ACQUISITION OF PSYCHOLOGICAL CAUSATIVE VERBS OF LANGUAGE LEARNERS: AN ANALYSIS BASED ON COGNITIVE PSYCHOLOGY

Yingrui Fan*

Abstract

The psychological causative verbs are a sub-category of causative verbs that describes the psychological activities of learners. These verbs are widely used in English and thus critical to English language learning. Based on cognitive psychology, this paper explores the variation in the cognitive level of English learners at different learning stages from the perspective of semantic organization and representation of psychological causative verbs. First, twenty typical English causative verbs were selected. Then, a questionnaire survey was carried out on the classification of psychological causative verbs. Moreover, the author conducted an interlingual priming effect experiment on psychological causative verbs between Chinese and English. On this basis, the acquisition of psychological causative verbs was evaluated in three stages, namely, high school, college and graduate school. The results show that the information processing of psychological causative verbs conforms to the development law of Bloom’s cognitive domain model: with the growing number of years of English language learning, the cognitive behavior of causative verbs moves onto a higher stage; interlingual priming effect exists in the cognitive process of psychological causative verbs. The research results provide a valuable guide for English language learners in all stages.

Key words: Cognitive Psychology, Psychological Causative Verbs, Semantic Organization, Semantic Representation.

Received: 12-01-19 | Accepted: 25-07-19

INTRODUCTION

Psychological causative verbs are the linguistic manifestations of the feeling, perception, attitude, emotion, and thinking of human brain in the cognitive objective reality. The use of psychological causative verbs is the key to language expression and language use (Gollob, 1974). The psychological causative verbs are a sub-category of causative verbs; because the English psychological causative verbs are different from the Chinese psychological causative verbs which have explicit structures such as “让” (means “let”), “使” (means “make”) and “令” (means “order”), the expression of English psychological causative verbs has the characteristics of implicit structure, so it causes great difficulties for the domestic English learners in their second language acquisition (SLA) (Willems, Hagoort, & Casasanto, 2010; Wolter, Horowitz, & Kenner, 2005). The study of English psychology causative verbs based on cognitive psychology is a branch of interdisciplinary psycholinguistics. Using experiments to analyze the language information processing procedures in the acquisition process of psychological causative verbs of language learners has become a hotspot in the field of language learning (Redelmeier, 2005).

Domestic researches on English psychological causative verbs have achieved certain primary achievements, the definition of English psychology causative verbs has matured and the classification of English psychology causative verbs has become more and more refined. Researchers have begun to study the acquisition
of psychological words from multiple perspectives such as structure analysis of causative verbs, the semantic attributes, and the acquisition outcomes, etc. According to the positions of the English causative verbs, some scholars investigated the relevance of English proficiency and psychological causative verbs acquisition outcomes through subject experience and object experience; Some scholars used corpus to calculate the learning characteristics of English causative verbs in Chinese English language learners, and the research results show that with the improvement of English proficiency, the correct use rate of psychological causative verbs is improving and the influence of mother tongue transfer is reducing. Although domestic researches on psychological causative verbs have made great progress, there is still a lack of research on the semantic organization and representation of psychological causative verbs using empirical research methods (Granello & Underfer-Babalis, 2004; Deacon, Grose-Fifer, Yang et al., 2004).

Based on cognitive psychology, this paper explores the changes in the cognitive level of English learners at different learning stages from the perspective of semantic organization and representation of psychological causative verbs. The study selects 20 typical English causative verbs, and designs a psychological causative verb classification questionnaire survey experiment and a psychological causative verb interlingual priming effect experiment, through questionnaire survey, it calculates the psychological causative verb acquisition situation in the three stages of high school stage, college stage and graduate school stage and draws related conclusions.

