

Retraction

Retracted: Processing of the Conceptual Semantics of Verbs and Clauses in English Learners under the Background of Wireless Communication and Artificial Intelligence

Scientific Programming

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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- [1] J. Mao, "Processing of the Conceptual Semantics of Verbs and Clauses in English Learners under the Background of Wireless Communication and Artificial Intelligence," *Scientific Programming*, vol. 2022, Article ID 4848829, 8 pages, 2022.

Research Article

Processing of the Conceptual Semantics of Verbs and Clauses in English Learners under the Background of Wireless Communication and Artificial Intelligence

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The development of wireless communication and artificial intelligence decision-making has allowed our scientific research to be carried out on a more convenient and precise basis. This kind of all-round progress is also very obvious in the field of linguistic research. The research presented to explain the observation that people may use one of the alternate clauses to describe the picture they see. This linguistic observation leads us to the assumption that there may exist a functional cortex connecting visual information of an event with a group of corresponding clauses. Between the visual information and a group of clauses can be understood as a shared conceptual content of both. It is well supported by the PET and the ERP experiments. In other words, if a group of alternate clauses are connected with the same visual information, they are said to have the same conceptual content. In our linguistic model, this shared conceptual content is represented as a conceptual frame. In most linguistic studies, however, alternate syntactic structures are said to be derived from different meanings of the same verb via different argument structures. The difference between the conceptual frame and its corresponding argument structures needs more substantial evidence from brain imaging for the plausibility of conceptual frame. To answer this question, we attempt to investigate the relationship between a group of alternate clauses and two different pictures via priming effect manifested by an ERP component. Also, we make full use of wireless communication and artificial intelligence decision-making technology to construct. This technical background allows this research to fully simulate the practical environment while also making more assumptions about uncertainty. In the clause-picture priming experiment, clauses are treated as prime stimuli, designated as S1. The pictures are treated as target stimuli, designated as S2. One picture is conceptually congruent with all the clauses, and the other is not. The ERP component N270 is expected to be sensitive to the degree to which the S2 (the target stimulus) is in agreement with S1 (stimulus). After many simulation experiments, the experimental framework of wireless communication and artificial intelligence decision-making technology architecture provides a lot of reference data for research. The results of the experiment show that the semantics of each individual clause of an event was consistent with the semantics of its following congruent picture but inconsistent with that of the incongruent picture. Therefore, each clause of an event, though has different grammatical structures, shares the same semantics. This shared semantics is understood as the conceptual frame.

1. Introduction

1.1. Theoretical Background. In the contemporary era of rapid development of wireless communication and artificial intelligence decision-making technology, people have more ways to verify academic disputes and hypotheses [1]. Even the linguistics belonging to the language of social sciences can solve many problems with this progress. The relationship between meaning and expression (linguistic structure)

is the focus of the contemporary linguistic theories. Many theoretical approaches and descriptive methodologies have been applied to research the problems of form-meaning relation. Case Grammar by Fillmore suggests that each semantic role defines a natural class of arguments, with members of this natural class usually having a common semantic relation to their verbs and sharing options for their morphosyntactic expression [2]. Levin's Lexical Semantics holds that verbs can be classified according to their shared

event structures and syntactic structures are projected from verb's lexical semantics; that is to say, lexical semantics determines syntactic structures. The formal semanticists employ true value to deal with the relation between intentionality of a clause and the lexical meaning.

These models study the form-meaning relation from different perspectives, with each having its advantages and disadvantages in theories and applications. However, they all fail to explore systematically the conceptual meaning (conceptual content) relevant to form-meaning relation [3]. Cognitive linguistics holds a new perspective to language study. It is based on human experience of the world and the way we perceive and conceptualize it. The proclaiming of cognitive linguistics is that the language is part of cognition and that linguistic investigation contributes to understanding the human mind [4]. Verbs play a very important role in various language systems. Research in this field has also achieved outstanding results. But looking at the existing research results, there are few research projects carried out in the context of wireless communication technology. Therefore, this paper can be said to fill the gap in this field and also open up new ideas for the study of verb usage.

