Facilitating and Inhibiting Factors in English as a Foreign Language Writing Performance: A Model Testing With Structural Equation Modeling

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This study presents and tests a hypothesized structural model that attempts to explain the relationship of writing in English as a foreign language by Taiwanese university students to a variety of factors. Investigated were factors considered to be inhibiting (writing apprehension and writer's block), factors considered to be facilitative (free reading and self-initiated writing), and students' beliefs about and attitudes toward the instructional activities they have experienced. Structural equation modeling (SEM) was employed to test the interrelationships among the factors and the impact of each factor on the dependent variable, writing performance. Results showed that free voluntary reading was the only significant predictor of students' writing performance. The SEM analysis also confirmed that the modified model containing both facilitating and inhibiting factors was an adequate representation of the sample data.   1

Writing in a second or foreign language is an acknowledged difficulty for a majority of English as a foreign language (EFL) and English as a second language (ESL) students at all levels. Difficulties may result from both the cognitive aspect (e.g., a lack of an appropriate composing process, which leads to procrastination or writer's block [WB]) and the affective aspect (such as writing apprehension [WA] and negative experiences from instruction and evaluation) of writing. Without fully understanding the difficulties that writers face that are not related simply to mastery of the conventions of writing, doubts about the effectiveness and efficiency of instruction will never cease. The goal of this study is to determine the relationships among cognitive and affective factors, reading and writing behavior, and their impact on writing performance.

Most previous studies on the cognitive and affective aspects have not considered these relationships (Bloom, 1980; Hayes, 1981; Selfe, 1981). Rose (1984) used his Writer's Block Questionnaire (Appendix A) on a large sample, 351 university students, to identify high- and low-blockers. Six high blockers and 4 low blockers, identified on the basis of extreme scores on each subscale of the questionnaire and a measure of English experience, underwent a series of investigations including writing and stimulated recall protocols. Rose took advantage of both qualitative and quantitative methods and provided an in-depth analysis of participants' composing processes and the beliefs and assumptions that they held about writing. He hypothesized that blocked writers may have failed to develop an efficient composing process.

Little work has been done on WB since the 1980s, but recently scholars have turned their attention to WB in second languages. Using a translated version of Rose's questionnaire, Lee and Krashen (2003) identified two aspects of an inefficient composing process with Taiwanese students writing in Chinese: difficulties in dealing with complex tasks and premature editing. However, neither Rose's study nor Lee and Krashen's provides information on how these factors affected students' writing ability or performance or on other factors that might also contribute to learning to write in another language.

Daly and Miller (1975a, 1975b), who were the first to create a questionnaire accessing people's anxiety toward and fear of writing in specifically evaluative situations (the Writing Apprehension Scale; Appendix B), conducted a number of correlational studies and discussed the relationship of WA to other cognitive and emotional traits and to various measures of writing quality. They found that WA is distinct from other attitudinal measures and is significantly associated with various performance measures among native English speakers. They also reported that WA is most likely to develop via negative past experience, especially from teachers' low expectations, evaluations, and excessive error correction.

As with WB, there has been little interest in WA, despite the obvious importance of this subject, since the 1980s, but some scholars have turned their attention to WA among second language writers. Lee (1996, 2001, 2002), Lee and Krashen (1997), Y. Cheng, Horwitz, and Schallert (1999), and Y. Cheng (2002) used Daly and Miller's Writing Apprehension Scale with Taiwanese university students learning EFL. Cornwell and McKay (2000) also attempted to determine whether this scale was equally valid and reliable cross-culturally using Japanese junior college students of English. Results of these studies showed that the Daly and Miller measure was a valid and reliable tool for measuring EFL students' apprehension toward English writing (as well as Chinese writing; see Lee, 1996) but were inconclusive in regard to whether apprehension led to lower writing performance.

The goal of this study, thus, is to examine the interrelationships among the above-mentioned factors and three additional factors that have been claimed to be facilitative to writing: free voluntary reading, out-of-school writing practice, and students' beliefs in formal instruction on reading and writing. An attempt was also made to construct and test a coherent model to determine the combined effect of all these factors on writing performance.

Rationale of the Hypotheses

Hypothesis 1: WA and WB are interrelated.

It is reasonable to hypothesize that WA is a reaction to WB. According to Rose (1984), blocking may be a possible pathology of the composing process. Blocked writers may have failed to develop an efficient composing process. They may, for example, have false beliefs about composing; rigid, conflicting, and inflexible rules and assumptions; ineffective rhetorical and planning strategies; and inappropriate internalized criteria of evaluation. An inefficient composing process can lead to apprehension. As Rose states, "apprehensiveness ... can result from the fix blockers find themselves in" (p. 4).

Rose (1984) also hypothesized that "apprehensiveness can lead to blocking (the anxiety being caused by prior negative evaluations or by more complex psychodynamics). ... But blocking and apprehensiveness are not synonymous, not necessarily coexistent, and not necessarily causally linked" (p. 4). Several researchers (Bloom, 1980; Hayes, 1981; Selfe, 1981) on WA reported that their high apprehensive participants wrote with poor composing processes (e.g., less planning, less prefiguring, having less concern with overall structure, and spending less time editing and revising). Hayes (1981) specifically hypothesized that the apprehension and the tremendous pressure her participant inflicted on herself was the cause of her poor use of writing strategies and blocking. It is therefore also plausible that WA is a cause of WB.

Hypothesis 2: WA and WB both have a negative and significant impact on writing performance.

If Hypothesis 1 is true, it follows that both WA and WB will have a negative impact on writing performance. There have been no studies, to my knowledge, attempting to relate WB and writing quality. As noted earlier, attempts to relate WA to writing performance have not produced clear results. Lee (1996), using

high school graduates, and Lee (2002), using university students, found a modest but consistent relationship between WA and writing performance in EFL. Lee and Krashen (1997) reported a significant but very modest association between performance on the Writing Apprehension Scale and writing in Chinese for Taiwanese college students. Use of grades as the dependent variable has produced variable results. Lee (2001) reported a −.51 correlation between the Writing Apprehension Scale and grades in an elective English writing course among Taiwanese university students who were not English majors. Y. Cheng et al. (1999) asked university-level English majors in Taiwan to complete a version of Daly and Miller's Writing Apprehension Scale. They reported that fear of evaluation was modestly associated with grades in English writing classes ($r = −.13$).

Studies also show small to moderate negative (but significant) correlations between performance on the Writing Apprehension Scale and widely used standardized tests of written performance: the Scholastic Aptitude Test (SAT), the American College Test (ACT), the Test of Standard Written English (TSWE), the English Composition Test (ECT), the McGraw-Hill Reading Test, and the Missouri College English Test (Daly & Miller, 1975b; Dickson, 1978; Faigley, Daly, & Witte, 1981; Fowler & Kroll, 1980).

The research literature thus reports consistently negative but small correlations between WA and writing performance, regardless of how writing performance is measured. The plausibility of the hypothesis, however, requires us to investigate further, using more sophisticated statistical techniques.

