The Main Determinant of English Sentences Comprehension by Chinese EFL Learners: The Verb or the Construction?

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Abstract

Using the self-paced reading, this paper investigated the role of verbs or constructions when Chinese EFL (English as a Foreign Language) learners try to understand an English sentence. Previous researches on the main determinant in English sentences comprehension had two different views. Healy and Miller (1970) held that the verb is the main determinant of sentence meaning, while Bencini and Goldberg (2000) held that the construction is directly associated with sentence meaning. However, studies from English as a second language may provide a clue of the main determinant of English sentence meaning. The paper classified English resultatives into four types: the Subcategorized Object Resultative, the Non-subcategorized Object Resultative, the Fake Reflexive Resultative and the No Object Resultative. The paper investigated high-level Chinese English learners’ understanding of the English resultative constructions which have the same surface structure but different deep structures (the first three types). The result showed that the acquisition of subcategorized object resultatives is better than non-subcategorized object resultatives. Therefore, this paper argues that although the construction has a suppressing impact on the verb, the basic determinant of English sentences comprehension by Chinese EFL learners is the verb.

Keywords
Self-Paced Reading, Verbs, Constructions, Chinese EFL Learners, English Resultatives, Surface Structure, Deep Structure

1. Introduction

The relationship among the verb, sentence structure and sentence meaning has always been the hot topic of the
sentence processing model in theoretical linguistics and psychological linguistics (Bencini & Goldberg, 2000). Whether the verb or the sentence structure plays a main role in the process of sentence comprehension remains controversial. Generative grammarian Chomsky (1965) emphasized the important role of verb in sentence comprehension since he published *Aspects of the Theory of Syntax* in 1965. However, cognitive linguists like Goldberg (1995) and Langacker (1991) hold that the construction is the pair of form and meaning and suppresses the function of verb. Besides, Bencini and Goldberg (2000) proved that the construction is directly related to the sentence meaning by conducting experiments. Dong and Liang (2004), by introducing three language level parameters (low, middle and high proficiency), conducted another experiment on the basis of the experiment of Bencini and Goldberg (2000) to explore which is the key factor of English sentence comprehension by Chinese EFL learners, the verb or the construction. Their results showed that low level learners tend to rely on the verb to understand English sentences while advanced learners tend to depend on the construction to comprehend English sentences.

As far as the language level parameter is concerned, this paper agrees with the conclusion of Dong and Liang (2004). That is to say, the higher the English level as a foreign language is, the more the learner relies on the construction to comprehend English sentences. In another word, the lower the English level as a foreign language is, the more the learner relies on verb to understand English sentences. However, Dong and Liang’s (2004) study is a comparative one taking language level as the parameter. They did not focus their study on the acquisition of resultative constructions of foreign language learners of English at a particular level. Based on Dong and Liang’s (2004) research, this paper will explore whether foreign language learners of English tend to rely on the verb or the construction to comprehend the sentence if we only investigate the acquisition of English resultative constructions of Chinese high level EFL learners.

2. Research Background

An argument is an expression which helps complete the meaning of a predicate and most predicates take one, two, or three arguments. Traditional argument structure theory holds that the main verb directly determines the form and meaning of the sentence, that is to say, the verb can project its own argument structure. Look at the following example:

1) Pat *gave* Mary a cake.

According to the traditional argument structure theory, the verb gave in this sentence is a three-argument verb and contains the information of transferring a thing from one person to another one. The argument structure of the verb plays an important role in the generation of a sentence. Accordingly, it is also the determinant factor in the comprehension of a sentence. This view of sentence comprehension is also called the verb-centered view.

In contrast to the verb-centered view, construction-centered view, however, emphasizes that the construction plays a central part in sentence comprehension. Goldberg (1995) argues that although the verb in a sentence seems to carry on the most part of syntactic and semantic information, some studies (Fillmore & Kay, 1999; Goldberg, 1995; Jackendoff, 1997; Michaelis & Lambrecht, 1996; Rappaport Hovav & Levin, 1998) showed the verb’s ability to predict the argument structure of the whole sentence is not so strong as what is argued in the traditional theory. The fact the verbs occur in many different argument structures indicates that the sentence meaning is assigned directly to sundry argument construction patterns. Look at the following example:

2) Pat *sneezed* the foam *off the cappuccino*.

