

## Cognitive Processing Models of Translation in Pedagogy

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**Abstract:** *This article focuses on the most important models of cognitive processing in translation studies. First, the main general models in process-oriented (Holmes, 1988; Bell, 1991; Hönig, 1991; Gile, 1995; Kiraly, 1995) and then a cognitive model in a specific problem (Moghadas, 2014) are presented. Studies in translation process can reveal a more complete picture of a translator's mental activities while carrying out a translation task. As the translation universals are cognitive phenomena, the cognitive models from researches in identifying professional or expert processing patterns help trainee translators in pedagogy to visualize the natural process of translation and improve the quality of the final product.*

**Key words:** *process-oriented, cognitive models, translation studies*

### 1. Introduction

Cognitive processes are the set of all mental abilities related to attention, working memory, remembering, producing and understanding language, problem solving, decision making, recognition, evaluation, comprehension, etc. Human cognition can be consciously or unconsciously, intuitively such as knowledge of a language or conceptually such as a model of a language. The cognitive revolution in the 1950s and 1960s brought renewed interest in higher-level cognitive processes. Investigators have tried to know how problem solving, concept formation and decision making could be explained by mediating thought processes (cf. Ericsson, 2003, 2006). In recent decades, the empirical studies using a cognitive approach in translation studies have focused on the mystery of the processes happening in the "black box" of the translator. This approach is related to process-oriented or what it is called as 'translation psychology':

While translation process research constitutes the core of 'translation psychology,' in the widest sense translation psychology can be seen to comprise a great deal more than what is happening in the translating mind during the translation process (Jääskeläinen, 2012, p. 2).

Translation process is what happens linguistically and cognitively when the translator renders a source text, formulated in a source language, into a target text using the resources of a target language. This process is a kind of problem-solving because the answer must be constructed from available information in memory or obtained from the environment. *For didactic purposes, a model of the translation process expresses all the characteristics of a general model of human communication, particularly components which represent identification*

of the problem and the strategies employed for problem-solving (Bell, 1998). The key point about research in translation cognitive process is expertise. Basically, researchers in this field should start “from analyzing successful practice among professional translators to work back from that to consider curriculum design and innovation in pedagogical practice, as well as the needs of the translation profession for ongoing professional development” (Fraser, 2000, p. 114). To know the complexity of translational phenomena, therefore, the researchers investigated on various topics such as problem-solving strategies, criteria for decision making, unit of translation, conscious processing, uncertainty management in translation, etc. But the analysis of the translation process involves a great deal of complexity:

The difficulties related to the investigation of the translation process are magnified by the different phases through which the process unfolds and by the complexity of the interwoven abilities and forms of specialized knowledge which play an integral part in it (Hurtado Albir & Alves, 2009, p. 54).

As the earliest formalized model of the translation process, Nida (1964; see also: Nida and Taber, 1969) provides a model based on Chomsky’s generative- transformational grammar. The model has three stage system of translation (analysis, transfer and restructuring). The basic structural elements are kernel sentences which must be obtained from the source text surface structure. Likewise, Seleskovitch (1968) and Lederer (1981) are pioneering researchers in taking a cognitive approach to translation process. They proposes the theory of sense or the Interpretive Theory of Translation (ITT) to identify three interrelated stages of translation/interpreting process: 1) Understanding ( the process of generating sense, involving both linguistic knowledge and some other cognitive inputs including encyclopedic knowledge and contextual knowledge; 2) Deverbalization (the non-verbal synthesis resulting from the process of understanding; 3) Re-expression (the work of both linguistic and non-linguistic knowledge to express the intended meaning in the target language). Later, Delise (1982) added a fourth stage to them, namely, Verification (the translator revisits and evaluates the target text). After that, scholars have tried to propose some more models for mental process of the translator by use of psycholinguistics and cognitive sciences. In the following, the main cognitive processing models of translation are presented briefly.

