

Investigating Mandarin Chinese Zi-V Reflexive Verbs

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1. Introduction:

As discussed in Reinhart and Reuland (1993), in natural language, a predicate can be interpreted as reflexive only if it is linguistically marked as reflexive. More specifically, this rules out structures of the type *DP V Pronoun* where DP binds the Pronoun and the pronoun is just a simplex element. There are two ways for reflexive marking to obtain, namely, intrinsically or extrinsically. In the former case a reflexivization operation takes place in the lexicon (with or without any overt morphological marking) on the verb, while in the latter case a transitive verb is reflexivized by one of its arguments being realized as a SELF anaphor. This is stated in the definitions from Reinhart and Reuland (1993) given below.

- (1) a. A predicate is reflexive iff two of its arguments are coindexed.
b. A predicate (of P) is reflexive marked iff either
(i) P is lexically reflexive or
(ii) one of P's arguments is a SELF anaphor.

In this article I will review how reflexivity is expressed in Mandarin Chinese (henceforth Mandarin) taking the definitions in (1) as a starting point. According to the standard analyses in the literature (e.g. Huang and Tang 1991). Mandarin has a complex reflexive—a SELF anaphor—*ta ziji*¹, as in (2a), and a simplex, monomorphemic, anaphor *zi-ji* as in (2c).

However as is generally ignored in the mainstream literature with the exception of (Wu 2010, Chief 1998, Tang 1992), Mandarin has another option to represent reflexive predicates, namely by prefixing *zi-* to the verb, as in (2b). The fact that the prefix *zi-* is a separate morpheme shows that contrary to the prevailing position in the literature from Pica (1987), and Cole et al. (1990) on, the anaphor *ziji* is complex rather than simplex (also in view of the fact that its other component *-ji* had the status of an independent pronominal element in older stages of Mandarin (see Tang 1992, Cheng 1999, Dong 2002, Liu 2016, and Wong (in preparation) for more discussion). In view of this, the alternative to (2a) in (2c) is also consistent with the claim in (1) that reflexivity must be marked.

¹ In fact, in the case, *ziji* is also possible.

(2) a. Lisi jiu le **ta-zi-ji**.

Lisi rescue ASP pron-self

‘Lisi rescued himself.’

b. Lisi **zi-jiu** le.

Lisi REFL-rescue ASP

‘Lisi rescued himself.’

c. Lisi jiu le **zi-ji**.

Lisi rescue ASP self

‘Lisi rescued himself.’

(2a-c) are semantically largely equivalent, but see Liu (2016) and Wong (in preparation) for a more detailed examination of possible meaning differences. As is well-known there is an important difference between *zi-ji* and *ta-zi-ji* in that the former, but not the latter allows long-distance binding (see Battistella 1989, Pica 1987, Cole et al. 1990, Huang and Tang 1991, for discussion, and more recently Giblin 2016). To the extent in which they are based on the incorrect assumption that *zi-ji* is mono-morphemic, their specific analyses will have to be revised, though. This issue will be addressed in Wong (in preparation).

Further elaborating the approach in Reinhart and Reuland (1993), Reinhart (2002) and Reinhart and Siloni (2005) develop an approach to reflexive marking based on a reflexivizing operation on argument structure. In their view such an operation can take place in the lexicon or in syntax (see Everaert, Marelj and Reuland 2016 for more discussion).

As illustrated in (2b), there is a type of reflexive verbs which is preceded by a reflexive prefix *zi-* 自 ‘self’ in Mandarin Chinese. These reflexive verbs such as *zi-nüe* ‘to abuse oneself’, and *zi-jiu* ‘to rescue oneself’, are formed with a reflexive prefix *zi-* ‘self’ and a transitive verb.

In the current contribution I will focus on the role of the prefix *zi-*, and more specifically on the question of whether *zi-*verbs reflect a lexical or a syntactic reflexivization operation. In order to do so, I will investigate possible restrictions on the kind of verbs that can be preceded by *zi-* to form reflexive verbs in Mandarin, since one of the relevant factors, according to Reinhart and Siloni, is that argument

structure operations in the lexicon may be restricted and reflect lexical idiosyncrasies.

2. Core concepts of the Theta System

The Theta System, as discussed and developed in Reinhart (2000/2016; 2002), Marelj (2004), Reinhart and Siloni (2005) and subsequent work, enables the interface between the Computational System (CS) and the System of Concepts. In this paper, I use the Theta System of Reinhart (2002). It is a coding system between syntax and extra-syntactic concepts. Taken as the central module of the mental system of concepts, the Theta System consists of two binary features encoding theta-roles, lexical entries, a set of arity operations on argument structure and mapping rules for the merger of arguments in the syntax.

Basically, the lexical entries are coded concepts with clusters of formal features indicating the theta relations it may enter in.

More specifically, θ -roles are defined in terms of two binary features [+/-c]=[c(ause change)] and [+/-m]=[m(ental state)]. Together these define eight feature clusters, which correspond to θ -roles. The eight feature clusters defined are given in (3) (Reinhart, 2002: 232).¹ It is noted that the correspondence of these clusters to the θ -roles known from the literature is not one to one, but reflects contextual factors. The roles are labelled based on the one they are most obviously related to.

- (3) a). [+c +m] – agent
b). [+c –m] – instrument (...)
c). [-c +m] – experiencer
d). [-c –m] – theme / patient
e). [+c] -- cause (Unspecified for / m); consistent with either (a) or (b).
f). [+m] --sentient
g). [-m] -- (Unspecified for / c): subject matter / locative source
h). [-c] -- (Unspecified for / m): Internal roles like goal, benefactor typically dative (or PP).

Notation:

¹ As argued by Marelj (2004), the system also gives rise to a 9th cluster, the empty cluster, which specifically plays a role in middle formation.

$[\alpha]$ = Feature cluster α .

$/\alpha$ = Feature (and value) α .

(E.g. the feature $/+m$ occurs in the clusters $[+c +m]$, $[-c +m]$ and $[+m]$)

$[/\alpha]$ = A cluster one of whose feature is $/\alpha$.

(E.g. $[/-c]$ clusters are $[-c +m]$, $[-c -m]$ and $[-c]$.)

$[+]$ = A cluster ALL of whose features have the value $+$.

(E.g. $[-]$ clusters are $[-c -m]$, $[-c]$, $[-m]$.)

The (3a-d) clusters are specified with a value for both features. The Agent role (3a) is $[+c +m]$ (an all plus cluster), as it brings about a change and must be animate (its mental state is relevant). The Theme or Patient role is (3d) $[-c -m]$ (an all minus cluster), as it neither triggers a change nor imposes an animacy restriction. The mixed-value clusters (3b, c) are somewhat more varied in their role interpretation, and mostly correspond to Instrument and Experiencer respectively. (3e-h) are unary clusters and have a yet greater freedom of interpretation. A verb selecting a $[+c]$ (cause) cluster can be realized both with an agent and with an instrument interpretation of this argument.

Merging instructions are given in (4) (Reinhart, 2002: 247):

- (4) a. When nothing rules this out, merge externally.
- b. An argument realizing a cluster marked 2 merges internally.
- c. An argument with a cluster marked 1 merges externally.

The unary $[-]$ cluster always merges as an internal argument.

