

Predicate restriction, discontinuity property and the meaning of the perfective marker *Guo* in Mandarin Chinese

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Abstract This paper argues that the most recent analyses of *guo* as proposed in Pan and Lee [(2004). The role of pragmatics in interpreting the Chinese perfective markers -*Guo* and -*Le*. *Journal of Pragmatics*, 36, 441–446] and Lin [(2006). Time in a language without tense: The case of Chinese. *Journal of Semantics*, 23, 1–53] still fail to explain the predicate restriction and the discontinuity property of *guo* in a satisfying manner. An alternative analysis, which is a more fine-grained version of Lin's (2006) proposal, is suggested. It is proposed that a sentence with the form *guo*(*P*) is true in a world *w* if and only if the run time of the internal stage of an event described by *P* is wholly before the speech time, and if the event *e* has a target state, then there is an inertia world w_{inr} stretching from *w* such that another event *e'* described also by *P* but distinct from *e* true in it at an interval containing the speech time.

Keywords Experiential Marker · Discontinuity Effect · Meaning of *Guo*

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1 Introduction

The aspectual marker *guo* is one of the two perfective markers in Chinese. Like the other perfective marker *le*, *guo* indicates an external viewpoint of the situation described and hence implies culmination of an event. For instance, in both (1a) and (1b), the event of Lisi's breaking his leg must happen at a time before the speech time.

- (1) a. Lisi shuai-duan-guo tui.
 Lisi fall-break-GUO leg
 'Lisi has broken his leg before.'
 b. Lisi shuai-duan-le tui.
 Lisi fall-break-LE leg
 'Lisi has broken his leg.'

Although both (1a) and (1b) require that the falling event is prior to the speech time, they have a different implication with regard to the result state of Lisi's leg being broken. While (1a) implies that Lisi's leg is healed and no longer broken at the time the speech is delivered, (1b) implies that Lisi's leg is still broken at the speech time. Such a contrast between *le* and *guo* was already discussed in Iljic (1990). Iljic (1990, p. 308) refers to such a feature of *guo* as "discontinuity between the event and the point of reference." Li and Thompson (1981, pp. 228–229) and Tiee (1986, p. 98) interpret this as the subject's having experienced the event at least once and the event's being over with respect to a reference time. Zhang (1995, p. 129) and Dai (1997, p. 63) and many others also have a very similar view about *guo*'s experientiality and discontinuity.

Another property of *guo* that is also well recognized in the literature is the repeatability property (re-occurrence), which requires that *guo* only occurs with repeatable situations (e.g., Li and Thompson 1981; Iljic 1990; Zhang 1995; Smith 1997; Dai 1997). This property explains why once-only predicates such as *si* 'die' may not occur with *guo*, as illustrated in (2).

- (2) *Ta si-guo.¹
 he die-GUO
 'He has died before.'

Yeh (1996) has proposed to derive the repeatability condition from the assumption that *guo* is a temporal quantifier like other adverbs of quantification such as *sometimes*, *always*, etc. According to de Swart (1991), quantificational adverbs are subject to a Plurality Condition on Quantification. Therefore, if *guo* is a temporal quantifier, the constraint on recurrence follows. Similarly, Smith (1997, p. 268) has said that *guo* has the repeatability property because it is "a temporal quantifier ranging over a set of situations" and "presents a given situation as a member of a set." However, as already pointed out by Chen (1979), Iljic (1990), Xiao and McEnery (2004) and Pan and Lee (2004), repeatability of a situation or requirement of recurrence is too

¹ One may sometimes hear utterances such as (i), where *si* 'die' and *guo* occur with each other.

(i) Ni si-guo yi ci le
 Youu die-guo one time Par
 'You have died once before.'

However, this use of *si* 'die' does not really refer to the physical death of a person but is a metaphoric expression indicating the undergoing of a death-like process which can be repeated.

strong a condition on the use of *guo*. For instance, although both the predicate *lao* ‘old’ and the predicate *nianqing* ‘young’ do not possess the repeatability property, the latter may occur with *guo*, whereas the former may not, as the contrast between (3a) and (3b) shows.

- (3) a. Ni ye niangqing-guo.
 you also young-GUO
 ‘You also have been young before.’
 b. *Ni ye lao-guo.
 you also old-GUO
 ‘You have also been old before.’

Examples such as (1)–(3) raise some interesting questions. For instance, is the discontinuity property semantically encoded in the meaning of *guo* or is it just a pragmatic inference? If the repeatability condition is not the right way to characterize the use of *guo*, what is the right property *P* that decides what predicates may occur with *guo* and what predicates may not? Is there any connection between the discontinuity property and the right property *P*? That is, is it possible to derive one property from the other one? Or are these two properties independent of each other and both have an independent theoretical status? Answers to the above questions have already been explored by some people other than Yeh (1996). For instance, Ilic (1990, p. 312) suggests that “*Guo* invariably refers to a non-empty class of occurrences of a predicative relation.” Pan and Lee (2004), on the other hand, say that the right property to characterize *guo* is the property of “change out of state.” More recently Lin (2006) argues that the property of discontinuity should be derived from the repeatability condition and has no independent theoretical status. Despite the many attempts to account for the behavior of *guo*, it seems that not all relevant examples containing *guo* have been adequately explained. In view of this, this article aims to provide an alternative analysis of *guo*, hoping that it may overcome the problems that the previous analyses have encountered. To this end, two of the most recent analyses of *guo*, i.e., Pan and Lee (2004) and Lin (2006), will be reviewed in detail and an alternative analysis of *guo* will be made that maintains the advantages of both articles but overcomes their shortcomings.²

This article is organized as follows. Sections 2 and 3 summarize the main points of Pan and Lee’s (2004) and Lin’s (2006) articles. Section 4 is an evaluation of these two works, discussing their strengths and weaknesses. Section 5 offers an alternative analysis of *guo* in terms of a pure semantic approach along the lines of Lin’s (2006) idea. Section 6 discusses some concerns that a reviewer has raised for the suggested analysis of *guo*. Section 7 concludes this article.

² Though in this article I only pay specific attention to Pan and Lee’s (2004) and Lin’s (2006) analyses of *guo*, (some of) my comments on them to be presented later may also apply to other works.

