

# Cognitive Process and Skill Training of Time-Limited Sight Translation

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**Abstract**—In sight translation, a written message is converted into a spoken message, or a written text must be read aloud in another language. Sight translation has long been considered a hybrid of translation and interpreting and a preparatory training method for simultaneous interpreting. However, because the information input in sight translation is in the form of text rather than fleeting speech, not enough attention is paid to the time factor of sight translation. This paper addresses the definition, cognitive process, and training of the skills of time-limited sight translation. The aim is to highlight the importance of time constraint in sight translation to strengthen the role of sight translation in language skill acquisition, including supplementing cognitive knowledge and improving bilingual conversion ability.

**Index Terms**—time-limited sight translation, cognitive process, skill set, training method

## I. INTRODUCTION

Sight translation, as the name suggests, is “translation while reading” or “an oral translation of a written text” (Agrifoglio, 2004, p. 43; Lambert, 2004, p. 298; Setton & Motta, 2007, p. 203). There are two types of sight translation, one based on reading the text, the other based on reading the text and listening to the audio of the text (Wan, 2017). The former is often used in liaison interpreting, consecutive interpreting or when sight translation of the text on the spot is required, often with no strict time limit imposed on the task. The latter is very similar to simultaneous interpreting with text, where the audio of the text is played and must be followed simultaneously. Sight Translation is neither considered “pure translation” nor “pure interpreting”, but is a “transitional form”, a hybrid of translation and interpreting. However, sight translation is generally considered to be closer to interpreting, especially simultaneous interpreting, because the procedures and strategies used are similar (Mikkelsen, 1994; Weber, 1990). Sight translation has always had a place in interpreting practice and teaching, but the academic community has not yet reached a consensus on the meaning of sight translation, the use of sight translation, or the variants of sight translation (Li, 2014). The relevant research findings are still limited. This paper discusses the definition, cognitive process, and training of time-limited sight translation to enrich the related research on the time factor of sight translation.

## II. DEFINITION OF TIME-LIMITED SIGHT TRANSLATION

The output form of sight translation is spoken language, which seems to imply that there are output speed or time limit requirements, but the definition of sight translation rarely explicitly mentions output speed or time limit. Moser-Mercer (1995) found that in the practice of sight translation with no time limit on output, veterans can multi-task, while novices generally interpret after reading. This leads to a large difference in the speed of sight translation between the two, with the former at 115 words per minute and the latter at 60 words per minute. Chmiel and Lijewska (2019) also found that professional translators spend less time on sight translation than student translators. Angelelli (1999) pointed out that sight translation in the target language should sound as if the translator is reading the text in the target language, and the target language output should be as fluent as possible, without hesitations or pauses. Setton and Dawrant (2016) believe that listeners should have expectations about the fluency of the translation, as the sight translation output is spoken language. The output of sight translation should be clear, easy to understand, and natural. When translating from language C or B into language A, the output time should not exceed the time spent reading the original text; when translating from language A into language B, the output time should not exceed 20% of the time spent reading the original text.

In the definition of sight translation, output at natural language speed seems to be the temporal standard for sight translation, but this standard is neither precise nor can it meet the needs of sight translation for different scenarios or purposes. Sight translation based on reading and sight translation based on reading and hearing can be seen as the two ends of the temporal limit for sight translation: One is sight translation without a time limit, and the other is time-limited sight translation, which can be overlaid with multiple cognitive tasks of simultaneous interpreting. Time-limited sight translation can be defined as follows: In contrast to self-contained or self-paced sight translation,

time-limited sight translation manipulates the input speed of the source text to guide the translator to produce the sight translation at a specific speed and within a specific time limit. The importance of exploring the time factor of sight translation is not only to clarify the two ends of the continuum, but also to pay more attention to the time factor in the interval and the integration of the time requirement in sight translation training, to clarify the limit limitation of sight translation, the cognitive process, and the composition of skills in order to better play the mediating role of sight translation between translation and interpreting.