3. Classifying verbs in terms of feature clusters

Verbs can be classified in terms of their thematic properties, which are coded in the features clusters. As mentioned above, a $/+c$ feature express that the argument bearing it is perceived as a sufficient condition for the event, and $/+m$ feature indicates the participant's mental state is relevant for the event to take place.

3.1. Types of features clusters

In the following sections I discuss a selection of the most common types of two-place verbs are chosen from Reinhart (2002); the order is based on the properties of the

subject clusters, with first the unary clusters and secondly the mixed-value clusters.

3.1.1. [+c] subjects

As stated above, the typical property of a verb selecting a [+c] (cause) cluster is that it can be realized both with an agent and with an instrument interpretation of this argument. These verbs differ in the realization of their internal role as either a Theme role [-c-m] (shown in (5)) or an Experiencer role [-c+m] (shown in (6)). The internal role of these verbs can be further distinguished by +/- animacy (example *d* sentences).

In addition, all verbs with this feature can alternate with an unaccusative derivation (example *e* sentences). Reinhart (2002) noted that in English there are a few exceptions such as *hit* and *destroy* which have no unaccusative derivation. Some illustrations follow below:

(5) a. Open [+c], [-c-m]

- b. The wind / Tim /The key opened the door.
- c. The wind / Tim /The key **caused** the door to open.
- d. The wind opened the door/*Tim.
- e. The door opened. (Unaccusative)

More examples of [+c], [-c-m] verbs are *break* and *melt*.

(6) a. Worry [+c], [-c+m]

- b. The storm/Ken/The test worries Joan.
- c. The storm/Ken/The test **caused** Joan to worry.
- d. The storm worried Joan/*the table.
- e. Joan worried.

The verbs with clusters [+c], [-c+m] are also known as Experiencing verbs; more verbs of this type are *surprise*, *amuse* and *scare*.

It is noted by Reinhart that the unaccusative derivation in (6e) is rare in English; generally, the English alternate is a passive like (7b). However, it is very productive in other languages as the Dutch in (7c).

(7) a. Surprise [+c], [-c+m]

- b. Helen was surprised.

- c. Jan verbaasde zich.
'Jan was surprised.'

3.1.2. [+m]-Verbs

This class consists of verbs with a [+m] cluster, which is unspecified for *cause*. Such [+m] verbs have the specific property of requiring an animate subject (8b) without involving agency or a causal relation, as in the case of *love*, *hate*, *know*, *believe* and *wonder*. Such a cluster is always merged externally; in addition, these verbs do not allow 'deliberately' (8c) and 'caused' (8d) since they do not license *cause*.

One-argument verbs of this type are *laugh*, *cry* and *sleep*.

- (8) a. Love [+m], [-c-m]
b. Tim/*The wind/*The table loves Joan.
c. *Tim deliberately loves Joan.
d. *Tim caused Joan to love.

3.1.3. Manner verbs

Manner verbs like *peel* and *cut* can take a subject as either Agent [+c+m] (9b) or Instrument [+c-m] (9c) but don't take a Cause (9d); hence, they have no reduced unaccusative entry (9e). These verbs include a reference to a specific instrument (the event denoted could not happen without that instrument). One of the roles, [+c], is realized obligatorily. An example from Reinhart 2002 is given below:

- (9) a. Peel [+c+m], [-c-m], [+c-m]
b. Max peels the apple (with a knife).
c. The knife peeled the apple.
d. *The heat peeled the apple.
e. *The apple peeled.

Other Manner verbs are *drill*, *screw* and *sow*.

3.1.4. Two-place unaccusatives

Two-place unaccusatives verbs have the typical property that they allow the verbs to select two [-] clusters as arguments. This type of verbs which do not have a [+c] cluster alternate, only realizes as unaccusative. Given the merging instructions in (4)

these [-] arguments obligatorily merge internally. These verbs can be captured easily in the present feature cluster system as in (10), since they have the widest range of thematic realizations.

- (10) a. Escape [-c-m], [-c]
b. The solution escaped **Tim**.
c. Ken escaped **from prison**.

It can be seen that *Tim* in (10b) is viewed as an Experiencer role, while *from prison* in (10c) is rather a Locative argument. That the verb ‘escape’ has such variation in the interpretation of its internal role follows from the feature cluster [-c].

The unary cluster [-c] is unspecified for [/m] leaving *-cause* as a sufficient condition. As Reinhart 2002 stated, the Goal-source (locative) argument is defined as [-c], while the interpretation as Experiencer ([-c+m]) is consistent with the minimal requirement of the verb that the internal argument is [-c]. These verbs do not allow a passive realization as in (11). Further two-place unaccusatives are *occur*, *appeal*, *miss* and *belong*.

- (11) a. Escape [-c-m], [-c]
b. *Tim is escaped by the solution.

3.1.5. Agentive Verbs

Last but not least, I discuss Agentive verbs. Agentive verbs play a crucial role as will be discussed later on in this paper. This type of verbs are the verbs with a [+c+m] cluster, representing an agent role; the feature [/+m] in this cluster expresses that the argument must be human or animate, as illustrated in (12)-(14). Agentive verbs have either a Theme [-c-m] (12) or Experiencer [-c+m] (13) as their internal arguments. A subset of these verbs has a reflexive one-place alternate (14c).

- (12) a. Eat [+c+m], [-c-m]
b. The boy/*The spoon/*Hunger ate the soup

- (13) a. Interrogate [+c+m], [-c+m]
b. The policeman/*The mobile/*The desire to know the truth interrogated Tim.
c. The policeman interrogated Tim/*the kitchen.

- (14) a. Shave [+c+m], [-c+m]
b. Helen/*The razor/*The heat shaved Ken.
c. Ken shaved.

Other Agentive verbs with the clusters [+c+m], [-c-m] are *dress* and *murder*, verbs with an internal experiencer role ([-c+m]) are verbs like *command*, *lead* and *snub*.

3.2. Arity Operations on Argument Structure

As indicated in section 2, the Theta System has three core components:

- (15) The Theta System
- a. Lexical entries: which are coded concepts, with formal features defining the θ -relations of verb-entries.
 - b. A set of arity operations on lexical entries, which may generate new entries, or just new options of realization.
 - c. Marking procedures, which ‘prepare’ a verb entry for syntactic derivations.

The arity operations may affect the predicate’s valence. They can in principle apply either in the lexicon or in the syntax (Reinhart & Siloni 2005). But if they apply in the lexicon they may be subject to restrictions. The system presented in Reinhart (2002) includes three types of operations, namely: Saturation, Reduction and Expansion which can yield passives, reflexives, reciprocals, unaccusative and causative derivations. (But note that as discussed in section 4, Reinhart and Siloni 2005 supplement internal reduction with a bundling operation on the roles involved.)

3.2.1. Saturation

Basically, the saturation operation applies to one of the arguments. The saturated argument that is closed is still present in the semantic interpretation (16d) but is not realized syntactically (16c). Note that the operation has the outcome of eliminating the accusative case. An example of a saturation operation is passivization, which is illustrated in (16):

- (16) a. Basic Entry: Wash [+c+m], [-c-m]
 Wash (θ_1, θ_2)
 b. Saturation: Wash [+c+m], [-c-m]
 $\exists x$ [wash (x, θ_2)]
 c. Merging: Tim was washed
 $\exists x$ (x washed Tim)
 d. Semantics: $\exists e \exists x$ [wash (e) & [+c+m] (e, x) & [-c-m] (e, Tim)]

3.2.2. Reduction

According to Reinhart 2002, the operation of Reduction reduces the verb's arity by one. This operation can be applied only to verbs with (at least) two arguments. Reduction and Saturation cannot both apply to a given entry. Based on whether the external argument or the internal argument is reduced, there are two reduction operations, namely, Expletivization and Reflexivization respectively.

