

The Resultative Nature of the Mandarin *Ba*-Construction and the German Separable and Inseparable Prefix-Constructions: a Comparative Study¹

Introduction:

The Mandarin Chinese *ba*-construction and the German separable and inseparable prefix constructions are both examples of complex predicates. More specifically, they are what Mohanan (1997) [Bender, 112] has defined as “construction[s] in which two semantically predicative² elements jointly determine the structure of a single syntactic clause.” Moreover, both constructions require resultative readings.

The Mandarin *ba* is an object marker and has been analyzed as both a P and V. I will treat it as a verbal element in this paper (for arguments to support this choice, see Bender (2000)). The following is a linear representation of the *ba*-construction:

(1) NP1 BA [NP2 mainV (NP3)]

Under the verbal analysis of *ba*, NP2, the main V and the optional NP3 appear in its clausal complement. This clausal complement has to have a resultative reading in a grammatical *ba*-sentence. The following sentences are examples of this:

- (2) a. Wo ba ni wang-le.
 ‘1S BA 2S forget-ASP’
 “I forgot you.”
 Implication: I made an effort to forget, and succeeded.
 b. Wo wang-le ni.

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² Where *semantically predicative* means [having] the capacity to constrain the number meaning and overt expression of the arguments in the clause”(Mohanan (1997), Bender 455).

‘I forget-ASP you’
“I forgot you.”
Implication: I forgot you without intending to.

The clausal complement of (2a) clearly shows an action, and a result that was achieved as a consequence. However, in (2b) the same elements that occur in (a)s clausal complement³ do not form a resultative, but describe a gradual and non-intentional kind of forgetting.

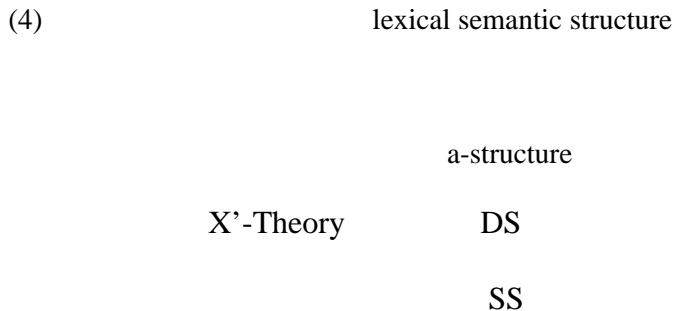
The German separable and inseparable prefixes, which constitute the two classes of German prefixes, are resultative elements, in that they render verbs resultative when they attach to them. The following is an example of a verb before and after a prefix has been added to it:

- (3) a. Ich hammere an die Wand.
‘1S hammer-1S on the-acc wall’
“I hammer on the wall.”
b. Ich zerhammere die Wand.
‘I ZER-hammer-1S the-acc wall’
“I hammer the wall to pieces.”

As we can see, in (a) hammering takes place without a result, and in (b), where the inseparable prefix *zer-* is added, there is a result.

My concern in this paper is to determine how elements within the two constructions interact in order to form the resultative reading. In Mandarin, these two elements are from the main and subordinate clause, and in German the elements are from the prefix and base verb. Accordingly, I will attempt to establish the mechanisms the grammar(s) might follow to generate these sentences. I will focus on the level of argument structure, since the relation between thematic components is basic enough to be suited for cross-linguistic study, and it seems to be the best starting point to understand other more language-specific things about the resultative aspect of the two constructions. After Grisham (1990), “argument structure represents a

complex of information critical to the syntactic behavior of a lexical item”(i). More specifically, argument structure interfaces between lexical semantic structure and DS:



As the above diagram shows, a-structure interfaces between lexical semantic structure and syntactic structure. As we glimpsed in sentences (2) and (3), the combining of elements in the German construction is partially happening in the morphology, while the combining of elements in the Mandarin construction happens in the syntax. We can thus expect differences. However, these difference are the most minimal in a-structure, which interfaces between, and interacts with both the lexicon and the syntax.

Roadmap:

Sections 1.0 and 2.0 will introduce the *ba*-construction and the German prefix construction respectively, and characteristics central to their resultative readings will be focused on. Tools to look at aspect from Smith (1991) will be introduced and applied to these characteristics. Section 3.0 will then draw the first important parallels between the two constructions, and argue why they are comparable. Focus will be on similarities in aspect or temporal structure. Sections 4.0 starts with a discussion of situation types with different

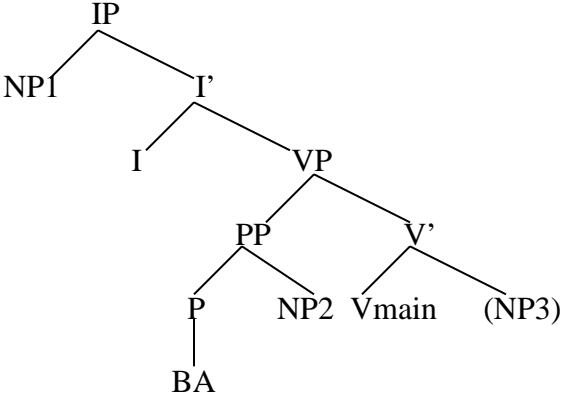
³ A word order change from SVO to SOV can be observed between (b) and (a). SOV is the characteristic word order of the *ba*-construction. However, since this point is not of central concern in the resultative semantics, we will not talk about in more detail.

temporal structure, and then moves towards more specific analyses of the resultatives in the two constructions. This discussion is greatly informed by Wunderlich (2000)'s analysis of different types of resultatives, namely the strong and weak resultative. Section 5.0 will reintroduce the issue of spectral structure to this discussion, and discuss logical relations between the components of the resultative structure. Finally, section six fine-tunes the derivational mechanisms for the resultatives in the two constructions.

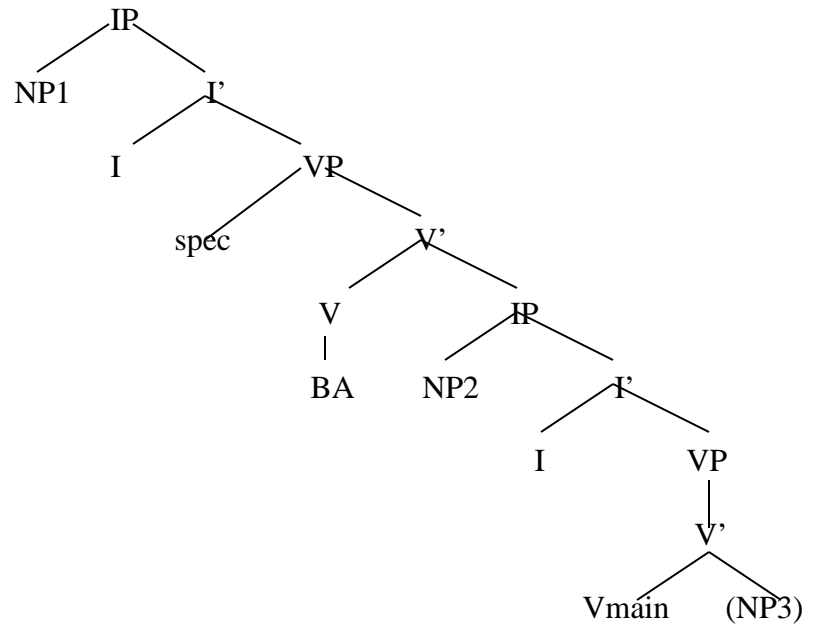
1.0 A closer look at the *ba*-construction:

The Mandarin *ba*-construction has been the subject of much study. The word *ba*, which is used as an object marker and has developed from the archaic Chinese V 'to take a hold of,' has been analyzed most frequently as a preposition, although it is very reasonable to look at it as a verb. Some linguists, among them Li and Thompson (1981), have placed it in the class of coverbs, which are verbs that occur in serial-verb constructions, and have been semantically depleted. Coverbs have qualities of both verbs and prepositions. One of the functions of *ba* is to assign case to NP2, its object. If we interpret *ba* as a P, NP2 will be the sister of P°. If we interpret *ba* as a V, NP2 will appear in the clausal complement of V. Let us look at this in trees (a) and (b):

(a)



(b)



Note that I have decided to call the V within the subordinate clause in (b) main V. The reason is that this embedded verb carries the most semantic content. I do not mean to suggest that this verb subcategorizes for the argument structure of the construction, an ability that should remain with *ba*, as I will discuss later. As we can see, in (a) *ba* does not c-command⁴ what follows after NP2; in (b), however, it does. Which option is more preferable seems to be a semantic issue: what are the control relationships within the sentence? Consider, for example, the following gloss, which includes *ziji*, ‘self’, a possessive marker which refers back to syntactic subjects only:

- (5) ‘He BA baby at-ziji(‘self’)-sink wash.’
a. “He washed the baby at his sink.”
b. He washed the baby at its sink.”

⁴ After Haegeman (1994), “A c-commands B if and only if A does not dominate B and every X that dominates A also dominates B.”

Since (5) is ambiguous and anaphoric binding of *ziji* is subject oriented⁵, we have to consider two subject-positions in the syntax of (5). Here, subject position means an NP that is daughter of an S (or IP). Furthermore, since there is an anaphoric relationship between either one of these NPs and *ziji*, both NPs should c-command what follows them. This points towards syntactic analysis (b).⁶ The *ba*-sentence has a number of distinguishing semantic characteristics. The Chinese linguist Wang Li has called it the ‘disposal form.’ More specifically, “[t]he disposal form states how a person is handled, manipulated, or dealt with; how something is disposed of; or how an affair is conducted”(translation by Li[1974:200-201]). Li&Thompson (1981) add to this that “disposal has to do with what *happens* to the direct object”(p468). The object of *ba* is the entity directly affected by the event. This explains certain constraints on when the construction is appropriate and when it is not. Consider the following two sentences:

(6) Wo ba cha-bei nong-po le.
 ‘I BA tea-cup make-broken asp’
 “I broke the teacup.”

(7) *Ta ba xiao mao ai.
 ‘3Sg BA small cat love.’
 (“S/he loves the kitten).

Li&Thompson (1981)

While (6) shows direct action on an object, together with what happens to the object as a result of the action, (7) does not. Furthermore, (6) describes a situation type that is clearly telic, while (7) describes a state, thus an event type that is atelic. Sentence (7) can be rendered grammatical if we add a resultative element to it:

(8) Ta ba xiao mao ai de yao si.
 ‘3sg BA little cat love CSC want die’
 “”S/he loves the kitten so much that s/he wants to die.”

⁵ class notes: *Structure of Chinese*, spring 2000 w/professor Shizhe Huang.

We might argue that the action of loving is not telic in (8) as the action of breaking was telic in (6). However, the situation does show the extent to which the kitten is loved, in the sense that it has brought about a result: the subject (experiencer) wants to die. The action of loving the kitten has thus reached its ultimate intensity and therewith has a (figurative) final point. We conclude that verbs of both telic and atelic situation type can occur with *ba*; however, the total event is telic, and should V itself be atelic it needs to have enough information in its complement to make it telic. In (8), this extra information is *yao si*. Thus the VP in the complement of *ba* needs to be telic.

However, it is not enough for the VP in the complement of *ba* to be telic: it also has to be clear that the endpoint of the telic event must have been reached:

- (9) *Wo ba pingguo chi-le, keishi mei chi-wan.
 'I BA apple eat-asp, but not eat-finish'
 ('I ate the apple, but didn't finish it')

The above sentence is ungrammatical, even though both clauses by themselves are grammatical. The truth conditions of the first and second clause are in conflict. More specifically, the interpretation of the first clause is completion of the apple eating, while the second clause denies completion. The characteristic of the *ba*-construction that a final point does not only have to be potentially present (as is the case in a telic event), but has to be realized in the situation referred to, can best be expressed in terms of viewpoint. Smith (1991) talks about three viewpoints:

- (10) a. perfective: situation as a whole with initial and final points.
 b. imperfective: part of situation, including neither initial nor final point
 c. neutral: initial point of situation and at least one internal stage (p7).

⁶ As this is a significant and controversial issue, which is not crucially relevant to the topic at hand, we will not present further arguments on the verbhood of *ba* in this paper, unless they come out of the analysis at hand.

As (7) suggests, (10b-c) are not licensed under the *ba*-construction. However, (8) and (9) suggest that the complement of *ba* has perfective viewpoint.

Since perfective viewpoint by definition suggests a telic event (events not brought to a final point but merely interrupted are imperfective), we can simplify the requirements we have so far established for the *ba*-construction: the complement of *ba* has to have perfective viewpoint. Because of this constraint, it naturally follows that atelic events with *ba* either occur with a resultative element, or are ungrammatical.

2.0 A closer look at German prefixes:

Now that we have a rudimentary idea of the *ba*-sentence, its components, and their semantic requirements, let us look at the German construction. The German prefixes differ from the Mandarin *ba* in that they are members of the two German prefix classes: the inseparable and the separable prefixes. Most German prefixes characteristically add resultative meaning to an already existing V. We will focus on three inseparable prefixes: *er-*, *ver-*, and *zer-*. They carry the following specific information as to how the result takes place:

- (11) *er-*: ‘produce/generate s.t. (by effort), emphasis on beginning/brevity of action, die, kill
ver-: ‘mistake/negative result in an action, sustain until the end, change, obstruction
zer-: ‘separation, breaking to pieces, scattering.’⁷

What precise meaning the prefix-verb combination ends up having depends on the verb the prefix combines with.

- (12) Sie zerreisst das Papier.
‘She ZER-tears the paper’
‘‘She tears the paper (into many pieces).’’
- (13) Er zerstreut den Sand.
‘He ZER-spreads the sand’
‘‘He spreads the sand (everywhere).’’

⁷ These definitions are loosely adapted from Keller’s *Dictionary of German Word Classes*

In (12), the dominant characteristic of the result is ‘breaking to pieces,’ but in (13) it is ‘scattering.’

The class of separable prefixes is bigger and more productive than the class of inseparable prefixes. It mostly consists of adjectival elements, such as *tot* (‘dead’) in *tot.schiessen* (‘shoot dead’), and some prepositional resultative elements, such as *durch* (‘through’) in *durch.reissen* (‘tear in half’).. The adjectival separable prefixes are limited to what Goldberg (1991) has introduced as ‘end-of-scale’ adjectives. Allowing some variation, these ‘end-of-scale’ adjectives are non-gradable, and in that all-or-nothing descriptors. Examples are *tot*, ‘dead’, *kaputt*, ‘broken’, *ein*, ‘into, and *durch*, ‘through.’ As we can see, these adjectives don’t describe states that begin gradually, but whose beginning marks a clear point in the temporal structure of an event. More specifically, this onset point of the states denoted by the prefixes seems to mark a sub-event. We will see that this is an important characteristic with regard to the temporal structure of resultatives.

A further characteristic of the separable prefix class is that its members occur separated from the Verb in sentence-final position when the verb is finite. Consider the following three sentences, featuring the inseparable prefix verb *zerreissen*, and the separable prefix verb *durch.reissen*:

(14) Sie zerreisst das Papier.
‘She ZER-tears the paper’
“She tears the paper (into many pieces).”