1.2. The Proposal of Conceptual Frame. Wireless communication and artificial intelligence decision-making have created a new application field of language cognition, enabling it to explore the cognitive laws of human language in a broader field. Under the guidance of cognitive linguistics, the cognitive functional model emphasizes the encyclopedic knowledge stored in the human brain and the inseparability of such encyclopedic knowledge with the lexical meaning of verbs. Thus, the use and understanding of verbs would produce a schematic effect; that is to say, the mental processing of the meaning of a verb would make use of the relevant schema in the brain, which is composed of encyclopedic knowledge. Also, this model is based on the known facts of language system that the perceptual locomotor system is connected with the linguistic expression system. The connective part is called conceptual meaning system, which is a kind of schema [5].

In the cognitive functional model, the conceptual content is mainly a conceptual semantic system that connects lexical grammar and sensory-motor system. The researcher of the brain believes that the form of the white matter means the maturity of the brain. According to the period that white matter forms and to the biological principle, the form and development of all the functional areas in the language system start from the sensory-motor primary functional area. Therefore, the conceptual semantics of language system must connect both sensory-motor system and language expression system. Accordingly, the language system must be the form-meaning relation system of conceptual content and language expression [6]. The conceptual content could not only activate lexical grammar and output language but also understand signals after being activated by the input of sensory signals. Also, the conceptual content can command the motion of body parts by activating and outputting motor signals (see Figure 1).

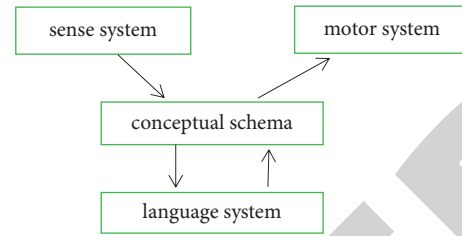


FIGURE 1: The connecting relation of conceptual schema.

In the cognitive functional model, the notion of conceptual frame is introduced. A conceptual frame is the “formal representation of the conceptual content of clauses” and connects with the linguistic expression to form semiotic relationship [7, 8]. The cognitive significance of conceptual frame is its semiotic relationship, i.e., its representational relation with grammatical structure and its operational feasibility. It is not against the physiological feasibility.

Why do we need to set up a conceptual frame? The cognitive functional model believes that the conceptual content and grammatical semantics should be represented as two different mechanisms: conceptual frame and argument structure [9–12]. For example:

- (a) Someone poured the oil into the fish tank.
- (b) The oil was poured into the fish tank by someone.

These two clauses have identical conceptual content: “someone” takes the action “pour” and makes “oil” go into the “tank”. Although these two clauses have the shared conceptual content, they are construed into two different argument structures. Consequently, two argument structures and a group of conceptual contents are not one-to-one correspondent. The object in the first clause is “fish tank”, while the object in the second clause is “oil”, so the conceptual content and grammatical semantics should be separately represented as the conceptual frame and the argument structure [1, 13]. Therefore, on account of conceptual frame, the argument structure could wholly express grammatical semantics, and the conceptual semantics could be expressed by the conceptual frame.

1.3. Objective of This Paper. Many research projects have theoretically proved that the conceptual frame is a set of language experience and knowledge and it is also a connection between language system and perceptual locomotor system. However, the results of these research projects need more neuroscientific evidence, so this study did an event-related potential (ERP) experiment. The experiment can be carried out from the perspective of choice science, and also owing to the high development of wireless communication network and artificial intelligence decision-making technology, we can simulate more neuronal responses in the experiment and increase the number of samples tested [14, 15]; in which verbs of the putting event and the sending-and-carrying event are chosen as corpus. The ERP experiment is to prove that there is a shared conceptual content among all the alternate clauses in an event, and this conceptual content is understood as a conceptual frame [16, 17].

1.4. Outline of This Paper. This paper is divided into four parts. Part one is a brief introduction on the theoretical background, the proposal of conceptual frame, and the definition of relevant terms. Part two is the literature review, which is divided into two sections: the theoretical study of the frame (including frame semantics, cognitive grammar, and conceptual frame) and the experimental research of the frame. The significance and limitations in their theories and applications are also discussed. Part three gives detailed information about the experimental research in this thesis [18, 19]. It introduces the subjects participating in the experiment, the stimulus materials, the procedure of the experiment, the data analysis, the results, and the discussion. At last, Part four draws a conclusion to this paper (Figure 2).