3.2.2.1. Expletivization: Reduction of the external argument

If the reduction operation applies to the external role, we speak of expletivization; if so, it eliminates the external role completely; therefore, the reduced role does not occur either in the syntax or the semantics. Reinhart 2002 states that expletivization only applies to [+c] arguments and that [+m] roles cannot be reduced. The definition of expletivization is given in (17):

- (17) Expletivization: Reduction of an external [+c]-role (semantically null-function)
 a. $V_{acc} (\theta_1 [+c], \theta_2) \rightarrow R_e (V) (\theta_2)$
 b. $R_e (V) (\theta_2) \rightarrow V (\theta_2)$

When this operation is applied to a two-place predicate it results in a one-place unaccusative as in (18):

- (18) a. Open [+c], [-c-m]
 b. $Open_{acc} ([+c], [-c-m]) \rightarrow R_e (Open) [-c-m]$
 c. The window opened.

3.2.2.2. Reflexivization: Reduction of the internal argument

In this paper I will focus on the reflexivization operation. This operation is the lexical

operation which broadly speaking derives a reflexive entry from a transitive entry (Reinhart 2002). In my subsequent discussion I will in particular address possible differences between Mandarin and English (Zhu 1982, Huang and Liao 1991). The reflexivization operation is given in (19) and illustrated in (20) (see Reinhart 2002 14). In later sections, I will present and apply the reflexivization operation based on Reinhart and Siloni (2005).

(19) Reflexivization: Reduction of an internal role-SELF-function

- a. $V_{acc}(\theta_1, \theta_2) \rightarrow R_s(V)(\theta_1)$
- b. $R_s(V)(\theta_1) = (\lambda x (V(x,x)))(\theta_1)$

(20) a. Basic Entry : $Shave_{acc}([+c+m]_1, [-c-m]_2)$

Lucie shaved him.

- b. Reduction : $R_s(shave)([+c+m]_1)$
- c. Semantics : $(\lambda x (V(x,x)))(\theta_1)$
- d. Output : Max shaved. (reflexive)

As illustrated in (19a) and (20b), the internal θ_2 role is reduced, creating a one-place verb which is interpreted as reflexive by the SELF function. Note that in Reinhart and Siloni (2005) the reduction operation is supplemented by a bundling operation, which bundles the internal and external roles into a composite agent-theme role, accounting for the fact that semantically the theme role is still there.

Reinhart argues that reflexivization can apply in the lexicon but also in the syntax (the Lexicon-Syntax parameter). Moreover, in some languages also Accusative Case is reduced, whereas in other languages a Case residue remains.

Reinhart 2002 points out that lexical reflexivization is restricted to a subset of agentive verbs. This restriction will play an important role in our subsequent discussion together with the issue of the Case residue.

3.2.3. Expansion: Causativization

The expansion operation expands the verb's grid by adding an argument. This operation applies only in the lexicon; it is also called Agentivization which indicates that it always adds an Agent [+c+m] argument. The operation also affects the original external argument by changing a [+c+m] cluster into a [-c+m] cluster. Mostly, this operation is applied to one-place-verbs as the example of the unergative verb *walk* in

(21):

(21) a. Walk ([+c+m])

b. The dog walked.

c. Agentivization: Walk ([+c+m]_{θ1}, [-c+m]_{θ2}) (θ₁ is an Agent)

c. Tim walked the dog.

3.3. Testing for verb types in Mandarin

The types of verbs in English are discussed in the previous section. This section will focus on the corresponding verb classes in Mandarin.

The main issue to be addressed is how to understand the status of reflexivization by the prefix *zi-* in comparison to reflexivization by *zi-ji* and also by *ta-ziji*. In English, reflexivization by reduction as in *John washed* is lexically restricted, unlike reflexivization by the complex anaphor *himself*. In many languages (e.g. Russian, Khanty, Meadow Mari, Indonesian) reflexivization by an affix is lexically restricted (Schadler 2014, Volkova 2014), unlike reflexivization by a complex anaphor. In Dutch reflexivization by the simplex anaphor *zich* is restricted unlike reflexivization by the complex anaphor *zichzelf*. Two questions arise to Mandarin: i) if *zi-ji* is complex, is it also lexically unrestricted? And ii) if *zi-* is a prefix, is it also a marker of lexical reflexivization, and is therefore reflexivization by *zi-* prefixation indeed lexically restricted, and if so subject to similar restrictions as found in other languages so far?

It is important to realize that not all verb classes in English have a direct counterpart in Mandarin. The class of grooming verbs constitutes a case in point.

There are some interesting differences between English and Mandarin in the expressions of the reflexive entry of verbs like *shave*, or more generally, verbs of grooming and bodily care (Levin 1993), as illustrated in (22)-(23):

(22) a. Mary **washes** John. (English)

b. *Lisi **xi zao** /**chongxi** Zhaoliu. (Mandarin)

Lisi have a bath/wash Zhaoliu

c. Lisi **wei** Zhaoliu **xizao/chongxi**. (Mandarin)

Lisi for Zhaoliu bathe/wash

‘Lisi bathes/washes for Zhaoliu.’

(23) a. The barber **shaves** Tim. (English)

b. *Lifashi **gua huzi** Zhaoliu. (Mandarin)

the barber shave moustache Zhaoliu

c. Lifashi **ti/bang** Zhaoliu **gua huzi**. (Mandarin)

The barber for/help Zhaoliu shave moustache

‘The barber shaves for Zhaoliu/The barber helps Zhaoliu to shave.’

First, the transitive verbs like *wash* and *shave* in (22a) and (23a) respectively cannot be used as transitive verb in Mandarin, like (22b) and (23b) are ungrammatical. But if *xi-zao/chongxi* ‘wash’ and *gua huzi* ‘shave’ co-occurs with a word *wei/ti* ‘for’ and *bang* ‘help’ as in (22c) and (23c) respectively, it is grammatical.

Note that the words *wei* ‘for’ in (22c) and *ti* ‘for’ and *bang* ‘help’ in (23c) are classified as *coverbs* by Li and Thompson (1981) in Mandarin. According to Li and Thompson (1981), the term *coverb* refers to a class of morphemes which includes the words such as *gen* ‘with’, *cong* ‘from’, *ti* ‘instead of/for’, *bang* ‘help’ and *wei* ‘for’. The class of coverbs consists of words that are partly like verbs and partly like prepositions; they have such a mixed property since most of them used to be verbs at the earlier stages of Mandarin Chinese.

In addition, many of coverbs still can be used as verbs that have similar meanings, for example, the coverb *gen* ‘with’ was once a verb meaning ‘follow’.

