

reference technical data for designers to carry out relevant work, and contributes to the smooth development of construction projects.

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## THE PSYCHOLOGICAL PROMOTING EFFECT OF MOTHER TONGUE ON WRITING FOR COLLEGE ENGLISH MAJORS BASED ON SAPIR-WHORF HYPOTHESIS

Man Chen<sup>1</sup> & Zihan Wang<sup>2</sup>

<sup>1</sup>*School of Foreign Languages, Huanggang Normal University, Huangzhou 438000, China*

<sup>2</sup>*Moray House School of Education and Sport, University of Edinburgh, Edinburgh EH8 8AQ, United Kingdom*

**Background:** Learners use their mother tongue to think in the process of second language writing, which is universal, and this kind of thinking consciousness and behavior is stubborn to some extent, especially for Chinese learners. So, any attempt to completely eliminate this kind of behavior from learners' foreign language writing process is unrealistic and irrational. Perhaps an unverified explanation for this deep-rooted phenomenon is that Chinese learners, especially English majors in colleges and universities, need high-quality language ability and writing, but they have always studied foreign languages in a living and learning environment out of context, so it is difficult for them to think freely in English like native speakers of foreign languages. Once they are required to do some writing in English, it is common to use Chinese as a translation strategy. Naturally, there are two different language systems in the process of Chinese learners' second language writing, which are both interrelated and independent.

**Study Design:** Language learning and teaching is an empirical science, and direct observation often triggers reflection on many problems. The major purpose of this study is to testify the influence and the role of L1 (Chinese) in the process of college English majors' writing in second language learning. Qualitative and quantitative analysis will be used to get a more comprehensive understanding of this issue.

**Subjects and Methods:** Twelve senior English majors are selected as the research objects. Given that TEM4 is a comprehensive test set for English majors only where writing plays a prominent role, the subjects are divided into three groups (weak, fair and good) based on their scores in TEM4. In this study, the method of thinking with voice is adopted and post-test interview is supplementary to further enrich and perfect the audio thinking record, as Table 1.

**Table 1.** Subjects' information

Level	Subjects	Score in TEM4
Weak	S1.1	55
	S1.2	58
	S1.3	58
	S1.4	59
Fair	S2.1	60
	S2.2	66
	S2.3	68
	S2.4	72
Good	S3.1	80
	S3.2	84
	S3.3	84
	S3.4	86

Wang Wenyu (2004) divided the thinking activities in writing into five categories. According to Wang Wenyu's classification of thinking activities in the writing process, this study classifies the contents of voiced thinking drafts, as Table 2.

**Data analysis:** The amount of mother tongue thinking in second language writing. In this section, research question 1 “How much do learners depend on their mother tongue thinking in the process of second language writing?” and question 2 “What are the differences in the influence of mother tongue thinking on different levels of second language learners?” will be answered. Here is the sheet of words calculation for both English and Chinese, which presents the proportion of mother tongue thinking for each subject, as Table 3.

The following table is the general description of how subjects act in five major thinking activities, as Table 4.

**Table 2.** Wang Wenyu's classification of thinking activities

Thinking Activity and Its Definition	Examples
Problem solving: analysis of task tips or task evaluation	"The actuality and problems of earth. How to protect earth making everyday earth day, "loving earth every day, problems, action, action, how to do it.
Content conception: thinking activities related to the content	<i>Oh, any convenient? The first is speed; bad, bad problems, like, such as what, nothing in brain....</i> (Italicized parts are expressed in Chinese in think aloud record.)
Structural conception: thinking activities about the article structure including conception and evaluation	<i>The first paragraph, the first paragraph puts forward one's own views first, then puts forward three reasons, and finally makes a summary.</i> (Italicized parts are expressed in Chinese in think aloud record.)
Text writing: thinking activities about choosing words and making sentences	<i>Imagine when lots of, when a hundred students sit in the classroom, listening, listen, listening, to teacher's lecture, and... Um...and several,em.</i>
Process control: management of the process, word count and status	<i>Don't know what to say, the number of the words is, ok? So many that I can't express, let it be.</i> (Italicized parts are expressed in Chinese in think aloud record.)

**Table 3.** Mother tongue usage in English writing

Subjects	L1 (No.)	L2 (No.)	L1 (%)
1.1	182	55	77
1.2	210	56	79
1.3	101	89	53
1.4	130	88	60
2.1	90	110	45
2.2	111	100	53
2.3	88	190	32
2.4	70	149	32
3.1	56	253	18
3.2	66	300	18
3.3	31	196	14
3.4	85	207	29
Average	102	149	42

**Table 4.** Mother tongue thinking in different thinking activities

Thinking activities	Average	
	L1 (%)	L2 (%)
Problem solving	28	72
Content conception	44	56
Structural conception	58	42
Text writing	43	57
Process control	38	62

Here is an example of S1.2. In her recording and the interview afterwards, reasons to the Chinese thinking interference in the major three activities can be briefly concluded, as Table 5 and Table 6.

The followings are detailed description of learners' dependence on their mother tongue for thinking in the major thinking activities of writing process, as Table 7.