2 Pan and Lee's (2004) view of *guo*

2.1 Their criticisms of previous analyses

Pan and Lee have pointed out three limitations of a purely semantic account of *guo* of previous analyses. According to them, the first limitation is the association of the discontinuity property with the speech time. As noted, the traditional assumption of *guo* requires that in a sentence such as *Ta qu-guo meiguo* 'He has been to America', the result state of his being in the US must no longer obtain at the speech time. They argue that there are two problems with this assumption. First, they point out that, if the discontinuity property of *guo* is associated with the speech time, then sentences like (4) should be contradictory sentence, because it is impossible to claim that a person is and is not in the US at the same time.

- (4) Ta sannian qian qu-guo meiguo, zuotian you qu-le
 he three-year ago go-GUO US yesterday again go-LE
 'He had been to the US three years ago (before). Yesterday, he went there again.'

Second, they observe that in sentences like (5a) and (5b), the relevant result states, i.e., the leg of the table being broken in (5a) and the disappearance of the book in (5b), clearly hold at or after the speech time. Therefore, according to them, the discontinuity property of *guo* must not be semantically encoded.

- (5) a. Shanggeyue ta non-huai-guo yitiaozhuozitui,
 last-CL-month he make-break-GUO one-CL-table-leg
 xianzai hai mei xiuhao.
 now yet not repair-good
 'Last month he broke one table leg. It is not repaired yet.'
- b. Shanggeyue wo diu-guo yiben shu
 last-CL-month I lose-GUO one-CL book
 xianzai hai mei zhao-dao.
 now yet not find
 'I lost a book last month, and still have not found it.'

The second limitation of the previous analyses that Pan and Lee discuss is related to the repeatability or reversibility property of *guo*. As mentioned, it has been proposed that a sentence with which *guo* is combined must describe a situation that is repeatable or reversible. This is why once-only predicates like *si* 'die' or *lao* 'old' are incompatible with *guo*. However, repeatability or reversibility cannot be the right property to explain the behavior of *guo*, because there are predicates such as *nianqing* 'young' which do not denote a repeatable or reversible property, yet *guo* is just fine with such predicates.

The third limitation that Pan and Lee discuss has to do with Huang and Davis' (1989) claim that while the perfective marker *le* indicates completion of a situation, *guo* suggests partial occurrence or completion. They argue that this contrast is wrong. Both *le* and *guo* allow partial occurrence or total completion of an event. They thus conclude that the total and partial realization contrast of *le* and *guo* is not purely semantic. Since the issue of partiality versus totality has more to do with situation types than the semantics of *guo*, this issue will be ignored in this article. The

reader is referred to Lin (2007) for an account for why the perfective viewpoint of an accomplishment in Chinese may allow an event to be partially realized or completely culminated.

2.2 Pan and Lee's solution

In order to see what kind of property really plays a role in the interpretation of *guo*, Pan and Lee have distinguished the properties of reversibility, repeatability and change out of state as follows, claiming that only the last one is the right characterization of *guo*.³

- (6) a. Reversibility: $[S_1 \rightarrow S_2 (\neq S_1) \rightarrow S_1]$, where S_2 stands for the present state, and S_1 for the pre-existing or the reversed state.
- b. Repeatability: $[Sit_1 \rightarrow Sit_1]$, where Sit stands for "situation."
- c. Change out of State: $[S_1 \rightarrow \text{not } S_1]$, where S stands for "state."

They define the term "state" as referring to either the state denoted by a stative predicate or the result state arising from the completion of a telic situation. Consider the contrast between (3a) and (3b) again. According to Pan and Lee, while one can turn from being young to not being young, it is not possible for one to turn from being old to not being old. Namely, while it is possible to have a change out of the state of being young, it is not possible to have a change out of the state of being old. Similarly, *si* 'die' is incompatible with *guo*, because once an individual is dead, s/he will not be alive again.

However, for Pan and Lee, the property of change out of state is not a semantic property of *guo* but only a pragmatic implicature derived from the context of use. According to them, this must be the case because as we saw from (5a) and (5b), the change out of state property can be cancelled. They therefore conclude that a purely semantic approach to the interpretation of *guo* is not possible and the change out of state property is essentially pragmatic in nature.

3 Lin's (2006) view of *guo*

The most recent discussion of the perfective (experiential) *guo* is offered by my own work in Lin (2006). In this paper, it is suggested that the meaning of *guo* consists of two parts. One part has to do with the temporal semantics of *guo* and the other part involves a presupposition concerning the discontinuity effect. It is assumed that an eventuality canonically breaks down into Inner Stage and Result State. For a dynamic event, the Inner Stage of an eventuality e is the event's development. For a state, the Inner Stage is the state itself. More formally, the Inner Stage of an eventuality, abbreviated as *Istage*, is defined as follows:

- (7) *Istage*(t, P) is defined if $P(t) = 1$, in which case
 - i. if P is telic, *Istage*(t, P) = t minus the last point of t ;
 - ii. if P is atelic, *Istage*(t, P) = t .

³ In addition to Pan and Lee (2004), Xiao and McEnery (2004) also suggest that *guo* implies a meaning of a change out of state, though they do not provide enough details.

It is then proposed that *guo* has the following temporal semantics.

(8) The temporal semantics of *guo*

$$\|\mathbf{guo}\| = \lambda P_{<i,t>} \lambda t_{\text{Top}} \lambda t_0 \exists t [P(t) \wedge \text{IStage}(t, P) \subseteq t_{\text{Top}} \wedge t_{\text{Top}} < t_0]$$

In English, (8) claims that *guo* requires that the Inner Stage of an eventuality *P* is included within a topic time, which in turn precedes a reference or evaluation time *t*₀. On this analysis, *guo* simultaneously expresses the notion of perfectivity, as indicated by the condition ‘IStage(*t*, *P*) ⊆ *t*_{Top}’ as well as the notion of anteriority as indicated by the condition ‘*t*_{Top} < *t*₀’. These conditions predict that the Inner Stage of an eventuality must be past relative to a reference or evaluation time *t*₀.

As for the discontinuity property of *guo*, Lin (2006) first points out that this property actually displays a definite/indefinite asymmetry as the following contrast shows.