More specifically, the function of a coverb is mainly that it introduces a noun phrase (NP) and forms a combination with the NP, in general; this combination of the coverb+NP can precede the main verb and follow the subject or topic in Mandarin. The coverb construction is given below:

(24) Subject/Topic + coverb+NP + verb + (NP)

Thus, the sentence in (22c) and (23c) can be accounted for in terms of the structure of (24). It indicates that all counterparts of English grooming verbs require a coverb to

co-occur in a sentence.

Secondly, the verb *shave* in sentence (25a) should be interpreted as *gua huzi*-‘shave’ in (25b) in Mandarin. Obviously, with regards to the structure is in (25b), this is a standard instantiation with the transitive verb *shave* and the structure S+V+O. However, unlike the English sentence in (25a) that is reflexive, the Mandarin counterpart has no reflexive form as *zi+V* like *zi-gua* in (25c).

(25) a. John **shaved**. (English)

b. Zhangsan **gua** le **huzi**. (Mandarin)
Zhangsan shave ASP moustache
‘Zhangsan shaved.’

c. *Zhangsan **zi-gua** huzi. (Mandarin)
Zhangsan self-shave moustache

Moreover, in the case of *shave*, the object shaved are not only *moustache*, *beard*, *hair*, but also *head* is possible. The example is given below:

(26) Lisi **ti diao** le **toufa/ti** le **ge tou**. (Mandarin)
Lisi shave off ASP hair/shave ASP CL head
‘Lisi shaved off the hair.’

This kind of Grooming and Bodily Care verbs in English are realized as Separable Verbs in Mandarin (Chao 1968, Zhu 1986, Huang and Liao 1991). Generally, they are formed with two morphemes, namely Verbal morpheme+Nominal morpheme, with the verbal morpheme as the head which are also treated as ‘V-O’ pattern of compounds, this is exemplified in (27):

(27) a. xi + zao
‘wash’(V) + ‘bath’ (NP)
‘bathe/have a bath’

b. xi + lian
‘wash(V)’+ ‘face(NP)’
‘to wash face’

As the term ‘separable verb’ indicates, the components of separable verbs can be separated by the insertion of other elements. In principle, they occur with a considerable degree of freedom in terms of the forms that can be inserted between the two morphemes. The elements that can be inserted into the separable verb are for instance, Aspect particles *zhe* ‘V-progressive tense’, *le* ‘V-past tense’, *guo* ‘V-perfect tense’ respectively, and also other components like Resultative complements, Tendency verbs, Quantifiers, etc. This is illustrated in (28-33):

(28) Aspect particles insertion:

a. Lisi xi – *zhe* – zao.

Lisi wash-ASP-bath

‘Lisi is having a bath.’

b. Lisa xi – *le* - zao.

Lisa wash-ASP-bath

‘Lisa had a bath.’

c. Lisa xi – *guo* - zao.

Lisa wash-ASP-bath

‘Lisa has had a bath.’

(29) Resultative complement insertion:

Peter xi - *hao* - le - zao.

Peter wash-already-ASP-bath

‘Peter finished having a bath/showering.’

(30) Tendency verb insertion:

Zhangsan zoudao hebian xi - *qi*- zao - *lai* - le.

Zhangsan walk to river side wash-up-bath-come-ASP

‘Zhangsan walked down to the river to have a bath.’

(31) Noun insertion:

Ta meitian zaochen xi – *lengshui* - zao.

he everyday morning wash-cold water-bath

‘He takes a cold bath every morning.’

(32) Quantifiers insertion:

Mary kuaisu de xi - le - *yi-ge* zao.

Mary quickly DE wash-ASP-one-CL bath
'Mary took a bath quickly.'

(33) Verbal Measure Complement insertion:

Ta yitian xi - le - *san-ci* zao.
he one day wash-ASP-three-times bath
'He had three baths a day.'

In addition, these separable verbs have other properties, such as that they contain a form duplicating the verbal constituent. And when they take a complement representing time or result, they duplicate the front verbal constituents. This is illustrated below:

(34) a. Lisi qu xi - xi - zao.

Lisi go wash-wash-bath
'Lisi goes to have a bath.'

b. Ta xi - zao - xi le yi - ge - xiaoshi.

he wash-bath-wash ASP one-CL-hour
'He had a bath for one hour.'

c. Ta xi - zao - xi de quanshen fadou.

he wash-bath-wash DE whole body shivering
'He had a bath and made him shivering.'

In order to investigate the role of the prefix *zi-* in *zi-V* reflexive verbs, I will test whether the most common types of two-place verbs selected from Reinhart 2002 that I discussed in section 3.1 have a *zi-V* alternates or not.

Mandarin has a rich system of compounding, which includes the formation of compound verbs (e.g. Li and Thompson 1981). Each compound verb consists of two morphemes. In general, *zi-* is attached to the head verb of a compound verb. If *zi-* is prefixed, adding a prefix like 'can-cruelly' is blocked. Take for example in (35):

(35) a. Basic compound verb: cansha (*sha* 'kill' is the head verb)
'kill cruelly'

b. Add prefix *zi-* to the head verb: *zi-sha*

‘self-kill’

- c. It blocks further compounding: **can-zisha*
cruelly-self-kill

The testing order follows the order of discussion in section 3.1 in that [+c]-Verbs, [+m]-Verbs, Manner verbs [+c+m] or [+c-m], two-place unaccusatives [-c-m] and Agentive Verbs [+c+m] are discussed in that order. The examples will be given in Mandarin, each of them with the corresponding translation in English.

3.3.1. Testing [+c] subjects

[+c]-Subjects are unspecified for mental state. Their role can be interpreted as Cause, Agent and Instrument (36b, c). Such verbs can be distinguished by their internal role, specifically in terms of animacy, reflected in the contrast between the feature clusters [+c -m] and [+c +m]. The [+c]- verbs that take a Theme [-c -m] internal role have an unaccusative alternate, as in (36d) which is discussed in section 3.2.2; this kind of verbs disallows prefixing with *zi-* to form reflexive verbs in Mandarin, as illustrated in (36e). Examples include:

- (36) a. Dakai ‘open’ [+c], [-c-m]
 b. Feng / yaoshi / Zhangsan dakai le men/ *Lisi.
 Wind/ Key / Zhangsan open ASP door/ Lisi
 ‘The wind/ The key/ Zhangsan opened the door/ *Lisi.’
 c. Feng / yaoshi / Zhangsan shi men dakai le.
 Wind/ Key / Zhangsan cause door open ASP
 ‘The wind/ The key/ Zhangsan **caused** the door to open.’
 d. Men kai le.
 Door open ASP
 ‘The door opened.’
 e. *Men **zi-kai** le.
 Door self-open ASP

- (37) a. Danyou ‘worry’ [+c], [-c+m]

- *b. Taifeng/ Zhangsan/ Kaoshi danyou Lisi.
Typhoon/Zhangsan/Test worry Lisi

- c. Taifeng/ Zhangsan/ Kaoshi shi Lisi danyou.
Typhoon/Zhangsan/Test **caused** Lisi worry
'The typhoon/Zhangsan/The test caused Lisi worried.'

- d. Lisi hen danyou.
Lisi very worry
'Lisi was very worried.'

