

Mandarin Intransitive Reflexive Verbs and the Unaccusative Hypothesis

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*The present paper focuses on the Mandarin Intransitive Reflexive Verbs. These verbs, such as *zi-sha* 'to commit suicide', and *zi-fen* 'to burn oneself', are formed with a reflexive morpheme *zi-* 'self' and a root verb. Take the verb *zi-sha* 'to commit suicide' for example, the reflexive morpheme contributes the reflexive meaning and the root verb *sha* 'to kill' contributes the meaning 'to kill'; hence, the meaning 'to kill oneself'. Two previous analyses have different classification of these reflexive verbs. For instance, Tang's (1992) analysis implies that these verbs are unergative, while Kao (1993) asserts that they are unaccusative. In light of the previous analyses, we present an alternative analysis by giving new data that are largely selected from Sinica Corpus.*

By scrutinizing the syntactic behavior of reflexive verbs, calculation of thematic properties of the subject, and the event structure of these predicates, we propose a morpholexical operation of reflexivization and conclude that intransitive reflexive verbs are unaccusative. Although our conclusion seems to be as same as Kao's conclusion, two analyses are strikingly different from each other. We will prove that Kao's analysis can only account for the partial truth, while the present analysis can fully explain the linguistic phenomenon of Mandarin intransitive reflexive verbs. In addition, the implication of two analyses is also different. It is believed that the present analysis offers additional evidence to support the idea that the distinction between thematic roles is not discrete.

1. INTRODUCTION

The concept of reflexivization can be represented not only in syntax as shown in (1a), but also in lexicon as shown in (1b).

(1a) Zhangsan sha le ziji
 Zhangsan kill ASP self
 'Zhangsan killed himself.'

(1b) Zhangsan zi-sha le
 Zhangsan REFL-kill ASP
 'Zhangsan committed suicide.'

In Mandarin Chinese, there is a class of reflexive verbs which is prefixed by a reflexive morpheme *zi-* 自 'self'. They can be intransitive such as *zi-sha* 自殺 'to commit suicide', or transitive such as *zi-ren* 自認 'to think of oneself as'. The reflexive anaphors, such as mono-morphemic reflexive *ziji* 'self' and poly-morphemic reflexive *ta-ziji* 'himself/herself', have attracted many Chinese linguists' attention (Sung and Cole 1994, Tang 1989, Chen 1992, Y. Huang 1994, Kao 1993, Xu 1993, Chief and Chen 1995). On the contrary, there are relatively few studies of the reflexive verbs. Two recent studies (Tang 1992, Kao 1993) aim at Mandarin reflexive verbs. However, they do not provide a full set of data to discuss the phenomenon of Mandarin reflexive verbs. Moreover, some of the conclusions drawn on the two studies make incorrect prediction. Therefore, a thorough research of Mandarin reflexive verbs should be conducted. This paper focuses on the presentation and description of the linguistic data of Mandarin intransitive reflexive verbs and provides an alternative analysis.¹ Section 2 provides a background understanding of the analysis in the present study, including previous analyses and the characteristics of Mandarin reflexive verbs. In section 3, we will present an alternative analysis. By applying the notion of Lexical Mapping Theory, a sub-theory of LFG, a morpholexical operation of lexical binding is proposed to account for the Mandarin intransitive reflexive verbs. Section 4 demonstrates that the present analysis can properly explain the facts that the previous analyses fail to account for. In section 5 we will compare the difference between the present analysis and other analyses. We discuss the implication of the present analysis in section 6. The final section concludes this paper.

2. INTRANSITIVE REFLEXIVE VERBS IN MANDARIN

The Mandarin intransitive reflexive verbs, such as *zi-sha* 自殺 'to commit suicide', *zi-ai* 自愛 'to respect oneself', are formed with a prefix *zi-* 'self' and a transitive verb. This sub-class of the intransitive reflexive verbs includes:

¹ For the analysis of transitive reflexive verbs or the classification of Mandarin reflexive verbs, please see Chief (1996, 1997a, 1997b).

- (2) *zi-nue* 自虐 'to torture oneself', *zi-sha* 自殺 'to commit suicide', *zi-ai* 自愛 'to respect oneself', *zi-bei* 自卑 'to feel oneself inferior', *zi-ba* 自拔 'to free oneself from', *zi-zhong* 自重 'to respect oneself', *zi-lian* 自憐 'to pity oneself', *zi-bi* 自閉 'to be autistic', *zi-wei* 自衛 'to defend oneself', *zi-fen* 自焚 'to burn oneself', *zi-lu* 自律 'to control oneself', *zi-qi* 自欺 'to cheat oneself', *zi-yu* 自娛 'to amuse oneself', *zi-yi* 自抑 'to suppress oneself', *zi-jing* 自盡 'to commit suicide', *zi-jiu* 自救 'to save oneself', *zi-bao* 自保 'to protect oneself', *zi-zhi* 自制 'to control oneself', *zi-kong* 自控 'to control oneself', *zi-yuan* 自怨 'to complain oneself', *zi-jiu* 自咎 'to blame oneself', *zi-lian* 自戀 'to be narcissist', *zi-qi* 自棄 'to abandon oneself', *zi-li* 自勵 'to encourage oneself', *zi-fu* 自負 'to think highly of oneself', *zi-wun* 自刎 'to kill oneself', *zi-da* 自大 'to boast oneself', *zi-can* 自殘 'to hurt oneself', and so on.

