-yang) le?
 Lisi how (-manner) PERF/INCH
 ‘What happened to Lisi?’

Through the above discussion, we find that the verbs in potential *de* construction are different from normal verbs. Manner adverbial modification is very restricted and manner *zenme* is not available in potential *de* construction. However, there is no manner adverbial restriction for normal verbs and they can be modified by both manner/instrumental *zenme* and causal *zenme*.

2.1.3 Duration/Frequency phrase restriction

Duration/Frequency Phrases (DRP/FFP) are barred from occurring in potential *V-de/bude* and *V-de/bu-R* constructions, as shown below.

- (26) *zhe ben shu kan -de/bude san ge zhongtou/san ci.
 this CL book read DE/BUDE three CL hour/ three CL
 Intended meaning: ‘This book can/could not be read for three hours/three times.’
- (27) *ta kan -de/bu -dong zhe ben shu san tian/san ci.
 he read DE/BU understand this CL book three CL/ three CL
 Intended meaning: *‘He can/can’t understand this book (from reading) for three days/ three times.’

2.2 Imperative form restriction

Unlike normal verbs, potential *V-(bu)de* and *V-de/bu-R* sentences cannot form imperatives, as in (28)–(29).

- (28) *pao -de/bude ! (imperative reading)
 run DE/BUDE
 Intended meaning: ‘Be able/unable to run!’
- (29) *kan -de/bu- wan! (imperative reading)
 read DE/BU finish
 Intended meaning: ‘Be able/unable to finish the reading!’

2.3 Some asymmetries

Besides the puzzles discussed above, there are some asymmetries observed between different sub-types of the potential *de* construction. First, the *V-de/bude* type behaves differently from the *V-de/bu-R* type. Second, in the *V-de/bude* construction, *V-de* and *V-bude* also behave somewhat differently. In this section, we shall first focus on the symmetries between *V-de/bude* and *V-de/bu-R*, and then we shall discuss the asymmetries between *V-de* and *V-bude*.

2.3.1 Asymmetries between *V-de/bude* and *V-de/bu-R*

2.3.1.1 Case-assignability of *V*'s. Most of the transitive verbs in potential the *V-de/bude* construction have lost their ability to assign accusative case to their canonical objects in Mandarin Chinese, as in (30).

- (30) a. ta xue -guo yingyu.
 he learn EXP English
 'He learnt English.'
- b. *ta xue -*de/bude* yingyu.¹²
 he learn DE/BUDE English
 'He can/couldn't learn English.'

There are a few exceptions to this, such as *she-de* 'can abandon', *she-bude* 'couldn't abandon', *dong-de* 'understandable', *ting-bude* 'can't understand', *kan/jian-bude* 'can't see', *wen-bude* 'can't smell'.¹³ In (31a), both *she-de* and *she-bude* can take their objects; however, in (31b) only the potential *de* reading is available. What is interesting is that the postverbal NP cannot be freely preposed to the verbs, as in (31a', 31b'). As will be seen in § 2.3.1.3, postverbal NPs are often required to be preposed in potential *V-de/bude* sentences. The abnormalities in (31) suggest that these exceptions are not real potential *V-de/bude* sentences and the *V-de/bude* may have been lexicalized as words (cf. Sun 1996).

- (31) a. ta *she-de/bude* zhe ben shu.
 he abandon-DE/BUDE this CL book
 'He can/couldn't abandon this book.'
- a'. *zhe ben shu *she-de/bude*.
 this CL book abandon-DE/BUDE
 'This book can/cannot be abandoned.'
- b. ta *dong-de/(*bude)* zhe ge daoli.
 he understand-DE/BUDE this CL reason
 'He can/(*couldn't) understand this lesson.'
- b'. zhe ge daoli *dong-de/(*bude)*.
 this CL reason understand-DE/BUDE
 'This lesson can/*cannot be understood.'

Comparing with *V-de/bude*, the case-assignability of V's is still maintained in the potential *V-de/bu-R* construction. The V's in the *V-de/bu-R* construction can still take their canonical objects, as illustrated in (32).

- (32) a. ta xue hui -le yingyu.
 he learn master PERF English
 'He has mastered English through learning.'

12. There is some dialectal variation in judging whether *V-de/bude* can take an object, which we shall not address here.

13. Sun (1996: 134–135) assumes that *she-de* and *she-bude* have grammaticalized into verb compounds.

- b. ta xue-*de/bu*-hui yingyu.
 he learn-DE/BU-master English
 'He can/couldn't master English through learning.'

2.3.1.2 Double object construction. Similar with the loss of case-assignability of V's in the *V-de/bude* construction, *V-de/bude* cannot be used in a double object construction (henceforth DOC). However, there is no such restriction in the *V-de/bu-R* construction.

- (33) a. wo gei -le ta san ben shu. (DOC)
 I give PERF him three CL book
 'I gave him three books.'
- b. *wo gei -*de/bude* ta san ben shu. (V-*de/bude* in DOC)
 I give DE/BUDE him three CL book
 Intended meaning: 'I can/couldn't give him three books.'
- c. wo gei -*de/bu* -liao ta san ben shu. (V-*de/bu-R* in DOC)
 I give DE/BU finish him three CL book
 'I can/can't give him three books.'
- (34) a. wo jiao san ge xuesheng yingyu. (DOC)
 I teach three CL student English.
 'I teach three students English.'
- b. *wo jiao -*de/bude* san ge xuesheng yingyu. (V-*de/bude* in DOC)
 I teach DE/BUDE three CL student English
 Intended meaning: 'I can/couldn't teach three students English.'
- c. wo jiao -*de/bu*-liao san ge xuesheng yingyu.
 I teach DE/BU finish three CL student English. (V-*de/bu-R* in DOC)
 'I can/couldn't teach three students English.'

The ungrammaticality of (33b)–(34b) shouldn't be due to semantic incongruity, as dynamic modals like *neng* 'can' and *buneng* 'couldn't' are found to be quite good in DOC, as in (35).¹⁴

- (35) wo neng/buneng gei ta san ben shu.
 I can/can not give him three CL book
- a. 'I can/?couldn't give him three books.' (ability)
- b. 'I may/may not give him three books.' (permission)

14. Here we use the term 'dynamic modals' (Portner 2009) to include the possible meaning covered by *neng/buneng* in DOC, as *neng/buneng* may not only express ability, but also permission like *keyi* 'may'. Comparatively speaking, the non-ability meaning of *buneng* is not easy to get, as in (35a)–(36a).

- (36) wo neng/buneng jiao san ge xuesheng yingyu.
 I can/cannot teach three CL student English
 a. 'I can/*can't teach three students English.' (ability)
 b. 'I may/may not teach three students English.' (permission)

2.3.1.3 *Movement asymmetries between V-de/bude and V-de/bu-R.* In § 2.3.1.1, it was pointed out that there are just few cases of transitive *V-de/bude* in Mandarin Chinese, such as *she-de* 'can abandon', *she-bude* 'can't abandon', *dong-de* 'understand', *ting-bude* 'can't hear', *kan/jian-bude* 'can't see', *wen-bude* 'can't smell', etc. Apart from some exceptions, as discussed in § 2.3.1.1, most transitive verbs which occur in the *V-de/bude* construction have lost their ability to take their canonical objects. However, if the postverbal NPs are preposed before *V-de/bude*, they turn grammatical, as in (37b)–(38b). The interesting thing is that there is no such contrast observed in the *V-de/bu-R* construction, and both sentences are grammatical, as in (39).

V-de/bude construction:

- (37) a. *ta xie -de zhe ge zi. → postverbal NP preposed
 he write DE this CL character
 Intended meaning: 'He can write this character.'
 b. zhe ge zi (ta) xie -de.
 this CL character (he) write DE
 'This character can be written (by him).'
- (38) a. *ta ma/da/jiao -Bude na ge xuesheng. → postverbal NP preposed
 he scold/beat/teach Bude that CL student
 Intended meaning: He may not scold/beat/teach that student.
 b. na ge xuesheng (ta) ma/da/jiao -bude.
 that CL student (he) scold/beat/teach BUDE
 'That student may not be scolded/beaten/taught (by him).'

V-de/bu-R construction:

- (39) a. ta kan-de/bu-dong zhe ben shu. → postverbal NP preposed
 he read-DE/BU-understand this CL book
 'He can/couldn't understand this book from reading.'
 b. zhe ben shu ta kan-de/bu-dong.
 this CL book he read-DE/BU-understand
 'This book, he can/couldn't understand from reading.'

The same contrast applies to non-canonical objects, as shown in (40) and (41).

- (40) a. fei Shanghai
 fly Shanghai
 'fly to Shanghai'

- b. *ta fei-*de/bude* Shanghai.
 he fly-DE/BUDE Shanghai
 'He can/can't fly to Shanghai.'
- c. Shanghai ta fei-*de/bude*.
 Shanghai he fly-DE/BUDE
 'Shanghai, he can/can't fly to.'
- (41) a. ta fei-*de/bu-liao* Shanghai.
 he fly-DE/BU-finish Shanghai
 'He can fly to Shanghai.'
- b. Shanghai ta fei-*de/bu-liao*.
 Shanghai he fly-DE/BU-finish
 'Shanghai, he can/can't fly to.'

2.3.2 Asymmetries between *V-de* and *V-bude*

In the above subsection, we have discussed some asymmetries between *V-de/bude* and *V-de/bu-R*. Actually, there is a paradigmatic asymmetry between potential *V-de* construction and negative potential *V-bude* construction (cf. Dahl 2010). Generally speaking, the negative form *V-bude* is more common than the positive form *V-de* in Mandarin Chinese.¹⁵ The asymmetries between *V-de* and *V-bude* are illustrated as below:

Transitive verbs:

- (42) a. ?*bieren de yijian ting-*de*. (2a)
 b. bieren de yijian ting-*bude*. (2b)
 c. bieren de yijian neng ting .
 other.people *de* suggestion can listen
 'Other person's advice can be adopted.'

Psycho verbs:

- (43) a. *zhe ge ren wangji/hen/ai-*de*.
 this CL person forget/hate/love-DE
 Intended meaning: 'This person can be forgotten/hated/loved.'
- b. zhe ge ren wangji/hen/ai-*bude*.
 this CL person forget/hate/love-BUDE
 'This person couldn't be forgotten/hated/loved.'

15. There are few cases of *V*'s whose *V-de* forms are good while their counterparts *V-bude* are not, as *dong-de/bude* in (31b), here repeated as in (i). As pointed out in § 2.3.1.1, we assume items like *dong-de* have been lexicalized.

i. ta dong-*de*/(**bude*) zhe ge daoli.

- c. zhe ge ren neng/keyi wangji/hen/ai.
 this CL person can/may forget/hate/love
 ‘This person can/may be forgotten/hated/loved.’

