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Recursive Cognitive Processes in L2 Writing of Korean EFL Students: An Analysis of Think-Aloud Protocols*

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This study investigated the writing process performed by six Korean EFL learners. These advanced writers were asked to compose four narrative writings and four argumentative writings in L2 under think-aloud conditions. Analysis of the forty eight think-aloud protocols revealed that all of the writers notably exhibited cyclical writing when producing a single idea unit. First, when generating ideas with less demanding contents, the writers involved the single brainstorming cognitive strategy of 'idea generation (IG)' directly in L2, and this sequence of a single strategy was shown repeatedly in think-aloud protocol data. Next, the 'idea generation (IG)-translation (T)-lexical searching (LS)' pattern was the second most frequently occurring strategy. This pattern is a partial section out of the full set of the 'idea organization (IO)-idea generation (IG)-lexical searching (LS)-translation (T)-text examination (TE)-metacommenting (MC)' writing pattern. In argumentative writing, the noticeable patterns were the 'IG (L1)-T,' 'IO-IG (L1)-T' and 'IG (L1)-LS-T' patterns. Meanwhile, for the narrative genre, the noticeable writing patterns were the 'IG (L2),' 'IG (L1)-T' and 'IG (L1)-LS-T' patterns.

[second language writing/writing pattern/cognitive strategy/think-aloud protocol]

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I. INTRODUCTION

There is cognitively oriented research focusing on the writing process (Flower & Hayes, 1977; Grabe & Kaplan, 1996; Kellogg, 1987; Kim, 2011; Lim, 2006; Wang & Wen, 2002). Flower and Hayes's model (1981) has provided learners with assistance on the writing process. This model only accounts for the process of writing in one's native language. Krapels (1990) supported the claim that the L1 writing process is largely the same as the L2 writing process, as he stated that there is nothing different between the two processes. However, that is an overgeneralization that does not accurately and specifically account for the L2 process. Also, the L1 writing process model is not sufficient to satisfactorily explain the L2 learner's writing process. Wang and Wen (2002) attempted to produce a descriptive model of the L2 composing process. Thus far, it is the only available model that intricately explains the cognitive writing process in L2 learners' minds while writing. There needs to be further study with a different perspective regarding this matter, especially research that fittingly explores the writing process of Korean students in the EFL context.

Wang and Wen (2002) compared the genre difference of narrative writing and argumentative writing in the L2 composing process. However, their methodological design is somewhat controversial. In their narrative task, instead of providing a prompt, they gave non-linguistic prompts in the form of pictures for story writing. In contrast, a short, one-paragraph prompt in L2 was provided for the argumentative task. This is problematic, in that picture writing cannot adequately represent the comprehensive narrative genre since it is more of a descriptive writing of the pictures and not precisely a narrative task. Furthermore, according to them, pictures acted as an attributable factor to the findings. The narrative writing task was provided without any textual input; hence, it triggered more L1 production. On the contrary, given input written in English for argumentative writing triggered more L2 production. Therefore, it seems that genre division played minor roles. To compensate for the above-mentioned problems, in this present study, letter writing was adopted as just one of four narrative writings along with three other narrative topics. Also, pictures were excluded in writing assignments, and all the prompts were given in English to produce reliable results.

Second, there is an affective problem in earlier studies where the participants were asked to perform in a limited space with the presence of the researcher. In some cases, there were also time and word limitations placed on participants. For instance, Van Weijen, Van den Bergh, Rijlaarsdam, and Sanders (2009) only provided 30 minutes to each participant to finish one task. This can be problematic in that time pressure can act as an interfering factor. Wang and Wen (2002) asked students to write no less than 200 words within 45

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minutes. This time limit and required word length may have constrained the composing process, and the student writers might have planned and revised less because of the time pressure.

Therefore, in this study, for each writing task participants were given one hour, which is the amount of time that both the researchers and the participants agreed as being more than enough for performing each writing task. Also, participants were told that a few additional minutes could be given at the end if they needed to wrap up their writing. In addition, all the writing tasks were carried out outside a classroom environment without the presence of the researchers. This allowed the participants to freely write under *think-aloud conditions* without any burden. The researchers believe that this design can best show the genuine underlying writing proficiency of the participants.

The writing pattern of writers does not show a series of linear movements from one sentence to another, but it involves dynamic and non-linear jumps from one problem to another (Flower & Hayes, 1977). L2 writing is a very complicated and demanding process since it is multifaceted with many of its elements functioning simultaneously and recursively resulting in a complicated phenomenon (Pennington & So, 1993). For L2 writers, writing is a bilingual event (Cumming, 1990; Lay, 1982; Manchón, Roca de Larios, & Murphy, 2000; Uzawa & Cumming, 1989; Wang & Wen, 2002) as L2 writing involves a series of dynamic patterns of numerous cognitive strategies since writers depend on their both L1 and L2 knowledge.

The present study primarily deals with the general cognitive processes that are involved in Korean EFL students' compositions, which deserve to receive attention from L2 learners and English teachers. This study also aims to specify the notable recursive pattern of individual cognitive strategies of six Korean EFL participants based on analysis of *think-aloud protocol*.

II. LITERATURE REVIEW

Early 1980 is marked as the beginning of the think-aloud protocol (TAP), and from then on, analysis on the writing process started to gain attention (Roca de Larios, Manchón, & Murphy, 2006). During the last two decades, with the introduction of the TAP method, there has been some research focusing on writers' verbal protocol data and their inner thoughts during the writing process. This is an attractive field of inquiry since it illuminates cognitive and invisible mental operations involved in second language writing, an area that was overlooked and received less attention in the past.

