

Identifying the Writing Processes a College Student Has to Undergo: The Generating Model

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In producing English compositions, five Chinese college English majors are found to undergo a series of mental processes reflecting how materials are retrieved, organized, edited, and then encoded into the written form of a language. Frequent occurrences of the L₁-L₂ translating act indicate that the first language (Mandarin) plays a vital role in the course of composing English passages. The structure of the composing process derived from think-aloud protocols produced by the subjects involves complicated sub-processes because of the interruption of the L₁-L₂ translating act. Compared with an English native speaker (who has to go through five sub-processes, according to Hayes and Flower's model published in 1980), a Chinese English major may have to go through eight sub-processes in generating a note. That is, the latter has to endure more complex cognitive processes if L₁-L₂ translating acts are involved in producing English compositions.

I. OBJECTIVE

Hayes and Flower (1980) suggested a generating model for English native speakers. The model does not seem sufficient enough to account for the writing processes undergone by Chinese English majors who use English as a foreign language in that these students can hardly avoid the interruption of their first language while producing English compositions. Liu (1996) has identified seven possible locations where these subjects tend to employ the Mandarin-English (L₁-L₂) translation act and five locations where the English-Mandarin (L₂-L₁) translation was involved. These locations, however, do not reflect details of how Chinese college students go through the whole process of generating ideas before a useful written note in English is produced. The think-aloud protocol shows that when a Chinese student produces a written note, he/she has to retrieve an idea from the long-term memory first or receive information from, for instance, a teacher's instruction. When the idea flashes into the subject's mind, it is only a piece of raw material to be evaluated, organized, and edited before it can be used as part of the written text. In this paper, the author analyzes the think-aloud protocols that help identify specific processes experienced by the subjects. These specific processes identified therefore reflect mental structures of the generating processes Chinese English majors undergo with the involvement of L₁-L₂ translation acts.

The generating processes to be discussed in this paper refer mainly to how a written note is produced. The following sections will identify the sub-processes that form the generating model. Discussions will include how the think-aloud protocols are analyzed, how the generating model developed from Chinese students differs from the one postulated by Hayes and Flower (1980), and what this study may provide for instruction or learning of English composition in Taiwan.

This study, however, is considered a case study in which all analyses are based on a close investigation of the transcriptions from the think-aloud protocols made by only five English majors who had been learning English as a foreign language. The findings may not apply to all cases of English writing experience gone through by Chinese students in general, they serve as other approaches to look at the cognitive

process of English writing.

II. THE THINK-ALOUD PROTOCOL

The think-aloud protocol serves as the fundamental data for this study. Though some (e.g., Nisbett & Wilson, 1977; Cavanaugh and Perimutter, 1982) believe that think-aloud protocols are invalid because, on one hand, people are not conscious of their cognitive processes and, hence, should not be able to report these processes; on the other, even if people report their conscious processes, these reports can be verbally distorted or incomplete. However, the verbalized protocols accompanied with video tapes still have the following advantages that no other methods could provide (Liu, 1997; Cheng, 1998):

- (1) The protocol provides direct and valid evidence about writing processes.
- (2) It provides rich data that allows exploration into phenomena unfamiliar before.
- (3) It may help uncover writing processes that are invisible to other methods like analyzing the written output or interviewing writers after they have produced their compositions.
- (4) After being instructed and trained for two to three times, the subjects are able to verbalize their mental processes without changing the order of the sequences nor slowing down their task performance.
- (5) If the subjects fail to verbalize their mental processes, there are always nonverbal signs or signals that help report useful data. The nonverbal reporting act may slow task performance, but it will not change the course or structure of the composing act. Any act that takes place during the course of composing may reflect a certain invisible mental process.

The think-aloud protocols produced by the subjects were first of all transcribed on the basis of different entries, each containing an “idea unit” or “intonation unit” (Du Bois, 1991; Schuetze-Coburn & Weber, 1991). Each idea unit serves as a parameter that signifies a cognitive process the subjects have experienced (see the “process” column in Table 1). The idea unit was identified according to two basic principles:

- (1) When a pause is made between two “utterances,” and
- (2) when a falling tone of an expression occurs, signaling the termination of the idea flow.