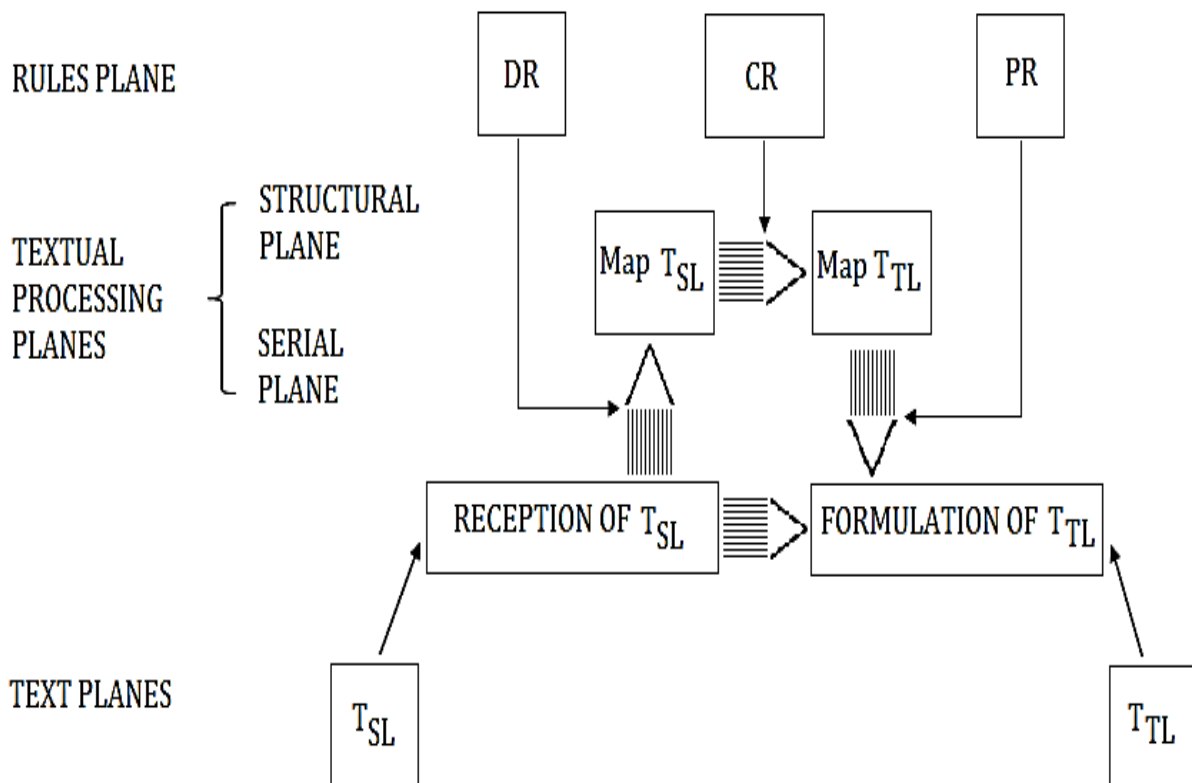
## 2. Cognitive models

### 2.1 The serial and structural planes

Holmes (1988) sees the translation process as both a serial and a structural analysis-process in which the product and process of translation must be recognized as a unit. He agrees with a distinction between the product-oriented and the process-oriented study of translating. But he believes that the nature of the product cannot be understood without a comprehension of the

nature of the process. In other words, the one is the result of the other. He proposes a model for translation process that takes place on two planes; the serial and structural (figure 1):

...after one has read a text in time, one retains an array of data about it in an instantaneous form. On these grounds, it has more recently been suggested (though nowhere, as far as I know, clearly set out in model form) that the translation of texts (or at least of extensive texts, or at least of complex texts) takes place on two planes: a serial plane, where one translates sentence by sentence, and a structural plane, on which one abstracts a 'mental conception' of the original text, then uses that mental conception as a kind of general criterion against which to test each sentence during the formulation of the new, translated text (Holmes, 1988, p. 82).



**Figure 1:** Holmes' Model

He mentions that the serial plane and structural plane should carry out respectively to create a balance between the two levels. According to this method, the serial plane is the level at which the source text is transferred into a receptor text through a process of analysis, transference, and restructuring and the structural plane is assessed continually during the translation process, through multiple levels of processing. Then three rules are determined:

the first, that of derivation rules (DR), determines the way in which the translator abstracts his map of the source text from the text itself, and the third, that of projection rules (PR), determines the way in which he makes use of his map of the prospective target text in order to formulate the text, while the second, that of correspondence rules (CR) or matching rules (MR) or, if one prefers, equivalence rules (ER) determines the way in which he develops his target-text map from his source-text map (Holmes, 1988, p. 84).