Hypothesis 3: Those who report doing more free reading will have higher writing performance, suffering less WB and WA.

There is a great deal of evidence confirming that much of our competence in written language is acquired through reading. Evidence for the reading hypothesis (Krashen, 1993) comes from

studies showing that more accomplished writers have read more than less accomplished writers and that those who participate in in-school free-reading programs, such as sustained silent reading, write better at the end of the program than comparison students.

Lee and Krashen (1997) suggest that one of the causes of WA is lack of knowledge of the written code. If so, reading may play a role in alleviating WA. Several studies have reported modest but significant correlations between the amount of free reading done and WA (Lee, 1996, 2002; Lee & Krashen, 1997) as well as between positive attitudes toward reading and lower WA (Daly & Wilson, 1983). Lee (2001), however, found this relationship statistically nonsignificant in a correlational analysis. Because of this inconsistency, a further test, with better controls of all possible confounding factors, is necessary.

If Hypothesis 1 is true, if WA is a cause or a result of WB, and if free reading is related to WA, we may also expect it to be the case that more free reading will result in less WB, directly, or indirectly mediated by WA. Thus, we hypothesize that free reading may significantly and negatively predict WA and WB.

Hypothesis 4: Those who read more will also write more.

If more reading is associated with lower WA (Hypothesis 3), it is reasonable to predict that those who read more will enjoy writing more and therefore write more on their own. Constantino (1995) observed that as ESL students read more, they avoided writing less and felt more comfortable writing. Lee (2002) also found in her path analysis that more English reading done by the students predicted more writing involvement in English. These predictions were consistent with Lee (1996), who reported a triangular relationship among WA, free reading, and leisure writing. The hypothesis therefore was that the more free reading one does, the more one is willing to write.

Hypothesis 5. The more writing done, the less WA and WB suffered, and the higher the writing performance.

Some researchers also report that good writers write more (Bamberg, 1978; McQueen, Murray, & Evans, 1963; Woodward & Phillips, 1967). It is plausible that as writers write, they develop better composing processes and suffer less blocking and procrastination. Therefore, one might hypothesize that the more writing is done, the better a composing process is developed (which helps to reduce WA), and the better the performance in the assigned writing task.

> Hypothesis 6. Those who have more positive attitudes toward reading and writing instruction have lower WA, experience less WB, and have higher writing performance.

The entire field of language education assumes that instruction is effective. It is assumed that formal instruction in writing provides writers with knowledge of the conventions of writing, through instruction and correction, as well as writing practice. Reading instruction is assumed to be of help by providing direct instruction in reading strategies and practice in reading challenging texts.

Experimental evidence related to the efficacy of instruction on writing, however, is not consistent. Some have argued that the practice of error correction that is so prevalent in instructional situations is not effective (Truscott, 1996, 1999), but others insist that it is (Ferris, 1999). Some have argued that formal grammar study is effective (Norris & Ortega, 2000) but Krashen maintains that it is not effective in developing writing ability (Krashen, 1984) or in general (Krashen, 2003). At least one writing course resulted in an increase in WA (Power, Cook, & Meyer, 1979).

It is one of the purposes of this study to examine whether students' attitudes toward instruction are related to writing ability and whether it affects WA and blocking. If instruction is effective, we would expect that those students who value instruction more highly would be those who take instruction more seriously and would therefore write better and have less blocking and apprehension.
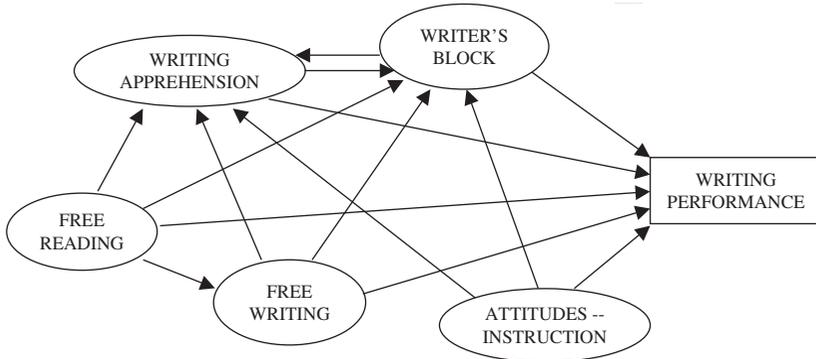
Figure 1. The hypothesized structural model.

The hypotheses proposed in this study were tested as a structural equation model, shown in Figure 1.

Method

Participants and Procedure

A total of 270 university students from three universities (two national universities and one private institute) took part in this study. One of the national universities ranked in the top 15 among all national universities in Taiwan, with a good reputation for its schools of law, commerce and humanistic studies; the other ranked closer to the bottom, with its main educational focus on oceanography; and the private institute ranked even lower among all universities and specialized in technology and science. All participants had been educated in Mandarin Chinese. English was learned as a foreign language. Fifty-three 2nd- and 3rd-year non–English majors and 217 freshman English majors participated in the study. The participants represented a fairly wide range of English language proficiency levels, from low to high intermediate. These participants were all taking an English writing course at the time of participating in this investigation (with the 53 non–English majors taking the

writing class as an elective and the English majors taking it as a mandatory course). It was assumed that students with some knowledge of the composing process and experience with the difficulty or enjoyment of writing in a foreign language would be more likely to understand the questionnaires. Many of the students, most likely, would have had the experience of blocking at least occasionally and would have experienced WA. These experiences were most likely to occur in college, as very little English writing is required in secondary school education in Taiwan.

Both required and elective English writing courses in all three universities met once a week for 2 hr. All three instructors followed standard textbooks to teach English writing, with an emphasis on patterns of organization, grammar instruction, and error detection and correction.

The completion of the questionnaires took 30–40 min, and students were given another 40 min to write a composition. Before the students completed the questionnaire task, the experimenter (the author) explained each question in Mandarin to make sure all the question items were well under-stood and took special care to explain the options available for responding to each item, from *strongly disagree* to *strongly agree* and from *always* to *never*. The author also explained that all questions were intended to probe their literacy behaviors in English. The entire task was done in class, taking about 100 min.

Instruments

Measures of apprehension, blocking, and literacy activities. Participants were asked to complete three ques-tionnaires: (a) the Writing Apprehension Scale (Appendix B), (b) the Writer's Block Questionnaire (Appendix A), and (c) a ques-tionnaire probing students' involvement in and attitudes toward different literacy activities (Table 1). All questionnaires were originally written in English. The Daly and Miller Writing

Table 1

Literacy questionnaire

Reading and writing you do at leisure:

1.	I have regular mail exchanges in English with foreign pen pals.
2.	I keep a diary and/or journal in English.
3.	I practice English writing for my own interest.
4.	I have e-mail exchanges in English even with my Chinese friends.
5.	I read in English for pleasure.
6.	I visit the library or check out books (for outside reading).
7.	I visit bookstores looking for books I am interested in.
8.	I am interested in reading English on the Net.
9.	I read English newspapers.
10.	I read English magazines.

