

# L2 Learners' Interpretation of Reflexive Anaphora in VP-Ellipsis: A Relevance Theory Perspective

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## 1. Introduction

The publication in 1986 of *Relevance: Communication and Cognition* by Dan Sperber and Dreidre Wilson set in motion a wide-ranging program of research into human communication (for a recent overview, see Yus Ramos, 1998). But actual relevance-theoretic research in second language acquisition (SLA) has barely begun (Foster-Cohen, 2000). Although fairly well studied in generative grammar (e.g., Fiengo and May 1994; Johnson 2001), reflexive anaphora in VP-ellipsis ((1) below) has not been studied in second language acquisition research.

(1) John defended himself and Bill did too.

Further, no recent L2 studies on reflexive binding have examined this syntactic structure from the perspective of Relevance Theory (RT), a pragmatic theory developed by Sperber and Wilson (1986/1995). This study intends to bridge the gap.

Reflexive anaphora in VP-ellipsis is interesting in that it allows two possibilities of interpretation (e.g., Fiengo and May, 1994):

(2)a. John<sub>i</sub> defended himself<sub>i</sub> and Bill<sub>j</sub>  
did [defend himself<sub>j</sub>] too. (i.e., Bill)

(2)b. John<sub>i</sub> defended himself<sub>i</sub> and Bill<sub>j</sub>  
did [defend him<sub>i</sub>] too. (i.e., John)

In (2a) the reflexive *himself* in the elided VP co-refers with *Bill*. This interpretation, known as the *sloppy* reading, is set by the requirement of Principle A of Binding Theory. In (2b), the pronoun *him* in the elided VP co-refers with *John*, the subject of the higher clause. This interpretation, known as the *strict* reading, is set by Principle B of Binding Theory.

## 2. Relevance Theory

Relevance Theory (Sperber and Wilson, 1986/1995) is a cognitive theory of communication which proposes that human cognition is relevance-based: we pay attention to information that appears relevant to us, construct relevant representations of such information, and process these representations in a context that maximizes its relevance. Sperber and Wilson (1986) define relevance in terms of two conditions (p. 125):

*Extent condition 1*: an assumption is relevant in a context to the extent that its contextual effects in this context are large.

*Extent condition 2*: an assumption is relevant in a context to the extent that the effort required to process in this context is small.

'Relevance' thus encompasses two factors: contextual effects and processing effort. Within RT, the idea that a linguistic expression may impose procedural constraints on the inferential phase of comprehension was first put forward by Blakemore (1987, 1988, 1992). She characterized discourse

connectives such as 'so' and 'after all' as constraining the inferential processing of propositions, namely, constraining the inferred conclusions from linguistic expressions containing the connectives.

- (3) He is an Englishman, *so* he is brave.
- (4) He is brave; he is, *after all*, an Englishman.

'So' signals an inferential connection between the two propositions in (3) in much the same way as 'after all' signals an inferential connection between the two propositions in (4). Whereas 'so' introduces a proposition which is understood to be proven or justified by the preceding one, 'after all' introduces a proposition which is understood as proof of the preceding one. As Blakemore (1987) pointed out, such expressions contribute to relevance by guiding the hearer towards the intended contextual effects, hence reducing the overall computational effort required.

To extend Blakemore's analysis of linguistic expressions, I would like to find out whether ensuing referential sentences impose procedural constraints on inferential processing, that is, whether there is an inferential connection between the information encoded by ensuing referential sentences and the information encoded by experimental sentences.

### 3. Research questions

Given the basic premises of RT, we are interested in finding out whether the minimal processing effort and the contextual effects of RT constrain adult L2 learners' processing of syntactically ambiguous sentences and whether an ensuing referential sentence places procedural constraints on the inferential phase of comprehension on the part of L2 learners. Thus, we set out the following research questions for investigation.

- (a) Do L2 learners follow the constraint of the minimal effort of RT in processing reflexive anaphora in VP-ellipsis?
- (b) Does an ensuing referential sentence impose procedural constraints on the inferential phase of comprehension by L2 learners when they process reflexive anaphora in VP-ellipsis, thus showing the contextual effects of RT?