For the first principle, any two “utterances” are treated as two entries, that is, two idea units if the subjects, while producing the “think aloud” protocol, generate a tangible interruption

by stopping the act of uttering an idea for more than two seconds,
by writing a note on the paper, by repeating the same utterance,
by making interjections, or
by causing other physical signs like coughing, throat clearing, or touching
their noses (Liu 1998b).

For example,

到目前為止 so far (*writing* “so far”)到目前為止//我已經//(*writing* “I have”) I have//我已經參加
加 (*writing* “taken”)//take (*writing* “par”)//(*erasing* “par”)啞修了//我已經修了許多課程
//many (*writing* “many”)//many classes (*writing* “classes”)

The subject who makes the expressions above produces 12 entries (see Table 1), including ten clear idea units, one text generating process, and one revising process. In this example, one single slash “/” refers to one second. Information in parentheses

refers to the subject producing the texts while she was producing the protocol.

For the second principle, the subject uses a falling tone to signal that an idea is completely uttered and another new idea is coming in. For example,

人類的共同生活//共同生活///和經驗^///人類的共同生活和生活和經驗^///

This subject has produced four idea units above: the first two by pauses only and the other two by both pauses and falling tones, signified by a caret “^.”

The entries are numbered and each entry provides rich information about how each idea is formed and how these transcribed entries match the written text. The data, for these purposes, are listed as shown in the following table:

Table 1
Part of the Data from the Transcription of Subject One

Protocol	Written text	Processes	Language*	Translation**
1. 到目前為止 so far	So far,	generating	C+E	1
2. 到目前為止		organizing	C	2
3. 我已經		generating	C	
4.	I have	generating	E	1
5. I have		organizing	E	
6. 我已經參加	taken	organizing + generating	C+E	2 & 1
7. take	par	organizing + generating	E	1
8.	par	editing	U	
9. 喔修了		generating	C	
10. 我已經修了許多課程		organizing + generating	C	
11. many	many	generating	E	1
12. many classes	classes	generating + organizing	E	1

* C = Chinese/Mandarin; E = English

** 1 = L₁-L₂ translation (Mandarin to English); 2 = L₂-L₁ translation (English to Mandarin)

In Table 1, 12 entries are successfully identified to match the text “so far I have taken many classes” on the basis of the definition of the “idea unit.” However, not every subject remembered to “think aloud” when he/she was doing the writing. For instance, this subject (who produced Table 2) did not say anything in Mandarin; nor did he express much about his mental activities. Throughout the course of making this composition, he seemed to “dictate” what he said. However, quickly and fluently as he spoke, he made pauses while he was producing the text. The written text in cases like this is also divided into different entries according to the pause the subject made. Table 2 shows that he made a two-second pause almost at every word he uttered when he put it down.

Table 2
Part of the Data from the Transcription of Subject Two

Protocol	Written text	Processes	Language	Translation
1. if	if	generating	E	
2. we are	we are	generating	E	
3. true	true	generating	E	
4. and	and	generating	E	
5. honest	honest	generating	E	
6. to	to	generating	E	
7. other people		generating	E	
8.	other people	generating	E	

The data to be analyzed are all listed in the same format and each entry is carefully

observed to see which mental process of writing each specific entry reflects. If one entry is likely to reflect more than one mental process, the possible mental processes are all listed (See entry 6 or 7 in Table 1).

III. SUBJECTS AND MATERIALS

The materials used in this project were produced by five English majors: one junior from Chinese Culture University and four juniors from Soochow University. All of them were trained to produce English compositions with their think-aloud protocols. Their performance was recorded on videotapes, and, after the writing task, the subjects were interviewed to recall what they had experienced during the course of writing. The subjects were all volunteers, who had been trained at least twice before they thought they were ready to do the job. The time for writing was not strictly confined, but the experimenters told them not to exceed one hour. The topic was given right before the writing task began. Little interruption was allowed to occur during the course of videotaping. If the experimenters observed that the subject failed to “think aloud,” they either reminded them with “signals” or asked them to report the process during the interview.