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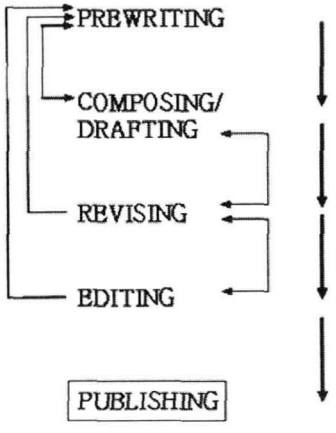
Tribble (1996) demonstrated the writing process model, and this became the most representative model adopted by many writing classes in the educational field. Also, this writing process model shifted the previous focus on textual writing to process writing. The model introduces the sequence of writing assignments as pre-writing, composing/drafting, revising, editing and publishing. In this process approach, in the first stage of pre-writing, the participants first brainstormed to generate ideas, and this was followed by actual composing, revision and publishing. Through think-aloud protocol, it was revealed that the students organized their writing in a productive and iterative manner. Tribble (1996) showed that writing is a goal-oriented activity with the aim of developing writing skills. Also, from the think-aloud protocol, it was found that professional writers composed their writing in a different manner in comparison with the low-leveled writers.

FIGURE 1

Recursive Cognitive Composition Processing Model (Tribble, 1996)



A writing processing model with a more complicated and dynamic and cognitive view was proposed by Kellogg (1987). He verified through verbal protocols and interviews that the cognitive process involved planning, translation, reviewing and collecting, which is recursive and iterative during all phases of composition. This shows the complex view of writing, and this was further analyzed in terms of the proficiency of the writers and cognitive effort allocated to writing processes. As Figure 2 shows below, there is a concurrent and repetitive nature to the composing process.

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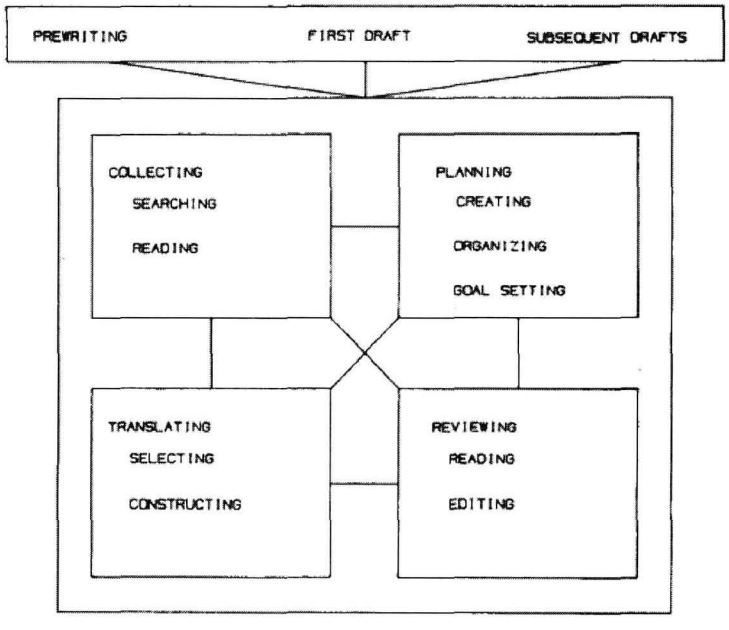
FIGURE 2

A Model of Product Phases and Recursive Cognitive Process in Writing (Kellogg, 1987)



In the same vein, Flower and Hayes (1981) stated that writing is a series of distinctive thinking processes, which involve constant decision making and countless choices. While performing the writing task, writers proceed to choose appropriate words and structures for their draft. The act of composing is a goal-directed thinking process that is guided by the writer's constant decision making. Flower and Hayes (1981) claimed that a simple composition model of pre-write, write, and re-write cannot be an accurate description of the composing process and instead came up with more sophisticated but complicated stages with a newly suggested model. The model identifies plan, translate, and review as the major processes and demonstrates that there can also be a number of sub-cognitive processes available to the writer.

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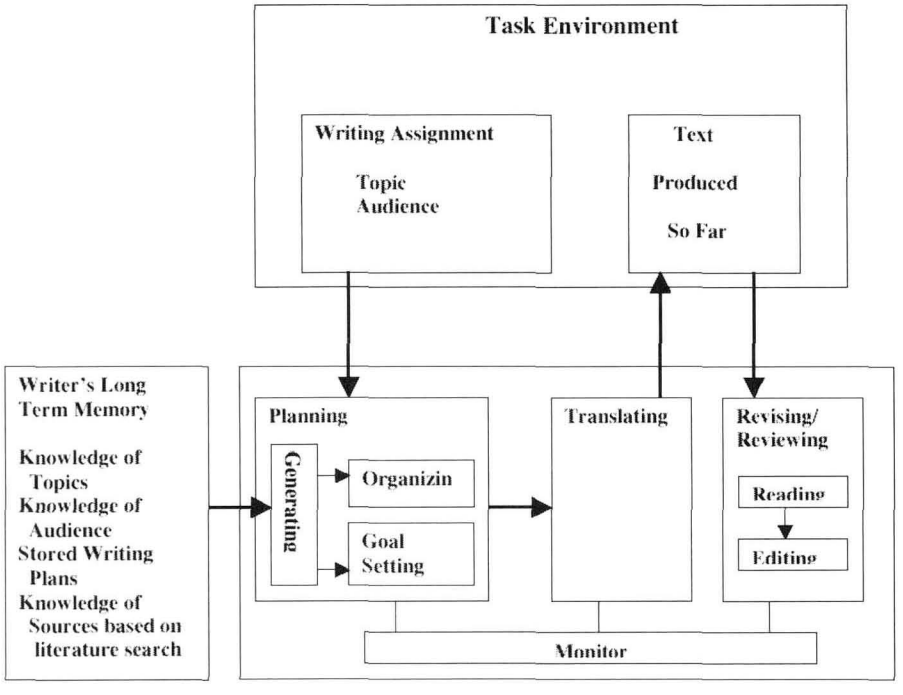
FIGURE 3