Unaccusative verbs:

- (44) a. *zhe ge ren si/lai-*de*.
 this CL person die/come-DE
 Intended meaning: ‘This person can die/come.’
 b. zhe ge ren (ke) si/lai-*bude*.
 this CL person (emphasis) die/come-BUDE
 ‘This person couldn’t die/come.’
 c. zhe ge ren neng si/lai.
 this CL person may die/come
 ‘This person may die/come.’

Unergative verbs:

- (45) a. *zhe ge ren ku-*de*.
 this CL person cry-DE
 Intended meaning: ‘This person can be cried for.’
 b. zhe ge ren (ke) ku-*bude*.
 this CL person (emphasis) cry-BUDE
 ‘This person couldn’t be cried for.’
 ‘This person may not cry.’
 c. ?zhe ge ren neng ku.
 this CL person may cry
 ‘This person may be cried for.’
 ‘This person may cry.’
 ‘This person is good at crying.’

It seems that the ungrammaticality of (42a), (43a), (44a), (45a) is not due to semantic incongruity as we can use *neng* to take the place of *de* and the sentences are quite good, as respectively shown in (42c), (43c), (44c), (45c). The difference in grammaticality between *V-de* and *V-bude* may supply some empirical evidence that *V-bude* is not derived from *V-de* with the insertion of *bu*. It may suggest that *V-de* and *V-bude* may develop independently.

3. The grammaticalization of *de* and *bude*

Following Yue (1984), Tang (1992), Sun (1996), Lien (2011), we assume the *de* in potential *V-de* construction has undergone grammaticalization from its verb form *de* ‘to obtain’. Originally, *de* was used as a lexical verb, as in (46). *De* was losing its

full verbal status in Old Chinese and was commonly used as a modal auxiliary in the form of ‘*de V*’, as in (47).¹⁶ Similarly, in English, there are some modals which were originally from full or independent notional verbs, as ‘can’ can coocur with its object in the fifteenth century (Gelderen 2004: 166; Lightfoot 1979: 100–101; Roberts 1985: 22, etc.), as in (48).

(46) er *de* tianxia (Mengzi, Gongsunchou shang)
and obtain world
‘And obtain the kingdom’

(47) An wei *de* shang tian (Shenxianzhuan, Liu An)
An not may up heaven
‘An couldn’t go to heaven.’

(48) He can al langagis.
‘He knows all languages.’
(Beryn 2662, Visser 499; cited from Gelderen 2004: 166 (28))

The *V-de* sequence entered into Chinese due to the grammaticalization of *de* and *V-de* acquired the potential meaning (cf. Sun 1996: 112), as in (49). Lü (1990[1944]: 132) notes that this process is something like the derivation of the affix *-able*, which is derived from the word *able*. Similarly, Cheng & Sybesma (2004) assume grammaticalization is involved in forming Cantonese *-dak*, which is a counterpart of *-de* in Mandarin Chinese.

(49) cangtian bianhua shui liao *de*? (Dujuanxing)
heaven change who predict DE
‘Who can predict the change of the heaven?’

Similarly, we may assume *bude* undergoes the same process as *de*. The negator *bu* ‘not’ combines with the verbal form *de* and forms a negation on the verbal *de*, that is *bu de*, meaning ‘not obtain’, as in (50); with the grammaticalization of verbal *de* into potential *de*, *bu de* takes some negative potential meaning accordingly. Due to lexicalization, *bu de* may have combined together as *bude*, functioning as a modal (cf. Lien 2011: 738; Shi 1985: 255), in the form of ‘*bude V*’, as in (51). The lexicalization of *bude* is not implausible, as Dong (2011: 244–246) independently points out that lexicalization is involved in forming words constructed with *bu* ‘not’, such as: *bumian* 不免 ‘inevitable’, *bujin* 不禁 ‘couldn’t help doing’, which have been lexicalized as an adverb; *bukan* 不堪 ‘can’t help doing’, *bude* 不得 ‘may not’, which have

16. Following Feng (2014: 579), Old Chinese is defined from 1250 BC–200 AD and Middle Chinese is from 420–1150. Pre-Modern Chinese (including Old Mandarin) is from 1150–1650 and Modern Chinese is from 1650 to present.

- (50) qiu zhi bu *de* (Shijing, Guangju)
 want her not obtain
 ‘(The lord) wished (for) her, (but) did not get (her)’
- (51) Zikuai *bu de* yu ren yan (Mengzi, Gongsun Chou xia)
 Zikuai not may give people Yan
 ‘Zikuai may not give other(s) (the state of) Yan!’
- (52) a. youke *bude* ru nei.
 tourist BUDE enter in
 ‘Tourists may not enter.’
 b. *youke *bude* ru nei, danshi gongzuorenyuan *de* jin.
 tourist BUDE enter in, but staff DE enter
 ‘Tourists are not allowed to enter, but staff are allowed to.’
 c. youke *bude* ru nei, danshi gongzuorenyuan *keyi* jin.
 tourist BUDE enter in, but staff may enter
 ‘Tourists are not allowed to enter, but staff are allowed to.’
- (53) jin tui *bude*, wei zhi naihe? (Wuzi, yingbian)
 advance retreat BUDE, take this how
 ‘(Somebody) couldn’t advance or retreat, how should he deal with this?’

To sum up, the historical development of *de* and *bude* can be depicted as a process of grammaticalization from a lexical verb to a modal and then to an affix. When the modal became too weak, it became affixal. This process of grammaticalization is not unique to Chinese but attested cross-linguistically. Gelderen (2004) illustrates many cases of grammaticalization from a lexical V to a light v and then to Perfect. One typical example is the grammaticalization of *le* in Chinese, which has undergone grammaticalization from a V to an affix (Z. Wu 2004). According to Z. Wu (2004: 265), Perfect marker *-le* is originally from the verb *liao* ‘finish’. *Liao* usually comes after the object, acting as completive Perfect, as in (54). Then *liao* re-positions itself adjacent to the verb as a suffix and reduces to *-le* as completive Perfect, as in (55).

(54) V Object *liao*

(55) V-*le* Object

In the above, we have discussed the grammaticalization process of *de* and *bude*. Next we are going to explore the syntactic status of *de* and *bude*.

4. *De* and *bude* as functional heads

4.1 *De* as a functional head

Under the framework of Distributed Morphology, Halle & Marantz (1993: 139) propose that “many of the terminal nodes that find phonological realization in affixes are syntactic heads; the rest are added or created at MS in principled and predictable ways.” Lü (1990[1944]: 132) points out that suffixal potential *-de* can be analyzed as “-able” in English. Along these lines, *de* may be taken as a functional head *v*, which subcategorizes for a VP (cf. Tsai 2001, etc.). Meanwhile, we assume that the formation of *V-de* is due to morphological requirements of *-de*.²⁰ This is in line with minimalist assumptions, which “suggest that the [displacement] property should be reduced to morphology-driven movement” (Chomsky 1995: 222).

4.2 *Bude* as a functional head

In § 4.1, *de* is taken as a functional head. Is it possible to take *bude* as a functional head in *V-bude* and *V-bu-R*? Is there any evidence for such an analysis? In this sub-subsection, we shall explore this topic. We shall start the discussion from an acquisition problem with the negative potential *V-bu-R* construction.

4.2.1 *The acquisition problem of V-bu-R*

It is reported that children speaking Mandarin Chinese have problems with the negative potential *V-bu-R* construction (Fan 2007). In negating *V-de-R*, the children tend to put the negator *bu* before VR instead of between V and R, as illustrated in (56). In (56), when Mama asks the child whether s/he can get the thing out, the child replies in the form of ‘not + VR’ (such as **bu na chulai* ‘not get out’ in 56Ba). After the researcher repeats the same question (56C), the child finally produces the right form ‘*V-bu-R*’ (such as *na bu chulai* ‘couldn’t get out’ (56Bb)).

- (56) A. Mama: *na-de-chulai* ma?
 take-DE-out Q
 ‘Could you get it out?’
 Ba. Child: **bu na chulai*.
 not take out
 Intended meaning: ‘I can not take it out.’

20. Shi (1985: 251) assumes instead that it is the potential *de* in *de-V* that moves behind the V, forming *V-de*.

- C. Researcher: na-*de*-chulai ma?
 take-DE-out Q
 ‘Could you get it out?’
- Bb. Child: wo na-*bu*-chulai.
 I take-BU-out
 ‘I couldn’t take it out.’ (Fan 2007: 153 (17))

According to Fan (2007: 151), the production of V-*bu*-R starts to exist when the children are 01;07, 01;08, 01;11,²¹ which is several months later than the production of the preverbal negative morpheme in the form of ‘*bu* + V’ (around 01;03). The frequency of V-*bu*-R produced by children aged from 01;07 to 01;11 is very low. It is around 2.1%. Fan (2007) assumes that V-*bu*-R is more complicated than ‘*bu* + V’.

The misuse of *bu* in V-*bu*-R construction by young children may be due to the fact that the *bu* in V-*bu*-R is actually different from the preverbal negative *bu* and children at a very young age cannot distinguish them. If these two *bu*’s are the same *bu*, the answer (56Ba) should be as acceptable as the one in (57B). Along these lines, the production of (56Ba) by a young child is predicted.²²

- (57) a. ni qu bosidun ma?
 you go Boston Q
 ‘Will you go to Boston?’
- b. bu qu.
 not go
 ‘(I will) not go (there).’

To account for the preverbal negator *bu*, Huang (1988: 284) proposes Principle P, which says ‘the negative morpheme *bu* forms an immediate construction with the first V⁰ element following it’. Obviously the *bu* in V-*bu*-R should not belong to this type of negative morpheme, as the V does not follow *bu* in V-*bu*-R construction. As noted in T. Wu (2004), what is negated in the V-*bu*-R construction is R, leaving

21. Three children were surveyed in Fan (2007). Here 01;07 refers to the age and the month of the child. According to the investigation by Zhou (2002: 44), children at the age of 02;00 start to use V-*bu*-R.

22. The acquisition problem of negative V-*bu*-R is introduced here to show that the *bu* in V-*bu*-R may be different from preverbal *bu* and that the children cannot realize this difference and misuse *bude* as the preverbal *bu*. As for the exact reason why this acquisition problem occurs, we have no definite answer. As suggested by an anonymous reviewer, it might be due to the merge operation between *bude* and VR proposed in this article. There is still another possibility, as suggested by the other anonymous reviewer, that the children at an early stage acquire the word order *bu*-(*de*) VR and later acquire the correct form V *bu*-(*de*)-R after he acquires the verb movement (or morphological merger/local dislocation as proposed in this article).

unspecified the issue of whether the V has been negated, as in (58). In (58a), the action *xie* ‘write’ has not initiated, while in (58b), the action *xie* ‘write’ has started (T. Wu 2004: 279–280). Meanwhile, the unspecified V in V-*de/bu*-R argues against the lexical analysis of V-*de/bu*-R, which says that V-*de/bu*-R is formed with the insertion of *de/bu* into VR (cf. Thompson 1973).

