

A DESCRIPTIVE STUDY OF THE  
CORRELATION BETWEEN  
FRESHMAN ENGLISH STUDENTS' COGNITIVE DEVELOPMENT  
AND SELECTED MEASURES OF THEIR WRITING ABILITY

A Dissertation Proposal

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For almost twenty years, theorists in English Education have actively suggested a strong relationship between cognitive development and the growth of writing ability. James Britton(1975), Walter Loban(1976), and James Moffett (1968), in commenting on the development of writing abilities, most often credit Jean Piaget with detailing the basic cognitive operations upon which language is constructed and with which language, both oral and written, eventually becomes intricately intertwined.

Many research studies have been and will be developed to delineate the relationship between language and thought. Initially though, I propose to study only the strength of the correlation between students' cognitive development and their writing abilities. A brief review of relevant literature seems to support just such a strong relationship.

Britton, Loban, and Moffett have discussed in their writings many of the features common to both Piaget's theory of intellectual development and a sound theory for teaching what Moffett calls the "universe of discourse." Britton(1975) discusses the young writer's limited sense of audience, drawing on the Piagetian notion of egocentrism(p. 62). Loban's "Stages and Velocity of Language Development" reflects in linguistic terms the four basic stages of Piaget's theory of cognitive growth(sensorimotor, preoperational, concrete operational, and formal operational--see Appendix A). Like Piaget, Loban points out the gradual development of the writer's ability to express causality and conditionality, to understand the complexity of time, and to express relationships between various propositions(pp. 79-85).

Moffett, however, best ties the subject of composing to Piagetian theory. He takes two basic concepts--space and time--and relates each of them to Piaget's notion of the mind's natural progression from concrete to abstract thought. Then he places types of discourse along each developmental spectrum. Growth along the time spectrum reflects an increasing ability to deal with abstract subject matter(the I-It relationship), while growth along the space line reflects an increasing ability to adjust for wider audiences(the I-You relationship).

Many researchers and theorists have discussed specific points common to the works of Britton, Loban, and Moffett. Among them are Crowhurst and Piche(1979), Smith(1979), Kirby and Liner(1981), Keene(1981), and Odell (1977). Other researchers have touched on very different aspects of Piaget's theory, yet ones that are no less important to a comprehensive, developmental theory of composition.

For instance, Flower and Hayes(1980 & 1981) echo many of the same ideas as Piaget on methods students use to approach a problem, whether in composition or day-to-day problem solving. For Piaget(1970), "necessity, instead of being the prior condition for learning, is its outcome"(p. 62). In other words, until a student learns the structures needed to solve a particular problem, neither the solution nor the problem itself exist in that student's mind (see also Inhelder, Sinclair, and Bovet 1974). For Piaget, when a new structure or operation appears(that is, is learned), the mind senses the new element and seeks either to assimilate it or to accommodate to it. Necessity then can be defined as a new, learned structure actively seeking coherence with other ideas and relations. Necessity thus leads to further learning, but learning based on an original crucial urge that now demands acceptance and adaptation.

Flower and Hayes (1980) basically state the same point: that people solve only those writing problems they recognize, that the realization of a problem in composition has dramatic effects on actual performance, and that good writers develop more of an ability to see problems in breadth and depth. The implications for curricular planning are obvious. If educators can come to recognize the developmental patterns of the cognitive structures related to writing ability, then they can teach language skills more effectively by sequencing "necessary" concepts more efficiently.

Yet necessity is not a sufficient cause for utilizing the many abstract, formal reasoning capabilities that most secondary schools and colleges deem essential for an advanced society. Most fourteen-year-old students possess the necessary structures to discuss their current interests with parents, teachers, and friends. In these discussions they utilize structures of time, space, relationships, causality, and conditionality. However, such a low-level use of these skills is not enough to develop students' more powerful abstract cognitive operations. To develop further, students need to be conscious of their different mental operations. In addition, they eventually must come to control their structures. It is that consciousness, or awareness, and then that control that best identifies the advanced, formal thinker. According to Piaget (1970), "Not until [a student] becomes old enough to reflect on his own habits and patterns of thought and action does the [student] become aware of structures as such" (p. 68). In other words, the only way to proceed effectively from the simpler to the more complex is to reflect on and to discuss the processes just used (p. 66). Not only does this reflection require talk in the classroom, it also suits the permanent nature of writing itself. Writing allows authors to preserve their ideas and to separate them

long enough to ponder their relationships and implications (Smith 1979).

Obviously then the progression through successive cognitive stages (especially from concrete to formal operational), the movement from possible to necessary structures, and <sup>the</sup> growth from an awareness to a control of existing structures or operations closely corresponds to the nature and development of the ability to write. Just how close they are is the major research question of this project.