Structure of the Writing Model (Flower & Hayes, 1981)



After the introduction of several writing and cognitive process models like the ones proposed above, there was still a necessity to develop a distinctive theory of L2 writing that should be differentiated from the L1 writing process. The L2 writing process model, compared with that of L1, lacked coherence and comprehensive patterns. This being so, an L2 composing process model was newly proposed by Wang and Wen (2002), and they criticized Flower and Hayes' (1981) model for following in a step-by-step linear fashion with clear boundaries among individual composing processes.

In the descriptive model by Wang and Wen (2002), there is a dynamic interaction of continuous cognitive and mental processes. This is because writers are constantly generating, expressing, refining and revising their ideas while producing a text.

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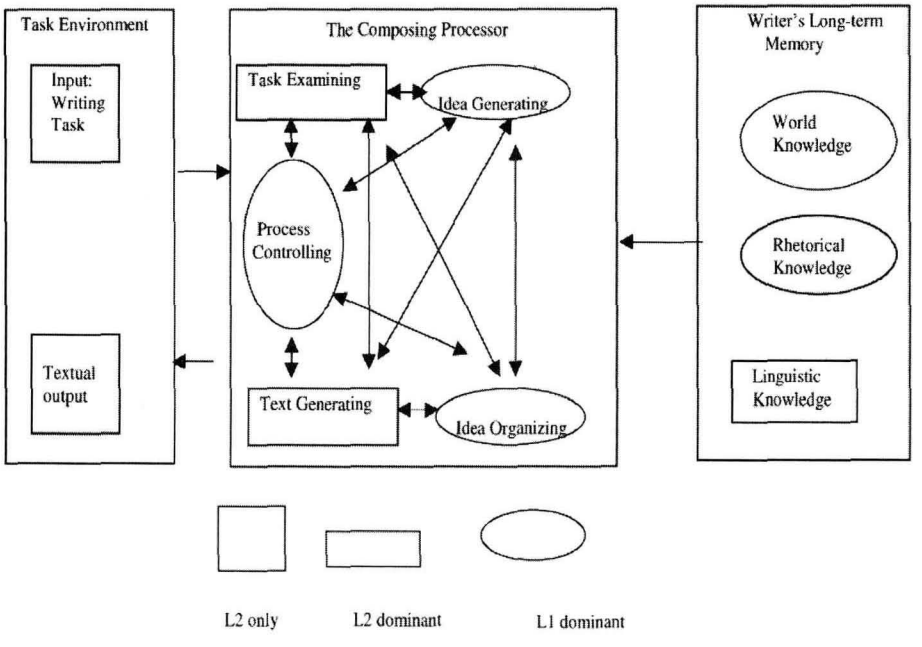
FIGURE 4

A Descriptive Model of L2 Composing Process Model (Wang & Wen, 2002)



III. METHODOLOGY

1. Participants and Setting

The present study took place in a large private university. Korean students make up a large portion of the overall student population, and the majority of Korean students have a high level of language skills and cultural background acquired in either short-term or long-term overseas experience. All participants were in close contact with the researchers for the six months of the observation period (from the start of the summer vacation to the end of the fall semester). The students volunteered to participate in this research and were paid a small amount of money for their participation.

Before the writing task was given to participants, a questionnaire was distributed to each in a face-to-face individual meeting. This was done to understand the overall demographic information of the participants ranging from his/her language background, language level, and previous writing experience to overseas experience. As Table 1 shows below, all the participants share common factors. They are undergraduate students majoring in English.

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They are all in their 20s, with four students in their early 20s and two students in their mid 20s (with their average age being 23). They were considered advanced learners according to their TOEIC scores.

TABLE 1

Profiles of Participants

Pseudonym	Gender	Age	School Year	TOEIC score	Experience Studying Abroad
Juhyeon	F	22	Junior	850	No
Yeongmi	F	22	Junior	855	No
Sangeun	F	25	Senior	855	No
Minkyu	M	26	Senior	865	No
Inseong	M	22	Sophomore	850	No
Hansu	M	21	Sophomore	885 (TOEFL 108)	Yes (0.5year)

2. Procedure

1) Think-Aloud Protocol

Think-aloud protocol (TAP) is a method that allows researchers to understand the thought process of a subject as they write. While the writers attempt to complete a defined writing task, ideally they will reflect on what they think. In this paper, the transcript of these thoughts, which amounts to fifteen to twenty pages for each writing session, is called the 'protocol.' TAP as a tool in the writing process has been much debated in the past (Ericsson, 1998; Janssen, Van Waes, & Van den Bergh, 1996; Manchón, Murphy, & Roca de Larios, 2005; Roca de Larios, Manchón, & Murphy, 2006), and TAP has received various criticisms in that it has reliability and effectiveness issues (Bracewell & Breuleux, 1994; Smagorinsky, 1994; Zamel, 1983). However, it still has some benefits in illustrating understanding the inner thoughts of a writer, and it makes it possible to ascertain instant information of a writer's inner view (Ericsson & Simon, 1993). Although it has inherent problems, when performed with cautious effort, its usefulness is far greater than its drawbacks (Smagorinsky, 1994). Also, Krapels (1990) stated that protocol analysis provides 'useful data' for L2 writing research. Therefore, the researchers concluded that TAP is considered the best existing method for understanding writers' writing processes.