Traditional grammar (verb-centered view) holds that “sneeze” is a one-argument verb. However, it is turned into a three-argument verb in this sentence, which is coerced by the construction.

English resultatives belong to the same construction family which means “X causes Y to become Z” and some of them have the same structure but different deep structures. An identifying characteristic of a resultative sentence is an adjective phrase (AP) or a prepositional phrase (PP) that occupies the normal position of a verbal argument which is called the resultative phrase (RP). According to the RP’s part of speech, Collin (1997), Wechsler (2001) and Baker (2003) classified the resultatives into AP Resultatives and PP Resultatives:

3) a) John *pounded* the metal flat. (AP Resultative)

b) John *wiped* the dust *off the table*. (PP Resultative)


4) Intransitive resultatives
a) The pond froze solid. (RP = AP)
b) John flew into a rage. (RP = PP)

5) Transitive resultatives
   a) John painted the house green. (RP = AP)
   b) Jack painted the brush into pieces. (RP = PP)

Then, they subdivided the transitive resultatives into Selected Transitive Resultatives and Unselected Transitive Resultatives according to the direct object is independently selected by the verb or not:

6) Selected transitive resultatives
   a) John painted the house green. (RP = AP)
      (cf. John painted the house.)
   b) Bill cut the bread into pieces. (RP = PP)
      (cf. Bill cut the bread.)

7) Unselected transitive resultatives
   a) Dave drank the pub dry. (RP = AP)
      (cf. *Dave drank the pub.)
   b) Jack painted the brush into pieces. (RP = PP)
      (cf. *Jack painted the brush.)

What is special about unselected transitive resultatives is that they have reflexive objects which cannot alternate with other NPs. They are often called fake reflexives (Simpson, 1983):

8) Fake reflexive resultatives
   a) Jack talked himself hoarse. (RP = AP)
      Unselected: *We yelled ourselves.
      Does not alternate with other NPs: *We yelled Harry hoarse.
   b) Tom drank himself to death. (RP = PP)
      Unselected: *Tom drank himself.
      Does not alternate with other NPs: *Tom drank them to death.

Based on the classification of previous scholars and according to the two new standards, namely whether there is a postverbal noun and whether there is semantic selective relation between the postverbal noun and the verb, this paper classifies the English resultatives into four types:

9) Type 1: Subcategorized object resultatives
   a) John painted the house green. (RP = AP)
   b) Bill cut the bread into pieces. (RP = PP)

10) Type 2: Non-subcategorized object resultatives
    a) Dave drank the pub dry. (RP = AP)
    b) Jack painted the brush into pieces. (RP = PP)

11) Type 3: Fake reflexive resultatives
    a) Jack talked himself hoarse. (RP = AP)
    b) Tom drank himself to death. (RP = PP)

12) Type 4: No object resultatives
    a) The pond froze solid. (RP = AP)
    b) John flew into a rage. (RP = PP)

Based on the above classification, this paper will study the high-level Chinese foreign language learners’ understanding of the first two types of English resultatives which have the same surface structure (both have the postverbal noun) but have different deep structures. The objective of the paper is to investigate the role of the verb and the construction in the process of sentence meaning comprehension.

3. Research Method

3.1 Participants

Fifty-four Chinese English major postgraduates in Beijing International Studies University (43 female, 11 male; mean age 25 years) participated in the experiment. They all passed the Band Eight Examination for English Majors (the highest level of English major tests). Participants were reimbursed for their time.
3.2. Stimuli

150 English sentences were used, composed of 75 resultatives (experimental sentences) which are not created but all found in relevant books and papers and 75 non-resultatives (control sentences). The experimental sentences and the control sentences have the same number of grammar components and the verb frequency of the experimental sentence and the control sentence is similar, as shown in Table 1.