(15) Sie reisst das Papier durch.
‘She tear-3SgPT⁸ the paper DURCH’
“She tears the paper (into two pieces).”

(16) a. Sie will das Papier zerreißen.

⁸ Where ‘3SgPT’ refers to the third person singular present tense ending. The second position in the German sentence takes the finite, thus [+tense] verb.

- ‘She want-3SgPT the paper ZER-tear’
 “She wants to tear the paper (into many pieces).”
 b. Sie will das Papier durchreißen.
 ‘She want-3SgPT the paper DURCH-tear’
 “She wants to tear the paper (into two pieces).”

As we can see, Sentence (14) exemplifies the inseparable prefix, *zer-*, which has to stay attached to the verb, and is a bound morpheme. In contrast, (15) shows that the separable prefix *durch-*, which occurs away from its verb in sentence final-position when the verb is [+ tense], is a free morpheme and a P when standing alone, and has the more definite meaning “through”. As (16a-b) show, when another verb is in the sentence’s [+tense] position, and the prefix-verb is moved into the sentence final [-tense] position, the prefix stays connected to the verb regardless of its character. These characteristics can be summarized as follows:

- | | | | | |
|---------|-----|----------------------------|-----|-----------------------------------|
| (17) a. | NP1 | [inseparable prefix]-mainV | NP2 | |
| b. | NP1 | mainV | NP2 | [separable prefix] |
| c. | NP1 | modal V | NP2 | {insep./sep. prefix}- infinitiveV |

We see that the difference between (a) and (b) is a movement rule. It is generally accepted (see Diesing (1990)) that the verb and its prefix are generated together in V’, and that the verb moves up to C if it is finite.⁹ Between (a) and (b), we see that the difference lies in the morphology of the prefix: if it is a bound morpheme, it has to move together with V, but if it is a free morpheme, it does not move together with V. Since the separable prefix does not move together with the verb, we can deduce that it must be a lexical head instead of an affix like the inseparable prefix.

⁹ The reason this assumption has been made is because the German finite verb is only in second position in clauses that have a free C position, hence non-embedded clauses.

All this does not necessarily mean a difference in semantics between the separable and inseparable prefixes, since there are cases where use of an inseparable prefix or a separable prefix with the same verb will produce semantically identical sentences. (Look ahead to sentences (15) and (16)). We can conclude that, since (17a-b) differ primarily on a morphological level, and both constructions can be used at times to express the same idea, (a) and (b) are related closely enough to each other to both be semantically parallel to the *ba*-construction.

Finally, we see that the aspectual constraints on both, (a) and (b), are similar to *ba*: the root verb does not have to be telic, as we see with *reissen* (see (7)-(9)) which, in connection with a PP argument, can describe an ongoing activity. However, the prefix, in this case *zer-* or *durch-*, imposes perfective viewpoint, and thus makes the total event telic. We will later return to discussing finer semantic differences between the two prefix classes.

3.0 Arguments in favor of making the comparison:

But how can we compare prefixes to a separate verbal (or prepositional) element as *ba*? The answer is twofold: first, *ba* is not as independent as it might seem. Consider the following sentences:

- (18) a. wo na le yi-ben shu.
 ‘I take PFV one-CL book’
 ‘I took a book.’
 b. *wo ba le yi ben shu.
 c. wo na nei-ben shu gei le ta.
 ‘I take DEM-CL book give PFV him.’
 ‘I gave him the book.’
 d. wo ba nei-ben shu gei le ta.
 ‘I gave him the book.’

Sun(1996, p 69)

In (18a-b), there is only one verbal element per sentence, which means that this verbal element must be independent of other verbal elements. This is certainly the case for *na* in sentence (a). However, it does not hold true for *ba* in (b). *Ba* cannot be an independent verb. It is grammatical only when there is another verb, a semantically dominant verb, in the sentence, as we see in (c-d). The same holds true for the German prefixes: we saw different degrees of independence: the separable prefix is a free morpheme, and the inseparable prefix is a bound morpheme. Yet, neither is free to the extent that it can grammatically occur in a full sentence without there being a main V.¹⁰ Therefore, no matter whether *ba* is a P or a verbal element, the parallel between it and the prefixes seems reasonable. The second part of the argument follows from the first part: both, *ba* and the prefixes, need a *main* verb, one that is semantically dominant. What is more, even though the main V is the semantically dominant one, both *ba* and the prefixes have their share in determining the semantic requirements on NP2. Consider the following sets of sentences:

- (19) a. *ta ba tang he le, keshi mei he-wan
 ‘3rd BA soup drink ASP but Neg. drink-finish.
 (“He has [completely] eaten the soup, but did not finish it”).
 b. ta he le tang le, keshi mei he-wan
 ‘3rd drink ASP soup ASP but Neg. drink-finish’
 “He has eaten the soup but did not finish (it).” (Sun, p55).

In (a), we create a contradiction that results in the ungrammaticality of the sentence: *ba* requires that the event it describes be completed. Hence, the soup has to be drunk completely, and cannot be in the condition of not being finished. The same does not occur in (b), where *ba* is absent, and the semantic requirements on NP2 are more flexible: the action can be either interrupted before completion, or completed. Since the second clause suggests that the action

¹⁰ But the separable prefix can appear in short utterances answering questions, such as *Vor dem Haus* (‘before

was interrupted, this interpretation is imposed on the first clause. We can thus see that *ba* significantly influences the nature of the event described, although it is not the dominant verbal element: it signals the degree to which NP2 is affected. More specifically, it forces the entailment that the action was completed, and thus that the soup was completely eaten. Now, consider the following German sentences:

- (20) a. *Klein Tommie verzerrt sein Gesicht, aber es aendert sich nicht.
 ‘little Tommie VER-pulls his face, but it changes itself not’
 (Little Tommie grimaces, but his face doesn’t change).
 b. Klein Tommie zerrt an seinem Gesicht, aber es aendert sich nicht.
 ‘little Tommie pulls at his face, but it changes itself not’
 “Little Tommie pulls at his face, but it doesn’t change.”

As we can see, both, (a) and (b), involve a case of “pulling” – which is the main verb. However, in (a) the addition of the prefix *ver-* adds the requirement that the direct object be something that is “pullable” *and* internally changeable, instead of simply being changeable in terms of location, as exemplified by the first clause of (b). In other words, the effect of the action on the direct object has to be more apparent in (a). A change has to take place, and the action is, with that, completed. Because the second clause denies change of the direct object, (a) creates a contradiction. The same happens as in (19): the first clause of (a) creates an entailment that is contradicted by the second clause; when the prefix (or in (19) *ba*) is not present, the entailment becomes an implicature and can thus be denied. Hence, the two constructions have the perfective viewpoint requirement and the clear-impact-on-NP2 requirement in common. In fact, they are so central to the constructions, that they determine their truth values. We have therewith drawn a plausible semantic parallel between the requirements of *ba* and those of the added prefixes in German.

the(dat) house, ‘*In front of the house*’), where *vor*, a potential separable prefix, operates as a P.

Let us now look closer at the two constructions, and specifically compare one of their attributes, which has been recognized by linguists to be central to both forms: the requirement for a noticeable effect on NP2.

4.0 Direct impact on NP2: Resultatives

How can the direct impact on an object be expressed? What seems to be central is that the state of the object before the action not be the same as after the action. Thus there should be a clear indication of the object going from one state into another state as a result of the action. We are thus dealing with specific kinds of events. More precisely, we are dealing with either telic situation types or atelic situation types that have perfective viewpoint due to their complements. Let us briefly review the 5 situation types as laid out by Smith (1991):

(21) Situation types

- a. states: static, durative
- b. activities: dynamic, durative, atelic
- c. accomplishments: dynamic, durative, telic; process w/successive stages
- d. semelfactives: dynamic, atelic, instantaneous
- e. achievements: dynamic, telic, instantaneous.