2.1 THE SEMANTIC COMPOSITION AND THE INTERNAL STRUCTURE

Most of the second-syllable morphemes are not free morpheme in modern Mandarin. However, Mandarin native speakers know that these morphemes, if isolated, are dyadic semantically. For example, in the reflexive verbs *zi-fen* 自焚 'to burn oneself' and *zi-nue* 自虐 'to torture oneself', the second-syllable morphemes *fen* 焚 'to burn' and *nue* 虐 'to torture' have the meanings 'to burn' and 'to torture'. Obviously, they are dyadic in nature, although they are no longer free morphemes in Modern Mandarin. In short, these second-syllable morphemes are transitive verbs alone, but become intransitive when they are prefixed by reflexive morpheme *zi-* 'self'. Mandarin reflexive verbs are complex predicates because their semantics is compositional. The first-syllable reflexive prefix *zi-* 'self' contributes the reflexive meaning and the second-syllable morpheme the predicate meaning. For instance, in the reflexive verb *zi-fen* 'to burn oneself', the reflexive morpheme *zi-* contributes the reflexive meaning and *fen* 'to burn' provides the predicate meaning 'to burn'; hence, the compositional meaning 'to burn oneself'.

2.2 PREVIOUS ANALYSES

Following Grimshaw's (1990) analysis that Romance reflexive verbs are unaccusative verbs, Kao (1993) argues that Chinese intransitive reflexive verbs are unaccusative verbs. Specifically, in Kao's (1993) proposal *zi-* is a reflexive clitic which can prefix to transitive verbs and suppress the external argument of the verb. As a consequence, the syntactic expressed argument is the internal argument of reflexive verbs. Therefore, the intransitive reflexive verbs are unaccusative verbs.

Kao (1993) claims that these verbs and unaccusative verbs share some characteristics. She indicates that there are some properties of unaccusative verbs in Mandarin Chinese. First, only unaccusative verbs can occur in presentative constructions. Second, they cannot take the durative marker *-zhe*. Third, only unaccusative verbs and passive verbs can be converted into an adjectival form. Fourth, resultative phrases can only modify the subject of the unaccusative verbs. Finally, only unergative verbs can undergo passivization. The lexical reflexive verbs share these properties with unaccusative verbs. We summarize her argument in table 1.

Table 1. Summary of Kao's Evidence

	Syntactic Tests	unergative verbs	unaccusative verbs	reflexive verbs
1	presentative construction	-	+	+
2	attachment of <i>-zhe</i>	+	-	-
3	converting to adj. form	-	+	+
4	subject modified by resultative phrase	-	+	+
5	passivization	+	-	-

However, the last three (no.3-no.5) diagnostics for unaccusativity are only proved to be good for other languages. It seems that these diagnostics cannot be directly extended to Mandarin Chinese. In next section, we provide new data to verify whether the Mandarin reflexive verbs are unaccusative verbs or unergative verbs.

2.3 THE SYNTACTIC BEHAVIOR OF INTRANSITIVE REFLEXIVE VERBS

In this section, we will examine every unaccusative characteristics of Mandarin intransitive reflexive verbs assumed in Kao (1993). In addition, we will also illustrate the characteristics of these verbs.

2.3.1 REFLEXIVE VERBS AND PRESENTATIVE CONSTRUCTIONS

In presentative constructions, the subject appears in the post-verbal position which is also the canonical object position in normal situation. Thus, only unaccusative verbs can occur in the presentative construction. Based on this criterion, Kao (1993) demonstrates that: in (3b) the verb *pa* 'creep' is unergative, so it cannot occur in the presentative construction; on the contrary, the unaccusative verb *lai* 'come' in (3a) and the reflexive verbs *zi-sha* 'to commit suicide' in (3c) can occur in this construction.

Presentative construction

- (3) a. lai le yi ge ren
come ASP one CL people
'Here comes a person.'
- b. *pa le yi tiao she
creep ASP one CL snake
- c. tingshou zai nei chang canju zhong, zi-sha le liang ge ren
hearsay at that CL tragedy LOC REFL-kill ASP two CL people
'They said two people killed themselves in that tragedy.'

However, with a further scrutiny, we find that not all of the intransitive reflexive verbs can occur in the presentative construction.

- (4) a. *ban shang zi-ai le liang ge xuesheng
class LOC REFL-love ASP two CL student
- b. *shiwei cunzhong zhong zi-lu le liang ge ren
demonstrationist LOC REFL-control ASP two CL people
- c. shiwei cunzhong zhong zi-fen le liang ge ren
demonstrationist LOC REFL-burn ASP two CL people

Most of the reflexive verbs in sentences (4) cannot occur in the presentative constructions. It seems that only a few intransitive reflexive verbs pass this test.

2.3.2 REFLEXIVE VERBS AND PARTICIPLE ADJECTIVE CONVERSION

Following Levin and Rappaport's (1986) analysis of English, Kao (1993) claims that only unaccusative verbs can be converted into an adjectival form in Mandarin Chinese. In the following, we will show that this criterion cannot be applied in Mandarin Chinese. We cite her examples in (5). The verb *pa* 'creep' in (5b) is an unergative verb, so it cannot be converted into an adjective to modify *she* 'snake'. On the contrary, the unaccusative verb *chen* 'sink' can be converted into an adjective as in (5a).

- | | |
|-------------------------------------------------------|-------------------------------------------------------------------------|
| (5) a. chen chuan
sink boat
'a boat which sunk' | c. zi-sha zhe
REFL-kill person
'a person who killed himself' |
| b. *pa she
creep snake | d. zi-nue zhe
REFL-torture person
'a person who tortured himself' |

She only provides two example (5c) and (5d) to show that reflexive verbs can be converted into an adjective. However, in these cases, the head noun which is modified by the converted adjectival form is *zhe* 者 'the one who . . .'. It seems that *zhe* 者 'the one who . . .' can be modified by unergative verbs, too.