- (9) a. Lisi nong-huai-guo zhe-bu shouti-diannao.
 Lisi make-broken-Asp this-Cl laptop
 ‘Lisi broke this laptop before.’
 b. Lisi nong-huai-guo yi-bu shouti-diannao.
 Lisi make-broken-Asp one-Cl laptop
 ‘Lisi broke a laptop before.’

While (9a) implies that the laptop is already fixed at the speech time, (9b) does not have such an implication. (9b) is compatible with a situation where the broken laptop is fixed at the speech time or one where it is not fixed yet at the speech time. In fact, it is even possible that the laptop in (9b) is not fixable at all. The definite/indefinite asymmetry of the discontinuity property has also been discussed by Liao (2003) and Wu (2005).⁴

Due to this definite/indefinite asymmetry, Lin (2006) proposes that the discontinuity property be detached from the temporal meaning of *guo* and be derived from the well-known repeatability property of *guo*. The analysis of *guo* in that article is based on Wu’s (2005) idea but differs from the latter in some details. According to that analysis, the object NP in (9a) is a definite noun phrase and the referent denoted by it is not only the theme of the first laptop-breaking event but also the theme of any other potentially repeated laptop-breaking event. However, in order for the same laptop to be broken in a repeated event, it should be first fixed before it can be broken again. Therefore, it is concluded that the discontinuity property of *guo* is derivable from the repeatability property and has no independent theoretical status.

As for (9b), the object NP *yi-bu shouti diannao* ‘a laptop’ is an indefinite rather than a definite. Therefore, in order for a similar event to reoccur, any laptop can serve the purpose. Since the laptop involved in the repeated event need not be the same laptop as the one in the original event, there is no requirement that the original laptop be fixed before another one is broken. It might be fixed but this is not a requirement. There is simply no logical connection between the two laptops. Therefore, an indefinite object NP does not necessarily give rise to the discontinuity effect.

⁴ Liao’s (2003) observation of the definite/indefinite asymmetry is credited to my class lecture at National Chiao Tung University.

4 Evaluating Pan and Lee (2004) and Lin (2006)

4.1 Evaluating Lin's (2006) analysis

I believe that the temporal semantics of *guo* as proposed in (8) is on the right track. So no additional comment will be made on it. However, my explanation of the discontinuity property of *guo* in Lin (2006) is problematic, because that account is based upon a dubious repeatability presupposition. As Pan and Lee (2004) and others have argued, not all predicates that do not have the repeatability property are incompatible with *guo*. The predicate *nianqing* 'young' does not have this property but can occur with *guo*. Similarly, in the following sentence, the proposition *kong-long cunzai* 'Dinosaurs exist' does not have the repeatability property, but the sentence is perfectly acceptable.

- (10) Konglong cuizai-guo.
 Dinosaur exist-GUO
 'Dinosaurs existed before.'

Despite this apparent weakness, the account for the definite/indefinite asymmetry of the discontinuity property given in Lin (2006) does have some intuitive basis and can be improved if more content or restrictions can be given to the notion of repeatability and the problem of predicate restriction can be better accounted for.

4.2 Evaluating Pan and Lee's (2004) analysis

Pan and Lee have rightly pointed out many weaknesses of previous analyses of *guo* in terms of the repeatability or reversibility property. However, even the "change out of state" property is still not the right characterization of the interpretation of *guo*; nor is it correct to say that the discontinuity property is not derivable from a pure semantic approach.

To begin with, let us consider the question of whether the discontinuity property is really a pragmatic inference as Pan and Lee have argued. Notice that the examples motivating them to conclude that sentences containing *guo* do not always require the discontinuity property are those involving an indefinite object NP. However, as Liao (2003), Wu (2005) and Lin (2006) have pointed out, when the theme object of a sentence involving a change of state is definite, the discontinuity property always holds. Indeed, I cannot think of a context in which the discontinuity property of a sentence like (9a) with a definite object NP can be cancelled in the same way as the sentences in (5a) and (5b) do. In fact, if the indefinite NPs in Pan and Lee's examples (5a) and (5b) are substituted for the definite ones, the discourse will become incoherent. If the discontinuity property is really pragmatic in nature as they have proposed, presumably substitution of an indefinite for a definite should not make a difference with respect to the implicature possibility. This not being the case, a pragmatic account of the discontinuity effect cannot be said to be successful. It is still possible that something semantic is responsible for the definite/indefinite asymmetry with respect to the discontinuity property.

It is worth noting that Pan and Lee actually suggest that the discontinuity property is not related to the definiteness of a NP. They point out that in contrast to (5a)

the following sentence is unacceptable with or without the numeral-classifier, implying that definiteness does not play a role in the discontinuity property.

- (11) %Shanggeyue ta shuaide-guo (yitia)tui, xianzai
 last-CL-month he break-GUO one-CL-leg now
 hai mei hao.
 still not heal
 'He broke his leg last month, and it still hasn't been healed.'

According to them, the contrast between (11) and (5a) is due to an [\pm animate] feature of the object NP. The object NP in (5a) is [-animate], whereas the object NP in (11) is [+animate].

The problem with Pan and Lee's account for the contrast between (5a) and (11) is that there is no explanation of why and how the property of being animate is related to the discontinuity property.

In fact, the contrast between (5a) and (11) is arguably an instantiation of the definite/indefinite asymmetry. Although the noun phrase (yitia)tui '(one) leg' in (11) is not a definite in terms of syntactic form, it is a definite or more accurately, specific NP, in terms of semantic interpretation. Note that the leg in (11) must be anaphoric to the subject NP rather than denoting any unknown individual's leg. In this sense, the object NP in (11) is actually definite or at least specific. This is in contrast to (5a) in which it is impossible for the hearer to tell which table's leg is involved. I think this is the reason why (11) patterns with sentence (9a) with respect to the discontinuity property.

Next, let us consider Pan and Lee's proposed "change out of state" property. Does this property rightly characterize *guo*? First, consider the following contrast.⁵

- (12) a. Ta da-si-guo yi-ge ren.
 he hit-dead-Guo one-CL person
 'He killed a person by hitting him (before).'
 b. *Ta da-si-guo na-ge ren.
 he hit-dead-Guo that-CL person
 'He killed that person by hitting him (before).'

