EFFECTS OF A KNOWLEDGE CONSTRUCTION EXERCISE ON THE FORMATION AND EVALUATION OF SOCIAL STUDIES GENERALIZATIONS AND STUDENT AUTHORITARIAN ATTITUDES

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CHAPTER I

Effects of a Knowledge Construction Exercise on the Formation and Evaluation of Social Studies Generalizations and Student Authoritarian Attitudes

Introduction

A. Background

A generally stated purpose of the social studies is to provide students with the knowledge, values, skills, and experiences they will need to participate in our global society (Jackson, 1992). The social studies generalization forms an important component of knowledge, along with facts and concepts, that make up the body of knowledge transmitted in social studies education (Naylor and Diem, 1987). These components of knowledge have received varying degrees of attention in social studies research. Facts are single pieces of data use in generalization formation. Facts are sometimes referred to as declarative knowledge or verbal information (Gagne, Briggs, & Wager, 1988). Michaelis (1988) defined facts as "statements of information that include concepts, but they apply only to a specific situation." (p. 13). There has been a use of mnemonics to memorize facts for centuries. Simonides, who lived around 500 B.C., is known as the "father of the art of trained memory" and this type of training continues in the twentieth century (Lorayne & Lucas, 1975).

Research on concept learning has a long history, albeit not so long as mnemonics. A concept is an idea symbolized by words (Brownell and Hendrickson, 1950) and constitutes a good portion of what we learn. Ausubel (1960), Bruner (1960), and Klausmeier (1976), to mention a few, researched concept learning in the 1960s and 1970s. More recently, Yoho (1986), McKinney (1985), and others have analyzed the problem of what is the best way to teach concepts.

Research on teaching generalizations has not so vigorously continued into the 1980s and the 1990s. Generalizations utilize facts and concepts to make a statement that summarizes or concludes. Michaelis (1988) after pointing out that a set of facts can form a generalization, defined generalizations as "statements of broad applicability that contain two or more concepts and show the relationship between them." (p. 13). Ausubel (1960) advocated the use of advance organizers for teaching concepts and generalizations, which resemble a deductive approach. Taba (1967) developed a generalization teaching model that utilized a spiraling inductive approach. Most of this research focused on the acquisition of the generalization.

Most teachers still see their role as transmitters of knowledge, while the formation of social studies generalizations by students is a critical thinking and knowledge construction activity. Unfortunately, social studies generalizations are usually taught as facts, i.e., something to be memorized and not questioned thus robbing students of an exercise in knowledge construction. The very tentative nature of most social studies generalizations provides an excellent opportunity to teach important critical thinking skills. Understanding generalization formation will enable students to challenge and modify generalizations as data is examined through their own research or experience. For these reasons, Wehlage and Anderson (1972) view generalizations as both a product of student inquiry and valuable knowledge.

John Dewey (1938b) maintained that a hypothesis is a generalization to be tested and that the testing and modifying of hypotheses are both the means and goals of education. If testing and modifying of generalizations are as important as Dewey suggests, then the question remains whether there is a method or model that would enhance students' grasp of generalizations as well as improve their ability to form and evaluate generalizations.

While extensive research has been conducted on the acquisition and application of rules, this research may not apply to the typical social studies generalization. An examination of the definition of rule and its application reveals a major structural difference with the typical generalization made in the social studies. From Reigeluth (1983):

> Learners have acquired a rule when they can demonstrate its application to previously unencountered instances. A rule is a relation between two or more concepts. An example is the use of 'Ohm's law," represented by V = IR, to solve electrical circuit problems. (p. 14)

This algorithmic definition has little to do with the divergent responses with the type of generalizations in the social studies that could be generated from the questions, "Why did Lee lose at Gettysburg?" or "What would you consider to be the successes and failures of President Clinton's first year in office." An examination of one of the more rigid rules in the social studies---the law of supply and demand---is not as algorithmic as rules found in the math and sciences. It presents a heuristic relationship between price, demand, and supply because it is a statement of probability. Likewise, the relationship between altitude and temperature is not as rigid as the rules governing math, sciences, and language. In addition, social studies generalizations that summarize or conclude may not be applicable to previously unencountered instances.

If generalizations and rules had a similar structure, a major problem would still exist in attempting to transfer research findings in one area to another. Klauer (1989) found this the case when reviewing literature on homomorphic problems in analogical transfer. Despite the same basic structure of problems, his research found the correlation in analogical transfer "disappointingly low" (p. 180). A sample review of the research utilizing rule learning strategies or research found language or spelling rules used in thirteen studies, (Barat, 1983; Connell, 1987; Dunn & Till, 1982; Feuerstein, 1983; Hoff, 1986; Johansen, 1981; Johansen & Tennyson, 1983; Morgulas, 1982; Noel, 1983; Petretic-Jackson, 1981; Smith, 1968; Tennyson, Welsh, Christensen, Hajovy, 1985; Welsh, 1987) computer rules used in four studies, (Lee, 1989; Lipuma, 1988; Saudi, 1986; Spock, 1987) algebra or math used in two studies, (Diaz, 1990; Lee, 1985) chemistry used in two studies, (Hurtado, 1980, Tabachneck, 1982) and one study each in the area of music, physics, medicine, and biology (Harwood, 1974; Hardiman, Pollatsek, & Well, 1986; Gluck & Bower, 1988; Arnett, 1985).

Not surprisingly, no study was found utilizing a social studies discipline. Because of the lack of rule learning research in the social studies and the possibility that rule learning research findings would not transfer to social studies generalizations, this study reviewed the literature that concentrated on social studies generalizations.

Several studies have focused on training in critical thinking and its effect on students working with social studies generalizations. Stitt (1967) found that instruction in inferential thinking, or generalization formation, would significantly increase inference skills among sixth grade students. David W. David (1968) found that students who practice generalizing were better able to generalize. Alexander, White, Haensly, and Crimmins-Jeanes (1987) found that training in analogical reasoning significantly improved fourth grade students' ability to reason analogically. Torrance, (1972) in a review of the literature on creativity training, found it to be effective. A Meta-analysis by Rose and Lin (1984) supported Torrance's claim that creativity training could be effective in promoting creativity.

Benes, McKinney, and Hagen (1991) found that a training lesson in inductive and deductive reasoning did not significantly improved seventh grade students' ability to acquire social studies generalizations. However, in that study, the students with the higher academic records were beginning to respond to training but their scores were not significantly higher than their untrained peers. One possibility is that training would have been more effective at the eighth grade level since all students would have matured some intellectually.

Other studies found significant changes in attitudes following critical thinking training (Kovalcik, 1979: Letzter, 1970; Tauran, 1967). Creativity training was found to have positive effects on related attitudinal measures (Reese, Parnes, Treffinger & Kaltsounis, 1976; Shivley, Feldhusen & Treffinger, 1972; Treffinger & Ripple, 1969). No study was found that explores the effects of an exercise in knowledge construction on eighth grade student authoritarian attitudes and their ability to form and evaluate generalizations.

B. Statement of the Problem

Teaching eighth grade students the process of knowledge construction could influence their attitudes. Some research indicates student attitudes can be affected by students' experiences with generalizations. Boedeker (1971) was interested in what would reduce dogmatism in students. She found that presenting evidence first (an inductive approach in generalization formation) was superior to the deductive teaching approach in reducing dogmatism. The Boedeker (1971) study looked at other attitudinal changes in the students. She did not utilize knowledge construction or a critical thinking exercise but rather compared teaching methods. The type of generalization taught has been found to affect the degree of dogmatism in students (Letzter, 1970). No study utilized a knowledge construction exercise to test its effect on generalization formation and evaluation and student's authoritarian attitudes. Since dogmatism and authoritarian attitudes are related (Adams & Martray, 1980) and student experiences with generalizations has been found to affect their dogmatic attitudes (Boedeker, 1971; Letzter, 1970) it is possible that a knowledge construction exercise could affect student authoritarian attitudes.

A review of research concerning generalizations found that the studies concentrated on what effect various teaching techniques had on generalization acquisition (Benes, 1991). While some studies examined the effect of inductive and deductive teaching or training, these studies still focused on generalization acquisition. The degree of change in their attitudes should be examined since the student's ability to form a generalization even slightly different than that of his teacher would directly challenge the traditional role of authority the teacher has in our society (Simon, 1980).

Since some studies report an attitudinal change in the students following critical skill training, it follows that an exercise emphasizing the knowledge construction aspects of generalization formation could have a significant effect not only in generalization formation and evaluation, but in students' authoritarian attitudes. Brooks and Brooks (1993) report that major resistance to constructivist pedagogy are from teachers concerned with classroom control. A constructionist pedagogy empowers student to construct their own understanding and therefore that can be seen as a threat to teacher authority of knowledge position. Teachers play a traditional role of authority in the area of knowledge construction for students. Brooks and Brooks (1993) report that teachers who oppose the constructivist classroom which emphasizes knowledge construction by students do so for reasons of control. These teachers see knowledge as power and as a behavior management device because students must be quiet to hear their information. An exercise in knowledge construction may affect a student's submission to idealized moral authorities. Student revelation about knowledge construction could also alter their own authoritarian aggression attitudes. An authoritarian aggression attitude is one that condemns those who oppose conventional values (Sanford, 1956).

C. Purpose of the Study

The purpose of this study is to investigate the effects of an exercise in knowledge construction on eighth grade students' authoritarian attitudes and their ability to form and evaluate generalizations. Specifically, this study examined the effects of a knowledge construction exercise on the student's ability to recognize the best and the worst instances of generalizations, support for a generalization, and sources of information for a generalization. Additionally, following the exercise, a modified F-scale test utilizing the subscales of Authoritarian Aggression and Authoritarian Submission designed by Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) was used to measure authoritarian attitudes.

D. Research Hypothesis

This study was designed to investigate the following null hypotheses:

1. Regardless of sex, race, or ability, a knowledge construction exercise will have no significant effect on eighth grade student's ability to recognize the best and worst generalization following a given set of data.
2. Regardless of sex, race, or ability, a knowledge construction exercise will have no significant effect on eighth grade students' ability to recognize the best and worst support for a generalization.
3. Regardless of sex, race, or ability, a knowledge construction exercise will have no significant effect on eighth grade students' ability to recognize the best and worst source of information for generating a generalization.
4. Students receiving a knowledge construction exercise will have no

significant change in their authoritarian attitudes as measured by the modified F-scale test.

E. **Assumptions**

1. Students randomly selected will not be significantly different in ability to recognize the best and worst instances of generalizations, support for a generalization, or source of information for a generalization.
2. Students randomly selected will not be significantly different in their authoritarian attitudes.
3. Significant difference between randomly selected students in their ability to recognize best and worst instances of generalizations, support for a generalization and sources of information for a generalization will be due to treatment.
4. Significant difference in student's authoritarian attitudes will be due to treatment.

F. **Definitions of Terms**

For the purpose of this study, these terms will be operationally defined as follows:

Knowledge Construction : The process of forming generalizations and selecting data and sources for generalization formation.

Generalization : A statement that synthesizes selected data referring to a relationship between certain facts, concepts, and/or statements about other relationships.

Facts: Events or observations that are rarely disputed and generally accepted as being true. Generalizations that experience an almost total degree of consensus will be and are considered facts. On the other hand, facts that are disputed can become generalizations.

Data: Same as facts.

Hypothesis: A generalization that is to be tested, having less consensus than generally accepted generalizations.

Low Achievement Group: Subjects who score below the median on the school measurements of achievements, i.e., academic scores and standardized statewide test scores or on the pretest.

High Achievement Group: Subjects who score above the median on the school measurements of achievements, i.e., academic scores and standardized statewide test scores or on the pretest.

Experimental Group: Subjects who received the treatment of a knowledge construction exercise.

Control Group: Randomly selected subjects who will take the same test measuring the ability to form and recognize sound generalizations without the treatment of a knowledge construction exercise. All subjects will take the same test measuring authoritarian attitudes.

Modified F-Scale Score: A test instrument that measures authoritarian attitudes. Test was modified to remove response bias and consists of two subtests measuring authoritarian submission and authoritarian aggression.

Authoritarian Submission . Submissive, uncritical attitude toward idealized moral authorities of the in-group (Sanford, 1956).

Authoritarian Aggression . Tendency to be on the lookout for, and to condemn, reject, and punish people who violate conventional values (Sanford, 1956).

F-scale Score : Total average score on either subscale of authoritarian submission and authoritarian aggression. Possible range of this average will be from one to seven with seven being a high authoritarian score. A score of one indicates low authoritarian attitudes and a score of four represents a neutral attitude toward an authoritarian position.

F. Limitations of Study

The main focus of the study is to measure the effect of a knowledge construction exercise on students' authoritarian attitudes and their ability to recognize best and worst instances of generalizations, support for a given generalization and sources for a generalization. Students were randomly assigned to receive a knowledge construction exercise self-instructed booklet or a placebo exercise booklet with some of the same information but no lesson on knowledge construction. Students unable to read were given the lessons orally or via cassette tape. Subjects were drawn from rural communities in the Southwest consisting of a racial mix with the majority of subjects coming from the working and middle classes. The percentage of nonwhites was small and predominately Native American. The gender division was roughly 50% males and 50% females. With the exception of the gender division, the subjects were not an exact replica of the general population and will further limit the generalizability of findings.

All limitations normally experienced in statistical analysis were present in this study.

CHAPTER II.

REVIEW OF THE LITERATURE

A. Philosophical History.

Philosophers have consciously set before themselves the task of understanding the world and, in that process have looked at knowledge construction. They realize that in order to understand and live in our world, we organize information from our everyday experiences into generalizations. We attach different degrees of belief and certainty to these generalizations, ranging from an absolute belief to a willingness to abandon our tentative generalization at the first sign of conflicting evidence. This section will examine how five philosophers--Plato, Dewey, Rousseau, Hume, and Descartes--approached generalization formation from facts derived from everyday experiences. Their differences in opinion about knowledge and its construction parallels the difference modern researchers have in defining generalizations.

This section attempts to link the philosophers' ideas about two types of generalizations: the covering law generalization, which is law-like in nature, and the everyday tentative generalization, which is based on experiences and subject to revision. The epistemological issues discussed are limited to those utilized in knowledge construction formation.

Plato maintained that there were only two ways to know the truth: by visiting the land of the Forms or by the use of the dialectic method (Grube, 1988). The land of the Forms was the world of Ideas, immaterial essences, that contain the true and ultimate realities. Since neither of these avenues are simplistic, people generally make statements about their world based on sensory information. Plato referred to these inaccurate statements as opinions. Statements about the Forms, on the other hand, would hold true for all time. This kind of generalization is called a "covering law" generalization. It would seem that as far as Plato was concerned, no other type of generalization is possible or useful.

Dewey felt that experience was useful for understanding the world around us. Each new experience adds to our knowledge and contributes to our mastery of a "craft". Practice and experience creates the knowledge for better practice and more knowledge. For this reason, John Dewey (1938a) rejected knowledge as an end in itself and saw knowledge as a means for more knowledge. In this view, Dewey readily admitted to the changing nature of knowledge as it leads to a better understanding of the world.

Generalizations are an important element of Dewey's philosophy of education. The tentative generalization provides the material for the next generalization to be formed from experience. These generalizations would be in the form of a hypothesis to serve in a scientific approach to problem solving. Hypotheses are generalizations that are formed from previous experiences and then subjected to testing. The experience gained from experimentation would inform the researcher to what degree the hypotheses needs to be modified. With a new hypotheses, the process continues, i.e., testing and modifying the hypotheses or generalization. Scientific inquiry would continue to add to knowledge in the form of sound generalizations. These generalizations from experience, according to Dewey (1938a), form the means and goals of education.

Rousseau recognized the importance of experience in the education of Emile (Rousseau, 1979). Rousseau was actively involved in Emile's knowledge construction but had a particular structure of knowledge in mind. Rousseau, as Emile's tutor, expected Emile to make generalizations based on the experience Rousseau arranged for him. Certainly these generalizations were less formal than the scientific inquiry advocated by Dewey. Evidence to support Emile's generalizations was mostly subjective and the "data" was controlled by Rousseau. In fact, if Emile made the wrong generalization from his experience, Rousseau would arrange for another "experiment" in order for Emile to come to the "right" conclusion. In this way Rousseau is like Plato in that he believed in a truth such as a covering law generalization or a form of the good. Rousseau was determined that Emile discover certain truths even if it meant Rousseau had to manipulate the experience. Unlike Dewey's belief that the learning experience was both the means and the goal of education, Rousseau saw experience only as a means. The generalization was of the utmost importance, not the experiences that may have caused the construction of that knowledge.

One philosopher who discounted the importance of cause was David Hume. In fact, Hume maintained that cause could not be proven: rather we perceive two events together and then believe in cause. He asserted that the connection cannot be proven between a cause and an effect but rather that events are simply conjoined (Steinberg, 1977). When the probability of the two events occurring together is high, we attach a greater belief to conjoining events as being an example of cause and effect. This connection between cause and effect, however, occurs only in our minds and cannot be proven. Hume's generalizations about experiences would always be tentative even if two events were always seen occurring together and never would he infer cause and effect. Even these generalizations would not constitute real knowledge for Hume.

Since a generalization is a form of an idea, Hume said that generalizations come from perceptions which are either impressions or reflections (Selby-Bigge, 1960). Hume claimed that no one has knowledge over and above one's own sensations and ideas. Any knowledge claims would involve inferences from these ideas and therefore a belief in cause and effect. Such induction is circular in Hume's views and therefore not rational. There can be no knowledge from perceptional generalizations, only from "relations of ideas." But this is not knowledge about observable phenomena, but rather knowledge about our own connections.
How does one see abstractions in the form of impressions or reflections? Jonathan Harrison (1976), a critic of Hume, felt that Hume must refer to abstract idea. From the impression of an experience would come an idea or generalization.

Another philosopher who would be tentative in his formation of generalizations from experience would be the uncertain Rene Descartes. Descartes was willing to doubt all experiences except the experience of thinking which proved his own existence (Ulich, 1954). He felt that if thinking, however, would employ the step by step method of mathematics and its certainty, then knowledge would be possible through thinking alone. Descartes believed that all initially indubitable knowledge of what exists or occurs is limited to those beliefs, feelings, and sensations each man has about himself. But, as Bertrand Russell (1921) pointed out, ideas about the past could be wrong since the world could have been created five minutes ago and our memories of the past could have started at that point. Furthermore, he argued, since speculation about the future is based on the past then the future is uncertain also. It appeared that Descartes was searching for law-like statements based on pure reason and would consider generalization formation or knowledge construction from everyday experiences as primarily subjective and non-universal in application.

The differences discussed here about the rigidiness of the nature of knowledge is very similar to the debate in the 20th century over the definition of generalization and rules. Dewey's beliefs about knowledge best summarizes the author's beliefs on generalizations.

B. Definitions and Terminology

A number of difficulties emerge when conducting a review of generalization research, the foremost being a lack of common terminology. Reigeluth (1983) complained that methods labeled "lecture" or "discussion" may vary more within each category than between categories. The definition of a generalization can vary depending on its usage and the discipline to which it is applied. In psychology, generalizing is often referring to the selection of stimulus based on its similarity as opposed to discriminating between stimulus. Although related, this generalization formation can be accomplished by lower life forms since it does not require verbalization or a written statement. In other disciplines generalizations take the form of descriptions, principles, explanations, interpretations, laws, rules, hypotheses, evaluations, and predictions (Mehlinger, 1981). In an attempt to define generalizations for research purposes, W. L. Taylor (1941) defined a generalization as "...a statement of a principle that is based upon the apparent relationship existing between or among a number of specific instances or experiences" (p. 147). Later, Brownell and Hendrickson (1950) defined a generalization as "...any verbalized formulation of a relationship which is of broad applicability" (p. 28). Hanna (1957) offered a similar definition by stating that a generalization is "...a descriptive statement of broad applicability indicating relationship between two of more concepts" (p. 29). Some form of a definition referring to a statement about the relationship between two or more concepts has been used by researchers in recent years (e.g., Banks, 1990; Jarolimek, 1990; Maxim, 1991; Van Cleaf, 1991).

McKinney (1991) found a problem with a concept definition of generalization with its emphasis on just the relationship between concepts.

He felt that the synthesizing of facts better defines the generalization. Furthermore, McKinney (1991) stated that "The sequence of the generalization learning progresses from the prerequisite concepts, to facts (or data), to the synthesis of the facts into a generalization" (p. 3). Because of this view he offered this definition: "A generalization is synthesized factual information which states a relationship between two or more concepts" (McKinney, 1991, p. 3).

The definition of fact, essential to some definitions of what is a generalization, can present a problem. In some ways a fact is a generalization and likewise a generalization can be a fact. For example, the statement that it is 30 degrees outside sounds factual enough but a closer examination can indicate otherwise. "Degrees" is a measurement concept. Even "30" is a numerical concept. Add Fahrenheit or Celsius to the other concepts of "30" and "degrees" and you have a statement about the relationship between three concepts, i.e., a generalization. However, you can take a dictionary definition of fact, such as, "...that which has actual existence, whether subjectively or objectively considered...the reality of which is manifest in experience or may be inferred with certainty..." (Neilson, 1934, p. 908). The "certainty" element appears to the dividing line between what is a fact and what is a simple generalization. Data, information, or generalizing statements that experience an extremely high degree of consensus can be and are considered facts. In this way, generalizations that are not disputed become facts.

Generalizations that state a high degree of reliability in a relationship are usually called rules. A rule usually has the connotation of being law-like. "'I' before 'E' except after 'C'" states a relationship that is rarely violated and the exceptions are usually made known. Social studies generalizations, on the other hand, are more tentative and less law-like in nature than a rule.

The tentative nature of the social studies generalization is not to be construed as a weakness. In fact, McNaughton (1969) maintained that a certain kind of vagueness in a generalization is a strength rather than a weakness. Taylor (1941) called generalizations a statement of probabilities. Because of the nature of social studies and for the purpose of social studies instruction, a good working definition of a social studies generalization is that it is a statement that synthesizes facts and concepts referring to the tentative relationship between certain facts, concepts, and generalizations.

Generalizations formed for testing become hypotheses. Facts and concepts that make up the generalization become the target for the investigation. For example, Dewey (1938b) said, "A generalization in the form of a hypothesis is a prerequisite condition of selection and ordering of materials as facts" (p.498). Banks and Clegg (1985) saw little difference between hypothesis and generalization when they maintained that generalizations must be able to be stated in if-then statements. R. C. Phillips (1974) leaned toward this hypothesis definition when stating that a generalization is "... a law-like statement that expresses a relationship between two or more concepts" (p. 75). He felt that generalizations "summarize large quantities of facts or account for a whole rather than a partial situation" (p. 72).

Labels used in generalization research can be misleading. For example, the term "ruleg" is use for the deductive teaching of a social studies generalization, which is not necessary a rule (Herman, 1969). Ruleg or egrule is used to denote a deductive or inductive approach and not to designate the knowledge component to be learned. For this reason the ruleg or egrule approach can be used on rules, generalizations, and even concepts. Generally, the terminology of rules, principles, and laws are applied in the disciplines of language, science, and mathematics. Even when these terms are used in the social sciences, such as with the law of supply and demand, they still lack the rigidity of mathematics and science laws, such as multiplication rules and the law of gravity. Because of the uniqueness of the social studies generalization, this literature review is limited to research on social studies generalizations. In some studies these generalizations may be called rules, but for the most part they are the typical social studies generalization that are usually tentative in nature.

Another difficulty with terminology was encountered when examining the teaching approach. As previously noted, there are four approaches to teaching generalizations: deductive, inductive, egruleg, and memorization. This terminology in the literature, however, is not always used. Frequently, such terms as "inquiry," "discovery," "expository," or "traditional" are employed (Hermann, 1969). Usually, inquiry and discovery approaches referred to an inductive approach, but not always. Likewise, expository and traditional approaches are generally deductive in nature. It was sometimes difficult to determine when the egruleg was actually being used. Sometimes this approach was used but not referred to as such. An attempt was made to determine which approach was utilized, although it was not always readily evident which approach was actually being used or if they were correctly identified.

C. Generalization formation as critical thinking.

Generalization formation is an exercise in critical thinking in social studies education. Students should be able to take numerous pieces of information and synthesize them to a single generalization. This is the process W. L. Taylor (1941) called "economy of learning." Using similar processes, several generalizations can also be combined to form yet another generalization. An example of this can be extracted from comments made during the Gulf War. President Bush and others referred to the "lesson" of the Vietnam War. Supposedly because of the knowledge acquired from this "lesson," the American people were assured that mistakes made during the Vietnam War would not be repeated. Students and others may wonder what was this all important lesson from the Vietnam War. Chances are few people would express that lesson in exactly the same terms. Indeed the lesson could be expressed in many different statements, some reflecting viewpoints that would conflict with others. One thing is certain: any of these "lessons" or the one big "lesson" would be expressed in the form of a social studies generalization. In other words, the U.S. military involvement spanning two decades and all the turmoil on American streets and college campuses could be reduced to a single social studies generalization. The idea that a single "lesson" could be learned from the experience of Vietnam illustrates the special feature of a social studies generalization, which is that numerous pieces of information can be synthesized into a single statement.

Besides enabling the student to handle numerous bits of information, the student engages in other critical thinking activities. Generalization formation and application involve the student in exercising the critical thinking skills of synthesis and analysis (Bloom, 1956). Taylor (1941) maintained that generalizing is a reasoning act. Since generalizations play a dual role of transmitting knowledge while providing exercise in critical thinking development, generalization formation and acquisition deserves special attention from the researcher in the social studies.

D. Teaching generalizations

The actual teaching of the generalization for knowledge acquisition may be accomplished in four ways. A generalization may be taught inductively. This method (also known as egrule) presents the facts or data first, and then students synthesize the information into a generalization. A deductive method, known sometimes as ruleg, presents the generalization first, and then the students are given information that supports the generalization (Hermann, 1971). A third method combines an inductive and deductive approach and is known as egruleg. With this method the information is presented first, a generalization is formed, and then the generalization is applied to new instances. Finally, a fourth method for generalization acquisition is simply the presentation and memorization of the generalization. Although this approach may seem to be unacceptable because of its lack of critical thinking involvement, the method is widely used, especially for simple generalizations. That is probably due to the perceived efficiency of presenting the generalization without evidence, which may not be provided or is assumed to be already known by the student. Generalizations presented this way actually become facts that rely on the authority of the teacher as the source of knowledge. A survey of grade school textbooks will quickly reveal the prevalence of this method. Presenting generalizations as facts, however, is not limited to elementary education and is fairly common at all levels of education.

E. Early Research

While looking at the importance of generalizations in education, C. H. Judd (1936) contended that progressives and conservatives agree on the goals of education. He felt that both philosophies maintained that the students should master generalizations and have the power to apply them. At what age should this begin?