**ENLIGHTENMENT OF COGNITIVE PSYCHOLOGY ON ENGLISH CAUSATIVE VERBS**

**English psychological causative verbs**

Psychological causative verbs are the inner cognitive attitudes of the human brain to objective things or events, such as expect, believe, remember, etc. Each behavioral verb has a matching psychological causative verb, the psychological causative verbs are the inner representation of human heart while the behavioral verbs are the external characteristics, such as say and think (Li, Li, Zhou et al., 2005). The psychological causative verbs are the specific interpretation of cognition and thinking, generally, the psychological causative verbs have polysemic which makes them more difficult to be mastered than ordinary nouns and verbs. Psychological causative verbs are a sub-category of psychological verbs, and they are passive form of the psychological verbs, for example, the two sentences “I like the pizza” and “The pizza pleases me” have the same meaning, and the use of the psychological causative verb “please” makes the syntactic structure present a characteristics of subject-object inversion (Cacciari & Levorato, 2000). English psychological causative verbs have the characteristics of implicit causativity, and Chinese English language learners often face greater difficulties in the learning of English psychological causative verbs.

**Cognitive psychology theory**

**Cognition classification theory**

Figure 1 shows the cognitive domain model proposed by cognitive psychologist Bloom. The model divides the human cognitive process into six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. Each level in the model is an extension of the previous level. Usually, knowledge, comprehension, and application are summarized into the process of convergent thinking, while analysis, synthesis and evaluation belong to the process of divergent thinking (Cheung, Chen, & Yeung, 2009). Bloom’s cognitive domain model has a long-term impact on the teaching and learning process in the world, and it has important guiding significance for linguistic research and second language learning.

**Figure 1. Cognitive domain of Bloom’s taxonomy**
Semantic representation theory of first language and second language

In the second language learning, the semantic representation of the first language (mother tongue) and the second language has always been a controversial topic. At present, psychologists and linguists mainly support the memory storage theory of second-language semantic representations (Gola, 2012). Figure 2 shows the shared bilingual memory storage system model, which believes that for the language learners, when they are studying a second language, it shares the memory system with the mother tongue; the first language and the second language are directly translated in the human brain and stored in the same memory system.

Figure 2 shows the independent bilingual memory storage system model, which believes that during the learning of first language and second language, the learning processes are separated, and the first language and second language have separate memory systems.

The memory system of second language semantic representation influences the cognitive response time of language learners in the learning process, and the independent memory system will make the semantic transformation in the process of language representation take a longer time (Hoskens & Boeck, 2010).

Enlightenment of cognitive psychology on the study of English causative verbs

Cognitive psychology mainly analyzes the psychological process of the human brain in the process of information input and output. Through the analysis of the process, it speculates the psychological characteristics of the human brain in the cognitive process. In the learning process of English causative verbs, the human brain is exploring the internal potential knowledge and ability to achieve the acquisition of the causative verbs (Turner, 2004) (Papafragou, Cassidy, & Gleitman, 2007).

The experimental methods of cognitive psychology for the study of language acquisition include input stimulus control, observation of language processing results, and so on. Semantic organization ability and semantic representation ability are the important language processing results of psychological causative verbs. Observing the changes in semantic organization and semantic representation of language learners is of great significance to study the acquisition of psychological causative verbs from the perspective of cognitive psychology.

Figure 2. Shared bilingual memory storage system model

![Shared bilingual memory storage system model](image1)

Figure 3. Independent bilingual memory storage system model

![Independent bilingual memory storage system model](image2)
EXPERIMENTAL RESEARCH

English psychological causative verbs classification and similarity judgment

Experimental subjects
The experimental subjects selected 50 high school students from a middle school, 50 English major undergraduates and 50 English major postgraduates from a college in Suzhou as the research subjects and divided them into three groups: the high-school student group, the undergraduate group, and the postgraduate group.

Experimental materials
20 typical psychological causative verbs from the American National English Corpus were selected as experimental materials, as shown in Table 1.

Experimental process
(1) Experiment 1: the subjects were asked to classify the 20 psychological causative verbs according to their understanding of the verbs in Table 1, each word can only be classified into one category and cannot be classified repeatedly, and there’s no objective restriction on the number of classification and classification standard.

