

Research on the Factors of Influencing English Writing Ability Based on Linear Structure Relationship

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Abstract. The linear structure model is a path analysis with latent factors. The model can analyze the structural relationships between the exogenous latent factors and the endogenous latent factors. The study uses a linear structure model to explore the main factors affecting English writing ability. In past studies, the definition of "English proficiency" was too simple. In fact, they often studied one or more sub-abilities (for example, English comprehension or speaking ability) of English proficiency in English writing. This study attempts to adopt a multidimensional "English level" model. This model includes a variety of sub-level competencies at the English level: English comprehension of knowledge and understanding skills, expression of English knowledge and expression skills. In addition, this study establishes a multidimensional model of English writing, pointing out the relationship between Chinese writing ability, English sub-abilities and English writing ability, and the internal relationships among these variables that may affect English writing ability. On this basis, the theoretical model was verified using empirical data.

Linear Structure

In social science research, there are many phenomena or events that cannot be directly measured. These unmeasured factors are called latent variables (such as learning achievement). For this reason, indirect evaluations can generally only be made by measuring the factors associated with them (these factors can be referred to as explicit variables, such as mathematics, physics, chemistry, etc.). Structural Equation Modeling (SEM) and Linear Structural Relations (LISREL) provide satisfactory research methods for analyzing this data[1]. Robert Kaplan points out that English passages develop in a straight line, that is, paragraphs usually begin with topical statements, followed by a number of subdivisions, and the flow of meanings proceeds in a gradually clear direction. It is often stated first at the central meaning of the passage, and then the points are explained. The English paragraph is typically linear, which is a special type of continuity in English paragraphs." Typical linear passages are common in English expository and discourse texts, followed by postscripts. After analyzing a large number of typical linear paragraphs, Zeng Lisha concluded the English linear paragraphs into three types: simple patterns, compound patterns, and complex patterns.

1) Simple type. Although the simple paragraph has developed in a straight line, there is no separate part.

2) Side by side compound type. Paragraphs usually contain more than two parts of the discourse. The number of disjunctions depends on the meaning of the control contained in the topic sentence, and each part of the discourse can be roughly balanced.

3) Complex type. Paragraphs are made up of multiple parts, but the unfolding of each part is unbalanced, that is, the unfolding of a certain part is more complete than the unfolding of other parts. Such paragraph patterns are more common. The linear structure of the English passage makes it easier for us to find the topic sentence. If we grasp the topic sentence and understand the main idea of the topic sentence, we can easily foresee the basic idea of this paragraph or the article. The main plots allow you to understand and master the central idea of the article at a relatively high speed. The characteristics of linear structural features of the English passages also have a certain

guiding significance for writing articles that are focused and structurally coherent.

This model includes a variety of sub-level competencies at the English level: English comprehension of knowledge and understanding skills, expression of English knowledge and expression skills[2]. Knowledge of English comprehension can be further divided into knowledge of vocabulary, grammar, and discourse. Understanding skills is divided into listening and reading. English express knowledge includes vocabulary, grammar and discourse knowledge. English language proficiency includes oral expression.

The Principle of LISREL

1) Several concepts that should be clear when using LISREL

- ① Manifest variable: Measurable and measurable variables such as gender and age;
- ② Latent variables: variables that cannot be directly observed, but can be represented by explicit variables, such as social status, learning attitude, etc.;
- ③ Exogenous variables: informally speaking, they are independent variables. In the LISREL analysis, explicit and potential exogenous variables use X and ε , respectively. Representation;
- ④ Endogenous variables (variables): In the LISREL analysis, explicit and potential endogenous variables are denoted by Y and η , respectively. The content of the LISREL study has three main aspects: First, the explicit variables are used to measure the accuracy of latent variables; second, the relationship between latent variables; and third, the credibility of the entire model.

2) The purpose and principle of LISREL analysis

As with any statistical method purpose, the ultimate goal of LISREL is to find the link between variables and variables[3]. The principle of LISREL is simple and can be summed up in one sentence: it determines the relationship between variables by examining the variance, covariance structure, or related structure among the variables. To give a simple example: assume that there is a correlation between variable X and variable Y , as expressed by the equation: $Y=4X$. By comparing the variance between two variables, if the Y variance is 16 times the X variance, it can also be indirectly explained that the above relationship exists.