Research reported that young students have the ability to generalize (Peterson, 1932; Edmistion, 1935; Croxton, 1936). According to Piagtian theory, children enter concrete operations around the years seven through twelve. The child can then operate on concrete objects or their representations. Operations include serializing, extending, subdividing, and differentiation (Pulaski, 1971). Most importantly for this study is the child's ability to combine existing structures into new relationships.

This combining ability is the generalization formation skill of interest to this study. It will be assumed that an overwhelming number, if not all, eighth grade students in their second semester with an age range from thirteen to fifteen years will be operating at least at the concrete operational level. It is likely according to Piaget (1928), some students will be in the formal operation level of their cognitive development. The entry year for this level is eleven or twelve. At this stage the form of reasoning can be more enhanced and abstract. The students operating at this stage will have some advantages over the concrete operating child since they will be able to deduce from hypothetical hypotheses. Piaget (1928) called the ability to draw conclusions from facts not in the immediate observation or which cannot be accepted as true without qualifications as "formal deduction." All facts used in this study should be items that eighth grade students can accept as being true. No hypothetical evidence will be presented that is not the type students would encounter in normal social studies generalization formation.

It still remains a question as to which teaching method stimulates the greatest amount of critical thinking development. Another important question is whether the teaching method has an effect on the student's ability to recall the generalization. Also, will the development of a critical thinking skill (i.e., analysis, synthesis, evaluation, etc.) be affected differentially by the generalization teaching method? Regardless of the method of generalization acquisition, students may be asked to evaluate the quality, credibility, worth, or practicality of generalizations, and thus engage in additional critical thinking activities.

F. Critical thinking training and student attitudes.

1. Authority of knowledge position.

Yves Simon (1980) believes students obey teachers because of their authority of knowledge position. This position is eventually challenged by students possessing "powerful critical minds" (p.95). Until then the student is in a weak position, with the teacher constructing knowledge for him or her. Thomas Kuhn (1970) called beliefs, values, and techniques being shared by members of a given community a paradigm. Students are a part of a paradigm not of their own construction. For example, Yves Simon (1980) observed:

> Since no scholar achieves any skill in any domain without having gone through a phase of apprenticeship and belief, the choice of a guide takes place at a time when the mind is still unable to estimate the value of theories and systems.... Throughout his life he is confronted with the necessity of trusting those who, on such and such a subject, know more than he does: until the last day of his research, his docility needs to be directed and stimulated. (p. 99)

Ehman, Mehlinger, and Patrick (1974) maintained that there were two ideal teaching method types which they called, "method of authority" and "method of inquiry". An extreme case of method of authority, according to Ehman, Mehlinger, and Patrick (1974), would resembled this:

> An extreme authoritarian teacher is one who tramples upon the rights and feelings of others. Such a person enjoys the exercise of power, fears debate, prefers an "orderly" classroom to one in which there is much activity, tends to use punishment more than reward, views students as undisciplined individuals who require control, and is uncomfortable in learning situations in which he is not acknowledged as the intellectual leader. Certainly such an individual is unlikely to practice the method of inquiry. However, the method of authority is more than that of

> an authoritarian personality, although those who have such personalities are likely to be examples (of such a teacher).
>
> (p. 65-66).

Even the other extreme in teaching method, the method of inquiry, is not without authority. Again Ehman, Mehlinger, and Patrick (1974) pointed out that ,

> In the classroom all teachers practice authority in at least one sense. They are given the authority by school officials to keep school records, to assign grades to students, to determine what shall be taught each day, and---perhaps most important of all---to set the tone or "climate" of the classroom. We see no way that a teacher can avoid this type of authority; even if he shares portions of it with his students, it is always his prerogative to offer it, withhold it, or even to take it back once it was shared. (p. 65).

When the students reach the stage where they feel somewhat a peer with mentors, capable of challenging the experts on some points, and not in need of direction or stimulation, a power shift takes place. The dominant theory of power states that there is only a fixed amount of power (Baldwin, 1989). This is sometimes referred to as the "zero-sum" concept. This theory maintains that for someone to have an increase of a quantity of power, there must be a decrease of the same quantity from other sources. In the case of teacher and student, the teacher, largely due to the authority of knowledge position, has the largest quantity of power in the relationship. Any action that would diminish the power of the teacher would automatically result in increased power for the student.

2. Student attitudes.

The teaching approach may affect student attitude toward the authority of knowledge. For example, L. C. Boedeker (1971) found that the deductive teaching approach increased student dogmatism. This means that by presenting the generalization *first* and then presenting the data that supports it, students will tend to recognize the generalization as dogma. Therefore, the deductive approach could be strengthening the teacher's authority of knowledge position. The inductive approach involves the students in the process of knowledge construction and may diminishe the teacher's authority of knowledge. Other studies examining generalizations found other student attitude changes (Kovalcik, 1979; Letzter, 1970; Tauran, 1967). These studies suggest that the generalization process may engage the student in some form of critical thinking that can change their attitudes.

G. Focus of Recent Research

One reason for the difficulty in determining the teaching approach was that the purpose of the study may not have been to look at approaches as a variable but rather to examine some other aspect of social studies generalizations. One study examined the appropriateness of certain social studies generalizations for lower elementary students (Beaubier, 1962). Two studies examined experimental models that did not necessarily compare approaches but were interested in the enriched content or complexity of the materials being presented (Armstrong, 1970; Greenblatt, 1963). Other studies examined correlational variables, such as Social Economic Status (SES) or reading comprehension, with the ability to generalize (Hills, 1964; Wulff, 1969).

Sometimes the teaching approaches were variables of interest in a study without looking at knowledge acquisition and critical thinking development. For example, Boedeker (1971) was mainly interested in the effect of the teaching approach on reducing dogmatism. She found that the discovery treatment (inductive) was superior to reducing dogmatism when compared to the presentation (deductive) treatment.

In studies that tested teaching approaches and their effect on knowledge acquisition and critical thinking skill development, there was a tendency to not separate concept acquisition from generalization acquisition. Only seven studies were found that clearly examined the effects of the teaching approach on generalization acquisition (Beery, 1972; Benes, McKinney, & Hagen, 1991; Black, 1981; Lahnston, 1972; Long, 1979; McKinney, Benes, Hagen, & Beckham, 1991; Wallace, 1967). Other factors, such as grade levels, subjects, and use of programmed instruction, made these studies vary substantially.

G. D. Hermann (1969) found various problems in his review of the research on discovery learning. He reported that lack of common terminology presented a problem in the classification of the studies. He concluded that discovery techniques generally, but not necessarily, employ an inductive approach. Not only could discovery techniques employ a deductive approach but they also tend to utilize an egruleg approach. These discrepancies should be kept in mind when examining his review findings.

The most consistent finding Hermann (1969) reported in his review was statistically nonsignificant results (29 nonsignificant cases to 17 significant). Overall, the discovery technique, when compared to expository presentations, produced significant results at more than two to one ratio (12 cases to 5). Only in studies involving elementary students did the expository or deductive approach produce a superior number of significant results to discovery techniques (3 to 1).

Hermann (1969) concluded that better retention is obtained from ruleg learning and better transfer is obtained from discovery learning. Early and late retention plus early and late transfer were the emphasis of his review. By his own admission there were several problems with this review. Hermann pointed out that improper methodology was commonly employed by researchers. Multiple interactions and confounding from the lack of control over test, time, IQ, and type of guidance made generalizability of results difficult. In addition, the subject matter varied greatly between experiments, not always utilizing a social studies discipline.

A majority of the studies (15) examined for this review took place during the 1960s and the 1970s. This is probably a result of interest in the new social studies movement, which emphasized inquiry and discovery learning. The number of studies about generalizations dropped sharply in the 1980s, and only recently has interest revived in social studies generalization research.

H. Overview of Studies

A clustering of generalization research appears around a couple of grades and social studies disciplines. Seventh grade students followed by sixth grade students were subjects for four (Beery, 1972; Benes, McKinney, & Hagen, 1991; Boedeker, 1971; Hagen, McKinney, & Benes, 1991) and three studies (Beaubier, 1962, Greenblatt, 1963, Wulff, 1969), respectively. All other grades, including one undergraduate study, appeared only once or twice. No generalization study was found using the first or eleventh grade. Geography was by far the most frequently used social studies discipline for generalization research. It was taught in eight cases (Armstrong, 1970; Benes, McKinney, & Hagen, 1991; David, 1968; Greenblatt, 1963; Hagen, McKinney, & Benes, 1991; Lahnston, 1972), followed by four cases utilizing anthropology or sociology (Beaubier, 1962; Beery, 1972; Boedeker, 1971; Hills, 1964). History was the subject in three cases (David, 1968; Letzter, 1970; Stanton, 1970; Stanton, 1976). The subjects of economics (Armstrong, 1970; Hills, 1964) and government (Black, 1981; McKinney, Benes, Hagen, & Beckham, 1991) were each found in two studies. One undergraduate study employed a psychology generalization (Long, 1979).

As previously mentioned, not all generalization studies were interested in testing one or more of the teaching approaches to generalization acquisition (inductive, deductive, egruleg, and memorization). However, ten studies examined the inductive and deductive approach, while only three examined the egruleg method (David, 1968; Letzter, 1970;

Stanton, 1976). Although the memorization of generalizations is probably the most frequently used approach in classrooms, no studies examined its effectiveness.

Most studies measure some critical thinking skill development. However, recall, retention, and identification were the most frequent skills measured. Some studies considered application and/or evaluation of generalizations. A few studies considered the ability to generalize. Over one half of studies employed teacher-made tests to measure results; the other half utilized some critical thinking instrument or standardized test.

I. Statistical Findings

Statistically significant results could be divided into two categories. One category would include those studies that revealed an effect of the teaching approach upon some critical thinking skill, while another category would include those studies that discovered something about the nature of social studies generalizations. Two studies that fell into the first category were similar in many aspects (Lahnston, 1972; Wallace, 1967). Both studies taught geography generalizations and tested third grade students. Wallace (1967) also included second grade students. Both studies compared the inductive approach to the deductive approach. Wallace also included what he called an intuitive approach. Both studies examined retention or understanding plus transfer or application of geography generalizations. Both studies reported the deductive approach to be the most appropriate.

Findings from other studies indicate that the inductive approach was more effective. Long (1979) reported that among college undergraduates the inductive approach improved motivation and the retention of a generalization. Armstrong (1970) compared two types of inquiry approaches (both inductive). He concluded that the reflective inquiry approach produced significantly higher evaluation skills among average ability students. Boedeker (1971) found that dogmatism and prejudicial attitudes could be reduced by utilizing the inductive approach. Boedeker also found support for using the inductive approach to improve certain types of critical thinking.

David (1968) reported that the ability to generalize is enhanced by the egruleg method over the deductive approach. His experimental method included this teaching approach but also contained additional material to which the deductive group did not have access. In addition, his experimental group practiced generalizing. No other study attempted to compare the egruleg teaching approach with a teaching approach using only a inductive or deductive method.

A couple of studies dealt with the nature of the social studies generalization. Letzter (1970) found a difference in the "covering law" generalization and the "ideal type" generalization. "Covering law" social studies generalizations resemble more of a rule or principle of the type used in mathematics and science. "Ideal type" generalizations are more traditional to the social studies, i.e., tentative in nature. Letzter (1970) found that teaching the "ideal type" reduced dogmatism when compared to those students taught "covering law" generalizations in world history. Boedeker (1971) also witnessed attitudinal changes in both dogmatism and prejudice when students were taught inductively. These two studies may suggest that an attitudinal change may occur if a knowledge construction exercise in generalization formation is utilized. One area of possible change is in the area of respect for authority since Simon (1980) maintains that teachers play a major authority role when they are transmitting knowledge.

Hagen, McKinney, and Benes (1991) found that nonsupporting data in the development and review of a geography generalization can increase a student's ability to recognize that generalization. They reported that factual recall was slightly enhanced by the absence of nonsupporting data.

Beaubier (1962) discovered that certain anthropology and economic generalizations could be acquired by students in the sixth grade. Only sociology generalizations proved too difficult for the sixth grade students to acquire.

Hills (1964) and Wulff (1969) found in similar studies that reading correlates with the ability to generalize. In addition, Hills found that IQ and vocabulary correlate with generalization ability.

Hermann (1971) did some research on egrule versus ruleg teaching methods using map locating rules. He reported no significant differences between groups in either the fifth or ninth grade. These findings were replicated in another study (Jacka & Hermann, 1977). Although the lesson used in both studies was a geography type exercise, the rule was rigid and mathematical in nature. Different results may have occurred had a more typical social studies generalization, one tentative in nature, been utilized for the study.

J. Review of Authoritarian Research

The main focus of authoritarian research has been to identify personality traits that make up the authoritarian personality and to identify social influences that may have contributed to that personality. The authors of *The Authoritarian Personality* (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950) generated a list of subparts to the authoritarian personality that was summarized later by Sanford (1956, p. 1) as the following:

1. *Conventionalism* . Rigid adherence to conventional middle-class values.
2. *Authoritarian Submission* . Submissive, uncritical attitude toward idealized moral authorities of the in-group.
3. *Authoritarian Aggression* . Tendency to be on the lookout for, and to condemn, reject, and punish people who violate conventional values.
4. *Anti-intraception* . Opposition to the subjective, the imaginative, the tenderminded.
5. *Superstition and Stereotypy* . Belief in mystical determinants of the individual's fate; the disposition to think in rigid categories.
6. *Power and Toughness.* Preoccupation with the dominance-submission, strong-weak, leader-follower dimension; identification with power figures; exaggerated assertions of strength and toughness.
7. *Destructiveness and Cynicism* . Generalized hostility, vilification of the human.
8. *Projectivity* . Disposition to believe that wild and dangerous things go on in the world; the projection outward of unconscious emotional impulses.

9. *Sex* . Ego-alien sexuality; exaggerated concern with sexual "goings on," and punitiveness toward violators of sex mores.

These nine sub-scales make up the F- scale test that the authors contend defines the authoritarian personality (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950).

Hyman and Sheatsley (1954) criticized *The Authoritarian Personality* on a number of points. The samples were not representative; statistics and analyses were weak and inaccurate; education as a variable was not controlled; and alternative explanations were not considered. In addition, these critics felt that the overall effect of the shortcomings work in favor of the author's assumptions.

Asch (1952) challenged the notion that psychological processes can be found in the responses to attitude test items. Likewise, Titus and Hollander (1957) found that the "F-scale correlates most systematically with other paper-and-pencil measures, and least systematically with interpersonal behaviors, particularly as situational conditions are varied" (p. 62). Because of such concerns, Kelman and Barclay (1963) suggest that psychological and sociocultural conditions be considered before interpreting F-scale scores.

Kirscht and Dillehay (1967) maintain that the original F-scale measures only authoritarianism of the political right, citing research by Shils (1954), Jackson, Messick, and Solley (1957), Christe and Jahoda (1954), and Barker (1963). Considering that tendency, Rokeach (1960) developed his dogmatism scale that he hoped would measure only the tenacity with which beliefs are held and not focus on the actual beliefs. Despite this difference, Kirscht and Dillehay (1967) maintain that there is the problem of response bias with both scales and found a correlation of .88 between the F and D (Dogmatism) scale.

A bias problem exists when the answers that correspond with the variable being measured are all worded positively or all worded negatively. To counter the response bias problem, Berkowitz and Wolkon (1964) developed a forced-choice form. Kirscht and Dillehay (1967) assert that this form and the one developed by Smith (1965) are the only revisions that do not contain potential response bias. Carefully choosing items and these revisions may overcome some of the shortcomings they found in the original F-scale.

Bhushan (1982) looked at the studies related to the validity of the F-scale through the year 1978. He concluded that despite some problems the F-scale was a good intercultural measure of authoritarianism. The response bias was controlled when negatively worded items were added. He pointed out that most reviewers criticize the F-scale for measuring only right-wing authoritarianism. However, Ray (1985) countered this notion later when he found that the F-scale had a high positive correlation with the Humanism Radicalism scale--a scale used to measure left-wing authoritarianism.

Bhushan (1980) developed a short form with both negative and positive worded items to use in India. Results using the Indian F-scale found it to have high reliability and validity. Sinha (1983) supported these findings with his assessment of the content and predictive validity of the Indian F-scale with the California F-scale. Bhushan (1985) pointed out later that due to political, spiritual, and social background differences with Americans, the Indian authoritarian is not the same type of authoritarian as the American psychologists would assume.

Such arguments over interpreting F-scale results led earlier to a couple of studies that warned against jumping to any conclusion about a high F-scale score. Orpen (1973) found a low correlation between the Bogardis Social Distance Scale, a prejudice-proneness measure, and the F-scale under certain conditions. He pointed out that this could limit the ability to account for prejudice in all authoritarian settings. Yinon (1975) still found, however, that his subjects who scored high on the F-scale exhibited more prejudice. Ray (1981) supported caution in broad interpretation of F-scale scores by finding no evidence that authoritarian behavior is psychopathological nor is there significant correlation between a balanced F-scale score and neuroticism.

McFarland (1985) investigated the internal consistencies of the F-scale test. He found that both age and education, with education being stronger, were linearly related to the internal consistency of the test. He concludes that there is a lower predictive power using the scale with nonadults but suggests that it is partly a measurement problem when subjects do not understand the items.

Using F-scale tests, researchers have been able to identify groups that tended to be more authoritarian. Nation and LeUnes (1983) found that among football players, Black seniors were more authoritarian than White seniors. Likewise, religious leaders were found to be the most authoritarian, with the intellectuals scoring the lowest on the F-scale test given to 1,000 religious, intellectual, governmental, and political leaders (Dubey, 1986). More recently, Pestell and Ball (1991) found that males were more authoritarian than female college students and that medical students were more authoritarian than law students. Higher education levels were significant in increasing the authoritarian score for females but lowered the F-scale scores for the males (Pestell and Ball, 1991).

Cultures can account for some variations in F-scale scores. Kenis (1977) found that Turks were more authoritarian than Americans. However, Lederer (1982) found American adolescents more authoritarian than West German adolescents in a 1981 study. Lederer's study compared F-scale scores with a similar study in 1945 that had the German youth more authoritarian than American youth. Duckitt (1983) found that language group was the best predictor of F-scale scores in his large community study conducted in South Africa.

Some attitudes have been found to correlate with authoritarianism as measured by the F-scale. Economic conservatism correlated positively with authoritarianism in a study by Sarkar and Hassan (1973). Teevan, Heinzen, and Hartsough (1988) also found a correlation supporting the idea that authoritarianism may result from a high need for achievement. Among students that made suicidal threats, Wenz (1978) found that a significant relationship with their F-scale scores existed. Authoritarian attitudes were not transferred to adopted children according to one study (Weinberg, 1983). Saiyadain (1975) found that knowing F-scale scores would help determine how supervisor behavior would be perceived by subordinates.

Two studies have found that training or education can effect F-scale scores. Parents who were taught democratic child-rearing principles experienced a significant decline in their authoritarian score (Meredith and Benninga, 1979). Likewise, university educated policeman did not have an increase in their authoritarian score following police officer experience whereas non-university educated colleagues did.

CHAPTER III

METHODOLOGY

A. Introduction

Studies have shown that critical thinking training can have a significant effect on student critical thinking skill in the social studies (Stitt, 1967; David, 1968; Alexander, White, Haensly, & Crimmins-Jeanes, 1987). However, no study was found that took the approach that generalization formation and evaluation were viewed as knowledge construction and emphasized this in the training. Attitudinal changes were noted in some studies (Boedeker, 1971; Kovalcik, 1979; Letzter, 1970; Tauran, 1967) but no study was found that considered student authoritarian attitude changes following some critical thinking training. Gender was not a significant factor in most studies about generalizations but gender difference in authoritarian attitudes was found in the Pestell and Ball (1991) study among medical and law students. In addition, race was found to be a significant factor in the F scores (Nation & Le Unes, 1983). Also different academic ability levels among students can be a factor (Armstrong, 1970). For these reasons, this study examined the effect of a Knowledge Construction Exercise, gender and race differences, and academic ability levels on the ability to form and evaluate generalizations and student authoritarian attitudes. The basic procedure was to give all students a pretest on generalizations on day one. All students could remain in their regular classroom even if they chose not to participate in the study. On day two students received either the Knowledge Construction Exercise or a placebo lesson in a self-instruction booklet. On day three all students received a post test on generalizations followed by the 15 item modified F-scale test.

B. Subjects

There were 340 eighth grade students from seven rural schools that participated in this study. The parents or guardians of these students recieved a research consent form prior to the experiment. (See Appendix A.) The form and research procedures will be in compliance with the Institutional Review Board (IRB) policies that deal with human subjects and policies of the school board. These subjects attend rural schools in the Southwest located near a major state university. The population is predominately white, working and middle class. The subjects are from schools that have an eighth grade population ranging from 18 to 99.

For research purposes, students were grouped by sex, race, and achievement levels. Student achievement scores were utilized in some correlation comparisons once parental permission was obtained to view historical records. Pretest scores were used for high and low achievement grouping since historical scores were not available on all students. From these groups students will be randomly assigned to either the experimental group or the control group.

C. Instruments and Procedures

Students took two generalization tests. These tests examined students' ability to recognize instances of the best and worst generalization, the best and worst support for a generalization, and the best and worst source for a given generalization. These two tests were examined by a committee of five university professors who determined they contain appropriate social studies generalization test items. Student scores on the two forms and their subtests were later be compared with student scores on the generalization formation and high order thinking skills portion of the Iowa Tests of Basic Skills (ITBS). One school was given Form Z for their pretest and the other schools Form Y as their pretest. A copy of Form Y and Form Z with their answer sheets are in Appendix B and C respectively.

The two tests are each composed of six recognition subtests. Each subtest will have six items making a total of 36 items on each generalization test form. The six recognition subtests are: Recognizing the Best Generalization (BG), recognizing the Worst Generalization (WG), recognizing the Best Support (BP) for a given generalization, recognizing the Worst Support (WP) for a specific generalization, recognizing the Best Source (BR) of information for a specific generalization, recognizing the Worst Source (WR) of information for a specific generalization.

Following the generalization pretest, a Knowledge Construction Exercise (KCE) self-instruction booklet was given to students randomly selected for treatment and a placebo self-instruction booklet was given to the control group. The Knowledge Construction Exercise emphasized that data is specifically selected, for a number of reasons, to form generalizations. The lesson also contained tips on recognizing the best and worst generalizations, best and worst support for a generalization, and best and worst sources of information for a specific generalization. The placebo lesson contained some factual information without any lesson on knowledge construction. A copy of the Knowledge Construction Exercise and the placebo lesson with their answer sheets are in Appendix E and F respectively.

All students, following the Knowledge Construction Exercise and placebo lesson, took the revised F-scale test of authoritarianism and a post test on generalization formation and evaluation. The F-scale test contained the subscales measuring Authoritarian Submission (AS) and Authoritarian Aggression (AA). Eight items on the test will measure the students AA score and 7 items will measure their AS score for a total of 15 items. The F-scale test was modified to remove response bias as suggested by Kirscht and Dillehay (1967). This was accomplished by wording approximately half of the items negatively. A copy of the modified F-scale is included in Appendix D.

Readability tests were performed on all instruments by computer analysis utilizing Lotus AmiPro 3.0® word processing software (CorrecText, 1990). Lotus AmiPro is a trademark of Lotus Development Corporation, copyright 1991, 1992. The results of the readability tests are reported in Table I.

TABLE I

READABILITY SCORES

	Form Y test	Form Z test	Knowledge Constructio n Exercise	Placebo Lesson	F-test
Flesch-Kincaid Score	7.2	7.2	6	6.5	7.5

A high percentage of the population sample took the Iowa Tests of Basic Skills the third month of 1993 as seventh grade students. An average gain of one reading grade level in a year assured that the reading levels of instruments in Table I fell within the range or below the levels of approximately 95% of the students in the sample. Students with the lowest scores will most likely be in special classes that are excluded from this study. The actual reading levels and ranges of the sample will be examined once permission is granted to view these scores.

D. Design and Data Analysis

1. <u>Preliminary Data</u>

Academic scores and other historical measurements of the subjects was obtained for statistical analysis purposes such as correlation studies. Information concerning gender and race be utilized as independent variables in the study. Scores from the pretest will be used for a median split into high and low achievement groups.

2. <u>Hypothesis One</u>

A Knowledge Construction Exercise given to eighth grade students should have an effect on student performance on the formation and evaluation of generalizations as measured by the six subtests. To investigate the effect of the Knowledge Construction Exercise an analysis of variance (ANOVA) will be employed on post test scores between experimental and control groups.

3. Hypothesis Two

Students that participate in a Knowledge Construction Exercise should experience a significant change in their authoritarian attitudes. To measure student authoritarian attitudes, a revised F-scale test that measures authoritarian aggression and authoritarian submission will be employed. To investigate the effect of the Knowledge Construction Exercise on student authoritarian attitudes a 2 achievement levels (High and Low) X 2 Sex (male and female) X 2 treatment groups (experimental and control) analysis of variance (ANOVA) design will be employed for each racial group. Should the racial groups be of significantly different sizes, a randomly selected number from the larger group will be paired with the smaller group. an ANOVA will measured the differences between racial groups on both subscales of the F-scale test. A copy of the experimental design model is included in Appendix G.

E. Summary

A three day study involving approximately 340 eighth grade students study will measure the effect of a Knowledge Construction Exercise. Students will remain in their regular classrooms and receive self-instruction booklets. The exercise's effects on student's ability to form and evaluate social studies will be examined. Dependent variables on this portion of the study will be post test scores of the six subtests. In addition, the effect of the Knowledge Construction exercise on student authoritarian attitudes will be analyzed. Dependent variables on this portion of the study will be the Authoritarian Aggression (AA) subscale scores and the Authoritarian Submission (AS) subscale scores on the modified F-scale test. Results of these investigations will be reported in chapter four.

CHAPTER IV

RESULTS

A. Demographic data

Data were collected from seven rural schools in the Southwest within a 50 mile radius of a major state university during the months of March and April of 1994. The size of the eighth grade class in these schools ranged from 18 to 91 students. Of the 342 students who participated, nine students were unable to complete the study due to absences. There were 179 males and 154 female students who completed the authoritarian survey portion of the experiment. The population consisted of 275 whites and 58 nonwhite students. Of the Nonwhite group, 47 were Native American, five were African-American, four were Hispanic, and two were Asian-American.

To obtain individual student performance profiles on the Iowa Tests of Basic Skills, consent forms were sent home for parents or guardians to sign. This test was taken by students in all schools the third month in 1993. Test profiles were not available on all students. A copy of the consent form is in Appendix A.

All students who participated in the three day study completed their instruments during school hours in their regular social studies classroom except at one school. School officials at that school wanted their eighth grade classes grouped together in the lunchroom a different hour each of the three days of the study. When compared to another school of similar size, there were no significant differences between this school's pretest and post test performance (p=.85) on the six subtest scores.