We can have Vs of all five situation types in connection with the *ba* and prefix constructions.

However, in both Mandarin and German we can only have VPs of telic situation types: the three atelic situation types, namely the states, the activities and the semelfactives, will need information around them that make them perfective. More specifically, they will require the addition of a resultative predicate to the VP, as we shall see below.

4.1 Separable vs Inseparable revisited:

The German prefixes are examples of resultative elements, that might be added to a base verb to make it perfective. Although we claimed that the German separable-prefix and

inseparable prefix constructions are essentially the same in terms of impact on NP2, and can both be compared to the *ba*-construction, it is worth it to look more closely at possible differences between the two classes of prefixes, and see whether both options are included in the *ba*-construction, or whether we are better off comparing the *ba*-construction to only one of the two prefix classes. Consider the following sentences:

- (22) a. Sie erschießt den Hasen.
‘she ER-shoots the(acc) rabbit’
“She shoots [and kills] the rabbit.”
b.* Sie hat den Hasen erschossen, aber er lebt noch.
‘she has the(acc) rabbit ER-shot, but he lives still’
“She shot [and killed] the rabbit, but he is still alive.”
- (23) Sie schießt den Hasen tot.
‘she shoots the(acc) rabbit TOT’
“She shoots the rabbit dead.”¹¹

In (22), the inseparable prefix, *er-*, appears with V. However, the separable prefix, *tot*, in (23), is situated at the end of the sentence, as expected. In (22), the information that an action that will have a significant and specific result on the direct object is taking place is encoded¹² in the prefix *er*: this result, ‘death,’ is not spelled out anywhere in the sentence. It is rather an entailment that is based on the combined meanings of the verb and the prefix it appears with. The contradiction test in (22b) shows that it is indeed an entailment rather than an implicature: the first phrase is truth conditional. In (23), on the other hand, the result is specifically spelled out in the separable prefix. In fact, this “prefix” can also appear as an adjective, as in (24):

- (24) a. Der Hase ist tot.
‘The rabbit is dead’
“The rabbit is dead.”

¹² Let us use the term *encoding* here, since information is put into ‘code’ for the listener to access via entailment, rather than overtly displayed in the sentence. No parallel to *encoding* as used in the acquisition literature is intended.

Since adjectives generally describe states, we have a typical change of state situation in (23), where the resulting state is spelled out. In fact, we can say that a sub-event, a new state, is introduced, following the semelfactive *shiessen*. Both, (23) and (24) see a change of state in the direct object. The base V *shiessen* is a semelfactive. Then, in (22) the inseparable prefix entails a resultant change of state of the direct object, while (23) specifically mentions it. Thus the event becomes telic, and an achievement with the addition of either prefix. We can thus talk about two options towards a similar result: either the encoding of enough general information, so that a result can be guessed from the combination of the verb and the encoding affix, as exemplified by (22), or a specific spelling out of the final state, as exemplified by (23).

The only difference in the aspectual outcome between the two sentences is that in (23) the sub-event is specifically introduced, while it is not in (22). This puts more focus on the sub-event, and thus outcome, in (23). In fact, some native speakers see (23) as more negative than (22).

This intuition that the overt result in (23) is slightly more negative than its encoded counterpart calls for a distinction between the inseparable prefix resultatives, and the separable prefix resultatives. Wunderlich (2000) provides such a distinction. He distinguishes between weak resultatives and strong resultatives:

- (25) Weak Resultatives: a result state already implied by the V is specified more narrowly.
Strong Resultatives: some result state predicating of one of the involved participants of a process is added (p257).

To kill is not necessarily implied by the base verb *shiessen*. Evidence for this is that you can *shiessen* ('shoot') a ball without killing it. However, the result of 'death' is evident

when either an inseparable (see(22)) or a separable (see (23)) prefix is added to the verb. Therefore, neither prefix creates a weak resultative. However, we can see that the separable prefix *tot* obviously stands as a new predicate that is saturated by one of the participating arguments in the shooting event. This can be captured formally:

(23)' *schliessen*'(AGENT, THEME) causes *tot*'(THEME)

As becomes clear in (26)', the THEME is a participant in the shooting event as well as in the resultant state, which we have earlier referred to as a sub-event.

Contrary to *tot*, the inseparable *er-* does not carry enough information to be an independent predicate, as (24b) suggests.

- (24) b. *Der Hase ist er-
 'The rabbit is ER-'
 c. Der Hase ist erschossen.¹³
 'The rabbit is ER-shot-participle'
 'The rabbit is shot (dead).'

Er- can only form a predicate together with the information from the base verb it attaches to, as (24c) illustrates. We thus get the following thematic representation of the causative in (24)':

(24)' *schliessen*'(AGENT, THEME) causes *erschossen*'(THEME),

Here, the resultant predicate is not the prefix, as was the case in (23)', but the entire participle from (24c) forms the result predicate. Both (23)' and (24)' are strong resultatives, as they create separate predicates filled by an already existing thematic role. However, the separable

¹³ This could also be used idiomatically to mean 'The rabbit is exhausted.' However, this parallel is a unique occurrence with this specific participle.

prefix creates this predicate by itself, while the inseparable prefix does not. The inseparable prefix can only create a causative predicate in connection with the base verb.

4.2 Encoding vs Spelling-it-out : towards the Resultative in the *ba*-construction

As we have seen from the German prefixes, there are two tactics in communicating the result of an action on its object. The first option is encoding: an inseparable prefix, such as *er-*, is added to the V, and interacts with its meaning as to create an entailment of a final result. The second option is to spell out the final result, which in German can be done via the separable prefix, which in itself stands as a result predicate. Both options are morphological processes, in that the prefix and the V are one lexical unit, even though they don't always occur together.

Let us now look at whether the encoding and spell-it-out options are also available for the *ba*-construction and, if they are, when each option is chosen. Since *ba* and the elements it interacts with are not part of the same lexical unit, but rather are put together in the syntax, I acknowledge that the interactions between the thematic components of the causative are at the morphosyntactic level in German, while they are at the syntactic level in Mandarin, unless we decide to see the Mandarin resultative predicates as parts of the same V-node as the main verb.

Let us start with a sentence we would consider most likely to be an example of encoding: one in which an outcome is not specifically mentioned, but forced because *ba* is present.

- (27) a. Ta ba pingguo chi le.
 '3rd BA apple eat ASP'
 'He ate the apple.' (Chaofen Sun (1996), p53)
- b. Ta chi-le pingguo le.
 '3rd eat-asp apple asp'
 'He ate the apple'

In the *ba*-sentence, completion is an entailment; in (b), which features the elements in the clausal complement of *ba* by themselves, the perfective reading is optional. We know that in grammatical *ba*-sentences *ba* and a resultative reading coincide. However, there is an argument against proposing that *ba* encodes the resultative as the German inseparable prefix does: the two constructions differ, because in German whenever a prefix is added nothing else needs to be added to form the resultative. This is not always the case for the *ba*-construction, as (28) illustrates:

- (28) a. Ta bu xiao-xin ba zhi men ti-le yige dong.
‘he neg careful BA paper door kick-asp one-AN hole’
‘He carelessly kicked a hole in the paper door.’ (Teng)
- b.* Ta bu xiao-xin ba zhi men ti-le
‘he neg careful BA paper door kick-asp’
(‘He carelessly kicked the paper door.’)