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2) Think-Aloud Training (40-60 minutes)

Upon receiving the questionnaire, think-aloud training with each participant was performed individually in a small private study room in the university with one of the researchers (the first author). They were given five math questions and one narrative writing task, for which they were asked to write a self-introduction to a newly arrived exchanged student, and they were asked to write under think-aloud conditions. When the first author witnessed any noticeable pause, she told them not to pause and to continue to think-aloud their inner thoughts. When necessary, she also showed them how to think-aloud as an example for better understanding. They were instructed and agreed to write eight writings outside a classroom environment privately with a recording device running without any outsider help. They were allowed to use a dictionary for their lexical searching.

3) The Writing Task

The six participants were asked to produce writing with a minimum of 300 words, and each writing task was to be performed within an hour, which both the researchers and the participants agreed was more than enough time for completing each writing session. Also, participants were told that some additional minutes could be added at the end in order to wrap up the writing. The researchers concluded that performing writing tasks within a limited space could be an interfering factor for evaluating the genuine writing proficiency and natural think-aloud conditions. Also, the unnecessary presence of the researchers could cause an uncomfortable atmosphere for writers, and also it could block their natural flow of thoughts. Therefore, in this study, all the writing tasks were performed outside a classroom environment without the presence of the researchers. This let participants freely write under think-aloud conditions without any burden posed upon them by various unwanted factors. Eight essays were collected from each participant for a total of 48 writing samples. The purpose of gathering abundant data from each participant was to safely draw conclusions to find reliable and accurate patterns for within-subject generalization. Writing topics for the writing task are shown in Table 2.

TABLE 2

Writing Topics

Session#	Writing#	Genre	Topic
Session 1	NW#1	Narrative	Write about your plan for this upcoming summer vacation.
Session 2	AW#1	Argumentative	Should the divorce procedure be made easier or more difficult?

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		Interval of 10-15 days	
Session 3	AW#2	Argumentative	Should drivers of automobiles be prohibited from using cellular phones?
Session 4	NW#2	Narrative	Describe the most difficult adjustment you have made being an undergraduate school student.
		Interval of 10-15 days	
Session 5	NW#3	Narrative	Write about the most frightening experience you had in the past.
Session 6	AW#3	Argumentative	Should the "Right to Die" be considered a right?
		Interval of 10-15 days	
Session 7	AW#4	Argumentative	Should animal experimentation be permitted?
Session 8	NW#4	Narrative	Write a letter to an immigrant worker coming to Korea about how to better adjust to life in Korea.

3. Data Coding

1) Transcription Conventions

Data coding and analysis were carried out upon receiving the data after each session. All the produced verbal data were meticulously transcribed, and each statement was divided into numbered segments that showed the units of thoughts as determined by the researchers, and here idea unit was used for detail segmentation. Transcription convention was adopted from Wang and Wen (2002) but was edited with fine adjustment and is shown in Table 3 below.

TABLE 3

Transcription Convention

Transcription Conventions	Definition	Examples
…	A series of three consecutive dots denotes a noticeable pause in the writer's verbalizations	음 그 다음엔…… 아, 그래
?	Question mark shows the rising intonation	그런데 요즘 사람들은 그렇지 않다?
.	Period shows the falling intonation and the end of one's units of thoughts	한편 이런 모습도 보여주고 있다.
(1) numbering	Numbered segments are divided based on individual cognitive strategy usually based on one idea unit. Each number is	(1) First, it will, it will influence our culture. (2) This is the first reaction of me. (3) On the other hand

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	later given the name of one out of 6 cognitive strategies	
Paragraph Division	Paragraph division shows the single idea unit that is composed of one or more cognitive strategies	I think she is nice. (Idea Generation) 그 다음에 뭐 쓰지 (Idea Generation) Umm…… I think…… 사전 찾아봐야겠다. (Lexical Searching) 아 오케이, I think the senior will come visit. (Translation) 선배는 아름다워. (Idea Generation) She is beauty, beautiful. (Translation)

2) A Coding Scheme

The researchers adopted the coding scheme developed by Wang and Wen (2002), and it was fine tuned for this present study. All the transcribed data were then categorized according to a coding scheme provided in Table 4 below. Here, each unit is defined with one out of the six categories: Idea organization (IO), Idea generation (IG), Translation (T), Lexical searching (LS), Task-examination (TE) and Metacommenting (MC).