B. Data analysis.

Statistical analyses used in this study was done by software that referenced Bruning and Kintz's *Computational Handbook of Statistics* (Bruning and Kintz, 1987), or Keppel's *Design and Analysis: A Researcher's Handbook* (Keppel, 1982). In addition, some statistical analysis was conducted within the software program *Quattro Pro®, version 5.0* (Borland International, Inc., 1993).

Pretest scores on the six subtests of the experimental and control groups taking the same form were compared and revealed no significant differences. Pretest scores from 104 students in the control group taking the Y form were compared with 104 students' pretest scores of the experimental group taking the same form. An analyses of variance (ANOVA) revealed no significant difference (F>.05) on all six subtests. See Appendix H for complete summary tables. Likewise there was no significant difference (P>.05) between the experimental and control groups taking the Z form as a pretest on any of the sub tests . (See Appendix I.) The effect of the order of testing was examined. Ninety one students took the Z form of the six sub tests as a pretest followed by an experimental or control lesson on the second day. Ninety-one students then completed the Y form of the six subtests for their post test. There were 253 students who completed the Z form as their post test. Randomly selected 46 students who took the Y form as a pretest were compared to the 46 students in the control group who took the Y form as a post test. Score comparison on all six subtests revealed no significant differences ($p > .05$). (See Appendix J.) Similarly, subtests scores of 90 students who were randomly selected from the control group taking the Z form as a post test were compared to subtest scores of 90 students who took the Z form as a pretest. No significant differences on the six subtests were found. See Appendix K for complete summary tables.

C. Tables summarizing findings.

Having established that there were no differences in the experimental and control groups taking the same pretest, an analysis of variance (ANOVA) was conducted between the Y and Z forms taken as pretests. Significant differences between test scores on some of the sub tests were found. See Table II. For complete summary tables comparing Y and Z forms on the subtests see Appendix L.

Table II

Y Form and Z Form Comparison

SUBTEST	Y FORM MEAN	Z FORM MEAN	P VALUE
BG	2.57	2.87	0.18
WG	2.66	2.61	0.81
BP	3.5	2.04	<.001
WP	2.86	2.43	0.06
BR	2.68	3.61	<.001
WR	3.03	2.86	0.45

Correlation between the two forms ranged from .20 on the Best Generalization (BG) subtest to .39 on the Best Source (BR) subtest. The correlation analysis was conducted on students in the control group who took the Y Form of the subtests as their pretest and Z form as their post test. See Appendix M for correlation results between the two forms on all six subtests. Because of significant difference between forms on some subtests and the moderately low correlation between forms, an ANOVA was conducted comparing control and experimental groups post test scores on the subtests of the two forms. Thus Y form post test scores were analyzed separately from Z form post test scores. Before this analysis, 55 students from the White group were randomly selected to compare subtest scores with the Nonwhite group. Because there was no significant difference ($P>.05$) on any of the subtests, the Nonwhite students scores were collapsed into the White group for the formation and evaluation of generalizations portion of the study. See Appendix N for complete summary tables.

There were 91 students who completed the Y form as their post test and an ANOVA measured significant difference between groups on some of the subtests. Seven group comparisons and 5 interactions were found significant reporting P values of less than .05 or .01. See Appendix O for complete summary tables on Y form post test group comparison on all subtests. Table III shows mean squares and F scores on comparisons that were significant. See Appendix P for charts and post hoc analysis on Y form post test group significant interactions.

TABLE III

Y FORM POST TEST

SUBTEST	GROUPS	MS	F	P VALUE
BEST SUPPORT(BP)	HIGH vs. LOW	30.1	16.68	P<.01
BP	MALE vs. FEM.	9.24	5.15	P<.05
BP	LEVEL X SEX	10.69	5.96	P<.05
BP	LEVEL X SEX X TREATMENT	8.3	4.63	P<.05
WORST SUP (WP)	HIGH vs. LOW	20.33	12.38	P<.01
WP	LEVEL X SEX X TREATMENT	7.117	4.33	P<.05
BEST SOURCE (BR)	HIGH vs. LOW	10.69	6.61	P<.05
BR	MALE vs. FEM.	20.87	12.9	P<.01
BR	LEVEL X TRTMNT	8.91	5.51	P<.05
WORST SOURCE(WR)	HIGH vs. LOW	14.98	8.99	P<.01
WR	EXP. vs. CNTRL	20.25	12.15	P<.01
WR	LEVEL X SEX X TREATMENT	15.45	9.27	P<.01

There were 253 students who completed the Z form of the six subtests as their post tests and an ANOVA was utilized to compare scores between groups. See Appendix R for complete summary tables. Six group comparisons were found significant with P values less than .01. Table IV shows mean squares and F scores on comparisons that were significant.

TABLE IV

Z FORM POST TEST

SUBTEST	GROUPS	MS	F	P VALUE
BEST GEN.	HIGH VS. LOW	89.84	46.12	P<.01
WORST GEN.	HIGH VS. LOW	73.89	38.76	P<.01
BEST SUPPORT	HIGH VS. LOW	28.14	20.35	P<.01
WORST SUP	HIGH VS. LOW	49.39	27.79	P<.01
BEST SOURCE	HIGH VS. LOW	98.28	45.18	P<.01
WORST SOURCE	HIGH VS. LOW	29.12	17.46	P<.01

There were 58 nonwhite students who completed the Authoritarian Aggression (AA) and the Authoritarian Submission (AS) subscale survey of the modified F-scale test. One group comparison was found statistically significant. The High achievement group had a significantly higher score on their AS survey than the Low achievement group with P value of less than .01. See Appendix R for complete summary table, and charts on the Nonwhite Authoritarian subscales.

There were 275 White students who completed the Authoritarian Aggression (AA) and the Authoritarian Submission (AS) subscale survey of the modified F-scale test. No differences between groups was found on the AS subscale. One interaction between Achievement and Treatment group comparisons was found significant (P< .05) on the AA subscale. Because of the exploratory nature of the authoritarian attitude portion of the study, a Neuman-Keuls test was used in a post hoc analysis to measure difference between means in the interaction. The differences between the means were found not significant. Complete summary tables, an interaction chart, charts on subscale scores, and the post-hoc test results are found in Appendix S. Table V reports the AA and AS means for each White and Nonwhite group.

TABLE V

AUTHORITARIAN MEANS

GROUP	AA	AS
WHITE HI MALE EXP	4.9	4.53
NONWHITE HI MALE EXP	4.43	4.49
WHITE HI MALE CNTRL	4.53	4.66
NONWHITE HI MALE CNTRL	4.08	4.79
WHITE HI FEMALE EXP	4.73	4.74
NONWHITE HI FEMALE EXP	4.8	5.01
WHITE HI FEMALE CNTRL	4.5	4.52
NONWHITE HI FEMALE CNTRL	4.5	5.02
WHITE LO MALE EXP	4.53	4.66
NONWHITE LO MALE EXP	3.84	4.18
WHITE LO MALE CNTRL	4.86	4.43
NONWHITE LO MALE CNTRL	4	3.97
WHITE LO FEMALE EXP	4.89	4.84
NONWHITE LO FEMALE EXP	4.35	4.27
WHITE LO FEMALE CNTRL	4.66	4.5
NONWHITE LO FEMALE CNTRL	4.33	3.95

Fifty eight students were randomly selected from the White groups for the purpose of comparison with the Nonwhite groups on the AA and AS subscales. Because the treatment effect was not significant for either racial group when analyzed separately, the experimental and control groups were collapsed in the comparison. White groups had a significantly higher Authoritarian Aggression score than the Nonwhite groups $F(1,108)=4.72$, $P<.05$. On the Authoritarian Submission subscale, the High achievement group reported a significantly higher score than the Low achievement groups from both racial groups $F(1,108)=13.356$ $P<.01$. The White versus Nonwhite AA and AS summary table and charts are found in Appendix T.

Correlation analysis was conducted comparing scores on the six subtests with the two authoritarian subscales scores. Subtest scores of subjects were also compared with subtest scores taken from their seventh grade Iowa Test of Basic Skills (ITBS). These ITBS subtest scores included Vocabulary Grade Equivalent (VGE), Reading Grade Equivalent score (RGE), and subjects Social Studies Grade Equivalent score (SSGE). There were 71 students who provided a complete set of data for this portion on the study. See Table VI for results and Appendix U for charts showing these correlations.

TABLE VI

CORRELATIONS

	BG	WG	BP	WP	BR	WR	AA	AS	VGE	RGE	SSGE
BG	1										
WG	0.42	1									
BP	0.29	0.19	1								
WP	0.46	0.19	0.3	1							
BR	0.41	0.39	0.3	0.35	1						
WR	0.23	0.25	0.2	0.29	0.4	1					
AA	0.01	-0.09	0	-0.05	-0.08	-0.04	1				
AS	-0.03	0.12	-0.02	0.05	-0.04	0.06	0.24	1			
VGE	0.05	-0.08	0.24	0.23	0.18	0.1	0.15	-0.12	1		
RGE	0.11	0.11	0.44	0.19	0.26	0.26	0.15	-0.09	0.8	1	
SSGE	0.23	0.06	0.5	0.45	0.29	0.25	0.07	-0.19	0.36	0.79	1

D. Summary of findings

A total of 333 students from seven rural schools in the Southwest were the subjects for the study. Of this total 58 students belong to nonwhite racial groups, mostly Native American. Approximately half of the subjects received either a control or experimental lesson following a pretest. There were 253 subjects who took the Z form of the post tests and 91 subjects completed the Y form as their post test. There were no statistical differences in the scores of the experimental and control groups on their pretest. Also post test scores of the control group were not significantly different from the group taking the identical form as a pretest.

The Y and Z forms were found to be statistically different with a low to moderately low correlation on the subtests. For this reason the groups taking the Y form and the group taking the Z forms were analyzed separately. The 58 nonwhite students post tests scores did not differ from an equal number of randomly selected White students. The racial groups were therefore combined for the generalization formation and evaluation portion of the study. Based on pretest scores, students were placed in High or Low Achievement groups, experimental or control groups and grouped by sex.

When an ANOVA compared Z form control groups with Z form experimental groups, seven group comparisons and 5 interactions were found significant at the 95 or 99 percent level of confidence. Some important findings among the comparisons were that Female groups out performed the Male group on the Best Support (BP) subtest and the Best Source (BR) subtest. Additionally, the Control group had a statistically higher score than the Experimental group on the Worst Source (WR) subtest. One two way interaction was found on the BP subtest in the Levels X Treatment Group comparison. In addition, the BP subtest produce a significant three way interaction between Level, Sex, and Group. A two way interaction between Level and Sex was found in the BR subtest.

The 253 subjects taking the Z form as their post test produced fewer but consistent significant results. On all six subtests, the High achievement group had significantly higher scores than their Low achievement peers. There were no significant interactions in the Z form group comparison.

Because of the unequal size of the Nonwhite groups compared to the White groups (58 to 275), the Nonwhite groups were first analyzed separately. The Nonwhite High achievement group had a significantly higher score on their Authoritarian Submission (AS) subscale portion of the modified F-scale test than their Low achievement peers $F(1,57)=8.339$, $P<.01$. In the White group, authoritarian attitudes did not differ between groups on the Authoritarian Aggression (AA) subscale. A post hoc test found no significant differences between the means in the significant interaction between the Achievement and Treatment groups.

To examine racial differences, an equal number of White subjects were paired with Nonwhite subjects. Fifty-eight White students were randomly selected for a racial group comparison on AA and AS subscales scores. The White groups had significantly higher AA scores at a 95% level of confidence than their Nonwhite peers. The High achievement group of both racial groups had significantly higher AS scores at a 99% level of confidence.

CHAPTER V

DISCUSSION

Social studies generalizations are an important component of social studies instruction. Generalizations utilize critical thinking skills in the formation and evaluation process while constructing a body of knowledge. Knowledge implies power and power implies authority. Traditionally, teachers have an authority of knowledge position before their students and primarily construct knowledge for their students' assimilation. Actively involving students in the knowledge construction process and thus sharing authority that is normally associated with knowledge may affect students' authoritarian attitudes. The purpose of this study was to determine what effects a knowledge construction exercise would have on student authoritarian attitudes and on student ability to form and evaluate social studies generalizations. In this chapter the major findings are discussed in relation to the hypotheses stated in chapter one. Other findings are discussed, other alternative interpretations are offered, implications of findings presented, and recommendations for future study will be presented.

A. Summary of Treatment Effects.

Each of the hypotheses specified that the treatment effect, a Knowledge Construction Exercise, would have a significant effect. The following are the stated hypotheses:

<u>Hypothesis One</u>

A Knowledge Construction Exercise given to eighth grade students should have an effect on student performance on the generalization test and its six subtests.

<u>Hypothesis Two</u>

Students who participate in a Knowledge Construction Exercise should experience a significant change in their authoritarian attitudes.

The hypotheses were not supported by the results. However, significant differences among groups were found in both the formation and evaluation portion of the study as well as in the authoritarian subscale measurements. Group differences were not consistent with the two forms, Form Y and Form Z. Although the treatment had no effect on student authoritarian scores, significant differences among groups were found on the two subscales of the F-scale test.

B. Generalization Hypothesis

The treatment had no effect on student ability to form or evaluate generalizations as measured by the six subtests, but other group differences were found. The two forms of the generalization test, Form Y and Form Z, produced different results on the post test measurement of formation and evaluation of generalizations. While the Form Z post test results were consistent, that is, the high pretest achievers significantly outperformed their low pretest achievers on all subtests, the Form Y post test results were varied and in some ways bizarre. For example, female subjects did significantly better on the Best Support (BP) subtest ($P<.05$) and the Best Source (BR) subtest ($P<.01$) on the Form Y post test. Sex was a factor in four of the six interactions (See Table II on page 60). On the Worst Source (WR) subtest Form Y post test subjects in the control group did significantly better than the experimental group ($P<.01$).

Outside factors could have confounded the results on the Form Y post test. Results for the Form Y post test came from only one school. Just prior to the experiment, the social studies teacher had taught a lesson on generalization formation and evaluation. A significantly large number of the boys had been absent due to a baseball tournament. The female students, who outnumbered the male students and had higher achievement scores, had an advantage in the experiment due to their recent experience with generalizations. However, since no prior training had been given on finding the worst source for a generalization, the female students may have reacted negatively to the training for this subtest, thus explaining the control group superior means. The significant interactions involving sex, level, and/or group could also be explained by these nuisance variables. The researcher believes these nuisance variables were not completely controlled by randomization. Cell sizes were also low, ranging from nine to fourteen students and means varied from 1.8 to 4.6 on the WR subtest. See Appendix P. For comparison, the range of means on the WR subtest of the Form Z post test were 2.25 to 3.72 with cell size ranging from 24 to 42. See Appendix R.

The more consistent results on the Form Z post test failed to produce any important findings. High pretest scorers significantly outperform their Low pretest scoring peers, but this was to be expected. Experimental group means were barely higher than the control group means on five out of six subtests with the Worst Support (WP) control group producing a slightly higher mean. See Table VII.

Table VII

Z Form Exp & Cntrl Means

Subtest	Exp Group	Cntrl Group
BG	2.9	2.57
WG	2.87	2.81
BP	2.33	2.22
WP	2.15	2.34
BR	3.69	3.52
WR	2.95	2.87

Male and female group means were almost identical (usually less than .1 difference) on five of the subtests. See Appendix R. The only exception occurred on the Worst Source (WR) subtest where the female group mean was 3.098 to the male group mean of 2.768.

C. Authoritarian Hypothesis

The treatment effect, a Knowledge Construction Exercise, had no effect on students' authoritarian attitudes as measured by the two subscales of the modified F-scale test. However, group differences were found between high and low achievement groups and racial groups. Nonwhite students that scored high on the generalization pretest were grouped into the High Achievement group. These students had significantly higher Authoritarian Submission (AS) subscale scores than the Low Achievement group, $F(1,57)=7.4$, $P<.01$. See Appendix S.

There were 275 White students that provided data for the authoritarian portion of the study. No significant difference was found between groups on either authoritarian subscale but a significant interaction was found among White groups on their Authoritarian Aggression (AA) subscale. Treatment groups and Achievement groups had this significant interaction, but a post hoc test revealed no significant difference between the means within the interaction. See Appendix T for complete summary tables, charts, and post hoc analysis.

There were 58 White students randomly selected for a White versus Nonwhite comparison on AA and AS scores. Whites were significantly higher than Nonwhites on the AA subscale score comparison. High Achievement groups of both racial groups had a significantly higher AS scores $F(1,115)=13.36$, $P<.01$ than the Low Achievement group. See Table VIII for mean comparison between the racial groups on AA and AS scores.

TABLE VIII

RACIAL GROUP AUTHORITARIAN SCORES

	WHITE AA	NONWHITE AA	WHITE AS	NONWHITE AS
HI FEMALE	4.48	4.69	4.68	5.01
HI MALE	4.85	4.27	4.83	4.63
LO FEMALE	4.68	4.35	4.34	4.15
LO MALE	4.55	3.91	4.35	4.1

The table reveals a consistent pattern of lower AA and AS scores among the Nonwhite groups except for High Achievement Females, which are higher than their White peers. On the AA subscale, Nonwhite High Females reported the highest score in the Nonwhite groups while White High Females report the lowest AA score in the White groups. The

Nonwhite High Female group reported the highest AS score, and the only authoritarian score that exceeded 5 (5.009), while the High Male group led the White group with the highest score of 4.825. Cell sizes in this comparison were 13 for the males and 16 for the female groups.

D. Other Findings

Correlation analysis found a low to moderately low positive correlation between the generalization subtests (.19 to .46). These findings would support a claim of the subtests measuring different aspects of the formation and evaluation of generalizations. Extremely low positive and negative correlations were found between the generalization subtests and the two F-scale subscales (-.09 to .12). This same low correlation pattern was found between the subtest scores of the Iowa Test of Basic Skills (ITBS) and the F -Scale subscales(-.19 to .15). The reading, vocabulary, and social studies grade equivalence scores (RGE, VGE, and SSGE) were moderately to highly positively correlated (.36 to .80) to each other.

E. Conclusions

The self-instruction booklet containing the Knowledge Construction Exercise (KCE) had no effect on student's ability to form or evaluate social studies generalizations or their authoritarian attitudes. This failure of the KCE could result from a number of factors. The notion of knowledge construction and the sharing of that power with the student may not have been achieved in the treatment format. A single lesson in a self-instruction booklet may have been too weak a presentation of this idea. The search for the best or worse answers, although not as convergent as students generally experience in testing, may still lack the divergence necessary to make the point of knowledge construction. The fact that the lesson had no effect on helping students form or evaluate generalizations indicates perhaps another problem. The lesson may have covered too much in too little time to be of help to students. Average post test scores generally ran 50% or less on all subtests. These low scores may indicate that too little time was spent on this difficult lesson to achieve better results on the post test. Since the lesson failed to help students form or evaluate social studies generalizations any better, it seems unlikely that it would affect attitudes in the way it was intended. There is no indication that students felt they were actively involved in knowledge construction.

Although the KCE had no effect on authoritarian attitudes, group and racial differences were found. White students had a significantly higher score on their AA subscale than nonwhite students. The AA means were 4.634 for the White group and 4.326 for the Nonwhite group.

The Authoritarian Aggression (AA) mean scores of the two racial groups is not alarmingly high when compared to historical scores of adult groups. Authoritarian aggression was defined as the tendency to be on the lookout for, and to condemn, reject, and punish people who violate conventional values (Sanford, 1956). A mean score of four is interpreted by the authors of the F-scale test to mean a neutral position toward authoritarian aggression. Less than a mean score of four is interpreted to mean a tendency to be anti-authoritarian aggressive.

Looking at this study's AA subscale means and comparing that with scores by adult groups in the original study by Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) will offer a perspective useful in interpretation of those scores. The adult mean scores are scores that are from the same forms used in this study but included other subscales as well, so the comparison is not designed to be exact. Also "Mack" was a 24-year-old college freshman whom the study found high on ethnocentrism. "Larry" was a 28-year-old college student that the Adorno et. al. study found low on ethnocentrism. See Table IX.

TABLE IX

AA Score Comparison

White High Female	4.48	Testing Class Women	3.62
White High Male	4.85	San Quentin Men Prisoners	4.73
White Low Female	4.68	Psychiatric Clinic Women	3.69
White Low Male	4.55	Psychiatric Clinic Men	3.82
Nonwhite High Female	4.69	Men Veterans	3.74
Nonwhite High Male	4.27	Maritime School Men	4.06
Nonwhite Low Female	4.35	"Mack"	5
Nonwhite Low Male	3.91	"Larry"	3.4

At first glance it may look like the eighth grade population has more in common with San Quentin Men and "Mack" than anyone else. However, it must be remembered that eighth grade students have less education than most adults and studies have shown a negative relationship between authoritarian scores and years of education and age (McFarland, 1985). The San Quentin Men may be the only group that come the closest to the number of years of education of the eighth grade population. Although eighth grade student scores were less than the highly ethnocentric "Mack," ethnocentrism can be expected to be relatively high at this age. Ethnocentrism, however, may be less among the nonwhite population since they are not members of the dominant race of the society. Teevan, Heinzen, and Hartsough (1988) found a correlation supporting the idea that authoritarianism may result from a high need for achievement. This finding may explain the trend found in the High achievement groups.

The Authoritarian Submission (AS) scores revealed a consistent pattern. Authoritarian submission is defined as having a submissive, uncritical attitude toward idealized moral authorities of the in-group (Sanford, 1956). Nonwhite students who scored high on their pretest and thus were placed in the High achievement group, had a significantly higher AS score than their lower achieving peers. A similar phenomena occurred when White and Nonwhite subjects were compared. The High achievement group of both racial groups had a significantly higher AS score. This finding supports the idea that authoritarianism may result from a high need for achievement. A study by Teevan, Heinzen, and Hartsough (1988) found a similar correlation .

For a more exact comparison with adult scores from the Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) study, means were calculated from the same items used to make this study's AS subscale.

"Mack" and "Larry" AS subscale items were slightly different. Age and education will still be a factor in lowering the means for the adults. In addition, it is important to remember that the number of males in each eighth grade group for the comparison is only thirteen. Female group cell size was sixteen. See Table X.

TABLE X

AS Comparison

Nonwhite High Females	5.01	Female Adult groups	3.88
White High Females	4.68	Male Adult groups	4.12
Nonwhite High Males	4.63	"Mack"	4
White High Males	4.83	"Larry"	3.13
Nonwhite Low Females	4.15		
White Low Females	4.34		
Nonwhite Low Males	4.1		
White Low Males	4.35		

Clearly the students who did poorly on the generalization pretest have AS scores close to the adult scores when age and education are taken into account. The vast difference between the High achievers and the adult scores can partially be explained by the high achievement and authoritarian connection found by Teevan, Heinzen, and Hartsough (1988). To help explain other reasons for the difference, correlations should be examined.

There was an extremely low correlation between the six subtests and AS scores (-.04 to .12) found in this study. This indicates that as a group the high pretest scorers are more authoritarian submissive but individually no pattern can be found between their AS scores and their subtest performance.

The subtest scores in turn did not correlate highly with any other measure used in this study except the SSGE score. With the exception that Worst Generalization (WG) scores had a positive correlation of only .06 with SSGE, the other subtests had a positive correlation of at least .23. The two Support subtests, Best Support (BP) and Worst Support (WP), had a positive correlation of .5 and .45. This is probably due to a good knowledge of the social studies which would aid in recognizing established generalizations and the facts that do or do not support them. The failure to produce equally moderate correlations with the Best Generalization (BG) and Worst Generalization (WG) subtests (.23 and .06) is probably due to the lack of student experience in inductive reasoning with social studies generalizations. Usually students are given generalizations and then shown support for them, i.e., a deductive approach.

Clearly there are differences in authoritarian subscale scores among groups of eighth grade students. Race appears to be a factor and, to a lesser degree, so does the sex of the student. Why a high score on the pretest seems to be the most significant factor for high authoritarian submission scores is difficult to explain since the subtest scores do not correlate well with other available measures. Perhaps students with a "submissive uncritical attitude toward moral authority" took the test more seriously and thus scored better than their peers. The low correlation between the subtest scores and AS scores limits this explanation to the high group only and not to the individuals within the group.

F. Recommendations

Further research is recommended to test the hypothesis that knowledge construction by students would alter their authoritarian attitudes. Students need to experience more than a limited introduction to the concept. A semester long teaching approach where students are given original documents and asked to formulate generalizations should accomplish this goal. In the process they also would be evaluating the best and worst support and sources for generalizations. Working in groups to form and evaluate generalizations would aid students in developing strategies for recognition of good sources, good supports for generalizations, and well worded generalizations that utilize the available information. This exercise may cause the students to experience the shifting of the power of authority from the teacher to themselves when it comes to knowledge construction.

Before replicating this study, steps should be taken to improve the reliability of Form Y and Form Z. The test retest reliability of the two forms was found to be .71 for the Y Form and .68 for the Z Form when administered to 29 and 23 students with a day between each testing. Unreliable items should be deleted and additional items added to increase the overall reliability of the instruments.

Breaking this study's Knowledge Construction Exercise into three parts may facilitate its comprehension and positively effect student ability to form and evaluate generalizations. Teachers could teach three lessons and include more practice items. Although this approach resembles a traditional method, the subject matter of knowledge construction may still have an effect on student authoritarian attitudes. Therefore, a measurement of authoritarian attitudes following these lessons may reveal some changes.

A cooperative learning activity could be utilized to replicate a portion of this study. Students may experience knowledge construction with a slight modification of the materials. Students could be placed in groups of three to five students and given basically the same materials used in this study. The difference would be the absence of choices for choosing the best and worst answers. The groups' answers could be submitted to the teacher who would write them on the chalk board. The class would then select the "best" answer and discuss the shortcomings of the rest. After a comfortable experience with this, students may be ready for individual testing.

This study revealed something that was expected: that authoritarian scores of eighth grade students would be higher than the general population because of their youth and limited years of education . However, the study was unable to find corresponding factors with high scores or to determine what anti-authoritarian effects schooling may have on students. Therefore a longitudinal study to trace the expected fall of these authoritarian scores would be useful in determining transitional years in student attitudes. Perhaps the institutional characteristics of public schooling itself is one of the contributing factors to high authoritarian scores. This may explain why another group of institutional members, the San Quentin Males, had authoritarian scores that came the closest to the eighth grade population. A longitudinal study that followed students through high school and beyond could shed some light on this question.

This study utilized only two subscales of the F-scale test. It may prove interesting to include the complete test to measure such elements as ethnocentrism, anti-Semitic attitudes, conventionalism, superstition and stereotypic attitudes among the eighth grade population. Again, race and sex could be a factor in the differences found in the population.

G. Summary

In this chapter the results of a study involving 333 eighth grade students were examined in light of the hypotheses. A knowledge construction exercise had no effect on student ability to form or evaluate social studies generalizations. The exercise also had no effect on the authoritarian attitudes of the students. However, some group differences were discovered. High achievers on the generalization pretest were found to have higher scores on authoritarian subscale measures, especially the authoritarian submission scale. This trend was especially consistent with the Nonwhite group. White students were more authoritarian aggressive than the Nonwhite group. The authoritarian attitude survey findings were fairly consistent with those found in other studies involving adults. The shortcomings of the study were discussed along with recommendations for further research in both generalization acquisition and authoritarian attitude survey.