### III. COGNITIVE PROCESS OF TIME-LIMITED SIGHT TRANSLATION

Weber (1990) uses a flowchart to illustrate the two stages of the process of sight translation: conceptualization and the representation of units of meaning. Gile's (2009) effort model: Simultaneous interpreting = listening + memory + production + coordination; Sight translation = reading + memory + production + coordination; Sight translation and simultaneous interpreting differ in the way they take in information. Since reading and listening are the main components of each process, and the rest is produced and modified by them, the cognitive processes of the two are similar but different. The visual input of sight translation can be revisited, which seems easier than the auditory input of simultaneous interpreting, but in fact the prolonged presence of visual input is a kind of interference, and the visual interference of reading causes the sight translator to pay more attention to vocabulary and makes "forgetting words" or "deverbalization" more difficult. For novice interpreters, sight translation is more difficult because they have not yet mastered the mental representation of distancing themselves from the language form (Gile, 2020).

When interpreting, if the interpreter cannot effectively divide the limited cognitive resources between completing the reading of the original text, short-term memory, and output in the target language, or if the cognitive resources are insufficient due to the difficulty of the interpreting task itself, cognitive problems occur, which are referred to as load imbalance. Cognitive load, applied to the study of translation cognition, can identify important features of the translation process; it can reveal complex relationships between factors such as "consciousness, problem solving, and automation" (Muñoz-Martin, 2012). Attention to the temporal constraints of sight translation and the inherent changes in cognitive load can highlight the multitasking nature of sight translation and refine cognitive research on sight translation. In time-limited translational activities such as simultaneous interpreting, consecutive interpreting, sight translation, and audiovisual translation, completing tasks and avoiding downtime is not only a "self-protection" decision but also a "survival" decision. In the case of time-limited sight translation, the translator must therefore complete several tasks at the same time to cope with the cognitive load.

The time difference between input and output is referred to as "ear-voice span" (EVS) in simultaneous interpreting, which refers to the time difference between hearing the source language and the output in the target language; in sight translation, it is referred to as "eye-voice span" or "sight-speech difference", which refers to the time difference between the translator seeing the source text and the output in the target language. Studies have shown that the time difference between hearing and speaking in simultaneous interpreting is basically between 0.5 and 11 seconds, with an average between 2 and 4 seconds (Oléron et al., 1965; Barik, 1973). The "sight-speech difference" in sight translation can also refer to such a range, although "reading ahead", i.e. processing before producing, is the norm and the existence of regressions complicates the "sight-speech difference" of sight translation. Setton and Dawrant (2016) found that increasing the amount of reading in sight translation can ensure the quality of the target language, but more information intake costs time and energy. To keep the "sight-speech difference" within a controllable range, sight translators need to complete the translation of fragments after they have absorbed a certain amount of information to reduce cognitive load and avoid cognitive overload.

Some researchers (Brady, 1989; Gile & Lei, 2021) believe that the difficulty of sight translation is that retaining the information of the original text constantly disturbs the translator. However, this is only one aspect of the problem. An essential component of human language is the ability to extract semantic information from spoken and written language, and semantic representations are not affected by sensory modalities (Binder et al., 2009; Price, 2012). On the one hand, in simultaneous interpreting, the source language is volatile, whereas in sight translation, the textual information is always present and can be retrieved multiple times as long as the span of working memory and the overall cognitive load allow, which facilitates comprehension of the source text, and the time difference between input and output can be made more flexible. On the other hand, Lamberger-Felber and Schneider (2008) found that visual and auditory input in sight translation and simultaneous interpreting has a significant impact on the output of the target language. The degree and frequency of impairment do not differ significantly by mode, but rather by the individual performance of the translator.

Like other time-limited translational activities, sight translation is a cognitive multitasking process that has a positive effect on source language comprehension, translation mentality, splitting and reorganization, use of parallel translation, and expression in the target language, helping translation students to sense and adjust to the process of "deverbalization" (Deng, 2017; Liu, 2011). Song (2010) found that the skill transfer between sight translation and simultaneous interpreting cannot be smooth if sight translation is not temporally limited, and its static features and the dynamic online information processing of simultaneous interpreting cannot be reconciled. Since it is a time-limited translational activity, the time limitation of sight translation plays an important role. This can highlight the role of sight translation in promoting translators to efficiently analyze the original text, detach from the original text structure, and develop a

translation strategy.