Activities that help improve your writing:

11.	The correction software in the computer.
12.	Conference (talk) with the instructor about my writing.
13.	Draft writing required by the instructor.
14.	Practice and correction in the classroom.
15.	Peer evaluation.
16.	Interpreting the meaning of a reading text.
17.	Analyzing the grammar and syntax of a text.
18.	Some other speaking activities in the reading class (including expressing my opinions or ideas).

19.	Some other listening activities related to the text.
20.	The assignments requiring memorizing words, grammar, or texts.
21.	Analyzing a text in order to show how a good composition is done.
22.	Teacher's comments and error correction.

Apprehension Scale had been widely used in first language writing research in the 1980s. In the 1990s, several scholars in Asian countries began to use it in second language writing research, as previously mentioned, hoping to find a valid and reliable tool to measure EFL or ESL students' writing anxiety. These studies all reported Cronbach alphas above .90 (in different-language versions, e.g., Mandarin Chinese, Japanese, and English). The Writer's Block Questionnaire had not been used as widely as the Writing Apprehension Scale. Rose (1980) employed correlational analysis as a factor analysis to determine if whether five subscales (Attitude, Complexity, Lateness, Premature Editing, and Blocking) of the Writing Apprehension Scale were conceptually related to one another but still distinct enough to measure different aspects of blocking. The same procedure was used here to allow a comparison between this study and Rose's. The third questionnaire (see Table 1) was designed by the author, whose purpose was to probe participants' involvement with reading and writing in English (items 1 to 10) and their views on activities that may or may not be helpful for their English writing (items 11 to 22). These items were generated through informal interviews and open-ended surveys done with several colleagues and students in the year prior to the study. No statistical procedure was involved in the item selection, but the items included reflected what many reading and writing teachers do in class as well as activities students engage in after school. Both the

validity and reliability tests for this self-designed questionnaire were stringently conducted using exploratory factor analyses and confirmatory factor analysis (reported in the following section).

The essay task. Participants were asked to write a short essay with a 40-min time limit. The task was completed in a classroom.[1] The time limit was imposed in order to induce a certain amount of apprehension, so that the ability to write under some strain could be observed.

Two raters were involved in the grading task. Following the scoring guideline of the Test of Written English for the Test of English as a Foreign Language (Bailey, 1998), each rater first divided the 270 essays into six piles, based on holistic judgments corresponding to six levels of writing proficiency, ranging from clearly competent to clearly incompetent. The second step required the two raters to read each essay again and assign a score from 0 to 9 on more detailed aspects of the essay, such as vocabulary, grammar, and mechanics. This step was added in order to supplement the results of the holistic scoring system. Thus, the final score consisted of a two-digit number, with the first number representing a holistically determined level (from 1 to 6) and the second number providing a more sensitive score. For example, if a student obtained a grade of 47, it meant that this student was placed in Level 4, with a score of 7 at that level.

Both raters were experienced writing teachers at the university level. After an elaborate discussion, we determined this grading system to be fair, as each composition had to be read at least four times, and the two-digit numbers yielded more information for the statistical analyses than the six levels of the Test of Written English. Indicators of interrater reliability were calculated, one for each step of the grading procedure. Reliability for the first step was $\rho = .83$, $p < .001$ (Spearman rank-order correlation). Reliability for the second step was $r = .67$, $p < .001$ (Pearson product-moment correlation).

The level of reliability is somewhat lower than that reported in other studies involving measures of writing.

Possible causes are the unusually wide range of scores produced by the procedure (10 to 69) and the raters' lack of familiarity with the scoring procedures. This level of reliability was deemed sufficient, however, to justify averaging the two raters' evaluations.

Results

The Literacy Questionnaire

Table 2 presents descriptive statistics for the questionnaire (Table 1) that probed students' involvement in English reading and writing as extracurricular activities and their rating of the perceived influence of each of the activities in English reading and writing class on their writing ability. For items probing students' leisure activities in reading and writing, students responded by circling *almost always, often, sometimes, occasionally*, or *almost never*, with points assigned from 1 to 5. Inspection of the means of items 1, 2, and 4 suggests that this group of participants rarely does writing as a leisure activity. More than

Table 2

Means and standard deviations for the literacy questionnaire items

Item	Mean	SD	Item	Mean	SD
1	1.40	.84	12	3.91	.86
2	1.55	.77	13	3.80	.80
3	2.29	1.11	14	4.00	.71
4	1.84	1.06	15	3.48	.85
5	3.15	1.18	16	3.65	.86
6	2.94	1.13	17	3.85	.72
7	3.50	1.07	18	3.79	.83
8	2.55	1.09	19	3.71	.88
9	2.38	1.01	20	3.73	.89
10	2.58	1.13	21	3.95	.78

half (52.6%) indicated that they "almost never" wrote in any form (letters, diary, or e-mails) in their leisure time. This result was consistent with the previous results (Lee, 2001, 2002) and with other studies in the professional literature (Allan, Cipielewski, & Stanovich, 1992; Krashen, 1995). The first four items were used to measure the frequency of free writing, and the resulting factor was termed Free Writing.

Participants clearly reporting doing much more free reading in English than writing: The means of items 5 to 10 ranged from 2.55 to 3.50. These six items were assigned to measure the latent factor Free Reading.

On items 11 to 22, students rated how they felt each class activity had helped improve their writing in English by circling options from *strongly agree* to *strongly disagree*. The responses were scored from 1 to 5. Students clearly believed in the efficacy of instruction; their responses showed that they tended to agree that class activities were of help. Items 12, 13, 14, 21, and 22 were the items related to activities done in writing classes. Approximately 90% of the participants agreed that these writing activities were helpful. Among these responses, 90% of the participants considered "teachers' comments and error correction" as the activity that helped their writing the most. This result indicates that Taiwanese college students depend heavily on teachers in learning to write, but it is inconsistent with conclusions that instruction and error correction are ineffective (Krashen, 1999, 2003; Truscott, 1996, 1999). These five items were assigned the label Writing Class, as one of the two indicators of the factor Attitudes toward Instruction.

Similarly, students felt that reading class helped improve their English writing. The mean scores for items 16 to 20 ranged from 3.65 to 3.85, suggesting that students tend to believe that the activities in the reading class help their writing; around 74% of the participants agreed that these activities had helped their writing. These five items were the measures for the indicator Reading Class to be analyzed in the structural model. Reading

Class and Writing Class were highly associated with the latent variable Instruction (Pearson's $r = .89$ and .90, respectively).

In order to make the whole model easier for the computer program EQS to identify, items were combined into composite scores as indicators of the latent variables (factors). For Free Writing, two indicators were obtained by adding the first two items as FW1 and the other two items as FW2. Correlations showed that these two new indicators were highly correlated with their designated factor ($r = .79$ and .91, respectively), which meant they had the same capacity to measure the factor as the individual four items. The six items measuring Free Reading were combined into three indicators: FR1, FR2, and FR3. Correlations of the factor with the three new indicators were .87, .86, and .83, respectively.

