



# Analysis of English-Chinese Interpretation from the Perspective of Cognitive Psychology

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## Abstract

Listening, memorizing, transferring and reproducing are the four basic steps in the process of English- Chinese (E-C thereafter) interpretation. To successfully accomplish the interpretation process, the interpreter should act well through all these steps. This paper separately analyzes the steps of E-C interpretation from the perspective of cognitive psychology. Moreover, the analysis also suits for interpretation between another two languages, and it provides reference and guide for interpreters and learners.

**Key words:** Interpretation; Cognitive psychology; Process

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## INTRODUCTION

Interpretation is an oral communication of transferring one language to its equivalent or approximate equivalent in another language form. Seleskovitch & Lederer, representatives of interpretive theory, once pointed out that the interpreter must go through three stages: comprehension, deverbalization and expression, which means the interpreter not only need to understand the spoken words, but also comprehend the meaning under the words, then express it with straightforward words immediately. From the perspective of communications, interpretation is a process of information reception-

decoding- expressing. However, it is generally accepted that interpretation process is composed of the following four steps: listening, memorizing, transferring and reproducing. In the first step of E-C interpretation, it requires of the interpreter an acute hearing, accurate comprehension on English words. Memorizing step requires instant and active memory, high concentration, focuses on ideas instead of words and essential note-taking. Transferring step requires good command of English and Chinese and logical reorganization of ideas. Reproducing step requires clear and correct mandarin pronunciation and intonation.

Cognitive psychology is a subdiscipline of psychology exploring internal mental processes, including attention, memory, language processing, perception, problem solving and thinking. From the perspective of cognitive psychology, interpretation process of listening-memorizing- transferring- reproducing can also be expressed as information perception- storing in memory-recoding-expression. Separate analysis of the four step of E-C interpretation can also be expanded to the interpretation between another two languages, through which the interpreter can learn about mental processes during interpretation to conduct conscious interpretation and grasp the pattern and effort model, hence enhance the efficiency of interpretation. Moreover, the analysis can also benefit interpreters and learners by adding specialty to their training, and promote interpretation teaching model and its theoretical studies.

## ANALYSIS OF E-C INTERPRETATION FROM THE PERSPECTIVE OF COGNITIVE PSYCHOLOGY

### Information Perception Step

#### Listening and Auditory Perception

Listening, the very beginning of interpretation is a process of information input. Sound information travels down the vestibulocochlear nerve, through intermediate stations being further processed and the information eventually reaches the thalamus, from where it is relayed to the cortex, therefore come into being the auditory sense in the human brain. Auditory perception begins when receptors are activated by stimuli in the environment. Receptors perceive the variation of acoustic wave, and form the auditory sense into meaning with the help of previous experience knowledge. Thus, auditory perception is a combined action of stimuli and previous experience.

Interpreter need to grasp information through numerous and complicated forms of discourse. So 'listen' is an active action which requires of interpreter percept auditory information with high concentration, then analyze them. To be specific, it means tone& pronunciation as well as communicative context should be paid attention to. Being the start step of interpretation, 'listening' lays the foundation for the following three steps and it directly decides the quality of whole interpretation. However, speakers may have various accents, such as London accent with Received Pronunciation, Indian accent with retroflex consonants, Japanese accent with no discrimination between /l/ and /r/. Besides these various accents, speakers' personal pronunciation preference and failure may slow interpreter's listening process. Thus, listening step also involves in comprehension, referred as perceptual process in cognitive psychology to get the meaning of auditory information.

### Comprehension and Perceptual Process

Comprehension is an information decoding process based on auditory sense. According to cognitive psychology, perceptual process is influenced by stimuli in the environment and knowledge of previous experience and it consists of bottom-up and top-down modes of processing. So comprehension demands a mutual operation of both the processing modes.

