

The Role of Intention in the Construction and Updating of Situation Model

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Abstract

This paper examines the role of intention in the construction and updating of situation models. In the experiment, we studied readers' reaction to three versions of situations (consistent, inconsistent and deviously consistent). By repeated measure ANOVA analysis, the present study concludes that readers follow the protagonist's intention to construct and update situation models. Readers' English proficiency significantly affects readers' text processing in deviously consistent and inconsistent situation models.

Keywords: Situation model, Intention, Inference, Construction, Updating

1. Introduction

The mental representation of what one reads is called a "situation model" or a "mental model". As a result of the development of cognitive psycholinguistics, especially since the two publications in 1983 of van Dijk and Kintch's *Strategies of Discourse Comprehension* and Johnson-Laird's *Mental Models*. These scholars focus their attention on the mental representations of verbally described situations, which have become known as mental models or situation models. They assumed that readers construct situational mental representations in conjunction with text-based representations. Thus, language is seen as a set of processing instructions on how to construct a mental representation of the described situation (Zwaan & Radvansky 1998).

Based on such views of text processing, text comprehension researchers typically identify at least five dimensions of situations: time, space, causation, intentionality, and protagonist (Givon 1992; Zwaan, Langston & Graesser 1995). Then, a bulk of text processing studies shifted to focus on one of the five dimensions of situation models, such as space. Among this, however, a particular finding that emerged from this line of research is the effects of intention/goal in the construction and updating of situation models.

2. The essence of text processing

Considering the fact that reading a text is not merely reading a list of unrelated sentences, so readers may not satisfy themselves that they have read the explicit text; they may try every means to search beyond text information and build up coherent situation models to organize what they have read by making inferences. Many researchers have argued that the construction of a coherent situation model is tantamount to the successful comprehension of a text. Evidence has shown that comprehension involves constructing a sensorimotor simulation of the described events. Gernsbacher et al (2004) points out that readers must keep track of who is doing what to whom so as to successfully read and comprehend a narrative. Readers' tracking of the narrative information leads to a mental representation which is built on the relevant textual information, with subsequent information being either relevant or irrelevant to the preexisting text base. Thus, when people comprehend certain texts, they create mental representations of the described state of affairs termed situation models. Meanwhile, as Zwaan & Madden (2004) points out that successful comprehension is impossible without some form of updating. Thus, inferencing has to be considered as the minimum prerequisite for successful text processing and the efficient building of an elaborated situation model. Inference is treated as one of the most important differences between a text base and a situation model. So the generation of inferences is a crucial component in constructing a situation model of a text.

Zwaan (2008) points out that "the essence of language comprehension is not to create a mental representation of the linguistic input per se, but to create a mental representation of the situation described by the linguistic input, a situation model." Many researchers have argued that the comprehension of narratives revolves around keeping track of the goals and plans of protagonists.

3. Research of intentionality in situation models

Research in the dimension of intentionality is far from enough. Most research in this field focus on the activation of those fulfilled and unfulfilled intentions/goals. As for the activation of intentions/goals, constructivism holds that reading is an active and tactful process, during which readers explain the events and protagonist's behaviors. Thus, information in long-term memory is activated by and integrated with information being processed. The integrated information is reprocessed in the next period of reading. According to constructivism, readers instantly construct and update situation model during reading. Suh and Trabasso (1993) proved this view. They hold that unfulfilled intention, compared with fulfilled intention, is more accessible and naturally easier to activate and integrate. In other words, as long as the original intention has not been fulfilled and the focus remains, the intention is easily accessible and have a low threshold to be activated. Richards and Singer (2001), however, holds the memory-based view. They argue that the intention of protagonist, as soon as it is put forward, becomes the focus, and even a dominant focus of the reader. With the flow of reading and the introduction of a new intention, the first intention tend to become recessive. This process continues with the introduction of another new intention. Richards and Singer believe that if the first intention is fulfilled, its related information can activate information in long-term memory, which can integrate with the current information. If the first intention is not fulfilled, its related information will not activate information in long-term memory and no integration will occur. They conclude that fulfilled intention is easier to activate than unfulfilled intention.

Then comes the question: fulfilled and unfulfilled intention, which one is easier to activate? From the examination of the research materials in the previous studies, we find that different research materials may be one of the reasons why they got quite different conclusions. Those scholars who hold the constructivist view use those reading materials with explicit goal and causality, while for those who hold memory-based ideas use common descriptive narrations as their research material.

4. The Present Study

The aim of the present study is to have an in-depth understanding of the effects that the protagonist's intention and readers' language proficiency pose on the processing performance of Chinese EFL readers. More specifically, we want to answer the following two research questions: first, does protagonist's intention, which was operationalized as consistent with protagonist's action, inconsistent with protagonist's action and deviously consistent with protagonist's action, has different effects on English text processing? If so, how? Second, does readers' English proficiency, which is operationalized as low and high, significantly affect readers' text processing? If so, how? The whole experiment is carried out with the assistance of E-Prime

4.1 Research material

Four situations, each of which is represented by a series of sentences, are presented to readers on the computer screen one by one in the study phase. For each situation, the description of the protagonist and the targeted recognition sentence have the following three relations(three versions): consistent (the description of the protagonist's intention and the recognition sentence are consistent), inconsistent and deviously consistent (the description of the protagonist's intention is inconsistent with the recognition sentence at first, and the following sentence show that the protagonist has changed his/her habit and the present condition of the protagonist is consistent with the recognition sentence). Appendix lists the research material that we used in one situation.

After the presentation of each situation, a sentence recognition test was conducted, in which readers are asked to make a True/False answer. If they think it is true, then, press J key on the keyboard; if not, press F key. During this process, their reaction time is recorded for further analysis.

