

Syntactic and Semantic Processing of Chinese Sentence Understanding in Dai Nationality Children's

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Abstract. In order to study the syntactic and semantic processing in Dai nationality children Chinese sentence understanding, the experiment selected a total of 50 children participant from Dehong Yunnan province joined the experiments. The result showed that Dai children are mainly rely on syntactic factors when they judge the information of Chinese sentences while the semantics has little effect.

Keywords: Syntax; Semantic; Chinese; Dai nationality.

1. Introduction

Sentence understanding is based on semantic and grammatical information. Only on the premise of a correct understanding of syntax and semantic information, can we interpret the right information form the sentence.[1][2]

In the study of sentence processing, there are representative interpretation theories, including modularization theory and interaction theory. Modularization theory holds that the initial stage of sentence processing is the initial construction of syntactic structure, and then the process of semantic processing, which is relatively independent of semantic processing. On the contrary, the interaction model holds that there is interaction between syntactic processing and semantic processing from the beginning to the end. Understanding the relationship of syntax and semantics in sentence processing is important to both first and second language learning.[3]

The two main models in second language syntactic processing are: the United competition model and the shallow structure hypothesis. According to the unified competition model, L1 (morphological) syntactic system (such as word order, congruence, etc.) influences L2 comprehension and production through the transfer of processing strategies. [4] [5]The shallow structure hypothesis holds that L2 syntactic processing is essentially different from L1 processing. Compared with native speakers, the grammatical representation established by them is more superficial and vague. Therefore, in order to make up for this defect, non-native speakers will rely heavily on unstructured, lexical semantic information and pragmatic information to understand sentences in the second language.[6]

Ethnic minorities are the largest bilinguals in China, and they generally master both national languages and Chinese. In this study, the Dai nationality in Dehong region of Yunnan Province will be selected as the subjects. In order to study the role of syntactic and semantic processing in the process of Chinese sentence understanding.

2. Experiment: The Influence of Word order and Animacy on Sentence Judgment

2.1 Participants

A total of 50 Dai children were randomly selected from a primary school in Dehong, Yunnan Province. Their mother tongue was Dai language, and their second language was Chinese. All the subjects had normal naked vision or corrected vision, without dyslexia.

2.1.1 Materials

The experimental material is a simple Chinese sentence mainly composed of two nouns and one verb, it can form active voice or passive voice .According to this, there are several sentence combination forms that meet this condition in Chinese at present: NNV, NVN, N operate NV() , N operated by NV.(V represent verb; N represent for noun. Nouns divided into two categories: one is animacy, we use the letter "A"; the other is inanimacy, we use the letter "I".).

2.1.2 Experiment Design Study of Chinese Sentence Comprehension without Grammatical Markers

4 (life attribute combination: AA, AI, IA, II) × 2 (word order: NVN × NNV). Both variables were internal variables. The dependent variables were reaction time and accuracy reported by the subjects.

2.1.3 Procedure

The experimental materials were programmed by E-Prime software, and all sentences were randomly presented on the computer screen. There are two stages: practice and test. Before the experiment, in order to make sure that the subjects understand the experiment task, first explain the instructions to the subjects: "let's do a small test. When you see a sentence in the center of the computer screen, please quickly judge whether the sentence is a syntactic correct and meaningful sentence. After the subjects understand the rules, they will enter the practice stage, and the sentence will come out Now a red fixation point "+" will appear first, lasting for 1 second, and then a sentence will appear randomly. After the subject reports, the main test will immediately press the key to enter the next cycle. In the exercise stage, the subjects were asked to do six reactions, and the main subjects fed back their reactions. Enter the formal test stage after the exercise, and the main test will not give feedback. In the experiment, the interference sentences and the test sentences are mixed together and then presented to the subjects. The program automatically records the response time and accuracy of the subjects.

3. Result

Because there are two subjects who do not answer some questions, it is considered invalid; in addition, there are two students whose accuracy rate is less than 40%, it is considered that they do not complete or understand the requirements seriously, and delete the data of these two students, so as to ensure the reliability of the data. Therefore, in this part of the experiment, four subjects were deleted.