- (58) a. Lisi *xie-bu-wan* zuoye, yinwei ta genben hai mei dong-bi.
Lisi write-BU-finish homework because he not.at.all yet not move-pen
‘Lisi cannot finish the homework, because he hasn’t started writing it
yet.’
- b. Lisi *xie-le* san-tian zuoye, haishi *xie-bu-wan* (zuoye).
Lisi write-PERF three-day homework yet write-BU-finish homework
‘Lisi has been writing the homework for three days, yet he wasn’t able to
finish it.’ (Adapted from T. Wu 2004: 279 (9))

Meanwhile, T. Wu (2004: 299–230) argues against taking the *bu* in V-*bu*-R as an adjunct of VR (cf. Li & Thompson 1981). Instead, she proposes to take *-bu* as a functional head. In this paper, we shall follow T. Wu (2004) in taking *bu* in V-*bu*-R as a functional head. We assume that *bu* in V-*bu*-R is actually a variant of *-bude*, which expresses the negative potential meaning. In the following subsection, we shall discuss a parallelism between the negative potential *-bu(de)* and the preverbal negator *bu* in observing an intervention effect.

4.2.2 *Bu(de) and intervention effect*²³

T. Wu (2004: 299) assumes that *bu* is base-generated as an incorporated head with *de* and they together create a complex head [*bu-de*]. Though we do not think *bu* is incorporated with *de* to derive *bude*, we agree with her on taking *bude* as a head. In this subsection, we shall try to argue that *bude* is used as a constitute functioning as a functional head from the intervention effect.

Beck (1996) and Beck & Kim (1997) observe that an intervening quantifier phrase (QP) or scope bearing element block the LF movement of an in-situ *wh*-element, as depicted in (59)–(60). In (59a), negative QP ‘nobody’ blocks the LF movement of ‘where’; however, if ‘where’ is put before ‘nobody’ as in (59b), the sentence is fine. In (60a), negative QP ‘nobody’ blocks the LF movement of ‘whom’; however, if ‘nobody’ is taken as a proper name (here, *Luise*), the sentence becomes grammatical as in (60b).

23. This subsection was illuminated by a joint course named *Seminar on topics in East Asian syntax and semantics* by James Huang and Shigeru Miyagawa, which was held at Harvard and MIT in the academic year 2012–2013.

- (59) a. *Wer hat niemanden wo angetroffen?
 who has nobody where met
 b. Wer hat wo_i niemanden t_i angetroffen?
 who has where nobody met
 ‘Who didn’t meet anybody where?’ (Beck & Kim 1997: 340 (4))
- (60) a. *Was glaubt niemand, wen Karl gesehen hat?
 what believes nobody whom Karl seen has
 ‘Who does nobody believe that Karl saw?’
 b. Was glaubt Luise, wen Karl gesehen hat?
 what believes Luise whom Karl seen has
 ‘Who does Luise believe that Karl saw?’
 (Beck & Kim 1997: 344 (17a)–(18a))

Next, let us come to the relevant data in Chinese. As pointed out by Huang (1982: 263–267), Chinese *wh*-arguments do not exhibit the intervention effect when they are preceded by quantifiers, as in (61); however, Chinese *wh*-adverbs do observe intervention effect, as in (62) (Tsai 2008; Yang 2008, 2012, etc.).

- (61) suoyoude/dabufende ren dou mai-le shenme?
 all/ most person all buy-PERF what
 ‘What did all people/most people buy?’
- (62) *suoyoude/dabufende ren dou weishenme cizhi? (reason-why)
 all/most person all why resign?
 Intended meaning: ‘Why did all people/most people resign?’

Similarly, there is no intervention effect found between the preverbal negative morpheme *bu* and *wh*-arguments like *na ji wan fan* ‘which bowls of rice’; however, the intervention effect is found between the negative morpheme *bu* and numeral-classifier phrases like *ji wan fan* ‘how many bowls of rice’ (cf. Szabolcsi 2006), as depicted in (63). Obviously ‘how many bowls of rice’ should be an argument in (63b), how could it behave like a *wh*-adverb which observes intervention effect? ²⁴

- (63) a. wo xiang zhidao ni bu chi [na ji wan fan].
 I want know you not eat which how-many CL rice
 ‘I wonder which bowls of rice you won’t eat.’
 b. *wo xiang zhidao ni bu chi [ji wan fan].
 I want know you not eat how-many CL rice
 Intended meaning: ‘I wonder how many bowls of rice you won’t eat.’

24. Many thanks to Dorothy Ahn for making the grammaticality judgement on the English glosses in (63)–(66).

Interesting enough, the same observation can be made in potential *V-bude*.

- (64) a. [na ji wan fan] chi *-bude*?
 which how-many CL rice eat BUDE
 ‘Which bowls of rice couldn’t be eaten?’
- b. *[ji wan fan] chi *-bude*?
 how-many CL rice eat BUDE
 Intended meaning: ‘How many bowls of rice couldn’t be eaten?’

The same intervention effect is also observed in the *V-bu-R* construction, as shown below:²⁵

- (65) a. wo xiang zhidao ni kan *-bu-* dong [na ji ben shu].
 I want know you read BU understand which how-many CL book
 ‘I wonder which books you couldn’t understand (by reading).’
- b. *wo xiang zhidao ni kan *-bu-* dong [ji ben shu].
 I want know you read BU understand how-many CL book
 Intended meaning: ‘I wonder how many books you couldn’t understand (by reading).’

Meanwhile, the difference between *na ji CL N* and *ji CL N* can be observed from their interaction with focus marker *zhi* ‘only’, if focus is taken as an intervener for the intervention effect in line with Kim (2002), Beck (2006), Li & Cheung (2012), Yang (2012), et al.

- (66) a. ta *zhi* chi [na ji wan fan]?
 he only eat which how-many CL rice
 ‘Exactly which bowls of rice does he eat?’²⁶
- b. ?*ta *zhi* chi [ji wan fan]?
 he only eat how-many CL rice
 Intended meaning: ‘Exactly how many bowls of rice does he eat?’

From the above discussion, we know that *bu(de)* in *V-bude* and *V-bu-R* is behaving like the preverbal negative morpheme *bu* in observing intervention effect. When they are used with ‘*na ji CL N*’, there is no intervention effect; however, when they are used with ‘*ji CL N*’, an intervention effect is observed. As briefly discussed

25. Interestingly, (65b) is quite good for James Huang (p.c.).

26. As pointed out by Dorothy Ahn (p.c.), it is not easy to translate the Chinese sentences in (66) into English. This may be due to the fact *zhi* ‘only’ and its counterpart *only* in English have different focalization scopes. For unknown reasons, *zhi* in (66a) can only bring focalization on *na ji wan fan* ‘which bowls of rice’ instead of the verb *chi* ‘eat’. On the contrary, ‘only’ in ‘which bowls of rice does he **only** eat?’ is ambiguous in English, as either ‘which bowls of rice’ or ‘eat’ can be focalized by *only*. This scope difference between Chinese and English awaits further research.

in § 4.2.1, there are several ways to analyze the preverbal negative morpheme *bu*: one is to take it as a clitic (cf. Huang 1988; Ernst 1995) or adjunct (cf. Hu 2007; Li 2007, etc), which is cliticized to a following verb or adjoined to a verb phrase; another is to take it as a certain functional head (cf. Xu 1997; Gelderen 2011; Chen et. al. 2013, etc.).²⁷ Since there are some scope problems in taking *bu* in V-*bu*-R as a clitic or adjunct (T. Wu 2004: 279–280), as shown in (58), we shall follow an analysis that takes *-bu(de)* as an affix, base-generated as a functional head. If both *bu* and *bu(de)* are taken as functional heads, the intervention effect observed in this subsection can be explained in a natural way, as these functional heads with negative potential meaning intervene before the *wh*-adjuncts to scope over them.²⁸ Meanwhile, the different behavior between ‘*na ji CL N*’ (such as *na ji wan fan*) and ‘*ji CL N*’ (such as *ji wan fan*) in their interaction with the preverbal negative morpheme *bu* and the negative potential *bu(de)* can be explained in line with Rizzi (2004).²⁹ According to Rizzi (2004: 243), measure phrases like ‘*ji CL N*’ (such as *ji wan fan*) are as quantificational as *Wh*, Negation and Focus phrases. Along these lines, the ungrammaticality of the above-discussed sentences (i.e. (63b), (64b), (65b), (66b)) is due to the fact that negator *bu/bude* or the focus marker *zhi* ‘only’ intervenes before the measure phrase *ji wan fan* and scopes beyond it.

Despite the parallelism between negative potential *bu(de)* and preverbal negator *bu*, the functional head *bu(de)* in V-*bu*-R should be distinguished from the negative morpheme *bu* in negative sentences, as the former one is used to negate a kind of potentiality. Furthermore, if the two are the same, it is difficult to explain the distributional difference between the preverbal negative morpheme *bu* and *bu(de)* in V-*bude* and V-*bu*-R (James Huang, p.c.). We assume *bu* in potential

27. Of course, as pointed out by James Huang (p.c.), a clitic can be used as a functional head too.

28. Dylan Tsai and an anonymous reviewer have pointed out to me that a negative element in a lexicon may also be an intervener and the intervention effect may be due to the existence of such a negative element as *bu*. We do not deny such a possibility. However, it seems that not every negative element may trigger the intervention effect, as in (i), in which the question of the numeral reading is still available despite the existence of a negative element *bu* in *bumian*.

- (i) A: ʔren de yisheng bumian yao fan ji ge cuowu?
 human *de* life inevitable will make how.many CL mistakes
 ‘How many mistakes should a man inevitably make in his life?’
 B: san ge cuowu.
 three CL mistakes
 ‘Three mistakes.’

29. Rizzi (2004) was brought to my attention by Dylan Tsai in his Peking University Serial Lectures in 2013.

V-*bu*-R is actually a variant of *-bude*, which can be evidenced by data from some dialects (cf. T. Wu 2004). We turn to these data below.

4.2.3 *The counterparts of bude in other dialects*

Tang (1992), and Wang (2010: 36–37) suggest that the Southern Min equivalents of the Mandarin *de* and its negative counterpart *bu(de)* are respectively *e* (會) and its negated form *bei* (勿會), as in (67). Interestingly, *bei* can be analyzed as ‘不+會’ (Tang 1992; Lien 2011: 738–739). This is similar to *bude* which can be analyzed as ‘*bu+de*’.