- | | |
|-----------------------------------------------------|------------------------------------------------------------|
| (6) a. pao zhe
run person
'runner' | c. youxing zhe
demonstrate person
'demonstrationist' |
| b. xingdong zhe
act person
'the one who acts' | d. li zhe
stand person
'the one who is standing' |

The examples in (6) show that the unergative verbs *pao* 'run', *xingdong* 'act', *youxing* 'demonstrate', *li* 'stand' can be converted into an adjectival form as a modifier of *zhe* 'the one who . . .'. One might think that we should not take *zhe* 者 'the one who . . .' as the examples. To solve this question, we must see if the Mandarin reflexive verbs, when converted into an adjectival form, can modify a normal head noun. The answer seems to be positive.

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|---------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| (7) a. zi-sha xuesheng
REFL-kill student
'the student who killed himself' | c. zi-bi er
REFL-close child
'autism children' |
| b. zi-zhu luren
REFL-help traveler
'self-helping traveler' | d. zi-jiu weiyuanhui
REFL-save committee
'self-helping committee' |
| | e. zi-zhu nuxing
REFL-master female
'independent woman' |

The sentences in (7a-e) display that the reflexive verbs can be converted into an adjective form to modify a head noun in addition to *zhe* 'the one who . . .'. The next step is to see if the Mandarin unergative verbs can be

converted into adjectival forms.

- | | | | |
|--------|-----------------------------------------------------|----|---------------------------------------------------------------|
| (8) a. | liulang gou
wander dog
'wandering dog' | c. | shi-zu nu
astray girl
'a girl who goes astray' |
| b. | youyong gaoshou
swim expert
'swimming expert' | d. | qianfu fengzi
hiding person
'spy' |
| | | e. | du-xing nuzi
alone-walk woman
'a woman who walks alone' |

The adjectives that modify the head nouns in (8) are derived from unergative verbs. Evidently, unaccusative, unergative, and reflexive verbs can be converted into adjectival forms in Mandarin. Contrary to Kao's assertion, the process of deriving adjectives from verbs cannot be an unaccusative test for Mandarin verbs.

2.3.3 REFLEXIVE VERBS AND RESULTATIVE CONSTRUCTIONS

In English, the resultative phrase can only modify the internal argument of a verb. In other words, it can be predicated of the object of transitive verbs or the subject of unaccusative verbs. Kao (1993) gives examples to illustrate that in Mandarin the resultative phrase can only modify the subject of unaccusative verbs (sentence 9a) and reflexive verbs (sentence 9c) but cannot modify the subject of unergative verbs (sentence 9b).

- | | |
|--------|------------------------------------------------------------------------------------------------------------------------------------------|
| (9) a. | xuesheng fen cheng liang zu
student separate into two group
'The students divided into two groups.' |
| b. | *xuesheng pao cheng liang zu
student run into two section
*'The student ran into two sections.' |
| c. | Zhangsan zi-nue de bu cheng ren xing
Zhangsan REFL-torture DE not into human form
'Zhangsan tortured himself into a haggard form.' |

By considering some more data, we observe that unergative verbs can also occur in the resultative construction.

- | | |
|---------|---------------------------------------------------------------------------------------------------------------|
| (10) a. | ta xiao de duzi tong
he laugh de stomach ache
'He laughed so badly that results in stomachache.' |
| b. | ta zou de you ke you lei
he walk DE also thirsty also tired
'He walks so that he is thirsty and tired.' |

The sentences in (10) show that the subject of Mandarin unergative verbs can also be modified by resultative phrases. We would suggest that the 'resultative construction' test cannot be used to verify the unaccusativity of Mandarin reflexive verbs, though this is a good test for English unaccusative verbs. One might turn to another resultative construction in Mandarin, namely, V-V resultative compound. But we will also suggest that this cannot be a good test for whether Mandarin reflexive verbs are unaccusative or unergative. The reason is that Mandarin reflexive verbs cannot form a V-V resultative compound with other verbs. Therefore, occurring with a resultative phrase cannot be a test for whether Mandarin reflexive verbs are unaccusative or not.

2.3.4 REFLEXIVE VERBS AND POSTPOSING OF NUMERAL PHRASE

Chang and Huang (1995) point out the unaccusative verbs (sentences 12b and 12c) can co-occur with the construction of postposing of numeral phrase, while the unergative verbs cannot (sentence 11b). For example,

- | | |
|---------|----------------------------------------------------------------------------------------------|
| (11) a. | er-fen-zhi-yi de xuesheng duo ku le
one-second DE student all cry ASP |
| b. | *xuesheng ku le er-fen-zhi-yi
student cry ASP one-second
'Half of the students cried.' |
| (12) a. | er-fen-zhi-yi de fanren pao ² le
one-second DE prisoner ran away ASP |

² The verb *pao* has two lexical items: one means run and the other escape. The former is unergative and the latter unaccusative.

- b. fanren pao le er-fen-zhi-yi
 prisoner ran away ASP one-second
 'Half of the prisoners ran away.'
- c. wu ge fanren pao le liang ge
 five CL prisoner ran away ASP two CL
 'Two of the five prisoners ran away.'