TABLE 4

A Coding Scheme of the Compositing Activities

Cognitive Strategy	Definition	Examples
Idea Organization (IO)	Planning the organization	첫 단락엔 간단한 소개를 하고 그 다음 단락엔 친한 친구를 소개하는 글도 적어봐야지
Idea Generation (IG)	Planning the content	그 다음 뭐에 관해서 쓰지, 아 맞다 나에 대해서 좀더 구체적으로 말해야겠다
Translation (T)	Translation from Korean to English directly/indirectly	네가 만약 온다면, if you visit me..
Lexical Searching (LS)	Searching for the right words	다음에 놀러와, 놀러와가 머지?
Task-Examination (TE)	Analyzing the writing prompt and commenting on the task	Write a personal letter to a new classmate in your class describing yourself with at least the following information. 음 무슨 소리지? 편지를 쓰라는 얘기인가?
Metacommenting (MC)	Control the overall writing procedure	아니다. 이렇게 쓰면 안될 거 같은데……

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The original coding scheme by Wang and Wen (2002) consists of 1) Idea organizing, 2) Idea generating, 3) Text generating activities, 4) Task examination, and 5) Process controlling. They defined idea organizing as the act of planning the organization and evaluating it, and here, this act is understood as a "what next?" approach (Uzawa, 1996). The researchers excluded the evaluation part from this coding scheme and re-categorized it under the metacommenting section.

Next, Wang and Wen (2002) defined idea generating as the act of planning and evaluating the content. In this study, the researchers excluded the evaluation part from this coding scheme and made a separate section and re-categorized it under the metacommenting category. Following that, they had text generating activities as a separate coding scheme, and it is defined as the act of producing and reviewing the text. The researchers deleted this section and used "the act of producing" under idea generating and "the act of reviewing the text" under task examination.

Wang and Wen (2002) defined task examination as an act of analyzing the writing prompt or commenting on the task and the act of examination of the already produced or given writing output. This was adopted into this research intact as it is defined. Lastly, they had process controlling as one of its coding schemes, and it is defined as the act of controlling the writing procedures, word length and time limit. The researchers deleted this section and redefined it under the metacommenting section.

Here are two additional coding schemes that the researchers used in this study, and they are lexical searching and translation. Lexical searching is the act of searching for appropriate lexical items in order to produce L2 written text. In formulating the text, L2 writers are frequently beset by language problems, many of which are lexical in nature (Murphy & Roca de Larios, 2010). The purpose of this separate coding scheme is to closely analyze how L2 writers switch to their L1 to compensate for their lack of L2 vocabulary skills. Next is translation, which is the act of translation from L1 to L2. This is a popular strategy that many second language writers adopt for their L2 writing. It is known from previous studies that translation is a necessary skill for students' L2 writing in that writers can take advantage of their solid L1 knowledge (Kobayashi & Rinnert, 1992). In conclusion, in this research, six coding schemes were utilized based on an original framework made by Wang and Wen (2002). Minor alterations were made with the final edited output as follows:

FIGURE 5

Finalized Coding Scheme Modified from Wang & Wen (2002)

1) Idea Organization (IO)	**2) Idea Generation (IG)**	**3) Lexical Searching (LS)**
4) Translation (T)	**5) Task Examination (TE)**	**6) Metacommenting (MC)**

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For data analysis, forty eight gathered voice files were first transcribed. After that, each line with the same purpose of production was grouped together and numbered. In most cases, each numbered segment was represented as the sentence level. After that, the given number was categorized with one out of the six cognitive strategies shown in Figure 5. Following that, the arrangements of individual cognitive strategies were grouped together based on a single idea unit. In the TAP data, the researchers added a paragraph division to distinguish one idea unit from another. Here, the researchers aimed to find any noticeable patterns and iterative patterns with these arrangements of cognitive strategies.

IV. FINDINGS

1. Overall Writing Pattern

The TAP overwhelmingly demonstrated that all the participants needed an extensive amount of support of their mother tongue during their writing process. The findings revealed a similar and consistent pattern in all of the 48 protocols. As Figure 6 shows below, the writers went through dynamic dimensions of different mental stages when they tried to represent a single idea unit in English sentences. In most cases, they first generated ideas in their first language, Korean, and this showed their heavy dependency on L1, which is the strategy constantly shown in all the participants throughout their whole writing process. After getting ideas in L1, the writers tried to translate the produced ideas into English. Lexical searching took place either soon after idea generation or in the middle of translation and lexical searching, which is seen as the middle ground where transition from L1 to L2 occurs.

In conclusion, the most frequently observed cognitive strategies were idea generation, lexical searching and translation (with some alterations of different arrangements). Hence, Figure 6 below describes the most iterative and noticeable yet orderly pattern of individual cognitive strategies. Coded transcription of TAP suggested that the 'IG-LS-T' and 'IG-T-LS' patterns were shown in a repetitive and cyclical fashion encompassing all the L2 writers across genres.

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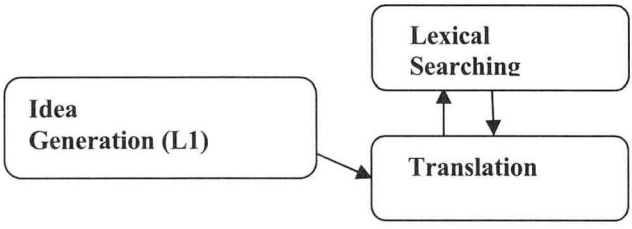
FIGURE 6