- (67) a. goa pha *e* si hit chiah katsua.
 I hit e die that CL cockroach
 Lit. ‘I can hit the cockroach to death.’
 b. goa pha *bei* si hit chiah katsua.
 I hit bei die that CL cockroach
 Lit. ‘I can’t hit the cockroach to death.’ (Wang 2010: 36–37)

T. Wu (2004: 298–299) reports that although “the pattern [*bu-de*] does not exist in modern Mandarin, it has been maintained in some other modern Chinese dialects, such as [*m-det*] in Hakka and [*m-dak*] in Cantonese (see also Cheng & Sybesma 2004).

- (68) a. gi au-*m-(det)*-ton liak-ji shuki. (Hakka)
 he bend-BU-DE-apart this-CL branch
 ‘He cannot bend this branch apart.’
 b. keoi sik-*m-(dak)*-baau. (Cantonese)
 he eat-BU-DE-full
 ‘He cannot be full after eating.’ (T. Wu 2004: 298–299 (34))

Furthermore, we have found several cases of V-*bude*-R in Pre-Modern Chinese, as listed below:³⁰

- (69) ruo wu tudi zhi fen ... bian jie *-bude-* qi. (Xiyouji, Ch 14)
 if no disciple *de* destiny then lift BUDE up
 ‘If I were not destined to be your master, I won’t be able to lift up (the magic figure).’

30. The examples are from Academia Sinica Tagged Corpus of Early Mandarin Chinese (<http://app.sinica.edu.tw/cgi-bin/kiwi/pkiwi/kiwi.sh>). According to Yue (1984: 27), there were few cases of V-*bude*-R with objects in the Song or Ming dynasties, such as (i):

(i) na daizi zuo zheng you zha, zheng *-bude-* tuo shou. (Xiyouji, Ch 69)
 that idiot left struggle right struggle struggle BUDE remove hand
 ‘That idiot struggled for a while but he couldn’t get out.’

- (70) zhe deng kewu jiao *-bude*- lai jiu ba le.
 this grade awful call BUDE come then finish PERF/Inch (*Jinpingmei*, Ch 58)
 ‘He is so awful. If we couldn’t ask him to come here, just give it up.’

4.2.4 *V-bu-R = V-bude-R*

In § 4.2.1, we have discussed the acquisition problem related to *V-bu-R* in Mandarin Chinese-speaking children (cf. Fan 2007). The acquisition problem reveals that the *bu* in *V-bu-R* is actually different from the normal preverbal negative morpheme *bu* (cf. Huang 1988). Meanwhile, we have discussed the possibility of taking *-bude* in *V-bude* and *V-bude-R* as a functional head. The Intervention Effect observed between *-bude* and numeral classifier phrases such as ‘*ji + CL + N*’ provides such a theoretical possibility. Furthermore, there is some empirical evidence for this assumption. Synchronically, *V-bude-R* form is found in some modern Chinese dialects, such as Hakka and Cantonese. Diachronically, *V-bude-R* form was commonly seen around in pre-Modern Chinese. All of this suggests that *V-bu-R* may originate from *V-bude-R*.

One key advantage of such a proposal is that it can explain why potential meaning is involved in *V-bu-R* from the point of view of semantics (James Huang, p.c.). It is not implausible to propose that there are two *bu*’s, one is the preverbal negator *bu* and the other is the negative potential morpheme *bu* in *V-bu-R*. If there is really a negative potential morpheme *bu*, how can we relate this *bu* to the negative potential meaning? One possibility is to assume this negative morpheme *bu* in *V-bu-R* is actually *bude*, as the *bude* in the negative potential construction *V-bude*. A subsequent question for this assumption is how the *de* in *V-bude-R* drops and becomes *V-bu-R*? We guess the deletion of *de* in *V-bude-R* may be due to prosodic effects, as in Modern Chinese disyllables and trisyllables are quite common and tetrasyllables are seldom seen except in idioms (cf. Dong 2011; Feng 2005, 2009; Zhuang 2014, etc.). This may be evidenced by the existence of *V-bude* in Modern Chinese, as *V-bude* consists of trisyllables, and trisyllables are allowed in Modern Chinese. Along these lines, the nonexistence of a negative potential form **V-bu* is expected.³¹ Or there may be another possibility, as suggested by James Huang (p.c.), that is for symmetry reasons: as *V-de-R* has three syllables, its negative counterpart *V-bude-R* takes three syllables accordingly, forming *V-bu-R*.

The formation of *V-bu-R* from *V-bude-R* may be something like impoverishment, which is “the deletion of certain morphosyntactic features in the presence of other such features in the same or in a governing morpheme.” (Hale & Marantz 1993: 156). From this point of view, *-bu* may be taken as a conditioned allomorph of *-bude* (cf. Hale & Marantz 1993: 123–124), that is, when *-bude* is merged with

31. Thanks to James Huang for pointing out this piece of evidence to me!

a disyllabic VR, *-de* is deleted. When *-bude* is merged with a monosyllabic V, it remains unchanged.

5. The derivation of V-*de* and V-*bude*

5.1 The formalization of grammatical change of *de* and *bude*

Based on the above discussion, it is assumed that potential *de* has grammaticalized from a verbal element to a modal auxiliary then to an affix (cf. Gelderen 2004). Along these lines, sentences like (47) and (49), here repeated as (71) and (73), can be depicted respectively in (72) and (74). *De* is used as a modal auxiliary in (71) and it is used as an affix in (73).³² In (71), *de* can stand alone. In (73), *de* needs to be supported by a host. For this reason, *liao* ‘expect’ in (76) merges with *-de* to meet the affixal property of *-de* at PF or MS.³³ Before this morphological merger takes place, *cangtian bianhua* moves to Spec, FocP, which takes place in syntax, as in (74).

From a modal auxiliary to an affix: *de* V → V-*de*

(71) An wei *de* shang tian. (Shenxuanzhuan, Liu An)

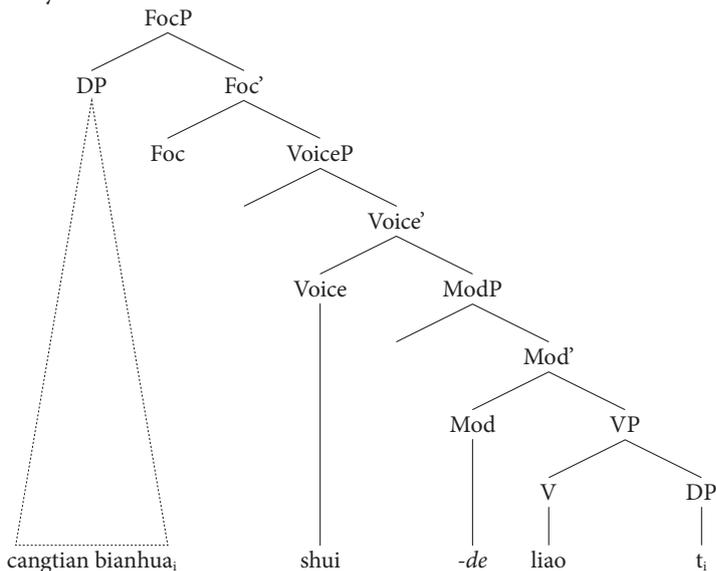
(72) [_{VoiceP} An Voice [_{NegP} [_{Neg} wei] [_{ModP} [_{Mod} de] [_{VP} shangtian]]]]

(73) cangtian bianhua shui liao *de*? (Dufu, *Dujuanxing*)

32. Following Kratzer (1996), Pytkänen (2008), we assume external argument is introduced by Voice. For the latest development of VoiceP, see Legate (2014).

33. We temporarily assume morphological merger (MM) is involved in the formation of V-*de*/*bude*. In § 7, we revisit this issue and assume that Left Location Merger is involved in the formation of V-*de*/*bude*.

(74) a. in syntax

b.³⁴ MM: cangtian bianhua_i shui liao_k-de t_k t_i

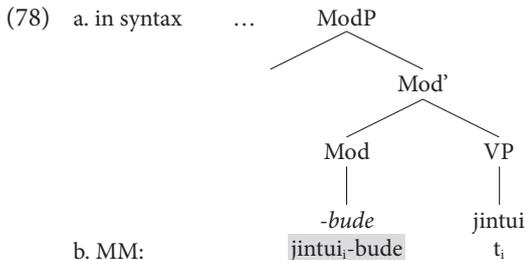
According to Shi (1985: 255), *bude* in Old Chinese was often used before verbs, expressing the negative potentiality. Along these lines, we may assume the negative potential *bude* has undergone a similar grammaticalization route, which is from a modal auxiliary to an affix. Sentences like (51) and (53), here repeated as (75) and (77), are respectively depicted as (76) and (78).³⁵ *bude* is used as a modal in (75) and an affix in (77).

From a modal auxiliary to an affix: *bude* V → V-*bude*

(75) zikuai *bude* yu ren yan (Mengzi, Gongsun Chou shang)(76) [_{VoiceP} zikuai Voice [_{ModP} [_{Mod} bude] [_{VP} yu ren yan]]](77) jin tui *bude*, wei zhi naihe? (wuzi, yingbian)

34. MM here refers to morphological merger, which takes after syntax. For the details, please see § 6.2.2.

35. Only the relevant part of (77) is depicted in (78).



One thing to note is that in our analysis, *V-bude* is not derived from *V-de*. Instead, it is proposed that *de* and *bude* underwent grammaticalization separately, though they grammaticalized in a similar mechanism. In the following subsection, we shall discuss this issue.

5.2 *V-bude* is not derived from *V-de*

In the literature, it is proposed that *V-bude* is derived from *V-de* through the insertion of *bu* (cf. Chao 1968). However, this analysis has some problems. One problem is related to the chronology of emergence of *V-de* and *V-bude*. According to Shi (1985: 254), *V-bude* occurred as early as the Warring States and *V-de* occurred in the Southern and Northern Dynasties. Another empirical problem is that there are some asymmetries observed between *V-de* and *V-bude* as in § 2.3.2. If *V-bude* is derived through *V-de*, these asymmetries await further explanation.

Meanwhile, Zhu (1982: 133) assumes that *-de* in *V-de* and *V-bude* is a verb, which is different from the potential *-de* in *V-de-R*. According to Zhu, *-de* in *V-de-R* is an infix. In his view, *kan de* in (79a) should be analyzed as *kan de de* as in (79b). In (79b), the first *de* is an infix and the second *de* is a verb, acting as a *buyu* ‘complement’, which is something like *jian* ‘see’ in *kan de jian* ‘able to see’ in (80). The infix *-de* in (79b) is deleted due to the haplology of *de*. The negative counterpart of (79b) is (79c), in which *-bu* is an infix as the auxiliary *de* in (79b). Along these lines, the derivation of *V-de* is just like the derivation of *V-bu-de*. Interestingly, an anonymous reviewer agrees with Zhu’s analysis of *V-de* as *V-de-de*. However, being different from Zhu’s analysis of *V-bude*, s/he proposes to analyze *V-bude* as *V-bu-de de*, with one *de* deleted due to haplology. This analysis seems to be superior to Zhu’s original analysis as the negative potentiality is expressed through *bude* while keeping the derivation of *V-de/bude* and *V-de/bu-R* in a similar way. Being simple as it is, there is a question awaiting further answers, that is how to derive the asymmetries observed in § 2.3.1.