Only English majors were chosen because they were believed to provide more diversity in writing performance. It was assumed that some English majors might go through the structure of the writing process closer to the one English native speakers go through, whereas other English majors, though exposed to a considerably better environment for English learning, perform very much like general students who learn English as a foreign language (EFL) in other disciplines. From the protocols made by the five subjects, it was found that only one of the students rarely involved Mandarin (say, thinking aloud in Mandarin) while producing his writing and the time he used to complete his written product was much shorter than other subjects (about 25 minutes, only a half of the average time). However, this unique subject, when interviewed, said that he also used some Mandarin to help organize ideas here and there. He did not say it out because he tried to prevent Mandarin from interrupting his writing. Because of this, this subject provided the least information that could help us identify what mental processes he went through during writing.

The other four subjects, contrarily, provided sufficient information that revealed the processes of how their written works had been produced. I would assume that these subjects also shared similar features that other EFL students in Taiwan had because, like non-English majors, these subjects learned the English language in the classroom setting and from reading, taking courses, and listening and speaking in the language lab. They were English majors, but they were also EFL students. They were no better than a political science major with a good command of English. The structure of writing process developed from the materials collected from these subjects, therefore, may also account for what general EFL students have to go through mentally in writing English compositions.

IV. ANALYSES AND DISCUSSION

While the protocols were transcribed with specific entries as defined previously, the written texts were also divided into sets of “notes.” Each note referred to a single idea produced as a written text. By employing different structures of the writing process, the subjects produced their notes in different ways. Some subjects tended to put down the note right after they “thought aloud” each idea. Some would

not put down anything until they finished “organizing”¹ the retrieved ideas they had in the working memory. As a result, the notes produced by the subjects who had to employ the organizing process generally spent more time processing the retrieved ideas before they could put them down as a written note. According to Liu (1998a), every subject used different structures of the writing process to elaborate his/her retrieved ideas. It is like people living in the city who have different ways to travel from one spot to another. Those who have a car available can get to the target spot in a short time via a freeway. Those who have no private transportation available may have to either get there by bus or on foot. It stands to reason that the one who takes the freeway experiences fewer processes than the one who has to walk, wait for traffic lights, and take turns here and there. In writing, one may simply retrieve an idea and find a way to encode it as a note without delay, or one may retrieve an idea, organize it, reorganize it, or even translate a Chinese idea into English idea. Comparatively, the latter takes more trouble producing a written note than the former.

Liu (1998a) developed a general structure (Figure 1) that reflects all possible processes a Chinese EFL student may experience in generating a written note as a useful text on the basis of transcribed protocols. This is like a map that depicts the routes leading from one spot to another. While different individuals tend to use different routes, there are also ways that attract more people because they are more convenient and efficient in general value. This is also true in writing. Individuals tend to use different processes to produce their works, but there are still processes that are commonly shared by most writers. For instance, every writer had to “set the goal” before he/she tried to “retrieve” materials, but not all of them had to “organize” the retrieved ideas. Liu (1998a) categorized all possible formats of thinking process as 18 types, each reflecting different sets of procedures that the subject went through before he/she completed one generating act. Two examples are as follows:

If a written note is produced by going through the first type² of mental structure, which is considered the most economical, seven “steps” must be experienced:

set the goal = generating → decide to retrieve element in English → retrieve elements in English → evaluate the retrieved elements as useful → organize the retrieved elements in English → consider elements a useful note in English → write it down as a note in English

If a written note is produced by following type 3 with L₁-L₂ translation involved, the processes to be undergone are as follows:

Set the goal = generating → decide to retrieve elements in English → retrieve elements

¹ The organizing process is to organize what is retrieved or generated into useful notes, propositions, or sentences. In this paper, the focus is on how retrieved materials are “organized” before they form a note. There are five principles to identify the organizing process:

1. when the subject repeats the retrieved ideas or generated notes
2. when the subject spells out the word or words to slow down the information flow
3. when the subject reads the written text or reads it again
4. when the subject says one thing and changes his mind by implicit signs like “this word would be better here”
5. when the subject explicitly says things like “Then, what can I say now?” (Liu 1998b)