In (12b), the object NP is a definite NP and the sentence is unacceptable. On Pan and Lee's analysis, (12b) is correctly predicted to be ill-formed, because once a person is dead, it is impossible for him to become alive again. But if this account were correct, the same prediction would hold of (12a) too, where the object NP is an indefinite. Since (12a) is well-formed, the property of "change out of state" is problematic. (12a) is also a very challenging case for the discontinuity property, because it is simply impossible for the result state to cease to hold.

⁵ The following contrast is similar to the distinction between (12a) and (12b).

- (i) a. Zhe-jian fangzi si-guo yi-ge ren.
 this-CL house die-Guo one-CL person
 'A person died in this house before.'
 b. *Zhe-jian fangzi si-guo na-ge ren.
 This-CL house die-Guo that-CL person
 'That person died in this house before.'

Next, let us consider sentence (13) below.

- (13) Ta chi-guo zhe-dao cai (le).
 he eat-Guo this-CL dish Par
 'He has eaten this dish.'

Once a person has eaten a dish, it is impossible to say that he has not eaten that dish. That is, it is impossible to claim a change of state from 'having eaten that dish' to 'not having eaten that dish'. Thus, according to Pan and Lee's "change out of state" property, (13) should be ill-formed, contrary to the fact. Perhaps Pan and Lee may argue that the state denoted by (13) is not a state in their sense. If this is the case, then a more explicit theory of states is needed and it needs to be explained why different kinds of states behave differently.

Still another problem with Pan and Lee's property of "change out of state" has to do with negation. As noted, predicates like *si* 'dead' are incompatible with *guo*. Interestingly, however, when the negation marker *mei* is added, it becomes possible for such predicates to co-occur with *guo*, as is shown by (14).

- (14) Ni mei si-guo, zenme hui zhidao si
 you not die-GUO how will know death
 shi shenme yangzi?
 be what look-like
 'You have not been dead before. How do you know how it is like
 to be dead?'

For Pan and Lee to explain this example, they have to say that the scope of *guo* is the whole negative proposition, because it is possible for one to change from not being dead to being dead but not possible for one to change from being dead to not being dead. However, this analysis is not correct. The negation marker *mei* 'not' in (14) must scope over *guo*, because (14) should be paraphrased as 'It is not the case that you have been dead' rather than 'It has been the case that you are not dead'. Thus, for Pan and Lee, this sentence should be as ill-formed as when the negation marker is not there, because *guo* has to combine with the predicate before it hits the negation.

4.3 Summary

From the above discussion, it is clear that both Pan and Lee's (2004) and Lin's (2006) analyses of *guo* have some problems that need to be fixed. The advantage of the latter analysis is that it is able to account successfully for the definite/indefinite asymmetry with respect to the discontinuity property. The weakness, however, is that the assumption of the repeatability condition behind this account is somehow dubious. In contrast, the former analysis of *guo* seems to better explain what kind of predicate is compatible with *guo*. But that analysis fails to explain the definite/indefinite asymmetry with regard to the discontinuity property, which does not seem to be a mere matter of pragmatic inferences as claimed. In addition, there are some examples in which the use of *guo* does not seem to follow straightforwardly from the property of "change out of state."

5 An alternative analysis

In the last section, we saw that both Pan and Lee's (2004) and Lin's (2006) analyses of *guo* have advantages and disadvantages. In this section, an alternative analysis of *guo* will be suggested that may cover all the relevant examples. It will be argued that once a proper formal characterization of the semantics of *guo* is spelled out, the property of "change out of state" and the definite/indefinite asymmetry with regard to the discontinuity property will follow automatically.

The analysis to be proposed is essentially a revision of Lin's (2006) proposal. Before spelling out the details, the assumptions made need to be clearly stated. It is assumed that in addition to regular individual arguments, verbs or adjectives have an eventuality argument and the run time of an event is obtained through the trace function τ . Thus, a proposition P is represented as follows, where e is an eventuality variable and x_1, x_2, x_3 , etc. are individual variables. The run time of e is $\tau(e)$.

$$(15) P(e, x_1, \dots, x_n)$$

Moreover, it is assumed that telic sentences denote complex eventualities consisting of a process eventuality and a result state eventuality or target state eventuality to be explained below. Such complex eventualities can be represented as in (16), where the event e is the summation of the process e' and the result state s .

$$(16) e = e' \oplus s$$

On this assumption, the time of a complex event e is the summation of the time of the process e' and the time of the state s .

Another notion that will be employed is that the same proposition P may be realized by distinct eventualities. The notation $e_1 \neq e_2$ will be used to mean that e_1 is distinct from e_2 when e_1 and e_2 are two different event realizations of the same proposition. Two event instantiations of the same proposition are distinct from each other if the following conditions hold:

- (17) For two eventuality descriptions, $P(e, x_1, \dots, x_n)$ and $P(e', y_1, \dots, y_n)$, e is distinct from e' , if
- i. $\tau(e) \cap \tau(e') = \emptyset$, or
 - ii. $\exists x_n \exists y_n [x_n \neq y_n]$

First, consider condition (i). Suppose that Zhangsan walked at a time t in an event e and he also walked at a time t' in an event e' . If there is no overlap between t and t' , the two walking events e and e' must be two different temporal-spatial instantiations of the same proposition described by *Zhangsan walked*. This is proved by the fact that we can use the sentence *Zhangsan walked twice* to describe the situation. In contrast, if the time t of Zhangsan's walking in event e and the time t' of Zhangsan's walking in event e' overlap, t and t' only represent the different temporal slices or continuous succession of the same event. Thus, for two eventuality e and e' described by exactly the same predicate and having exactly the same participants, e and e' are distinct from each other if the time of e and the time of e' do not overlap.

The second condition in (17) is also quite easy to understand. When two events are described by the same predicate but have different participants, they are different events. For instance, for a proposition such as *John broke a laptop*, which is represented as $\exists e \exists x [\text{laptop}(x) \ \& \ \text{broke}(e, \text{John}, x)]$, every time when the individual variable x is assigned a different value by the variable assignment, a different event is obtained.

In addition to the above assumptions, Dowty's (1977) notion of *inertia world* will be adopted, which with respect to a given interval and world $\langle i, w \rangle$, picks out the alternative possible worlds in which what is going on in w during i continues in a normal way as one would expect it to. Inertia worlds are used by Dowty to explain the semantics of the progressive and the lack of existence entailment of the event modified by the progressive operator. According to him, a sentence such as *John was building a house*, which does not entail that John built a house, is true if and only if a house-building event was going on that if it had proceeded normally, i.e., nothing unexpected happened, would lead to a complete house-building by John. In what follows, the symbol w_{inr} is used to stand for an inertia world.