Items 11 and 15 were excluded from the groupings because of their low factor loadings ($<.30$), meaning they could not measure the construct to which they were assigned (Attitudes toward Instruction) as other items did. These two items, therefore, were deleted from all the following analyses.

To test the validity of this measure, an exploratory factor analysis using principal component analysis was performed. It showed that all these items were valid in measuring their assigned factors (loadings ranged from .51 to .78 for Free Writing, Free Reading, and Attitudes toward Instruction). The results of the test of internal consistency (test of reliability) for each set of factor items were considered to be adequate (see Table 3).

Writing performance was the manifest variable, measured by the essay written in class. Because of the two-step scoring method previously described, the range of the scores was from 10 to 69; the mean score was 34.11, with a standard deviation of 15.67.

Writing Apprehension

The reliability of the Writing Apprehension Scale was high (alpha = .90). The validity of this measure was tested jointly with that of the Writer's Block Questionnnaire and the

Table 3

Factor loadings and alphas for literacy questionnaire

Factors Items	Free Witing	Free Reading	Attitudes toward Instruction
1	.71		
2	.58		
3	.52		
4	.66		
5		.60	
6		.78	
7		.77	
8		.51	
9		.62	
10		.70	
12			.59
13			.58
14			.58
21			.65
22			.70
16			.55
17			.68
18			.59
19			.60
20			.66
Cronbach's alpha	.65	.84	.83

Note. Factor loadings lower than .50 are not listed.

author-designed questionnaire using confirmatory factor analysis (see Test of the Measurement Model).

For the same statistical purpose (easy identification by the statistical program), the Writing Apprehension Scale items were divided into four indicators for the latent variable Writing Apprehension (WA1, WA2, WA3, and WA4). Conceptually, WA1 and WA2 represented the 13 positive statements on the scale concerning enjoyment and confidence in writing, whereas WA3 and WA4 represented the scale's 13 negative statements

about the fear and avoidance of writing. The correlations of the Writing Apprehension Scale with the four composite scores ranged from .83 to .86, meaning that the division did not harm the measurement capability of the scale.

Writer's Block

The reliability of the Writer's Block Questionnaire was satisfactory (Cronbach's $\alpha = .86$). A principal component analysis was initially performed to determine whether the five factors created by Rose (1984) would be accordingly extracted. The result was slightly different, which was not surprising, considering that a different cultural group with a different educational background was involved, and a slight rearrangement of the variables was necessary. This difference notwithstanding, the five major subscales remained the same: (a) Attitudes (i.e., feelings and beliefs about writing and evaluation; items 1–7); (b) Lateness (i.e., missing deadlines; items 13 and 14); (c) Premature Editing (i.e., editing too early in the composing process; items 15–18); (d) Complexity (i.e., lack of strategies to interpret and write complex materials; items 8–12); and (e) Blocking (i.e., the main indicator of WB; items 19 to 24).

As shown in Table 4, blocking had moderate correlations with the other four variables. Table 5 presents the correlations among the five indicators, which were conceptually related, but still distinct from each other. Results were similar to those found

Table 4

Correlations among the five subscales of the Writer's Block Questionnaire

	Attitude	Complexity	Lateness	Preediting
Blocking	.44**	.56**	.61**	.42**

**$p < 0.01$.

Table 5

Intercorrelations among variables

	ATT	COM	EDIT	LATE	BLO	WA1	WA2	WA3	WA4	FR1	FR2	FR3	FW1	FW2	RC	WC
COM	.399															
EDIT	.146	.189														
LATE	.426	.450	.281													
BLO	.440	.556	.416	.608												
WA1	−.228	−.055	−.072	−.173	−.160											
WA2	−.247	−.216	−.139	−.220	−.238	.617										
WA3	.250	.211	.182	.216	.243	−.657	−.534									
WA4	.231	.196	.173	.267	.179	−.578	−.599	.723								
FR1	−.323	−.123	−.136	−.259	−.162	.317	.175	−.285	−.185							
FR2	−.402	−.183	−.058	−.275	−.234	.297	.126	−.223	−.156	.669						
FR3	−.298	−.173	−.107	−.199	−.186	.167	.093	−.191	−.146	.565	.555					
FW1	−.271	−.174	−.072	−.179	−.183	.153	.137	−.121	−.147	.268	.239	.319				
FW2	−.337	−.212	−.084	−.158	−.212	.261	.071	−.255	−.160	.505	.469	.469	.457			
RC	−.240	−.074	−.009	−.136	−.263	.251	.006	−.285	−.138	.264	.362	.278	.036	.250		
WC	−.229	−.114	−.083	−.157	−.161	.147	.055	−.240	−.114	.219	.271	.252	.043	.204	.589	
WP	−.221	−.138	−.173	−.146	−.169	.067	.118	−.031	−.138	.227	.212	.247	.192	.100	.132	.127

Note. ATT = Attitude; COM = Complexity; EDIT = Premature Editing; LATE = Lateness; BLO = Blocking; RC = Attitudes toward Reading Class; WC = Attitudes toward Writing Class; WP = Writing Performance.

by Rose (1984) and Lee (2002). A composite score for each sub-scale was computed by adding the scores for the items designated for each subscale. The five composite scores were then generated as the observed indicators of the latent variable Writer's Block.

Test of the Measurement Model

The purpose of testing a measurement model prior to testing the full structural model is to (a) account for the relationship between the observed variables (measures) and the latent variables (i.e., tests of validity and reliability; Byrne, 1994) and (b) examine how well these variables jointly serve as measurement instruments for the latent variables. Confirmatory factor analysis is capable of accomplishing this task, for which correlations (see Table 5) among the observed variables, together with their standard deviations and means, were required.

In the present study, the measurement model being tested included 5 latent variables and 16 observed variables that purport to measure the 5 latent variables, as indicated in Figure 2. The five latent variables are represented by ovals: (a) Writer's Block, measured by five subscales; (b) Writing Apprehension, grouped into four indicators; (c) Free Reading, divided into three variables; (d) Free Writing, grouped into two variables; and (e) Attitudes toward Instruction, defined by two variables (students' beliefs in the usefulness of Reading Class and Writing Class).