Notable Iterative and Cyclical Pattern of Individual Cognitive Strategies

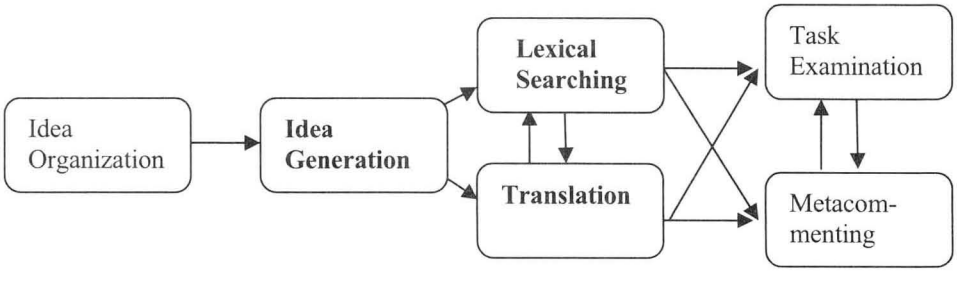


In comparison to Figure 6, Figure 7 below shows a full set of the overall pattern of individual cognitive strategies. Some TAP data showed that when producing a single idea unit, all types of cognitive strategies were required. When the writers were faced with producing a sentence that was challenging or were burdened when trying to produce certain expressions they had in mind, TAP showed the pattern in Figure 7, which consists of IO, IG, LS, T, TE and MC as its elements (with a change of order and alteration). However, in most cases, only two to three cognitive strategies were needed (e.g., IG-T).

It is important to note that a vast amount of the TAP data demonstrated only three types of cognitive strategies being used, such as IG, T and LS, as was shown in Figure 6. In comparison, this also indicates that the writers used IO, TE and MC less frequently. Firstly, the particular purpose of idea organization is to organize and outline a structure, and it was a genre-specific strategy that occurred mostly in argumentative writing. Next, text examination and metacommenting occurred when writers needed to examine the produced text by reading and then producing textual content. These two cognitive strategies seldom occurred, and some TAP data for certain participants did not even show any use of these two strategies. Thus, distinguishing between text examination and metacommenting was very difficult because in most cases, the TAP data did not reflect a clear boundary between these two strategies. Often times, writers' attention shifted back and forth between these two strategies and eventually combined into one.

FIGURE 7

Overall Pattern of Individual Cognitive Strategy When Producing a Single Idea Unit



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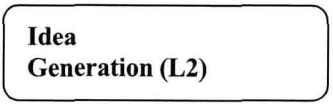
In contrast, when the participants produced texts directly in L2 without having to depend on their L1 knowledge, they skipped lexical searching and translation. Idea generation in L2 occurred more in narrative writing that did not require a great cognitive burden to think and produce contents. As Figure 8 shows below, an idea unit is produced based on a single stage of idea generation in L2, and such high frequency of IG in the L2 sequence in TAP is not surprising since all participants in this study were advanced students whose TOEIC scores exceeded 850. In other words, if less proficient writers had participated in this study, lower incidences of IG in L2 might have been appeared.

FIGURE 8

Single Individual Cognitive Strategy of IG in L2



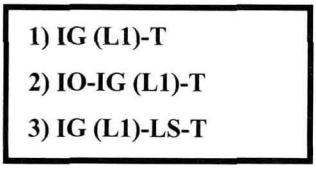
2. Genre Specific Pattern

1) Frequent Pattern for Argumentative Writing

The purpose of this section is to describe the specific patterns found in argumentative writing. The three most frequently detected patterns are shown in Figure 9 below. The 'IG-T' pattern most frequently occurred in the argumentative genre followed by the 'IO-IG-T' and 'IG-LS-T' patterns. It is notable that this 'IO-IG-T' pattern rarely occurred in the narrative genre, making this a genre-specific pattern of argumentative writing. The difference between the 'IG-T' pattern and the 'IG-LS-T' pattern is the presence of LS. LS occurs at the stage where writers transition from IG to T. The fact that the 'IG-T' pattern occurred more frequently than the 'IG-LS-T' pattern in argumentative writing shows that the writers were able to write and translate the text without having to be heavily dependent on LS.

FIGURE 9

Three Most Frequently Detectable Patterns in the Argumentative Genre



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(1) IG (L1)-T

The most outstanding pattern in argumentative writing is the 'IG-T' pattern where writers first generated ideas in L1 and then translated them into L2. Here, there was no interruption of LS during the act of translation. This pattern was repeated the greatest number of times, and this shows how dependent the writers were on their L1 knowledge and how frequently they employed translation as a writing strategy. The writers freely took advantage of their L1 and L2 knowledge, both serving as beneficial language assets.

Example (1) IG-T
IG 오직 몇몇만 휴대전화의 위험에 대해서 알고 있다…
T But only a few people recognize dangerousness of using a cellular phone

Example (2) IG-T
IG 이 수치는 다른 세대보다 상대적으로 높다
T This figure is relatively high compare to other age generation.

Example (3) IG-T
IG 집중력상실이 끔찍한 사고로 이어질 수 있다..그리고 이런 게 다른 사람도 죽일 수 있다..
T Losing of concentration leads to a terrible accident, and this means you can take someone's life by just using cellular phones.

(2) IO-IG (L1)-T

In the present study, any pattern preceded by IO is defined as the 'IO-IG-T' pattern. For example, the idea unit formed by the cognitive strategies of 'IO-T-IG,' 'IO-IG-LS-T,' 'IO-IG-T-LS,' and 'IO-IG-T-LS-T' are all considered to belong to the 'IO-IG-T' pattern for the sake of convenience. The researchers represented them as the 'IO-IG-T' pattern since this type of arrangement was the most frequently occurring pattern. The researchers mentioned the actual order in the parenthesis as the examples show below.

The writers were seemingly conscious about the organization and the structure of the writing when they wrote all four argumentative essays. Before or after IG, the writers first attempted to consider the organization and made an effort to distribute the content to the appropriate section. Also, the TAP analysis shows numerous pauses and stuttering since the writers' cognitive processes were multitasking; they were busy activating their thoughts related to their previous knowledge, and at the same time, the writers were mentally organizing and were heavily engaged in forming structures.