Bottom-up processing put in motion by the stimulus, and the stimulation triggers a series of events in which electrical signals are transmitted from the receptors toward the brain. When interpreter receive auditory information, first the auditory system confirms all the elements of the spoken sounds, such as vowels, consonants, stresses, pauses and so on. Then all the elements combined to form units of meaning. At last, the brain integrates all the information to comprehend the whole speech. Through bottom-up processing, interpreter converts specific spoken words into his/her own comprehension, during which interpreter discards most original text's expression form. According to Lindsay and Norman, this process also refers as stimulus-driven process (Lindsay & Norman, 1977, pp. 11-14), for such process is automatically invoked by the physical nature of the stimulus. It is obvious that bottom-up processing requires of interpreter a through English knowledge. However, since there are

thousands of polyphonic or polysemous words in English, the interpreter can hardly effectively fulfill the task of comprehension only with bottom-up processing and top-down processing is also necessary.

Top-down processing depends on personal prior knowledge or expectation, and 'control and structure information delivered by input processes' (Gordon, 1989:137). In contrast to stimulus-driven process, Lindsay and Norman named it knowledge-driven process. In interpretation, top-down processing is reflected in the way that the context, topic, culture may determine interpreter's estimation and expectance to the speech. So the interpreter is required to get used to English culture, custom, idiom, slang, etc. With this knowledge, interpreter can forecast the speaker's idea even before the speech. What's more, top-down processing helps interpreter to comprehend the spoken words effectively and accurately. However, top-down processing alone cannot come to the meaning, because without the stimulus of specific auditory information, interpreter may be lost in speculation or delusion. Bottom-up processing and top-down processing are of opposite directions, which should be combined to form an integrated comprehension process in practical interpretation. Here, the listening step of E-C interpretation is accomplished.

### Information Storing Step

The step of storing the auditory information in memory is important and inevitable in the process of E-C interpretation because the interpreter can only hear the whole speech for once and has to interpret it immediately. According to cognitive psychology, there are three major structural features of memory, which are sensory memory, short-term memory (STM) and long-term memory (LTM). Sensory memory is the retention of the effects of sensory stimulation that holds all incoming information for seconds or fractions of a second. STM is the system storing small amounts of information for about 15-30 seconds, which also involved in the transfer of information to and from LTM. LTM is the system that is responsible for storing information and it covers a span for years or even decades. A modal model of memory (Fig.1) was proposed by Richard Atkinson and Richard Shiffrin in the 1960s. Atkinson and Shiffrin described that when sensory memory stimulated by the information, some information can be remembered and stored in STM while others be forgotten, and some information of STM can be turned into LTM after rehearsal.

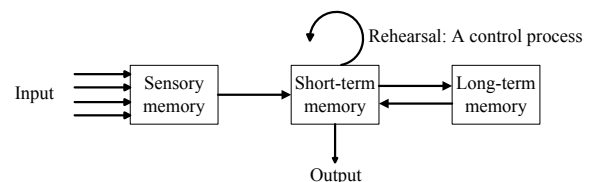


Figure 1  
Modal Model of Memory

In the process of E-C interpretation, the main function forms of memory are sensory memory and STM. When the interpreter hears the auditory information, the stimulated receptors deliver the information to sensory memory. Through sensory memory has a limited capacity to store information, it provides interpreter materials and time for the next stage of memory and further processes. Then the brain will select important information and store it in STM. Because the massive auditory information can only last for seconds, it mainly relies on STM and STM is operative and is easy to retrieve information.

However, STM capacity is limited for it can only store a few items. Many psychologists have tried to measure and calculate the specific number of STM capacity with various materials. In 1956, George A. Miller suggested that STM capacity is where between 5 and 9 in a paper titled *The Magic Number Seven, Plus or Minus Two*. Klatzky compared STM as an area where the more items stored, the less room for work will left, vice versa. His viewpoint that STM capacity and its work are mutually restricted was thoroughly described in a paper titled *Human Memory: Structures and Processes* in 1975. On one side, the limited STM capacity reduces interpreter's memory burden. On the other side, it requires of interpreter to select crucial information to memorize. But the interpreter has limited time to decide which information to memorize during interpretation, he/she needs to organize the whole information and form a clear and logical chart in brain. Moreover, to avoid information forgotten for limited STM capacity, the interpreter takes note of certain figures or characters. For example, keywords, numbers, names, dates and proper nouns shall be taken to accomplish an accurate interpretation.