In sentence (b), we see a clausal complement of *ba* without a resultative element. The sentence is ungrammatical, which suggests that *ba* does not manage to encode a resultative reading. The resultative has to be overtly added, as (a) shows, in order to generate a grammatical sentence.

Why, then, is it that (27) takes a resultative reading with the presence of *ba* and without a resultative element, while (28b) does not? In (28a), we see a specific result of the kicking action spelled out for us: there is a hole in the door. Note that this seems to be a predictable result, since we are given the information that the door is made of paper, and that there has to be a significant change on it because it is preceded by *ba*. However, (28b) shows that the sentence is ungrammatical without the resultative complement. The entailment of a definite final state cannot be arrived at. This makes the constellation different from (27): the verb and object are telic, and the natural endpoint of *eating*, if it is being completed, is *finishing*. However, the verb and object in (28) are a semelfactive: the final result of *kicking*, if it is being completed, could

be making a hole, making a bad dent, opening the door (any achievement), or no result at all. Hence, since the main verb in (28) does not carry enough information to have a single predictable result, but *ba* requires such a result, it is aided by the specific mentioning of the resulting state of the door, and a sub-event is introduced to make the semelfactive an achievement. Although *yige dong* is an NP, it serves as an independent predicate describing the resulting state of the door – the THEME of the semelfactive V'. We can represent this in the following way, where *res* stands for *result*:

- (28a) Ta ba zhi-men ti-le yige dong.
 (28a)' V'(AGENT, THEME) causes res'(THEME),

This is a strong resultative, since a new predicate which takes one of the thematic participants of the V' event is added: *yige dong* the new predicate, is true for *zhi-men*, the theme. The same is not true for (27a), where an entailment indicates the result, but it is not specifically stated. Let us capture this in the following terms:

- (27a) Ta ba pingguo chi-le.
 (27a)' V'(AGENT, THEME) causes (perfective viewpoint (V'))'(THEME),

This case falls into neither of the two resultatives proposed by Wunderlich (2000). *Ba* forces a resultative state implied by V' to appear. More specifically, the overt V', the verb and its object, together with *ba* entail completion of the event denoted by V'. Since *ba* forces the resultative, it has a role to play in (27a)'. However, it does not contribute any information to the result, which is thus completely shaped by the characteristics of V'. This falls into the region of

weak resultatives, but it is in a sense weaker, because the implied result is not specified more narrowly.

We can thus conclude that the spell-it-out tactic is used in the *ba*-construction, but the encoding tactic is not. More specifically, *ba* does not manage to encode a result like the German inseparable prefixes do. Instead it ‘encodes’ the requirement for a result. However, as became clear in (18a), this result has to be completely derived from the main verb and its object. As we saw in (28), if the V’ component is not telic, and hence cannot produce such a result, an additional resultative predicate has to be added, or ungrammaticality results.

In summary, the separable prefixes we looked at form independent strong resultative predicates. The inseparable prefixes also form strong resultatives, but don’t do so independently: they require information from the base verb to contribute, and are thus weaker resultatives than the separable prefix Vs, since they are more predictable from V’. Looking at the *ba*-construction, we saw that *ba* does not add any information to resultative predicates, but forces the main verb to form them. This happens either by the entailment of a result, which creates a weak resultative where the result is a natural endpoint to the main verb, or it happens with the addition of a separate resultative predicate. This is a strong resultative because a predicate that could not have been predicted by the main verb -- a sub-event -- is added. In both cases, it is not the verb itself but the entire VP that determines the kind of resultative being formed.

5.0 Aspect and the Structure of Resultatives:

Our discussion of resultatives in the Mandarin and German constructions has made it clear that that the basic action of V’((AGT), TH) results in a significant change on the THEME,

and a resultant new state of it. Let us now take a closer look at this general aspectual structure.

Goldberg (1991) proposes the following simple aspectual constraint for English resultatives: “the change of state must occur simultaneously with the endpoint of the action denoted by the verb”(8). I believe that the same holds for the *ba*- and prefix constructions: the action takes place until the point is reached where NP2 is significantly affected, which is also the point at which change is seen. Clearly, not all verbs necessarily denote an endpoint. However, we can reason that if the V itself does not denote an endpoint, once such an endpoint is added the most relevant part of the action is the part that occurs before this endpoint is reached. Consider the following two sentences with respect to this:

- (29) Da shui ba qiao chong-zou le.
‘big water BA bridge wash-go LE’
‘The flood washed away the bridge.’
- (30) Wo ba ta bang-le liang-shi jiao.
‘1sg BA 3sg tie:up-LE two –CL foot’
‘I tied up his/her two feet.’

There are clear points where the bridge ‘goes’, and where the feet are tied. Thus the semantic interpretation of (29) is that ‘the flood washed against the bridge to the extent that it was washed away.’ A similar interpretation is possible for (30). The points that mark the onsets of the resultative states occur after the action to bring them about has reached a certain extent. What concerns the interpretation of the sentences, the part of the action from its onset until it has reached this extent is the only part relevant. Whether the action goes on beyond the point where the resultant state starts is optional. What is significant is that the first possible point where the action could end is the point where its THEME, here the bridge or the feet first qualify to describe the resultant state. Now consider two German sentences:

5.1 More on logical relations between states A and A'

We can add a further specification to structure (32a). Consider sentences (29) and (30): sentence (29) presupposes that the bridge was originally in place, and sentence (30) presupposes that the patient's feet were not tied originally. Likewise, (31a-b) presuppose that the window was originally intact. Indeed, all *ba*-sentences and German prefix sentences show a clear final result brought about by a significant impact, as discussed earlier, and therein presuppose an initial state of the THEME as different as it could be to its final state. Hence, state A, the original state of the THEME as identified in (32a), is the negative of state A', and vice versa. With this new definition in mind, we can represent the idea that mentioning of the final state, A', triggers the presupposition that its opposite was true initially.

(32b) state A << state A', where A = not(A')

I chose to arrange the representation going from right to left in order to preserve the idea of temporal sequence that is the basis of (32a).

Is (32b) necessarily a one-way statement? State A can always be derived from state A'. However, the reverse is not always true. The reverse is shown in (32c);

(32c) state A >> state A', where A = not(A')

Here, knowledge of the original state is sufficient to derive the final state. In what type of scenario would this happen? We would be talking about the entailment of a resultant state, a weak resultative where the addition of an overt resultant predicate is not necessary. Thus the

result is derived from the verb. More specifically, the result can be derived from the verb and its object. Reconsider sentence (28a):

- (28) a. Ta ba zhi men ti-le yige dong.
‘he BA paper door kick-asp one-AN hole’
‘He kicked a hole in the paper door.’ (Teng)

(28a) presupposes that there was no hole in the door to begin with.¹⁵ Hence, in looking at the utterance, state A can be derived (by presupposition) from state A’, as illustrated in (32b). However, the reverse is not the case, since state A is not explicit enough to derive an opposite state from. Clearly, this discussion goes back to previous analysis of some *ba*-sentences deriving state A’ by entailment, and others mentioning it as a resultative complement. To solidify the argument that (28a) shows presupposition from A’ to A, we can use the contrast in definition of presuppositions being preserved in negative environments, against that of entailments not being preserved. These characteristics are based on the fact that presuppositions are not dependent on the truth values of their surroundings, while entailments are. Consider (28c):

- (28) c. Ta mei ba zhi-men ti-(#le) yige dong.
‘he not BA paper-door kick-(#asp) one-AN hole’
‘He didn’t kick a hole in the paper door.’