2. Literature Review

2.1. Theoretical Study of Frame

2.1.1. Frame Semantics. Frame semantics is a semantic theoretical model advocated by Fillmore. The representation form of frame semantics is the “frame”, which expresses the relation between language and experience and between language and knowledge structure. The knowledge structure (frame) of a word is the conceptual knowledge evoked when that word is being understood. Like other theoretical models in cognitive linguistic [20, 21], frame semantics focuses on language in use, form-meaning relation, conceptual semantic meaning, continuous relation between language and experience, and the gestalt psychological unity. Frame semantics is a sort of semantics of understanding. It believes that the abstract meaning in dictionary is not enough for understanding the language, and the reader or listener also needs his semantic frame. The semantic frame in understanding language is a set of rich encyclopedic knowledge.

Especially in the era of rapid development of wireless communication and artificial intelligence decision-making technology at this stage, the coverage of the semantic framework has been greatly expanded. The semantic frame can represent word, clause, and text. To understand a certain word needs to understand its background knowledge [22, 23]. This background knowledge is known as semantic frame. This frame can express different cultural background knowledge that could not be found in a dictionary book. For example:

- (a) John gave a diamond ring to Mary.
- (b) A diamond ring was sent to Mary by John.

The verbs in these clauses are different, but their clauses all highlight the giving frame: someone gives someone something, so these clauses share the same giving frame [24]. Also, the semantic frame can deal with the relevant frame that evoked in text concept. For example, “after picking some apples and putting four bottles of apple juice in the shopping basket, Lily went to the cashier’s and paid for her items”. In this sentence, the events “picking some apples”, “putting four bottles of apple juice in the shopping basket”, “went to the cashier’s”, and “paid for her items” have no interconnection, but they have a shared frame semantic

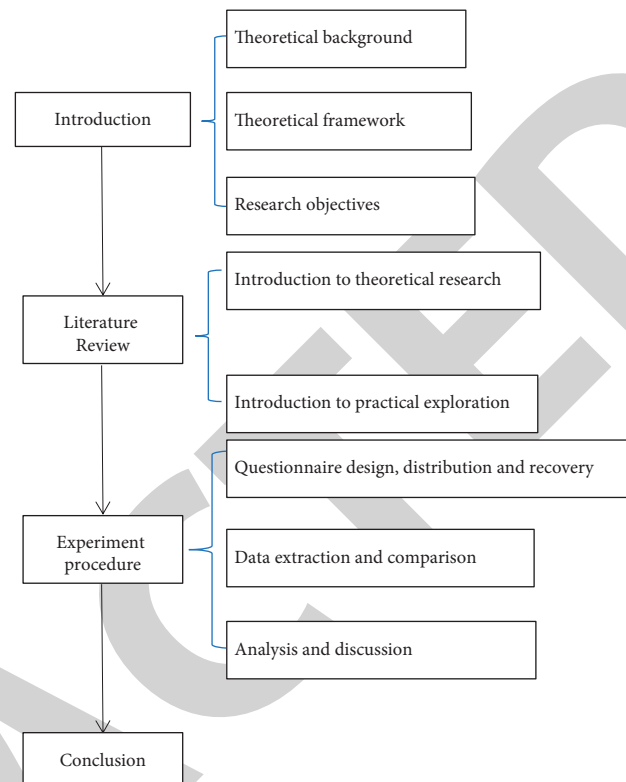


FIGURE 2: Research flowchart.

meaning “shopping”. In another word, “shopping”, as a semantic frame, contains these events [25]. These above events are coherent because they can evoke the same frame semantics together and be connected into a gestalt.

However, compared with the cognitive functional model, Fillmore pays more attention to the relation between the verb frame and the clause. But the cognitive functional model focuses on the types of basic concept structures within the frame and the different superposition relation between these types. So, the expressions of inner structures of the frame semantics and conceptual frame are different [26]. The conceptual frame can properly represent the operation process when understanding and expressing clauses and can represent the cognitive operation process when obtaining conceptual semantic meaning. But Fillmore did not care about these issues.