- e. *Lisi **zi-you**.
Lisi self-worry

Mandarin lacks a simplex equivalent of verbs like *worry*, that is [+c]-verbs with an Experiencer [-c+m] internal role. Examples like (37b) are unacceptable. The counterpart of *worry* is expressed with an overt causative. These verbs have no *zi*-V reflexive derivation as illustrated in (37e). If *zi*-prefixation reflects a lexical operation this fact would be in line with Reinhart and Siloni's generalization that bundling is restricted to (a subset of) agent-theme verbs.

3.3.2. Testing [+m]-Verbs

[+m]-Verbs are also referred to as subject experiencer verbs. Their external argument is unspecified for *cause*. Therefore, these verbs do not accept 'deliberately' (38c) and 'caused' (38d). Their subjects being specified for [+m] these verbs have the specific property of requiring an animate subject (38b) without involving agency or a causal relation of the verb. The [+m]-verbs do not allow prefixation with *zi*-, as illustrated in (38e). Cross-linguistically, these verbs resist lexical reflexivization. Thus the ill-formedness of (38e) is to be expected under Reinhart and Siloni (2005)'s approach, under the assumption that *zi*-prefixation reflects a lexical operation.

- (38) a. Hen 'hate' [+m], [-c-m]
- b. Zhangsan/*Feng/*zhuozi hen Lisi.
Zhangsan/ wind/ table hate Lisi
'Zhangsan/*The wind/*The table hates Lisi.'

- c. *Zhangsan guyi hen Lisi.

Zhangsan deliberately hate Lisi

d. *Zhangsan shi Lisi hen.

Zhangsan cause Lisi hate

e. *Zhangsan **zi-hen** le.

Zhangsan self-hate ASP

3.3.3. Testing Manner verbs

This set of verbs can take either an Agent [+c+m] in (39b) or an Instrument [+c-m] subject, they include a reference to a specific instrument and select this instrument as part of their grid. These verbs don't allow Cause (39c) and have no reduced unaccusative entry as in (39d). In addition, in line with Reinhart and Siloni (2005), manner verbs don't allow the *zi*-prefix to form a reflexive in Mandarin, as illustrated in (39e).

(39) a. Xiao 'peel' [+c+m], [-c-m], [+c-m]

b. Lisi xiao tudou (yong xiaodao).

Lisi peel potato with knife

'Lisi peels potato (with knife).'

c. *Reli xiao tudou.

heat peel potato

d. *Tudou xiao le.

potato peel ASP

e. *Lisi **zi-xiao** le.

Lisi self-peel ASP

3.3.4. Testing Two-place unaccusatives

In Reinhart's classification this type of verbs does not have a *cause* argument. They are only realized as unaccusatives, since have only [-] arguments which obligatorily merge internally. They have no passive derivation. This is shown in (40):

- (40) a. Bikai ‘escape’ [-c-m] [-c]
b. Zhege jiejie fangan bikai le Lisi.
This CL solution escape ASP Lisi
‘This solution escaped Lisi.’
c. *Lisi bei fangfa bikai.
Lisi by solution escape
d. *Lisi **zi-bi** le.
Lisi self-escape ASP

As in (40d) indicates, two-place unaccusatives have no *zi*-V reflexive alternates. This is to be expected if *zi*-prefixation involves a lexical operation, since they are not agent-theme verbs.

3.3.5. Testing Agentive Verbs

These verbs have agent cluster [+c+m], the feature /+m indicates that the argument must be human or animate, as shown in (41b), (42b) and (43b). The internal argument of Agentive verbs can be Theme [-c-m] (41a) or Experiencing [-c+m] (43a). The pattern of *zi*-reflexivization in this class is illustrated in (41c/43d):

- (41) a. Chi ‘eat’ [+c+m] [-c-m]
b. Zhangsan /*Kuaizi /*Ji’e chi le pingguo.
Zhangsan/ chopsticks/ hunger eat ASP apple.
‘Zhangsan/*The chopsticks/*The hunger ate the apple.’
c. *Zhangsan **zi-chi** le.
Zhangsan self-eat ASP
- (42) a. Jiu ‘rescue’ [+c+m] [-c-m]
b. Zhangsan /*Zhuozi jiu le Lisi.
Zhangsan/ table rescue ASP Lisi
‘Zhangsan/*The table rescued Lisi.’
c. Zhangsan **zi-jiu** le.
Zhangsan self-rescue ASP
‘Zhangsan rescued himself.’

Thus, the example in (42c) is acceptable while that in (41c) is unacceptable; it shows that some verbs with the feature clusters [+c+m] [-c-m] in Mandarin allow *zi*-prefixation to produce reflexive verbs, but others don't. This is in line with Reinhart and Siloni's generalization. It is important to explore what underlies this contrast.

In order to test the internal argument of agentive verbs for the [+m] feature, the animacy test can likewise be applied. If *zi*-prefixation reflects a lexical process, one expects that this class of verbs does not allow reflexivization with *zi*-prefixation, as in (43d)

- (43) a. Zhiwen 'interrogate' [+c+m] [-c+m]
b. Laoshi/*Shu zhiwen Lisi.
teacher/ book interrogate Lisi.
'The teacher/*The book interrogates Lisi.'
- c. Laoshi zhiwen le Lisi [-c+m] /*fangjian[-c-m].
teacher interrogate ASP Lisi / room
'The teacher interrogated Lisi/*the room.'
- d. *Laoshi **zi-wen** le.
teacher self-ask ASP

4. The reflexivization operation (Bundling)

In Reinhart's original approach the internal role of reflexive verbs is reduced. Semantically, this is problematic however. In order to resolve this Reinhart & Siloni (2005) further develop the theory of reflexivization. They argue that reflexivization bundles the internal theme-role with the external agent-role, producing a complex [agent-theme]-role that must merge externally. Thus, although the reflexive verb is syntactically a one-place unergative, its semantics retains the original roles of the transitive base entry. The effect of the bundling operation is, then, that two available theta roles are assigned to the same syntactic argument. Importantly, the requirement on bundling is that it must apply to an external theta role which obligatorily merges externally (e.g., an Agent). The bundling operation bundles any theta role with an external theta role as defined in (44).

(44) Reflexivization bundling

$[\theta_i] [\theta_j] \rightarrow [\theta_i - \theta_j]$, where θ_i is an external θ -role.

Reinhart & Siloni (2005) argue that the bundling operation can be applied in the lexicon or in the syntax. This is formulated as the lex(icon)-syn(tax) parameter given in (45):

(45) The lex-syn parameter

Universal Grammar allows thematic arity operations to apply in the lexicon or in the syntax.

Thus the reflexive operation can be lexical or syntactic. Broadly, then, languages can be divided into two groups, namely, ‘syntax’ languages and ‘lexicon’ languages.² The lexicon languages are the languages that form reflexive verbs in the lexicon such as English, Dutch, etc. Syntax languages are those languages that form reflexive verbs in the syntax such as the Romance languages, German, etc. As stands to reason, these two languages types can both also realize reflexive sentences by syntactic binding, using anaphors such as English *himself*, Dutch *zichzelf*, Mandarin *ziji* and *ta-ziji*. The core contents of the reflexivization operation in the lexicon are summarized in (46):

(46) Reflexivization in the lexicon

- a. Bundling: Operation (44) applies on the verb’s grid.
- b. Case: The accusative Case feature of the verb is reduced.