3.3. Procedure

Participants were seated in front of a computer running with the E-Prime software package (Schneider, Eschman, & Zuccolotto, 2002). Participants were timed in a word-by-word self-paced non-cumulative reading task. Stimuli were presented on the computer screen randomly (Ueno & Garnsey, 2008). Each grammar component was presented at the center of the screen at a time and participants pressed the spacebar to reveal each subsequent word of the sentence. Yes/No comprehension questions (expressed by Chinese) were presented after each English sentence and participants pressed one of the two keys on the keyboard to answer them (key 1 stands for Yes and key 2 for No), as illustrated in Figure 1. Before beginning the experiment, participants were given a practice set of 20 sentences, after which they received feedback. Only after the correct rate reaches 85% can participants get into the formal experiment part. The experiment took participants approximately 30 minutes to complete.

4. Results

Analyses were conducted on both question-response accuracy and reading time per word. The paper studies the high level English learners, so the correct rate should be equal to or higher than 80%. Besides, the reaction time should be between 300 ms and 1200 ms which stems from the two extremes’ mean reaction standard. As a result, the data of two participants were excluded from the statistic analysis. According to the correct response rate of each resultative type, the study conducted a repeated analysis of variance among subjects by 2 (without preposition and with preposition) × 4 (Type 1, Type 2, Type 3, Type 4), as indicated in Figure 2.

The statistical analysis shows that the types of resultatives have a significant main effect, \( F(3,153) = 21.82, p < 0.05; \) the main effect of the presence of the preposition is not significant, \( F < 1; \) and the interaction between types of resultatives and the presence of preposition is not significant, \( F < 1. \) Therefore, the correct response rate has nothing to do with the form of the resultative phrase. This paper takes the resultative phrases without preposition as an analysis. As Figure 2 illustrates, the correct rate of subcategorized object resultatives (Type 1) is 92% and that of non-subcategorized object resultatives (Type 2) is 78%. The accuracy rates of these two types with the same surface structure but different deep structures vary considerably. Then, the paper studies the reaction time of the experimental sentence and the control sentence of Type 1 and Type 2 in the process of pace reading.

As for Type 1, the paper conducted repeated analysis of variance within subjects by 2 (resultatives and non-resultatives) × 5 (four grammar component positions and the full stop). The result showed the main effect of grammar components is significant, \( F(4,204) = 47.96, p < 0.05; \) that of resultative types is significant, \( F(1,51) = 6.06, p < 0.05; \) and that of the interaction between grammar components and resultative types is significant, \( F(2,204) = 3.04, p < 0.05. \) The comparison between reaction time of each grammar component in the

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John painted the house green.

Time

Figure 1. The process of presenting a sentence and the question.

Figure 2. The correct rate of different resultative types.

The experimental sentence and in the control sentences indicates that the reaction times of the third position has a significant tendency, \( F(1,51) = 3.78, p = 0.06 \) and the reaction time of the fourth position vary remarkably, \( F(1,51) = 33.15, p < 0.05 \), as illustrated in Figure 3.

As for Type 2, the paper conducted repeated analysis of variance within subjects by 2 (resultatives and non-resultatives) \( \times 5 \) (four grammar component positions and the full stop). The result showed that the main effect of grammar components is significant, \( F(4,204) = 37.63, p < 0.05 \); that of resultative types is significant, \( F(1,51) = 4.18, p < 0.05 \); and that of the interaction between grammar components and resultative types is significant, \( F(2,204) = 9.78, p < 0.05 \). The comparison between reaction times of each grammar component in the experimental sentence and the control sentence indicates that only reaction time of the fourth position vary remarkably, \( F(1,51) = 33.15, p < 0.05 \), as illustrated in Figure 4.