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Example (1) IO-IG-T

IO 음. 이제 바디로 들어가기 전에 뭘 애기해 주겠다….let me tell you more details. 라고 적으면 될 것 같네 여기까지 적으면 Introduction 이 된 것 같고…

IG 음…한… 조사가 있었다 집중력 상실에 정도..집중력 상실 요정도.. 전화할 때 집중력 상실된 자료가 객관적인 자료가 있으면 좋겠네

T First, there is a research finding which indicates, first, there is a research finding which indicates level of concentration losing when people drive a car with using cellular phones. When people drive a car with using cellular phones. First, there is a research finding which indicates level of concentration losing when people drive a car with using cellular phones..

Example (2) IO-IG-T (in the order of IO-IG-T-LS-T)

IO 일단 introduction 먼저 쓸까.. 일단 어떻게 생각하지..일단 글 읽는 사람의 관심을 끌어야 하는데..

IG 운전 중 휴대폰을 쓰는 게 음주 운전이랑 비슷하다… 라고 써야겠다. 전화사용과는 관계없는 음주운전을 쓰면 좋을 것 같은데.. 음…예를 들어서… 휴가기간에 음주운전 측정하는 경찰을 본적이 있을 거다… 그만큼 휴대폰 사용하는 것도 위험하다라고 .그러면

T You can see many police officers who

LS 음주 측정하다가 뭘까… 네이버를 켜서…음주 측정하다, 음주 측정하다, 음주 측정하다, 음주 측정하다,,,,measure one's blood alcohol level

T measure drivers' blood alcohol level on vacation periods.

(3) IG (L1)-LS-T

The third most frequently repeated pattern in the argumentative genre is the 'IG-LS-T' pattern. Patterns that consisted of any variation of IG, LS and T as constituting elements were grouped together and considered the same pattern. This means that the researchers deem patterns such as 'IG-LS-T,' 'IG-T-LS,' and 'IG-T-LS-T' as identical patterns because the differences in these arrangements are insubstantial. The actual order is indicated in parenthesis as the examples show below.

In the 'IG-LS-T' pattern, writers first generated ideas in L1 and were immediately challenged to find appropriate lexical items either in the beginning, middle or at the end of T. They usually paused for a short time in order to search for the right words, either by consulting a dictionary or relying on their ability to recall the applicable words. Upon finding the right terms, writers presumed to translate their thoughts into English in an effort to produce L2 writing.

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Example (1) IG-LS-T
IG 그래서 법 이런 규칙? 법이나 법제화가 필요하다.
LS 법제화를 뭐라고 하지? 음…… 아 이렇게……암..
T So, laws for prohibiting cellular phones use of drivers should be made as soon as possible.

Example (2) IG-LS-T (in the order of IG-T-LS)
IG 알코올 0.1 퍼센트 마신 거랑 같다.. 휴대폰 사용할 때 운전할 때 휴대폰 사용하면,
T If drivers use a cellular phone while they are driving, it's like driving a car with a
LS 혈중 알코올농도를 뭐라고 하지 사전을 다시 한번 찾아봐야겠네…… 사전을 찾아보면 아 여기 나와있구나 Blood Alcohol Content. 0.1 percent Blood Alcohol Content. 미국이랑 우리랑 이런 단위가 같나? 그냥 우리랑 똑같이 써서……

Example (3) IG-LS-T (in the order of IG-T-LS)
IG 운전하는 동안에 핸드폰 쓰면 더 난폭하게 하는 난폭하게 운전한다……
T if drivers use a cellular phone while they are driving,
LS 급 발진,, 급하게 브레이크를 밟는다. 어떻게 하지 slam on the brakes,.

2) Frequent Pattern for Narrative Writing

In narrative writing, as shown in Figure 10 below, the participants were less conscious about the organizational structure of the writing. Though 'IO-IG-T' was the second most frequently occurring pattern in argumentative writing, it was hard to spot the occurrence of this pattern in the narrative genre. Instead, idea generation in L2 was shown most frequently in TAP analysis of narrative writing, whereas the occurrence of IG in L2 was displayed less in the TAP of argumentative writing. Instead, idea generation in L1 occurred frequently in the argumentative genre involving frequent acts of translation. In conclusion, IG in L2 is a pattern specific to the narrative genre.

FIGURE 10

Three Most Frequently Detectable Patterns in the Narrative Genre

1) IG (L2)
2) IG (L1)-T
3) IG (L1)-LS-T

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(1) IG (L2)

In the narrative genre, the independent cognitive strategy of IG was processed directly in L2, and the TAP consistently showed this single cognitive strategy. When the writers were engaged in the argumentative genre, they were more dependent on L1 for IG, showing the 'IG-T' pattern most frequently. The fact that IG in L2 occurred most frequently in narrative writing shows that the writers relied on their L2 knowledge rather than employing both L1 and L2 knowledge.

Example (1) IG (L2)
IG But I am looking forward to taking these classes,,, because I have been interested in these two classes.

Example (2) IG (L2)
IG This certificate is regarded as one of the most important thing when people get a job.

Example (3) IG (L2)
IG But I am looking forward to taking these classes,,, because I have been interested in these two classes.

(2) IG (L1)-T

The continuation of the cyclical fashion of the 'IG (L1)-T' pattern was repeated many times for both genres. Writers first generated ideas in L1 and translated them into L2 without an interruption of LS. The six L2 writers freely took advantage of their L1 and L2 skills, and both L1 and L2 acted as useful language assets regardless of genre. However, it is noteworthy that this pattern occurred less in the narrative genre compared to the argumentative genre.