### 4. The present study

The subjects were 28 intermediate and 22 advanced Chinese-speaking learners of English (the experimental groups) and 20 native speakers of American English (the control group). The intermediate learners were second-year university students enrolled in intermediate English-learning classes. The advanced learners were fourth-year university students enrolled in advanced English composition classes. The fifty Chinese-speaking learners were all English majors learning English as a foreign language in Shanghai, China. None of the students had studied English in an English-speaking country. The native speakers of American English were students at a medium-size public institution in the United States.

There were two experiments for the present study. Experiment 1 addressed the first research question, that of whether L2 learners follow the constraints of the minimal processing effort of RT when they process reflexive anaphora in VP-ellipsis. I presented 17 experimental sentences of the same form as (1) to the subjects along with 34 filler sentences. Experiment 2 addressed the second research question, that of whether an ensuing referential sentence imposes procedural constraints on the inferential phase of comprehension by L2 learners when they process reflexives in the VP-elliptical construction, thus showing the contextual effects of RT. Experiment 2 used the same experimental sentences as Experiment 1, but the sentences were followed by a referential context favoring the strict interpretation, as in (5), by a non-referential context not favoring the strict interpretation, as in (6), and 51 unambiguous filler items, as in (7).

- (5) John defended himself and Bill did too.  
Bill was a good friend of John.

- (6) John defended himself and Bill did too.  
Bill went to the restaurant afterwards.
- (7) John saw Catherine yesterday and Bill did too.

Following Frazier and Clifton (2000), we used a judgment task in which each sentence is followed by two alternative interpretations:

- (8) John defended himself and Bill did too.  
What does the underlined part of the sentence mean?  
\_\_\_\_ Bill defended Bill.  
\_\_\_\_ Bill defended John.

Like Frazier and Clifton (2000), the participants were asked to check which version matched their initial understanding of the underlined part of the sentence. In other words, the students were instructed to check the answer that first came to their mind without rethinking or editing. They were instructed NOT to go back and make changes after they had made the choice.

Table 1. Performance on the 17 experimental sentences by Chinese learners and native speakers of American English.

	C- 1 (Int)	C-2 (Adv)	E-Grp
Sloppy reading	13.96 (1.99)	12.59(2.0)	12.90(2.15)
Strict reading	3.04 (1.99)	4.41 (2.08)	4.10 (2.15)

Table 1 reports the performance on 17 experimental sentences by two Chinese groups and native speakers of American English. The intermediate Chinese Group (C-Group 1) interpreted the reflexive in VP-ellipsis sloppily (M=13.96 for the sloppy interpretation vs. M=3.04 for the strict interpretation). The advanced Chinese group (C-Group 2) patterned like the intermediate Chinese group in terms of their reading of the reflexive (M=12.59 for the sloppy reading vs. M=4.41 for the strict reading). The Chinese learners of English were comparable with native speakers of English, who also interpreted the reflexive sloppily (M=12.90 for the sloppy reading vs. M= 4.10 for the strict reading). The differences of the sloppy interpretation across the two Chinese groups were found to be statistically significant,  $F(1, 48) = 3.76, p < .05$ . The differences between the native speakers and the intermediate L2 learners in terms of the sloppy reading were found to be statistically significant, too,  $F(1, 46) = 3.48, p < .05$ . But the differences between the native speakers and the advanced L2 learners in terms of the sloppy reading were found to be statistically non-significant,  $F(1, 40) = 2.16, p > .05$ .

Table 2. Performance on the 17 experimental sentences in a referential and non-referential context by Chinese learners and native speakers of American English.

	<u>Referential</u>	
	Sloppy	Strict
C-1 (Int)	5.96 (2.03)	11.04 (2.03)
C- 2 (Adv)	4.91 (1.63)	12.09 (1.63)
E-Grp	3.05 (1.32)	13.95 (1.32)
	<u>Non-Referential</u>	
	Sloppy	Strict
C-1 (Int)	8.93 (1.98)	8.07 (1.98)
C- 2 (Adv)	9.49 (1.40)	7.51 (1.40)
E-Grp	9.45 (1.05)	7.55 (1.05)