Some of the reflexive verbs such as sentence (13a) and (13b) can pass this unaccusative test and some cannot as shown in sentence (14). For example,

- (13) a. nanmin zi-sha le yi-ban
 refugee REFL-kill ASP half
 'Half of the refugees committed suicide.'
- b. shi ge shiwei zhe zi-fen le san ge
 ten CL demonstrationist REFL-burn ASP three cl
 'Three of the ten demonstrationists burned themselves.'
- (14) *shuohai-ren zi-bao le er-fen-zhi-yi
 victim REFL-protect ASP one-second

Based on the above observation that different reflexive verbs have different behavior, should we classify Mandarin intransitive reflexive verbs into two classes? Or, there are other factors to account for this phenomenon. We will try to account for such a variation of syntactic behavior shortly.

3 THE ANALYSIS OF INTRANSITIVE REFLEXIVE VERBS

3.1 THE THEORETICAL FRAMEWORK

In this paper, we will apply the Lexical Mapping Theory (LMT) to illustrate the observed phenomenon.³ In movement theories, the surface subject of unergative verbs is also the underlying subject, while the surface subject of unaccusative verbs is the underlying direct object. Then, how does a *monostratal* syntactic theory which does not have the notion 'underlying object' account for the distinction between unaccusative and unergative verbs? Bresnan and Zaenen (1990) and Zaenen (1994) point out that the intrinsic feature of thematic roles can describe the distinction between unaccusative and unergative. The characterization of unaccusative and unergative suggested by Zaenen (1994: 153) is:

- (15) an unaccusative participant is a participant that is intrinsically marked [-r]
 an unergative participant is a participant that is intrinsically marked [-o]

Following this approach, we, then, do not have to refer to the notion of underlying object and movement.

Recent studies of reflexive verbs tend to treat the reflexive morpheme which signals the reflexive meaning in reflexive verbs as a valency reducing morpheme (Grimshaw 1990, Alsina 1994). Specifically, the reflexive morpheme is a marker of the binding relationship in argument structure. In other words, it makes one argument binds another of a predicate. Take *sha* 'to kill' and *zisha* 'to commit suicide' for example. Conceptually, there are two roles in the predicate *sha* 'to kill', the agent and the patient. Projecting to the syntactic level, there are two NPs as in sentence (16).

- (16) Zhangsan sha le (ta)ziji.
 Zhangsan kill ASP himself
 'Zhangsan killed himself.'

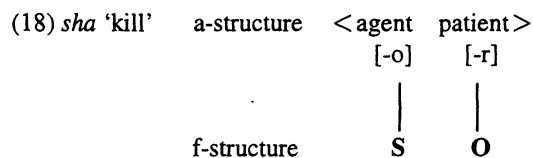
As for the reflexive verb *zi-sha* 'to commit suicide', there are also two roles conceptually, the agent and the patient. The one who does the action 'kill', the agent, and the one who is killed, the patient, are the same one. Projecting to the syntactic level, there is only one NP in c-structure and one GF in f-structure as in sentence (17).

- (17) Zhangsan zuotian zi-sha le
 Zhangsan yesterday REFL-kill ASP
 'Zhangsan committed suicide yesterday.'

Unlike the binding in the syntactic level, such as sentence (16), the binding relationship of reflexive verbs is determined in the a-structure rather than c-structure or f-structure. Therefore, we can say that the function of the reflexive prefix *zi-* 'self' is to cause one argument of a predicate to bind another. The appearance of only one NP in syntax is the consequence of the lexical binding. In other words, the valence-reducing is a by-

³ In LMT, grammatical functions are further classified by two features: [o] and [r]. The features [\pm o] and [\pm r] are used to specify whether the syntactic functions are objective or nonobjective and restrictive or nonrestrictive. The grammatical functions subject and object are nonrestrictive because they can correspond to any thematic role, while the functions OBJ_θ, OBL_θ are restrictive because they only correspond to a limited set of roles.

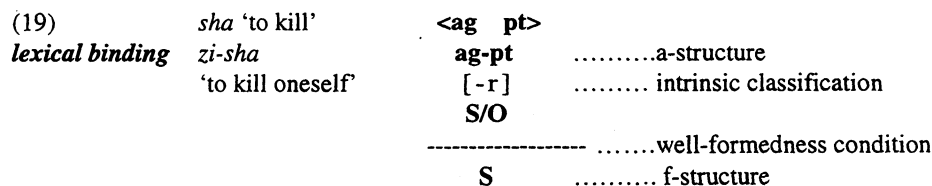
product of a lexical binding process. It is interesting to discuss why and how the semantic roles project onto the grammatical function in Mandarin reflexive verbs. The morpholexical operation in LMT can alter the argument structure by adding, suppressing, or *binding* roles. Bresnan (1989: 297) indicates that "suppression means simply that the role is syntactically unexpressed." Take the verb *sha* 'to kill' and *zisha* 'to commit suicide' for example again, the argument structure of *sha* 'to kill' is altered after the process of reflexivization or *zi*-prefixation. The verb *sha* 'to kill' has an argument structure (18).



The thematic roles agent and patient can project to or link to the grammatical function subject and object respectively. After the process of reflexivization, the verb *zisha* 'to commit suicide' has only one syntactically expressed function, subject. What happened to the thematic roles agent and patient in the mapping or linking process is the question to be solved in this study.

3.2 THE MORPHOLEXICAL OPERATION OF REFLEXIVIZATION

We propose a lexical binding morpholexical operation to account for the phenomena of intransitive reflexive verbs. Take the verb *zi-sha* 'to commit suicide' for example, the reflexivization is illustrated in (19).