Finally, another notion that is adopted is Parson's (1990) *target states*. He has differentiated two kinds of states of events—target states and resultant states. Cited below is a quote from Parson to illustrate the distinction between target states and resultant states:

It is important not to identify the Resultant-state of an event with its “target” state. If I throw a ball onto the roof, the target state of this event is the ball's being on the roof, a state that may or may not last for a long time. What I am calling the Resultant-state is different; it is the state of my having thrown the ball onto the roof, and it is a state that cannot cease holding at some later time. (Parsons 1990, p. 235)

Further illustrating Parson's notion of target states, Kratzer (1994) has provided many examples to show that different predicates may impose different requirements on the target states of the events they classify.

- (18) The sacks are unloaded. The state comes into existence as soon as the sacks have been unloaded and lasts for a little while.
- (19) The theorem is proven. The state comes into existence as soon as the theorem has been proven and lasts for ever.
- (20) The door is bolted. The state comes into existence as soon as the door has been bolted and lasts until it is unbolted again.
- (21) The lobster is consumed. The state comes into existence as soon as the lobster is gone, and lasts for God knows how long.

Armed with the above assumptions, let us return to the semantics of *guo*. To begin with, a comparison between *guo* and the English tense operator might help the reader appreciate the temporal meaning of *guo*. Normally, an English sentence such as *John was swimming one hour ago* implies that John is not swimming now, but this

implicature can be cancelled if the speaker continues the utterance by saying *and is still swimming now* as in (22), where the swimming activity at the utterance time is a continuous activity of the swimming event that was holding one hour ago.

(22) John was swimming one hour ago and is still swimming now.

In other words, the implicature that a given eventuality does not hold true at the utterance time is only a contextual implicature of the past tense operator in English rather than part of its truth conditions.⁶

In contrast to the English past tense operator, the experiential marker *guo* in Chinese does not allow the same kind of implicature cancellation. Compare the following sentences.

- (23) a. *Yuehan yi-ge xiaoshi qian jiu you-guo
 John one-Cl hour ago JIU swim-GUO
 yong, xianzai hai zai you.
 swim now still Prog swim
 'John swam one hour ago and now is still swimming.'
- b. Yuehan yi-ge xiaoshi qian jiu you-guo
 John one-Cl hour ago JIU swim-GUO
 youg, xianzai you zai you le.
 swim now again Prog swim Par
 'John swam one hour ago and is now swimming again.'
- c. Yuehan yi-ge xiaoshi qian jiu youyong
 John one-Cl hour ago JIU swim
 le, xianzai hai zai you.
 Par now still Prog swim
 'John (began to) swim one hour ago and now is still swimming.'

The contrast between (23a) and (23b) shows that *guo* is incompatible with *hai* 'still' but is compatible with *you* 'again'; (23c) shows that when *guo* is replaced by the perfective or perfect marker *le*, the use of *hai* in the second sentence becomes acceptable. It is important to note that though (23b) is acceptable, the swimming event at the utterance time is not the continuous succession of the swimming event that was true one hour ago but is a distinct swimming event. This is in contrast with (23a) in which the use of *hai* 'still' implies that the swimming activity at the utterance time is a continuous activity of the swimming event that was holding one hour ago.

The impossibility of the above mentioned implicature cancellation is captured by Lin's (2006) proposal that the run time of the internal stage of the event modified by *guo* is before the speech (or evaluation) time. In accord with Lin's original definition of Istage (internal stage), the semantics of *guo* can be rewritten as follows:

(24) $[[guo]] = \lambda P \exists e [P(e) \ \& \ \tau(Istage(e, P)) < s^*]$

Although Lin (2006) does not discuss this, the semantics in (24) actually has already partly explained the co-occurrence restriction between *guo* and some (once-only) predicates. Consider the following sentences:

⁶ For this point, see also Kamp and Reyle (1993) for more discussion.

- (25) a. Ni ye ningqing-guo.
 You also young-Asp
 'You have also been young before.'
- b. *Ni ye lao-guo.
 you also old-Asp
 '*You have also been old before.'
- c. Konglong cunzai-guo.
 Dinosaur exist-Asp
 'Dinosaurs existed before.'
- d. *Zhangsan si-guo.
 Zhangsan dead-Asp
 '*Zhangsan have been dead before.'

All the predicates in (25) are atelic, so the run time of the internal stage of these predicates is equivalent to their situation time, i.e., the time the whole eventuality takes. Now the semantics of *guo* in (24) requires that the run time of the internal stage of an eventuality be wholly before the speech time. This condition can be satisfied by the predicate *nianqing* 'young' and *cunzai* 'exist', because a person can be young before the speech time but not young at the speech time, and something can exist before the speech time but no longer exist at the speech time. In contrast, once a person is old or dead at a time before the speech time, he must also be old or dead after any time following that time, including the speech time. This makes the condition on *guo* not satisfiable for predicates such as *lao* 'old' and *si* 'dead'.

The condition in (24) also predicts that an atelic activity such as (26) should be OK with *guo*.

- (26) Ta you-guo yong.
 He swim-Asp swim
 'He has swum before.'

Nothing is wrong with (26), because it is certainly possible for someone to begin to swim and stop doing it before the speech time.

Another advantage of (24) is that it provides a very simple account for why a negation marker may license the co-occurrence of *guo* with a predicate such as *si* 'dead' as we saw in (14). Under the semantics of *guo* in (24), the truth conditions of (27a) is (27b).

- (27) a. Ni mei si-guo.
 You not dead-Asp
 'You have not been dead.'
- b. $\neg \exists e[\text{dead}'(e, \text{you}') \ \& \ \tau(\text{Istage}(e, \lambda e.\text{dead}(e, \text{you}')) < s^*]$

The truth conditions in (27b) claim that there does not exist an eventuality of your being dead before the speech time. It is certainly very easy to satisfy these truth conditions as long as you are alive.