#### IV. SKILL TRAINING IN TIME-LIMITED SIGHT TRANSLATION

In time-limited sight translation, reading of the original text, short-term memory, and output in the target language must be coordinated within the time limit, and all tasks must compete for limited cognitive resources to ensure that the task pile does not exceed the available processing capacity. The skill composition and training methods for time-limited sight translation are considered below from three points of view: fast reading, working memory, and production in the target language.

##### A. *Fast-Reading Competence*

Time-limited sight translation requires more efficient reading comprehension. According to eye-tracking research on the reading process, the reader's eyes do not read word by word from left to right, about one-third of the words in reading are not fixed (Rayner et al., 2011), and the brain infers and receives overall information based on partial information and impressions using syntactic and semantic rules. Research on fast reading also shows that there is a trade-off between reading speed and accuracy.

Aspects of reading efficiency are particularly important in time-limited sight translation. Efficient readers can focus on content words that contribute more to the information structure, spend less time on fixations, have longer saccades and look back less often. Inefficient readers cannot focus on content words, spend more time fixing words, have shorter saccades, and look back frequently. So whether the fixated word is a more effective content word for building information, whether more or less time is spent on fixated words, whether saccades are large or small, and whether regressions are more frequent or less frequent, are all important factors in reading efficiency. This is crucial for sight translation because only when the translator becomes an efficient reader can he or she excel at sight translation.

The improvement of speed-reading skills during time-limited training in sight translation depends on numerous factors. Kalina (2000) and Sandrelli (2006) propose timed sight translation, training that focuses on the role of speed reading and comprehension in sight translation. Chung (2007) suggests marking the semantic units of the source text, highlighting the key words that represent the content and structure to avoid students getting stuck on the surface structure of the source text, and helping students generate the target language according to the semantic and structural cues. Song (2010) helped students learn interpreting skills and strategies, especially simultaneous interpreting, by using timed PowerPoint presentations; Setton and Daurant (2016) suggested dividing the text into blocks of information and presenting them one after the other. The presentation speed can be adjusted according to training needs, and students can be trained to segment sentences so that students feel that the information is limited and that they need to weigh risks and caution in order to complete the interpreting task. Moreover, fast reading is not only a method and way of language learning, but also the need and trend of human beings to absorb information quickly. Reading software uses rapid serial visual presentation (RSVP) (or guided highlighting mode) to display the text word by word (or multiple words) in the center of the screen to avoid eye backtracking, and to encourage the reader to read faster. These methods are similar to traditional sight translation training methods and can be used as a reference for time-limited sight translation training.

##### B. *Working Memory Competence*

Time-limited sight translation requires more efficient working memory. Miller (1956) suggested that the human short-term memory span is  $7 \pm 2$ , i.e. between 5-9, which means that the capacity of human short-term memory is limited and people can remember 5-9 chunks at a time in short-term memory. An updated study found that this number is closer to 4, i.e. the human short-term memory span is  $4 \pm 1$  or between 3-5, which is a more precise capacity limit, it is only three to five chunks, in young adults, and less in children and older adults (Cowan, 2001). Cowan's suggested value of four chunks may be an overestimate. The number of chunks can be as low as 2, and the size, rather than the number, of chunks that are stored in short-term memory is crucial to an individual's improved memory performance (Gobet & Clarkson, 2004). Studies on the span of human short-term memory can explain the visual span and processing ability of sight translators. When short-term memory processes information, it extracts existing knowledge and experience from long-term memory into short-term memory. This information is processed, which is also called working memory. Working memory is divided into long-term working memory and short-term working memory.