#### THE OPERATIONAL DEFINITIONS

In a descriptive study involving cognitive levels and writing abilities, operational definitions need to be assigned to each major variable. The first variable is "cognitive development." Students' cognitive levels will be measured by Hans Furth's "Inventory of Piaget's Developmental Tasks," a paper-pencil test that according to Patterson and Milakofsky (1980) is acceptably valid and reliable. Some subtests from the entire test will be eliminated in order to match the level of the inventory to the abilities of college freshmen (see Appendix B for a sample segment from this inventory).

The second variable, "writing ability," will be measured by a composite of four separate scores. Students will write two essays in class using the persuasive aim (Kinneavy 1971) (The reasons for choosing this aim will follow in the section "Methodology."). Correlations between the IPDT and each essay, as well as between the IPDT and the essays combined will be studied. Also, a separate correlation will be computed between the IPDT and Walter Loban's Elaboration Index (see Appendix C).

In addition, three other measures of syntactic complexity will be correlated to Furth's inventory, since past research has indicated that each

of these measures correlates highly with the development of syntactic structures. For years since Hunts' (1965) study, "Grammatical Structures Written at Three Grade Levels," researchers have used the T-unit as an acceptable gauge of syntactic development. In his review, O'Donnell(1976) says that the T-unit is "the most useful and useable index of syntactic development over a wide age range. . . ." (p. 38). The other two correlations involve the mean number of adjective clauses per writing sample, and the mean number of subordinate clauses per T-unit. According to Loban(1976), the use of subordination in general is a reliable index of linguistic growth(p. 88), while for Hunt (1965), the frequency of adjective clauses clearly indicates the degree of syntactic maturity.

#### THE RESEARCH QUESTIONS

This study will attempt to answer the following three major questions:

1. Does a strong positive correlation exist between a set of IPDT scores measuring cognitive development and a second set of holistic scores on:

- a) Essay #1?
- b) Essay #2?
- c) Essay #1 + Essay #2?

2. Does a strong positive correlation exist between the set of scores on the IPDT and a second set of scores using the number of Elaboration Index Points per Communication Unit as a measure of syntactic complexity?

3. Does a strong positive correlation exist between the set of scores on the IPDT and a second set of scores measuring:

- a) mean length of T-units?
- b) mean number of adjective clauses per essay?
- c) mean number of subordinate clauses per T-unit?

A fourth question concerning reliability will also need to be answered

before interpreting this study's data.

4. What level of reliability exists between the students' scores on the essays, and among the three teachers' holistic evaluations of each writing sample?

#### METHODOLOGY

**Subjects:** The original pool of subjects will include 250 freshmen in E306 (8 classes) and E307 Special (2 classes). This pool should be representative of freshmen at the University of Texas-Austin because between 20-25% of the new students test out of E306 and instead take E307 Special.

All 250 will be tested using the IPDT, and all 250 will write both essays. After the aberrant cases have been eliminated, 75 students will be chosen at random for the major portion of this study. The essays of the remaining students will be used to train raters in the holistic scoring needed to evaluate both essays.

Before students write the essays, they each will receive a consent form explaining the project as well as requesting permission to use their essays and IPDT scores. Also, before the IPDT test is taken, each student will be given a cover sheet requesting descriptive data. This data will aid in identifying subjects who are not college freshmen or those who have had a previous college or university level composition class. A sample data sheet is included here as Appendix D.

**The Essays:** The two essays will be structured and analyzed using Cooper's (1977) suggestions for best utilizing written samples

in a testing situation. Cooper says that researchers must have two pieces of writing preferably written on different days. Also he requires that students be permitted to exhibit their best, rehearsed performances under controlled conditions. The key words for this study are rehearsed and controlled. The week before they are scheduled to write, students will be given a general idea of the eventual topic. The information given will reveal the general subject but not the rhetorical stance students will be expected to take toward it. They then will be encouraged to note their ideas toward the subject. Only the note paper distributed to them at the time the subject cue is given can be brought to the writing class.

On the day of the exam, students will be given the instructions and 45 minutes to write and edit their essays. Finished essays as well as note sheets will be collected at the end of the time allotted. All instructions will be standardized along with answers to probable questions students may raise about the assignment.

The essays themselves will call for responses using the persuasive aim. Each student will be asked to persuade an audience that his or her approach to a problem is the best possible means of solving that problem. The rhetorical stance required will probably enable each student to be himself or herself, and will ask each writer to use the language structures, arguments, and logic appropriate for an older audience. Thus the essays will mirror each student's ability to reflect on and choose from a variety of authorial tones, organizational patterns, and syntactic structures.