Result:Study of Chinese sentence comprehension

Table 1. Mean reaction time(ms) of sentence judgement

Word order	combination of life attributes			
	AA	AI	IA	II
NNV	1916.22	1908.70	1859.47	1873.89
NVN	1717.29	1771.15	1827.36	1751.33

Table 2. Accuracy (%)of sentence judgement

Word order	combination of life attributes			
	AA	AI	IA	II
NNV	1916.22 (76.6)	1908.70 (75.0)	1859.47 (73.9)	1873.89 (70.7)
NVN	1717.29 (81.5)	1771.15 (79.3)	1827.36 (85.9)	1751.33 (78.3)

According to the results of the reaction time of Dai children to the judgment of two sentences without grammatical markers, a two factor ANOVA of 2 (word order) × 4 (combination of life attributes) was conducted. The results are shown in table 3.

Table 3. ANOVA of reaction time 2 (word order) × 4 (combination of life attributes)

	SS	df	MS	F	P
Word Order	1386565.61	1	1386565.61	7.024 **	.0011
combination of life attributes	381.572	3	381.572	0.03	.956
Word Order*combination of life attributes	128961.45	1	128961.45	0.89	.35

* P<0.05, ** P<0.01

The results of variance analysis of response time data showed that the main effect of word order was significant ($f(1,45) = 7.024$, $P < 0.01$), the response of NVN word order was faster than that of NNV, and the main effect of life attribute combination was not significant. (3) The interaction between word order and life attribute combination is not significant, which shows that NVN is faster than NNV no matter how life attribute is combined.

Based on the results of the accuracy of Dai children's judgment on two sentences without grammatical markers, a two factor ANOVA of 2 (sentence pattern) × 4 (life attribute combination) was conducted. The results are shown in table 4.

Table 4. ANOVA of accuracy 2 (word order) × 4 (combination of life attributes)

	SS	df	MS	F	P
Word Order	.477	1	.477	22.536***	.000
combination of life attributes	.161	3	.054	2.104**	.103
Word Order*combination of life attributes	.083	3	.028	1.270	.287

** P<0.01, ***P<0.001

The results showed that: (1) the main effect of word order was very significant ($f(1,45) = 22.536$, $P < 0.001$); the main effect of life attribute was not significant; the interaction between word order and life attribute combination was not significant. ($f(3,135) = 1.270$, $P > 0.05$); the accuracy of NVN is higher than NNV, and the response is faster.

The results of response time and accuracy of sentences without grammatical markers show that Dai children are mainly influenced by syntactic factors when they judge the syntax and semantics of Chinese sentences, while the semantics have little effect.

4. Discussion

In the experiment, the word order shows a strong subject effect. Because the experiment only uses sentences containing subject predicate object, the order of subject predicate object in Dai language and Chinese language is basically the same, which may show that there is a transfer between grammatical structures. In this experiment, the subjects are all bilingual people with Dai language as their mother tongue, belonging to the ethnic minorities learning Chinese in Chinese subculture, whose mainstream culture is exactly The cultural circle of the second language Chinese that it uses is more influenced by Chinese than its native language. The subjects selected in this study are proficient in listening, speaking, reading and writing in Chinese. But what's more special is that although the Dai nationality has its own language and characters, only a few monks and experts can write the Dai language. Ordinary Dai people only use the Dai language for oral communication and can't write. Chinese is the only written language they master. It can be said that in reading, Chinese is their first language, which also makes the research on Dai children show that Where previous studies have been inconsistent.

5. Conclusion

1. Dai children use both syntactic information and semantic information in the process of understanding Chinese sentences.

2. Dai children mainly rely on syntactic information in the process of understanding Chinese sentences.

3. There is no interaction between syntax and semantics in all experiments, which shows that syntax and semantic processing are two independent processes, supporting the modularization theory of syntax.

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