Example (1) IG-T
IG 방학에 몇 개의 계획을 갖고 있다..
T I have a few plans to do for this upcoming summer vacation.

Example (2) IG-T
IG Third라고 적어놓고..영어공부 중에서도 뭘 할지 구체적으로 적어야 하는데.. 말하기 듣기를 향상시킨다..바꿔보면..
T I will study English hard to improve English listening and speaking ability.

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Example (3) IG-T
IG 이유를 쓰면…연습하거나 공부할 기회가 많지 않았다…
T Because there were not many chances to practice and study English.

(3) IG (L1)-LS-T

Here, any pattern that consists of a variation of IG, LS and T that constitute a single idea unit are grouped together and seen as one pattern type. The researchers views patterns such as 'IG-LS-T,' 'IG-T-LS,' and 'IG-T-LS-T' as the same pattern because the differences in these arrangements are insignificant.

Although this pattern was the third most frequently occurring pattern for both argumentative and narrative writing, more incidences of LS were shown in the narrative genre. The TAP analysis clearly showed how the writers constantly grappled with finding the appropriate terms to deliver the right meaning. The writers paused to find the appropriate English word that matched the Korean meaning either by recalling or by consulting a dictionary.

Regarding the time interval allocated to lexical searching, it took a relatively longer amount of time for writers to choose the right term when they composed narrative writing. The cognitive strategy of LS occurred repeatedly since the dictionary did not instantly solve the problem. In contrast, lexical searching in the argumentative genre was done in a relatively short time.

Example (1) IG-LS-T
IG 군복무 후 다시 계획을 짤 것인데,,
LS 군복무를 하다가 머지? serve military service? 인 것은 아는데.. 사전을.....
After I served my mandatory service.
T after I served my mandatory service I need a further plan…

Example (2) IG-LS-T (in the order of IG-T-LS)
IG 정규학기 이후에 듣는 것이라 좀 스트레스 받는 상황이다..
T It is a little bit stressful situation to take classes right after
LS 정규학기? 일학기를 뭐라고 하지? first semester…spring semester라고 쓰는 게 나을 것 같네.. spring semester.

Example (3) IG-LS-T (in the order of IG-T-LS-T)
IG 처음엔 일단 계절학기를 듣는다고 적어볼까?
T First, I will take

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LS 계절학기가 뭐지. 네이버에 나오나? 외국에 계절학기 있나? 아 그냥 이렇게 표현하는구나..그러면..

T some classes in this summer vacation, I will take some classes in this summer vacation

V. CONCLUSION

The six cognitive strategies examined in this paper were idea organization, idea generation, translation, lexical searching, task examination and metacommenting. All of these cognitive approaches show the effort of the writers to formulate and construct L2 writing. The think-aloud protocol analysis suggested that L2 writing involves a complex phenomenon of dynamic mental pictures. No matter how advanced the learners were the participants depended on both L1 and L2 which required a constant mental process of translation from L1 into L2. In addition to IG, other strategies such as IO, T, LS, TE, and MC were necessarily involved during the process, and they all served as necessary tools to aid the development of the writing.

First, the participants showed iterative and noticeable writing patterns encompassing both genres, and the 'IG-T' and 'IG-T-LS' pattern occurred most frequently. These continual and repeated writing patterns show that the writers paid a great amount of attention to IG, T and LS during the writing process. This also means that other cognitive strategies such as IO, TE and MC were given relatively little attention. Next, when generating ideas with less demanding content, the writers involved the single cognitive strategy of IG produced directly in L2, and this usage of a single strategy was shown in numerous TAP sessions. These overall writing patterns and the proportional use of each cognitive strategy underwent some noticeable change when different genres were attempted.

When the writers were engaged in argumentative writing, the noticeable patterns were the 'IG (L1)-T', 'IO-IG (L1)-T' and 'IG (L1)-LS-T' patterns. Most protocols showed that the participants were heavily dependent on L1 and were more concerned with IO when performing argumentative writing than narrative writing. This is because participants struggled to develop coherent content with the required structure. This IG (L1) was often immediately followed by T, and this made the 'IG-T' pattern the most frequently occurring arrangement of strategies in argumentative writing. Accordingly, the act of translation was an indispensable strategy, especially when processing argumentative writing.

For the narrative genre, the noticeable writing patterns were the 'IG (L2),' 'IG (L1)-T' and 'IG (L1)-LS-T' patterns. When engaged in the narrative genre, the participants were comparatively less engaged with structure but showed higher use of LS in narrative writing than in argumentative writing. The cognitive strategy of LS was much more frequently

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employed in narrative writing than in argumentative writing because the writing topics were closely related to writers' L1 lives, and it allowed for use of culturally intertwined words that are very difficult to translate. This further confirms the reason why the 'IG (L1)-LS-T' pattern took place repeatedly in the protocol of the narrative genre.

There are some limitations in the design of this study. Although each writer produced eight writing drafts, the number of writers was small. To address this issue, future research should utilize a greater number of L2 writers with a variety of different L2 levels to see if there is any variation in writing patterns. Further attempts to investigate the writing process of skilled and unskilled nonnative speakers of English should result in more consolidated and richer findings. The purpose of this paper is not to confirm the previously recognized measures and findings but to make a case for further investigation into the L2 writing process. Therefore, more rigorous future studies should attempt to give stronger evidence and testimony to the account of this provisional paper for more general acceptance.

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