4.2 Research design

In the study, we evaluated the effects of readers' L2 proficiency and protagonist's intention on text processing, which were measured by a sentence recognition test. Two factors, that is language proficiency and different versions of situation models are involved. For language proficiency, there are two levels and for situation models, there are three levels. Thus, the present study is a 2 (language proficiency) \times 3 (versions of situation models) mixed design (repeated measure). Since all readers sit in the same sentence recognition test, versions of situation models is the within-subject factors, while language proficiency is the between-subject factor. Our research is a two-factor mixed design (repeated measure).

4.3 Participants

Sixty Chinese readers of English participated our research. Thirty of them are freshmen and the other thirty are seniors, who represent low and high language proficiency respectively. Each participant got his scores for correct percentage (CP) and reaction time (RT).

5. Results of the present study

5.1 General findings

Table 1 is the descriptive statistics of the general mean scores obtained by our three groups of readers.

Insert Table 1 Here

It is clear from the table that, all participants got high correct percentage (CP). This shows that readers can generally grasp the intention of the protagonist and make choice according to the intention.

As for reaction time, the effect of different versions of situation is significant ($F = 8.98, p < .001$). That is to say, irrespective of the proficiency level, readers' sentence recognition performance was significantly different between consistent, inconsistent and deviously consistent situations. More importantly, the interactions between language proficiency and versions of situation have statistical significance ($F = 5.58, p < .001$), which indicates that the effects of the two variables are not independent from each other. In other words, performance of the participants at different proficiency levels may not be significantly different on every version of the three situations.

Thus, we can see that, from the perspective of RT, the effect of within-subject factor (three versions of situation models), between-subject factor (language proficiency) and their interactions are all significant. So the nature of the significant difference between these factors should be examined through further comparisons of a series of means.

5.2 Effects of versions of situations

The effect of versions of situations is significant on reaction time. To further determine whether the observed versions of situations effect is significant on both language proficiency, pairwise comparisons of means were conducted.

As for the reaction time of the three versions of situation models, $RT_{inconsistent} (M=3012) > RT_{deviously\ consistent} (M=2471) > RT_{consistent} (M=2098.5)$. *Scheffe post hoc* test shows that no significant difference is found between the consistent and deviously consistent versions. This shows that readers constantly construct information around the intention of the protagonist, which is naturally carried on to the following process of reading. So the reaction time between the consistent and deviously consistent version has no significant difference. Thus, we can say that during reading, readers follow the protagonist's intention to construct and update situation models.

5.3 Effects of language proficiency

We have seen that the main effect of readers' language proficiency on the recognition performance is significant $RT_{low\ proficiency} (M=2980) > RT_{high\ proficiency} (M=2075)$. Further *Scheffe post hoc* comparisons of means found no significant difference between the two proficiency levels in the recognition of consistent version of situation model. This reveals that both low and high proficiency level readers use protagonist's intention as a very important method of integrating information in their reading. The significant difference in RT in inconsistent and deviously consistent versions may be caused by the restriction of short-term memory or reading skills. Further study is needed to explore more specifically the effects of language proficiency in intention-including text processing.

6. Conclusion

From the above analysis, we can conclude that readers follow the protagonist's intention to construct and update situation models. Readers' English proficiency significantly affect readers' text processing in deviously consistent and inconsistent situation models. For consistent situation model, however, significant difference does not exist between the two language levels.

References

- Gernsbacher M.A., et al. (2004). Managing Mental Representations during Narrative Comprehension. *Discourse Processes*, 37(2): 145-164.
- Givon, T. (1992). The grammar of referential coherence as mental processing instructions. *Linguistics*, 30, 5-55.
- Richards E. Singer M. (2001). Representation of complex goal structures in narrative comprehension. *Discourse Processes*, 31(2):111-135.
- Suh S Y & Trabasso T. (1993). Inferences during reading: Converging evidence from discourse analysis, talk - aloud protocols, and recognition priming. *Journal of Memory and Language*, 32(3):279-330.
- Zwaan, R. A. & Madden, C. J. (2004). Updating situation models. *Journal of Experimental Psychology*:

Learning, Memory, & Cognition, 30:283-288.

Zwaan, R. A., Magliano, J. P., & Graesser, A. C. (1995). Dimensions of situation model construction in narrative comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21:386-397.

Zwaan, R.A. & Radvansky, G.A. (1998). Situation models in language and memory. *Psychological Bulletin*, 123, 162-185.

Zwaan, R.A. (2008). Time in language, situation models, and mental simulations. *Language Learning*, 58:13-26.

Table 1. General descriptive statistics

	Language Proficiency	Consistent	Inconsistent	Deviously Consistent
CCP (%)	Low	100	96.7	96.7
	High	100	100	96.7
RT (ms)	Low	2210	3746	2983
	High	1987	2278	1959

Appendix:

Model situation used in the research

Introduction of the intention

1. Lee went to buy something for breakfast in the morning.

Consistent version

2. The restaurant sells delicious fried foods.
3. Lee is not particular about diet.
4. His favorites are fast foods and fried foods
5. He usually eats several days in fast food restaurant every week.
6. Lee easily found his breakfast in the restaurant.

Inconsistent version

2. The restaurant sells delicious healthy foods.
3. Lee is very particular about diet.
4. He is a vegetarian.
5. He never eats fried foods.
6. Lee easily found his breakfast in the restaurant.

Deviously consistent version

2. The restaurant sells delicious healthy foods.
3. He thought that he used to be a vegetarian.
4. And he never ate fried foods.
5. He, however, now likes meat.
6. Lee easily found his breakfast in the restaurant.

Recognition sentence

7. Lee ordered a fried chicken basket combo.