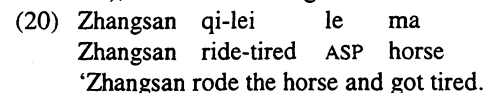
In the lexical binding operation (19), the reflexive morpheme *zi-* causes the two roles to fuse together. In addition, the composite role is intrinsically marked [-r]. The assignment of intrinsically classification [-r] to the composite role is data-driven. It will be proved in section 3.3 that the intransitive reflexive verbs are unaccusative verbs. Since they are unaccusative verbs, the role should be marked [-r] according to the LMT. The intrinsically classification [-r] of the composite role is a by-product of the lexical binding. In other words, the lexical binding operation, or, the prefixation of *zi-*, brings in two morpholexical effects: (i) two roles fuse together, and (ii) the reflexivization assigns [-r] classification to the composite role. In the following section, we will show that Mandarin intransitive reflexive verbs are unaccusative verbs. Since these verbs are unaccusative verbs, the intrinsically classification of the composite role is [-r]. In brief, the lexical binding operation assigns [-r] to the composite role. In the following section, we will first point out that the phenomenon of composite role is not unique. Furthermore, we will prove that the analysis that applies the concept of composite role is necessary and can properly account for the thematic properties of the subject of the intransitive reflexive verbs. Furthermore, we will justify why the morpholexical operation of lexical binding assigns a [-r] classification to the composite role.

3.2.1 WHY COMPOSITE ROLE

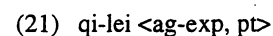
In section 3.2.1, we first point out that the argument structure of resultative compound verbs also contains composite roles, and then explain why and how the subject of reflexive verbs is mapped from a composite role.

3.2.1.1 THE PHENOMENON OF COMPOSITE ROLES IS NOT UNIQUE

It is not a unique phenomenon that the sole function of Mandarin reflexive verbs is mapped from a role with two kinds of thematic roles. In the V-V structure of Mandarin (Chang 1991, Her 1997, and Huang and Lin 1992), there is also one grammatical function which has not only agent properties but also patient properties.



One of the readings of sentence (20) is that *Zhangsan* rode the horse and got tired. The a-structure is like (21).



The subject of the complex predicate *qi-lei* 'ride-tired' is mapped from the composite role which consists of

agent and experiencer. The subject, *Zhangsan*, is both the agent, the one who rode the horse, and the experiencer, who got tired, at the same time. The abundant data of resultative verbs in Mandarin demonstrates that it is not a unique phenomenon that one role has two kinds of thematic properties in a verb's a-structure.

3.2.1.2 THE SUBJECT HAS TWO KINDS OF THEMATIC PROPERTIES

Based on Dowty's distinction of thematic properties, we will examine the thematic properties of reflexive verb's subject. The principles for determining the thematic properties are listed in (22).

(22) Agent properties

- a. volition
- b. sentience (and/or) perception
- c. causes event
- d. movement
- e. referent exists independently of action of the verb

Patient properties

- a. change of state
- b. incremental theme
- c. causally affected by the event
- d. stationary (relative to movement of proto-agent)
- e. referent may not exist independent of action of verb, or may not exist at all

We take the verb *zi-sha* 'to commit suicide' for example.

(23) *bei-bao-xian-ren guyi zi-sha*
 the insured purposely REFL-kill
 'The insured committed suicide on purpose.'

(24) *tamen jiti zi-sha shenwang*
 they mass REFL-kill die
 'They died of mass suicide.'

The subject of *zi-sha* 'to commit suicide' has the proto-agent properties (22a) *volition* and (22c) *cause event*. For example, if someone decides to commit suicide, s/he must have the volition to do so as exemplified by sentence (23). In sentence (23), the reflexive verb co-occurs with the purpose adverb *guyi* 'on purpose', so the subject of the reflexive has the volition. Specifically, s/he has the ability to control the performance of the action of suicide. This action should also cause the event of suicide. In addition, the one who commits suicide must also be causally affected by the event (Patient Property c in 22) and undergoes the change of state (Patient Property a in 22) because of the event of suicide. S/he must be hurt or killed by herself/himself as exemplified by sentence (24). In addition, the subject of *zi-sha* 'to commit suicide' might also have the agent properties *referent exists independently of action of the verb* (Agent Property e in 22). The Agent Property e in 22 means that the participant is "presumed to exist before and after the action" (Dowty 1991: 573). The subject of *zi-sha* 'to commit suicide' exist before and after the action. In addition to the reflexive verb *zi-sha* 'to commit suicide', the other reflexive verbs such as *zi-nue* 'to torture oneself' and *zi-fen* 'to burn oneself' have the same pattern.

(25) *Ta yin huo zi-fen shen-wang*
 he burn fire REFL-burn die
 'He burned himself and was dean.'

Like the case of *zi-sha* 'to commit suicide', in the verb *zi-fen* 'to burn oneself' the one who burned himself/herself must have the volition to do so and cause an event of burning. Besides, s/he must also be burned and affected by the event. Moreover, in the case of *zi-nue* 'to torture oneself', the one who tortured himself/herself must also have the volition to do so and caused the event of torturing himself/herself. S/he must be hurt and affected by this event. In brief, the above discussion shows that the subject of Mandarin intransitive reflexive verbs is mapped from a composite role because it possesses not only agent properties but also patient properties. Thus, it is justified that the subject of intransitive reflexive verbs is mapped from a composite role.

3.2.2 JUSTIFICATION OF THE ASSIGNMENT [-r] TO THE COMPOSITE ROLE

In this section, we will prove that all the intransitive reflexive verbs behave like unaccusative verbs syntactically. In the lexical binding morpholexical operation, the assignment of [-r] to the composite role ensures that the verbs which undergo the reflexivization become unaccusative verbs.