2.1.2. Cognitive Grammar. Langacker’s Cognitive Grammar (1987) believes that there is no truth in the objective world. The truth of the world is the inner mind’s cognition on the objective world. The world knowledge is a kind of conceptual content that is formed through language. Langacker puts forward “domain” and emphasizes the unsymmetrical relation between the prominent ingredient and its background. The ingredient is the direct conceptual semantics of the concrete language, and the background is the background knowledge used to understand the language.

Langacker’s Cognitive Grammar focuses on the feature of language that can express identical (or similar) conceptual content differently according to different images and from

different perspectives. For example, if there is a broken toy, we can use different grammatical structures to construe the same conceptual content, so we can say:

- (a) He broke the toy.
- (b) The toy was broken by him.

These different expressions are different construals of the same conceptual content (toy + broken).

The “conceptual frame” and the “domain” in Langacker’s Cognitive Grammar both emphasize the gestalt encyclopedic knowledge. They both indicate there is a gestalt unity in humans’ memory. But the conceptual frame emphasizes that the gestalt unity could be dissolved, and it contains inner structure. However, Langacker focuses on the unsymmetrical relation between the prominent ingredient and its background.

2.2. Relevant Experimental Research on Frame. There are also experimental research projects on the frame. These research projects usually apply the priming effect model to study conceptual semantics. The current research projects are mainly related to words (verbs, nouns) that have shared conceptual semantics.

2.2.1. Priming Effect. The priming effect was found by Meyer and Schvaneveldt (1974). The theoretical foundation of priming effect is the “Semantic Spreading Activation Model” (Collins and Loftus, 1975), which holds the view that the conceptual system is organized in the form of network, and this network is connected according to different semantic binding intensities between conceptual systems. The distance in the network between the concepts that have distinct binding intensities is different. In the semantic network, when a certain concept is activated, and as the activation being spread, its neighboring concepts will be activated then. So, when the concepts appear again, the weights of recognition will be reduced, and the priming effect will appear. Priming is an effect that “prime” speeds up the cognition of “target”.

2.2.2. Behavioral Measures. In Liu’s (2005) experiment, he studies the binding intensity between conceptual semantics of words in the brain. The experimental material contains 36 pairs of English words. In each pair, the first word is the priming stimulus, and the second is the target stimulus. In the experiment, 18 pairs of words are semantically related, for example, “grass-flower”; while other 18 pairs have no semantic association, for example, “sky-hair”. The result of the experiment shows that when the prime stimulus and target stimulus are semantically related, the target stimulus has a prominent semantic priming effect. Consequently, this result gives evidence that the priming words and target words that are semantically related have identical conceptual content. Words that are semantically related are under the same frame.

According to Collins and Loftus’s Semantic Spreading Activation Model (1975), this priming effect in this

experiment could have such explanation: the priming stimulus activates the subjects’ semantic concept, and the activated semantic features spread around automatically. The spreading makes the relevant concepts be activated. This procedure promotes the operation and reaction of the target stimulus.

2.2.3. Electrophysiological Investigations. On the basis of behavioral research, many studies have done neuro-experiments to exam the binding intensity between conceptual semantics of words in the brain. In ERP studies, most of the experiments use pictures as stimuli or targets. In a relatedness judgment task using pairs of line-drawing pictures and words, Barrett and Rugg (1990) examined the semantic relatedness between words and pictures. It gave evidence that words do have schema in our brain, and related words belonging to the same categories are under the same schema.

In Marc E. Pratarelli’s (1994) research, he studied the semantic processing of pictures and spoken words by using the ERP technology. In his experiment, semantic associations between pictures and their verbal referents were assessed in ERP experiments where pictures and words acted both as primes and targets. ERPs were recorded from 20 adults. According to the result, the common later peak activity elicited by pictures and words reflected the processing of a single common semantic processor of the pictures and words. This study gave evidence that the picture and its related spoken words have the shared conceptual semantics.