This is illustrated in (47):

| | | |
|------------------------------------|--|---------|
| (47) Verb entry: | Shave _{acc} $[\theta_i] [\theta_j]$ | English |
| Reflexivization output (Bundling): | Shave $[\theta_i - \theta_j]$ | |
| Syntactic output (Merging): | Tom _{$[\theta_i - \theta_j]$} shaves (reflexive) | |
| Interpretation (Semantics): | $\exists e$ [shave(e) & [+c+m](e, Tom) & [-c-m](e, Tom)] | |

Thus, the sole syntactic argument of the verb *shave* is linked to two semantic roles (the Agent and Theme), resulting in a ‘reflexive predicate’, which is syntactically

² But see Marelj and Reuland (2016) for an argument that the lexicon-syntax parameter as a global parameter can be dispensed with.

intransitive.

(48) **Reflexivization in syntax**

- a. Case: Case is reduced by the appropriate morphology (such as the clitic *se*).
- b. Bundling: Operation (44) applies to unassigned θ -roles, upon merger of the external θ -role.

The derivation is exemplified in (49):

- (49) a. Mary *se* lave. (French)
Mary SE washes
'Mary washes.'
- b. VP: [*se* lave _{θ_i -Agent, θ_k -Theme}]
 - c. IP: [Mary_{< θ_i , θ_k >} [*se* lave _{e_j} [_{VP} t_j]]]
 - d. $\exists e$ [wash (*e*) & Agent(*e*, Mary) & Theme(*e*, Mary)]

In order to determine whether bundling takes place in the syntax or the lexicon in a certain language, Reinhart and Siloni (2005) suggest four diagnostics: the presence of (i) Reflexivized ECM, (ii) Reflexive nominals, (iii) Dative reflexivization and (iv) the productivity of reflexivization.

Following the assumptions of Reinhart and Siloni (2005), in order to judge whether Mandarin Chinese is a syntax language or a lexicon language, I discuss the *zi*-V reflexive construction below:

(i) **ECM Reflexives**

ECM predicates can reflexivize. In ECM construction, there are two distinct predicates involved. Lexicon Languages have no ECM reflexives since there is no relation between distinct predicates in the lexicon. Syntax Languages can derive ECM reflexives.

Chinese shows the following option:

- (50) Lisi **zi-jue** lianghao.
Lisi self-think good
'Lisi considers himself good.'

The question is how to interpret this pattern. Is this a case of ECM, or is there an alternative? In fact it has been argued that the two predicates ‘*jue (juede)*-think’ and ‘*lianghao*-good’ actually can be analyzed as compound verbs (Zhu 1982, Tang 1992), reflecting the *Shu-bu shi* ‘verb-complemental formula’. If so, *zi-* can be analyzed as a prefix which attaches to the compound verb, and does not argue against Mandarin being a lexicon language, unless compounding has to be analyzed as a syntactic operation.

(ii) Reflexive Nominals

Reflexive Nominals are nominals derived from a verb by reflexivization followed by nominalization. The closest one can find to these in Mandarin are given in (51):

- (51) a. **zi-nüe** zhe
self-abuse person
‘a person who abused himself’
- b. **zi - zhu** shangren / xuesheng
self-subsidize/help businessman/student
‘a businessman/student who subsidized/helped himself’

However, in fact reflexivization applies to the modifier here, hence these don’t qualify as proper instantiations. The question is then whether one finds sentences like *this child is already an elegant dresser* in Mandarin. This issue will be addressed in a follow-up study. For now I leave this as undecided.

(iii) Dative Construction

Dative reflexivization occurs in Syntax Languages but not in Lexicon Languages. The fact shown in (52) indicates that Chinese lacks a reflexive dative construction.

- (52) *Wangwu **zi-ji** le yi zhang ka.
Wangwu self-send ASP a CL card
(Intended meaning ‘Wangwu sent himself a card.’)

Note, however, that the absence of dative reflexivization does not show that Mandarin

that (55b) is unacceptable. Thus Mandarin Chinese *zi*-verbs are intransitive syntactically, and also, most plausibly, unergative.³ They are subject to some aspectual restrictions. While ‘*zi+V*’ verbs can co-occur with the progressive marker ‘*zai*’ like (56a) *zi-nüe*-‘REFL-abuse’, they cannot be modified by ‘*hen*-very’, as (56b) *zi-sha*-‘REFL-kill’. For illustration see the examples below:

- (55) a. Lisi **zi-fen** le.
Lisi self-burn ASP
‘Lisi burned himself.’
b. *Lisi **zi-fen** le **ziji** / **Zhangsan**.
Lisi self-burn ASP anaphor/Zhangsan

- (56) a. Zhangsan **zai** *zi-nüe*.
Zhangsan being REFL-abuse
‘Zhangsan is doing self-abuse.’
b. *Lisi **hen** *zi-sha*.
Lisi very REFL-kill

5. Current Hypothesis

Reinhart and Siloni (2005) claim that the reflexivization operation in the lexicon is limited to a subset of Agent-Theme verbs.

Summarizing the test result in section 3.3, we see that indeed only Agent-Theme verbs ([+c+m] [-c-m]) allow reflexivization by *zi*-prefixation in Mandarin. However, not all of them do, as illustrated by the examples given in (41c) and (42c) repeated in (57a) and (57b). Thus it raises a puzzle that the verb ‘*chi*-eat’ and ‘*jiu*-rescue’ are both categorized as Agent-Theme [+c+m] [-c-m] verbs, but behave differently on **zi-V** reflexivization in that the latter allows the *zi*-prefix to form a reflexive verb, whereas the former disallows the *zi*-prefix.

- (57) a. *Zhangsan **zi-chi** le (disallow *zi*-V reflexive derivation)
Zhangsan self-eat ASP

³ Chief 1998 argues that they are unaccusative but for reasons that are not compelling (see Wong in preparation).

- b. Zhangsan **zi-jiu** le. (allow *zi-V* reflexive derivation)
Zhangsan self-rescue ASP
'Zhangsan rescued himself.'

In this particular case, Mandarin is no different from other languages. Neither in English, nor Dutch, nor Russian-to mention a few-does the verb *eat* allow lexical reflexivization. Note that *eat* itself is special in that it allows object omission. For a full picture one would have to systematically assess which agent-theme verbs do and which don't allow *zi*-reflexivization and to what extent their counterparts in other languages show the same restriction.

It should be noted, though, that the external argument of the main verb *jue* 'think' in cases like (50) is not an agent. This is also true of the other verbs allowing compounding of this type.

- (50) Lisi **zi-jue** lianghao.
Lisi self-think good
'Lisi considers himself good.'

This would go against Reinhart and Siloni's generalization, if *zi-* is to operate in the lexicon. For the moment, therefore, no firm conclusion can be drawn on the status of Mandarin with respect to the lexicon-syntax parameter, see Wong (in preparation) for more discussion

6. Methodology

In order to determine the range of *zi*-prefixation I will carry out a systematic investigation of verbs in Mandarin in section 7, using the method proposed in Dimitriadis and Everaert (2014). Dimitriadis and Everaert (2014) define as a reflexive an element (or a device) expressing identity between two arguments of a transitive base predicate. Other uses of the same grammatical form, such as focus markers, intensifiers, are not regarded as reflexives. Also middles or so-called 'inherent reflexives' which are formed from a transitive verb, but don't express a reflexive relation are not regarded as representing reflexivization.