So far we have seen that the simple temporal semantics as stated in (24) alone has already had many interesting consequences. In fact, (24) can do most of the jobs that Pan and Lee's property of 'change out of state' does. However, the temporal semantics as stated in (24) alone is not able to account for every case where *guo* is not allowed. One problematic case involves the verb *juezhong* 'become extinct'. This verb is an

achievement verb denoting a becoming event with a target state of being extinct. As (28) below shows, *juezhong* ‘become extinct’ is not able to occur with *guo*.

- (28) *Konglong juezhong-guo.
 dinosaur become-extinct-Asp
 ‘Dinosaurs have become extinct before.’

The temporal semantics as stated in (24) predicts (28) to have a meaning according to which the becoming process takes place before the speech time. This seems to be consistent with the reality, but (28) is an unacceptable sentence.

Pan and Lee’s property of “change out of state” may account for (28). According to them, (28) is unacceptable, because there is no change of state from dinosaurs being extinct to dinosaurs not being extinct. In this sense, Pan and Lee’s property of “change out of state” seems to have a plus that (24) lacks.

Although the property of “change out of state” may account for (28), as noted earlier, it encounters problems in some other respects such as (9) and (12), reproduced below.

- (9) a. Lisi nong-huai-guo zhe-bu shouti-diannao.
 Lisi make-broken-Asp this-CL laptop
 ‘Lisi broke this laptop before.’
 b. Lisi nong-huai-guo yi-bu shouti-diannao.
 Lisi make-broken-Asp one-CL laptop
 ‘Lisi broke a laptop before.’
- (12) a. Ta da-si-guo yi-ge ren.
 he hit-dead-GUO one-CL person
 ‘He killed a person by hitting him (before).’
 b. *Ta da-si-guo na-ge ren.
 he hit-dead-GUO that-CL person
 ‘He killed that person by hitting him (before).’

The examples in (9) and (12) all involve a target state. On Pan and Lee’s analysis, (12b) is ruled out, because the verb *dasi* ‘hit-dead’ does not allow a person to turn from a state of being dead to a state of not being dead. However, as noted, the same analysis would wrongly predict (12a) to be ill-formed. Similarly, this analysis is not able to explain why in (9a) there must be a change of state from the laptop being broken to a state of the laptop not being broken but there is no such a requirement in (9b). Most importantly, it is not clear at all whether and how Pan and Lee’s suggested property of “change out of state” may unify all these phenomena. It is precisely due to this that an alternative analysis is called for.

Before discussing the alternative analysis, let me note that in fact Pan and Lee also need something like (24) to explain the temporal meaning of *guo*. So the “change out of state” requirement is actually an extra condition on the use of *guo*. If we can come out with something that may replace the “change out of state” property and account for all the data in (9) and (12), then the plus that the “change out of state” property has will no longer be there.

The hunch of the alternative analysis is to keep the temporal semantics of *guo* in (24) as is and to add a presupposition to it so that eventualities with a target state are also covered. The presupposition is a variant of the notion of repeatability as discussed by Lin (2006) and others, but has a more fine-grained definition in the

present paper. Formally, the meaning of *guo* is defined as follows, consisting of an assertion component and a presupposition component:

(29) The meaning of a sentence *P* with *guo*:⁷

Assertion: $\exists e \exists w [P(e)(w) \ \& \ \tau(\text{Istage}(e, P)) < s^*]$

Presupposition: $\exists s [\text{Target}(e, P) = s] \rightarrow \exists w_{\text{inr}} \exists e' [e' \neq e \ \& \ s^* \subseteq \tau(e') \ \& \ P(e')(w_{\text{inr}})]$

Intuitively, what the assertion and presupposition say is that *guo*(*P*) is true in a world *w* if and only if the run time of the internal stage of an event described by *P* is (wholly) before the speech time, and if the event *e* has a target state, then there is an inertia world *w*_{inr} stretching from *w* such that another event *e'* described also by *P* but distinct from *e* is true in it at an interval containing the speech time. I have discussed the assertion component and its consequences earlier, so no comments will be made here. As for the presupposition, the existential quantification over inertia worlds amounts to expressing a possibility. That is, the presupposition of *guo* requires the possible existence of a distinct event. In what follows, I will illustrate how the presupposition works.

First consider the definite/indefinite asymmetry with regard to the discontinuity property as exhibited in (9) and (12). The sentence *Lisi nong-huai-guo yi-bu shoutidiannao* ‘Lisi has broken a laptop before’ contains an indefinite object NP. The proposed semantics of *guo* predicts that for this sentence to be true, the process, i.e., the internal stage of the event *e* denoted by *Lisi nong-huai yi-bu diannao* must precede the speech time *t*₀ in the actual world *w*. Moreover, because this sentence has a target state, it has to satisfy the presupposition that it is possible for a distinct eventuality *e'*, also characterized by the sentence *Lisi nong-huai yi-bu diannao* to be true at an interval containing the speech time in an inertia world *w*_{inr} stretching from *w*. This is easy to satisfy. One possibility for such an *e'* is to let the laptop in *e'* be different from the laptop in *e*. Since a choice of different participants is sufficient to establish distinctness of two events, the times of the two events do not need to play a role for the purpose of distinctness. Thus, there is no requirement that the time of the original event *e* and the time of the event *e'* distinct from *e* do not overlap. Consequently, the time of the target state of the event *e* may either end before the speech time, not overlapping the time of the distinct event *e'*, or stretch to the speech time or a time after it, hence overlapping the time of the distinct event *e'*. This explains why sentences such as (9b), where the object NP is an indefinite, do not necessarily display the discontinuity property.

In contrast to the indefinite cases, when the object NP of a telic sentence such as (9a) is definite, the participants and the predicate in *e* and *e'* are exactly the same. Therefore, in order for an event *e'* to be distinct from the event *e*, the time of *e'* must not overlap the time of *e*. It follows that if an event *e'* distinct from *e* is to be true in an inertia world *w*_{inr} stretching from the actual world *w* at an interval containing the speech time, the time of the original event, including the time of the target state, must be wholly located before the speech time. Therefore, when the object NP is a definite NP as in (9b), the property of the laptop being broken must cease to exist, deriving the discontinuity property.

⁷ ‘*s**’ in (29) can be replaced with a reference time variable whose default value is the speech time but may pick up a different value if the context provides one.