ERPs have also been examined to pictures in sentence contexts (Nigam et al., 1992) using the anomalous sentence task in which the N400 was originally observed (Kutas and Hillyard, 1984). In these studies, the final word of each sentence was replaced with a line drawing of the corresponding object. The result showed that incongruous pictures generated a larger ERP wave at 400 ms than congruous final pictures.

In the above ERP studies, the target picture can be treated as a representation of the image schema in our brain. In the experiment, if the content of the pictures are identical with the semantic meaning of the related words or sentences, those words and sentences could be taken as under the same image schema.

3. Experimental Research

3.1. Question Proposed. The guiding hypothesis of this work is that in the technical background of wireless communication and artificial intelligence decision-making, a certain conceptual web connects both visual information of an event and a group of corresponding clauses. This interconnectivity between the visual information and a clause may be understood as the shared semantics of both. If a group of clauses are all connected with the same visual information, those clauses are theoretically said to have the same semantics. In linguistic studies, however, clauses of the same group may often be classified into different semantic structures. This paper will argue with an ERP experiment

that the shared semantics is understood as a conceptual frame that can be connected with different linguistic semantic structures realized by different grammatical structures.

3.2. N270. N270 is one of the negative ERP components found and named by a Chinese scholar, Wang (2000), in a S1-S2 matching task. When S1 is compared with S2 and their information is conflict, N270 could be recorded 270 ms after S2 appears. In Wang's research, a line-drawing picture (S1) was followed by another stimulus (S2). S2 was either the same picture as S1 or a reversed picture of S1. He observed a component that peaked at about 270 ms on the anterolateral scalp that was more negative to the reversed picture than the same picture. Wang suggested that no matter what the type of stimulus it was, N270 could be elicited when the conflict between information compared. N270 reflects the brain's processing of conflicts.

A frontally distributed ERP component peaked at around 300 ms is also found in Barrett and Rugg's (1990) study. A similar observation was made in the word-picture priming experiment by Kutas and Hillyard (1984). On the one hand, picture-picture information conflict could elicit an N270, and on the other hand, visual semantic processing of pictures is similar with verbal semantic processing (Pratarelli, 1994; Vandenberghe, 1996). Therefore, we assumed if a group of alternate clauses, though classified as different argument structures, have the same conceptual content or conceptual frame as we propose, then the ERP component of the primed target picture may also be sensitive to the congruency. To be more specific, the picture incongruent with the alternate clauses may elicit more negative N270 than the congruent one. Our priming experiment will investigate the possible N270 component in a clause-picture priming task. So, we assumed the sentence-picture information conflict in our work could also elicit an N270.

3.3. Research Approach. The aim of our study is to give evidence that a group of clauses that realized by different grammatical structures but connected with the same visual information have shared semantics. For example, in a sending event, the clauses "I give a pen to him" and "I give him a pen" are supposed to have shared semantics, although they have distinct grammatical structures.

In our study, we chose two events (sending-and-carrying event and putting event) as the experimental materials. In each event, we also chose a group of clauses and two pictures. One picture's semantics matched with the meaning of the event (Figure 3), and the other did not (Figure 4). We assumed: if semantics of each clause in a group was consistent with Figure 3, but inconsistent with Figure 4, we can say that this group of clauses in an event have shared semantics that are connected by a certain conceptual web.

In the experiment, the clause was chosen as the first stimulus (S1). It was followed by the second stimulus S2. S2 was a picture, and its information was related to S1 in Condition 1 and unrelated to S1 in Condition 2. We measured the ERP amplitudes and utilized repeated-



FIGURE 3: Clause test chart.



FIGURE 4: Clause test chart.

measures analysis of variance (ANOVA) with two factors: condition with two levels (related and unrelated) and clause with four levels (four clauses in a group) to compute the main effect of condition and clause.

Because of the sentence-picture conflict, we predicted that (1) S2 in Condition 2 would elicit a more negative N270 than S2 in Condition 1 and the main effect of condition would be significant and (2) the main effect of clause would not be significant. The prediction of the result also means the semantics of each clause in one event was consistent with the meaning of the related picture and inconsistent with that of the unrelated picture. So, it would give evidence that a group of clauses in one event share the same semantics.