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APPENDIX A

RESEARCH CONSENT FORM

RESEARCH CONSENT FORM

Your child is invited to take part in a research project that may help determine if a "knowledge construction exercise" will help his/her ability to form and evaluate social studies generalization. This study is part of an investigation entitled "Effects of a Knowledge Construction Exercise on the Formation and Evaluation of Social Studies Generalizations and Student Authoritarian Attitudes."

"I give my consent for my child, ______________________________, to participate in the research project and hereby authorize Clarance Benes, or associates or assistants of his choosing, to perform the following procedure:

Should student be randomly selected, he/she will participate in a lesson known as a "knowledge construction exercise" in which the student will learn about generalization formation and evaluation, an important critical thinking skill.

The lesson may take up to two regular class periods and will be followed by an examination and attitude survey to be given during another class period. Participants will remain with their regular classroom teacher and receive self-instruction booklets.

Only the researchers will have access to the student name and records needed for and produced by this experiment. For research purposes only and prior to random selection, students will be grouped on the basis of gender, race, and achievement levels. From these groups students will be randomly selected for the experimental or control lesson. Historical achievement scores, such as the Iowa Test of Basic Skills, and personal information and grades will be obtained from the school counselor, the classroom teacher, and/or other school officials. The data will be coded and remain confidential. After the coding, names will be removed and burned at the home of the researcher. Published results of the experiment will not identify school or students.

The lesson is not unlike other activities that students have had before and may be useful in research promoting critical thinking. Students may find the exercise interesting and enjoyable. There is no cost to the student and no fee paid to participate.

I understand that participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation in this project at any time without penalty after notifying the project director. Students who do not participate will remain with their regular teacher. Student's grade will not be affected in any way.

I may contact Clarance Benes at 624-2427 should I wish further information about the research. I may also contact the University Research Services, 001 Life Sciences East, Oklahoma State University, Stillwater, OK 74078; phone number 744-5700."

"I have read and fully understand the consent form. I sign it freely and voluntarily."

Date ____________ ____

(parent or guardian's signature)

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 02-23-94 **IRB#:** ED-94-062

Proposal Title: EFFECTS OF A KNOWLEDGE CONSTRUCTION EXERCISE ON THE FORMATION AND EVALUATION OF SOCIAL STUDIES GENERALIZATIONS AND STUDENT ATTITUDES TOWARD AUTHORITY

Principal Investigator(s): John E. Steinbrink, Clarance Benes

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL. ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: John H. Wholoff
Chair of Institutional Review Board

Date: February 24, 1994

APPENDIX B

Form Y Generalization Test

Enclosed you will find a

WHITE LESSON Booklet

and a

YELLOW ANSWER Booklet.

Do not write on the WHITE LESSON booklet.

Write only on the YELLOW ANSWER Booklet.

Do not write your name on either booklet.

Begin now on page 1 on the WHITE LESSON booklet.

MARK YOUR ANSWERS ONLY ON THE YELLOW ANSWER SHEET

1. An American heard that a huge Iraqi army attacked Kuwait. Kuwait is a small Arab country. Kuwait and other Arab nations are members of the United Nations. Kuwait appealed to the UN Security Council. Iraq was given an ultimatum: Withdraw from Kuwait or a combined UN force would attack. On CNN (Cable News Network) you hear that American bombs are dropping on Baghdad. Based only on the facts above, find the BEST and the WORST generalization below. Be sure to mark your answers on the answer sheet.

A. The United States will use the United Nations to protect its oil interests.
B. The United Nations is defending one of its members against an aggressor by attacking Iraq.
C. The UN and the US are encouraging Arab nations to fight each other when they support one against another.
D. Kuwait has convinced the US. that destroying Iraq would be in the UN's best interests.

2. The U.N. mission was to make the Iraqi army leave Kuwait. After the war one general said, "U.N. forces won a decisive (major) victory over Iraq in the Gulf War." Find below the BEST and WORST support for his generalization.

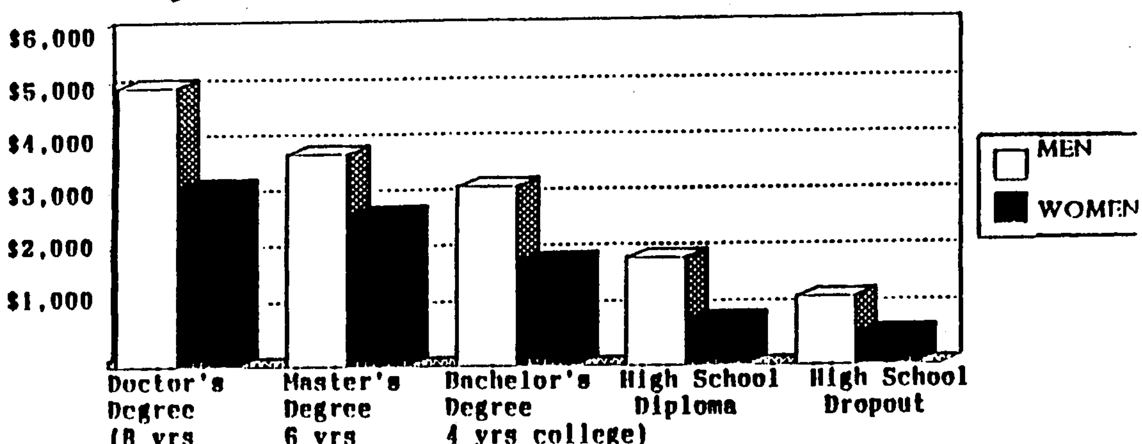
A. U.N. forces drove Iraqi troops out of Kuwait in less than 42 days.
B. Iraq lost all but 600 of her 4,700 tanks.
C. Over 50,000 Iraqis were taken prisoner. Thousands were killed.
D. Saddam Hussein was still Iraq's dictator before and after the war.

3. Students read some news that compared education systems. In China, Taiwan, and Japan it has been a rule not to allow students to ask questions. Their school day and year are longer than it is in the US. Their students score higher in math and science than Americans. China, Taiwan, and Japan provides high school for only its top students. The US provides free education for everyone through high school. The US leads the world in new inventions. The best American students do as well or better than the top students anywhere. Mark the BEST and the WORST generalization on answer sheet.

A. America's education system may encourage inventors.
B. The schools of China, Taiwan, and Japan are the best.
C. The US will soon have better scores in math and science.
D. Longer school days and year will always lead to more inventions.

Look carefully at the chart below.

Monthly Average Income and Education by Sex, 1990



4. Find the BEST and WORST generalization below and mark your answer sheet.

A. Men with a High School diploma make more than women with a bachelor's degree.
B. Men and women make more money when they have more education.
C. Men demand and get more money because they are more intelligent.
D. Education increases income, with men's average income more than women's.

5. Joe thinks he knows why men make more money than women. He made this generalization: Men are usually larger and stronger than women so they are paid more. Find below the BEST and WORST support for Joe's generalization.

A. Size and strength can help one do their work in some construction jobs.
B. Some teachers with the same experience and education are paid the same.
C. Some women are as big and strong as men.
D. Very few jobs require strong or large workers.

Continue on the next page

MARK YOUR ANSWERS ONLY ON THE YELLOW ANSWER SHEET

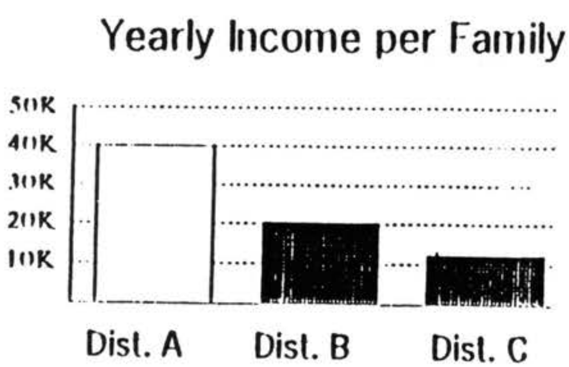
6. Judy was reading about the space race between the USA and the Soviet Union. Here is what she found.

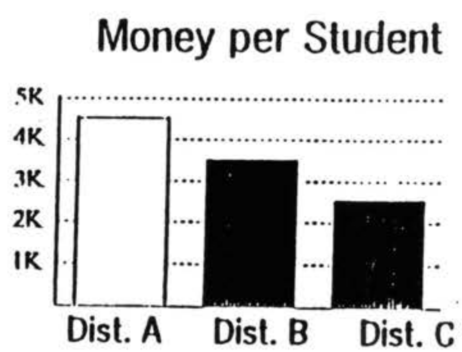
Name	Mission	Year	Nation
Sputnik	1st satellite	1957	Soviet Union
Luna 1	1st unmanned probe to moon.	1959	Soviet Union
Yuri A. Gagarin	1st man in space	1961	Soviet Union
Surveyor 1	1st unmanned landing on moon	1965	USA
Apollo 11	1st men to land on the moon	1969	USA

Consider the data and find the BEST and the WORST generalization.

A. The Soviet Union gave up on the race to the moon in the early 1960s.
B. The Soviets were ahead in the Space race in the late 1950s and early 1960s.
C. After trailing the Soviets, USA won the race to the moon in 1969.
D. The US was behind in the space race when the Soviets launched *Sputnik* .

7. Look at the two graphs below. One is about average yearly income per family in District A, B, and C. The other graphs is about the money spent per student in the three districts' schools.



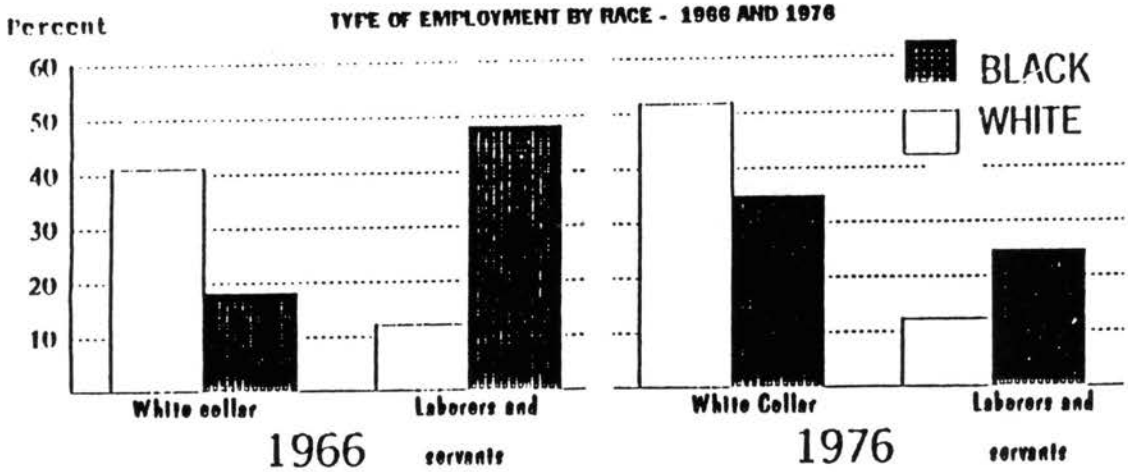


K = $1,000

Find the BEST and the WORST generalization using the facts from both graphs.

A. The richer the school district the more money is spent per student.
B. Yearly income in District A is more than 3 times that of District C.
C. Dist. B students get $1,000 more than Dist. C but a $1000 less than dist. A.
D. Regardless of where you live, the money spent per student is about the same.

8. One goal of Dr. Martin Luther King Jr. was better jobs for Black people. He felt that African Americans did not get the higher paying "white collar" jobs due to discrimination and prejudice. Servants and laborers make far less than white collar workers. Dr. King succeeded in bringing this and other issues to the attention of the American people. Look at the two charts below and find the BEST and WORST generalization.



A. More whites had white collar jobs than Blacks did in 1976.
B. The percent of Black laborers and servants in 1966 was nearly 50%.
C. Whites will not allow Blacks to have any more high paying jobs after 1976.
D. From 1966 to 1976 Blacks moved into higher paying jobs.

9. There is a new theory about the sinking of the U.S.S. *Maine*. Many Americans had believed that Spain sank the ship. A special type of explosive was used in the harbor of Havana, Cuba to sink this ship. This event led to the Spanish American war of 1898. Cuban rebels were fighting the Spanish at the time of the sinking. This is the new theory stated as a generalization. Not Spain but Cuban rebels blew up the ship to get the US in a war with Spain. Find below the BEST and the WORST support for this generalization.

A. Only Cuban rebels had that type of explosives on the island.
B. Cubans and Spanish were seen in small boats in the harbor.
C. Spain rejected US peace offer after the sinking.
D. Some US property had already been destroyed in Cuba.

10. Students reading about dictators in the 20th century found this generalization. "Dictators often start wars with other nations which cause millions of their own people to die." From the facts below find the BEST and the WORST support for this generalization and mark your answer sheet.

A. Hitler, Germany's dictator, started WW2. Millions died including Germans.
B. Stalin killed millions of Soviets while ruling the Soviet Union.
C. Mao Tse-tung killed millions of Chinese during his dictatorship in China.
D. Castro overthrew a dictator to gain control of Cuba. He has fought in a few small wars in the last 30 years.

11. A mayor of a large city was running for reelection. She looked at some facts about her city during her term. She decided on a campaign slogan. "Reelect the Mayor for she has done the city good." Find the BEST and the WORST support for her slogan below.

A. The city population grew slightly.
B. The number of failed businesses has not gone up.
C. More people are working in the city then ever before.
D. There has been only a small increase in the crime rate.

12. The mayor in case #11 got another list of facts about her city during her term. Find the BEST and WORST support for her slogan in this list.

A. There has been a no increase in the number of city workers.
B. Average salaries in the city have gone up 12%.
C. The city serves 10% more people.
D. The number of homeless people has gone up 5%.

13. Next year you will need to pick a science course. You want a good class with a good teacher. Your older brother knows all the science teachers. He graduated last year. He took a lot of science courses at your school. Your best friend doesn't like one of the science teachers. This will be the first year for the new principal who knows none of the teachers. Find the BEST and WORST source for advise about your future science class.

A. Older brother.
B. Best friend.
C. New principal.
D. A science teacher.

14. Mary has been reading about current events in Haiti. She plans to give a report about Haiti next Friday. Her title is, "Recent unrest in Haiti." Of the choices below, find the BEST and WORST source of information for her report.

A. Encyclopedia, 1990 edition.
B. Last month's *Time* magazine.
C. Book on Haiti published in 1991.
D. Last night's TV news report on Haiti.

15. Mary decides to change her report. Her title now is "Haiti in the 1980s." Find the BEST and WORST source for her new report.

A. Book on Haiti published in 1991.
B. Encyclopedia, 1985 edition.
C. Today's newspaper article on Haiti.
D. A 1988 magazine article on Haiti.

16. Bart recently found some information about his great grandparents. They lived in Spain and moved to America in 1919. He generalized that their first years in America were hard. Find the BEST and WORST source of information.

A. Book on Spanish immigration, published in 1992.
B. Letters from his great grandparents, dated 1920.
C. Current newspaper article about immigrants from Europe.
D. His older brother's story about his trip to Spain.

17. Gail watched the movie "Gettysburg." It was about a very important battle of the Civil War. Over 200, 000 men under several generals fought in this battle. Gail was interested in how well each of these generals fought during the battle. Of the choices below, find her BEST and WORST source of information.

A. A Northern general's eyewitness report of the battle.
B. A Southern general's eyewitness report of the battle.
C. A Southern newspaper account one month later.
D. A foreign observer's eyewitness report of the battle.

18. Gail continues to study about the battle of Gettysburg. This time she wants to know what effect the battle had on people from the South. Find her BEST and WORST source for this from the list below.

A. A Northern newspaper article.
B. Southern diaries.
C. Letters of Southern soldiers.
D. A Southern newspaper editiorial.

First AND Last NAME______________________

STUDENT ID# Y_______________ ANSWER SHEET

1. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

2. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

3. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

4. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

5. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

6. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

7. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

8. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

9. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

Fill in one "BEST" and one "WORST" on each question.
For example:
1. BEST
(A)(B)(C)(D)
WORST
(A)(B)(C)(D)

DO NOT CIRCLE YOUR CHOICE. FILL IN SPACE

10. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

11. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

12. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

13. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

14. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

15. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

16. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

17. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

18. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

If you want to change an answer and you are unable to erase, write the letter next to your choice.
For example:
1. BEST
(A)(B)(C)(D) A
WORST
(A)(B)(C)(D) D

APPENDIX C

Form Z Generalization Test

Enclosed you will find a

WHITE LESSON Booklet

and a

YELLOW ANSWER Booklet.

Do not write on the WHITE LESSON booklet.

Write only on the YELLOW ANSWER Booklet.

Do not write your name on either booklet.

Begin now on page 1 on the WHITE LESSON booklet.

MARK YOUR ANSWERS ONLY ON THE YELLOW ANSWER SHEET

1. A group of students were reading about Mexico. They read that many Mexicans are out of work. Mexicans that did work made little money because of no minimum wage law. There were many Mexicans who could not afford good health care. Find the BEST and the WORST generalization below.

A. Mexicans will need to work longer hours.
B. Mexicans are probably not as healthy as Americans.
C. Mexicans suffer from not having enough money.
D. Mexicans suffer from having a poor government.

2. The students continued to read about Mexico. Many Mexicans cross the border into the US. One political party has controlled the nation for many years. Opposing party candidates are sometimes shot at during elections. There are some people in the government that steal money. Recently, armed rebels captured a few towns. Find the BEST and the WORST generalization below.

A. Mexico's government may need to add a political party.
B. Mexicans may be entering the US to escape government and money problems.
C. Mexicans will return to Mexico when they find life much harder here in the US.
D. Mexican rebels may overthrow the government of Mexico.

3. Fred was reading about the L.A. riot. It seemed to him that the communist nations of China and Cuba have less trouble than we do. On TV you will hear reports of people upset with our government. Fred concludes that China and Cuba have less trouble than the US. Find below the BEST and WORST support for Fred's generalization.

A. China and Cuba control their newspapers, radio, and television shows.
B. The US allows free speech which encourages debate.
C. Unbiased reports coming out of China and Cuba do report trouble.
D. With only one political party, China and Cuba have fewer debates.

4. Cal wanted to know if "Tum Yums" were good or bad for his health. Of the choices below, find the BEST and WORST source of information.

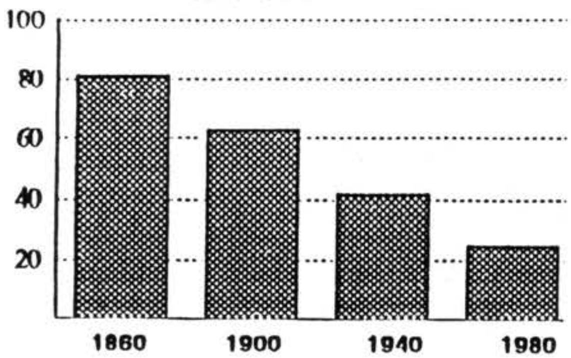
A. A customer at a health food store.
B. A medical doctor.
C. His friends who eat "Tum Yums."
D. School lunch room cook.

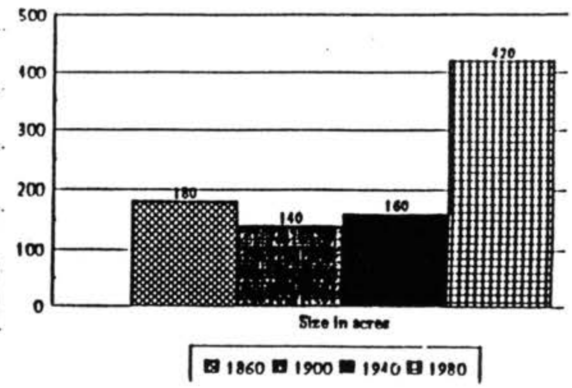
Look carefully at the information on the two graphs. One is about the percentage of people living in rural areas. The other is about the size of farms.

Percent Living in Rural Areas

SIZE OF FARMS - 1860 TO 1980.

1900 -1980



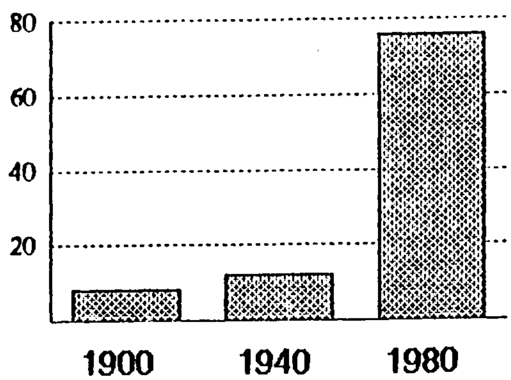


5. Consider the data from both graphs above. Find the BEST and the WORST generalization below.

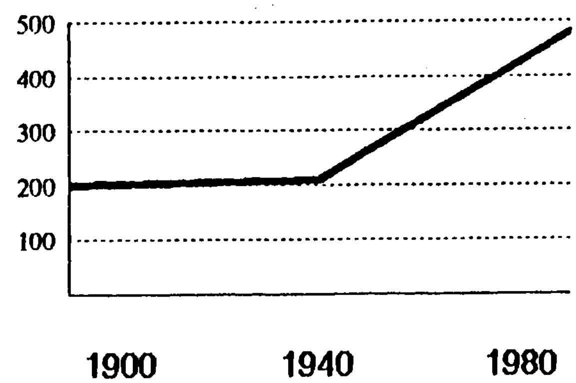
A. At the current rate, the size of farms will continue to increase.
B. At the current rate, the number of Americans living in rural areas will continue to go down.
C. At the current rate, people will soon go back to living in rural areas.
D. Since 1900 the size of farms has gone up while the percentage living in rural areas has gone down.

Look at these two graphs about American farming.

PEOPLE FED BY ONE FARM WORKER



MILLIONS OF ACRES FARMED



6. Find the Best and the Worst <u>generalization</u>.

   A. The number of people fed by one farm worker has gone up since 1900.
   B. The number of people fed and the total acres farmed has gone up since 1900.
   C. The number of people fed by one farm worker and the total acres farmed will not continue to go up.
   D. Since 1940 the total acres farmed has gone up at a very fast rate.

7. Medical research has brought some diseases under control. Small Pox, polio, and bubonic plague are no longer a major threat. Two deadly diseases, Cancer and AIDS, have not been controlled. Millions of dollars are spent each year for Cancer and AIDS research. More people die each year from these diseases.

   Find the BEST and the WORST <u>generalization</u>.

   A. Medical research needs more money to wipe out all diseases.
   B. Research has controlled some diseases and continues to work on others.
   C. Medical research cannot find a cure for some major diseases.
   D. In the near future less people will die of AIDS and Cancer.

MARK YOUR ANSWERS ONLY ON THE YELLOW ANSWER SHEET

8. Dan researched religious cults. He found that they were small groups. Usually they were not part of any major religions. A cult usually has a dictator type leader. He expects deep commitment from his followers. Followers must strictly obey many rules. Dan read a generalization. Some cults can become suicidal and violent against others. Find the BEST and the WORST support for this generalization.

A. In "The Jonestown Massacre" 900 people committed suicide.
B. A cult, while fighting with police in Philadelphia, were killed in a fire.
C. One cult lives a simple life eating only vegetables and praying often.
D. After killing federal agents in Waco, Texas, cult leaders killed cult members and committed suicide.

9. Amy read some more about cults. She found this generalization. Most major religions started out as religious cults. Look at the definition of cults on number 8. Find below her BEST and WORST support for this generalization.

A. All major religions started out as small committed groups.
B. Most major religions have always had strong leaders.
C. Most major religions allow some beliefs and practices to vary.
D. Some religious people have been violent.

10. Sal found when reading about cults that not all sources agreed on what groups in America met the definition of "religious cult." He felt he needed to read more. Among the sources below, find the BEST and WORST source of information on what groups in America are cults.

A. Literature from a Buddhist temple.
B. A college study of religious cults.
C. A Christian bookstore.
D. An encyclopedia article on religions.

11. The Middle East nation of Iraq is lead by Saddam Hussein. He appeared on television during the Gulf War. He told the Iraqi people, "The US. is an enemy that wants to rob and destroy Iraq." Find below the BEST and WORST support for his generalization.

A. US supports Israel, an enemy of Iraq, with military aid.
B. The US has said it will use force to secure oil from the Middle East.
C. Iraq is a Moslem nation, the United States is not.
D. The US has introduced Western ideas into Kuwait, Iraq's enemy.

MARK YOUR ANSWERS ONLY ON THE YELLOW ANSWER SHEET

5

12. Ann and Ken were talking about the Gulf War. They do not agree on why the US was involved in the war. Ken believes this. The US attacked Iraq to protect her oil interests in the Middle East. Find below the BEST and WORST support for Ken's generalization.

A. The US imports oil from Saudi Arabia and Kuwait who each border Iraq.
B. It was the United Nations (UN) that ordered Iraq's withdrawal from Kuwait.
C. Iraq was no direct threat to the US yet the US provided most of the troops.
D. Most of the world supported the attack and needs oil from the region.

13. John was reading about soccer teams. He wants to know what is the best soccer team in Australia. Find the BEST and WORST source of information.

A. The national soccer league of Australia.
B. Interview with several soccer players in Australia.
C. Interview with the oldest sport fan in Australia.
D. A former coach of a soccer team in Australia.

14. Lee was reading about World War Two (WW2). He wanted to know what nation should get the most credit for defeating Germany. Was it the US or the former Soviet Union? What would most likely be the BEST and WORST source of information for this question.

A. A textbook of the former Soviet Union published in 1982.
B. A new American history textbook.
C. A neutral nation's account of the war published in 1991.
D. Japan's military reports during the war.

15. Sally wanted to buy a TV for her home. However, she knew little about the different brands. After getting some facts she made up her mind. "Brand X is the best TV for the money." Find the BEST and the WORST source of information for Sally's decision.

A. Sally talked to her cousin Maud and others who had owned Brand X.
B. Sally compared all the ads from several brands.
C. Sally talked to a repairman who works on TVs.
D. Sally read a magazine that compares and test products.

MARK YOUR ANSWERS ONLY ON THE YELLOW ANSWER SHEET

5

16. Students found these facts when reading about world religions. Islam is the religion found mainly in north Africa and the Middle East. Christianity is found mainly in Europe and the Americas. Buddhism is found mainly in the Orient. Hinduism was found mostly in India. Find the BEST and WORST generalization.

A. North and South Americans have not been expose to other religions.
B. Christianity is rarely found in parts of the Middle East and Africa.
C. Religions appear to follow some geographic patterns.
D. Followers of world religions appear to be scattered equally.