The case of (12) is completely analogous to (9). For (12a) to satisfy the presupposition of *guo*, it is sufficient that a person different from the one in the original event is hit to death in an inertia world. Thus, the time of the original event does not need to play a role here. As a consequence, (12a) is well-formed and there is no discontinuity effect. In contrast, in (12b), the agent and patient of the hitting-to-death event are the same. So the only possibility for the inertia world to contain a distinct event is for the distinct event not to overlap the time of the original event. However, no such distinct event can be found, because once a person is dead, he is dead forever. More precisely, the time of the original event in (12b) stretches to an infinite time point, making it impossible for a distinct event to be true at an interval containing the speech time in an inertia world. In other words, (12b) is an unacceptable sentence, because there is no way to satisfy the presupposition of *guo* as stated in (29). (28) is ruled out for exactly the same reason.

It might be interesting to compare (13), reproduced below, with (9a) at this point.

- (13) Ta chi-guo zhe-dao cai (le).
 he eat-GUO this-CL dish Par
 ‘He has eaten this dish.’

Although the object NP *zhe dao cai* ‘this dish’ in (13) is a definite, it allows a type interpretation when the sentence is understood as expressing an experience. On this interpretation, it is possible for the agent to eat in the future a dish cooked in the same way as the food was cooked this time. Since the participants of the eating event in the future can be different, time does not need to play a role in distinguishing two distinct eating events. Consequently, the duration of the target state does not matter.

(13) also has another interpretation where the object NP *zhe dao cai* ‘this dish’ is understood as a token. This interpretation is more easily to get with the help of the sentence-final particle *le*. On this interpretation, (13) is understood as meaning I have already tasted this dish. In other words, the predicate here actually denote activities rather than accomplishments. So distinctness in this case refers to non-overlapping activities of tasting the dish. Therefore, this token interpretation of the definite NP *zhe dao cai* ‘this dish’ in (13) is not a problem to the proposed analysis of *guo* in (29).

The proposed semantics of *guo* in (29) also explains the puzzle raised by (4) as discussed in Pan and Lee. As noted by them, the state of his being in the US of the first clause is not the same state of his being in the US of the second clause. This is allowed by the analysis of *guo* in (29) because the two events of going to America are distinct events which do not overlap in time. (29) also predicts that when the inertia world chosen happens to be the actual world, the speech time should be included in the distinct event. Indeed, this is the case of (4).

In connection with (4), it is interesting to discuss the following examples provided by a reviewer.

- (30) a. Wo qu-guo yingguo.
 I go-Asp England
 ‘I have been to England before.’
 b. Wo lai-guo yingguo.
 I come-Asp England
 ‘I have come to England before.’

- c. Lisi lai-guo yingguo.
 Lisi come-Asp England
 ‘Lisi has come to England before.’

While in (30a) the speaker is not in England at the speech time, in (30b), he/she is. As for (30c), Lisi may or may not be in England at the speech time.

All the examples in (30) are covered by the proposed semantics of *guo*, the varying interpretations due to the contrast between the verbs *lai* ‘come’ and *qu* ‘go’ and the distinction between the first and third person subject. For someone to go or come to somewhere is a telic eventuality in which the target state is someone’s being somewhere. Given this assumption, the first thing to note about the three examples in (30) is that they all display the discontinuity effect, namely, the target state of the original event as described by the sentence must not hold at the speech time. This follows from the presupposition of *guo*. None of the sentences in (30) contains an indefinite participant. Therefore, in order for them to have a distinct event at an interval containing the speech time in an inertia world, the time of the distinct event and the time of the original event must not overlap. This is possible only when the target state of the original event does not hold at the speech time. This explains why the three sentences in (30) all display the discontinuity effect.

It is important to note that possible existence of a distinct event in an inertia world does not necessarily entail existence of the distinct event in the actual world. An inertia world can be just a possible world. For (30a) to be true, it is sufficient for the distinct event to exist in a possible world. (30b) is a case where the distinct event is already realized in the actual world and the target state continues to exist in it. (30c) can be like either (30a) or (30b).

As for the varying interpretations of the sentences in (30), they can be explained as follows. In (30a), the subject must not be in England at the speech time, because this is what the semantics of the verb *qu* ‘go’ requires. In (30b), though the subject NP can be in England at the speech time, this is not the target state of the original event but the target state of a different event of coming to England not described by the speaker’s utterance. The original target state as described by the sentence must end before the speech time; otherwise, it is impossible for the first person subject to come to England a second time and to utter the sentence *Wo lai-guo yingguo* ‘I have come to England before’. (30b) requires that the speaker be in England at the speech time, because the verb *lai* ‘come’ requires that the speaker be at the location where the utterance is delivered. As for (30c), the verb *lai* ‘come’ also requires that the speaker be in England at the speech time. However, the third person subject is not the speaker and hence it is not necessary that the third person subject be in England at the speech time. This is how the different interpretations of the examples in (30) arise; all the interpretations are fully predictable from the semantics of *guo* and the semantics of the verbs *lai* ‘come’ and *qu* ‘go’ as well as the semantics of first and third person pronouns.

Before proceeding to the next section, some remarks on the relation between atelic eventualities and the presupposition of *guo* should be made. It is reasonable to say that atelic eventualities such as activities and states do not have target states as defined by Parsons (1990). Thus, for atelic eventualities, the antecedent clause of the presupposition of *guo* as defined in (29) is always false. As a consequence, the whole conditional, i.e., the presupposition, is always true by the semantics of conditionals. In other words, for atelic eventualities, as opposed to telic eventualities, the

presupposition of *guo* does not really play a role. This should be fine as long as the temporal semantics of such sentences come out right as discussed earlier.

6 Replies to a reviewer's comment

A reviewer has raised some concerns about the proposed analysis of *guo*. According to him/her, the suggested analysis gives a puzzling reading for sentences where the object is an indefinite as in (9b) repeated below or (31).

- (9b) Lisi nonghuai-guo yi-bu shoutidiandnao.
 Lisi break-Asp one-Cl laptop
 'Lisi has broken a laptop before.'
- (31) Lisi wangcheng-guo yi-bu xiaoshuo.
 Lisi complete-Asp one-Cl novel
 'Lisi has completed a novel before.'