3.4. Experimental Research

3.4.1. Participants. Twenty Chinese graduates of Shanghai University (10 females, 10 males) between the ages of 22–24 participated in the study.

3.4.2. Stimulus Materials. We used two groups of four acceptable alternate clauses of Chinese as S1 and two pictures in two conditions: Condition 1 (semantically congruent with S1) and Condition 2 (semantically incongruent with S1). In order to ensure clauses of S1 semantically congruent with S2 in Condition 1, we designed a matching quiz. 30 graduates were asked to complete the quiz in which they were asked to

make a judgment whether the clause was congruent with the picture. Only those clauses judged to be congruent by 70% or more participants were chosen as our materials.

The alternate clauses used as S1 are the ones with the same verb, similar meaning, and different syntactic structures. The following four Chinese clauses all containing the same verb *song* (give), for instance, have the similar meaning that the teacher gave a book to him.

Lao-shi song ben shu gei ta.
 Teacher give copy book to her.
 Lao-shi song gei ta yi ben shu.
 Teacher give to her one copy book.
 Lao-shi ba shu song gei ta.
 Teacher ba-marker book give to her.
 Lao-shi song ta yi ben shu.
 Teacher give her one copy book.

The two pictures taken as S2 contain the same three participants as the clauses do. The three participants are the teacher, she, and book (see Figures 3 and 4). The alternate clauses are congruent with Figure 3 and incongruent with Figure 4.

To ensure there was enough number of stimuli, our materials were tripled. Finally, 90 stimuli in each condition were formed.

3.4.3. Procedure and ERP Recording. A single trial included a focal point (+) in the center of the screen for 500 ms, a blank screen for 200 ms, S1 for 1300 ms, and another blank screen for 500 ms. S2 was presented until the participants pressed the key to make a choice on whether the picture was congruent or incongruent with the previous sentence. After the response, another blank for 400 ms was presented. To observe the different effects of congruent and incongruent S2, we obtained two different waves: wave of Condition 1 (congruent) and wave of Condition 2 (incongruent). The amplitude data of different waves were compared using a within-subject repeated-measures analysis of variance (ANOVA). The factors were conditions with two levels (related and unrelated) and clauses with four levels (four clauses in each event). We examined their respective main effect.

3.5. Results

3.5.1. Behavior Data. A within-subject repeated-measures analysis of variance (ANOVA) was conducted on the RT data with the condition as a within-subject factor. The mean RTs of S2 in Condition 1 and Condition 2 were 628 ms and 696 ms, respectively. The main effect of condition was significant ($F(1,38) = 4.758$ $p = .042 < .05$). It indicated that the differences of reaction time between S2 in Condition 1 and Condition 2 were significant.

3.5.2. ERP Data. The ERPs in the two conditions are very similar in the first 200 ms after the onset of S2: a negative component (N100) is visible followed by a positive component (P200). This is consistent with previous studies presenting picture stimuli visually (Wang, 2000). In this experiment, our primacy interest is in the subsequent negative component and its sensitivity to information conflict. In the time window of 200–350 ms, a negative component peaks at about 270 ms after the onset of S2 and has broad scalp distribution with the effect observable in central and anterior regions. Visualization of the difference is aided by the examination of the different waveforms that were produced by subtracting the ERPs for related pictures from the ERPs for unrelated pictures and the examination of voltage maps. N270 is followed by a long negative wave in the time window of 370–560 ms, which we consider as N400. But no significant differences in amplitude are found among two conditions in this time window.

The distribution of N270 is on the central and anterior regions. The amplitudes are more negative on the left anterior and left central regions than the right anterior and right central regions.

In our statistical analyses, we utilized a within-subject repeated-measures ANOVA containing two factors: condition with two levels (related and unrelated) and type with two levels (sending verb and putting verb) to examine the mean ERP amplitudes within a time window of 230–310 ms. We observed from ERP waves and ANOVA results (see Table 1) that the mean amplitudes of the unrelated picture were more negative than that of the related picture in the anterior region and central region, but not in the posterior region. Also, we observed from Table 2 that the main effect of type was significant. Type 1 and Type 2 were different in the anterior region and central region, but not in the posterior region.