17. Jay kept a record on who got called on in Mr. Jones' class. During a discussion nearly everyone wanted to answer the questions. Students would raise their hands. Mr. Jones called on different students each time. The class had 15 boys and 15 girls. Jay generalized that "Mr. Jones usually calls on boys more often than girls." Find the BEST and the WORST support for his generalization below.

A. Day #1, 5 boys and 3 girls were called on.
B. Day #2, 4 boys and 2 girls were called on.
C. Day #3, 6 boys and 5 girls were called on.
D. Day #4, 9 boys and 8 girls were called on.

18. During the 1980s, the US had two Republican presidents. They were Ronald Reagan and George Bush. Al was reading that during this period some people became rich. At the same time more people were becoming poor. Al wanted to know more about this trend. Find his BEST and WORST source of information below.

A. A rich person.
B. A High School teacher.
C. Republican party headquarters.
D. US Census Bureau data.

First AND Last NAME____________________

STUDENT ID# Z____________ ANSWER SHEET

1. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

2. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

3. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

4. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

5. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

6. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

7. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

8. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

9. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

Fill in __one__ "BEST" and __one__ "WORST" on each question.
For example:
1. BEST
(A)(B)XCX(D)
WORST
(A)(B)(C)XDX

DO NOT CIRCLE YOUR CHOICE, FILL IN SPACE

10. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

11. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

12. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

13. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

14. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

15. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

16. BEST Generalization
(A) (B) (C) (D)
WORST Generalization
(A) (B) (C) (D)

17. BEST Support
(A) (B) (C) (D)
WORST Support
(A) (B) (C) (D)

18. BEST Source
(A) (B) (C) (D)
WORST Source
(A) (B) (C) (D)

If you want to change an answer and you are unable to erase, write the letter next to your choice.
For example:
1. BEST
XAX(B)XCX(D) A
WORST
A)XBX(C)XDX D

APPENDIX D

Modified F-Scale Test

First and last Name____________________

Student ID#_____

We are interested in what 8th graders think about a number of social issues. This is not an intelligence test or test of information. Therefore, there are no "right" or "wrong" answers. The best answer is your personal opinion. Only the researchers will see your responses.

Instructions:

1. Read each statement carefully and mark it according to your first reaction. It isn't necessary to take a lot of time for any question.
2. Answer each question by filling in one response in the answer column.
   For example:
   1. Red is a good color to wear in the summer. (SA) (MA) (A) (D) (MD) (SD)

(SA)= STRONGLY AGREE
(MA)= MODERATELY AGREE
(A) = AGREE slightly
(D) = DISAGREE slightly
(MD)= MODERATELY DISAGREE
(SD)= STRONGLY DISAGREE

Turn the page and begin.

FILL IN YOUR CHOICE, DO NOT CIRCLE
EXAMPLE: (SA)(MA)(A)(D)(MD)(SD)

1. One main trouble today is that people talk too much and work too little. — 1. (SA) (MA) (A) (D) (MD) (SD)

2. Obedience and respect for authority are not the most important virtues children should learn. — 2. (SA) (MA) (A) (D) (MD) (SD)

3. A person who has bad manners, habits, and upbringing can still expect to be liked and accepted by decent people. — 3. (SA) (MA) (A) (D) (MD) (SD)

4. Science has its place. But there are many important things that can never be understood by the human mind. — 4. (SA) (MA) (A) (D) (MD) (SD)

5. An insult to your honor should never be punished. — 5. (SA) (MA) (A) (D) (MD) (SD)

6. Every person should have complete faith in some supernatural power who decisions he obeys without question. — 6. (SA) (MA) (A) (D) (MD) (SD)

7. Young people do not need strict discipline, rugged determination, and the will to work and fight for family and country. — 7. (SA) (MA) (A) (D) (MD) (SD)

8. Young people sometimes get rebellious ideas. As they grow up they do not need to get over them or settle down. — 8. (SA) (MA) (A) (D) (MD) (SD)

9. The trouble with letting everybody have a say in running the government is that so many people are just naturally stupid or full of wild ideas. — 9. (SA) (MA) (A) (D) (MD) (SD)

10. No sane, normal, decent person could ever think of hurting a close friend or relative. — 10. (SA) (MA) (A) (D) (MD) (SD)

11. Sex crimes, such as rape and child abuse, deserve more than mere punishment; such criminals should be publicly whipped, or worse. — 11. (SA) (MA) (A) (D) (MD) (SD)

12. What this country needs most, more than laws and political programs, is a few courageous, tireless, devoted leaders in whom the people can put their faith. — 12. (SA) (MA) (A) (D) (MD) (SD)

13. There is nothing wrong with a person who does not feel a great love, gratitude, and respect for his parents. — 13. (SA) (MA) (A) (D) (MD) (SD)

14. In order for us to do good work it is not necessary that our our bosses outline carefully what is to be done and exactly how to go about it. — 14. (SA) (MA) (A) (D) (MD) (SD)

15. Most of our social problems would be solved if we could somehow get rid of the immoral, crooked, and weak minded people. — 15. (SA) (MA) (A) (D) (MD) (SD)

FILL IN YOUR CHOICE, DO NOT CIRLCLE
EXAMPLE: (+1)(+2)(3)(+5)(+6)(+7)

KEY

1. One main trouble today is that people talk too much and A+ work too little.	1. (+7) (+6) (5) (3) (+2) (+1)
2. Obedience and respect for authority are <u>not</u> the most S- important virtues children should learn.	2. (+1) (+2) (3) (+5) (+6) (+7)
3. A person who has bad manners, habits, and upbringing A- can still expect to be liked and accepted by decent people.	3. (+1) (+2) (3) (+5) (+6) (+7)
4. Science has its place. But there are many important things S+ that can never be understood by the human mind.	4. (+7) (+6) (5) (3) (+2) (+1)
5. An insult to your honor should never be punished. A-	5. (+1) (+2) (3) (+5) (+6) (+7)
6. Every person should have complete faith in some S+ supernatural power who decisions he obeys without question.	6. (+7) (+6) (5) (3) (+2) (+1)
7. Young people do not need strict discipline, rugged A- determination, and the will to work and fight for family and country.	7. (+1) (+2) (3) (+5) (+6) (+7)
8. Young people sometimes get rebellious ideas. As they S- grow up they do <u>not</u> need to get over them or settle down.	8. (+1) (+2) (3) (+5) (+6) (+7)
9. The trouble with letting everybody have a say in running A+ the government is that so many people are just naturally stupid or full of wild ideas.	9. (+7) (+6) (5) (3) (+2) (+1)
10. No sane, normal, decent person could ever think of S+ hurting a close friend or relative.	10. (+7) (+6) (5) (3) (+2) (+1)
11. Sex crimes, such as rape and child abuse, deserve more A+ than mere punishment; such criminals should be publicly whipped, or worse.	11. (+7) (+6) (5) (3) (+2) (+1)
12. What this country needs most, more than laws and S+ political programs, is a few courageous, tireless, devoted leaders in whom the people can put their faith.	12. (+7) (+6) (5) (3) (+2) (+1)
13. There is nothing wrong with a person who does not feel A- a great love, gratitude, and respect for his parents.	13. (+1) (+2) (3) (+5) (+6) (+7)
14. In order for us to do good work it is not necessary that our S- our bosses outline carefully what is to be done and exactly how to go about it.	14. (+1) (+2) (3) (+5) (+6) (+7)
15. Most of our social problems would be solved if we could somehow A+ get rid of the immoral, crooked, and weak minded people.	15. (+7) (+6) (5) (3) (+2) (+1)

APPENDIX E

Knowledge Construction Exercise

Enclosed you will find a

WHITE LESSON Booklet

and a

YELLOW ANSWER Booklet.

Do not write on the WHITE LESSON booklet.

Write only on the YELLOW ANSWER Booklet.

Do not write your name on either booklet.

Begin now on page 1 on the WHITE LESSON booklet.

LESSON BOOKLET

WELCOME TO A **KNOWLEDGE CONSTRUCTION EXERCISE**

WHAT IS A KNOWLEDGE CONSTRUCTION EXERCISE?

When we take what we know and put it all together, making a single statement, we have constructed knowledge. That statement is called a generalization.

Generalization?

You may not be sure what exactly is a generalization. However, I am sure that you have made them in the past and are probably making one now! A generalization can be defined as a conclusion. It is a type of conclusion that we make from viewing the facts. For example, suppose we hear a police car and see an ambulance go by. We may make the generalization that there has been an accident. Single facts combine to help us form this generalization. All generalizations are made this way.

Facts play an important role when you make a generalization. Even a single fact can change a generalization. For example, take our generalization about the accident. Suppose you hear on the radio that an accident was going to be staged at 1:00 P.M. today to test the way a hospital will respond. This is the very time we heard the police and ambulance! Then we may have to change our generalization. Therefore, a single fact can change our generalization or make it completely false!

Mike has beaten Joe playing one-on-one basketball twenty times. Joe has won no games. A generalization could be made that "Mike ALWAYS beats Joe playing one-on-one basketball." Today Mike loses to Joe. Then the generalization MUST be changed to something like "Mike wins *most* of the time!" A generalization summarizes the facts.

Okay, I know what a generalization is so...?

Why learn how to make generalizations? You have all seen that it is easy to make poor generalizations when some facts are not known or just ignored. You all know people who ignore certain facts when they make statements using ALWAYS or NEVER in their generalizations. (For example, "The teacher is always picking on me!" or "She never calls on me when I raise my hand!") We can all make better generalizations if we look at the facts a little closer.

NOW TURN TO PAGE 1 IN YOUR <u>ANSWER</u> BOOKLET.

Let's check your answers.

1.

Row 1 went first 3 times.
Row 2 went first 3 times.
Row 3 went first 1 times.
Row 4 went first 2 times.
Row 5 went first 1 time.

A. **Row 1 usually goes first!** (This is true but is unclear. It does not include facts from the other statements. There may be a better generalization.)
B. **Row 2 goes first a lot!** (This is also unclear. It does not compare Row 2 with other rows. Row 1 and row 2 both went first 3 times.)
C. **Row 4 goes first less than Rows 1 and 2!** (This is the best generalization because it uses more data--facts--and is clear.)
D. **Row 5 never goes first!** (This is the worst generalization because it goes against the fact that row 5 went first ONCE.)

2.

Row 1 went first 4 times.
Row 2 went first 3 times.
Row 3 went first 1 time.
Row 4 went first 2 times.
Row 5 went first 0 times.

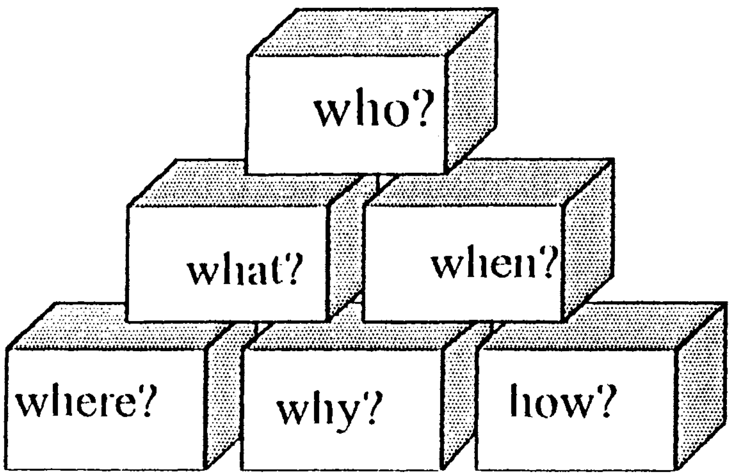
A. **Row 1 always go first!** (Although row 1 goes first the most, it is not true that it always goes first. This is the worst generalization.)
B. **Row 2 goes first a lot!** (This is true but is unclear. It also doesn't use any of the other data.)
C. **Row 3 seldom goes first!** (This is like choice B. It is true but it is not clear what seldom may mean in this case.)
D. **Row 5 never goes first!** (This is clear for never means never! Of the choices, it is the best.)

How did you do? To make good generalizations all related facts must be considered. In both cases a better generalization may have been possible. Look at case #1. A better generalization may have been, "In the two week period, rows 1 and 2 each went first 30% of the time with the remaining rows going no more than 20% of the time." This generalization uses more of the data and is exact. There are still other ways to state a good generalization from the data. Always look for the statement that uses all of the known facts.

Case #2. A better generalization may be, "Ranking the order of who went first the most was row 1, row 3, row 2, and row 4. "

Go to next page

Remember, when you make a generalization you are constructing knowledge. The material you use in construction needs to be inspected for its quality.



In the first sentence or two of a newspaper story, the paper tries to answer the following questions: ***Who? What? When? Where? Why?*** and ***How?***

These questions need to be asked. Answer as many of them as possible before you form or accept a good generalization.

So...concerning the facts or data used in generalization formation ask...

WHO are the sources of the information? — Are they **RELIABLE** sources of information?

WHAT are the facts? (That were used to make the generalization.) — Are **ALL** the relevant facts being considered?

WHEN were the facts collected? — Does the information come from **ORIGINAL** or **SECONDARY** sources?

WHERE did the facts come from? — Can the facts be **CHECKED** for accuracy?

WHY were these facts collected? — Is the purpose or **MOTIVE** known?

Okay, you need to ask these questions. Now try to find the best and worst source of information for new knowledge construction!

GO TO PAGE 2 IN YOUR ANSWER BOOKLET.

Which of the sources did you chose? Well, it is a trick question for the answer DEPENDS on what facts or generalizations are being considered. For example, an older brother or sister would know more about what is going on in their own lives than the UPI. The UPI would know more about what is going on in the world. An encyclopedia is an excellent source of information on most things. However, your teacher may have more recent facts. The encyclopedia did not have access to today's current events!

Let's look at the question "WHAT are the facts?" Suppose you are aware of relevant facts that were ignored when a generalization was formed. For example, recall the Mike and Joe basketball story on page one. Knowing Mike lost one game, you would not be able to accept the following generalization. "Mike ALWAYS wins!" All relevant facts MUST be considered!

When lawyers defend their clients, they present only the evidence that "builds" the case in their favor. They hope the judge or jury will see their clients based on the evidence that they present. They are constructing knowledge with a clear purpose in mind.

Consider the question, "WHEN were the facts collected?". How old should your sources be?

GO TO PAGE 3 OF YOUR ANSWER BOOKLET.

LESSON BOOKLET

Did I trick you again? Or did you answer, "It depends"? For the best AGE of the information depends on what kind of generalization you are considering. The old letter could be an good source of information about the TIME it was written. It is not always the newest information that is the best. The best sources are ORIGINAL sources. That means firsthand records. SECONDARY sources are second hand sources. The sources could be original or secondary depending on what facts from the source are used.

"Where did the facts come from?" This could be a very important question to ask. For example, a tabloid newspaper may report that Abraham Lincoln was revived from the dead for a short time. The report couldn't give you any facts about WHERE this event happen because it was *secret*. Knowing where the information came from can also help you answer the next question - WHY?

"Lincoln is an bad leader."

Why was this generalization formed? It is sometimes helpful to know why the generalization was formed. The motive can reveal a bias that can make the generalization worthless. To be biased means to favor one side and not to be neutral. If there is a strong bias, then certain facts will be ignored on purpose. For example, look at these two sources:

	Source #1	Source #2
Who?	Confederate Congress	Lincoln's Republican party
What?	A report on Lincoln	A report on Lincoln
When?	1862	1862
Where?	Richmond, Virginia	Washington, D.C.
Why?	Report needed to discredit Lincoln	Report needed to rally people behind the President.
How? (was information gathered)	Report comes from several Southern Senators opinions.	Report comes from supporters of Lincoln's war efforts.

Without knowing what either report says, could you guess what the difference between them may be? Which report would be the most biased? Would they both be biased? Could a source be found that would not begin with a strong bias? Bias or favoritism can be either negative or positive. Remember that to make a generalization, you must choose what facts you will use and what source is likely to be least bias.

Another example is advertisement. Have you ever heard of a commercial that started something like this... "Our product is not the best or the lowest in price, but we want you to buy it anyway so we can make a profit!" I doubt if you will ever hear of such a commercial. The reason is that companies carefully select the information to form generalizations that favor their products. This does not mean they are lying! In fact, there are laws against false advertising. Look at the generalizations in the two ads on the next page.

Turn to next page

Ad #1

* Best selling car in America!
* Lowest price for car in its class!
* 40,000 miles warranty!

Ad #2

* More standard equipment!
* Best selling car in the World!
* Lower repair costs than any car

Which car would you like to buy? Do you need more facts? Before you buy a car would you like to hear a report about the cars that was not biased? A completely unbiased report on anything is going to be difficult to find.

A DIFFERENT PERSPECTIVE...

Jamie recently returned from Europe. She was very happy to tell all of her friends that she "discovered Europe!" One of her friends asked her, "How could you have discovered something that was already discovered?" Jamie replied, "I was the first one in my family to see Europe, so I discovered it!"

Jamie's friend wanted to point out the obvious. "Jamie, weren't there people there in Europe when you 'discovered' it? Don't you think they discovered Europe *before* you did?" "Maybe so," Jamie was quick to add, "But I'm not related to any of them, so I'm still the first!" (from her family)

Some Native Americans feel the same way about Columbus's discovery of America as Jamie's friend feels about Jamie's "discovery." We have all heard that Columbus discovered America in 1492. However, like Jamie's discovery of Europe, there were people already here. Some estimate over 100 million people lived in North and South America at the time of Columbus's discovery! Columbus gave the natives the name "Indians" because he thought he was somewhere near India. Imagine Jamie deciding to call all the people of Europe "Chinese"! She thought China was the main country in Europe!

The history of the North American continent has mainly been written from a European perspective or viewpoint. Columbus may have been the first *European* to discover this land. However, there are many who believe the Vikings beat Columbus by 500 years! The natives that lived here when Columbus arrived have stories and legends about how their ancestors got here. Anthropologists believe that the first immigrants to North America came from Asia. They may have crossed the Bering strait into Alaska about forty thousand years ago. From there the people migrated south to warmer climates.

A small number of scientists believe that Egyptians came to America before Europeans. They may have sailed to South America about four thousand years ago. There is no written evidence of this expedition.

What would be your generalization to this next question. Who was the first to discover America?

TURN TO THE NEXT PAGE.

Let us look again at the different perspectives. From Jamie's perspective she discovered Europe only because it was her first trip. Members of her family, like her mom and dad, "discovered" America before she did.

The Vikings were probably the first Europeans to discover America. This may be true although there is less evidence for this. The Vikings did not announce their discovery to the world and it did not lead to more exploration by other nations.

Columbus was the first European *of his time* to discover America. His discovery was important. It launched an age of exploration and colonization.

The Egyptians may have been the first Africans to discover America. They would have been earlier then Columbus or the Vikings. Even if the Egyptians did (and the evidence is weak) they probably found people already here.

People from Asia were probably the very first to discover America. This generalization is supported by the information given to you. It was the best generalization. It is based on the known facts.

In each case above there was knowledge construction. Each viewpoint or perspective constructed knowledge in a different way for a different reason.

As a critical thinker, you must always consider whose viewpoint you are hearing. Suppose your school's basketball team won an important game. After watching it, you may be convinced that the athletic ability of your school's players is superior to their opponents. For this reason they easily defeated the other team. However, the other school's players may be saying they had an "off" night. They may claim that their main player was sick. From their perspective, they are just as good. If your school had lost the game, you may be tempted to find reasons for the defeat. Just because perspectives are different, doesn't mean either one is wrong.

When people give a different account of an event it is usually in the form of an opinion. Remember, an opinion is not the same as a fact. People may use facts to support their opinion. An opinion that is well supported becomes a good generalization.

Remember the story about Joe and Mike? Mike won 20 games and Joe won only one. Find the BEST and the WORST generalization from each of their perspectives.

GO TO PAGE 4 IN YOUR ANSWER BOOKLET.

Do you see anything in common with Joe's and Mike's statements? Joe and Mike's first three statements, A, B, C, are predictions or opinions. They do not sum up the facts of the past events. They are based on what they hope to happen. Choice A of Mike's perspective is not based on facts. It is Mike's worst generalization.

Joe made three statements that are predictions and opinions. Of those three, choice C is the worst. Can you see why? It goes against the facts that are known. Mike can play basketball and is probably able to win games in the future. When looking for the worst generalizations, find those that go against the known facts.

The last statement for Joe and Mike are good generalizations. Still, you can clearly see a difference. Each are emphasizing one fact over another. Joe is emphasizing his win and Mike is emphasizing his past wins. Each has constructed knowledge the way they wanted to. Neither gave false information or stated a prediction.

BEST GENERALIZATION	GOOD GENERALIZATION	POOR GENERALIZATION	WORST GENERALIZATION
Uses all of the known facts. If prediction, it must state trend.	Uses some facts.	Opinions or predictions using unknown facts.	Opinions or predictions that go against known facts.

GO TO PAGE 5 IN YOUR ANSWER BOOKLET.

Let us look at each case and your answer. Read each choice.

1. A. **When racing MO, AL will always win by a mile.** (This is a prediction not based on facts at all. It is the worst generalization.)
   B. **MO came in second with AL coming in next to last.** (This is worded a little strange because it is from Mo's perspective but it is true. Coming in "next to last" is FIRST when there is only two people in the race!)
   C. **It was just one of many races.** (This is a true statement but it does not give much information. It is *too* general.)
   D. **AL will probably win most of the races in the future.** (This is a prediction that may or may not be true. Predictions are a different type of generalization.)

A good generalization refers only to facts that are known. A good prediction MUST refer to the TREND that is present in the facts. It will say something like "If the trend continues..." Bad predictions ignore the facts. A good prediction is *still* not as good as a generalization that sums up the current facts. Avoid accepting predictions as generalizations.

The best generalization above is choice B. Choice B sums up all the facts and is not a prediction or an opinion.

2. A. **MO has an unbroken winning streak of seven races.** (This is a true statement but incomplete. Other facts could be used to make a better generalization.)
   B. **Al had an unbroken winning streak of eight races.** (This statement ignores some facts.)
   C. **AL has won the most games but is on a losing streak now.** (This is the best generalization because it uses all the facts. It is not an opinion or prediction.)
   D. **MO will win the next several races.** (This is a prediction that may or may not be true. Nothing in the story tells us that MO will definitely win the next several races. Of the four statements, this one is the worst generalization. It is an opinion and a prediction.)

3. A. **Bob told his family not to invite Sam.** (This is an opinion. It assumes that Bob is a liar. There is no evidence that Bob tell lies. This opinion is the worst generalization of the four items.)
   B. **Bob doesn't like Sam anymore.** (This opinion is not based on any known facts. It *could* be true, so it is not as bad as statement A.)
   C. **Bob couldn't help leaving Sam out of the party.** (This is the best generalization. It is based on the facts. It is not an opinion or a prediction.)
   D. **Bob's family doesn't like Sam.** (This opinion is not based on the facts given in the story.)

   Choice B and D may or may not be true. No facts were given to support them. Choice A goes against the facts of the story. Opinions or predictions that go against the facts are the worst kind of generalizations.

4. A. **It is going to get hotter after this week.** (This prediction may not be true.)
   B. **It is most likely going to get cooler next week.** (This prediction claims the opposite of the trend notice this week. This is the worst generalization.)
   C. **If the trend continues, it will get hotter next week.** (This prediction is based on the condition that the trend must continue. It is an good generalization because it uses facts that are known.)
   D. **It cannot get any hotter next week.** (This prediction is not based on the facts. However. it may be true. This prediction is more likely to occur than the prediction in choice "B". A trend usually stops before it reverses. Choice D ignores the trend in rising temperatures.)

GO TO THE NEXT PAGE.

READ EACH CHOICE

5. A. Beth's grades will get better. (A prediction of hope not based on all of the facts.)

   B. Beth is not a good student. (It is not clear what is meant by the term, "good student." This is an opinion based on unknown facts. This is the worst generalization.)

   C. Beth's grades will probably get worse over time. (A prediction not based on all the facts. This statement points to the grade that went down while ignoring other facts.)

   D. Overall, Beth's grades have not changed. (This statement looks at all the facts. Beth had one grade go up and one grade go down. The other two grades remained the same. It is not an opinion or a prediction. It is the best generalization.

6. A. The map that they had been reading was wrong. (This is an opinion and not likely the case. Nothing in the story indicated a problem with the map.)

   B. If they continue along the river they will find a major city. (Assuming everything in the story is true this is the best generalization.)

   C. This major river does not have a major city near it. (This is a prediction. For it to be true the map would have to be wrong. The story indicates that a major city will be found.)

   D. Cities do not rely on rivers for transportation anymore. (This is an opinion. It goes directly against the facts of the story making it the worst generalization. Major rivers are still used for transportation.)

7. A. Kris will definitely not win any money. (This is a prediction based on the low odds of winning. It may or may not be true.)

   B. Kris has already won the money. (This is a prediction. It may be true but the odds are very low. She does quality to win so it is possible.)

   C. Contests like these are not honest. (This is an opinion. Nothing in the story indicates that this contest is dishonest. No facts were given about dishonest contests. This is the worst generalization because it is an opinion with no facts supporting it.)

   D. Kris may win some money in the contest. (This prediction clearly states the possibility without being definite. We know that Ann didn't win any money. Kris is qualified to win. This is the best generalization.)

Sometimes good generalizations state the possibility of something happening in "real terms." For example, if it is cloudy outside you may say, "It may rain!" After looking at the weather data the weather reporter gives a percent chance of rain. Absolute predictions are usually not good generalization.

GO TO PAGE 7 IN THE ANSWER BOOKLET.

ANSWER BOOKLET

1. Mrs. Adams' room is full of students. She allows one row of students to leave for lunch. She calls another number of a row. She calls out row numbers until all have been dismissed. Hank kept track for two weeks what row went to lunch first. Here's his data.

Row 1 went first 3 times.
Row 2 went first 3 times.
Row 3 went first 1 time.
Row 4 went first 2 times.
Row 5 went first 1 time.

A. Row 1 usually goes first!
B. Row 2 goes first a lot!
C. Row 4 goes first less than Row 1 and 2!
D. Row 5 never goes first!

Mark the **BEST** generalization.
(A) (B) (C) (D)
Mark the **WORST** generalization.
(A) (B) (C) (D)

2. For the next two weeks Joe kept a list like the one above. Here's his data.

Row 1 went first 4 times.
Row 2 went first 3 times.
Row 3 went first 1 time.
Row 4 went first 2 times.
Row 5 went first 0 times.

A. Row 1 always goes first!
B. Row 2 goes first a lot!
C. Row 3 seldom goes first!
D. Row 5 never goes first!

Mark the **BEST** generalization.
(A) (B) (C) (D)
Mark the **WORST** generalization.
(A) (B) (C) (D)

RETURN TO LESSON BOOKLET PAGE 2.