- (79) a. kan *-de*
 see DE
 ‘can see’
- b. kan-*de-de*
 see DE obtain
 ‘can see’
- c. kan *-bu-de*
 see not DE
 ‘can not see’
- (80) kan *-de- jian*
 look DE see
 ‘can see’

Shi (1985: 252–253) presents several arguments against Zhu’s (1982) proposal (see also Tang 1992, 1999: 80). The first argument is that there are few cases like (79b) found in Mandarin Chinese, even in other dialects, in which the first *de* is an auxiliary and the second *de* is a verb.³⁶ Another problem related to this analysis is whether there are infixes such as *de* and *bu* in Chinese. Wang (2011) questions taking *de/bu* as infixes, as Chinese seem to have no other infixes. Meanwhile, he points out that *de/bu*, as an infix, could not be inserted into other (real) compounds, as shown in (81).³⁷

- (81) da-(*bu)-ji, po-(*bu)-huai,
 hit-not-strike break-not-spill
(Wang 2011: 2 (6))

In the above discussion, we assumed that *V-de* and *V-bude* are derived independently, though they have undergone a similar grammaticalization process. *De* and *bude* have grammaticalized from a modal auxiliary to a suffix. The imbalance between *V-de* and *V-bude* described in § 2.3.2 could not be because of the insertion of *bu*, but for some other reason. In the following subsection, we shall investigate this further.

36. Wang (1998: 23–24) provides some cases of ‘V *dede*’ in Dazhi Dialect and Jianghuai *guanhua*, such as *chuan dede* ‘may wear’, *jie dede* ‘may borrow’, *jia dede* ‘may marry’. Despite these dialectal data, Wu (2002: 22–23) argues that Zhu’s (1982) related analysis will encounter problems from the perspective of historical development and the dialectal data may be analyzed in some other way.

37. An anonymous reviewer questions the compound status of *daji*, as obviously *ji* ‘strike’ in *daji*, being a verb, is not as resultative as *huai* in *pohuai*. The reviewer suggests making a distinction between real compounds and fake ones. Actually this difference is discussed in Wang (2011), in which he distinguishes real compounds from VR, which is derived in a syntactic way. The citation of (81) here is just to show that *bu* should not be analyzed as an infix.

5.3 The derivation of *V-de* and *V-bude*: between morphology and syntax

In § 2.3.1, we discussed the asymmetries between *V-de/bude* and *V-de/bu-R*. One key asymmetry between these two main potential forms lies in the ability to assign accusative case to postverbal NPs. It is found that almost all of the *V-de/bu-R* can take their canonical objects, while most *V-de/bude* could not. To our surprise, when these postverbal objects are put in front of *V-de/bude*, in the form of ‘NP + *v-de/bude*’, the sentences become grammatical. As the preposed NPs are mainly Patient or Theme, we shall use NP_{P/T} to distinguish them from the Agent NP. (37) and (38) are two such examples, here repeated as (82)–(83).

- (82) a. *ta xie *-de* zhe ge zi → (postverbal NP_{P/T} preposed)
 he write DE this CL character
 Intended meaning: ‘He can write this character.’
 b. zhe ge zi (ta) xie *-de*.
 this CL character (he) write DE
 ‘This character can be written (by him).’
- (83) a. *ta ma/da/jiao *-bude* na ge xuesheng → postverbal NP preposed
 he scold/beat/teach BUDE that CL student
 Intended meaning: He may not scold/beat/teach that student.
 b. na ge xuesheng (ta) ma/da/jiao *-bude*.
 that CL student (he) scold/beat/teach BUDE
 That student may not be scolded/beaten/taught (by him).

The contrast in grammaticality shown in (82)–(83) suggests that there should be some constraints involved in the preposing of the postverbal NP_{P/T} in *V-de/bude* construction, if there is movement involved. This is taken from a synchronic view. Diachronically, the earliest examples ‘NP_{P/T} + *v-bude*’ were found as early as in Wudai to South Tang Dynasty (937–957), as in (84), and the earliest examples of ‘NP_{P/T} + *v-de*’ were found a bit later, that is in South Song (1127–1279), as in (85).³⁸ The difference in the chronology of emergence of these two types may be due to the independent grammaticalization processes of *-bude* and *-de*. As *-bude* occurred earlier than *-de* (cf. Shi 1985), accordingly, it is possible that “NP_{P/T} + *v-bude*” occurred earlier than “NP_{P/T} + *v-de*”.

- (84) a. xin jiu tian *-bude*.
 new old add BUDE
 ‘The new and the old couldn’t be added.’

38. Thank Wei Chin for pointing out these examples to me!

- b. jin suo bi -*bude*.
golden lock close BUDE
'The golden lock couldn't be closed.' (Zu tang ji)

- (85) a. fan you na ceng chi-*de*.
rice again that past eat DE
'How can rice be eaten?'

- b. shi shu zi dang ji-*de*
poem book self should remember DE
'Confucian classics should be remembered.'

(Yongle dadian xiwen sanzong, Zhangxie Zhuangyuan)

Let us return to (82) and (83). We speculate that the ungrammaticality of (82a) and (83a) is due to some morphological operation (cf. Chomsky 1995; Mei 1991, 2012, etc.). When *de/bude* has grammaticalized into an affix, *de/bude* is attached to a monosyllabic verb, forming *V-de* or *V-bude*. This morphological operation may change the argument structure of a transitive verb.³⁹ That is, to make a transitive verb intransitive. This process is roughly depicted in (86).

- (86) Vt.+*de/bude* → Vi.-*de/bude*.⁴⁰

This is something like the classical analysis of passives in English, where passive suffix *-en* is assumed to absorb the external argument and accusative case and make the transitive verb intransitive (cf. Chomsky 1981, et al.). This argument structure change in the *V-del/bude* construction can be evidenced by some unaccusative verbs, which can occur in 'NP_{T/P} + v-*bude*' as in (87), and some unergatives, which cannot occur in 'NP + v-*bude*' as in (88). As unaccusative verbs cannot assign accusative case to their objects, it is natural for the objects to move upward to get case, as depicted in (89). However, there should be no such thing as movement as unergatives do not have objects. This is the case in (88), in which the agentive reading of *zhe ge ren* 'this guy' is not easy to get, as in (88a). When 'this guy' is taken as the non-canonical object of 'cry' as the oblique reading, it is quite good, as in (88b). If Li's (2010, 2011) observation on the parallelism between

39. This morphological process may have semantic consequences as well, as briefly discussed in § 8.

40. As discussed in § 2.3.2, there are asymmetries between NP + *V-de* and NP+ *V-bude*. This may be due to the fact that affixes *-de* and *-bude* underwent grammaticalization independently. In modern Chinese, *V-bude* is used more frequently than *V-de* and *V-bude* is used in a more systematic way (cf. Shi 1985). This is not a typical property of Chinese, as pointed out by Shibatani (1985: 828), "in many languages, the potential reading of the passive/reflexive is restricted to, or more commonly found in, negative sentences (e.g. Hindi)." For this reason, we shall mainly focus on *V-bude* in this subsection. The V discussed here mainly consists of one syllable.

canonical objects and non-canonical objects is on the right track, ‘this guy’ in (88b) can also be taken as an internal argument of ‘cry’. The non-availability of agentive reading in unergative *V-bude*, such as (88a), may be used as evidence to show that ‘NP_{TP} + *v-bude*’ is derived from the postverbal object.⁴¹ Further evidence for this analysis is from an ambiguous sentence like (90), where ‘chicken’ can be used as Agent (90a) or Theme/Patient (90b). However, in an ‘NP + *v-bude*’ construction, only the Theme reading of ‘chicken’ is available, as in (91).

- (87) zhe ge ren (ke) si/lai-*bude*.
 this CL person (emphasis) die/come-BUDE
 ‘This person can’t die/come.’
- (88) ?*zhe ge ren (ke) ku-*bude*.
 this CL person (emphasis) cry-BUDE
 a. ?* This person can not cry. (Agentive reading)
 b. This person cannot be cried for. (Oblique reading)
- (89) a. in syntax: [_{TP}[_{DP}zhe ge ren]_i (ke) [_{ModP}-*bude* [_{VP} si/lai t_i]]]]
 b. MM: [_{TP}[_{DP}zhe ge ren]_i (ke) [_{ModP} si/lai_k-*bude* [_{VP} t_k t_i]]]]
- (90) ji bu chi -le.
 chicken not eat PERF/INCH.
 a. The chicken didn’t eat. (Agentive reading)
 b. (I/Someone) do/does not want to eat chicken. (Theme reading)
- (91) ji chi -*bude*.
 chicken eat BUDE
 ‘The chicken couldn’t be eaten.’

The morphological operation involved in the formation of ‘NP_{TP} + *v-de/bude*’ may be something like the loss of causative prefix *s- and the voicing alternation which turn a transitive verb into an intransitive verb in Medieval Chinese, as illustrated in Mei (1991, 2012: 12). The voicing alternation in intransitive/transitive verbs is due to the devoicing effect of the causative prefix: *s-brads > *prads. The change is triggered phonologically, however, the effects are syntactic (Feng 2014; Huang 2014; Mei 2012).

41. There seem to be some exceptions, such as *zhe ge ren ke bing-bude*, in which *bing* ‘ill’ is often taken as an unergative verb. The grammaticality of this sentence may be explained with the assumption that some unaccusativity is involved in this sentence (Huang 2006). It roughly means that ‘this person couldn’t get ill; otherwise, we shall undergo some loss due to his illness.’ The disappearance meaning may be implied due to some pragmatic reason.

(92) 敗

- a. *s-b- > *prads > pwai 'to ruin, defeat'
 b. *brads > bwai 'ruined, defeated'

One thing to note is that *-de/bude* usually combines with a monosyllabic verb but not a disyllabic verb, i.e. VR. This is a morphological constraint. In combining with a VR, *de/bude* could not make it detransitivize. Meanwhile, the meaning of *de/bude* in *V-de/bude* is a bit different from that of *de/bu(de)* in *V-de/bu-R*. According to Xie (2012), the ability reading of *de* requires its subject to be agentive. However, the NP in 'NP_{T/P} + v-*de/bude*' is not an Agent but a Theme or Patient. Accordingly, there is no ability reading for *-de* in 'NP_{T/P} + v-*de/bude*'. The *de/bude* in 'NP_{T/P} + v-*de/bude*' mainly means (im-)permission; in *V-de/bu-R*, *de/bu(de)* mainly expresses ability.⁴² Similar observation has been made in Cantonese by Cheng & Sybesma (2004) and in Hakka by Chung (2012). Here we shall briefly discuss *dak* in Cantonese. In (93a), *dak* is denoting permission, while *dak* in (93b) refers to potentiality (ability).⁴³ The two are also different in forming negative sentences, as in (94). For the negation of permission, the negative particle is used before the V, as in (94a); while for the negation of potentiality/ability, the negative particle is inserted between V and R, as in (94b).