Table 2 reports the performance on the 17 experimental sentences in a referential and non-referential context by Chinese-speaking learners of English and native speakers of American English. The intermediate Chinese Group (C-Group 1) showed a preference for the strict interpretation in a referential context ( $M=11.04$  for the relative clause interpretation vs.  $M=5.96$  for the sloppy interpretation). In comparison, they did not show a preference for the strict interpretation in a non-referential context ( $M=8.07$  for the strict interpretation vs.  $M=8.93$  for the sloppy interpretation). The advanced Chinese group (C-Group 2) patterned like the intermediate Chinese group with respect to their preferences for the strict interpretation in a referential context ( $M=12.09$  for the strict interpretation vs.  $M=4.91$  for the sloppy interpretation). On the other hand, there were no such preferences in a non-referential context ( $M=7.51$  for the strict interpretation vs.  $M=9.49$  for the sloppy interpretation). The Chinese-speaking learners of English were comparable with native speakers of English, who also showed a strong preference for the strict interpretation in a referential context ( $M=13.95$  for the strict interpretation vs.  $M=3.05$  for the sloppy interpretation). However, there were no such preferences in a non-referential context ( $M=7.55$  for the strict interpretation vs.  $M=9.45$  for the sloppy interpretation). The differences between the native speakers and the intermediate and advanced Chinese learners in terms of the strict reading in a referential context were found to be statistically significant,  $F(1, 67) = 4.12, p < .05$ . And the differences across the two Chinese groups with respect to the strict interpretation in a referential context were also found to be statistically significant,  $F(1, 48) = 3.26, p < .05$ .

An examination of the individual results concerning the strict reading indicates the advanced L2 learners did so to a much greater extent than the intermediate learners (Table 3).

Table 3. Individual Data on the 17 VP-elliptical sentences with the strict reading by the intermediate and advanced Chinese-speaking learners of English

Percentages of The strict Interpretation	C1 (Int)	C2 (Adv)
47.1%	0	1
41.2%	1	3
35.3%	3	3
29.4%	3	4
23.5%	4	4
17.6%	5	3
11.8%	5	2
5.9%	4	1
0.0%	3	1

The experiments investigated whether (a) L2 learners follow the constraint of the minimal processing effort of RT in processing reflexive anaphora in VP-ellipsis, and (b) whether an ensuing referential sentence imposes procedural constraints on the inferential phase of comprehension by L2 learners when they process reflexives in the VP-elliptical sentences, thus showing the contextual effects of RT. The results appear to provide positive answers to both questions.

Experiment 1 showed that the minimal processing effort of RT constrained the adult L2 learners' (and the native speakers') interpretation of reflexives in the VP-elliptical construction. The intermediate and advanced Chinese-speaking learners of English chose the most accessible 'sloppy' reading as the interpretation of the reflexive in the VP-elliptical structure. The sloppy (i.e., the lower subject) interpretation involves the least effort in computing cognitive effects mainly for two reasons. First, copying the antecedent VP into the elided VP was immediately available in the linguistic information of the sentence. Second, seeking the lower subject to be the antecedent for the reflexive was easier than seeking, for example, the higher subject as the antecedent for the reflexive, not only because the distance between the reflexive and the lower antecedent is shorter than the distance between the reflexive and the higher subject, but also because the binding relationship between the reflexive and the lower subject is within a single bounding node. In contrast, the strict (i.e., the higher subject) reading is costly on the grounds that (i) the pronoun reading, which involves a change to the pronoun

from the reflexive, is not immediately available in the linguistic information of the sentence, (ii) the distance between the reflexive and its higher antecedent is greater than the distance between the reflexive and its lower antecedent, and (iii) the binding relationship of the reflexive in the elided VP with its higher subject is not within a single bounding node: it crosses one bounding node. Thus, constrained by the least processing effort of RT, the L2 learners plowed ahead with the most accessible ‘sloppy’ interpretation, as evidenced by the high percentages of the ‘sloppy’ interpretation (82.1% for the intermediate learners and 74.1% for the advanced learners).

Experiment 2 showed that the contextual effects of RT constrained the L2 learners' processing of reflexives in the VP-elliptical construction in a referential context. The ensuing referential information constrained the inferred conclusion about encoding the reflexive in VP-ellipsis. Hence the L2 learners' strict reading of the reflexive in the VP-elliptical structure. In constraining the inferential processing of ambiguous sentences this way, the procedural information encoded by ensuing referential sentences had the effect of reducing the overall computational effort required and of guiding the L2 learners (as well as the native speakers) towards the intended contextual effects.