Holmes states that the map of the source text will be a conglomerate of highly disparate bits of information. Then he presents three maps for source text: 1) Map of a linguistic artifact: it contains contextual information; 2) Map of a literary artifact: it contains inter-textual information; 3) Map of a socio-cultural artifact: it contains situational information. In the case of three types of information, the translator should seek “correspondences with which to design his target text map... or he starts thinking *How am I going to translate this?*” (Ibid, p. 85).

## 2.2 linguistic and psycholinguistic perspectives

Bell (1991) based on linguistic and psycholinguistic perspectives, presents a hypothetical model with two phases of analysis and synthesis (figure 2). Each of them has three stages: syntactic, semantic and pragmatic processing. Bell’s model focuses on the psychological information processing and both short-term and long-term memories for the decoding of source language (SL) input and the encoding of target language (TL) output. Moreover, the model operates at the linguistic level of clause, proceeds in both a bottom-up and top-down manner in processing text.

In the phase of analysis, the first major stage is syntactic analysis of the source language text (SLT) by reading the text. It can be done by FLS (frequent lexis store), FSS (frequent structure store), parser (analyzing any clause) and lexical search mechanism. In the second stage the semantic analyzer has the task of ‘concept recovers’ underling of the syntactic structure of the clause. In the third stage, the pragmatic processer should isolate the thematic structure and provide a register analysis of it. Therefore, the semantic representation of the clause contains 1) mood and lexical choices including lexical meaning and uncommon lexis; 2) transitivity choices, the logical relations based on the syntactic structure; 3) theme choices including indication of markedness; 4) register features; 5) illocutionary force; 6) speech act. When the decision to translate is taken at the phase of analysis, the input is reprocessed by synthesizers distributed in pragmatic (to map for suitable purposes, thematic structures and discourse parameters of mode, tenor and domain), semantic (to carry the propositional content and produce a satisfactory proposition) and lexicon-grammatical levels to be encoded in a new writing system of the target language text. However, no fixed order permits the translator to revise the process and previous decisions constantly.