The results of the confirmatory factor analysis using the maximum likelihood method showed that each indicator significantly loaded on its assigned construct. However, a chi-square of 220.25 with 94 degrees of freedom ($p < .001$) and one of the indices under .90 (normed fit index [NFI] $= .87$) indicated that the model showed a significant discrepancy with the data. In order to improve the model, errors of indicators were correlated according to the Lagrange multiplier test, yielding statistics very crucial to pinpointing the misfit in misspecified models (Byrne, 1994).
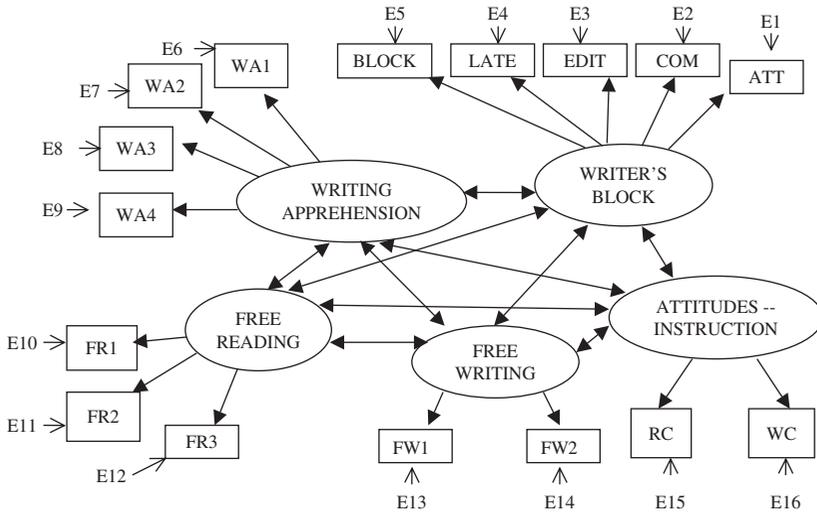
Figure 2. The measurement model. COM = Difficulties Dealing with Complex Tasks; ATT = Writing Attitude; EDIT = Premature Editing; RC = Attitudes toward Reading Class; WC = Attitudes toward Writing Class; E = Error.

Starting from the error covariance with the largest chi-square, seven error covariances were set to be freely estimated (correlated), as shown in Figure 3. These modifications were done with consideration of their conceptual senses. Among them, five of the parameters representing "correlated errors among subscales of the same measurement instruments" (Byrne, 1994, p. XXX) were first estimated (i.e., E3 and E5, E8 and E9, E8 and E7, E7 and E6, E9 and E6). Further, two conceptually reasonable error covariances across variables were also set to be freely estimated: (a) the error covariance between Complexity and WA1 and (b) the error covariance between Edit and FW2. According to Rose (1984), WB is distinct from apprehension, which is affectively oriented, and WA is a possible cause of WB, which is more cognitively oriented. Thus, the two indicators Complexity and WA1 may have measured something related, possibly referring to the effect of WA on students' willingness, knowledge of how, and ability to deal with complex materials. Recall that WA1 represents
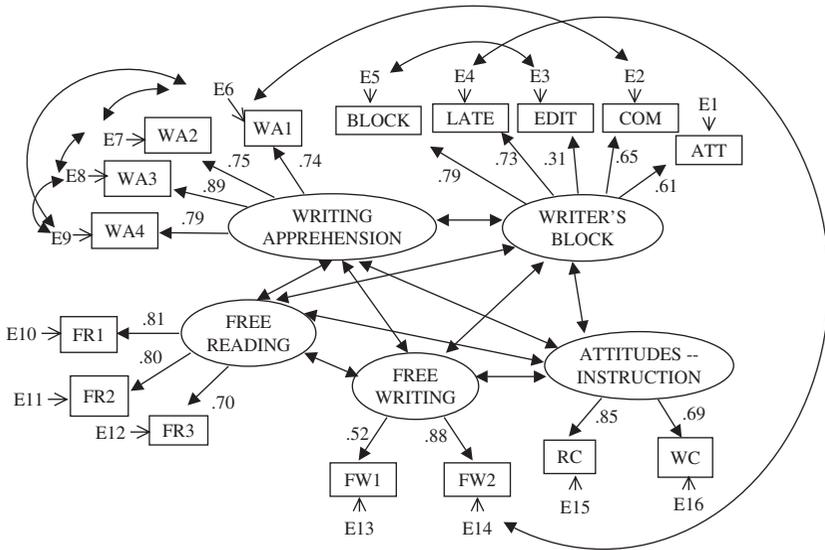
Figure 3. The revised measurement model.

enjoyment and confidence in English writing. Second, the relation-ship between the variables Lateness and FW2 was also substan-tiated by the fact that those who would practice English writing as an interest (item 3 of the author-designed questionnaire) and who had exchanged e-mail in English even with their Chinese friends (item 4 of the author-designed questionnaire) would have less difficulty in getting the words on paper (item 13 of the Writer's Block Questionnaire) or fewer chances to get stuck when writing (item 14 of the Writer's Block Questionnaire).

After these parameters of error covariances were set free, there was a significant drop in the chi-square, which was then 161.288 ($df = 87$, $p < .001$). Bentler-Bonett's NFI was .91; the nonnormed fit index (NNFI) was .94; and the comparative fit index (CFI) was .95. All these indices except for one, the probabil-ity for the chi-square, indicated that the revised measurement model provided a good fit to the data. Conventionally, a model having a good fit to the data yields a small chi-square with a nonsignificant probability. However, it is widely acknowledged

that the chi-square likelihood ratio test is sensitive to (large) sample sizes; therefore, the CFI, a revised NFI that takes sample size into account, should be the index of choice (Bentler, 1990; Byrne, 1994). In conclusion, the factor analysis confirmed that all the indicators were well-designed measures of the constructs proposed in this study and were sufficiently valid and reliable for testing the structural model in the following stage.

Test of the Full Structural Model

As shown in Figure 4, the single dependent variable in the model was Writing Performance, measured by the in-class writing task. Paths depicted by arrows in the figure indicate possible causal relationships among the five constructs and the manifest dependent variable.

The goodness-of-fit results for the initial full model embedding the revised measurement model indicated that this model did not provide a good fit to the data collected. The chi-square was 247.37 ($df = 99$, $p < .001$); the values of NFI, NNFI, and CFI were .86, .88, and .91, respectively. The difficulty with chi-square probability has been discussed. However, even though
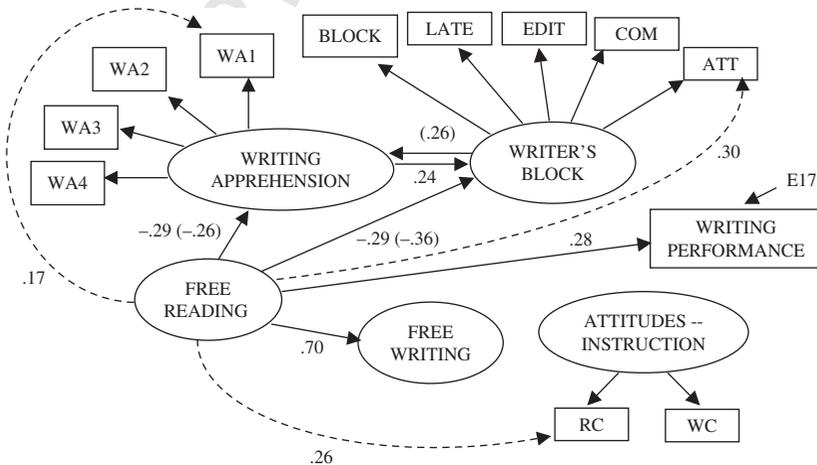

Figure 4. The revised structural model after 14 respecifications.

the CFI was acceptable, this marginal adequacy suggested that there was some misfit in the model. Therefore, model improvement with the parameters respecified was conducted according to the Wald test (suggesting parameters to be dropped) and the Lagrange multiplier test (for parameters to be added), based on the appropriate theoretical interpretations (Byrne, 1994).