Improving working memory competence in time-limited sight translation training is of paramount importance. Psychological studies have shown that individual working memory can be improved by training the inhibition, switching, and updating functions of the central executive system (Zhou & Zhao, 2010; Zhao & Zhou, 2011). Research on the combination of working memory and interpreting has also found that interpreters have advantages in cognitive transformation compared to ordinary bilinguals (Zhao & Dong, 2021); the inhibitory function of the central executive system of working memory is related to the length of interpreting experience; the better the inhibitory function, the shorter the input-output time difference; and interpreting accuracy shows an upward trend (Chmiel, 2021; Timarov á et al., 2014; Zou, 2017). Traditional interpreting training methods such as shadowing, shadowing + retelling, multitasking shadowing, and synchronization of listening and reading, can improve interpreters' multitasking skills. Working memory training methods that can be used for reference include visual-spatial working memory tasks, digit span tasks, word span tasks, working memory training tasks such as reaction time choice, and strategy training tasks such as

repetition and n-back tasks (Wang, 2013). In addition, the use of professional working memory training software, such as the Lumosity cognitive training program ([www.lumosity.com](http://www.lumosity.com)) or the CogniFit personalized training program ([www.cognifit.com](http://www.cognifit.com)), can improve working memory levels after 4-5 weeks of continuous training (Liu & Zhou, 2012). Applying working memory training methods in time-limited sight translation training and learning from interdisciplinary achievements can improve the efficiency and sustainability of translation training methods.

### C. Target Language Production Competence

Time-limited sight translation requires more efficient production of the target language. Sight translators can control the rhythm of perceived information, but fluency can only be ensured if the target language is produced while reading. Research shows that veterans pay more attention to overall meaning and use a top-down strategy; novices pay more attention to specific words, especially words that cause difficulty, and use a bottom-up strategy (Davis & Bistodeau, 1993; Liu et al., 2004). Wang (2012) also found that veterans are good at inferring the unknown from the known and skipping the unknown information if it is redundant or negligible, while novices often focus on the unknown information and therefore get “stuck”. Under time pressure, professional interpreters pay more attention to the main information and information structure, while maintaining a certain success rate in prediction and completing the translation with high quality. The presence of the source text in sight translation makes it more difficult to break away from the shell of the source language. Therefore, the speed and ability of “deverbalization” displayed by the interpreter are the result of deliberate training in interpreting.

Improving target language production competence in time-limited sight translation training depends on proven tactics. The methods for improving target language expressive competence are often based on the general methods for improving bilingual expressive competence, such as supplementing relevant cognitive knowledge with parallel text input exercises and translation exercises; free speech based on word lists, cue text output, cloze text output, compressed output, and flexible output in a thematic framework. In time-limited sight translation, however, the guiding principle is to overcome the excessive influence of the source text and to try to translate as smoothly as possible at a given speed. In addition, the rapid conversion of main terms and the flexible handling of syntactic differences are comparable to bricks and cement, and by forming an organic integration, the target language is built up faster and better. The bricks include not only the terms that charge thematic and world knowledge but also the general vocabulary: “rapid continuous visual presentation” or “scrolling presentation” can train the accuracy and speed of bilingual term conversion to improve the efficiency of “baseline” conversion; the cement refers to flexible processing of syntax, recognition and full use of linguistic plasticity, suppression of linguistic interference, more linear output, and output as authentic as possible while maintaining the original word order. Falbo (1995) suggested using pseudo sight translation method. Even if there is a direct correspondence between the original text and the translation, students need to consciously transform the syntax and vocabulary of the original text in order to train students to produce flexible output. Nolan (2008) found that there is not much difference in effect when multiple methods of expression and organization are used for the same source language. Setton and Dawrant (2016) also pointed out that flexible syntax processing can better cope with the time constraints of interpreting and ensuring fluency in the target language.

## V. CONCLUSION

Sight translation plays an important role in linking translation and interpreting. The similarities and differences to traditional translation and interpreting, the cognitive characteristics, the skills required, and the development of skills should be considered. Based on the time-limited nature of sight translation, this paper discusses the definition, cognitive process, and skill training of time-limited sight translation. Training in time-limited sight translation can help to improve the interpreter’s ability to read quickly and the efficiency of working memory, to make the reception of information more effective, and to weigh the pros and cons (risks and benefits in terms of expression, fluency, accuracy, etc.) more quickly and then decide whether a restart or linguistic restructuring is needed to ensure fluency in the target language. Emphasizing the importance of the time limit in sight translation can better play the mediating role of sight translation, optimize the process of translation and interpreting, and better realize cross-border integration between the sub-disciplines of translation and interpreting.

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