² A total of 18 types are identified by Liu (1998). The two types mentioned in this paper are described as Type 1: retrieving ideas (in English) → organizing ideas (in English) → generating notes (in English) and Type 3: retrieving ideas (in English) → organizing ideas (in Chinese) → generating notes (in English)

in English → evaluate the retrieved elements as useful → organize the retrieved elements in English → set a goal to translate the retrieved elements into Chinese → translate the retrieved elements into Chinese → organize the elements in Chinese → consider elements a useful note in Chinese → translate the note into English → consider the translated note useful → write it down as a note in English

The only difference between type 1 and type 3 (see Note 2) is that at one time the subject produces a note by using English throughout the processes; at other times he/she uses both Mandarin and English simultaneously (i.e., retrieving an idea in English but organizing it in Mandarin). Five more processes are involved to deal with the translation tasks if the type 3 is involved in producing a note. Compared with Hayes and Flower's model (Figure 2), which involves only four steps to produce a written note, the subjects in this study are definitely loaded with more mental work than English native speakers while producing a writing piece in English.

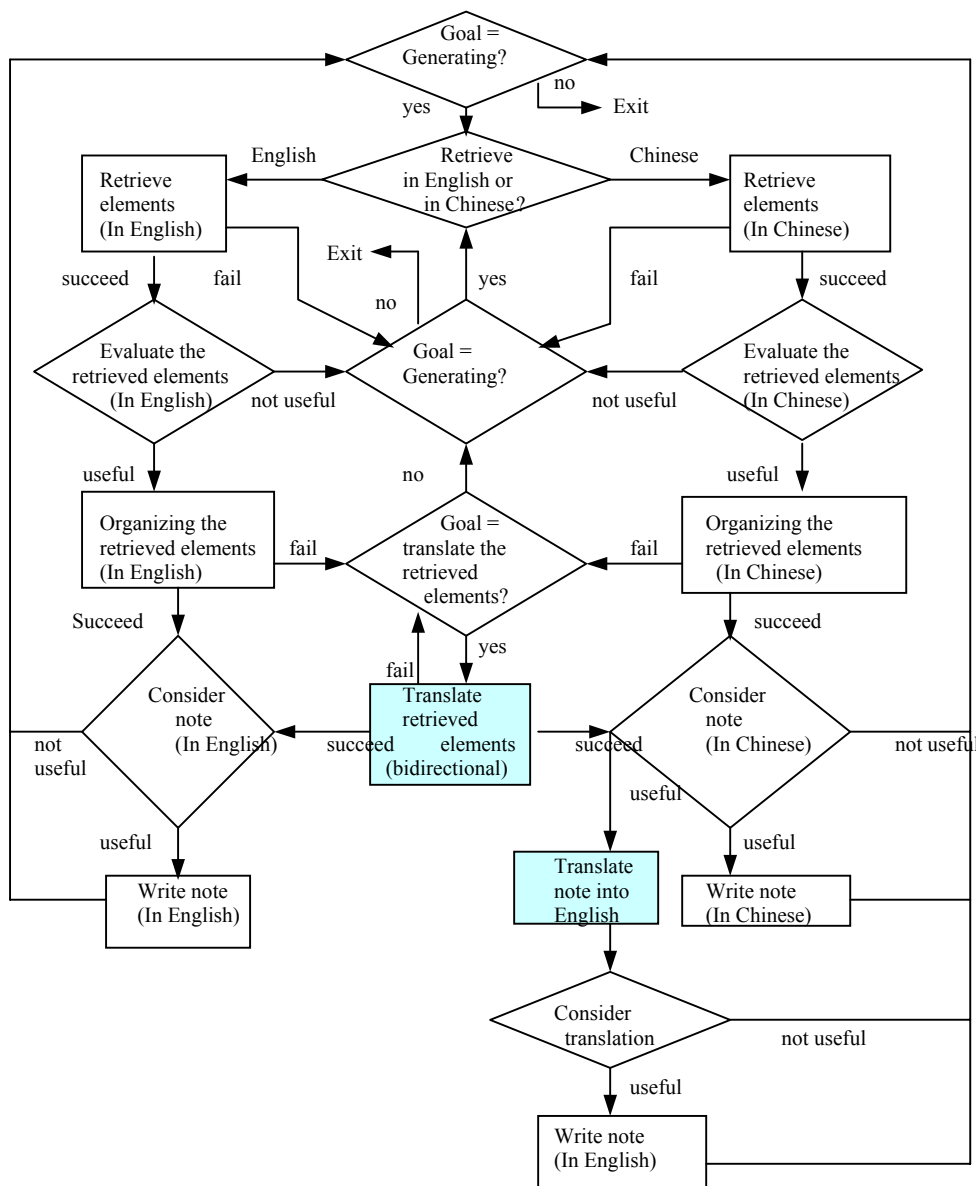


Figure 1
The Structure of the Note Generating Process of the Chinese Subjects (Liu 1998a)