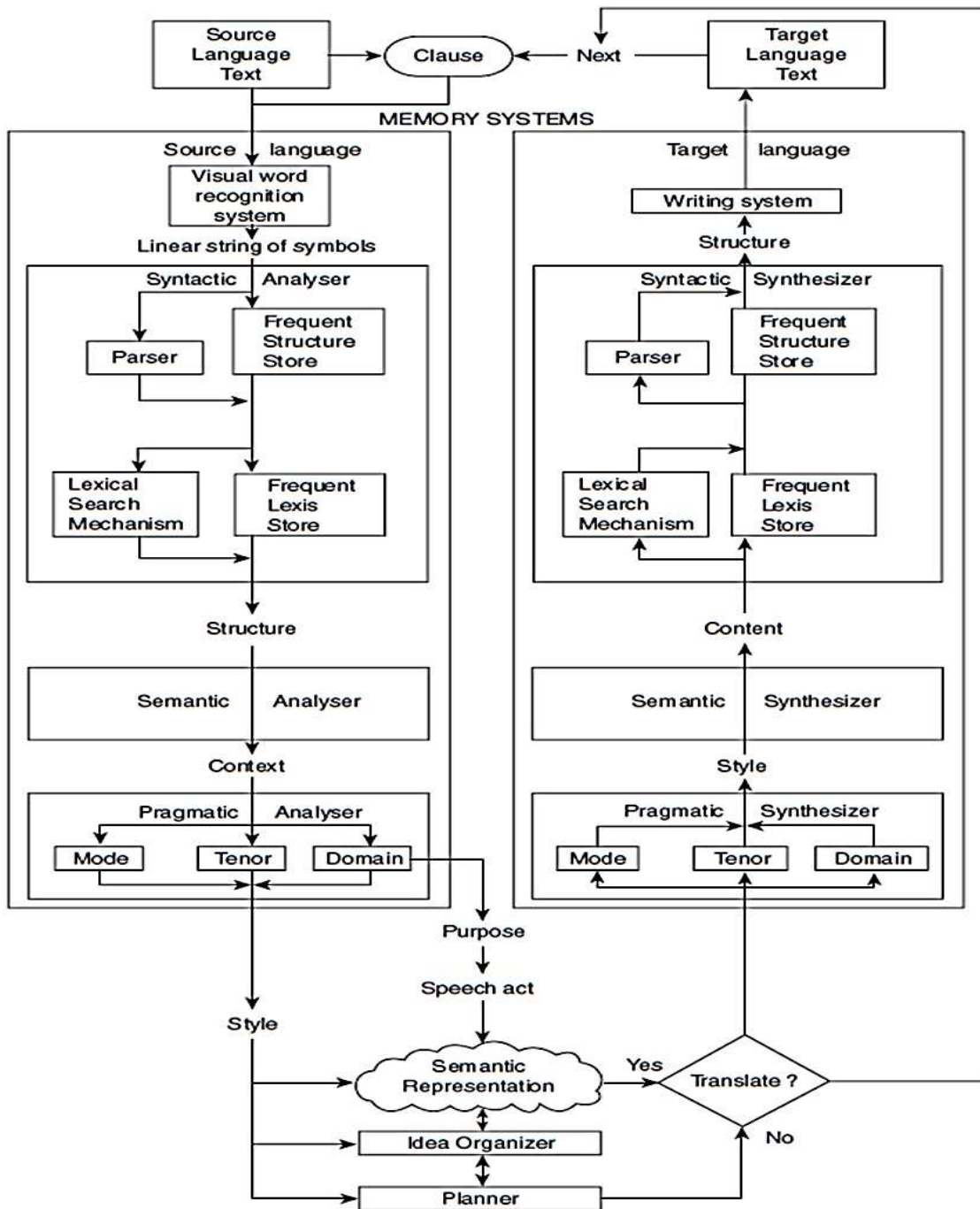


Figure 2: Bell's model of the translation process

### 2.3 An ideal translation process

Hönig (1991) presents a model for the mental reality of translation processes on a passage (figure 3). He explains the importance of his model for translation pedagogy:

The main reason why many students and teachers of translation are frustrated is that they experience the complexity of their mental processes while translating, but try to relieve themselves of this complexity because they do not really understand the processes. (Hönig, 1995, p. 57; translation of Susanne Göpferich).

According to Hönig, the source-text reception differs between ordinary readers in a non-translation-specific situation and professional translators who want to translate that text because reception is influenced by the translation task they have in mind. In this model, the translator's mental processing occurs in two different workspaces: the uncontrolled workspace and the controlled workspace. The translator's first 'understanding' of text takes place in the uncontrolled workspace involves the activation of frames and schemes, which are structured domains of long-term memory, in associative processes (Hönig 1991, p. 78, 79). He mentions that the translator will become aware of his translation task by collecting and collating data from his uncontrolled workspaces, the prospective target text, using the projected source text. This leads to a macro-strategy which may take place more or less automatically for professional translators or "very deliberately, possibly with the aid of translation-relevant textual analysis" (Ibid, p. 80). Approved data may become part of the target text in four different ways (Hönig 1991, p. 80):

- (1) As a linguistic reflex stimulated by the first contact between the *projected st* [source text] and semantic associations in the *uncontrolled workspace*.
- (2) As an automatic transfer from the *uncontrolled workspace* after a macro-strategy has been worked out.
- (3) As a product of a micro-strategy applied in the *controlled workspace* which has been approved by *monitoring*.
- (4) As a product of interdependent processes taking place in the *controlled* and *uncontrolled* workspaces, whereby the final approval can be either by uncontrolled (automatic) or controlled (cognitive) processes.

During the translation phase, the processes in the uncontrolled workspace are complemented by an associative competence (or transfer competence: the ability and knowledge about translation, to complete the transfer process from the Source Text to the Target Text; PACTE, 2000). Then, decisions are evaluated in controlled workspace and led to a target text.