In the E-C interpretation process, the interpreter comprehends and stores English information in STM, and simultaneously takes note of some figures, initials and so on. The most commonly used shorthand's forms are homonymic word and sign. For example, the interpreter takes 'U' instead of 'you', '4' instead of 'for', 'E' 'P' 'En' to replace 'economy' 'politics' and 'environment', and the plus mark '+' can be used to stand for male, increase or agreement, the question mark '?' to stand for question, problem or uncertainty.

### **E-C Transferring Step**

The transferring step of E-C interpretation is a process that the interpreter transforms the original English sentences into its Chinese equivalence. It's a complicated psychological process involving brain operation between the two language systems. In the field of cognitive psychology, transformational grammar and dual-coding theory help to observe this process.

Transformational grammar proposed by Chomsky describes that natural language has a surface structure and a deep structure. The former refers to the superficial form of sentence while the latter is an underlying structure

containing a string of absurd symbols. Each surface structure is generated from a deep structure by taking the components in the underlying structure and manipulating these in particular ways. During interpretation process, the interpreter grasps the deep structure of meaning through the spoken sentences' surface structure and transfers it into Chinese surface structure.

Dual-coding theory, another theory related to cognition, was hypothesized by Paivio in 1971. According to dual-coding theory, both visual and verbal information are used to represent information, and mental codes are used to organize incoming information that can be acted upon, stored, and retrieved for subsequent use. Paivio also suggested a dual-coding theory of bilingualism, which describes that beside a specific system for language process and store, bilingual users has another system for representation. In the view of dual-coding theory of bilingualism, E-C transferring step is how the language system of English transformed to the language system of Chinese through the representational system.

Both the theories mentioned above describe the transferring step as a process of turning one language's superficial form into another language's superficial form through a deeper level of meaning. It is necessary to comprehend words' meaning for directly transferring English words may lead to misunderstanding. In the process of E-C interpretation, the interpreter gets the auditory information first, and comprehends the meaning under the words, then organizes the meaning into Chinese according to Chinese expression form. So the interpreter not only needs to be familiar with English pronunciation, but also master the skills of Chinese organization. As to Chinese organization, for example, there are various compound words and reduplicated word, and the sentences are usually short or without subjects.

### **Information Reproducing Step**

Information reproducing step, the expression of final result of E-C interpretation, is a process that interpreter deliver the concept of meaning to the hearers in the form of mandarin. According to cognitive psychology, there are three stages in language production: confirming intended message, encoding message into linguistic form, and encoding linguistic form into speech. The information reproducing step mainly touches the last stage.

In this process, the interpreter has to specify the transferred meaning into Chinese character, grammar, phrases and pronunciation, and then produces Chinese pronunciation. Here, the interpreter may be easily interfered by original language, so his/her expression ability determines whether the final step is successful or not. It is generally accepted that the most optimum E-C interpreters are the ones whose first language is Chinese. Because E-C interpretation's hearers are Chinese, and Chinese-speakers are more familiar with mandarin and conventional expression. Beside expression skills, the

interpreter has to make a proper choice of linguistic style according to the field, tenor and mode. The five different linguistic style of oral expression are frozen, formal, general, informal and casual. For example, a frozen and formal style should be employed in a conference or work report, while a general and casual style can be employed for a visit or daily communications.

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## CONCLUSION

Generally speaking, E-C interpretation from the perspective of cognitive psychology involves in the following four steps: 1) The interpreter is stimulated by the auditory English information and comprehend the information through bottom-up processing and top-down processing, 2) The interpreter stores the information with sensory memory and in STM assisted with note-taking, 3) The interpreter transfers the superficial structure of English information into that of Chinese through a deep level of meaning, 4) The interpreter reproduces the organized Chinese words in mandarin. The whole process requires of interpreter a good knowledge of English and Chinese, an acute hearing, a high concentration, a good memory, and familiarity with simultaneous note-taking, a quick and accurate response and a good articulation. And all these abilities can be trained pertinently.

This analysis of E-C interpretation can suit for interpretation between another two languages, too. For the four steps and psychological processes are involved in all the interpretation between any two languages, and the only difference lies upon the superficial structures of language. So, this analysis also provides reference and guide for all the interpreters and learners.

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