The ensuing non-referential sentences in Experiment 2 did not constrain the inferential processing of the ambiguous sentences. Neither the L2 learners nor the native speakers showed a clear tendency toward interpreting the reflexive strictly. This result is consistent with the assumptions of RT. RT assumes that the non-inferential information presented in the context following the experimental sentences carries the presumption of relevance. The participants would expect the information presented to be worth their effort. In an attempt to establish the relevance of the information presented, they spent extra processing effort for no extra contextual effects: they found the ensuing information to be non-referential to the foregoing experimental sentence. Thus, the following irrelevant information distracted the participants' ability to process the experimental sentences, leading to their lower performance in the experiment. This explains why the participants performed more poorly in encoding the reflexive as a strict interpretation in the experimental sentences that are followed by a non-referential context (12) than they did when the ensuing information was relevant to the strict interpretation (11). It also explains why they performed more poorly in interpreting the reflexive sloppily than they did in Experiment 1, where their ability to process the experimental sentences was not distracted by the irrelevant information.

As Table 1 shows, the intermediate Chinese L2 learners had a higher percentage of sloppy reading than the advanced learners, but they had a lower percentage of strict reading than their advanced peers. This calls for an explanation. Sperber (1994, 2000) suggests that all communicators follow a path of least effort in computing cognitive effects, but there are varying degrees of expectations of relevance in the course of comprehension. He discusses three increasingly sophisticated strategies used for comprehension. The simplest strategy is that of what he calls “naïve optimism” (Sperber, 1994, p. 189). An addressee using this strategy looks for an interpretation that appears to be relevant enough. If the addressee finds one, s/he assumes that it was the intended interpretation and attributes it to the addresser’s meaning. A more complex strategy is that of what he calls “cautious optimism” (*ibid*, p. 191). In addition to taking the first interpretation as relevant enough and attributing it to the addresser’s meaning, an addressee using this strategy also considers what interpretation the speaker *might have thought* would be relevant enough (Wilson, 2000, italics hers). A third strategy is that of “sophisticated understanding” (*ibid*, p. 194). An addressee using this strategy considers what interpretation the speaker *might have thought he would think* was relevant enough (Wilson, 2000, italics hers). In other words, the person using this strategy can go beyond cases in which nothing more than the appearance of relevance is achieved and perform at a more abstract and elaborate level. It appears that the intermediate Chinese-speaking learners of English used the strategies of naïve optimism and cautious optimism. Copying the antecedent VP into the elided VP and having the local antecedent for the reflexive in the elided VP, they interpreted the reflexive sloppily using the strategy of naïve optimism. But they sometimes ventured into strict reading using the strategy of cautious optimism: one student did so 41.2%, three 35.3%, three 29.4%, four 23.5%, five 17.6%, five 11.8%, four 5.9% and three 0.0% (Table 3). On the other hand, the advanced Chinese-speaking learners of English appear to have used all three strategies. Like their intermediate peers, they interpreted the reflexive sloppily using the strategy of naïve optimism: the sloppy interpretation was available in the linguistic environment of the sentence and did not require gratuitous processing effort. But they were more adept at using the strategies of cautious optimism and sophisticated understanding, which resulted in a higher percentage

of strict reading than their intermediate peers: one student did so 47.1%, three 41.2%, three 35.3%, four 29.4%, four 23.5%, three 17.6%, two 11.8%, one 5.9% and one 0.0% (Table 3).

The Chinese L2 learners used the strategy of naïve optimism, but the intermediate learners did so to a greater extent than their advanced peers. This explains why the intermediate learners had a higher percentage of the sloppy reading (82.1%) than the advanced learners (74.1%). The strategies apart, there appear to be similar cognitive processes at work. The L2 learners' dominant sloppy interpretation indicates that the least computational effort of RT constrained their interpretation of the reflexive in the elided VP.

## 5. Summary

This study provides a relevance theory perspective on how L2 learners process reflexive anaphora in VP-ellipsis. The two experiments reported in this study presented evidence that the principle of relevance constrained the adult L2 learners' processing of the ambiguous sentences in English. In Experiment 1, constrained by the minimal processing effort of RT, both the intermediate and advanced Chinese-speaking learners of English interpreted the reflexive sloppily. In Experiment 2, they interpreted the reflexive strictly, using the procedural information encoded by the ensuing referential sentences. Such information had the effect of reducing the overall computational effort required and of guiding the L2 learners towards the intended contextual effects.

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