Comparing Figure 1 and Figure 2, it is obvious that Hayes and Flower see the native English speaking subject produce a note in the following procedure:

set the goal = generating → retrieve element in English → evaluate the retrieved elements as useful → consider elements a useful note in English → write it down as a note in English

The structure does not show the native English speaker has to organize the retrieved materials whereas four of the five subjects in this study have to go through the organizing process while generating written notes either in Mandarin or in English. According to Hayes and Flower, a note has to be generated and then be organized and becomes an “organizational note” (pp. 14-15). However, the data collected for this study provides examples of a different nature in that the retrieved materials are often organized first before they are encoded as a written note. Table 1 indicates that the subject experiences six organizing processes before the expression “so far I have taken many classes” is produced. Of the six organizing acts, two of them are involved with generating the note “I have,” another two with the note “taken” and still another two with the note “many classes.” From these procedures it can be seen that the Chinese subjects in this study need to go through many more mental procedures than a native English speaker does.

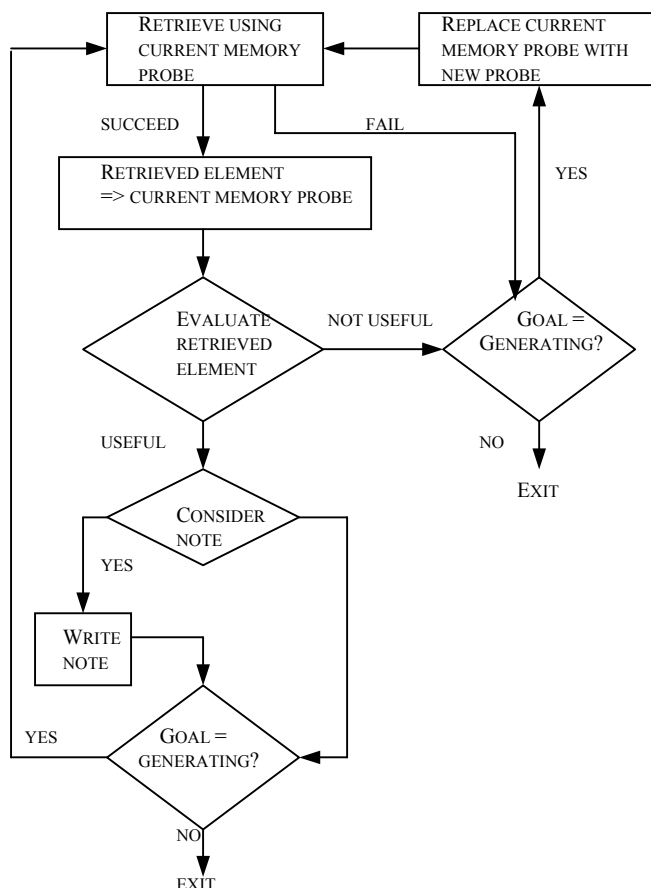


Figure 2

The Structure of the GENERATING Process by Hayes & Flower (1980, p. 13).