(93) a. keoi zaa-dak li-ga ce.⁴⁴

3s drive-dak this-cl car

's/he can [i.e., is permitted to] drive this car.'

b. keoi lo-dak-hei li-seung syu.

3s take-dak-up this-box book

's/he can [i.e., will manage to] lift this box of books.'

(Cheng & Sybesma 2004: 420 (1))

42. There might be exceptions to this generalization, as pointed out by an anonymous reviewer. For details, please see the discussion in § 8.2.

43. Roughly speaking, the potential reading here is like the ability reading and it is not easy to tease them apart (cf. Cheng & Sybesma 2004). The difference between the two lies in that "the ability reading doesn't subsume the completability of an act" (Cheng & Sybesma 2004: 421). There seems to be no completability difference between *V de/bude* and *V-de/bu-R* in Mandarin Chinese. For this reason, we shall not distinguish potential reading from ability reading unless necessary.

44. As pointed out by an anonymous reviewer, the Cantonese *de*, i.e. *dak*, does not have the ability to detransitivize a verb, no matter whether it means permission or ability. If our intransitivization analysis of *V-de* is right, this is unexpected. We guess this phenomenon may be due to the different status of *de* and *dak*.

- (94) a. keoi m-zaa-dak li-ga ce cf.
 3s NEG-drive-DAK this-CL car
 's/he cannot drive this car.' (permission reading only)
- b. keoi lo-m-hei li-seung syu cf.
 3s take-NEG-up this-box book
 's/he cannot lift this box of books.' (potentiality/ability reading only)
 (Cheng & Sybesma 2004: 422 (5a), (6a))

Interestingly, it is observed that there is a co-occurrence restriction between *V-de/bude* and permission *neng/buneng* or *keyi/bu keyi*, as shown below:

- *NP_{T/P} + neng/keyi + v-de:
- (95) a. zhe ben shu kan-*de*.
 this CL book read-DE
 'This book can be read.'
- b. zhe ben shu **neng/keyi** kan.
 this CL book can/may read
 'This book can be read.'
- c. *zhe ben shu **neng/keyi** kan-*de*.
 this CL book can/may read-DE
 Intended meaning: 'This book can be read.'
- *NP_{T/P} + bu neng/keyi + v-bude:
- (96) a. zhe ben shu kan-*bude*.
 this CL book read-BUDE
 'This book couldn't be read.'
- b. zhe ben shu bu **neng/keyi** kan.
 this CL book not can/may read
 'This book couldn't be read.'
- c. *zhe ben shu bu **neng/keyi** kan-*bude*.
 this CL book not can/may read-BUDE
 Intended meaning: 'This book couldn't be read.'

This restriction may be due to semantic redundancy, as pointed out by an anonymous reviewer, as both (*bu*) *neng/keyi* and -(*bu*)*de* express (im-)permission reading in such a sentence.

If 'NP_{T/P} + v-*de/bude*' is derived like a passive sentence, there should be implicit control involved, such as the purpose clause 'to pass the test' in (97); however, there seems to be no implicit control in 'NP_{T/P} + v-*de/bude*' construction, as in (98). This may be due to semantic considerations. As *-de/bude* mainly refer to potentiality, accordingly, 'NP_{T/P} + v-*de/bude*' refers to potentiality rather than specific actions. This is predicted in our analysis of 'NP_{T/P} + v-*de/bude*' as *-de/bude* is proposed to be a head of modal phrase which selects a VP as its complement and

V-de/bude is realized at the PF/MS. When *-de/bude* in (99) is substituted by *neng/buneng* with (im-)permission reading, the sentences are not good either (cf. Liu 2012), as in (100).

(97) The book was (not) read to pass the test.⁴⁵

(98) *wei.le tongguo kaoshi, zhe ben shu du- *de/bude*.⁴⁶
 for pass exam this CL book read DE/BUDE
 ‘To pass the exam, this book may/may not be read.’

(99) *wei.le tongguo kaoshi, zhe ben shu neng/buneng du.
 for pass exam this CL book can/couldn’t read
 ‘To pass the exam, this book may/may not be read.’

To sum up, due to morphological operations as shown in (86), transitive verbs in a potential *V-de/bude* construction could not take their objects any longer and the postverbal objects need to move forward, as happens in passives.⁴⁷

6. The derivation of *V-de-R* and *V-bu-R*

6.1 LF movement analysis in T. Wu (2004)

T. Wu (2004) proposes that *de* in *V-de-R* projects as an inner modal De^0 . De^0 is assumed to be generated between the projections of *V* and *R* and De^0 is c-commanded by $Modal^0$ which can be null or filled by an overt modal. De^0 and $Modal^0$ share the same potential modality feature [M], either [$M_{possibility}$] or [$M_{ability}$], and the correlation between De^0 and $Modal^0$ is derived by an LF X^0 /head-movement from De^0 to $Modal^0$. Along these lines, (100) is depicted as (101), in which [*V-de/bu-R*] is derived through head movement and *de/bu* moves upward to $Modal$ to check its own [M] feature, either [$M_{possibility}$] or [$M_{ability}$].

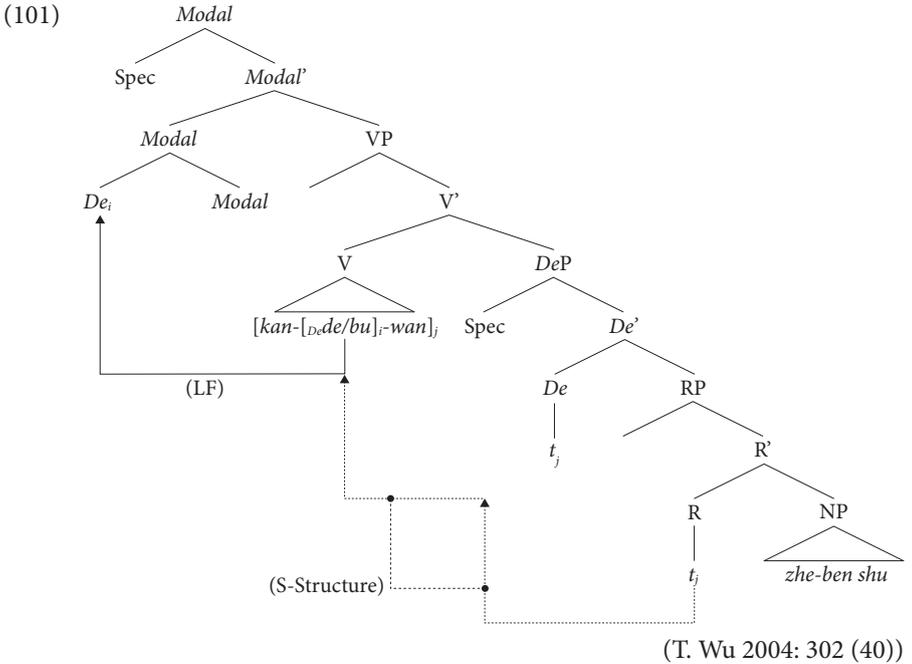
- (100) Lisi (*bu*)*neng* kan-*de*-dao zhe ke shu.
 Lisi not-can chop-DE-fall this-CL tree
 a. ‘It is possible/impossible for Lisi to chop the tree down.’

45. The negative sentence may sound good if the book contains many mistakes and reading it may mislead readers.

46. Interestingly, an anonymous reviewer points out to me that s/he is quite good with the negative potential meaning *V bude* in (98) and *buneng V* in (99).

47. As discussed in § 5.3, there are few transitive verbs which can still take objects in *V-de/bude* due to lexicalization. We speculate that these verbs are exceptions to the morphological operation in (86).

- b. ‘Lisi is able/unable to chop the tree down.’
- c. ‘It is possible/impossible for Lisi to be able to chop the tree down.’
(T. Wu 2004: 278 (8))



There are some empirical problems for T. Wu’s feature-checking analysis. According to her, *de* in *V-de-R* can refer to possibility or ability. However, as discussed in Xie (2012), there is some dialectal variation on whether an epistemic reading is involved in the *V-de/bu-R*. If the epistemic meaning is assumed to be separated from *V-de/bu-R* and produced with a covert epistemic modal *keneng/bu keneng*, T. Wu’s (2004) analysis will encounter some problems. First we shall discuss an empirical problem. In line with T. Wu (2004), the reading in (101c) is available. In order to explain the co-occurrence between *bu keneng* and *de* in (101c), we may assume that *bu keneng* is an epistemic modal and there is a covert modal $\emptyset_{\text{ability}}$ licensing $[M_{\text{ability}}]$ on *de* (cf. J. Lin 2012). However, if such a covert modal is overtly realized, the sentence becomes bad, as in (102).

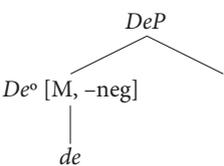
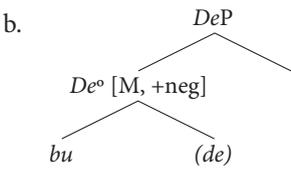
- (102) *Zhangsan bu keneng neng kan-de-dong zhe ben shu.
 Zhangsan not possible can read-DE-understand this CL book
 Intended meaning: ‘It is impossible that Zhangsan can understand this book.’

A similar problem occurs in the *V-bu-R* construction. When *bu* takes negative $[M_{\text{ability}}]$ and co-occurs with *bu keneng*, a covert negative modal $\emptyset_{\text{ability}}$ needs to be

assumed to check the negative feature $[M_{\text{ability}}]$ on *de*. Whereas, when this covert negative modal turns overt, the sentence is ill-formed, as in (103).

- (103) *Zhangsan **bu keneng bu neng** kan-*bu*-dong zhe ben shu.
 Zhangsan not possible not can read-BU-understand this CL book
 Intended meaning: 'It is impossible for Zhangsan not be able to understand this book.'

Another problem related to T. Wu's analysis is theoretical. There seems to be some problems in her analysis of the modal feature of *bude*. She assumes *de* as a head De^0 with the feature $[M, -neg]$, as in (104a). *Bu*, with the feature $[M, +neg]$ is base-generated as an incorporated head with *de*, forming a complex head $[bu-de]$, as in (104b). The problem lies in the feature contradiction, as *bu* is assumed to take $[+neg]$, while (covert) *de* is with $[-neg]$. Therefore, it remains unclear how the complex head $[bu-de]$ gets the $[+neg]$ feature.