3. Find the BEST and WORST source.

A. United Press International (UPI)

B. Your teacher.

C. An encyclopedia.

D. An older brother or sister.

Mark the BEST Source.
(A) (B) (C) (D)
Mark the WORST Source.
(A) (B) (C) (D)

RETURN TO LESSON BOOKLET PAGE 4

4. Find the BEST and WORST source of information to answer the question, "How old should your sources be?"

A. An old letter found in the attic.

B. The 10:00 News report last night.

C. A book published in 1989.

Mark the **BEST** source.
(A) (B) (C) (D)

Mark the **WORST** source.
(A) (B) (C) (D)

RETURN TO LESSON BOOKLET PAGE 5.

5. **Mike's Perspective.**

A. I always win.
B. I will always win.
C. Joe got lucky once, but it won't happen again.
D. I have won all the games until recently.

Mark the BEST generalization.
(A) (B) (C) (D)
Mark the WORST generalization.
(A) (B) (C) (D)

6. **Joe's Perspective**

A. I'm going to win all the games now.
B. After losing all the games, I will now win all of them.
C. Mike can't play basketball so I'll always win.
D. My losing streak has ended.

Mark the BEST generalization.
(A) (B) (C) (D)
Mark the WORST generalization.
(A) (B) (C) (D)

RETURN TO LESSON BOOKLET PAGE 8

ANSWER BOOKLET

AN EXERCISE

1. AL and MO like to race only each other. They do not race with other people. In the last race they ran a mile. AL won the race by only a few feet. AL and MO generalize about the race.

A. When racing MO, AL will always win by a mile.
B. MO came in second with AL coming
C. It was just one of many races.
D. AL will probably win most of the races in the future.

Mark the BEST generalization.
(A) (B) (C) (D)
Mark the WORST generalization.
(A) (B) (C) (D)

2. AL and MO have raced 15 times. MO won the last seven races. When they talk about these races they generalize.

A. MO has an unbroken winning streak of seven races.
B. AL had an unbroken winning streak of eight races.
C. AL has won the most races but is on a losing streak now.
D. MO will win the next several races.

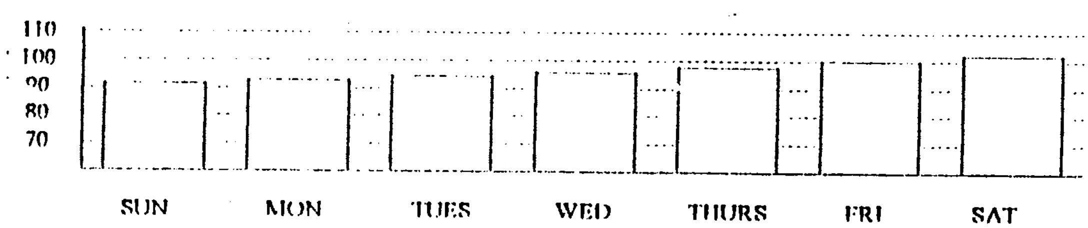
Mark the BEST generalization.
(A) (B) (C) (D)
Mark the WORST generalization.
(A) (B) (C) (D)

3. Bob and Sam are best friends. Bob had a birthday and his family threw him a party. Since Sam was not a family member, he was not invited. The party was a surprise for Bob so he did not have time to invite anyone. Bob told Sam these things. Find the BEST and WORST generalization for Sam to make about Bob.

A. Bob told his family not to invite Sam.
B. Bob doesn't like Sam anymore.
C. Bob couldn't help leaving Sam out of the party.
D. Bob's family doesn't like Sam.

Mark the BEST generalization.
(A) (B) (C) (D)
Mark the WORST generalization.
(A) (B) (C) (D)

4. Amy kept a record of the daily high temperatures for a week. She plotted them on the graph below.



A. It is going to get hotter after this week.
B. It is most likely going to get cooler next week.
C. If the trend continues, it will get hotter next week.
D. It cannot get any hotter next week.

Mark the BEST generalization.
(A) (B) (C) (D)
Mark the WORST generalization.
(A) (B) (C) (D)

TURN TO THE NEXT PAGE

ANSWER BOOKLET

5. Beth was looking at a record of her nine week grades. In math she went from a "C" to a "B". In science she made a "C" again. In English she dropped from a "C" to a "D". In social studies she made a "C" again.

A. Beth's grades will get better.
B. Beth is not a good student.
C. Beth's grades will probably get worse over time.
D. Overall, Beth's grades have not changed.

Mark the **BEST** generalization.
(A) (B) (C) (D)
Mark the **WORST** generalization.
(A) (B) (C) (D)

6. Students reading about rivers found that they were very important for the growth of cities. Rivers provide a source of water and transportation. Students looked at a map of Europe. They could not find any major city without a major river near it. The students traveled to Europe. They noticed that the highway followed the course of a major river. They traveled a short distance along the river, but they spotted no city. On the basis of these facts find the BEST and WORST generalization below.

A. The map they had been reading was wrong.
B. If they continue along the river they will find a major city.
C. This major river does not have a major city near it.
D. Cities do not rely on rivers for transportation anymore.

Mark the **BEST** generalization.
(A) (B) (C) (D)
Mark the **WORST** generalization.
(A) (B) (C) (D)

7. Kris received a letter in the mail. She told her friends, "I've won! I've won!" Kris explains, "It says that if I am selected from those with the matching number, I win ten million dollars! I have the matching number!" Her friend Ann told her that she got a similar letter last year. Ann won nothing. Ann's letter stated her chances of winning were one in ten million. On the basis of these facts, find the best and worst generalization below.

A. Kris will definitely not win any money.
B. Kris has already won the money.
C. Contests like these are not honest.
D. Kris may win some money in the contest.

Mark the **BEST** generalization.
(A) (B) (C) (D)
Mark the **WORST** generalization.
(A) (B) (C) (D)

RETURN TO PAGE 9 IN THE LESSON BOOKLET.

ANSWER BOOKLET

Add up the number of times you picked the correct BEST generalization on <u>pages 5 and 6</u> in this answer booklet. You may need to refer to pages 9 and 10 in the lesson booklet for the answers.

Write that number here. _______ out of 7.

Add up the number of times you picked the correct WORST generalization on pages 5 and 6 in this answer booklet

Write that number here. _______ out of 7.

Thank you very much!!

Please rate this knowledge construction lesson. Cross out one choice below.

DISLIKED IT A LOT.	DISLIKED IT A LITTLE.	IT WAS OKAY.	LIKED IT A LITTLE.	LIKED IT A LOT.
-2	-1	0	+1	+2

You may now turn in your lesson and answer booklet to your teacher. Thank you again.

APPENDIX F

Construction Knowledge Exercise

(Placebo Lesson)

Enclosed you will find a

WHITE LESSON Booklet

and a

YELLOW ANSWER Booklet.

Do not write on the WHITE LESSON booklet.

Write only on the YELLOW ANSWER Booklet.

Do not write your name on either booklet.

Begin now on page 1 on the WHITE LESSON booklet.

WELCOME TO A

CONSTRUCTION KNOWLEDGE EXERCISE

WHAT IS A CONSTRUCTION KNOWLEDGE EXERCISE?

We take some things for granted. This lesson will be about things in our lives and what they do for us. First, a generator.

GENERATOR?

You may not be sure what exactly a generator is but I am sure that you have made use of them in the past and are probably using one now!

A generator can be defined as a producer. It is a type of producer that we use to produce electricity. For example, if we hear a police car and see an ambulance go by, we can be sure the generator is helping to produce the sirens to inform us that there has been an accident. The sirens get their power from batteries but the power in the battery is maintained by a generator.

Before you can build most things, you need power. Generators provide power for many types of tools. Even if the construction takes place miles from a source of electricity, a generator can produce the electricity there. For example, take our story about the accident. Life support machines and other equipment can operate in isolated places where there is no other power!

Consider another example for your experience. Many people have seen basketball games. Think about how much power has to be generated to operate the lights in a gym. The power source is not a portable generator like in the previous example. Still there MUST be a generator at the power plant to produce the electricity that is coming through the lines. Otherwise we would be "in the dark!"

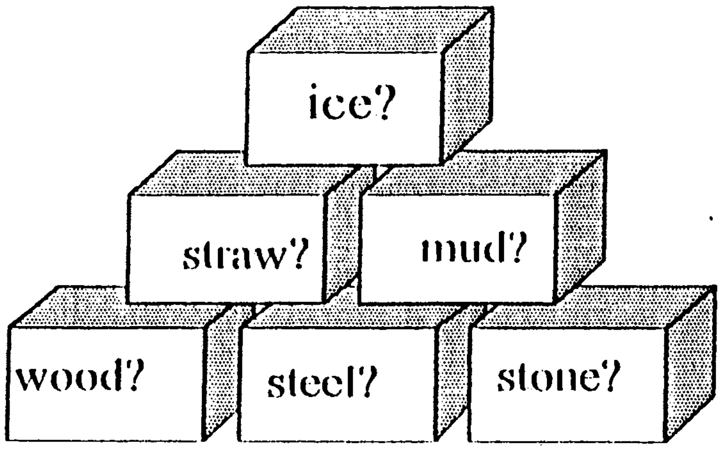
Okay, I know what a generator is so...?

You may be thinking that since you already knew what a generator was, why learn anymore about them? You have also seen that sometimes it is easy to forget how much we rely on generators. But this lesson is about construction. You all know people who live in different kinds of houses. They may make statements using ALWAYS or NEVER in their preferences about houses. (For example, "The teacher said she will always live in a house!" or "She said never again will she live in an apartment!") Regardless of our preferences, there are certain qualities that all houses have in common.

What kind of qualities?

TURN TO PAGE TWO.

Remember, when you make a house you need construction material. The material you use in construction needs to be inspected for its quality.



All houses use some sort of material for the basic structure. One or more of materials to the left can be used. What determines for the builder what material he will use?

There are some questions that need to be asked, and as many of them answered as possible before you decide on the materials

So...concerning the type of house you want, ask...

WHO is going to live in the house?

WHAT are the available materials?
(That will be used to make the house.)

WHEN will construction begin?

WHERE is the house going to be built?

WHY is the house needed at this time?

Are they REASONABLE sure of what they want?

Are ALL the materials being considered?

Can the owners live how long WITHOUT a house or is this a SECOND house?

Can it be CHECKED for safety?

Is it possible they may MOVE again?

Okay, after you have asked these questions, there are other things to consider before you begin to construct some new house (or check someone's construction!)

TURN TO PAGE 31

THINGS TO CONSIDER

Asking the questions is the easy part. The answers may not always be easy to get. When you have an answer to one or more of these six questions, there are several things you should consider. For example, suppose you can find the house you want and it is not necessary to built a new one. Can you think or other sources that may provide you with the information that you need to find the house you want?

A. Classified ad in the newspaper

B. Your high school teacher

C. A Realtor's listing

D. An older brother or sister

Can you think of other sources? Probably one or more of these sources will be plenty to help you start you search for a new house. You will still need to know what you want in a home. For example, if you are going to live alone then you might consider an apartment. If you have a family, a house may give you more room. If your job requires that you move a lot, you may want a mobile home. In all cases you will need to consider location for the type of home and safety!

Let's us look at the safety question "WHAT are the risks?" Suppose you are aware of violent storms in the area you want to live. That can't be ignored when a type of house is was being built. It is easy to lose a house to hurricanes, earthquake, tornadoes, etc. No home is safe from all disasters. You cannot be say for sur that the house you built will "ALWAYS be here!"

When you buy or rent a house, you may know little about the construction or who built the house. You hope they judged the materials strong enough for the job. They were constructing your home with a clear purpose in mind.

Consider the question, "WHEN was the house constructed?". Maybe some of the following would be a source of information.

A. An title deed to the house

B. The construction report

C. A book at the courthouse

You can probably think of other sources. Did I list all of them? Or did you think of, "A lot more"? For the information depends on what kind of house or apartment you are considering. The older the house could mean it will be difficult to find what YEAR it was built. It is not always the most important information that you need to know. The best source could be the ORIGINAL owners. They may have the records. SECOND owners are probably a good source. The sources could be helpful depending on what information you need the most.

TURN TO PAGE 4

Remember the question, "Where is the house going to be built?" You can imagine why this could be a very important consideration. For example, a hundred and fifty years ago Abraham Lincoln was alive. He lived in a log home for a brief time. This type of home could be built near a forest. WHERE this home was built provided security. Knowing where the material came from can also help you answer the next question-WHY?

Why was the home needed? It is sometimes helpful to know why the type of home is built. The motive can reveal the needs that can make some building material worthless. Remember that in order to make a house inexpensive, you must choose material that is available at low cost. However, some materials cannot be used. If there is a strong wind, then certain material will not be adequate. For example, consider these two houses:

	House #1	House #2
Who?	Eskimos in Alaska....................	Aborigines
What?	Snow and Ice	Snow and Ice
When?	Anytime................................	Anytime
Where?	Arctic Circle.........................	Australian Desert.
Why?	Protection from cold and snow.....	Protection from the heat and basic shelter.
How?	(was material gathered)............... Snow is cut from snow banks and use as blocks	Material shipped in from colder climates.

Without knowing the construction method of either house, you can guess what the difference between these houses may be. Which house would be the most likely to survive in their environment? Or would they both be okay? Could a material be found that would build a house with a strong base (in either climate hot or cold)?

Another question is transportation. Have you ever heard of a house that was built where you couldn't get to it. "Our house is safe because no one can get here, not even family members half the time!" It would be silly to build such a house unless you were a hermit. You would have to have all the supplies you would ever need stored. I doubt if you will ever hear of such a house. The reason is that people carefully select their homes that have easy access. This does not mean they will always have it easy getting to their house!

Access problem #1

* Car travels on pavement only!

* Car is only 6 inches of ground!

* At least 4 miles of rough roads!

TURN TO NEXT PAGE

Advertisement #2

* Best off road vehicle in the World!

* More standard equipment!

* Paved driveway takes vehicle to highway.

Which car is suited for the conditions? Do you need more facts? Before you build or buy a house you might consider what other people are doing around the world. A junior high girl traveled to Europe. Let's see what she finds.

A DIFFERENT PERSPECTIVE...

Jamie recently returned from Europe. She was very happy to tell all of her friends that she "discovered her dream home!" One of her friends asked her, "Tell us what you have discovered and why you think it so special." Jamie replied, "I was the first one in my family to see a castle, and I loved it!"

Jamie's friend wanted to know more about the castle. "Jamie, weren't there people there in Europe still living in castles? Don't you think they are still building castles in Europe?" "Maybe so," Jamie was quick to add, "But I'm not sure and it doesn't matter, I'm still want to build one!" (In America)

Some Americans live in homes that are a lot like the castles Jamie discovered in Europe. We have all heard of Kings and Queens living in castles. Some of these castles are still in very good condition after hundreds of years. However, like Jamie discovered in Europe, there were very very few people there that still live in castles. Some estimate it would cost over 100 million dollars to build even a small castle today. Castles will last a long time because they are usually built with thick stones. In North and South America only a few natives built with stone.

In the history of the North American continent there has many different types of houses built. Always it depended upon the family needs and available materials what type of home was built. The teepees were excellent mobile homes and built quickly from buffalo hides. Some natives did build more permanet homes out of wood or stone. Europeans that came to America adapted some of the home building methods from the natives. Likewise, the natives were able to trade for materials that would use in building houses. The canvass quickly replaced buffalo hides in many parts of the West in teepee construction.

A small number of people around the world still build homes exactly like their ancestors. This is mainly because of wide range of materials available. Because of mass production and transportation advances, these materials came be shipped to most areas of the world.

Based on the reading above here are some facts for you to remember.

A. Jamie discovered castles when she went to Europe.
B. Stone lasts longer than most materials.
C. Some American natives liked mobile homes.
D. The material used today is different from the past.
E. More material is available to most people today.

TURN TO PAGE 1 OF THE YELLOW ANSWER SHEET

ANSWER BOOKLET

1

1. Mrs. Adams' room is full of students. She talks about the unusual house she lives in. She calls on a number of a row of students. They try to guess what kind of house she lives in. She calls out row numbers until all have guessed. Hank kept track of the guesses. Here's his data.

Row 1 went with a ice house.
Row 2 went with a straw house.
Row 3 went with a mud house.
Row 4 went with a house of sticks.
Row 5 went with a stone hut.
What do you think?

A. Row 1 is crazy!
B. Row 2 has no idea!
C. Row 4 goes with anything crazy!
D. Row 5 is never right!
E. Hey! I need more information!

2. For the next two weeks Joe kept a list of what she said about the house. Here's his data.

It has 2 stories.
It can hold 9 or more kids.
It has an unusual door.
The top floor is small.
The teacher is not young.

Now what do you think?

A. The teacher is crazy!
B. Row 2 can't be right!
C. Row 4 might be right!
D. Row 1 might be right!
E. I need more information!

TURN TO NEXT PAGE.

ANSWER BOOKLET

3. You read in the newspaper that the town has set a record on high temperatures. The high temperature has not been below 90 degrees for a month.

What about your teacher's house?

A. It can't be ice!

B. It could be mud.

C. Steel is not unusual enough.

D. Wood and stone are common.

4. The teacher gives you a hint. She tells you that the house used to be alive! What do you think now!

A. It can't be mud or stone.

B.. It could be straw or wood.

C. It is probably something else.

D. I still need more information.

TURN TO THE NEXT PAGE

ANSWER BOOKLET

5. More information is available. An old letter is discovered that reveals that the house that your teacher lives in has had a famous poem written about it. A late night news report said that a fire raged through the area where your teacher lives. Her unusual home suffered only minor damage. What do you think?

A. It can't be straw.

B. Never thought it was wood.

C. An Encyclopedia might help.

D. An older brother or sister may know.

6. Here's another tip. The heat wave reported earlier had an effect on your teacher's house. She reports that it caused the house to SMELL a little. Review your clues again. It is unusual material that your teacher used to build the house. It can't be something that burns easily. It is two stories but the second story is smaller than the first floor. The material used to be alive. There has been a poem written about it. Okay, this is it. The last question about your teacher's house before we go on to something else. What is the material?

A. Wood.
B. Fire treated Straw.
C. Leather.
D. Grass.

GO TO THE NEXT PAGE FOR SOME SERIOUS QUESTIONS.

ANSWER BOOKLET

4

AN EXERCISE

1. List below some major considerations one must make before building or buying a home.

   A. Who?____________________________________

   B. What? ____________________________________

   C. When? ____________________________________

   D. Where? ____________________________________

   E. Why?____________________________________

2. List below some sources of information for locating a new home.

   A. ____________________________

   B. ____________________________

   C. ____________________________

   D. ____________________________

3. In selecting some materials for your house, list some major considerations below.

   A. ________________________________

   B. ________________________________

   C. ________________________________

   D. ________________________________

4. Explain why early white settlers, American Indians, and Eskimos all had different types of homes.

5. What were the original reasons for building a castle and why do few people live in them now?

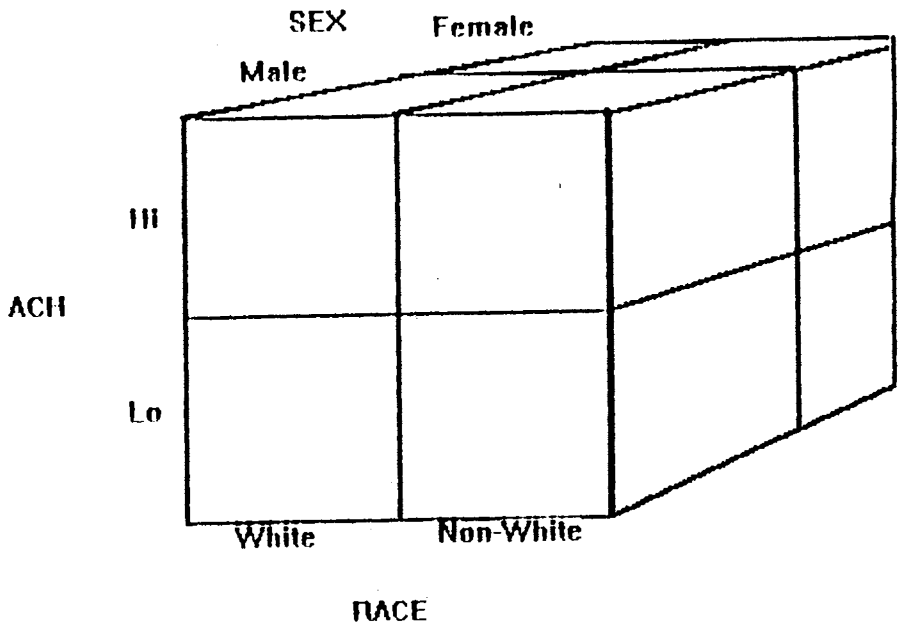
YOU HAVE NOW COMPLETED THIS LESSON, CONGRATULATIONS!

APPENDIX G

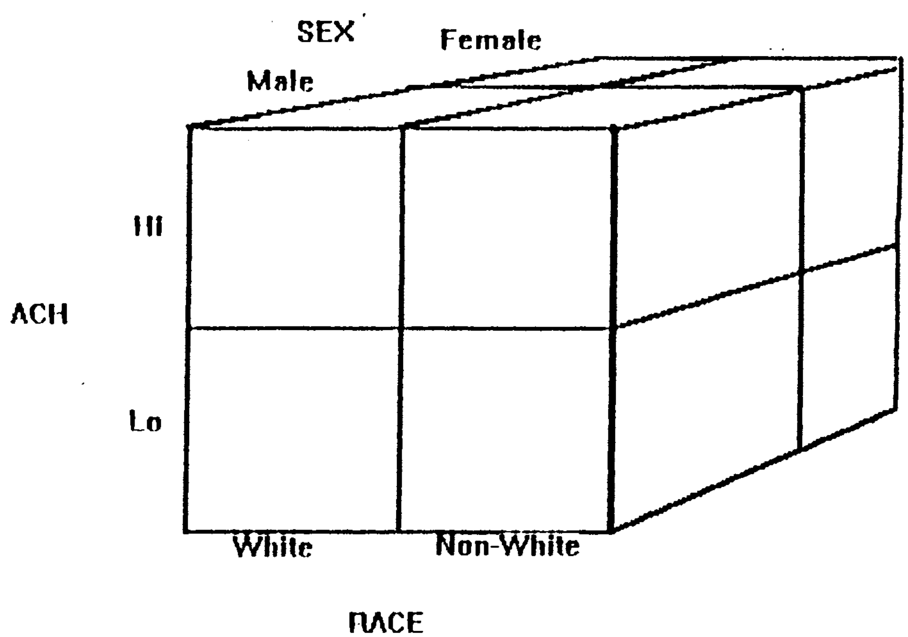
Experimental Design Model

EXPERIMENTAL DESIGN MODEL

EXPERIMENTAL GROUP



CONTROL GROUP



APPENDIX H

Form Y Group Comparison
(Exp vs Control on pretest)

FORM Y EXP VS. CONTROL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preYcontrol	104	1846	17.75	38.7
preYexp	106	1898	17.91	31.2

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	12.755	1	12.75	0.34	0.56	3.886
Within Groups	7884.8	208	37.55			
Total	7897.5	209				

TOTAL PRETEST SCORES

Y FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
YBGcnt	**104**	299	2.875	2.01335
YBGexp	**104**	311	2.99038	1.621266

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Group	**0.692**	1	0.69231	0.380952	0.5378	3.887
Within Groups	**374.4**	206	1.81731			
Total	**375.1**	207				

BEST GENERALIZATION SUBTEST

Y FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
YWGcnt	104	276	2.65385	2.267
YWGexp	104	268	2.57692	1.936

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.308	1	0.30769	0.146	0.7024	3.89
Within Groups	432.9	206	2.10157			
Total	433.2	207				

WORST GENERALIZATION SUBTEST

Y FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
YBPcnt	104	366	3.51923	2.776
YBPexp	104	351	3.375	2.353

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	1.082	1	1.08173	0.422	0.5168	3.887
Within Groups	528.3	206	2.56474			
Total	529.4	207				

BEST SUPPORT SUBTEST

Y FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary
PRETEST

Groups	*Count*	*Sum*	*Average*	*Variance*
YWPcnt	104	299	2.875	1.897
YWPexp	104	278	2.67308	1.601

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	2.12	1	2.12019	1.212	0.2722	3.887
Within Groups	360.3	206	1.74883			
Total	362.4	207				

WORST SUPPORT SUBTEST

Y FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary
PRETEST

Groups	*Count*	*Sum*	*Average*	*Variance*
YBRcnt	104	284	2.73077	2.16
YBRexp	104	318	3.05769	1.88

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	5.558	1	5.55769	2.751	0.0987	3.887
Within Groups	416.1	206	2.01998			
Total	421.7	207				

BEST SOURCE SUBTEST

Y FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary
PRETEST

Groups	*Count*	*Sum*	*Average*	*Variance*
YWRcnt	104	322	3.09615	2.709
YWRexp	104	315	3.02885	2.514

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.236	1	0.23558	0.09	0.7642	3.887
Within Groups	538	206	2.61142			
Total	538.2	207				

WORST SOURCE SUBTEST

APPENDIX I

Form Z Group Comparison
(Exp vs Control on pretest)

EXP VS. CONTROL Z-TEST AS PRE TEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
Z-preC	47	750	15.9574	31
ZpreE	45	761	16.9111	27.8

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	1.287	1	1.28723	0.04	0.8478	3.945
Within Groups	3197	92	34.7521			
Total	3198	93				

TOTAL TEST SCORES

Z FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
ZBGcntrl	45	132	2.933333	2.245
ZBGexp	45	132	2.933333	1.882

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0	1	0	0	1	3.95
Within Groups	181.6	88	2.063636			
Total	181.6	89				

BEST GENERALIZATION SUBTEST

Z FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
ZWGcntrl	45	143	3.177778	1.46768
ZWGexp	45	141	3.133333	1.52727

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.044444	1	0.044444	0.02968	0.863615	3.9493
Within Groups	131.7778	88	1.497475			
Total	131.8222	89				

WORST GENERALIZATION SUBTEST

Z FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
ZBPcntrl	45	98	2.177778	1.7404
ZBPexp	45	90	2	1.54545

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.711111	1	0.711111	0.43283	0.51232	3.9493
Within Groups	144.5778	88	1.642929			
Total	145.2889	89				

BEST SUPPORT SUBTEST

Z FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
ZWPcntrl	45	119	2.644444	1.96162
ZWPexp	45	105	2.333333	2.13636

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	2.177778	1	2.177778	1.06285	0.30539	3.9493
Within Groups	180.3111	88	2.04899			
Total	182.4889	89				

WORST SUPPORT SUBTEST

Z FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
ZBRcntrl	45	155	3.444444	1.84343
ZBRexp	45	177	3.933333	1.92727

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	5.377778	1	5.377778	2.8524	0.094778	3.9493
Within Groups	165.9111	88	1.885354			
Total	171.2889	89				

BEST SOURCE SUBTEST

Z FORM EXP VS. CNTRL ON PRETEST

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
ZWRcntrl	45	128	2.844444	1.54343
ZWRexp	45	135	3	1.72727