3.2.2.1 THE SYNTACTIC EVIDENCE

This section demonstrates that syntactically the intransitive reflexive verbs are unaccusative verbs. Section 3.2.2.1.1 shows that some of the intransitive reflexive verbs can occur in the presentative construction. These verbs, by definition, are surface unaccusative verbs. Section 3.2.2.1.2 indicates that all of the intransitive reflexive verbs cannot take the durative marker *-zhe*. This piece of evidence shows a strong tendency that the Mandarin intransitive reflexive verbs are unaccusative verbs.

3.2.2.1.1 SURFACE UNACCUSATIVITY

We mentioned in 2.3.1 that some of the reflexive verbs can occur in the presentative construction and some cannot. In addition, some of the reflexive verbs can occur in the post-posing of numeral phrase construction and some cannot as shown in 2.3.4. The reflexive verbs, such as *zi-sha* 'to commit suicide' and *zi-fen* 'to burn oneself' which can occur in these constructions are surface unaccusative verbs, because their subject appears in the canonical object position. By definition, they are surface unaccusative verbs, and the unaccusative participant should be intrinsically [-r] according to Bresnan and Zaenen (1990) and Zaenen (1994). As for those that cannot occur in the presentative constructions, they are possibly the deep unaccusative verbs. Because one cannot tell unergative verbs from deep unaccusative verbs simply in terms of syntactic behavior. As mentioned in Levin and Rappaport Hovav (1995: 19), "diagnostics that rest on properties like θ -role assignment or the building of compositional semantics will show properties of deep unaccusativity." In other words, the subject of deep unaccusative verbs and the subject of unergative verbs are all occur in the pre-verbal position. However, the subject of deep unaccusative verbs has different properties from that of unergative verbs. Specifically, the subject of deep unaccusative verbs has the object-like or patient-like properties, while that of unergative verbs does not. Thus, we have to apply the other diagnostics in addition to the presentative constructions.

3.2.2.1.2 THE ATTACHMENT OF THE DURATIVE MARKER *-zhe*

Some studies (Kao 1993; Pan 1996) point out the significant correlation between the unaccusative verbs and the durative marker *-zhe*. We believe that this syntactic test has a semantic explanation. As pointed out by Li and Thompson (1981), "an activity verb that signals a state associated with its activity meaning takes *-zhe* as the durative marker." According to this statement, we infer that the subject of a verb that can take a durative marker *-zhe* must be high in agentivity. The attachment of *-zhe* applied here is to show its ability of co-occurrence with action verbs (Li and Thompson 1981) rather than to show the other meaning that relates to the co-occurrence with stage-state verbs (Yeh 1993). The following examples prove that the above statement has empirical grounding.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <p>(26) Lisi zai lu-shang zou zhe
 Lisi at road-LOC walk DUR
 "Lisi is walking on the street."</p> <p>(27) Lisi zhan zhe
 Lisi stand DUR
 "Lisi is standing."</p> | <p>(28) *Lisi si zhe
 Lisi die DUR</p> <p>(29) *Lisi dao zhe
 Lisi arrive DUR</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|

Sentences (26) and (27) demonstrate that the action verbs can take the durative marker *zhe*, while sentences (28) and (29) show that the verbs which are not action verbs cannot take the durative marker *-zhe*. Also notice that the verbs in sentences (26) and (27) are unergative verbs, and those in sentences (28) and (29) are unaccusative verbs. In brief, if a verb can take a durative marker *-zhe*, it tends to be an unergative verb. On the contrary, if a verb cannot take the *-zhe*, it tends to be an unaccusative verb. Since all of the intransitive reflexive verbs cannot take *-zhe*, they should be classified as unaccusative verbs.⁴ The following examples illustrate this point.

- (30)a. *Zhangsan zai fangjian li zi-jin zhe
 Zhangsan at room LOC suicide ASP
- b. *Lisi yin zhangxiang qite er zi-bei zhe
 Lisi because appearance strange so REFL-dispise ASP
- c. *ta ju qiang zi-jin zhe
 he take gun suicide ZHE
- d. *ta hen zi-ai zhe
 he very REFL-love ZHE

⁴ The evidence from the Sinica Corpus, which contains 4 million tagged words, also supports the fact that reflexive verbs cannot take the durative marker *-zhe*. In the corpus, we only find one instance in which the reflexive verb takes *-zhe*.

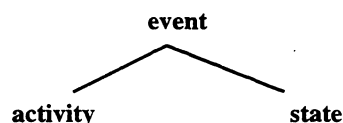
- (1) ta xianran zai nuli zi-zhi zhe
 he obviously PROG hard REFL-control DUR
 'He is obviously trying to control himself.'

We believe that this sentence stands for a special case. If we take out the word *nuli* 'work hard', this sentence is still anomalous. Since there is only one special case that reflexive verbs co-occur with the durative marker *-zhe*, we still hold the claim that reflexive verbs cannot take *-zhe*.

3.2.2.2 A VIEW FROM EVENT STRUCTURE

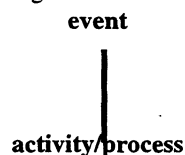
The event structure proposed by Pustejovsky (1988) and modified by Grimshaw (1990) also supports the fact that Mandarin intransitive reflexive verbs are unaccusative verbs. She proposes the following event structure for transitive predicates (Grimshaw 1990: 26).

(31)

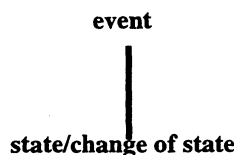


In (31) the event structure consists of an activity and a state. The event structures of unergative verbs and unaccusative verbs are (32) and (33) respectively (Grimshaw 1990: 27-40).

(32). Unergative verbs



(33). Unaccusative verbs



We will demonstrate that the event structure of all the reflexive verbs denotes a state. Consider the following sentences.