After the nonsignificant paths between factors were dropped as suggested, the Lagrange multiplier test suggested that adding three parameters (indicated by the dashed arrows) to be estimated would substantially lower the chi-square value: (a) the cross-loading of the subscale Attitude in the Writer's Block scale onto Free Reading; (b) the cross-loading of the WA1 subscale onto Free Reading; and (c) the cross-loading of the Reading Class subscale onto Free Reading. As discussed earlier, Daly and Wilson (1983) found a significant correlation between WA and reading attitudes ($r = .32$), suggesting that people who have a positive attitude toward reading may also enjoy writing more. In many empirical studies of both first and second language acquisition, findings consistently show that "a substantial amount of receptive vocabulary knowledge is acquired from extensive reading" (Lee, 1996, p. XXX). Glynn, Muth, Matthew, and Garrido (1982) also found inverse correlations between WA and verbal SAT scores in two of their studies. These studies in different areas of language learning and language anxiety suggest potential links among WA, free reading, and vocabulary knowledge: The more reading done, the bigger the vocabulary size, and thus the lower the WA. In addition to the support from previous studies related to apprehension and reading, by inspecting the intercorrelation table (Table 5), we can see that WA1, one of the four indicators of WA representing enjoyment and confidence with English writing, was actually positively correlated with all the reading indicators, consistent with Daly and Wilson's (1983) finding. Blocking has never been tested for its relations with other measures. In the correlation analysis, however, it can be observed that the attitude subscale in the Writer's Block construct was negatively associated with all three

of the free-reading indicators. It was therefore theoretically reasonable to include the cross-loadings (a) and (b) in the model. Second, the inclusion of the cross-loading of Reading Class onto Free Reading was also justifiable, because those who were more enthusiastic about reading class might do more reading on their own.

8

As shown in Figure 4, 5 out of the 13 paths were significant at the .05 level according to the *z* statistics as discussed below (i.e., Free Reading → Free Writing, Free Reading → Writing Performance, Free Reading → Writing Apprehension, Free Reading → Writer's Block, and Writing Apprehension ←→ Writer's Block).

As hypothesized, and consistent with previous studies (Constantino, 1995; Lee, 1996, 2002; Lee & Krashen, 1997), participants who said that they read more did more leisure writing in English (β = .70, *z* = 5.42, *p* < .05). The amount of free reading was the only significant predictor of writing performance (β = .28, *z* = 4.15, *p* < .05). Students' attitudes or beliefs toward instruction failed to significantly predict any other factor, contrary to the prediction of Hypothesis 6.

Free Reading had a negative and significant relationship with Writing Apprehension (β = −. 29, *z* = −3.43, *p* < .05) and Writer's Block (β = −. 29, *z* = −3.71, *p* < .05). These negative associations suggest that both the cognitive and affective difficulties of writing could be alleviated if more free reading were done.

In this study, it was hypothesized that WA and WB may be interrelated, as Rose (1985) suggested, in that WA might be a cause of or a reaction to WB. Two analyses were performed to test the hypotheses that WA is (a) a cause of WB and (b) a result of WB. Changing the direction of the arrow between Writing Apprehension and Writer's Block slightly changed the interrelationships among Free Reading, Writing Apprehension, and Writer's Block, as shown in Figure 4. The numbers marked in the parentheses were the beta values when Writer's Block was considered to be the cause of Writing Apprehension. All betas

were significant at the .05 level ($z = -2.76$, 3.00, and -4.15, respectively). Results of the two models are shown in Table 6.

Results showed that Model 2 had a slightly lower chi-square and a better CFI. With Writer's Block as the cause of Writing Apprehension, the impact of Free Reading on Writer's Block increased ($\beta = -.36, z = -4.15, p < .05$), especially on the Attitude subscale of the Writer's Block Questionnaire, and the interrelationships among Free Reading, Writing Apprehension, and Writer's Block remained significant. This finding confirmed previous studies' findings about the relationship between WA and WB. It is more likely, however, that WB affects WA more than vice versa. As discussed earlier, the probability of the chi-square value, which is sensitive to sample size, did not affect the goodness of fit.

Discussion

The Relationship Among Writing Apprehension, Writer's Block, and Writing Performance

It was hypothesized that WB and WA were interrelated, and this was confirmed by the structural equation modeling (SEM) test, although this result is somewhat different from what Rose hypothesized. According to Rose (1984), "blocking

Table 6

Results of two models with Writing Apprehension and Writer's Block as causes and effects

	χ^2 (*df*)	NFI	NNFI	CFI	$\beta(z)$	χ^2
Model 1 WA→ WB	177.604 (99)	.90	.93	.95	.24* ($z = 2.92$)	$p < .001$
Model 2 WB→ WA	177.424 (102)	.90	.94	.95	.26* ($z = 3.00$)	$p < .001$

*p < .05.

and apprehensiveness are not synonymous, not necessarily coexistent, and not necessarily causally linked" (p. 4). Many previous studies on WA have noted that high apprehensive students had poor composing processes. Rose also observed that those with WB had difficulties dealing with complex tasks, applied inefficient editing strategies, and had negative attitudes toward evaluation. We may say that WA and WB are, in most cases, intimately related, in that one may give rise to the other. However, the findings resulting from Model 2 show that blocking has a larger impact on apprehension than apprehension has on blocking.

Rose also observed, however, that not all high blockers are apprehensive about writing, though they might feel temporarily nervous when a deadline is approaching, and they do not necessarily avoid writing courses or majors that require writing. On the other hand, not all low blockers, as Bloom (1980) has noted, enjoy writing. This might be the reason for the following result.

Neither WA nor WB was found, in the results of the current study, to be associated with writing performance. Those who reported more WB did not write more poorly. In addition to the reason discussed above, one interpretation for this result is that self-reported data, or self-perceived WB, might not reflect participants' true ability, especially when a writer is "toying" with ideas when planning. Another possibility is that the writing task in the current study was not challenging enough; WB may play a role only when the task is at the edge of one's writing competence.[2]

A similar interpretation could be made for the nonsignificant relationship found between WA and writing performance. Although this result is not consistent with previous studies (Lee, 2001; Lee & Krashen, 1997), this study provides more convincing results, because participants wrote on an assigned topic, and the scores assigned by two consistent graders were used as a measure, instead of grades for a course taught by different instructors. This method involved less uncontrollable variance among different instructors' standards of evaluation. Another

improvement in the current study is that a more powerful measurement tool, SEM, was used to test constructs jointly and to correct measurement errors that often occur when other statistical tools are employed.