In the present overview, all Mandarin Agentive verbs are tested. The list of Agentive verbs are selected from the 'Xiandai Hanyu Cixi-Xiandai Hanyu Donci Cidian'- 'Modern Mandarin Chinese Dictionaries- Modern Mandarin Chinese Verbs

Dictionary’ which is published in Beijing. It has been estimated to consist of around 7100 verbs. In addition, data were collected from the Modern Mandarin Chinese Corpus <http://asbc.iis.sinica.edu.tw> which consists of 19,247 articles in terms of Literature, Life, Society, Science, Philosophy and Arts fields, and 11,245,330 word token. In addition, I used the ‘Xiandai Hanyu Cidian’-‘Modern Mandarin Chinese Dictionary’ published in Beijing.

The focus is on the Agent-Theme [+c+m] [-c-m] verbs which were selected from the list of all verbs with a [+c+m] subject. The verbs selection excludes non-transitive verbs, [+c]-verbs, [+m]-verbs, two-place unaccusatives and inherent reflexive verbs.

In order to filter out the [+c+m]-verbs, the testing scheme established by Lemmen (2005) is employed given in (58):

(58) Testing scheme: Testing [+c+m], external role

| | |
|---|--------------------------------|
| Is the verb transitive? | → No → Exclude verb |
| ↓yes eg. <i>aiqiu-beg</i> | eg. <i>daoqian-apologize</i> |
| Does the verb license an animate subject <i>and</i> object? | → No → Exclude verb |
| ↓yes eg. <i>baohu-protect</i> | eg. <i>changxiao-sell well</i> |
| Does the verb license <i>cause</i> ? | → No → Exclude verb |
| ↓yes eg. <i>chouda-whip</i> | eg. <i>zenghen-hate</i> |
| Does the verb license natural force as external role? | → Yes → Exclude verb |
| ↓No eg. <i>cansha-kill cruelly</i> | eg. <i>dakai-open</i> |
| <i>Include this [+c+m]-verb</i> | |

To test the internal role, the verbs [+c+m] all select a *-cause* as internal role including [-c-m] and [-c+m] which is required to be mentally involved. Note that mental involvement entails animacy, but animacy does not entail mental involvement. Thus Lemmen (2005) suggests a ‘coma-test’, which will fail if the verb requires its participant to be mentally involved.

(59) Testing scheme: Testing [-c+m], the internal role

Consider [+c+m]-verb X

Does the verb license animate and non-animate objects? → Yes → **Internal role is [-c-m]**

↓No eg. *biance-spur on* eg. *aihu-take good care of*

Can a person be X-ed when he is in a coma? → Yes → **Internal role is [-c-m]**

↓No eg. *zhiwen-interrogate* eg. *sha-kill*

The internal role is [-c+m]

Furthermore, as discussed in section 1, normally, in Mandarin Chinese the bundled sentence with **zi-prefixed** verbs (60c) is semantically equivalent to the reflexive sentence with two complex anaphors **ta-zi-ji** (60b) and **zi-ji** (60d).

(60) a. *jiu* ‘rescue’ [+c+m] [-c-m]

b. *Lisi jiu le ta-zi-ji.*
Lisi rescue ASP pron-self
‘Lisi rescued himself.’

c. *Lisi zi-jiu le.*
Lisi REFL-rescue ASP
‘Lisi rescued himself.’

d. *Lisi jiu le ziji.*
Lisi rescue ASP self
‘Lisi rescued himself.’

The meaning of the sentence with **zi-V** reflexive verbs (60c) = the meaning of sentence with two complex anaphors **ta-zi-ji** (60b) and **zi-ji** (60d) by binding.

7. Results and Findings

I checked the verbs I chose with six Mandarin native speakers. I selected a total of 459 verbs out of 7103 verbs from ‘Xiandai Hanyu Cixi-Xiandai Hanyu Donci

Cidian'-Modern Mandarin Chinese Dictionaries Series - Modern Mandarin Chinese Verbs Dictionary'.

Following the test schema given above, the author tested and determined the features of 459 verbs, containing 134 verbs with the feature clusters [+c+m] [-c-m], and 325 verbs with the clusters [+c+m] [-c+m]. If there were any questions of verb selection or classification, I double checked with three Mandarin native speakers. Furthermore, in order to collect data more precisely, the Sinica Modern Mandarin Chinese Corpus was used. The results are presented in **Appendix 1 and 2**.

Not all Agent-Theme verbs were found to occur with a **zi-prefix** to form a reflexive verb. 46 verbs were found to allow it, whereas 88 verbs did not occur with it. The percentages are 34% and 66% respectively. The data analysis is summarized in **Tables 1, 2 and Figure 1**.

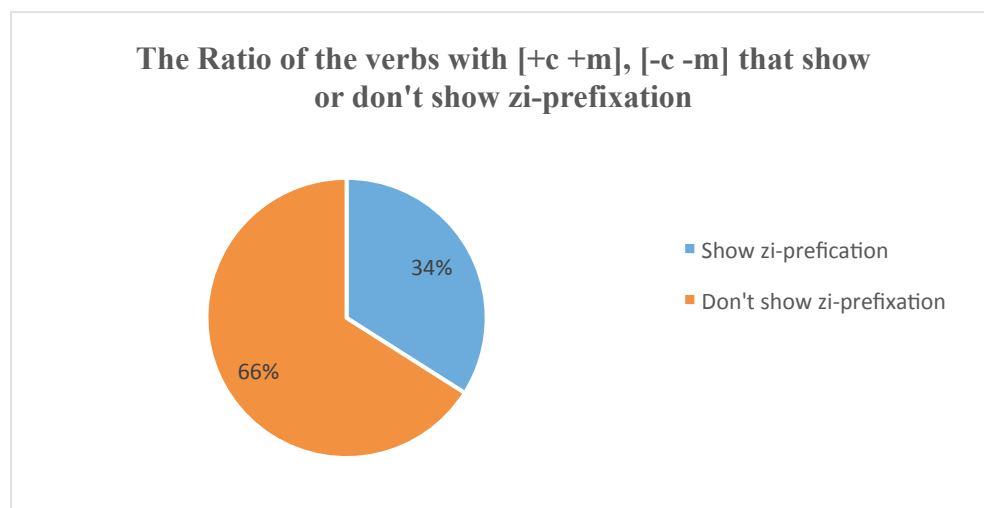
Table 1: Agentive verbs occurring or not occurring with *zi*-prefixation

| Classification | <i>The transitive verbs with a [+c +m] Subject</i> | | |
|--|--|----------------|-------|
| | [-c +m] Object | [-c -m] Object | Total |
| Occur with <i>zi</i> -prefixation | 0 | 46 | 46 |
| Didn't occur with <i>zi</i> -prefixation | 325 | 88 | 413 |
| Total | 325 | 134 | 459 |

Table 2: The ratio of the agentive verbs with [+c +m], [-c -m] clusters that occur or don't occur with *zi*-prefixation

| The agentive verbs | Classification | | |
|--------------------|--------------------------------|--------------------------------------|---------|
| | Occur with <i>zi</i> -prefix % | Don't occur with <i>zi</i> -prefix % | Total % |
| [+c +m], [-c -m] | 34% | 66% | 100% |

Figure 1: The ratio of the agentive verbs with [+c +m], [-c -m] clusters that occur or don't occur with *zi*-prefixation



8. Summary

To sum up, the findings reported here support the hypothesis that *zi*-V reflexivization of Agent-Theme verbs is lexically restricted in Mandarin. This indicates that *zi*-prefixation may possibly reflect a lexical reflexivization operation. On the other hand, the number of verbs allowing *zi*-prefixation is such that *zi*- is clearly analyzable as a separate reflexivizing element across its different occurrences, including its occurrence in *zi-ji* showing that the latter element is complex rather than simplex.