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.544444	1	0.544444	0.33292	0.565417	3.9493
Within Groups	143.9111	88	1.635354			
Total	144.4556	89				

WORST SOURCE SUBTEST

APPENDIX J

Form Y Sequence Comparison
(Pre versus Post control)

Y FORM: PRE VS POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Coui*	*Sum*		*Variance*
YBG-pre	46	135	2.93	1.9
YBG-PC	46	138	3	2.6

Analysis of Variance

Source of Variation

	SS	*df*		*F*	*P-value*	*F-cri*
Between Groups	0.1	1	0.1	0.0	0.8354	3.9
Within Groups	203	90	2.25			
Total	203	91				

BEST GENERALIZATION SUB TEST

Y FORM: PRE VS POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
YWG-pre	46	121	2.6304	2.06039
^YWG-PC	46	119	2.587	1.71449

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.043	1	0.0435	0.02304	0.8797	3.95
Within Groups	169.9	90	1.8874			
Total	169.9	91				

WORST GENERALIZATION SUB TEST

Y FORM: PRE VS POST CONTROL

Analysis of Variance:One Way

Summary

Groups	Count	*Sum*	*Average*	*Variance*
YBP-pre	46	160	3.47826	2.92
^YBP-PC	46	168	3.65217	2.32

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.696	1	0.69565	0.27	0.6077	3.9469
Within Groups	235.9	90	2.62126			
Total	236.6	91				

BEST SUPPORT SUB TEST

Y FORM: PRE VS POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
YWP-pre	46	144	3.1304	2.1
^YWP-PC	46	139	3.0217	1.9

Analysis of Variance

Source of Variation

	SS	*df*	MS	*F*	*P-value*	*F-ci*
Between Groups	0.272	1	0.2717	0.1	0.7119	3.9
Within Groups	178.2	90	1.98			
Total	178.5	91				

WORST SUPPORT SUB TEST

Y FORM: PRE VS POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
YBR-pre	46	126	2.7391	2.01932
^YBR-PC	46	134	2.913	2.61449

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.696	1	0.6957	0.30025	0.5851	3.95
Within Groups	208.5	90	2.3169			
Total	209.2	91				

BEST SOURCE SUB TEST

Y FORM: PRE VS POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	**Averagı**	*Variance*
YWR-pre	**46**	**143**	**3.1087**	**2.7657**
YWR-PC	**46**	**160**	**3.4783**	**2.21063**

Analysis of Variance

Source of Variation

	SS	*df*	MS	*F*	*P-value*	*F-cri*
Between Groups	**3.141**	**1**	**3.1413**	**1.2625**	**0.2642**	3.95
Within Groups	**223.9**	**90**	**2.4882**			
Total	**227.1**	**91**				

WORST SOURCE SUB TEST

APPENDIX K

Form Z Sequence Comparison
(Pre versus Post control)

Z FORM PRE VS. POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preZBG	90	264	2.933333	2.04045
ZBGpc	90	237	2.633333	2.45955

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	4.05	1	4.05	1.8	0.181422	3.89423
Within Groups	400.5	178	2.25			
Total	404.55	179				

BEST GENERALIZATION SUBTEST

Z FORM PRE VS. POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preZWG	90	284	3.155556	1.48115
ZWGpc	90	260	2.888889	1.62797

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	3.2	1	3.2	2.05846	0.153117	3.89423
Within Groups	276.711	178	1.554557			
Total	279.911	179				

WORST GENERALIZATION SUBTEST

Z FORM PRE VS. POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preZBP	90	188	2.08889	1.63246
ZBPpc	90	197	2.18889	1.34594

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.45	1	0.45	0.30218	0.583211	3.89423
Within Groups	265.078	178	1.4892			
Total	265.528	179				

BEST SUPPORT SUBTEST

Z FORM PRE VS. POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preZWP	90	224	2.48889	2.05044
ZWPpc	90	223	2.47778	1.9377

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.00556	1	0.00556	0.00279	0.957964	3.89423
Within Groups	354.944	178	1.99407			
Total	354.95	179				

WORST SUPPORT SUBTEST

Z FORM PRE VS. POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preZBR	90	332	3.68889	1.92459
ZBRpc	90	322	3.57778	2.58377

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.55556	1	0.55556	0.24646	0.620195	3.89423
Within Groups	401.244	178	2.25418			
Total	401.8	179				

BEST SOURCE SUBTEST

Z FORM PRE VS. POST CONTROL

Analysis of Variance:One Way

Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
preZWR	90	263	2.92222	1.6231
ZWRpc	90	255	2.83333	1.96067

Analysis of Variance

Source of Variation

	SS	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	0.35556	1	0.35556	0.19843	0.656536	3.89423
Within Groups	318.956	178	1.79189			
Total	319.311	179				

WORST SOURCE SUBTEST

APPENDIX L

Form Y vs. Z Comparison
(pretest scores on all subtests)

Y-TEST VS. Z-TEST AS PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
YpreC	92	1620	17.6087	42
Z-preC	92	1511	16.42391	29.3

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	63.197	1	63.19681	1.54	0.21607	3.892
Within Groups	7629.3	186	41.0179			
Total	7692.5	187				

TOTAL TEST SCORES

YBG VS. ZBG ON PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
ZBGpre	92	264	2.86957	2.18
YBGpre	92	236	2.56522	2.31

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	4.1702	1	4.17021	1.77	0.18492	3.892
Within Groups	438.04	186	2.35507			
Total	442.21	187				

BEST GENERALIZATION SCORES

YWG VS. ZWG ON PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
ZWGpre	92	240	2.6087	2.04
YWGpre	92	245	2.66304	2.34

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	0.133	1	0.13298	0.06	0.80978	3.892
Within Groups	425.67	186	2.28855			
Total	425.8	187				

WORST GENERALIZATION SCORES

YBP VS. ZBP ON PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
ZBPpre	92	188	2.04348	1.69
YBP	92	322	3.5	2.96

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	95.511	1	95.5106	39	2.8E-09	3.892
Within Groups	454.98	186	2.44612			
Total	550.49	187				

BEST SUPPORT SCORES

YWP VS. ZWP ON PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
YWPpre	92	263	2.8587	2.06
ZWPpre	92	224	2.43478	2.14

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	8.0904	1	8.09043	3.68	0.05674	3.892
Within Groups	409.37	186	2.20093			
Total	417.46	187				

WORST SUPPORT SCORES

YBR VS. ZBR ON PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
YBR	92	247	2.68478	2.22
ZBRpre	92	332	3.6087	2.17

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	38.431	1	38.4309	16.3	8E-05	3.892
Within Groups	439.37	186	2.36222			
Total	477.8	187				

BEST SOURCE SCORES

YWR VS. ZWR ON PRE TEST

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
YWR-C	92	279	3.03261	2.76
ZWRpre	92	263	2.8587	1.77

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	1.3617	1	1.3617	0.57	0.45209	3.892
Within Groups	446.06	186	2.39819			
Total	447.43	187				

WORST SOURCE SCORES

APPENDIX M

Correlation: Form Y and Z

CORRELATION Y & Z SUB TESTS

	ZBG-C	YBG-C
ZBG-C	1	
YBG-C	0.19789	1

	ZWG-C	YWG-
ZWG-C	1	
YWG-C	0.2514	1

	ZBP-C	YBP-C
ZBP-C	1	
YBP-C	0.31893	1

	ZWP-C	YWP-
ZWP-C	1	
YWP-C	0.3097	1

	ZBR-C	YBR-C
ZBR-C	1	
YBR-C	0.39389	1

	ZWR-C	YWR-
ZWR-C	1	
YWR-C	0.3539	1

CONTROL GROUPS

APPENDIX N

White Vs. Nonwhite Comparison
(pretest scores on all subtests)

WHITE VS. NON-WHITE PRETEST COMPARISON

Analysis of Variance:One Way

Summary

Groups PRE TEST	Count	Sum	Average	Variance
YWG WHITE	55	144	2.61818	2.35152
YBG NON-WHITE	55	139	2.52727	1.47609

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	0.227	1	0.22727	0.11875	0.73106	3.929
Within Groups	206.7	108	1.9138			
Total	206.9	109				

BEST GENERALIZATION SUBTEST

WHITE VS. NON-WHITE PRETEST COMPARISON

Analysis of Variance:One Way

Summary

Groups PRE TEST	Count	Sum	Average	Variance
YWG WHITE	55	144	2.61818	2.35152
YBG NON-WHITE	55	139	2.52727	1.47609

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	0.227	1	0.22727	0.11875	0.73106	3.929
Within Groups	206.7	108	1.9138			
Total	206.9	109				

WORST GENERALIZATION SUBTEST

WHITE VS. NON-WHITE PRETEST COMPARISON

Analysis of Variance:One Way

Summary

Groups	Count	Sum	Average	Variance
YBP WHITE	55	181	3.290909	3.39529
YBP NON-WHITE	55	191	3.472727	1.95758

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	0.909	1	0.909091	0.33967	0.56124	3.929
Within Groups	289.1	108	2.676431			
Total	290	109				

BEST SUPPORT SUBTEST

WHITE VS. NON-WHITE PRETEST COMPARISON

Analysis of Variance:One Way

Summary

Groups PRETEST	Count	Sum	Average	Variance
YWP WHITE	55	151	2.745455	2.2303
YWP NON-WHITE	55	151	2.745455	1.2303

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	0	1	0	0	1	3.929
Within Groups	186.9	108	1.730303			
Total	186.9	109				

WORST SUPPORT SUBTEST

WHITE VS. NON-WHITE PRETEST COMPARISON

Analysis of Variance:One Way

Summary

Groups PRETEST	Count	Sum	Average	Variance
YBR WHITE	55	152	2.763636	2.10976
YBR NON-WHITE	55	167	3.036364	2.51717

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	2.045	1	2.045455	0.88415	0.34917	3.929
Within Groups	249.9	108	2.313468			
Total	251.9	109				

BEST SOURCE SUBTEST

APPENDIX O

Form Y post test Group Comparison
(summary tables on all subtests)

Z-Y GROUP BEST GENERALIZATION TEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	220.571	90			
Rows	8.793	1	8.793	3.901	---
Columns	3.912	1	3.912	1.735	---
Slices	7.594	1	7.594	3.369	---
R x C	2.995	1	2.995	1.329	---
R x S	6.050	1	6.050	2.684	---
C x S	-1.274	1	-1.274	-0.565	---
R x C x S	5.410	1	5.410	2.400	---
Error	187.091	83	2.254		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.022	1.726	46	HIGH, ALL COLUMNS, ALL SLICES
2.400	1.289	45	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.500	1.515	44	ALL ROWS, MALE, ALL SLICES
2.915	1.569	47	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.422	1.453	45	ALL ROWS, ALL COLUMNS, EXP
3.000	1.602	46	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
3.000	1.706	22	HIGH, MALE, ALL TRIALS
3.042	1.744	24	HIGH, FEMALE, ALL TRIALS
2.000	1.087	22	LOW, MALE, ALL TRIALS
2.783	1.350	23	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
2.478	1.691	23	HIGH, ALL COLUMNS, EXP
3.565	1.583	23	HIGH, ALL COLUMNS, CNTRL
2.364	1.150	22	LOW, ALL COLUMNS, EXP
2.435	1.409	23	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.346	1.440	26	ALL ROWS, MALE, EXP
2.722	1.592	18	ALL ROWS, MALE, CNTRL
2.526	1.464	19	ALL ROWS, FEMALE, EXP
3.179	1.582	28	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
2.769	1.717	13	HIGH, MALE, EXP
3.333	1.633	9	HIGH, MALE, CNTRL
2.100	1.578	10	HIGH, FEMALE, EXP
3.714	1.532	14	HIGH, FEMALE, CNTRL
1.923	0.917	13	LOW, MALE, EXP
2.111	1.286	9	LOW, MALE, CNTRL
3.000	1.155	9	LOW, FEMALE, EXP
2.643	1.445	14	LOW, FEMALE, CNTRL

Rows = High Low (level)
Colums = Male Female (sex)
Slices = Exp Control (grp)

Z-Y GROUP WORST GENERALIZATION TEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	179.033	90			
Rows	5.016	1	5.016	2.473	---
Columns	2.183	1	2.183	1.076	---
Slices	0.236	1	0.236	0.117	---
R x C	0.000	1	0.000	0.000	---
R x S	0.761	1	0.761	0.375	---
C x S	1.223	1	1.223	0.603	---
R x C x S	1.250	1	1.250	0.616	---
Error	168.363	83	2.028		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
2.870	1.439	46	HIGH, ALL COLUMNS, ALL SLICES
2.400	1.323	45	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.477	1.438	44	ALL ROWS, MALE, ALL SLICES
2.787	1.352	47	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.689	1.503	45	ALL ROWS, ALL COLUMNS, EXP
2.587	1.295	46	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
2.682	1.458	22	HIGH, MALE, ALL TRIALS
3.042	1.399	24	HIGH, FEMALE, ALL TRIALS
2.273	1.388	22	LOW, MALE, ALL TRIALS
2.522	1.247	23	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
2.826	1.551	23	HIGH, ALL COLUMNS, EXP
2.913	1.316	23	HIGH, ALL COLUMNS, CNTRL
2.545	1.437	22	LOW, ALL COLUMNS, EXP
2.261	1.188	23	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.462	1.575	26	ALL ROWS, MALE, EXP
2.500	1.213	18	ALL ROWS, MALE, CNTRL
3.000	1.338	19	ALL ROWS, FEMALE, EXP
2.643	1.342	28	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
2.692	1.682	13	HIGH, MALE, EXP
2.667	1.054	9	HIGH, MALE, CNTRL
3.000	1.342	10	HIGH, FEMALE, EXP
3.071	1.437	14	HIGH, FEMALE, CNTRL
2.231	1.423	13	LOW, MALE, EXP
2.333	1.333	9	LOW, MALE, CNTRL
3.000	1.333	9	LOW, FEMALE, EXP
2.214	1.081	14	LOW, FEMALE, CNTRL

Z-Y GROUP BEST SUPPORT TEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	214.110	90			
Rows	30.096	1	30.096	16.767	p<.01
Columns	9.245	1	9.245	5.150	p<.05
Slices	0.031	1	0.031	0.017	---
R x C	10.694	1	10.694	5.958	p<.05
R x S	5.849	1	5.849	3.259	---
C x S	0.909	1	0.909	0.506	---
R x C x S	8.302	1	8.302	4.625	p<.05
Error	148.984	83	1.795		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics*. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.239	1.432	46	HIGH, ALL COLUMNS, ALL SLICES
3.089	1.411	45	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
3.341	1.637	44	ALL ROWS, MALE, ALL SLICES
3.979	1.360	47	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
3.689	1.561	45	ALL ROWS, ALL COLUMNS, EXP
3.652	1.507	46	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
4.273	1.388	22	HIGH, MALE, ALL TRIALS
4.208	1.471	24	HIGH, FEMALE, ALL TRIALS
2.409	1.302	22	LOW, MALE, ALL TRIALS
3.739	1.188	23	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.000	1.615	23	HIGH, ALL COLUMNS, EXP
4.478	1.175	23	HIGH, ALL COLUMNS, CNTRL
3.364	1.432	22	LOW, ALL COLUMNS, EXP
2.826	1.340	23	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
3.462	1.646	26	ALL ROWS, MALE, EXP
3.167	1.607	18	ALL ROWS, MALE, CNTRL
4.000	1.376	19	ALL ROWS, FEMALE, EXP
3.964	1.349	28	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			R x C x S COMPARISONS
4.308	1.538	13	HIGH, MALE, EXP
4.222	1.133	9	HIGH, MALE, CNTRL
3.600	1.625	10	HIGH, FEMALE, EXP
4.643	1.172	14	HIGH, FEMALE, CNTRL
2.615	1.273	13	LOW, MALE, EXP
2.111	1.286	9	LOW, MALE, CNTRL
4.444	0.831	9	LOW, FEMALE, EXP
3.286	1.161	14	LOW, FEMALE, CNTRL

Z-Y GROUP WORST SUPPORT TEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	170.989	90			
Rows	20.332	1	20.332	12.375	p<.01
Columns	0.544	1	0.544	0.331	---
Slices	0.100	1	0.100	0.061	---
R x C	3.685	1	3.685	2.243	---
R x S	2.336	1	2.336	1.422	---
C x S	0.508	1	0.508	0.309	---
R x C x S	7.117	1	7.117	4.332	p<.05
Error	136.367	83	1.643		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.457	1.192	46	HIGH, ALL COLUMNS, ALL SLICES
2.511	1.376	45	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.909	1.443	44	ALL ROWS, MALE, ALL SLICES
3.064	1.295	47	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.956	1.382	45	ALL ROWS, ALL COLUMNS, EXP
3.022	1.359	46	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
3.591	1.154	22	HIGH, MALE, ALL TRIALS
3.333	1.213	24	HIGH, FEMALE, ALL TRIALS
2.227	1.379	22	LOW, MALE, ALL TRIALS
2.783	1.317	23	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
3.261	1.293	23	HIGH, ALL COLUMNS, EXP
3.652	1.047	23	HIGH, ALL COLUMNS, CNTRL
2.636	1.400	22	LOW, ALL COLUMNS, EXP
2.391	1.343	23	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.962	1.506	26	ALL ROWS, MALE, EXP
2.833	1.344	18	ALL ROWS, MALE, CNTRL
2.947	1.191	19	ALL ROWS, FEMALE, EXP
3.143	1.355	28	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			R x C x S COMPARISONS
3.692	1.202	13	HIGH, MALE, EXP
3.444	1.066	9	HIGH, MALE, CNTRL
2.700	1.187	10	HIGH, FEMALE, EXP
3.786	1.013	14	HIGH, FEMALE, CNTRL
2.231	1.423	13	LOW, MALE, EXP
2.222	1.315	9	LOW, MALE, CNTRL
3.222	1.133	9	LOW, FEMALE, EXP
2.500	1.350	14	LOW, FEMALE, CNTRL

Z-Y GROUP BEST SOURCE TEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	185.824	90			
Rows	10.689	1	10.689	6.606	p<.05
Columns	20.874	1	20.874	12.901	p<.01
Slices	0.928	1	0.928	0.573	---
R x C	1.930	1	1.930	1.193	---
R x S	8.913	1	8.913	5.508	p<.05
C x S	1.978	1	1.978	1.223	---
R x C x S	6.210	1	6.210	3.838	---
Error	134.301	83	1.618		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.152	1.367	46	HIGH, ALL COLUMNS, ALL SLICES
2.467	1.408	45	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.318	1.328	44	ALL ROWS, MALE, ALL SLICES
3.277	1.364	47	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.711	1.222	45	ALL ROWS, ALL COLUMNS, EXP
2.913	1.599	46	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
2.818	1.302	22	HIGH, MALE, ALL TRIALS
3.458	1.353	24	HIGH, FEMALE, ALL TRIALS
1.818	1.154	22	LOW, MALE, ALL TRIALS
3.087	1.349	23	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
2.739	1.188	23	HIGH, ALL COLUMNS, EXP
3.565	1.409	23	HIGH, ALL COLUMNS, CNTRL
2.682	1.257	22	LOW, ALL COLUMNS, EXP
2.261	1.510	23	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.462	1.216	26	ALL ROWS, MALE, EXP
2.111	1.449	18	ALL ROWS, MALE, CNTRL
3.053	1.146	19	ALL ROWS, FEMALE, EXP
3.429	1.474	28	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
2.846	1.231	13	HIGH, MALE, EXP
2.778	1.397	9	HIGH, MALE, CNTRL
2.600	1.114	10	HIGH, FEMALE, EXP
4.071	1.163	14	HIGH, FEMALE, CNTRL
2.077	1.071	13	LOW, MALE, EXP
1.444	1.165	9	LOW, MALE, CNTRL
3.556	0.956	9	LOW, FEMALE, EXP
2.786	1.473	14	LOW, FEMALE, CNTRL

Z-Y GROUP WORST SOURCE TEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	200.462	90			
Rows	14.983	1	14.983	8.988	p<.01
Columns	6.749	1	6.749	4.049	---
Slices	20.249	1	20.249	12.147	p<.01
R x C	2.115	1	2.115	1.269	---
R x S	4.868	1	4.868	2.920	---
C x S	-2.317	1	-2.317	-1.390	---
R x C x S	15.453	1	15.453	9.270	p<.01
Error	138.362	83	1.667		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

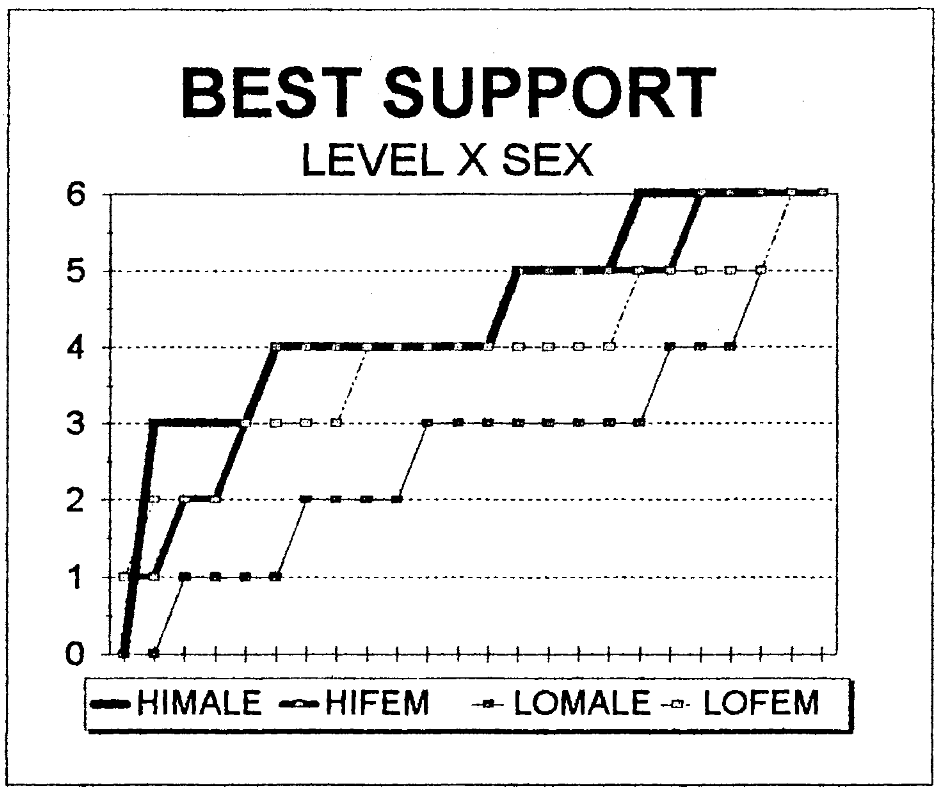
MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.478	1.514	46	HIGH, ALL COLUMNS, ALL SLICES
2.667	1.333	45	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.795	1.324	44	ALL ROWS, MALE, ALL SLICES
3.340	1.575	47	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.600	1.389	45	ALL ROWS, ALL COLUMNS, EXP
3.543	1.425	46	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
3.364	1.226	22	HIGH, MALE, ALL TRIALS
3.583	1.730	24	HIGH, FEMALE, ALL TRIALS
2.227	1.165	22	LOW, MALE, ALL TRIALS
3.087	1.349	23	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
2.783	1.413	23	HIGH, ALL COLUMNS, EXP
4.174	1.274	23	HIGH, ALL COLUMNS, CNTRL
2.409	1.337	22	LOW, ALL COLUMNS, EXP
2.913	1.282	23	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.538	1.365	26	ALL ROWS, MALE, EXP
3.167	1.167	18	ALL ROWS, MALE, CNTRL
2.684	1.416	19	ALL ROWS, FEMALE, EXP
3.786	1.520	28	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
3.231	1.187	13	HIGH, MALE, EXP
3.556	1.257	9	HIGH, MALE, CNTRL
2.200	1.470	10	HIGH, FEMALE, EXP
4.571	1.116	14	HIGH, FEMALE, CNTRL
1.846	1.167	13	LOW, MALE, EXP
2.778	0.916	9	LOW, MALE, CNTRL
3.222	1.133	9	LOW, FEMALE, EXP
3.000	1.464	14	LOW, FEMALE, CNTRL

APPENDIX P

Form Y post test Group Interactions
(charts and post hoc analysis)

Z-Y GROUP INTERACTIONS



BEST SUPPORT

TUKEY HSD TEST

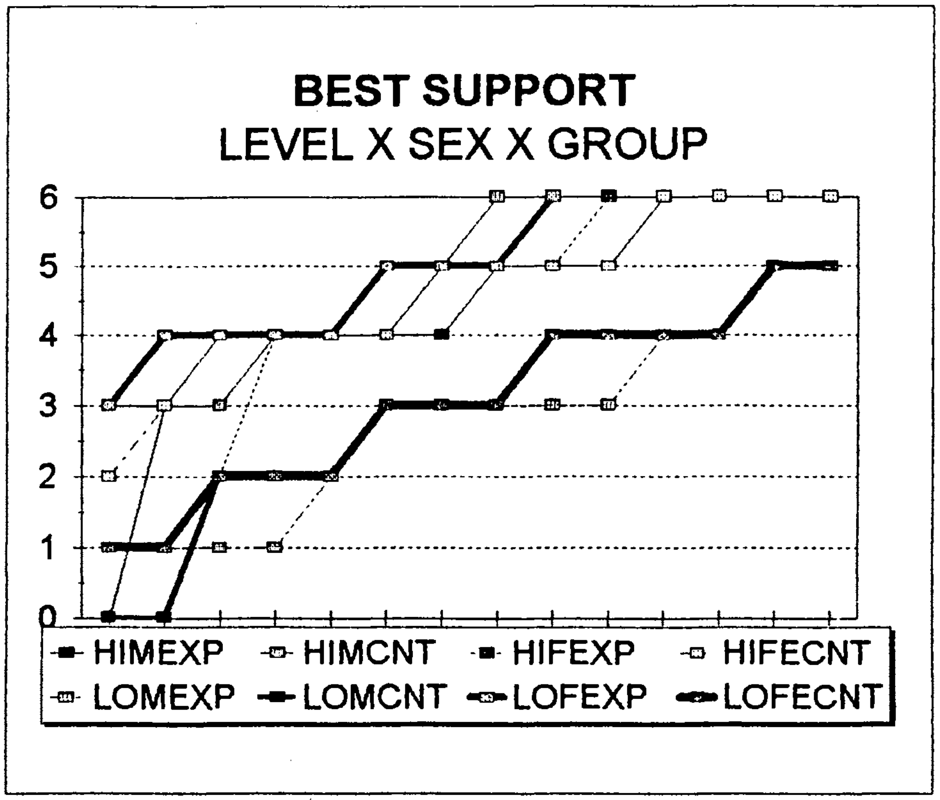
THE CRITICAL DIFFERENCES ARE 0.976 (.05) AND 1.194 (.01).