Nonetheless, self-perceived WA did not influence students' writing performance in the current study,[3] but it was related to their composing process, including frequency of blocking, premature editing, poor planning and interpretive strategies, and negative attitudes toward writing based on evaluations from others. This possibility of WA's being a cause of WB could arise from students' negative past experience in writing classes (excessive negative reactions and even punishment; Daly & Miller, 1975a, 1975b; Daly & Wilson, 1983; Harvley-Felder, 1978). In an EFL situation, Lee (2002) found that students' past experiences in language instruction in the first language had an impact on their attitudes toward second language acquisition. Students reported that their negative experiences in first language instruction led to negative attitudes toward language learning, which transferred to their second/foreign language writing, causing blocking when writing in the foreign language, English.

The Relationship Among Free Reading, Writing Apprehension, Writer's Block, and Writing Performance

The finding that free reading was a predictor of writing performance in the current study is consistent with previous studies of EFL (Lee, 2001, 2002), and it is also consistent with research studies demonstrating the positive influence of reading in the second language on second language writing proficiency (Gradman & Hanania, 1991; Janopoulos, 1986; Lee & Krashen, 1997). In addition, the current study confirmed that free reading significantly and negatively predicts WA and WB. In other words, the more one reads, the less one feels apprehensive about writing, and the less one suffers from dysfunctional composing, thanks to having more competence in the conventions of

writing. Lee (1996) also found a significant relationship (also using SEM analysis) between reading and WA ($ß = -.38$), with Chinese the target language.

WA, as discussed earlier, in addition to having a reciprocal relationship with aspects of the composing process (such as blocking and planning strategies), could also be caused by negative past experiences. Free reading might help alleviate WA by providing additional knowledge of literary language and thereby developing one's confidence in writing. Similarly, free voluntary reading might also help reduce WB by increasing knowledge of the written language.

This study also found that free voluntary reading apparently helps reduce WB in a foreign or second language.

It will be of interest to conduct more detailed investigations of how reading affects each aspect of WB defined by Rose. Moreover, although no significant path from reading to students' overall attitudes toward instruction was found, it can be observed from the modified path analysis that free reading did have some influence on students' attitudes toward reading instruction, suggesting that those who do more extensive reading also find reading classes helpful. A plausible interpretation is that more reading results in better reading and thus less frustration in reading classes.

Free Writing

It was hypothesized that the more reading one did, the more one would engage in free writing (Hypothesis 4). This hypothesis was confirmed. It was also hypothesized that the more writing one did, the less WA and WB one would experience, and the better one's writing performance would be (Hypothesis 5). Hypothesis 5 was not supported. There was no significant relationship between frequency of free writing and WB or WA, and writing frequency was not a significant predictor of writing proficiency.

The failure to find a relationship between writing frequency and writing performance may appear to some to be counterintuitive. Sasaki and Hirose (1996), in fact, found that a significantly greater number of better writers in EFL reported doing more writing in classes "beyond the paragraph level" (p. XXX). Their conclusion, however, was based on a small sample: Six of 20 "good writers" had this experience, whereas none of 23 "weak writers" did. In addition, Sasaki and Hirose reported no difference between good and weak writers in the amount of writing required in school, in the self-initiated writing done, and in the frequency of writing journals, stories, poems, letters, and materials in other genres outside of school.

Other second language studies confirm that adding more writing does not influence writing quality. Burger (1989) reported that adding an extra class on writing to sheltered subject matter teaching in ESL at the university level had no effect on writing proficiency. Mason (2003) found that adding English writing to an extensive reading class, with or without correction, did not increase writing accuracy for college EFL students in Japan.

The factor underlying both writing frequency and writing ability appears to be reading, a hypothesis consistent with the results of this study: Free reading was found to be a significant predictor of both writing quantity and writing performance, but writing quantity and writing performance were not significantly related. Lee and Krashen (1997) reported low but positive correlations between free writing and writing quality and free reading and writing quality for Taiwanese high school students writing in Chinese, but only the free reading–writing relationship survived a multiple regression analysis.

In three older experimental studies of English as a first language, a group that wrote frequently was compared with a group that wrote less but spent more time reading. The combination of more writing and less reading was found to be more effective than writing alone in two out of three studies (Heys,

1962; De Vries, 1970), and no difference was found in the third ☐10
study (Christiansen, 1965), suggesting that reading is a more
potent influence on writing proficiency than writing.

Students' Attitudes Toward Instruction

It was hypothesized that students who had more faith in
reading and writing instruction were the more dedicated stu-
dents and would thus do better on the measure of writing
performance and show less apprehension and blocking.
Attitudes toward instruction, however, failed to significantly
predict WA and WB, nor did they significantly predict writing
performance. These results do not demonstrate that instruction
is ineffective, but they are consistent with research showing
the disappointing effects of instruction (e.g., Truscott, 1996,
1999; Krashen, 1999).

Of course it is quite possible that aspects of writing instruc-
tion other than those investigated here are helpful. Instruction
may help students understand the composing process, the means
by which writers discover meaning through writing. Knowledge
of the composing process includes strategies such as delaying
editing, planning, and a willingness to revise one's plans and
one's prose. Direct teaching of the composing process may be
necessary in cases in which previous instruction has led writers
to utilize nonproductive strategies that lead to apprehension and
blocking (Krashen, 1984).

Conclusion

This study applied SEM with EQS to determine how the
five factors concerned interacted with one another, providing a ☐11
multidimensional model demonstrating a more comprehensive
understanding of EFL writing. The purpose of using SEM was
twofold: one purpose was instrumental; the other was concep-
tual. Retesting some of the hypotheses in previous studies that
were inconclusive is always necessary as researchers improve

their ability to control factors such as sample selection, learning situations, testing situations, and the overall research procedure. In addition, retesting is called for when more powerful measurement tools are available. Any measurement tool can yield results with variances and errors. Through retesting, a researcher can not only expand the theoretical base of a research study but also measure the observable and unobservable data with variances controlled and errors corrected. As a result, a more precise finding with a more convincing interpretation can be established.

In this study, students' attitudes toward or faith in instruction did not predict writing performance, nor were they related to any other factor studied, despite the fact that students were confident that instruction was helpful. Of course, this conclusion is limited to those aspects of instruction covered in the questionnaire (i.e., correction, grammatical analysis, writing drafts, conferencing, etc.).

This study also confirmed that participants' perceived anxiety and difficulties with the composing processes (responses to the Writer's Block Questionnaire) were not significantly associated with their writing performance. Reasons for this result include the possibility that the writing task used was not challenging enough for these participants (see note 3). Another possibility was that perceived anxiety does not have an effect on actual writing performance because of participants' ability to control their anxiety (N. S. Cheng, 1998; Madsen et al., 1991; Young, 1986). The result is consistent with Rose's (1984) observation that blockers are not always poor writers and, given time, may eventually produce good writing.