(2) Experiment 2: the subjects were asked to classify words that are randomly composed of the 20 psychological causative verbs according to the 7-point Likert scale, 7 represents the highest degree of similarity, and 1 represents the lowest degree of similarity.

Analysis and summary of experimental data
The purpose of Experiments 1 and 2 is to study the characteristics of Chinese English learners in the semantic organization of psychological causative verbs. In Experiment 1, the subjects’ classification results of psychological causative verbs are shown in Table 2.

For the high-school student group, the psychological causative verbs were divided into 4, 6, 7, 8 categories mostly, accounting for 64%, with an average of 6 categories; for the undergraduate group, the psychological causative verbs were divided into 5, 6, 7, 8 categories mostly, accounting for 68%, with an average of 7 categories; for the postgraduate group, the psychological causative verbs were divided into 4, 6, 7, 8 categories mostly, accounting for 64%, with an average of 5 categories. It can be seen from the data in the table that, as the level of English learners increases, they tends to simplify the classification and attributes of the English psychological causative verbs, and it’s easier for them to reorganize, summarize, and analyze in terms of semantic organization (Spanoudis & Natsopoulos, 2011; Kittler, Krinsky-Mchale, & Devenny, 2004).

Table 1. English psychological causative verbs

|   | compare | 2. choose | 3. decide | 4. estimate | 5. explain |
|---|---------|-----------|-----------|-------------|------------|
| 6. | figure out | 7. explore | 8. guess | 9. learn | 10. know |
| 11. | memorize | 12. notice | 13. observe | 14. pay attention | 15. plan |
| 16. | question | 17. reason | 18. remember | 19. think | 20. understand |

Table 2. Statistics of subjects’ classification of English psychological causative verbs

| High-school student group | Undergraduate group | Postgraduate group |
|---------------------------|---------------------|--------------------|
| **Type** | **Frequency** | **Ration** | **Type** | **Frequency** | **Ration** | **Type** | **Frequency** | **Ration** |
| 2 | 2 | 4% | 2 | 1 | 2% | 2 | 0 | 0% |
| 3 | 3 | 6% | 3 | 3 | 6% | 3 | 2 | 4% |
| 4 | 6 | 12% | 4 | 5 | 10% | 4 | 5 | 10% |
| 5 | 5 | 10% | 5 | 8 | 16% | 5 | 7 | 14% |
| 6 | 7 | 14% | 6 | 15 | 30% | 6 | 24 | 48% |
| 7 | 7 | 14% | 7 | 5 | 10% | 7 | 6 | 12% |
| 8 | 12 | 24% | 8 | 6 | 12% | 8 | 4 | 8% |
| 9 | 3 | 6% | 9 | 1 | 2% | 9 | 2 | 2% |
| 10 | 2 | 4% | 10 | 4 | 8% | 10 | 0 | 0% |
| 11 | 3 | 6% | 11 | 2 | 0% | 11 | 0 | 0% |
Table 3. Statistical results of the 7-point Likert scale

|                      | 7-point scale value | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
|----------------------|---------------------|----|----|----|----|----|----|----|
|                      | Percentage          |    |    |    |    |    |    |    |
| High-school student  | Percentage          | 28%| 24%| 17%| 14%| 9% | 4% | 4% |
| group                |                     |    |    |    |    |    |    |    |
| Undergraduate group  | Percentage          | 36%| 21%| 13%| 14%| 9% | 5% | 2% |
| Postgraduate group   | Percentage          | 34%| 21%| 16%| 14%| 9% | 4% | 2% |

For the experimental subjects in Experiment 2, their results of the 7-point scale of the psychological causative verbs are shown in Table 3.

For the students in the three groups, their evaluations on the similarity of the phrases composed of English psychological causative verbs are quite similar, more subjects selected 1, 2, 3, 4 (the similarity is not high), indicating that the meanings of the English psychological causative verbs are not easy to be confused.