Note that we have to alter the original proposition in order to create a grammatical sentence: the completion marker *le* needs to be removed, since the completed action is denied. After this, (28c) optionally presupposes that there was no hole originally, a presupposition shared by the sentence’s positive equivalent. As with its positive equivalent, entailment is not an option here,

¹⁵ This, and the other Mandarin data in 6.1, are the intuition of a native speaker I consulted.

because the final result is overt. Let us also look at a sentence in which we know that state A leads to an entailment of state A.’

- (33) a. Ta ba pingguo chi le
‘3rd BA apple eat ASP’
‘He ate the apple.’
b. Ta mei ba pingguo chi le.
‘3rd not BA apple eat ASP’

Here, the original presupposition is preserved in the negative environment: both (a) and (b) presuppose the initial presence of an apple. However, the entailment in (a), namely that the apple was completely eaten, is clearly not preserved in (b). Since what happens in (33b) is what typically happens to presupposition and entailment in negative environments, we can see it as evidence for an entailment relationship from state A to state A’, as captured in (32c). Further, (33b) is evidence for a presupposition relationship from state A’ to state A in (33a). We can thus conclude for the *ba*-construction that presupposition always holds, whether state A’ is an entailment or spelled out; but that entailment only holds when state A’ is the natural endpoint of the main V’, and thus a weak resultative. In more abstract terms, it is always true that $A \ll A'$, but it is only true for weak resultatives that $A \gg A'$.

Now let us briefly look at the German equivalents to see whether this generalization holds. Consider (34), where the result is spelled out:

- (34) a. Ich schlage das Fenster kaputt.
‘I hit the window broken’
‘I break the window[by hitting it].’
b. Ich schlage das Fenster nicht kaputt.
‘I hit the window not broken’
‘I don’t break the window [by hitting it].’

Here, (a) presupposes that the window is unbroken originally. Sentence (b) presupposes the same. There are no entailments in this case, since state A' is spelled out. This is a parallel to (28a) and (c), as we see that presupposition from A' to A holds in strong resultatives. Now consider an identical pair of sentences, where an inseparable prefix is used to encode the final result.

- (35) a. Ich zerschlage das Fenster.
 'I ZER-hit the window'
 'I break the window [by hitting]"
 b. Ich zerschlage das Fenster nicht.
 'I ZER-hit the window not'
 'I don't break the window [by hitting it]."

Here, (a) again presupposes an intact window, and so does (b). On top of that, (a) entails a broken window. However, as in (33b) this entailment is not preserved in the negative environment.

We herewith see that the German data and the Mandarin data act identically in terms of presupposition and entailment. We can conclude with the following generalization:

- (36) Presupposition from A' to A always holds, but entailment from A to A' only holds when the resultative predicate is at least partially derived from the main V and its TH.¹⁶

6.0 Towards more specific rules for the German and Mandarin Constructions:

We have established that the resultative construction has an initial and final state characteristic of its THEME at these points in time. Further, we have come to a generalization

¹⁶ This analysis was slightly simplified, since presupposition between the original proposition and the proposition embedded in a negative does change somewhat when [-instantaneous] situations are described where the onset of action doesn't coincide with the beginning of state A'. In those cases, the negative presupposes whatever the original utterance presupposed, *as well as* that the action itself has already begun.

describing the relationship between these states depending on what kind of resultative is formed. Strong resultatives result from the presence of resultative predicates independent of V', while weak resultatives result from the presence of resultative predicates derivable from V'.

Now that we have carefully investigated the semantic structure of the Mandarin *ba*-construction and the German prefix constructions, and how they form the resultative, we can move towards establishing more specific rules for these mechanisms. Let us first consider a more specific morphological derivation of German prefix constructions, since they occur earlier on in the grammar than when the Mandarin components, which combine in the syntax

6.1 Towards a lexical rule for German

In establishing a lexical rule for the German constructions, we will follow the following path: first we will take a closer look at the syntactic environments that base verbs and prefixed verbs can occur in. This will lead us to subcategorization frames for different elements. We will then consider how the thematic representations of these components interact to form the causative, and come to a generalization that includes the aspectual information derived in the previous sections.

Consider the following environment for the transitive verb *hammern*, 'to hammer':

- (37) a. #Ich hammere den Nagel.
'I hammer-1SgPT the-acc nail'
"I hammer the nail."
b. Ich hammere den Nagel in das Brett.
'I hammer the(acc) nail into the(acc) board'
"I hammer the nail into the board."
c. Ich hammere den Nagel ein.
'I hammer-1SgPT the-acc nail IN'
"I hammer in the nail."
d. Ich hammere den Nagel platt.
'I hammer the(acc) nail flat'

- “I hammer the nail flat.”
 e. Ich hammere an die Wand.
 ‘I hammer at the-acc wall’
 “I hammer on the wall.”

(37a) is weird: ‘to hammer’ by itself is atelic. However, ‘to hammer the nail’ is telic given what we know about the world. Note in (e) that when the hammering event is not telic, German requires a P before the object. (a) is weird in that it signals telicity, but the endpoint of the action is not clear. There can be more than one result to hammering, and therefore a specific result has to be spelled out.¹⁷ Sentence (b) shows that this requirement can be fulfilled in adding a PP. Sentences (c-d) show that it can also be achieved in adding a separable prefix.

But what happens here is in a sense new to our discussion: the verb itself has the ability to encode the same kind of information (direct resultative action on NP2) that we ascribed to inseparable prefixes, such as *er-* and *zer-*. More precisely, (37a) shows that the following subcategorization frame for *hammern* is insufficient:

(37a)’ #*hammern*, V, [_ NP]

<AGENT<THEME>>

Instead, we see in (37b) that a further resultative element has to be present to make the verb grammatical. Let us represent it in the following way:

(37b)’ *hammern*, V, [_ NP PP]

<AGENT<THEME, GOAL>>

hammern’ (AGENT,THEME) causes PP’ (THEME)

¹⁷ As in Mandarin, this is not the case with sentences where the outcome is clear. *Ich esse den Apfel*, ‘I eat the apple’, is perfectly acceptable as it is.

(37b)' represents what happens in sentence (37b). The third line attempts to capture the causative relationship between V+O and the added PP. (*cause* is a somewhat strong description, since (37b) is a weak resultative: that there is a result is already encoded in the V, and the PP merely specifies what exactly it is).

Sentences (37c-d) have the same base verb, but different separable prefixes. Like the PP complement, this makes *den Nagel* grammatical as the direct object of the verb. Unlike the PP, the two prefixes, *ein*, 'into', and *platt*, 'flat', add a resultative state that is not predicted by the base verb. They are thus strong resultatives. The prefixes are included in the lexical entry of the V:

(37c-d) *platt.hammern*, V, [_ NP]

<AGENT<THEME>>
hammern '(AGT, TH) causes *platt*' (TH)

The first difference between (37b)' and (37c-d)' is that the former is a lexical entry for the base verb only, and attempts in its thematic structure to capture the relationship between the elements it subcategorizes for in the syntax. However, (37c-d)' is the lexical entry of a compound word, and captures the thematic relationship between the elements it subcategorizes for, but since the prefix has added a further argument, it also captures the relationship between this argument and the rest of the thematic structure in line three. As Wunderlich (2000) has predicted for strong resultatives, the resultative predicate shares an argument with the participants of the main verb, thus there is argument linking at the morphological level.