Specifically, the LISREL model includes two models

① Measure model: It shows the relationship between latent variables and explicit variables. It is

$$\text{expressed as a formula: } \begin{cases} Y = A\eta + \varepsilon \\ X = B\xi + \delta \end{cases} \quad (1)$$

② Structural equation model: It represents the lineage between potential variable mothers (including exogenous latent variables and endogenous latent variables) expressed by formula:

$$\eta = C\eta + \tau\xi + \theta \quad (2)$$

In the formula, C is the effect matrix between potential endogenous members, and τ is the coefficient matrix of the potential endogenous variable effect on potential exogenous changes, θ indicating residual bias.

Research Method

(1). Research object

The test subjects were 100 second-year non-English majors. They completed nine tests of English knowledge and skills, and propositional composition tests in English and Chinese. The scores of all tests constitute the indicator of knowledge and ability (potential variables).

Table 1 Potential Variables and Indicator Variables Table Potential Variables Indicator Variables

Latent variable	Indicator variable
English understanding of vocabulary knowledge	Four levels of basic vocabulary, four vocabulary
English understanding of grammar knowledge	Tense, voice, agreement, structure, non-predicate verb test scores
English comprehension textual knowledge	Grammar convergence, lexical cohesion, discourse reconstruction test scores
Reading Comprehension Ability in English	Reading comprehension test score
English listening comprehension	Listening test scores
English speaking ability	Reading, oral test score, teacher's impression score
English writing skills	Composition score, composition word count, superstructure score
Chinese Writing Skills	Composition score, composition word count, superstructure score

(2). Results

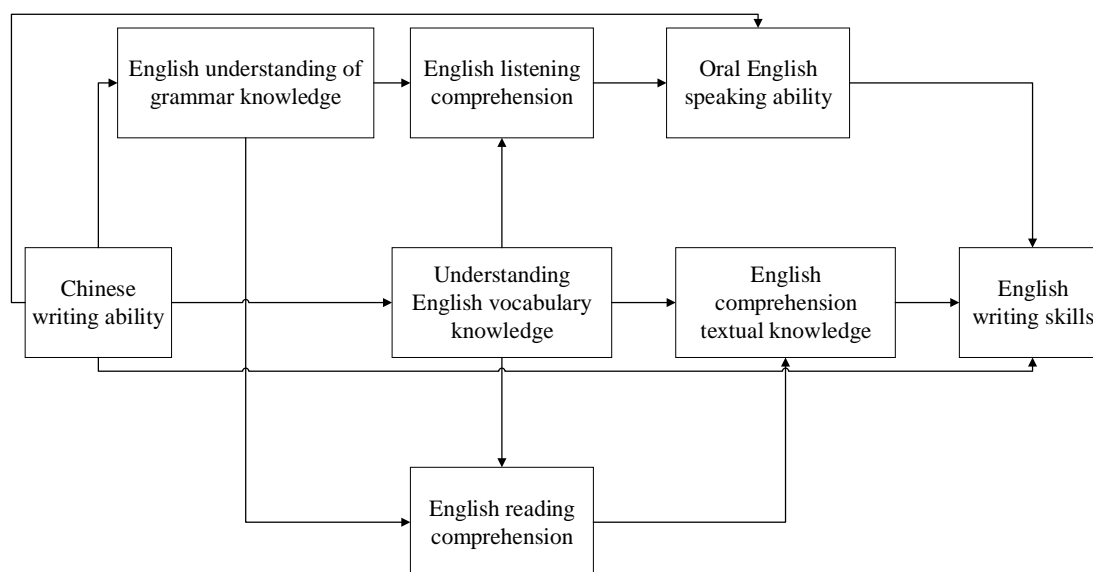


Figure 1 Effects of language knowledge and ability variables on English

writing ability

After we tested through dozens of models, we finally chose the model of Figure 1. There are two reasons for choosing this model: First, test results show that the model is well-matched with empirical data, indicating that the model is established; second, it is consistent with the purpose of this study. In the pattern of Figure 1, a line with an arrow is called a path, indicating the causality and direction between latent variables, and indicating which latent variable or latent variables indirectly influence another latent variable. The number in the model is called the path coefficient and represents the degree of direct influence of one potential variable on another potential variable. Table 2 shows the influence of independent variables on English writing ability[4].

The third column, R-squared, indicates that the three independent variables that have direct influence on English writing ability can explain the 75% variation in English writing ability. That is to say, the difference in students' English writing ability, 75% can be written by Chinese. This is explained by the difference between the spoken English ability and the vocabulary level expressed in English. The fourth column shows the direct influence of independent variables on English writing ability. The fifth column is the indirect influence of independent variables on English

writing ability. [3]The last column is the total effect of independent variables on English writing ability, ie the sum of direct influence and indirect influence.