Therefore, it can be concluded that there is no strict relationship between English proficiency and the influence of Chinese in specific thinking activity. The following are some examples with detailed data to illustrate the thinking process of some participants, as Table 8 and Table 9.

**Table 5.** General performance of S1.2

Subject	L1 (No.)	L2 (No.)	L1 (%)
1.2	210	56	79

**Table 6.** Specific performance of S1.2: Mother tongue thinking in three major activities

Thinking activities	L1 (No.)	L2 (No.)	L1 (%)
Content conception	110	6	95
Structural conception	43	10	81
Text writing	35	12	74

**Table 7.** Mother tongue thinking in three major thinking activities

Subjects	Thinking Activities		
	Content conception L1 (%)	Structural conception L1 (%)	Text writing L1 (%)
1.1	88	78	56
1.2	95	81	74
1.3	53	51	18
1.4	65	60	66
2.1	56	56	26
2.2	45	54	44
2.3	42	76	64
2.4	36	23	56
3.1	13	45	57
3.2	10	56	48
3.3	18	28	5
3.4	7	90	29

**Table 8.** General performance of S1.3

Subject	L1 (No.)	L2 (No.)	L1 (%)
1.3	101	89	53

**Table 9.** Specific performance of S1.3: Mother tongue thinking in different thinking activities

Thinking activities	L1 (No.)	L2 (No.)	L1 (%)
Problem solving	21	0	100
Content conception	44	39	53
Structural conception	20	19	51
Text writing	6	26	18
Process control	10	5	66

Meanwhile, she thinks that many clauses are used in English sentence patterns, but there is no need to consider the logical relationship between sentences in Chinese. She said that it takes a long time to think when writing English. If she encounters words that you can't express or when your thinking is hindered, it will make her feel relaxed to use Chinese thinking mode to solve difficulties. If she must use English, she will only get more and more nervous as Table 10 and Table 11.

**Table 10.** General performance of S2.1

Subject	L1 (No.)	L2 (No.)	L1 (%)
S2.1	90	110	45

The thinking habits of the subjects in the second group are similar, and both Chinese and English account for almost the similar proportion. S2.1 is outstanding in solving problems, because she uses English to analyze the problems completely. She thinks that one of the reasons why she solves problems in English is that this topic is in a social hot spot, and the other is that her analysis of the topic is not too deep. In the

process of thinking and writing by this group of students, it is not difficult to find that the second language generally appears in simple expressions and examples. S2.1 said that it is precisely because there is little contact with English in daily life, and the new vocabulary only stays at the level of understanding and cannot be used flexibly, so it is slow and not flexible enough to extract English vocabulary. She also added, because writing in her mother tongue is a habit developed from an early age, it is an internalized habit to conceive in Chinese, whether it is a simple diary or a complicated argumentative paper. Although she is an English major, she has spent much longer time studying English than most non-major learners, but she seldom comes into contact with English on weekdays, especially conceiving textual words in English. Now, she still borrows the template from the exam to help express her clear views in English, and cannot express her true thoughts freely, as Table 12 and Table 13.

**Table 11.** Specific performance of S2.1: Mother tongue thinking in different thinking activities

Thinking activities	L1 (No.)	L2 (No.)	L1 (%)
Problem solving	0	11	0
Content conception	46	35	56
Structural conception	23	18	56
Text writing	11	31	26
Process control	10	15	40

**Table 12.** General performance of S3.3

Subject	L1 (No.)	L2 (No.)	L1 (%)
3.3	31	196	14

**Table 13.** Specific performance of S3.3: Mother tongue thinking in different thinking activities

Thinking activities	L1 (No.)	L2 (No.)	L1 (%)
Problem solving	0	25	0
Content conception	20	88	18
Structural conception	6	15	28
Text writing	3	54	5
Process control	2	14	12

**Conclusions:** It is found that the higher the learners' second language proficiency, the smaller the participation of mother tongue thinking in the process of second language writing, and the smaller the influence of mother tongue thinking. However, there is no obvious relationship between the participation and influence of mother tongue thinking in five writing activities and learners' English proficiency. It is a matter of fact that although the subjects were asked to say any thoughts that flashed in their minds when they were writing a second language, oral expression always lags behind the progress of brain thinking in speed. Moreover, the study is limited by the comparatively small sample data size. As a result, the findings can hardly be generalized, but this did not hinder this research to shed light on other similar settings and provide empirical evidence for second language acquisition. Therefore, further research may wish to use large-scale sample size and different styles of writing investigated by means of thinking aloud.

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## RESEARCH ON THE CONSTRUCTION OF INDEX SYSTEM OF FINANCIAL AND ECONOMIC PSYCHOLOGICAL LITERACY OF HIGHER VOCATIONAL STUDENTS

Sumin Jin

*Department of Accounting, Jiangsu College of Finance & Accounting, Lianyungang 222000, China*

**Background:** In 2012, as the Organization for Economic Cooperation and Development (OECD) added the assessment of financial and economic literacy to the Student Ability Assessment Program, the world began to pay attention to the financial and economic literacy education. In 2017, China's "Exploration and Practice of Financial and Economic Literacy Education" forum pointed out that "the primary work to promote financial and