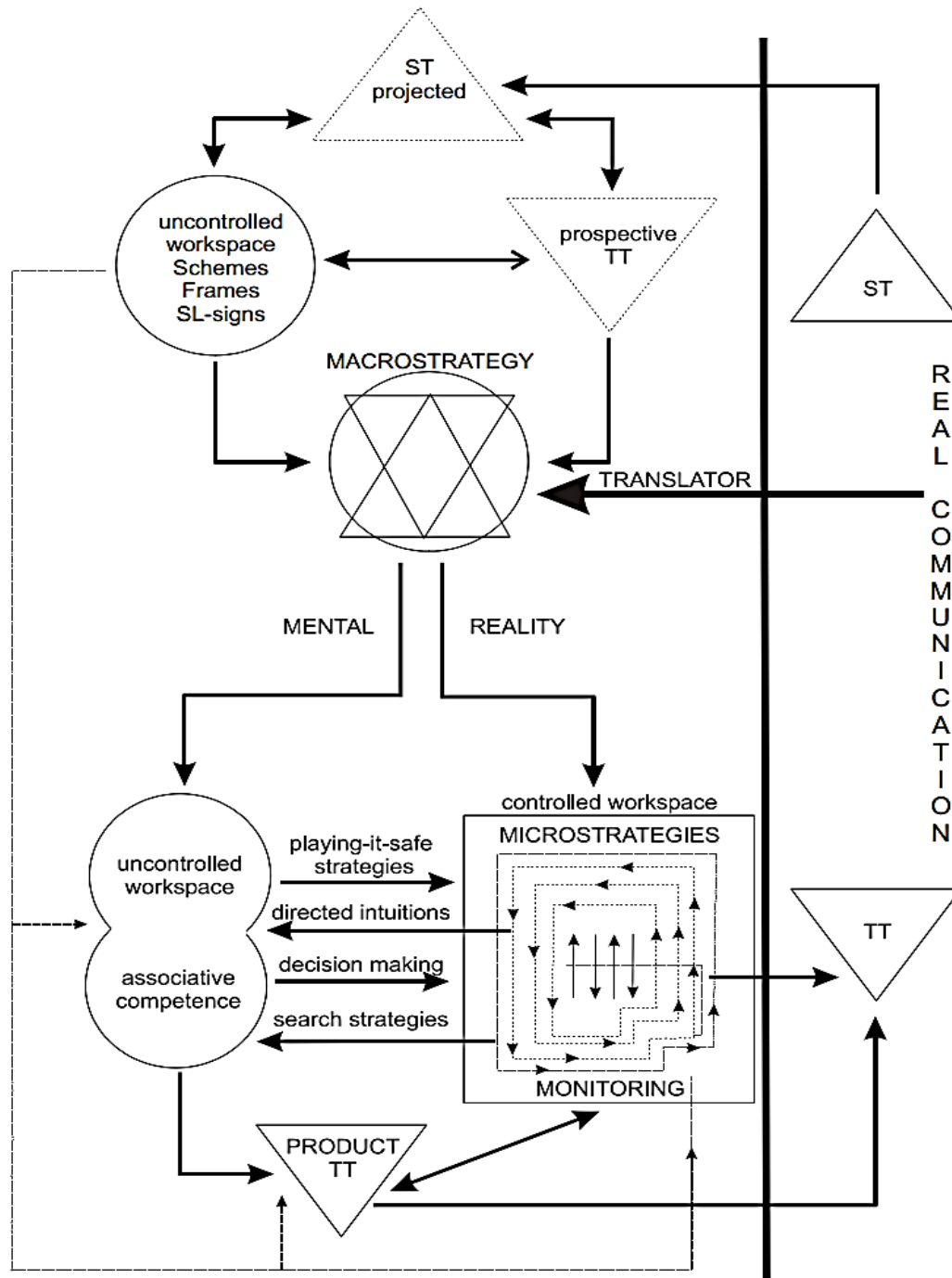
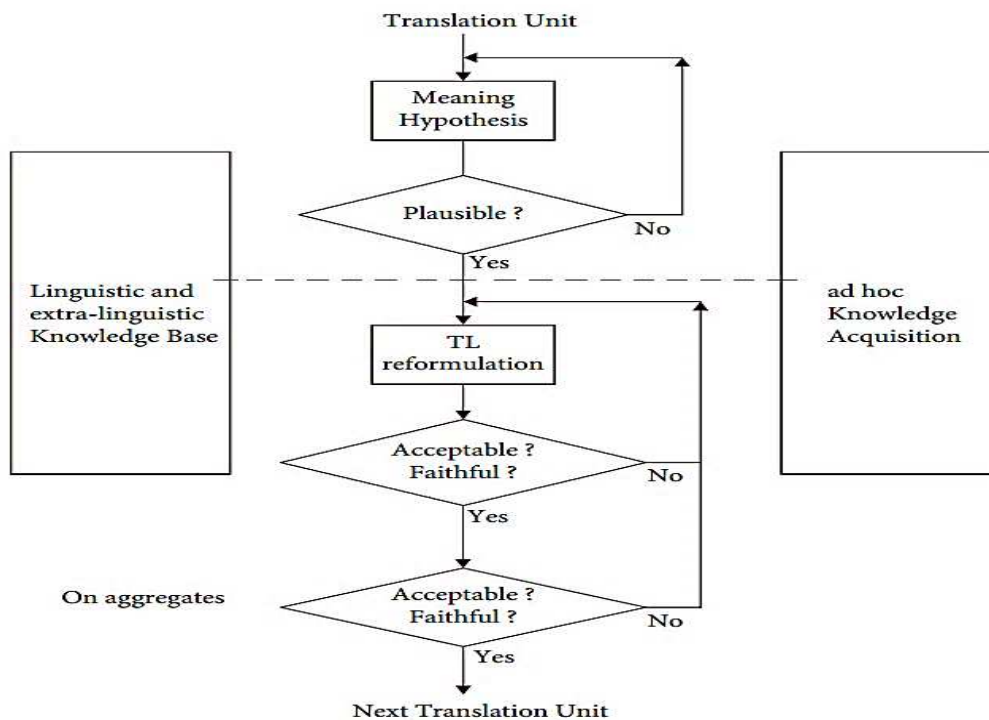