Thus we know that *hammern* can either appear with a PP that specifies its result, or with a separable prefix that introduces an independent result. Can it occur with both? Consider the following sentences:

- (38) Ich hammere den Nagel in das Brett ein.
 'I hammer-1s the-acc nail in the-acc board EIN'
 "I hammer the nail into the board.
- (39) *Ich hammere den Nagel auf den Tisch platt.
 'I hammer-1S the-acc nail onto-acc the table PLATT'

We have the two separable prefixes *ein* and *platt*, which take independent resultative predicates, in addition to directional PPs. From what we know so far, *ein-* will create the resultative predicate $\text{pfx}'(\text{TH})$, $\text{pfx}' = \textit{ein}$. The PP will also form a resultative predicate, $\text{PP}'(\text{TH})$, $\text{PP}' = \textit{in das Brett}$. Finally, the base verb will form the following thematic structure by itself: $\text{V}'(\text{AGT}, \text{TH}) \text{ cause PP}'(\text{THEME})$. The result is what we see below:

- (38)' $\text{V}_{\text{base}}'(\text{AGT}, \text{TH}) \text{ causes } (\text{PP}'(\text{TH}) \ \& \ \text{pfx}'(\text{TH}))$, where $\text{PP}' = \text{specified pfx}'$

We can hypothesize from comparing the input to the output, that the combining strategy is to copy all the input together into the basic $\text{V}'(\text{AGT}, \text{TH}) \text{ causes result.predicate}'(\text{TH})$ resultative template. Like elements unify, since they really represent the same theta-role. Following this strategy, we can derive the following thematic structure for (39), which is ungrammatical:

- (39)' $\text{V}_{\text{base}}'(\text{AGT}, \text{TH}) \text{ causes } (\text{PP}'(\text{TH}) \ \& \ \text{pfx}'(\text{TH}))$, where $\text{PP}' \neq \text{specified pfx}'$

Hence in (39) there are two resultative predicates that are not the same, and thus cannot unify. This may cause the ungrammaticality of the sentence. We will shortly return to this speculation.

Does the main verb in (37), *hammern*, require, or tolerate, additional spell-it-out information when it occurs with an inseparable prefix? Consider (40):

- (40)

- a. Ich zerhammere den Nagel.
 ‘I ZER-hammer-1SgPT the-acc nail’
 ‘I hammer the nail into many pieces (until its original shape is practically
 unrecognizable.’
- b. Ich zerhammere den Nagel in tausend Stuecke.
 ‘I ZER-hammer-1SgPT the-acc nail into thousand pieces’
 ‘I hammer the nail into a thousand pieces.’
- c. #/*Ich erhammere den Nagel
 ‘I ER-hanner-1SgPT the-acc nail’
 ‘I hammer the nail to death.’
- d. Ich erhammere den Zwerg.
 ‘I ER-hammer-1SgPT the-acc dwarf’
 ‘I hammer the dwarf to death.’
- e.* Ich erhammere den Zwerg in den Boden.
 ‘I ER-hammer-1Sg the-acc dwarf into the-acc ground’

We see in (a) and (d) that the inseparable prefixes carry enough information to make the result clear. Assume that *hammern* has the same requirements as in (37a)’: <AGENT<THEME, GOAL>>. In (37b) the GOAL requirement was fulfilled in the syntax by a post-verbal PP. Now, this addition isn’t needed anymore, and in fact is ungrammatical, as (40e) shows. On the other hand, in (40b) we have a grammatical example of an inseparable prefix together with a post-verbal directional PP. The difference is that while in (40b) the PP describes a result already predicted by the lexical entry, in (40e), it introduces a new resultative. We thus have seen that for both prefixes only one resultative predicate can exist in a grammatical construction. This can be explained by the theta-criterion¹⁸ where every thematic component can only be represented once. We see that in (40b) there is a single GOAL, once predicted by the lexical item via the prefix, and once further modified by a post-verbal PP. Since both components have the same thematic referent, the GOAL-role only exists once in the clause, and the theta criterion is not violated. In (40e), on the other hand, there are two GOAL roles, referring to different results: the role from the prefix *er-* predicts the death of the dwarf, but the

role of the resultative PP represents a change of location of the dwarf. These are not the same outcomes, and the theta criterion is violated. In order to prevent the ungrammatical co-occurrence of the resultative with the directional, Goldberg(1991) introduces the ‘Unique Path Constraint’: the resultative and directional are both either literal or metaphorical ‘paths’, and only one of these paths can occur within a single clause.

Finally, let us take a look at why some PP complements to the V are acceptable, while others are not. Consider the following minimal pair:

- (41) a. Die Butter zerläuft (auf dem Tisch).
 ‘the butter ZER-go3Sg (on the(dat) table’
 “The butter melts (on the table).”
 b. Die Butter zerläuft *(auf den Tisch).
 ‘the butter ZER-go3Sg (on the(acc) table’
 “The butter melts (onto the table).”

(41) features two kinds of PP: (a) describes a general location of the event, and (b) is directional. Since (a) describes the location of the entire event, we get that $PP_a'(TH)$ is true for both, the initial state, A, and the final state, A', of the event. On the other hand, $PP_b'(TH)$ is only true of state A'. We thus have to assign the two PP predicates different positions in the resultative template. Consider the following two representations:

- (a) $(V_{base}'(TH) \text{ causes } V_{participle}'(TH)) \& PP_{loc}'(TH)$
 (b)* $V_{base}'(TH) \text{ causes } (V_{participle}'(TH) \& PP_{dir}'(TH))$

This locating of PP predicates clearly takes into account which state is described by the predicate, as state A is in the area to the left of *causes* and state A' is in the area to the right of it.

¹⁸ The Theta Criterion: Each argument is assigned one and only one theta role, and each theta role is assigned to

A further remark we have to make on aspectual structure and its interaction with thematic structure is that A and A' will be derivable from each other according to certain guidelines, which we have established earlier, depending on kind of resultative that is formed. More specifically, it will be true for all resultatives that A is derivable from A'. A', in turn, is equal to the content of the resultative predicate. Hence, once the resultative predicate is known, state A' is known, and state A is not(A') by presupposition. Since the THEME of the event needs to be changeable into state A', its requirement for the formation of a meaningful resultative is not to be in state A' initially. The initial state of the TH has to be A, more specifically not(A'). We will add this as a requirement feature on the TH in the argument structure of the final verb.

To illustrate this reasoning, consider now a full lexical derivation of the separable prefix verb *tot.schiessen*, 'to shoot dead.'

(42)

<p>schiessen, V, [_ NP] V'(AGT, TH) (causes PP'(TH)) + tot, pfx/P pfx/P'(THEME)</p>	<p>V'(AGT, TH) causes (PP'(TH) & pfx'(TH)) state A: not(<i>tot</i>) << state A': <i>tot</i> totschiessen, V, [_ NP_{[not[pfx'(TH)]]]}]</p>
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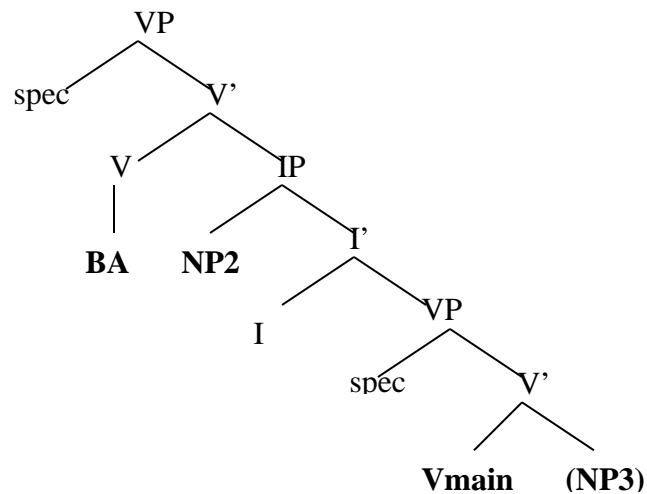
The output of this derivation, more specifically the resultative predicate in the output, is subject to the Unique Path Constraint. Here, since PP'(TH) = pfx'(TH) = *tot*'(TH), the output passes the constraint. The mechanism is identical with the inseparable prefix verbs, except that the input is different. Any verb with any argument structure can be placed into this rule, as long as the total passes the Unique path constraint, a correct output will be generated.

one and only one argument (as cited in Haegeman (1994)).