(34) *zuotian zi-sha le yi ge guozhong xuesheng*
 yesterday REFL-kill ASP one CL junior high school student
 'Yesterday, a junior high school student committed suicide.'

In sentence (34), the verb *zi-sha* denotes a state; that is, the student died. The event structure of *zi-sha* 'to commit suicide' focuses on the state of death rather than the activity of killing. Teng (1975) and Li and Thompson (1981) indicate that only action verbs may occur in the progressive or take the progressive marker *zai*. Almost every reflexive verb cannot co-occur with *zai*.⁵⁶

(35) **Lisi zai zi-sha*

Lisi PROG REFL-kill

(37) **Lisi zai zi-lian*

Lisi PROG REFL-love(narcissist)

(36) **Lisi zai zi-bao*

Lisi PROG REFL-protect

(38) **Lisi zai zi-jiu*

Lisi PROG REFL-save

Since reflexive verbs cannot take the progressive marker *zai*, we claim that the reflexive predicates should denote a state rather than an activity in the event structure. Other reflexive verbs also have an event structure of state. Teng (1975) indicates that only state verbs may be modified by *hen* 'very'. For example,

(39) *youke hen zi-ai*

tourist very REFL-love

'The tourists behave themselves well.'

In sentence (39), the event must denote the state that the tourists have good manner. In other words, *zi-ai* 'to respect oneself' cannot be an event of activity. We will consider more examples such as *zi-bei* 自卑 'to feel oneself inferior', *zi-bi* 自闭 'to be autistic', *zi-da* 自大 'to boast oneself', *zi-jiu* 自咎 'to blame oneself', and so on.

(40) *ta hen zi-bei*

he very feel oneself inferior

'He feels himself inferior.'

(41) *ta hen zi-da*

he very REFL-boast

'He boasts himself.'

⁵ In Sinica Corpus, we find no reflexive verbs co-occur with the progressive marker *zai*.

⁶ The only exception found so far is the verb *zi-wei* 自慰 'to masturbate'. However, we believe that this phenomenon has an explanation. This reflexive verb is an euphemism of the other verb *shouyin* 'to masturbate'. The verb *shouyin* 'to masturbate' can take the marker *zai*. The usage of *shouyin* 'to masturbate' might influence or diffuse to that of its euphemism *zi-wei* 'to masturbate'.

- (42) ta hen zi¹-bi
 he very REFL-close
 'He is very autistic.'

In (40), (41), and (42), all the events are state rather than activity. Thus, the reflexive predicate denotes an event structure of state. According to Grimshaw's (1990), the event structure of unaccusative verbs is a state. The reflexive verbs and the unaccusative verbs have the same event structure. In brief, the event structure provides additional evidence which supports the fact that reflexive verbs are unaccusative verbs. The subject of Mandarin intransitive reflexive verbs is an unaccusative participant and thus should be intrinsically marked [-r].

3.2.2.3 AGENT PROPERTIES ARE DILUTED AFTER THE REFLEXIVIZATION

The following evidence also shows that the intrinsically classification of the composite role should be [-r] rather than [-o]. After the reflexive morphological operation, the agent properties are reduced. To compare with the verb *sha* 'to kill', the reflexive verb *zi-sha* 'to commit suicide' has less agent properties. Suppose the adverb *yi-bian . . . yi-bian* 'at the same time, simultaneously' can be used to test the agentivity of the subject.⁷

- (43) Zhangsan yi-bian sha ren, yi-ban kuang-xiao
 Zhangsan one-side kill people one-side crazy-laugh
 'Zhangsan killed people and laughed crazily at the same time.'

- (44) *Zhangsan yi-bian zi-sha, yi-ban kuang-xiao
 Zhangsan one-side REFL-kill one-side crazy-laugh
 '*Zhangsan committed suicide and laughed crazily at the same time.'

(43) and (44) show that the subject of the verb *sha* 'to kill' is high in agentivity, so the verb *sha* 'to kill' can occur in the construction of *yi-bian . . . yi-bian* 'at the same time, simultaneously'. After the reflexivization, subject of the reflexive verb *zi-sha* 'to commit suicide' loses some agent properties, so the reflexive verb *zi-sha* 'to commit suicide' cannot occur in the *yi-bian . . . yi-bian* construction. As indicated previously, the [-r] participant is more like a patient role and the [-o] is more like an agent role. This is incorporated in the LMT itself (Bresnan and Zaenen 1990). The relatively low agentivity of the subject of reflexive verbs is one of the reasons that the morphological operation of reflexivization assigns the [-r] feature to the composite role.

4 EXPLAINING THE VARIATION OF SYNTACTIC BEHAVIOR

We have indicated that not all of the intransitive reflexive verb can occur in the presentative construction and not all of the intransitive reflexive verbs can co-occur with the construction of post-posing of numeral phrase. In fact, not all of the intransitive reflexive verbs behave exactly the same. Based on this observation, we raised a question: should we distinguish the reflexive verb *zi-sha* 'to commit suicide' from the other reflexive verbs and claim that only the reflexive verb *zi-sha* 'to commit suicide' is an unaccusative verb? The answer is that the various syntactic behavior of different reflexive verbs results from the difference between surface and deep unaccusativity. As defined in Bresnan and Zaenen (1990), in languages with surface unaccusativity, the argument of an intransitive verb can appear overtly in object position(s) in surface constitute structure; in language with deep unaccusativity only, that argument appears only in surface subject position. In the following, we first summarize the variation in table 2, and then explain why we claim so. Table 2 shows the variation of the syntactic behavior of reflexive verbs presented in 2.3.

Table 2: The variation of the syntactic behavior of reflexive verbs.