The reason that even the most economical type of writing process for generating a written note found in this study includes more sub-processes than the

what is postulated by Hayes and Flower is that the idea unit used in the think-aloud protocol in this study reveals clearer information. Each idea unit reflects one or more than one process or sub-process that the Chinese subjects may undergo while producing an English composition. Instead of having only “GENERATING” and “GOAL SETTING” as in Hayes and Flower’s structure of the generating process, the data derived from the think-aloud protocol in this study indicate that generating a written note has to include the following sub-processes—generating ideas by retrieving materials directly from the long-term memory or from other sources (e.g., the given topic or teacher’s instruction), organizing retrieved raw materials, generating notes as part of the text, and organizing the generated note to make it useful. Each sub-process can be defined as follows:

- A. **Generating ideas:** This act refers to the process in which the subject retrieves an idea from the long-term memory or from other sources like given information; it can also be labeled as **retrieving ideas**.
- B. **Organizing ideas:** This act refers to the process in which the subject tries to “do something” about the retrieved ideas before they are put down as a useful note. The process “may be structured either temporally (e.g., ‘First, I’ll say A, then B.’) or hierarchically (e.g., ‘Under topic #1, I should discuss A, B, and C.’) or both” (Hayes & Flower, 1980, p. 14). If the process is not obviously structured as was mentioned, the subject may repeat a retrieved idea and try to fit it into the context. Other options include spelling out the English word to make sure that the right word is found to express the retrieved idea as a useful note, or retrieving more new ideas to make sure the previous idea has the potential to make a good part of a note, or doing any other act that reflects the organizing of the retrieved elements before turning them into a note. However, in reality, not all subjects said aloud their “organizing acts” while producing the “think-aloud” protocol. Some of them put down the note right after they had retrieved an idea. In this case, if the note the subject produced was identical to the “transcribed idea unit” in the “think-aloud” protocol, the organizing act was not considered a necessary process. But if the note would be different from the “transcribed idea unit,” the organizing process, though not seen in the protocol, would be still believed to have occurred before the note was created.
- C. **Generating notes:** This act refers to the process in which the subject encodes the retrieved idea as a useful note in the form of written context.
- D. **Organizing notes:** This act refers to the process in which the subjects “do something” about the written notes before they are completed as a sentence. The subject may repeat one written note or try to combine the note with other notes into a proposition. The subject may also reorganize the word order or add new ideas to or delete retrieved elements from the written notes. If the writer has to read the written notes more than once, this process is also regarded as a type of organizing act.

The organizing process, based on the data, occurs in three different phases. The first phase refers to the organizing act that occurs right after the writer retrieves an idea and before it is encoded into a note. The second phase refers to the moment when the writer tries to organize retrieved ideas with the note produced. And the third phase is

when the writer tries to organize the notes produced into a bigger unit of note. The organizing process established by Hayes and Flower (1980) involves only the third phase, which explains why their model is not sufficient to account for the generating process the Chinese subjects went through when they produced English writings.

V. IMPLICATIONS AND LIMITATIONS

As a fundamental study with only five subjects, the findings, explicit as they are, can only serve as references for both English instructors and learners to have another approach to look at English writing on this island. The contribution of this study is that English instructors can see the clear mental processes of how a Chinese student completes a task of generating a written note. This paper, together with others (Liu, 1997; 1998a; 1998b), provides clear flow charts that reflect where Chinese students may experience the L₁-L₂ translating act and how this translating act interacts with other processes such as organizing or generating acts. However, as I mentioned in the previous section that writing an article is like traveling from one place to another. The process of the travel itself cannot tell what the result might be. In other words, while one traveling via a freeway gets to the target place faster than walking along the local roads full of traffic lights and tedious labor, the former does not guarantee a better quality of the trip. By the same token, there is no predicting how well or how poorly the subject will achieve the goal of writing by simply looking at the structure of the cognitive process. To find solutions to this problem, I have designed another study with fifty subjects involved. The data have been collected and are being analyzed at this moment. The results of this new study may provide further information to clarify the doubts confronted here.

There may be other possible processes hidden in the structure of the generating process that are not discussed in this paper. Perhaps the data from the new study will provide more information to account for the writing processes Chinese students have to experience. However, the findings in this paper already build up a prototype of how the L₁-L₂ translating act is involved in English writing done by Chinese subjects. Besides, the findings here may provide some help for English instructors and learners to identify the writing processes. Whether or not they serve as a guide to the diagnosis of writing difficulties that Chinese college students may confront still remains to be explored.

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