- (104) a. 
- b. 
- (Wu 2004: 299 (35))

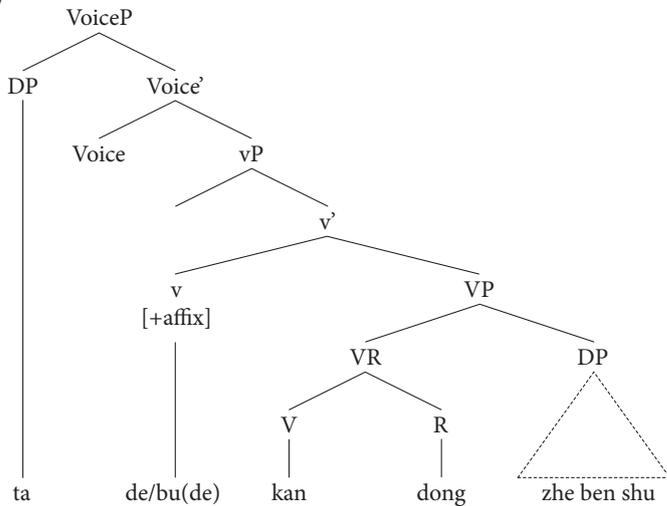
6.2 A morphosyntactic approach to *V-de/bu-R*

6.2.1 A proposal

In consideration of the above problems in T. Wu (2004), we would like to take a morphosyntactic approach to the *V-de/bu-R* construction. In explaining potential *V-de-R* expressions, we assume that potential affix *-de*, as a functional head, subcategorizes for a VP which consists of a VR. In deriving *V-bu-R*, we assume *-bu* is an allomorph of *-bude*. *-Bude* is also a functional head, subcategorizing for VP which consists of a VR. In *V-bu-R*, *bu* is not the same as preverbal negative morpheme *bu* (cf. Huang 1988), but a distinct one with negative potential meaning. *-Bu* in *V-bu-R* is assumed to be *-bude*. This not only helps to explain why there is potential meaning involved in *V-bu-R*, but also explains the negation scope problem of *V-bu-R* (cf. T. Wu 2004), as *-bude* does not negate the V or R, but negates the potentiality of VR. In this way, (3a)–(3b), here repeated as (105a)–(105b) can be depicted as in (106).

- (105) a. ta kan-*de*-dong zhe ben shu.
 he read-*DE*-understand this CL book
 b. ta kan-*bu*-dong zhe ben shu.
 he read-*BU*-understand this CL book

- (106) a. in syntax:
 ...



- b. MM: ta kan-*de/bu*-dong zhe ben shu.

As Tsai (2001) and T. Wu (2004) have shown, *-de/bude* is here taken as an independent functional head realized by light verb (*v*). Instead of proposing that VR raises to infixal modal *-de/bu* and wraps around *-de/bu* in syntax (cf. Tsai 2001; T. Wu 2004), we assume that *-de/bude* is merged with *V* to meet the morphological properties of *de/bu*. Following Marantz (1984, 1988), Halle & Marantz (1993), and Embick & Noyer (2001, 2007), we assume this merger is a kind of morphological Merger, which takes place after syntax. To make it clear, the morphological merger is illustrated in grey color. In the following subsection, we shall explore this type of morphological operation.

6.2.2 Morphological Merger

“Morphological Merger”, proposed first in Marantz (1984), was originally a principle of well-formedness between levels of representation in syntax. In Marantz (1988: 261), it was generalized as follows:

- (107) Morphological Merger

At any level of syntactic analysis (d-structure, s-structure, phonological structure), a relation between *X* and *Y* may be replaced by (expressed by) the affixation of the lexical head of *X* to the lexical head of *Y*.

Merger has different consequences depending upon the level of representation it occurs at. When Merger applies in syntax, it is Head Movement (Baker 1988). According to Harley & Noyer (1999: 5), Merger may also apply after syntax, such as the Tense to verb affixation in English (Bobaljik 1995) or perhaps C-to-I lowering in Irish (McCloskey 1996). Depending on different stages, Mergers take place in a sequential PF derivation, Embick & Noyer (2001) distinguish two types of merger, one is Lowering, which occurs in Morphology before Vocabulary Insertion; the other is Local Dislocation, which operates in Morphology in terms of linear adjacency. Verb inflection in English is a typical example of Lowering. In Chomsky (1957), an affix-hopping proposal is adopted to analyze verb inflection in English, that is, T lowers to V by affix hopping. Halle & Marantz (1993: 134–135), Bobaljik (1995, 2002), et al. have argued for a return to this analysis. Here we mainly introduce Bobaljik's (1995, 2002) analysis. According to Bobaljik, the finite verb, surfacing in the VP, comes together with the inflectional features (in Infl) via –PF/morphological merger and not by syntactic (overt or covert) raising of the verb, as illustrated in (108), with the joined circles indicating Merger in a post-syntactic component.

- (108) a. $[_{IP} \text{Sam } [_I^0 \text{ -s}] [_{VP} \text{ eat- Spam}]]$
 b. $\text{O} \text{-----} \text{O} \leftarrow \text{Morphological/PF-Merger}$
 c. Sam eats Spam. (Bobaljik 2002: 210 (15))

One condition for this type of Morphological Merger is adjacency. When structural material, such as *not* in (109a), disrupt the adjacency between the inflection –s and the verb *eat*, the morphological merger between these two elements is not possible and *do*-support is resorted to (cf. Chomsky 1957), as in (109c).

- (109) a. $[_{IP} \text{Sam } [_I^0 \text{ -s}] \text{not } [_{VP} \text{ eat- ham}]]$
 b. $\text{O} \text{--}^* \text{-----} \text{O} \leftarrow \text{Adjacency Disrupted}$
 c. $\emptyset \rightarrow do \leftarrow do\text{-insertion}$ (Bobaljik 2002: 211(17))

One thing to note is that adverbial elements, such as *never* in (111), appear to be invisible to the computation of adjacency. For details, please refer to Bobaljik (1995, 2002).

- (110) a. $[_{IP} \text{Sam } [_I^0 \text{ -s}] \text{never } [_{VP} \text{eat- anything}]]$.
 b. $\text{O} \text{-----} \text{O} \leftarrow \text{Morphological Merger}$
 c. Sam never eats anything. (Bobaljik 2002: 212 (21))

A second variety of Morphological Merger is Local Dislocation, which occurs after Vocabulary Insertion. Embick & Noyer (2001: 562–563) distinguish Local Dislocation from Lowering on the notion of Merger. The properties of Merger differ depending on whether Merger applies on a linearized or unlinearized structure.

In Local Dislocation, linear ordering is not a property of syntactic representations but is imposed at PF, as depicted in (111), where X takes $[_{YP} [_{ZP} Z] Y]$ as its complement, where ZP is either a complement to Y or an adjunct to YP. To show the linear precedence between elements, Embick & Noyer (2001) use the notation $a * b$ to denote a requirement that *a* must linearly precede *b* and be adjacent to *b*. Along these lines, a possible linearization of (111) is shown in (112), in which X must immediately precede $[Z^*Y]$ and Z must immediately precede Y. According to Embick & Noyer (2001), Local Dislocation does not refer to (111); rather, it refers to (112), as Local Dislocation requires linear precedence and adjacency as shown by $*$. Similarly, (112) can be converted into (113) through Local Dislocation.

(111) $[_{XP} X [_{YP} [_{ZP} Z] Y]]$ (Embick & Noyer 2001: 562 (9))

(112) $[X * [Z^* Y]]$ (Embick & Noyer 2001: 562 (10))

(113) $[[[_Z^0 Z+X] * Y]$ (Embick & Noyer 2001: 563 (11))

One simple example of Local Dislocation is shown in (114a), whose corresponding syntactic structure should be (114b), in which *er* and *smart* change their positions after syntax.

(114) a. John is smart-er than Bill. (Embick & Noyer 2001: 564 (14a))

b. John is -er smart than Bill.

An important difference between Lowering Merger and Local Dislocation Merger lies in that “Lowering is sensitive to syntactic headedness and can therefore affect elements that are not string adjacent. Local Dislocation, however, is sensitive to relations of adjacency and precedence between constituents, and not to syntactic headedness directly. Thus, Local Dislocation must always be *local*, as its name suggests; it cannot skip any adjoined elements, as Lowering can.” (Embick & Noyer 2001: 564). The following is such an example. In (115a), Local Dislocation is impossible, as *amazingly*, a modifier of *smart*, blocks the adjacency between the superlative *-(e)st* and *smart*, making the morphological merger impossible and forcing the presence of *mo-st*.

(115) a. Mary is the mo-st amazingly smart person.

b. *Mary is the *t* amazingly smart-est person.

(Embick & Noyer 2001: 565 (15))

6.2.3 Local Dislocation in the formation of V-*de*/bu-R

In this subsection, we assume V-*de*/bu-R is operated at a post-syntactic level. According to the classification of Embick & Noyer (2001: 562–563, 2007: 319–320), the formation of V-*de*/bu-R should belong to Local Dislocation instead of

Lowering. This is evidenced by the behavior of certain adverbials.⁴⁸ According to Bobaljik (1995), Embick & Noyer (2001), Lowering are invisible with adverbs. However, Local Dislocation cannot skip any adverbials. If *V-de/bu-R* is formed through Local Dislocation and there is an adverbial between *-de/bude* and VR, the formation of *V-de/bu-R* should not be possible. This is borne out, as in (116).⁴⁹

- (116) *ta **manmande** ting-*de/bu*-dong ni de hua.
 he slowly listen-DE/BU understand you *de* words
 Intended meaning: *‘He can understand your words slowly (through listening).’

The ill-formedness of (116) can be explained with (117), which is the syntactic structure before the post-syntactic operation. If a manner adverbial like *manmande* ‘slowly’ is analyzed as an adjunct to V’ (cf. Huang et al. 2009), it will block the adjacency between *de/bude* and VR, leaving the morphological merger between V and *de/bude* impossible.

- (117) [_{VoiceP} ta [_{vP} *de/bude* [_{VP} **manmande** [_{v'} tingdong ni de hua].

However, if the adverbials are not positioned between *de/bude* and VR, but above *de/bude*, such as those Perfect-related adverbials like *changchang* ‘often’, *yijing* ‘already’ or sentential adverbs like *keneng* ‘possibly’ or *dagai* ‘probably’, the sentences should be good, as there is no adverbial blocking the morphological merger between *de/bude* and VR. This is also predicted, as in (118). Interestingly, when *manmande* is interpreted as time-denoting ‘gradually’ instead of manner-denoting ‘slowly’ in (116), as pointed out by Dylan Tsai (p.c), the sentence is not so bad if a sentence-final *le* is added into the sentence. This is expected, as time-denoting ‘gradually’ is structurally higher than manner-denoting ‘slowly’ (cf. Cinque 1999).