He/she says that for such sentences, the contrast between two eventualities is not due to time intervals, but to different participants, so we would expect the sentence to imply something about some other laptop, in the same way that we expect a contrast between two time intervals as when the object NP is a definite. However, it seems that we don't get that reading. Another concern of the reviewer's has to do with (31). According to him/her, the proposed semantics of *guo* would have to say something about an entity that does not exist in the possible world yet and this seems to be problematic.

Let me first address the second concern. The most novel part of the proposed semantics of *guo* is the notion of possible existence of a distinct event. Since we are talking about possible existence in an inertia world, there is no requirement that the participants that make an event distinct must exist in the actual world. Take the reviewer's (31) for example. In order to say that the proposition *Lisi wangcheng yi-bu xiaoshuo* 'Lisi completes a novel' to be true in an inertia world, it is not necessary that the novel has existed in the actual world. The novel that (31) talks about is only a possible entity in a possible world. The challenge that the reviewer has raised is perhaps that the situation under discussion does not seem to fit the definition of distinctness as outlined in (17ii), because according to (17ii), for two individuals to be distinct, it seems that the two individuals must exist and be different. This problem can be easily solved if we take possible individuals into consideration. Namely, individuals in distinct events which contrast with individuals in the original events can be possible individuals instead of actual individuals. That is, the definition of distinctness is not restricted to actual individuals but include possible individuals. Therefore, the non-existence of contrasted participants of distinct events in the actual world should not constitute a serious problem. After all, this is what possible world semantics is about and the proposed presupposition of *guo* is in fact a modal-like intensional analysis.

The reviewer's first question is somehow difficult to answer, but it is difficult perhaps not because it imposes a serious technical problem on the proposed semantics of *guo* but because the reviewer might have misunderstood the proposed analysis. According to the reviewer, when the contrast between the original event

and the distinct event is due to different participants, the sentence is expected to imply something about the distinct participant, in the same way that a contrast between two time intervals is expected when a time argument is what causes distinctness. This, I think, is a misinterpretation of the suggested analysis. If there is “something” that the suggested proposal has implied for the two contrasting entities, it is distinctness as defined in (17) and this is all there is for the two contrasting entities, no matter whether it is a time argument or normal individual. The reviewer questions, ‘if a contrast between two participants is part of the meaning of the sentence, why don’t we get that reading?’ If I understand him/her correctly, this question can be paraphrased as follows: For those linguists who have suggested that *guo* can only occur with predicates that denote repeatable situations, namely, if the repeatability condition is part of the meaning of *guo*, *guo* must imply something for the potentially repeated situation. But do we really get the repeatability reading and have to say something special about a potentially repeated eventuality? In all likelihood the answer is negative. Repeatability or possible existence of a distinct event is only a condition on the use of *guo*. The status of a distinct event in the proposed analysis is exactly like the status of a repeated eventuality. One does not need any concrete repeated or distinct eventuality in order to judge whether a sentence containing *guo* is well-formed. Repeatability or possible existence of a distinct event is a condition on the use of *guo*. They are not readings. Just as the repeatability analysis does not imply anything special about a potentially repeated event, the proposed analysis of *guo* does not imply anything special about a distinct event.

Finally, in view of the reviewer’s questioning of the intensional component of *guo*, it is helpful to provide one more piece of evidence in support of it. In a recent paper on free choice items in Chinese, Cheng and Giannakidou (to appear) have argued that Chinese free choice items must be divided into two types: intensional ones such as *na*-CI NP ‘which’ and *renhe* NP ‘any’, and non-intensional ones ‘bare *wh*’s’. Hence, a bare *wh* may appear in a perfective sentence with *le* but a *na*-CI NP and *renhe* NP may not. The following examples are adopted from Cheng and Giannakidou (to appear).

- (32) a. Shei dou jin-lai-le.
 who all enter-come-Asp
 ‘Everyone came in.’
 b. *Na-ge xuesheng dou jin-lai-le.
 which-CI student all enter-come-Asp
 Intended: ‘Anybody/everybody came in.’
 c. *Renhe xuesheng dou jin-lai-le.
 any student all enter-come-Asp
 ‘Any student came in.’

Very interestingly, Cheng and Giannakidou point out that if *le* in the above sentences is replaced with *guo*, (32b) and (32c) become fully grammatical, as (33a) and (33b) indicate.

- (33) a. Na-ge xuesheng dou jin-lai-guo.
 which-CI student all enter-come-Asp
 ‘Any student has come in (at least once before).’

- b. Renhe xuesheng dou jin-lai-guo.
 any student all enter-come-Asp
 ‘Any student has come in (at least once before).’

If Cheng and Giannakidou’s analysis is correct that a free choice *na*-CI NP and *renhe* NP must be licensed in an intensional context, the contrast between (32b,c) and (33a,b) constitutes a strong piece of evidence supporting the view that the meaning of *guo* has an intensional component, i.e., the presupposition, as proposed in this paper.

7 Conclusion

In this article, it is argued that there are two major properties of *guo* that any analysis of it has to deal with. One is the co-occurrence restriction between *guo* and different types of predicates. The other one is the discontinuity effect associated with *guo*. It is shown that previous attempts to account for the two properties, in particular, Pan and Lee’s (2004) and Lin’s (2006) analyses of *guo*, are still not satisfying. To overcome the problems of their analyses, following Lin (2006), this paper has suggested that the meaning of *guo* consists of two components, one being an assertion and the other being a presupposition. The assertion requires that the inner stage of the event *e* modified by *guo* is wholly located before the speech (or reference) time and the presupposition requires that if the event *e* has a target state, then there is an inertia world w_{inr} stretching from *w* such that another event *e*’ described also by *P* but distinct from *e* is true in it at an interval containing the speech time. On this analysis, the predicate restriction of *guo* is accounted for partly by the assertion and partly by the presupposition. The presupposition component also explains the discontinuity property as well as the different interpretations of sentences containing *guo*. The new analysis thus not only accounts for the relevant linguistic data in a more comprehensive and satisfying way but also captures Iljic’s (1990) important insight that *guo* indicates a “non-empty class of occurrences.” Finally, all the results, be it predicate restriction or the interpretation of the sentence, are brought about by a formal characterization of the semantics of *guo*. The proposed analysis of *guo* thus defends a pure semantic approach to the meaning of *guo*, in contrast to Pan and Lee’s (2004) view.

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