Finally, this study found an interesting yet substantively interpretable relationship among WA, WB, and free reading. It was found that the more one reads, the less one feels anxious about writing, and the less blocking one experiences. In addition, it was found that those who read more possess a better composing process (less blocking) and thus feel less apprehensive about writing. Thus, WA and WB are reciprocally related.

As predicted, the amount of free reading done was found to have a positive relationship with WA and WB, as well as with writing performance. A clear implication of these results is that free reading should be emphasized as a part of developing writing ability.

The finding that free reading has an impact on writing performance, and students' attitudes toward aspects of instruction does not, suggests that mastery of the conventions of writing comes from reading, not direct instruction, a conclusion consistent with research on the role of grammar and the impact of reading (Krashen, 2003). If it is the case that a good composing process is an important means of reducing WA and avoiding blocking (Rose, 1984), and if aspects of the composing process can be taught, it follows that encouraging wide reading and teaching the composing process are crucial aspects of writing instruction. A program emphasizing these two factors will help develop knowledge of the written language and will greatly reduce students' apprehension and blocking.

An obvious limitation of any study is that possibly relevant factors have not been included. This study includes one factor that has consistently been omitted from many previous studies: the role of reading. The results of this study confirm that this omission has been a serious one: Reading is clearly a factor that must be considered when doing research regarding writing or designing writing curricula. Other possible factors that deserve inspection in a multivariate design include motivation (learner attitudes toward literacy activities) and the home environment (family literacy), as well as instructional variables such as strategy training, process instruction, teacher feedback, computer use, and frequency and kind of in-class writing. Further, it is also of interest to compare models to examine different possible patterns of relations among factors (e.g., different directions in multivariate path analysis).

An additional concern is the scoring criteria used. It is possible that the relatively low level of reliability achieved in the second step of the scoring procedure used in this study

resulted from raters' not being familiar enough with the criteria. Longer training sessions might be required or changes in the procedure used. In addition, the time limit imposed on the writing task (30 min) might have been too short to allow students to display their true competence. Ideally, more than one writing sample should be used, but practical constraints when dealing with large sample sizes makes this difficult to do.

Finally, this study utilized students' self-report on a newly designed questionnaire. The use of self-report is always problematic, because of the desire of participants to provide socially desirable answers (e.g., Y. Cheng, 2002).

Notes

[1]The instructions for the essay were as follows: "Everyone agrees that television has had a tremendous influence on society since it was invented. Some influences have been positive, but others have been negative. Brainstorm both positive and negative influences, think about and write a composition on how television has changed communication, education, and family life. (40 minutes; you may use 10 minutes to plan and 30 minutes to complete the essay.)"

[2]Researchers have found that some students may be better at controlling their anxiety; anxiety need not always affect performance (N. S. Cheng, 1998). Also, related studies on oral anxiety (Madsen et al., 1991; Young, 1991) indicate that the effect of anxiety on oral performance might be moderated by a student's actual ability in the language.

[3]As noted in the text, the writing task might not have been demanding enough for this group of participants; recall that most of the participants were English majors ($n = 217$) and/or students with strong motivation to improve their English ($n = 53$). Also, the topic (see note 1) might have stimulated some writers to write an argumentative essay, which, according to Faigley et al. (1981), does not distinguish between high and low apprehensive writers. Richardson (1980) also failed to find any significant difference in quality ratings of essays composed by high and low apprehensives on a topic that could be construed as argumentative (writing to a television station to explain why a particular program should be taken off or kept on the air). Further study with essay prompts that explicitly require different rhetorical pattern is called for.

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25

Appendix A

Writer's Block Questionnaire

Directions: Below are 24 statements about what people do or how they feel when they write. Under each is a 5-point scale describing degrees of agreement or disagreement with the statements. Please circle from 5 (*Almost Always*) to 1 (*Almost Never*) that best describes your agreement or disagreement with your own writing behavior.

1. My teachers are familiar with so much good writing that my writing must look bad by comparison.

2. I've seen really good writing, but my writing doesn't match up to it.

3. I think my writing is good.

4. I think of my instructors as reacting positively to my writing.

5 Writing is a very unpleasant experience for me.

6. I enjoy writing, though writing is difficult at times.

7. I like having the opportunity to express my ideas in writing.

8. I'm not sure, at times, of how to organize all the information I have collected for a paper.

9. Writing on topics that can have different focuses is difficult for me.

10. I have trouble deciding how to write on issues that have many interpretations.

11. To write essays on books and articles that are very complex is difficult for me.

12. I have trouble with assignments that ask me to compare or contrast or to analyze.

13. I run over deadlines because I get stuck while trying to write my paper.

14. I have to hand in assignments late because I can't get the words on paper.

15. Each sentence I write has to be just right before I'll go on to the next.

16. When I write, I'll wait until I've found just the right phrase.

17. I find myself writing a sentence, then erasing it trying another sentence, then scratching it out. I might do this for some time.

18. My first paragraph has to be perfect before I'll go on.

19. While writing a paper, I'll hit places that keep me stuck for an hour or more.

20. At times, I find it hard to write what I mean.

21. At times, my first paragraph takes me over two hours to write.

22. Starting a paper is very hard for me.

23. At times, I sit for hours unable to write a thing.

24. Some people experience periods when, no matter how hard they try, they can produce little, if any, writing. When these periods last for a considerable amount of time, we say the person has a writing block. Estimate how often you experience writer's block.

Appendix B

The Writing Apprehension Scale

Directions: Below are a series of statements about writing. There are no right or wrong answers to these statements. Please indicate the degree to which each statement applies to you by circling whether you (1) *strongly agree*, (2) *agree*, (3) *are uncertain*, (4) *disagree*, or (5) *strongly disagree* with the statement. While some of the statements may seem repetitious, take your time and try to be as honest as possible.

1. I avoid writing.

2. I have no fear of my writing being evaluated.

3. I look forward to writing down my ideas.

4. I am afraid of writing essays when I know they will be evaluated.

5. Taking a composition course is a very frightening experience.

6. Handing in a composition makes me feel good.

7. My mind seems to go blank when I start to work on a composition.

8. Expression ideas through writing seems to be a waste of time.

9. I would enjoy submitting my writing to magazines for evaluation and publication.

10. I like writing my ideas down.

11. I feel confident in my ability to clearly express my ideas in writing.

12. I like to have my friends read what I have written.

13. I'm nervous about writing.

14. People seem to enjoy what I write.

15. I enjoy writing.

16. I never seem to be able to clearly write down my ideas.

17. Writing is a lot of fun.

18. I expect to do poorly in composition classes even before I enter them.

19. I like seeing my thoughts on paper.

20. Discussing my writing with others is an enjoyable experience.

21. I have a terrible time organizing my ideas in a composition course.

22. When I hand in a composition I know I'm going to do poorly.

23. It's easy for me to write good compositions.

24. I don't think I write as well as other people.

25. I don't like my compositions to be evaluated.

26. I'm no good at writing.

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