4.42 Heading towards a Mandarin Rule:

Let us now attempt to find a formalism for the resultative reading of the *ba*-construction. Once again, we will assume that *ba* is a verb, and that it has a clausal complement. Hence, The VP of a *ba*-sentence will look like this:

(43)



We have come to the conclusion in the comparison of the *ba*-construction to the German prefix constructions, that a major difference exists between how these two structures form the resultative. While the prefix is always heavily involved in contributing lexical information to the resultative predicate, *ba* is not. Instead, *ba* merely forces the presence of such a predicate. We can say that *ba* in a way takes the role of a main verb in the matrix clause, in that it subcategorizes for a resultative predicate. We thus have a very clear ‘division of labor’ between subcaterorizing (*ba*) and contributing meaning (the embedded V’) that is not present in the

German data. To recall this, reconsider sentence (19), where (a) contains *ba* and (b) contains the same information as the clausal complement of *ba* does:

- (19) a. *ta ba tang he le, keshi mei he-wan
 ‘3rd BA soup drink ASP but Neg. drink-finish.
 b. ta he le tang le, keshi mei he-wan
 ‘3rd drink ASP soup ASP but Neg. drink-finish’
 “He has eaten the soup but did not finish (it).” (Sun, p55)

In (a), $V'(AGT, TH)$ causes entailment’(TH), where entailment = perfective endpoint (V’).

However, (b) has a thematic representation where the *cause ent’(TH)* component is optional.

We can thus see that *ba* forces this component to become mandatory, in order to fulfill the general resultative template we have also seen with the German construction:

- (44) $V'((AGT), TH)$ causes resultative Predicate’(TH)

More specifically, *ba* forces this template to be present, and to be filled with thematic information. As we know, if the resultative predicate can not be derived from the verb, an independent resultative has to be inserted in its position in this template. I propose that we represent this requirement *ba* places on its clausal complement in terms of feature assignment from *ba* to its sister node, the imbedded IP. Since the resultative construction is greatly characterized by an underlying aspectual structure, it is reasonable that this feature be one of aspect. More specifically, we have seen that the perfective aspect is mandatory for all resultative constructions. The reason is that it describes an event that has both a starting point and an endpoint. The same is true for the resultative, where state A is the initial state, the initial point of the event is the onset of the action, and the beginning of state A’ is the final point. We can thus represent the lexical entry of *ba* as follows:

(45) *ba*, V, [_ IP[+perfective]]

Once the resultative template is established, it is filled with thematic components very much according to the rules of the German resultative. All predicates are copied together into the template, and the Unique Path Constraint is applied to filter out ungrammatical formations.

Consider the following sentences:

(46) *Wo ba cha-bei da-po.*
'I BA tea-cup hit-break'
"I broke the tea cup"

(47) *Wo ba cha-bei da-le fen shui.*
'I BA tea-cup hit-asp powder'
"I broke the tea cup into lots of pieces (as fine as powder)."

(48) **Wo ba cha-bei da-po fen shui.*
'I BA tea cup hit-break powder'

Common thematic elements in (46), (47), and (48) are *da*, 'hit', whose THEME is *cha-bei*, 'tea cup'. Together, they form the following basic event: V'(AGT, TH). Further, in (46) and (48) we have *po*, 'break', a resultative predicate that is saturated by the TH of the basic event: resP'(TH). In (47) and (48) we have another resultative predicate, *fen shui*, 'powder', also saturated by the TH of the basic event. We thus get the following three thematic representations:

(46)' V'(AGT, TH) causes resP₁' (TH), resP₁' = *po*

(47)' V'(AGT, TH) causes resP₂' (TH), resP₂' = *fen shui*

(48)*' V'(AGT, TH) causes (resP₁' (TH) & resP₂' (TH)), resP₁' resP₂'

As we can see in (48)', there are two resultative predicates which do not have the same thematic referent. This is what caused ungrammaticality with the German resultative structures as well,

and we can conclude that the same constraint, the Unique Path Constraint, acts on both constructions.

A last point of concern is to determine how the structure derives the constraints on its TH before this spot is filled by a lexical item in the syntax. The same mechanism we proposed for the German construction seems reasonable here as well: once the resultative predicate is known, we know state A', and once we know A', we can derive the initial state A by presupposition. State A then becomes the constraint on TH in the argument structure: A, namely not A', has to be true for the TH in order for the insertion of this TH into the structure to lead to a grammatical output. This mechanism clearly seems reasonable in the case of a strong resultative, where the resultative predicate is not derived from the verb, but added separately. We thus see that this resultative element puts constraints on TH, and hence the lexical item for the result predicate needs to be added to the template before the lexical item for the TH is added.

On the other hand, when we look at a weak resultative where the resultative predicate is derived from the verb is the initial state, is A still derived from A'? We know for certain that A' is derived from the basic event, since that is how the entailment is formed. However, this event does not focus on the initial state of the THEME, but only on what happens to the THEME. This is a reason to believe that the specific initial state A is not completely understood until the entailment is arrived at. I leave this issue as a future research question, since I believe that other characteristics of *ba*, which we have not investigated here, play into it. I am specifically thinking of topicality. More specifically, without having come to an entailment of the event, once the THEME occurs preceded by *ba*, certain things are known about it, such that it certainly exists, and that the speaker and the listener both know about it.

Conclusions:

We have found both striking similarities and significant differences in our comparison of the Mandarin *ba*-construction and the German separable and inseparable prefix constructions. Let us first briefly summarize the similarities: The two structures have as far as I can tell identical aspectual structures. More specifically, both constructions take perfective viewpoint, and have verb and object components that are telic. Moreover, as the different constituents of the constructions combine to form a thematic whole, the same mechanisms are evident: all constituents are combined into a basic resultative template, which is the same for both languages, and the Unique Path Constraint proposed by Goldberg (1991), a special case of the theta criterion, acts as a filter to ‘disqualify’ ungrammatical combinations.

However, we have also found significant differences between the two constructions which weaken the analysis. First and foremost, while the German prefixes themselves add at least partial specific lexical information into the resultative predicate; *ba* does not do so. *Ba* forces elements that form a resultative structure to occur in its clausal complement; however, it is not itself a resultative element in the sense that the German prefixes are. I propose the following explanation for this. The German prefixes are specific, in that they describe only certain kinds of results, and leave other results to other specialized prefixes in their class. For example, recall that *zer-* specifically means ‘scattering’, while *er-* specifically puts an emphasis on the brevity of an action (etc). One of the things that *ba* is most known for, however, is that it is lexically depleted. It occurs over a wide range of situations, and is thus a broad generalization across resultative actions. This makes *ba* and the prefixes different. However, it

is an argument for a same kind of underlying mechanism, where *ba* assigns everything it has to the resultative. It cannot assign lexical information, because it does not have it.

In general, we have come to the conclusion that studying the thematic structure of two causative constructions of different languages comparatively has been successful, in that thematic relationships seem to be basic enough to hold across languages. We have gotten a glimpse at the fact that whenever we moved into morphology for the German data, or syntactic considerations for the Mandarin data, language differences grew more apparent. An interesting follow-up study would be to take a closer look at these differences, and explore further to what extent what German does in the lexicon is parallel to what Mandarin does in the syntax.

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