Table 2 Influence of Independent Variables on English Writing Ability

Dependent variable	Independent variable	R squared	Direct impact	Indirect effects	All influence
English writing skills		0.75			
	Chinese writing ability		0.38	0.32	0.70
	English vocabulary knowledge		0.45		0.45
	English spoken		0.21		0.21
	English reading ability			0.19	0.19
	English listening ability			0.15	0.115
	Understanding English vocabulary knowledge			0.49	0.49
	English comprehension textual knowledge			0.16	0.16

(3) Discussion

① Direct influence

In the pattern of Figure 1, three independent variables—Chinese writing ability, spoken English ability, and English expression (reuse) vocabulary—have a direct effect on English writing ability, and can account for 75% of the variation in English writing ability. In related research in the past, linguistic variables can only explain about 30% of the variation. The reason why the past research failed to explain English writing ability is mainly because of its influence on English comprehension knowledge and skills in English writing ability, and neglecting the influence of English expression knowledge and skills. This study incorporates the variables of understanding and expressing two levels into a model, so that the model has a stronger explanatory power. The direct influence of Chinese writing ability on English writing ability (.38) shows that students with high Chinese writing ability generally have high English writing ability. Students with low level of English writing are affected to a certain extent by the low level of Chinese writing. Oral English proficiency has a direct impact on English writing ability. This shows that the improvement of English speaking ability contributes to the improvement of written expression. Although there are differences in spoken language and writing in terms of psychology, language, and cognition, they still have much in common. These commonalities can explain the direct influence of English speaking ability on English writing ability. Both reflect communicative competence, that is, the internal thoughts are expressed in a clear and appropriate language form to specific information receivers in order to realize the ability to successfully communicate. The direct influence of English vocabulary level is greater than the direct influence of Chinese writing ability and spoken English ability on English writing ability. This shows that the level of English expression vocabulary plays a crucial role in English writing ability. The greater the students' vocabulary, the more content they can write, the length of the article, and the greater the likelihood that the subject will be fully developed, and the higher the quality of the text. From the perspective of the entire model, the expression of vocabulary level is a key factor affecting English writing ability, because five indirect channels affect the passage from here..

② Indirect effects

In addition to its direct influence on Chinese writing ability, it also has an indirect effect on

English writing ability. The indirect influence of Chinese writing ability is generated by its direct influence on the spoken English ability, comprehension vocabulary and discourse ability. The direct influence of the ability of Chinese writing on spoken English ability, and the high level of Chinese writing help to improve the ability of spoken English. This is because the ability of Chinese writing to a large extent reflects the ability of a person to use language to communicate. In addition to the different forms of language, Chinese writing and spoken English have many things in common in terms of audience awareness, clarity, fluency and decentness, and the purpose of communication. English reading ability has an indirect effect on English writing ability. This shows that high English reading ability does not necessarily improve English writing skills. In other words, the model failed to prove that "the higher the reading level, the higher the writing level." In addition, the effect of reading ability on writing ability is generated through the direct effect of reading on the vocabulary; students who demonstrate strong reading ability are more capable of obtaining vocabulary from reading. There may be two reasons. One is that time-limited writing does not give students sufficient time to read. In theory, the writing process should also be a reading process. The indirect influence of English listening on English writing ability is similar to the indirect effect of reading ability. Listening tests, like reading tests, often measure the ability to capture information quickly, rather than the meticulous analysis, comprehension, judgment, and comprehensive comprehension that writing often requires. Therefore, listening, like reading ability, does not show its direct influence in a system model. The indirect impact of listening on writing is due to its direct influence on spoken language ability. This fully illustrates the close relationship between listening and speaking. Good oral English skills must be based on good listening skills. If you do not understand it, you cannot communicate orally. In addition, good listening helps learners obtain "input" from the listening materials that can be used for oral expression.

Conclusions

The mother tongue writing ability, English knowledge and ability have a systematic influence on English writing ability. The direct influence on English writing ability is the expression of knowledge and ability, rather than the understanding of knowledge and ability. Therefore, it should focus on improving students' expression of knowledge and ability. In addition, students of different English proficiency should adopt different strategies. For students with low English proficiency, the most urgent task in English teaching is to improve their English proficiency. For students whose English has reached a certain level, English teaching should focus on the improvement of students' overall ability to express, including the improvement of the ability to write a native language and improve knowledge and ability to communicate in English.

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