Appendix 1: List of [+c +m], [-c -m]-verbs that allow the *zi*-prefix

| Chinese Verbs Corpus (Pinyin) | Translation English | <i>zi</i> -V Data | Chinese Verbs (Pinyin) | Translation English | <i>zi</i> -V Data |
|-------------------------------------|------------------------|----------------------|---------------------------|--------------------------|----------------------|
| 1. anwei | console | zi-wei 48 | 25. jiejiu | make it out of danger | zi-jiu 27 |
| 2. ansha | assassinate | zi-sha 442 | 26. jiu | rescue | zi-jiu 27 |
| 3. baohu | protect | zi-bao 39 | 27. jiuzhu | succor | zi-zhu 92 |
| 4. bianze | blame | zi-ze 57 | 28. jujian | recommend sb. | zi-jian 4 |
| 5. canhai | harm | zi-can 7 | 29. kongzhi | control | zi-zhi 44 |
| 6. can sha 殘殺 | kill cruelly | zi-sha 442 | 30. nüedai | abuse | zi-nüe 7 |
| 7. can sha 慘殺 | kill tragically | zi-sha 442 | 31. nüesha | abuse to death | zi-sha 442 |
| 8. chi ze 叱責 | reproach loudly | zi-ze 57 | 32. paoqi | discard | zi-qi 7 |
| 9. chousha | for hatred to kill | zi-sha 442 | 33. pieqi | cast away | zi-qi 7 |
| 10. chujue | put to death | zi-jue 20 | 34. qianze | condemn | zi-ze 57 |
| 11. cisha | assassinate | zi-sha 442 | 35. qiangsha | shoot to death | zi-sha 442 |
| 12. dajiu | help to out of | zi-jiu 27 | 36. qiangjue | execute by | zi-jue 20 |

| | | | | | | | |
|---------------|--------------------|--------|-----|--------------|--------------------------|---------|-----|
| | danger | | | | shooting | | |
| 13. dizhi | resist | zi-zhi | 44 | 37. qiangjiu | rescue quickly | zi-jiu | 27 |
| 14. dusha | kill with poison | zi-sha | 442 | 38. sha | kill | zi-sha | 442 |
| 15. duanjue | sever | zi-jue | 7 | 39. shahai | kill or hurt to death | zi-sha | 442 |
| 16. esha 扼杀 | strangle | zi-sha | 442 | 40. tuijian | recommend sb. or sth. | zi-jian | 4 |
| 17. ezhi 遏制 | keep within limits | zi-zhi | 44 | 41. wanjiu | rescue from danger | zi-jiu | 27 |
| 18. fangqi | give up | zi-qi | 7 | 42. yazhi | suppress | zi-zhi | 44 |
| 19. fenhua | burn | zi-fen | 10 | 43. yinjian | recommend sb. by leading | zi-jian | 4 |
| 20. fuchi | help | zi-chi | 17 | 44. zanzhu | sponsor | zi-zhu | 92 |
| 21. fuzhu | aid | zi-zhu | 92 | 45. zhengjiu | rescue sb. from disaster | zi-jiu | 27 |
| 22. fuwei | pacify | zi-wei | 48 | 46. zizhu | subsidize | zi-zhu | 92 |
| 23. gongji 供給 | supply | zi-ji | 7 | | | | |
| 24. jiezhi | limit or control | zi-zhi | 44 | | | | |

Appendix 2-1: List of [+c +m], [-c -m]-verbs that disallow the *zi*-prefix

Chinese Verbs (Pinyin) Translation English Chinese Verbs (Pinyin) Translation English

| | | | |
|----------------|-------------------|----------------|-------------|
| 1. aihu | take good care of | 34. dujie | intercept |
| 2. anzang | bury | 35. fangwen | pay a visit |
| 3. bamian | depose | 36. fensui | crush |
| 4. bazhan | occupy | 37. genghuan | change |
| 5. baituo | break away | 38. huli | nurse |
| 6. baowei | surround | 39. husong | escort |
| 7. baoyuan | complain | 40. huifu | reply |
| 8. beipan | betray | 41. jicha | inspect |
| 9. bihu | shelter | 42. jiancha | examine |
| 10. biao Zhang | commend | 43. jianyue | review |
| 11. boxue | exploit | 44. jiaohuan | swap |
| 12. bochi | refute | 45. jiaoluan | commove |
| 13. buzhuo | capture | 46. jieshou 接收 | receive |

| | | | |
|--------------|----------------------|----------------|--------------------------------------|
| 14. caozong | rig | 47. jieshou 接受 | accept |
| 15. chafang | visit | 48. kunbang | truss up |
| 16. chanhai | slander | 49. landang | block |
| 17. chaoxi | attack | 50. lanjie | intercept |
| 18. chaoyue | exceed | 51. lou | hug |
| 19. chehuan | replace | 52. mai | bury |
| 20. chengzan | praise | 53. maizang | bury or eliminate |
| 21. choudiao | shift | 54. manyuan | complain |
| 22. chouhua | vilify | 55. nicang | hide |
| 23. chuli | deal with | 56. paida | pat |
| 24. citui | fire or unaccept | 57. piping | criticize |
| 25. dafa | dismiss | 58. puda | swat |
| 26. daji | hit | 59. qizha | swindle |
| 27. dajie | rob | 60. qiaozha | blackmail |
| 28. dakua | defeat | 61. qiaoda | beat |
| 29. daiti | replace | 62. qiaoyu | meet coincidentally |
| 30. daonian | mourn | 63. qin | Touch sb. or sth. by mouth with love |
| 31. digu | underestimate | 64. qinwen | kiss |
| 32. douchao | round up to attack | 65. qinfan | impinge |
| 33. doujiao | round up to wipe out | 66. quzhu | expel |

Appendix 2-2: List of [+c +m], [-c -m]-verbs that disallow the *zi*-prefix (cont.)

Chinese Verbs (Pinyin)

Translation English

| | |
|---------------|-----------------|
| 67. saoshe | strafe |
| 68. shalu | massacre |
| 69. shengchan | produce |
| 70. shuai | fling |
| 71. soucha | search |
| 72. tanwang | visit |
| 73. ti | kick |
| 74. tihuan | displace |
| 75. tiaoxuan | select |
| 76. touxi | attack sneakily |

| | |
|---------------|---------|
| 77. wannong | twiddle |
| 78. xiedai | carry |
| 79. xuanze | choose |
| 80. yajie | escort |
| 81. yingjie | greet |
| 82. youpian | lure |
| 83. zanmei | laud |
| 84. zhenya | repress |
| 85. zhengdiao | muster |
| 86. zhiyuan | support |
| 87. zhuizhu | chase |
| 88. zuzhi | prevent |

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