Figure 3: Hönl's model of an ideal translation process

### 2.3 Sequential model

Gile (1995) proposes a model of efforts related to simultaneous and consecutive interpreting, based on the concept of processing capacity stemming from cognitive psychology (figure 4). The model of Gile presupposes a distinction between automatic and non-automatic mental operations, which consume part of the processing capacity available. However, the great deal of researches showed that professionals can switch between automatic processes in routine tasks and conscious processing in new situations (Jääskeläinen, 1999, 2009). Gile emphasizes the non-automatic character of the mental operations and presented three types of effort in simultaneous interpreting: (1) Efforts related to listening and analyzing, (2) Efforts related to discourse production in reformulation, (3) Short-term memory efforts. He mentions that the translation process is recursive, and the several steps may be processed simultaneously. To Gile, the direction of translation and the languages involved will influence the process. Today, scholars have illustrated that translation is non-linear task and the mind keeps looking for alternatives even after a translation problem has been solved.

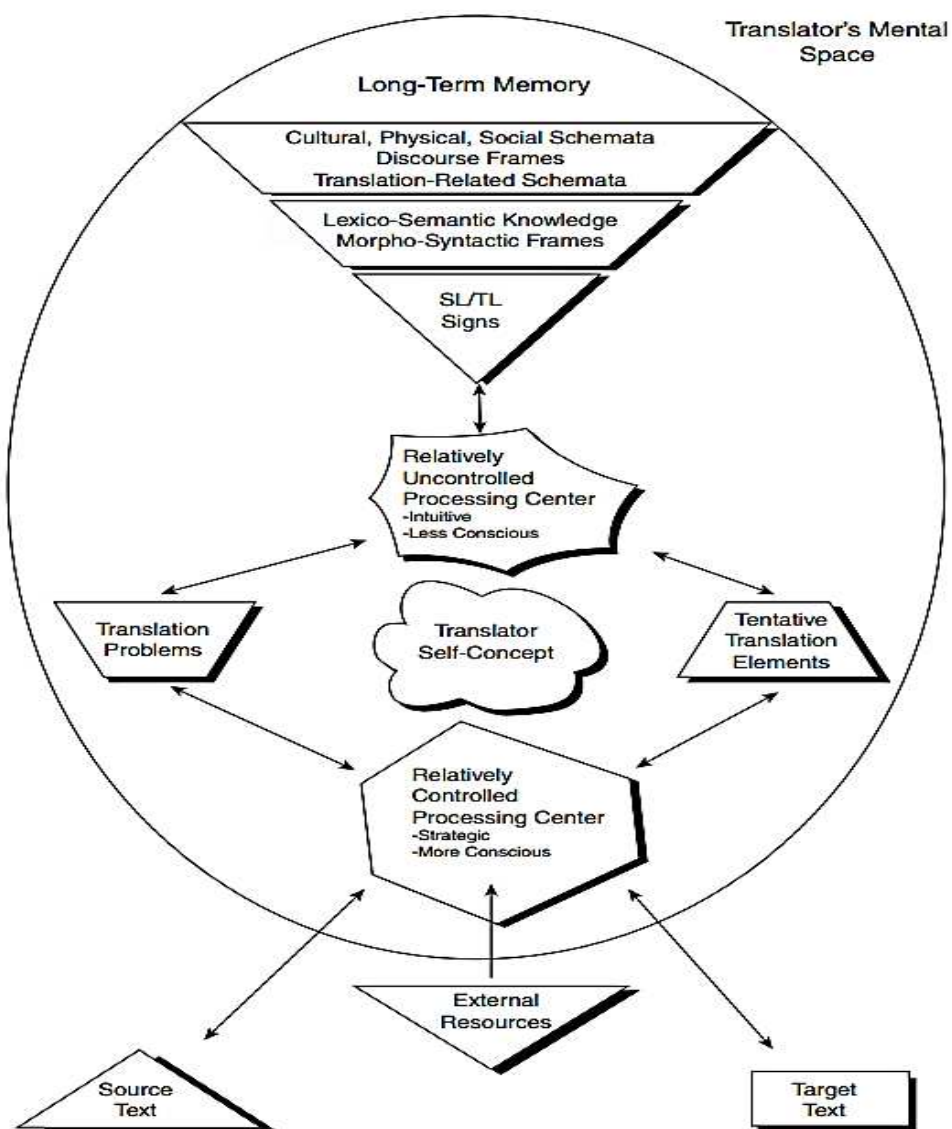


**Figure 4:** Daniel Gile's Sequential Model of Translation



#### 2.4 A social (external) and a cognitive (internal) activity

Kiraly (1995) presents a model of the translation process based on an external communicative/social activity and an internal cognitive activity which draws on psycholinguistics (Figure 5). In social model, the translator is considered an active participant in three interrelated situational contexts, of the source text, of the TT, and a particular context.



*Figure 5:* A psycholinguistic model of translation processes

According to Kiraly, cognitive (psycholinguistic) model of translation is defined as follow:

The translator's mind is an information-processing system in which a translation comes from the interaction of intuitive and controlled processes using linguistic and extra linguistic information. (1995, p. 102)