5. Discussion

Resultatives contain a main verb (V) and a secondary predicate called RP, predicating some state that comes about for some participants in the event as a result of the action described by the verb (Beavers, 2012). The form of English resultatives is \( N_1 + V (+N_2) + RP \) while that of Chinese resultatives is \( N_1 + V + RP (+N_2) \). The verb and the RP are split by a noun in English resultatives but not in Chinese resultatives which have the monomorphemic verbs (Zhang, 2009). From the above Figure 3 and Figure 4, it shows that slow reading time at the fourth grammar component position in resultative sentences is due to the different sequences among the verb, the noun and the resultative phrase in English resultatives and Chinese resultatives. The resultatives represent an event composition denoted independently by the verb and the resultative phrase. The whole sentence represents a single and derived eventuality in which there is a semantic relationship between the verb and the resultative phrase. Take the subcategorized object resultative (Type 1) “John painted the house green” as an example. This sentence can be paraphrased as “John painted the house and the house became green”. When participants read the grammar components of the sentence one by one as the time goes, they may think the sentence is over on the appearance of the third grammar component “the house” because the sentence “John painted the house” is a
Figure 3. Mean reading times for each grammar component of Type 1.

Figure 4. Mean reading times for each grammar component of Type 2.

complete grammatical sentence. However, the appearance of the fourth grammar component “green” makes the participants connect it with the former grammar component, that is, the second one, the verb “painted”. On the contrary, the fourth grammar component “today” of the counter control sentence “Boss sprayed the plants today” does not have that kind of semantic relation in resultatives. This leads to a shorter time in comprehending the fourth grammar component in non-resultatives than in resultatives. The same is true for non-subcategorized object resultatives.

The following is the Chinese translations of English resultatives, taking Type 1 as an example:

13) 约翰刷绿了房子。 
   Yuehan shua-lv-le fang-zi
   John paint-green-ASP the-house
   “John painted the house green.”

It is indicated in 13) that the verb and the resultative phrase are closer in Chinese resultatives than in English resultatives. This situation is also true for Type 2.

The different sequence of the verb and the resultative phrase in English resultatives and Chinese resultatives results in the similar time reaction models in Figure 3 and Figure 4, which shows that participants have a similar cognitive model of Type 1 and Type 2 with the same surface structure but different deep structures. However, although the time reaction model of Type 1 is similar to that of Type 2, they have considerably different correct rates (the accuracy rate of Type 1 is 92% and that of Type 2 is 78%). That is to say, the similar cognitive model does not bring about a similar sentence comprehension. What causes the accuracy rate different? Goldberg and Jackendoff (2004) put forward a hypothesis called Full Argument Realization (FAR) stated as “All of the arguments obligatorily licensed by the verb and all of the syntactic arguments licensed by the construction must be simultaneously realized in the syntax, sharing syntactic positions if necessary in order to achieve well-formedness”. According to Goldberg and Jackendoff (2004), a resultative sentence contains two separable subevents, one is the Verbal Subevent and the other is the Constructional Subevent.

14) Subcategorized object resultatives
   John painted the house green.
   Constructional subevent: Agent: John; Patient: the house; Predicate: green.
   Verbal subevent: Agent: John; Patient: the house.

The two arguments of the verb must appear in the syntax in 14) demanded by FAR. The constructional subevent has three arguments: an agent, a patient and a predicate and all of these syntactic positions must be realized by FAR. Therefore, there are five arguments to be mapped into only three syntactic positions. Full argu-
ment realization permits two arguments to be shared. “John painted the house green” can be paraphrased as:

15) John painted the house, and the house became green.

It is concluded that subcategorized object resultatives definitely conform to the definition of resultatives that an action acts on one object and then makes the object change its state. Therefore, Type 1 is the prototypical one in which the postverbal noun is the patient of the causing event and the subject of the caused event and also the postverbal noun is a real object.

However, non-subcategorized object resultatives are another situation.

16) Non-subcategorized object resultatives

Dave drank the pub dry.

Constructional subevent: Agent: Dave; Patient: the pub; Predicate: dry.

Verbal subevent: Agent: Dave; Patient: implicit.

In the Type 2 case, the patient of the constructional subevent differs from that of the verbal one. It shows that the sentence only expresses the patient of the construction and that of the verb is implicit. Here it proves that arguments of the construction can suppress those of the verb. That is to say, “the pub” is not the patient of the verb “drink”, it cannot be grammatical to say “Dave drank the pub”. The constructional patient “the pub” does not bear the directness of a real object, so “the pub” is a fake object that takes up the object position as illustrated in 17):

17) *Dave drank the pub, and the pub became dry.