Syntactic Context	<i>zi-sha</i> 'to commit suicide'	<i>zi-ze</i> 'to blame oneself'	<i>zi-lu</i> 'to behave oneself'	<i>zi-fen</i> 'to burn oneself'	<i>zi-wu</i> 'to hurt oneself'	<i>zi-ai</i> 'to respect oneself'
presentative construction	+	-	-	+	-	-
postposing of numeral phrases	+	-	-	+	-	-
imperative construction	+	+	+	+	+	+
in the COMP of <i>qitu</i> 'to try'	+	-	-	+	-	-
co-occurring with purpose adverb	+	+	-	+	-	-
taking durative marker -zhe	-	-	-	-	-	-

Table 2 demonstrates that each reflexive verb has different syntactic behavior. Occurring in presentative construction is the syntactic evidence of surface unaccusativity, because the sole grammatical function, the subject, appears in the canonical object or post-verbal position. According to table 2, we observe that the

⁷ In the Sinica Corpus which contains 4 million words, we find 256 sentences with *yi-bian . . . yi-ban*, among which only two items occur with the stative verbs, others are all occur with active verbs.

intransitive reflexive verbs are rarely surface unaccusative verbs. However, all of them are indeed unaccusative verbs, as we have proved. In other words, we suggest that although all the intransitive reflexive verbs are unaccusative verbs, some of them display the pattern of deep unaccusativity and others that of surface unaccusativity. Specifically, the reflexive verbs *zi-sha* 'to commit suicide' and *zi-fen* 'to burn oneself' can occur in the presentative construction, that is, their subjects can appear in the post-verbal position, the canonical object position, so they are surface unaccusative verbs; while the subjects of other reflexive verbs cannot be post-verbal, they are deep unaccusative verbs.

5. THE COMPARISON

The present analysis can properly account for the observed linguistic phenomena of reflexive verbs such as the thematic properties of the subject and the various syntactic behavior of each reflexive verb. Both Kao (1993) and Tang (1992) can only account for the partial truth. Kao's suppression of agent analysis fails to account for why the subject possesses some agent properties. In Tang's analysis, the reflexive morpheme *zi-* is moved from the object position and then incorporated into the matrix verb. As a result, the surface subject is also the underlying subject and the reflexive verbs are unergative verbs. This movement approach fails to account for why the reflexive verbs cannot take the durative marker *-zhe* and why the subject is low in agentivity. Furthermore, his analysis cannot explain why the intransitive reflexive verbs can occur in the context such as presentative constructions where the unaccusative verbs can occur.

Although our conclusion is the same as Kao's, the implications of the two analyses are strikingly different. Kao (1993) does not make a distinction between surface and deep unaccusativity. She asserts that all the reflexive verbs are unaccusative verbs because *zi-sha* 'to commit suicide' can occur in the presentative construction. However, she leaves those reflexive verbs which cannot occur in the same context unexplained. In other words, she overlooks the fact that not all of the intransitive reflexive verbs behave exactly the same. The present analysis claims that the intransitive reflexive verbs are unaccusative verbs. They are either deep unaccusative verbs or surface unaccusative verbs. The syntactic behaviors of two kinds of unaccusative verbs are different. Since some of the intransitive reflexive verbs, such as *zi-sha* 'to commit suicide' and *zi-fen* 'to burn oneself' are surface unaccusative verbs and others such as *zi-ai* 'to respect oneself' are deep unaccusative verbs, the syntactic behavior of the intransitive reflexive verbs are also different. In brief, we properly account for the observed syntactic variation among the class of intransitive reflexive verbs.

6 THE IMPLICATION

We believe that the linguistic phenomenon of Mandarin reflexive verbs is one of the best examples to support Dowty's (1991: 608) view of thematic proto-roles. He claims that "predicates that are 'high' in agentivity and 'low' in patient properties are invariably unergative, while those low in agent properties and high in patient properties are invariably unaccusative; only those high in both kinds of entailments, or low in both, should be *unstable* [italics mine]." Speakers would recognize that the agent and the patient are the same one in the case of Mandarin reflexive verbs. We assert that Mandarin reflexive verbs are the best manifestation of this *unstable* case in the sense of Dowty (1991). The thematic properties of the subject of intransitive reflexive verbs are unstable, because the sole role of these verbs has two kinds of thematic properties. The only participant of the reflexive predicates is both the agent and patient. In other words, the one who performs the action and the one who receives the action are the same one. Because of the different proportion of agent properties and patient properties in the composite role, some of them can appear with the purpose adverb, and some of them can appear in the imperative construction, and some of them can occur in the presentative construction. Thus, some of them are surface unaccusative verbs and others deep unaccusative verbs. The fact that reflexive verbs have two kinds of thematic role properties supports Dowty's claim of the unstable case.

7. SUMMARY

In this paper, first, we discuss the semantic composition and the internal structure of intransitive reflexive verbs in Mandarin, and then describe the linguistic phenomena of these verbs. It is observed that the sole argument of reflexive verbs has not only patient properties but also some agent properties. Second, we briefly discuss the analysis of unaccusativity in the framework of LFG. In this study, we propose a lexical binding morpholexical operation that assigns [-r] to the composite role of Mandarin intransitive reflexive verbs. In LFG, an unaccusative participant is marked [-r]. The claim that the intransitive reflexive verbs are unaccusative verbs is proved by not only syntactic evidence but also semantic explanation and event structure. In addition, the present analysis can properly account for the linguistic facts of Mandarin reflexive verbs that the previous analyses cannot. Finally, the present analysis offers a new data to support the idea that the distinction between thematic roles is not discrete.

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