The evaluation results of the three groups of experimental subjects were separately sorted, and the average value of each phrase was calculated. Using SPSS 17.0, multi-dimensional semantic organization operation and processing was carried out. In the clustering analysis results of the SPSS 17.0 we can find that, for the 20 typical psychological causative verbs, in terms of word attribute and semantic organization, learners of different levels have some differences in their psychological cognitive process and cognitive focuses as shown in Table 4.

Table 4. Differences of psychological causative verbs in cognitive process and cognitive focus

|                      | Cognitive process                                           | Cognitive focus       |
|----------------------|------------------------------------------------------------|-----------------------|
| High-school student  | Attention, Translation, Information processing, semantic relatedness, Attention, Translation | Knowledge and Comprehension |
| student group        |                                                            |                       |
| Undergraduate group  | Information processing, semantic relatedness, Memorization strategy, attention, Translation, Information processing | Analysis and Application |
| Postgraduate group   | Information processing                                     | Synthesis and Evaluation |

For learners of different English levels, in their cognitive process of psychological causative verbs, they have similar cognitive process and their classification of psychological causative verbs mainly includes: comparison-type, evaluation-type, inference-type, knowing-type, and memory-type; while the information processing dimension, the determinacy dimension, and the semantic relatedness dimension are the necessary dimensions for the semantic organization of psychological causative verbs. In cognitive thinking expansion, learners of different English levels have different cognition focuses, high-school students focus on knowledge understanding, undergraduates focus on analysis and application, and postgraduates focus on synthesis and evaluation. In responds to the Bloom’s cognitive domain model (Figure 1), with the improvement of English levels, the cognitive thinking of psychological causative verbs also presents a trend of developing from a lower stage to a higher stage.

English psychology causative verb classification and similarity judgment

Subjects
The subjects are 50 high-school students from a high school, 50 English major undergraduates and 50 English major postgraduates from a college in Suzhou, and they were divided into three groups: high-school student group, undergraduate group, and postgraduate group. In order to exclude the influences of Experiments 1 and 2 on the experimental results of Experiment 3, the students participating in Experiment 3 did not participate in Experiment 1 and Experiment 2.

Experimental materials
Based on 20 typical psychological causative verbs, 40 pairs of semantic correct words (e.g. invent-发明, 发明-invent) and 80 pairs of semantic incorrect words (e.g. invent-选择, 选择-invent, invent-抱怨, 抱怨-invent) were created. The first word in the word pair is the semantic start word and the second word is the semantic target word.
**Experimental process**
During the experiment, the experimental materials were randomly presented to the subjects, the materials were divided into 3 groups and there were 40 word-pairs in each group, the subjects took a 10-min break between the groups. In the experiment, first, a “+” displays on the computer screen for 500ms to remind that the word pairs are about to show up; then the start word shows for 100ms and disappears; at last, the target word displays for 2000ms. Within the 2000ms, the subjects judge the correctness of the translated words by clicking the keyboard (J key represents correct; F key represents wrong).

**Analysis and summary of experimental data**
Figure 3 shows the statistics of the average response time of different-level learners for the semantic correct target phrase and semantic incorrect target phrase in Experiment 3.

**Figure 4. Average response time of semantic correct and incorrect words**

![Figure 4](image)

From the response time in Figure 4 we can see that, regardless of the English level of the subjects, their response time of the semantic incorrect words is longer than that of semantic incorrect words, indicating that in the cognitive process of psychological causative verbs, there is an interlingual priming effect between the English language and the Chinese language.

The presentation method of the word pairs is: English-Chinese, and Chinese-English, through further statistics of the response time it’s found that, when the Chinese word is taken as the target word, the average response time of subjects in each group is longer than that when the English word is taken as the target word, as shown in Figure 5. It indicates that the semantic correctness factor has a major influence in semantic initiation. In the process of language cognition, the human brain effectively memorizes and stores according to the correct semantic relationship.