The principal components of the model involves (1) information sources, including long-term memory, source text input, and external resources (e.g., reference books, data bases, native-speaker informants, subject experts); (2) the intuitive workspace, which is relatively uncontrolled and subconscious; and (3) the controlled processing center.

### 3. Cognitive model for Specific problems

Studies on the translation process of specific items confine the research problem very nicely. Moghadas and Sharififar (2014) deal with the cognitive process of problem-solving to translate a neologism as a specific problem in the source text by using TAPs. Then it is possible to identify all the material in the TAPs which relates to this particular item and its translation. They present a cognitive flowchart model for the translation process of neologisms in ideal situations (figure 6). They use the famous coding scheme of Krings (1986) and Gerloff (1986) with some modifications as strategies of problem solving and problem indicators, to analyze the data obtained from their professional participants.

The model starts with the visual recognition of the neologism in the source text. After recognition, continuation of the process depends on the special storing information in LTM (e.g. translation competence). Accordingly, this is the knowledge in memory which can help constructing a justification of the solution for the problem. Then translator may use translation aids immediately (comprehension) or he/she prefers to analyze the linguistic aspects of the neologism briefly. Before comprehension, the translator may draw an inference the neologism meaning which comes back to his/her world knowledge or experiences (it may happen only one time in the process). After comprehension, the translator may find out the solution(s) or it can be done after linguistic analysis process. After presenting the solution or preliminary solution(s), the translator monitors the progress of the problem-solving and evaluates the solution. If the solution is satisfactory, the problem solving process comes to end. If the solution is unsatisfactory, the

translator feels the need of revision, or backs to the linguistic analysis or comprehension phase to present another solution. The model shows that the process direction of linguistic analysis and comprehension phases may be passed several times from beginning to end (Moghadas and Sharififar, 2014, p. 12).