- (118) ta changchang/dagai ting-*de/bu*-dong wo shuo *de* hua.
 he often/possibly listen-DE/BUDE-understand I say *de* words
 ‘He sometimes can/couldn’t understand what I say (through listening).’
 ‘Probably he can/couldn’t understand what I say (through listening).’

48. Chen & Xiong (2014) take a Lowering approach to explain the potential constructions in Chinese and other east Asian languages. However, it is not clear how the manner adverbial restrictions observed in potential *de* construction in Chinese could be explained in such an approach.

49. As pointed out by James Huang (p.c.), the manner adverbial restriction in a potential *-de/bude* construction may be due to semantic incongruity, as manner adverbials are mainly used to describe a certain action and a potential *de/bude* construction mainly denote a kind of potentiality. We do not deny such a possibility; for related discussion, please see Wang (2014a). However, this paper supplies a structural analysis for this restriction.

This also explains why *zenme* couldn't be used as a question on manner in *V-de/bu-R*. Just like a manner adverbial, manner *zenme* is taken as a modifier of *V*' and positioned between *de/bude* and *V*'. This will break the adjacency between *de/bu* and *VR*, making the morphological merger between the two impossible.

Meanwhile, the Local Dislocation analysis of manner adverbials in *V-de-R* can predict the difference between potential *neng* and *V-de-R*. T. Wu (2004) assumes that *V-de-R* construction is similar with potential *neng*, as in (119). However, the two behave differently with respect to the manner adverbial restriction, as respectively listed in (120). In (120a), *kuaisude* 'fast' can be used to modify *kan wan zhe ben shu* 'finish reading this book'; whereas, in (120b), *kuaisude* 'fast' can't be used to modify *kan wan zhe ben shu* 'finish reading this book', as it blocks the merger between *de* and *kanwan*, resulting in ungrammaticality. This difference in manner adverbial modification can be easily explained with the Local Dislocation analysis.

- (119) a. ta neng kanwan zhe ben shu.
 he can read.finish this CL book
 'He can finish reading this book.'
- b. ta kan *de* wan zhe ben shu.
 he read-DE finish this CL book
 'He can finish this book through reading.'
- (120) a. ta *neng* *kuaisude* kan wan zhe ben shu.
 he can fast read.finish this CL book
 'He can finish reading this book fast.'
- b. *ta *kuaisude* kan *de* wan zhe ben shu.
 he fast read-DE finish this CL book
 Intended meaning: 'He can finish reading this book fast.'

To sum up, the formation of *V-bu-R* is the result of morphological merger between *de/bude* and *VR*. To be specific, it is through Local Dislocation. For the negative potential *V-bu-R*, it was originally *V-bude-R*. This may be evidenced by some dialects and pre-modern language data in Chinese.

7. Puzzles and asymmetries revisited

7.1 Restrictions revisited

As discussed in § 6.2.3, the manner adverbial restriction and non-availability of manner *zenme* in *V-de/bu-R* construction may be well explained if *V-de/bu-R* is derived through Local Dislocation (cf. Embick & Noyer 2001, 2007). Under Local Dislocation, manner adverbials and manner *zenme* will block the morphological

merger between *de/bude* and VR. Similarly, if DRP/FP is assumed to be adjoined at V' as in Huang et al. 2009), it will also block morphological merger between *-de/bude* and VR like manner adverbials do. Therefore, the DRP/FP restriction in *V-de/bu-R* construction is accordingly explained

The adverbial modification restriction in *V-de* and *V-bude* can be explained in a similar way, if *V-de/bude* is derived through Local Dislocation, too. Meanwhile the non-availability of manner *zenme*, and DRP/FP restriction in *V-de/bude* can be well explained through the proposed morphosyntactic analysis.

The non-availability of imperative forms for *V-de/bude* and *V-bu-R* is due to the fact that the functional head *de/bude*, meaning potentiality, selects a V or VR as its complement. *V-de/bude* and *V-bu-R* refer to potentiality rather than specific actions, resulting in incongruity with imperative form.

7.2 Asymmetries revisited

In *V-de/bude* and *V-de/bu-R* constructions, *-de* and *-bude* have grammaticalized into affixes. *-de* and *-bude* are functional heads in syntax, which undergo morphological merger with a V and VR on the morphological structure, forming *V-de/bude* and *V-de/bu-R*. The asymmetries between *V-de/bude* and *V-de/bu-R* are due to the argument structure change of verbs in the two constructions. Most of transitive V's in '*V-de/bude*' have been intransitivized due to the morphological merger with affixal *-de* or *-bude*. Whereas, the argument structure of a VR stay unchanged. This difference explains the asymmetries observed between *V-de/bude* and *V-de/bu-R* in § 2.3.1. As the transitive verbs have been detransitivized, they could not take their canonical objects and lose the ability of assigning accusative case to them as in § 2.3.1.1 and § 2.3.1.2. Therefore, their canonical objects have to be preposed for case reasons as a passive or passive-like sentence. This helps to explain the movement asymmetries observed between *V-de/bude* and *V-de/bu-R* in § 2.3.1.3. The asymmetries between *V-de* and *V-bude* in § 2.3.2 are explained with the hypothesis that each of them grammaticalized on its own way and *V-bude* is not derived from *V-bude*. Therefore, the asymmetries between *V-de* and *V-bude* is not unexpected.

8. Conclusion and discussions

8.1 Conclusion

In this article, we have discussed some puzzles and asymmetries involved in the potential *de* construction in Chinese. It is proposed that *de* and *bude* have undergone grammaticalization independently from a verb to a modal auxiliary and then

to an affix. In syntax, *de* and *bude* are functional heads which subcategorize for a V or VR. *V-de/bude* and *V-de/bu-R* are formed through morphological merger, to be specific, Local Dislocation, which takes place after syntax.

The manner adverbial restriction, the non-availability of manner *zenme* and *DRP/FP* can be well explained through the Local Dislocation merger. The manner adverbial or *DRP/FP* will block the morphological merger between V and *-de* or *-bude*. Meanwhile, as *-de/bude* is a functional head with potential meaning, the *V-de/bude* and *V-de/bu-R* are with potential meaning, which makes the corresponding imperative forms impossible. It is assumed that the asymmetries between *V-de/bude* and *V-de/bu-R* are due to some morphological operations. When a transitive monosyllable V is morphologically merged with *-de/bude*, its argument structure may be changed and the postverbal NP_{T/P} is often preposed; however, when *-de/bude* is morphologically merged with a VR, no such things happen.

8.2 Unsolved problems and discussions

A fundamental but tricky question raised by an anonymous reviewer is: why does *de/bude* detransitivize the verb in *V-de/bude* but not in *V-de/bu-R* if they are derived in a similar way as proposed in this paper? We have no definite answers to this question at present. This question might suggest that the detransitivization hypothesis in *V-de/bude* is not on the right track or there are some other reasons for this detransitivization. Another important question raised by the same reviewer is related to the semantic difference of *de/bu(de)* shown respectively in *V-de/bude* and *V-de/bu-R*. In this paper, we adopt a general term ‘potentiality’ and we don’t distinguish the semantic difference in detail. However, as pointed out by the reviewer, we tend to say that *V-de/bude* mainly expresses permission, as in (1), while *V-de/bu-R* mainly denotes ability, as in (3). The question is why there is such a difference.

We speculate the ability reading of *V-de/bu-R* may be related to the resultative meaning in VR. As suggested in Hackl (1998) (cf. Xie 2012), agentivity is involved in the ability reading and it is this agentivity which brings or causes the result. As no resultative meaning is involved in *V-de/bude*, the ability reading is less possible to occur in *V-de/bude*. From the perspective of event semantics (Parsons 1990), *V-de/bu-R* may denote two events: an action event denoted by a V and a result event denoted by an R. It is just the action V which needs an Agent-like entity and this Agent-like entity brings the ability reading. As for the reason why less agentivity is involved in *V-de/bude*, it is unexpectedly surprising that it may be helpful to answer the first question raised by the reviewer, that is, why the V in *V-de/bude* detransitivizes but not in *V-de/bu-R*? When the V detransitivizes in *V-de/bude*, it is something like the verb’s detransitivizing in a passive(-like) sentence. A related

consequence is that the original Agent gets demoted. This is something like the Agent in a passive sentence, in which the Agent is often optional, or as the Agent in a passive-like derivation, i.e. *zhe ben shu de chuban* ‘the publication of this book’ (Wang 2014b), in which the Agent is barred from occurring.

The above discussion may be helpful to explain another related problem, as pointed out by the same reviewer. The problem is that some *V-de/bude* sentences can actually express ability reading, which is unexpected in line with our analysis, as in (121) and (82b), here repeated as (122).

(121) *ta ting -bude bieren de yijian.*
 he listen BUDE other.person *de* advice
 ‘He cannot accept others’ suggestions.’

(122) *zhe ge zi (ta) xie -de.*
 this CL character (he) write DE
 ‘This character can be written (by him).’

We quite agree with the reviewer’s judgment that ability reading is available in (121). However, this is not unexpected, as *ting-bude* is not a (typical) *V-bude* construction as it does not detransitivize and still takes a canonical object, as *bieren de yijian* in (121). From this perspective, *ting-bude* is like *V-bu-R*, which is similar with *ta ting-bu-liao bieren de yijian*. If *V-bu-R* expresses an ability meaning, accordingly, *ting-bude* in (121) gets the ability reading.

On the other hand, according to the reviewer, the permission reading may be not available in (122), and the right rendering may be the ability reading. My response to this is twofold. First, if *ta* ‘he’ is deleted from (122), the permission prevails and no ability reading is available. Second, if *ta* is in the sentence, a bit different from the judgment of the reviewer, I feel that the permission reading still exists in spite of the fact that an ability reading may be available too. Under the ability reading, it means *ta xie de liao zhe ge zi*. The intuition difference between the reviewer and myself may be due to the existence of *ta* ‘he’. If the ability reading is available, *ta* acts as something like an Agent; while when the permission reading is available, *ta* is not Agent-like, but Experiencer-like. Along these lines, the ability reading of (122), according to the reviewer, is similar with (121) and *V-de/bu-R* construction, in which agentivity is involved. One thing to note is that, as pointed out by the reviewer, the permission-ability distinction in *V-de/bude* and *V-de/bu-R* is just a tendency but not a clear-cut border.

The answers to the above-mentioned questions are just speculations and they still await further research, which may deepen our understanding of the puzzles and asymmetries observed in the potential *de* construction in Chinese.

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