Choosing the aim or purpose for this study is far from a haphazard procedure. To give students a chance to exhibit their most advanced mental structures, I chose an aim that would exemplify various stages of egocentricity, serious considerations by students for causal, conditional, temporal, and spatial variations, and gradations among them in their ability to express and qualify relationships between multiple propositions. Moffett's (1968) kinds and orders of discourse as well as research by O'Donnell (1976) and Crowhurst and Piche (1979) point out the complex, abstract nature of persuasive discourse.

Procedures: Data will be gathered according to the following time schedule (the timing is flexible for MWF or TTh classes).

	Mon.	Tue.	Wed.	Thur.	Fri.
Week #1	Explanation of the study and of the IPDT test. Pass out consent forms.	Explanation of the study and of the IPDT test. Pass out consent forms.	Collect consent forms. Give fact sheets and explanation for Essay #1.	Collect consent forms. Give fact sheets and explanation for Essay #1.	
Week #2	Write Essay #1.	Write Essay #1	Fact sheets and explanation for Essay #2.	Fact sheets and explanation for Essay #2.	
Week #3	Write Essay #2.	Write Essay #2.	Administer the IPDT test.	Administer the IPDT test.	

1. On the Monday or Tuesday of week #1, I will visit each class to explain to students their role in the project. At this time I will distribute consent sheets and inform students that anyone who chooses not to participate in the study will be expected

to attend class to work individually with their instructors. Also students will be told how their instructors will use the essay part of this project. Some instructors will use it as an extra credit assignment; some as a **required**, in-class essay; and others as an essay to be graded and held in reserve for borderline cases. Instructors can choose between my holistic grade, or they can grade the essays on their own.

2. On Wednesday or Thursday of that same week, I will return to collect the consent forms and to give the subject for Essay #1.

3. After the consent forms are collected, I will code each signed form with a six digit number. This number will be placed on the blank paper provided for each essay, and it will be written on each student's IPDT answer form. In order to distribute all papers and forms correctly, the student's name will be written on a small piece of paper that is stapled to the essay sheets as well as to the inventory answer form. When the essay sheets and answer form are handed to the student, the name tag will be removed and destroyed. In the end, the only place where a name and identification number will exist together is on a student's consent form.

4. Five days after the subject cue is given, students will write Essay #1. They have 45 minutes. All note sheets will be collected with the essays.

5. At the end of the next class period, the same instructions are given for Essay #2 as were given in week #1 for Essay #1. The subject has changed, but the aim has not.

6. Five days later, students write Essay #2. Again they have 45 minutes.

7. On Wednesday or Thursday of week #3, students will take the IPDT. After filling in the brief data sheet that is attached to the answer form, they will have the entire period to complete the inventory.

8. Before randomly selecting the 75 sets of data for analysis, I will remove the work of any student who has not completed both essays, the IPDT, or signed a consent form. Also removed from consideration will be the work of any subject whose essays show signs of having been plagiarized. Such a removal should be rare because students are not told in advance what rhetorical stance will be assigned. However, studying the collected note sheets will help to assure that any plagiarized work does not contaminate the data.

9. The IPDT will be scored and the scores paired with the matching results on each of the following measures of writing ability.

- a) Essay #1
- b) Essay #2
- c) Essay #1 + Essay #2
- d) Elaboration Index Points per Communication Unit  
(see Appendix C for Loban's results in grades 4-12, and for the Table of Elaboration Index Weights)
- e) Mean Length of T-units
- f) Mean Number of Adjective Clauses per Essay
- g) Mean Number of Subordinate Clauses per T-unit

Pearson Product Moment Coefficients will then be computed for each set of paired data in order to answer this project's three major research questions. Any test of critical values for the Pearson  $r$  will be made at the .01 level.

10. Lastly, for correlations a), b), and c) above, Essays #1 and #2 will be holistically graded by three trained raters on a 1-4 scale. The three individual ratings will be summed, thus allowing each essay to range in score from a 3 to a 12. Raters must be certified teachers with at least five years of secondary school teaching and either a master's degree or a summer's experience with the Texas Hill Country Writing Project. I will be responsible for selecting and training raters as well as for developing the necessary training materials.

PROCEDURES IN PROGRESS

1. Permission to use freshman composition classes has been requested from the Freshman English Policy Committee and Dr. John Ruszkiewicz, Director of Freshman English. I am presently awaiting approval.
2. The forms and application for the Human Subjects Committee have been submitted.
3. Permission slips for freshman subjects have been prepared and are ready for distribution.
4. Pilot studies testing essay topics and a shortened form of the IPDT have been completed and are being analyzed.
5. Instructors in E306 and E307 Special have been contacted and arrangements are being made to select 10 classes. An attempt is also being made to integrate the two writing assignments into each class' regular pattern of assignments.

All of these procedures will be completed by the formal proposal meeting.

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