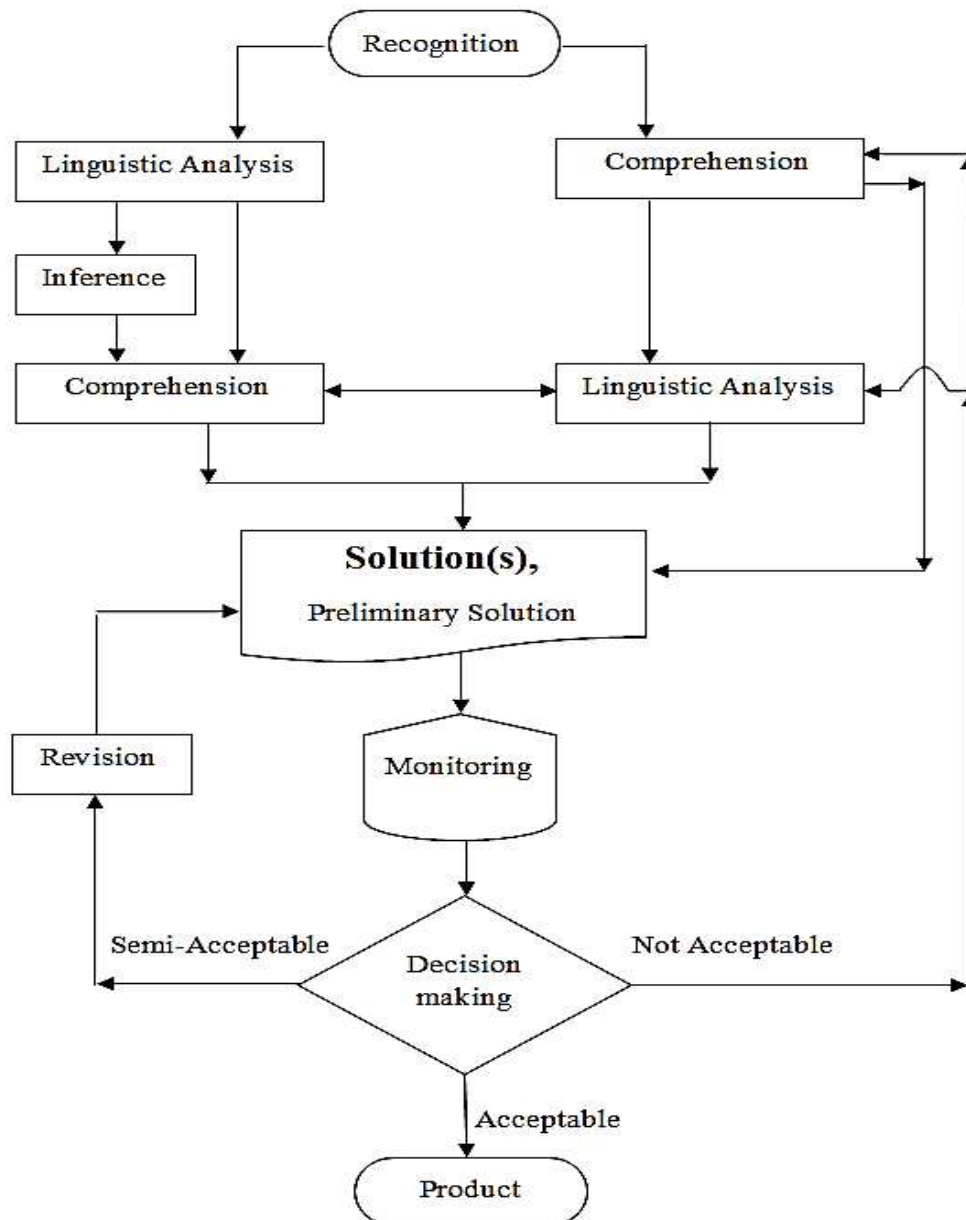


Figure 6: A Proposed Cognitive Model of Neologisms Translation

## 4. Conclusion

Recently there is more attention for translation process research as a cognitive activity. To avoid the subjective analysis, process-oriented in Translation and Interpreting should apply some of the concepts and methods of cognitive science to reach the translation universals and focuses on the relationship between translation theory and practice.

The study of the process of professional's problem solving can lead to a deeper understanding of what translation and interpreting looks like. As Jääskeläinen mentions (2012, p. 8) this is necessary "to learn how translation experts excel in their own fields of expertise and how the quality of their performance is rated in their own work, instead of using 'academic' quality criteria only".

Therefore the importance of knowing process has been always emphasized in pedagogy:

... it's absolutely essential to know as much as we can about the process, both in order to plan the teaching in a good way, but also to focus on the process and not just fill the classes with texts that students have to translate and tell them that here you translated like this and here you translated like that, but instead actually help students to gain insight into their own process, because processes may vary between different people, and you have to raise that awareness with the student (Englund Dimitrova, 2011, p. 350).

The results obtained from most process researches indicate that the professional translators do not use one single way of performing a translation task and the complexity of the process of problem-solving depends on the translation competence of translators. Therefore, scholars believe that a translator training program should not teach students one specific way of approaching a translation task.

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