The verb “drink” can be transitive or intransitive. Here “drink” acts as a transitive verb. The patient of “drink” should be something can be drunk such as beverages, water, wine, and so on. We cannot say “drink the pub”, so 17) is ungrammatical. However, the sentence becomes grammatical when it is added a second predicate or a phrase resultative at the end of the sentence. Therefore, sentence “Dave drank the pub dry” is permitted. During the process of expressing the resultatives which consist of the causing event and the caused event, people tend to profile the latter one (Wang, 2009). The speaker focuses on conveying the caused information “the pub was dry” through the cognitive system in which people tend to profile the latter caused event than the former causing event.

The patient of the causing event of Type 2 is implicit and the object position is occupied by the subject of the caused event. When participants read the grammar components of the Type 2 sentence one by one as the time goes, they may think the sentence is ungrammatical on the appearance of the third grammar component “the pub” because the sentence “Dave drank the pub” is an ungrammatical sentence. Although the appearance of the fourth grammar component “dry” makes the sentence grammatical, it makes participants find it more difficult to comprehend the Type 2 sentence than the Type 1 sentence.

There is another case of Type 2 in which the object position is not taken up by a patient. The case is when the verb is intransitive:

18) Mary ran her feet sore.

Constructional subevent: Agent: Mary; Patient: her feet; Predicate: sore.

Verbal subevent: Agent: Mary.

If the verb is intransitive, for instance “run”, there is no patient in the verbal event but the object position is still occupied by a fake object, which violates the syntactic argument structure. Participants need to mediate and integrate the semantic relations among the verb “run”, the postverbal noun “feet” and the resultative phrase “sore”. Constructions have a suppressing impact on verbs, which makes the sentence acceptable and grammatical, but it makes more difficult for participants to understand these types of sentences.

Here it is necessary to talk about Chinese resultatives, given that the questions of the stimuli are Chinese and the participants are Chinese EFL learners. Fake objects do exist in Chinese resultatives, but it is another thing in Chinese. The transitivity of the Chinese resultatives (V + RP) does not follow from the transitivity of the verb (Huang & Lin, 1992).

19) a) The verb is transitive and the resultative is transitive

约翰刷绿了房子。

Yuehan shua-lv-le fang-zi

“John paint-green-ASP the-house

b) The verb is intransitive and the resultative is transitive

玛丽跑疼了她的脚。
Mali pao-teng-le ta-de-jiao
Mary run-sore-ASP her-feet
“Mary ran her feet sore.”

c) The verb is transitive or intransitive and the resultative is transitive
大卫喝干了酒吧。
Dave drink-dry-ASP the-pub
“Dave drank the pub dry.”

From the above, it is concluded that Chinese resultatives (the verb + the resultative phrase) are always transitive no matter what the transitivity of the verb is, which is different from English resultatives. Therefore, the correct response rate to the English sentence meaning comprehension questions is not affected by the fact that the questions are expressed by Chinese resultatives.

6. Conclusion
From the constructional view of grammar, Goldberg and Jackendoff (2004) classified resultatives whose object position is taken up as transitive resultatives no matter what the transitivity of the verb is. However, the experimental result shows that advanced Chinese EFL learners have different acquisition levels for English resultatives with the same surface structure but different deep structures. Participants have a better understanding of the subcategorized object resultatives than that of the non-subcategorized object resultatives, and these two types of resultatives are both called as transitive resultatives by Goldberg and Jackendoff (2004). Therefore, it is reasonable in this paper to classify English resultatives into and name them as the following four types: the subcategorized object resultatives, the non-subcategorized object resultative, fake reflexive resultatives and no object resultatives.

The fact that the fake object does exist in English resultatives makes participants have a worse comprehension of non-subcategorized object resultatives than that of subcategorized object resultatives. Therefore, it is concluded that the verb is the main determinant of English sentence meaning.

Moreover, from the aspect of pedagogy, Chinese English-teachers need to introduce the construction concept to students. Making them realize that the construction is the pair of form and meaning and the construction has a suppressing function to the verb. And by this way, it can help Chinese English-language-learning students improve the acquisition of the non-subcategorized object resultatives.

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