**Figure 5. Average response time of Chinese target words and English target words**

![Figure 5](image)

**CONCLUSIONS**
As a branch of cognitive psychology, language psychology has played an important role in the study of language learning. The theoretical basis of cognitive psychology has important guiding significance for language learning, especially for the second language learning. From the perspective of cognitive psychology, this paper studied the acquisition of English psychological causative verbs that are difficult for Chinese language learners to master, it used experiments to analyze the psychological causative verbs from different aspects and concluded the experimental results. The main conclusions and significance of this paper are as follows:

(1) From the experiments of psychological causative verb cognition and classification we can see that, language learners of different levels have different cognitive focuses in the classification process and they produce different classification results. In general, the cognitive thinking classification model conforms to the Bloom’s cognitive domain model, and shows a trend of developing from a lower stage to a higher stage.
This paper used experiments to measure the response time of subjects for inter-linguistic psychological causative verbs, and we can see that for the psychological causative verbs, there is an interlingual priming effect in the learners’ cognitive thinking.

From the perspective of cognitive psychology, this paper explores the characteristics existing in the acquisition of psychological causative verbs, which is of certain guiding significance for Chinese English learners to better master the psychological causative verbs.

REFERENCES

Cacciari, C., & Levorato, M. C. (2000). The semantic structure of vision verbs: a psycholinguistic investigation of Italian. *European Journal of Cognitive Psychology, 12*(1), 87-106.

Cheung, H., Chen, H. C., & Yeung, W. (2009). Relations between mental verb and false belief understanding in cantonese-speaking children. *Journal of Experimental Child Psychology, 104*(2), 141-155.

Deacon, D., Grose-Fifer, J., Yang, C. M., Stanick, V., Hewitt, S., & Dynowska, A. (2004). Evidence for a new conceptualization of semantic representation in the left and right cerebral hemispheres. *Cortex, 40*(3), 467-478.

Gola, A. A. H. (2012). Mental verb input for promoting children’s theory of mind: a training study. *Cognitive Development, 27*(1), 64-76.

Gollob, H. F. (1974). The subject-verb-object approach to social cognition. *Psychological Review, 81*(4), 286-321.

Granello, D. H., & Underfer-Babalis, J. (2004). Supervision of group work: a model to increase supervisee cognitive complexity. *The Journal for Specialists in Group Work, 29*(2), 159-173.

Hoskens, M., & Boeck, P. (2010). An implicit theory of intelligence-related mental activities. *Journal of Personality, 59*(4), 793-814.

Kittler, P., Krinsky-Mchale, S. J., & Devenny, D. A. (2004). Semantic and phonological loop effects on verbal working memory in middle-age adults with mental retardation. *American Journal on Mental Retardation, 109*(6), 467-480.

Li, S., Li, W., Zhou, C., & Lim, A. (2005). Research on chinese ellipsis recovering based on discourse representation theory. 17th IEEE International Conference on Tools with Artificial Intelligence, 667-670.

Papafragou, A., Cassidy, K., & Gleitman, L. (2007). When we think about thinking: the acquisition of belief verbs. *Cognition, 105*(1), 125-165.

Redelmeier, D. A. (2005). Improving patient care: the cognitive psychology of missed diagnoses. *Annals of Internal Medicine, 142*(2), 115-120.

Spanoudis, G. C., & Natsopoulos, D. (2011). Memory functioning and mental verbs acquisition in children with specific language impairment. Research in developmental disabilities, 32(6), 2916-2926.

Turner, J. (2004). David r. olson, psychological theory and educational reform. how school remakes mind and society. *Pragmatics & Cognition, 12*(2), 401-404.

Willems, R. M., Hagoort, P., & Casasanto, D. (2010). Body-specific representations of action verbs: neural evidence from right- and left-handers. *Psychological Science, 21*(1), 67-74.

Wolfe, J. M., Horowitz, T. S., & Kenner, N. M. (2005). Cognitive psychology: rare items often missed in visual searches. *Nature, 435*(7041), 439-440.