Comparing the topography of stimuli in two conditions, we can see that N270 is distributed in the central and anterior regions, and its amplitude enhances (more negative) on the left anterior and left central regions than the right anterior and right central regions.

Viewing the result of second ANOVA (Table 2) within each type, no significant main effect was found among four variants at all electrodes.

3.6. Discussion. No matter what type of stimulus it was, N270 could be elicited when the target stimulus is incongruent (Wang, 2000). N270 could also be elicited in our clause-picture experiment. Since both pictures and clauses have the same participants, N270 has nothing to do with the participants. The syntactic difference is also insignificant.

Our study set out to exam the sentence-picture conflict. We examined the ERP effects elicited during semantic processing of pictures in a task. Our task chose two sorts of verbs (Sort 1: sending-and-carrying verb; Sort 2: putting verb), and each sort contained four verbs. We measured the ERP amplitudes and utilized repeated-measures ANOVA to compute the main effect of condition and clause. Viewing the ANOVA and ERP waveforms, we observed the main

TABLE 1: The N270 ANOVA results of **condition**'s main effect.

Site	F (1, 38)	Sig
F3/F4, FZ, FC3/FC4, FCZ, C3/C4, CZ	14.777	0.001

TABLE 2: The N270 ANOVA results of **clause**'s main effect.

Site	F (1, 38)	Sig
F3/F4, FZ, FC3/FC4, FCZ, C3/C4, CZ	0.979	0.409

effect of condition was significant. Incongruent pictures elicited a significantly more negative N270 than congruent pictures. This indicated that the semantics of all the clauses in one group of an event was consistent with the semantics of its following congruent picture, but inconsistent with that of the incongruent picture.

They are supposed to be such a situation that one of the four variants did not share the same schema with others, and its following S2 in Condition 1 and Condition 2 turned out to be both unrelated to S1; that is, the N270 of the two conditions were of no significant difference. But as we treated the four variants as a whole in the first ANOVA, its result was very likely to be averaged by the others, and thus this variant might wrongly be treated as sharing the same schema as other three variants. So, in order to avoid this situation and to prove the semantics of each individual clause in this group was consistent with the semantics of the congruent picture, we had another ANOVA that measures the main effect of clause (4 levels). The result of the second measurement showed the main effect of clause was insignificant. It proved that there was no significant difference between the effects of each individual clause.

Based on the results of the main effect of condition and clause, we concluded that the semantics of each individual clause of an event was consistent with the semantics of its following congruent picture, but inconsistent with that of the incongruent picture.

4. Conclusion

Many theoretical and descriptive methods have been applied to study the form-meaning relationship from different aspects. These studies have their own strengths in theory and application. However, none of them systematically explore the conceptual meaning (conceptual content) associated with the form-semantic relationship. The rise of contemporary wireless communication and AI decision-making technologies presents a great opportunity for us to integrate the advantages of various experimental models.

Based on cognitive linguistics, this experiment builds an experimental model with the help of wireless communication and artificial intelligence decision-making technology. The randomness of triggering and the intelligence of the results of experimental trigger analysis have been improved. The cognitive function model emphasizes the encyclopedic knowledge stored in the human brain and the inseparability of the encyclopedic knowledge and the meaning of verbs. On the basis of theoretical research, this paper starts to study the

conceptual content of a group of sentences in an event and conducts an ERP experiment, which proves that there is a common conceptual content among all alternative clauses in an event. Placement events and send-and-carry events were selected for this study. Each event consists of four subordinate clauses. Experimental results show that the semantics of each individual clause of an event is consistent with the semantics of its subsequent congruent graphs, but not the semantics of incongruent graphs. Since an image schema is like an abstract image of an event in the brain, the consistent images of the two events chosen in our experiments can be viewed as the image schema for placing the event and sending and carrying the event, respectively. Therefore, each clause of an event that is semantically the same as a congruent picture can be considered to share the same image pattern.

Data Availability

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

It is declared by the authors that this article is free of conflicts of interest.

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