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 2	-0.826	N.S.
1 VS. 3	0.057	N.S.
1 VS. 4	0.478	N.S.
2 VS. 3	0.883	N.S.
2 VS. 4	1.304	P < .01
3 VS. 4	0.421	N.S.

Z Y BP

#1 Hi Exp
#2 Hi CNTRL
#3 Lo Exp
#4 Lo Exp

Z-Y GROUP INTERACTIONS



BEST SUPPORT

TUKEY HSD TEST

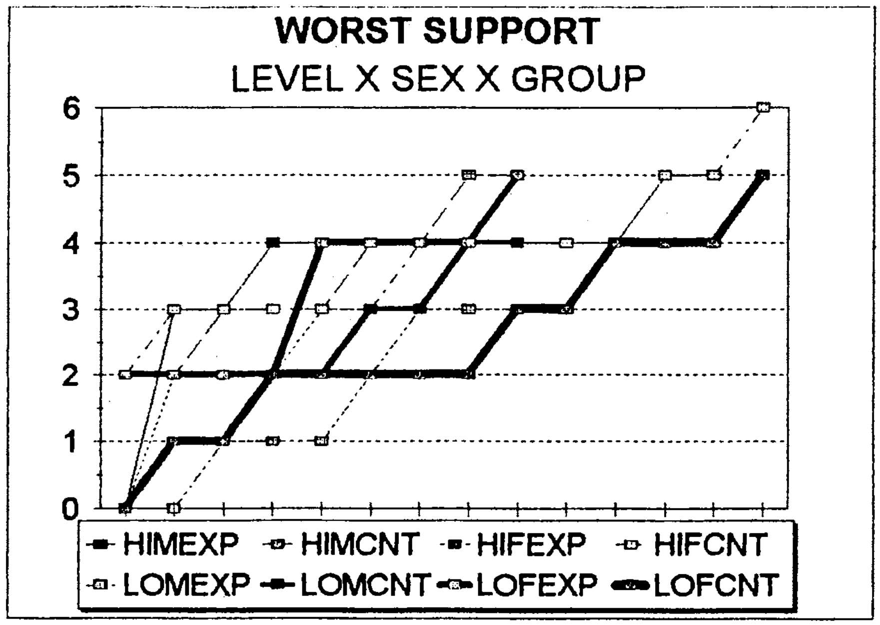
THE CRITICAL DIFFERENCES ARE 1.847 (.05) AND 2.169 (.01).

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 2	0.086	N.S.
1 VS. 3	0.708	N.S.
1 VS. 4	-0.335	N.S.
1 VS. 5	1.693	N.S.
1 VS. 6	2.197	P < .01
1 VS. 7	-0.136	N.S.
1 VS. 8	1.022	N.S.
2 VS. 3	0.622	N.S.
2 VS. 4	-0.421	N.S.
2 VS. 5	1.607	N.S.
2 VS. 6	2.111	P < .05
2 VS. 7	-0.222	N.S.
2 VS. 8	0.936	N.S.
3 VS. 4	-1.043	N.S.
3 VS. 5	0.985	N.S.
3 VS. 6	1.489	N.S.
3 VS. 7	-0.844	N.S.
3 VS. 8	0.314	N.S.
4 VS. 5	2.028	P < .05
4 VS. 6	2.532	P < .01
4 VS. 7	0.199	N.S.
4 VS. 8	1.357	N.S.
5 VS. 6	0.504	N.S.
5 VS. 7	-1.829	N.S.
5 VS. 8	-0.671	N.S.
6 VS. 7	-2.333	P < .01
6 VS. 8	-1.175	N.S.
7 VS. 8	1.158	N.S.

RXCXS Level X Sex X Group

Z-Y BP

Z-Y GROUP INTERACTIONS



WORST SUPPORT

TUKEY HSD TEST

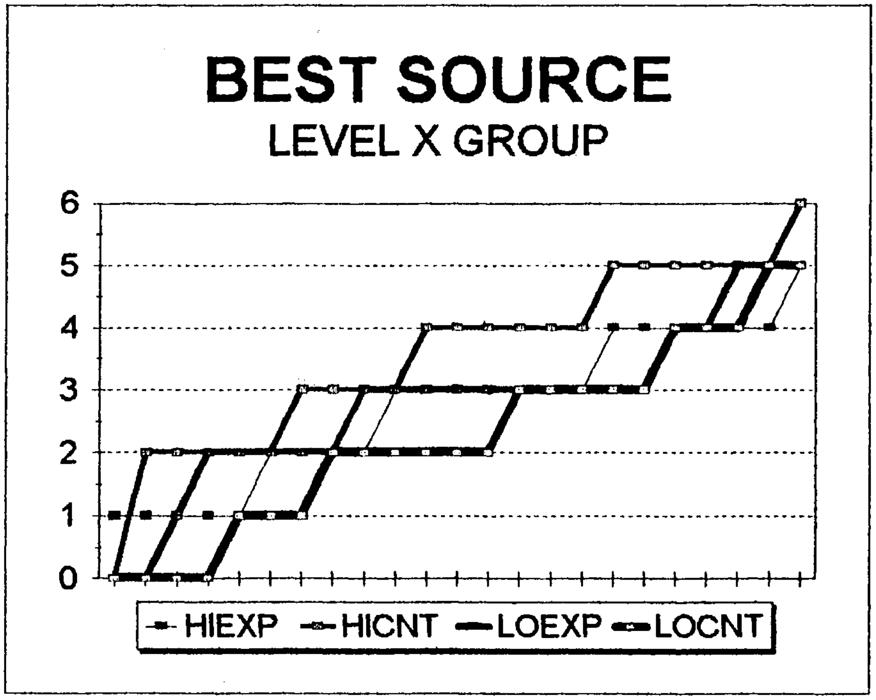
THE CRITICAL DIFFERENCES ARE 1.780 (.05) AND 2.090 (.01).

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 2	-0.325	N.S.
1 VS. 3	1.031	N.S.
1 VS. 4	-1.340	N.S.
1 VS. 5	1.385	N.S.
1 VS. 6	0.453	N.S.
1 VS. 7	0.009	N.S.
1 VS. 8	0.231	N.S.
2 VS. 3	1.356	N.S.
2 VS. 4	-1.015	N.S.
2 VS. 5	1.710	N.S.
2 VS. 6	0.778	N.S.
2 VS. 7	0.334	N.S.
2 VS. 8	0.556	N.S.
3 VS. 4	-2.371	P < .01
3 VS. 5	0.354	N.S.
3 VS. 6	-0.578	N.S.
3 VS. 7	-1.022	N.S.
3 VS. 8	-0.800	N.S.
4 VS. 5	2.725	P < .01
4 VS. 6	1.793	P < .05
4 VS. 7	1.349	N.S.
4 VS. 8	1.571	N.S.
5 VS. 6	-0.932	N.S.
5 VS. 7	-1.376	N.S.
5 VS. 8	-1.154	N.S.
6 VS. 7	-0.444	N.S.
6 VS. 8	-0.222	N.S.
7 VS. 8	0.222	N.S.

WP

Level X Sex X Group

Z-Y GROUP INTERACTIONS



BEST SOURCE

TUKEY HSD TEST

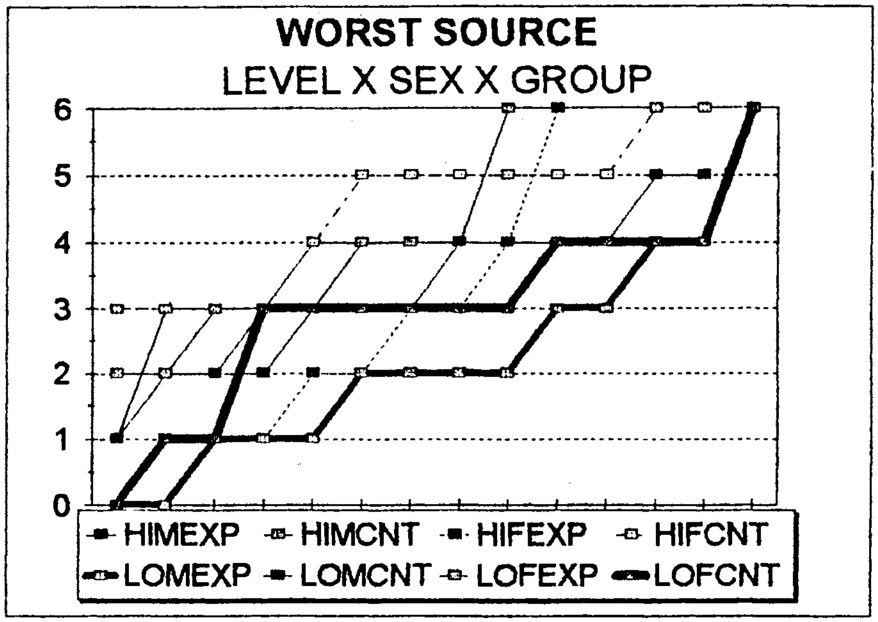
THE CRITICAL DIFFERENCES ARE 1.051 (.05) AND 1.285 (.01).

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 2	0.065	N.S.
1 VS. 3	1.864	P < .01
1 VS. 4	0.534	N.S.
2 VS. 3	1.799	P < .01
2 VS. 4	0.469	N.S.
3 VS. 4	-1.330	P < .01

RXC Z-Y B.R

Level X Sex

Z-Y GROUP INTERACTIONS



WORST SOURCE

TUKEY HSD TEST

THE CRITICAL DIFFERENCES ARE 1.051 (.05) AND 1.285 (.01).

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 2	0.065	N.S.
1 VS. 3	1.864	P < .01
1 VS. 4	0.534	N.S.
2 VS. 3	1.799	P < .01
2 VS. 4	0.469	N.S.
3 VS. 4	-1.330	P < .01

RXC Z-Y BR

Level X Sex

APPENDIX Q

Form Z post test Group Comparison
(summary tables on all subtests)

BEST GENERALIZATION SUBTEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	576.292	252			
Rows	89.836	1	89.836	46.124	p<.01
Columns	0.009	1	0.009	0.005	---
Slices	6.609	1	6.609	3.393	---
R x C	0.101	1	0.101	0.052	---
R x S	0.666	1	0.666	0.342	---
C x S	0.181	1	0.181	0.093	---
R x C x S	1.699	1	1.699	0.872	---
Error	477.190	245	1.948		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.357	1.456	126	HIGH, ALL COLUMNS, ALL SLICES
2.165	1.315	127	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.754	1.593	142	ALL ROWS, MALE, ALL SLICES
2.766	1.395	111	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.897	1.511	146	ALL ROWS, ALL COLUMNS, EXP
2.570	1.486	107	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
3.366	1.540	71	HIGH, MALE, ALL TRIALS
3.345	1.338	55	HIGH, FEMALE, ALL TRIALS
2.141	1.397	71	LOW, MALE, ALL TRIALS
2.196	1.201	56	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
3.486	1.434	72	HIGH, ALL COLUMNS, EXP
3.185	1.467	54	HIGH, ALL COLUMNS, CNTRL
2.324	1.357	74	LOW, ALL COLUMNS, EXP
1.943	1.220	53	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.869	1.587	84	ALL ROWS, MALE, EXP
2.586	1.587	58	ALL ROWS, MALE, CNTRL
2.935	1.401	62	ALL ROWS, FEMALE, EXP
2.551	1.356	49	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			R x C x S COMPARISONS
3.524	1.500	42	HIGH, MALE, EXP
3.138	1.570	29	HIGH, MALE, CNTRL
3.433	1.334	30	HIGH, FEMALE, EXP
3.240	1.335	25	HIGH, FEMALE, CNTRL
2.214	1.389	42	LOW, MALE, EXP
2.034	1.402	29	LOW, MALE, CNTRL
2.469	1.299	32	LOW, FEMALE, EXP
1.833	0.943	24	LOW, FEMALE, CNTRL

WORST GENERALIZATION SUBTEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	545.012	253			
Rows	73.894	1	73.894	38.764	p<.01
Columns	0.077	1	0.077	0.040	---
Slices	0.206	1	0.206	0.108	---
R x C	0.006	1	0.006	0.003	---
R x S	0.564	1	0.564	0.296	---
C x S	0.319	1	0.319	0.167	---
R x C x S	1.010	1	1.010	0.530	---
Error	468.937	246	1.906		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.386	1.398	127	HIGH, ALL COLUMNS, ALL SLICES
2.307	1.325	127	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.831	1.458	142	ALL ROWS, MALE, ALL SLICES
2.866	1.473	112	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.871	1.596	147	ALL ROWS, ALL COLUMNS, EXP
2.813	1.261	107	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
3.366	1.386	71	HIGH, MALE, ALL TRIALS
3.411	1.411	56	HIGH, FEMALE, ALL TRIALS
2.296	1.326	71	LOW, MALE, ALL TRIALS
2.321	1.324	56	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
3.452	1.490	73	HIGH, ALL COLUMNS, EXP
3.296	1.257	54	HIGH, ALL COLUMNS, CNTRL
2.297	1.486	74	LOW, ALL COLUMNS, EXP
2.321	1.060	53	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.881	1.538	84	ALL ROWS, MALE, EXP
2.759	1.330	58	ALL ROWS, MALE, CNTRL
2.857	1.670	63	ALL ROWS, FEMALE, EXP
2.878	1.172	49	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
3.405	1.432	42	HIGH, MALE, EXP
3.310	1.316	29	HIGH, MALE, CNTRL
3.516	1.563	31	HIGH, FEMALE, EXP
3.280	1.184	25	HIGH, FEMALE, CNTRL
2.357	1.461	42	LOW, MALE, EXP
2.207	1.095	29	LOW, MALE, CNTRL
2.219	1.515	32	LOW, FEMALE, EXP
2.458	0.999	24	LOW, FEMALE, CNTRL

BEST SUPPORT SUBTEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	376.102	254			
Rows	28.143	1	28.143	20.352	p<.01
Columns	0.212	1	0.212	0.153	---
Slices	0.708	1	0.708	0.512	---
R x C	1.519	1	1.519	1.098	---
R x S	4.059	1	4.059	2.936	---
C x S	0.031	1	0.031	0.022	---
R x C x S	-0.119	1	-0.119	-0.086	---
Error	341.549	247	1.383		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
2.617	1.167	128	HIGH, ALL COLUMNS, ALL SLICES
1.953	1.170	127	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.261	1.243	142	ALL ROWS, MALE, ALL SLICES
2.319	1.177	113	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.331	1.270	148	ALL ROWS, ALL COLUMNS, EXP
2.224	1.130	107	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
2.662	1.186	71	HIGH, MALE, ALL TRIALS
2.561	1.140	57	HIGH, FEMALE, ALL TRIALS
1.859	1.166	71	LOW, MALE, ALL TRIALS
2.071	1.163	56	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
2.770	1.192	74	HIGH, ALL COLUMNS, EXP
2.407	1.097	54	HIGH, ALL COLUMNS, CNTRL
1.892	1.192	74	LOW, ALL COLUMNS, EXP
2.038	1.132	53	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.310	1.253	84	ALL ROWS, MALE, EXP
2.190	1.224	58	ALL ROWS, MALE, CNTRL
2.359	1.291	64	ALL ROWS, FEMALE, EXP
2.265	1.006	49	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			R x C x S COMPARISONS
2.810	1.139	42	HIGH, MALE, EXP
2.448	1.220	29	HIGH, MALE, CNTRL
2.719	1.256	32	HIGH, FEMALE, EXP
2.360	0.933	25	HIGH, FEMALE, CNTRL
1.810	1.160	42	LOW, MALE, EXP
1.931	1.172	29	LOW, MALE, CNTRL
2.000	1.225	32	LOW, FEMALE, EXP
2.167	1.067	24	LOW, FEMALE, CNTRL

WORST SUPPORT SUBTEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	442.756	253			
Rows	29.118	1	29.118	17.462	p<.01
Columns	0.032	1	0.032	0.019	---
Slices	2.161	1	2.161	1.296	---
R x C	0.387	1	0.387	0.232	---
R x S	0.075	1	0.075	0.045	---
C x S	0.234	1	0.234	0.141	---
R x C x S	0.546	1	0.546	0.327	---
Error	410.203	246	1.667		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
2.567	1.378	127	HIGH, ALL COLUMNS, ALL SLICES
1.890	1.165	127	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.218	1.311	142	ALL ROWS, MALE, ALL SLICES
2.241	1.331	112	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.150	1.285	147	ALL ROWS, ALL COLUMNS, EXP
2.336	1.360	107	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
2.592	1.369	71	HIGH, MALE, ALL TRIALS
2.536	1.388	56	HIGH, FEMALE, ALL TRIALS
1.845	1.134	71	LOW, MALE, ALL TRIALS
1.946	1.201	56	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
2.466	1.396	73	HIGH, ALL COLUMNS, EXP
2.704	1.342	54	HIGH, ALL COLUMNS, CNTRL
1.838	1.078	74	LOW, ALL COLUMNS, EXP
1.962	1.273	53	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.119	1.267	84	ALL ROWS, MALE, EXP
2.362	1.361	58	ALL ROWS, MALE, CNTRL
2.190	1.308	63	ALL ROWS, FEMALE, EXP
2.306	1.358	49	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
2.500	1.402	42	HIGH, MALE, EXP
2.724	1.310	29	HIGH, MALE, CNTRL
2.419	1.386	31	HIGH, FEMALE, EXP
2.680	1.378	25	HIGH, FEMALE, CNTRL
1.738	0.977	42	LOW, MALE, EXP
2.000	1.313	29	LOW, MALE, CNTRL
1.969	1.185	32	LOW, FEMALE, EXP
1.917	1.222	24	LOW, FEMALE, CNTRL

BEST SOURCE SUBTEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	639.717	253			
Rows	98.283	1	98.283	45.177	p<.01
Columns	0.087	1	0.087	0.040	---
Slices	1.801	1	1.801	0.828	---
R x C	3.921	1	3.921	1.802	---
R x S	0.349	1	0.349	0.161	---
C x S	0.063	1	0.063	0.029	---
R x C x S	0.031	1	0.031	0.014	---
Error	535.180	246	2.176		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.244	1.390	127	HIGH, ALL COLUMNS, ALL SLICES
3.000	1.527	127	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
3.606	1.644	142	ALL ROWS, MALE, ALL SLICES
3.643	1.511	112	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
3.694	1.606	147	ALL ROWS, ALL COLUMNS, EXP
3.523	1.555	107	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
4.338	1.373	71	HIGH, MALE, ALL TRIALS
4.125	1.402	56	HIGH, FEMALE, ALL TRIALS
2.873	1.565	71	LOW, MALE, ALL TRIALS
3.161	1.461	56	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.301	1.430	73	HIGH, ALL COLUMNS, EXP
4.167	1.330	54	HIGH, ALL COLUMNS, CNTRL
3.095	1.544	74	LOW, ALL COLUMNS, EXP
2.868	1.493	53	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
3.667	1.657	84	ALL ROWS, MALE, EXP
3.517	1.621	58	ALL ROWS, MALE, CNTRL
3.730	1.535	63	ALL ROWS, FEMALE, EXP
3.531	1.472	49	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
4.381	1.463	42	HIGH, MALE, EXP
4.276	1.229	29	HIGH, MALE, CNTRL
4.194	1.378	31	HIGH, FEMALE, EXP
4.040	1.428	25	HIGH, FEMALE, CNTRL
2.952	1.527	42	LOW, MALE, EXP
2.759	1.611	29	LOW, MALE, CNTRL
3.281	1.546	32	LOW, FEMALE, EXP
3.000	1.323	24	LOW, FEMALE, CNTRL

WORST SOURCE SUBTEST SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	500.094	253			
Rows	49.386	1	49.386	27.791	p<.01
Columns	6.844	1	6.844	3.851	---
Slices	0.362	1	0.362	0.203	---
R x C	0.926	1	0.926	0.521	---
R x S	3.665	1	3.665	2.062	---
C x S	0.487	1	0.487	0.274	---
R x C x S	1.269	1	1.269	0.714	---
Error	437.157	246	1.777		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
3.354	1.258	127	HIGH, ALL COLUMNS, ALL SLICES
2.472	1.402	127	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
2.768	1.432	142	ALL ROWS, MALE, ALL SLICES
3.098	1.343	112	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
2.946	1.418	147	ALL ROWS, ALL COLUMNS, EXP
2.869	1.381	107	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
3.155	1.391	71	HIGH, MALE, ALL TRIALS
3.607	1.012	56	HIGH, FEMALE, ALL TRIALS
2.380	1.367	71	LOW, MALE, ALL TRIALS
2.589	1.436	56	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
3.288	1.308	73	HIGH, ALL COLUMNS, EXP
3.444	1.181	54	HIGH, ALL COLUMNS, CNTRL
2.608	1.441	74	LOW, ALL COLUMNS, EXP
2.283	1.323	53	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
2.774	1.417	84	ALL ROWS, MALE, EXP
2.759	1.454	58	ALL ROWS, MALE, CNTRL
3.175	1.386	63	ALL ROWS, FEMALE, EXP
3.000	1.278	49	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
3.119	1.418	42	HIGH, MALE, EXP
3.207	1.349	29	HIGH, MALE, CNTRL
3.516	1.103	31	HIGH, FEMALE, EXP
3.720	0.873	25	HIGH, FEMALE, CNTRL
2.429	1.330	42	LOW, MALE, EXP
2.310	1.417	29	LOW, MALE, CNTRL
2.844	1.543	32	LOW, FEMALE, EXP
2.250	1.199	24	LOW, FEMALE, CNTRL

APPENDIX R

Nonwhite Authoritarian Scores
(AA & AS summary tables)

NON-WHITE AUTHORITARIAN AGGRESSION SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	41.157	57			
Rows	1.811	1	1.811	2.523	---
Columns	2.641	1	2.641	3.678	---
Slices	0.270	1	0.270	0.376	---
R x C	0.002	1	0.002	0.002	---
R x S	0.641	1	0.641	0.892	---
C x S	-0.050	1	-0.050	-0.069	---
R x C x S	-0.062	1	-0.062	-0.087	---
Error	35.904	50	0.718		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.500	0.773	29	HIGH, ALL COLUMNS, ALL SLICES
4.147	0.871	29	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
4.087	0.793	26	ALL ROWS, MALE, ALL SLICES
4.516	0.833	32	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
4.379	0.871	35	ALL ROWS, ALL COLUMNS, EXP
4.239	0.790	23	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
4.269	0.695	13	HIGH, MALE, ALL TRIALS
4.688	0.783	16	HIGH, FEMALE, ALL TRIALS
3.904	0.841	13	LOW, MALE, ALL TRIALS
4.344	0.845	16	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.647	0.780	17	HIGH, ALL COLUMNS, EXP
4.292	0.713	12	HIGH, ALL COLUMNS, CNTRL
4.125	0.876	18	LOW, ALL COLUMNS, EXP
4.182	0.862	11	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
4.117	0.836	15	ALL ROWS, MALE, EXP
4.045	0.727	11	ALL ROWS, MALE, CNTRL
4.575	0.844	20	ALL ROWS, FEMALE, EXP
4.417	0.803	12	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
4.429	0.619	7	HIGH, MALE, EXP
4.083	0.731	6	HIGH, MALE, CNTRL
4.800	0.843	10	HIGH, FEMALE, EXP
4.500	0.629	6	HIGH, FEMALE, CNTRL
3.844	0.903	8	LOW, MALE, EXP
4.000	0.720	5	LOW, MALE, CNTRL
4.350	0.784	10	LOW, FEMALE, EXP
4.333	0.937	6	LOW, FEMALE, CNTRL

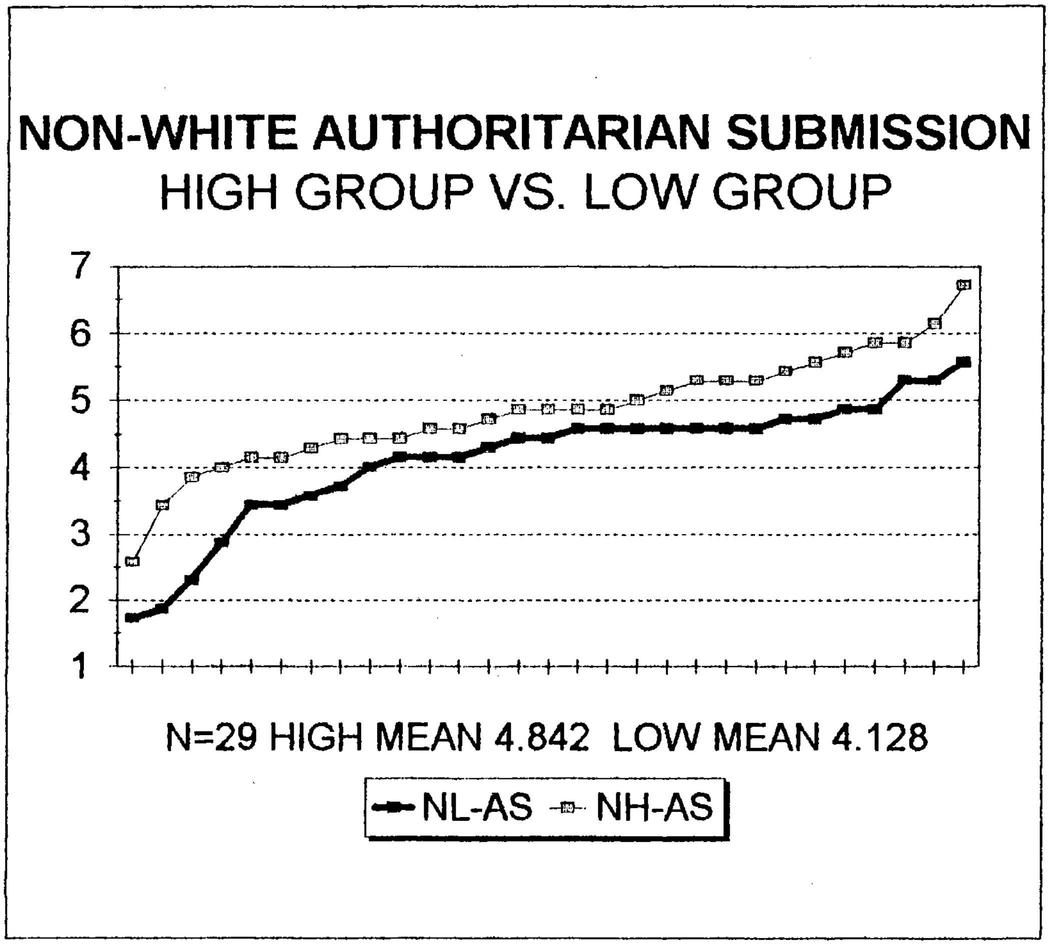
NON-WHITE AUTHORITARIAN SUBMISSION SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	53.674	57			
Rows	7.399	1	7.399	8.339	p<.01
Columns	0.708	1	0.708	0.798	---
Slices	0.039	1	0.039	0.044	---
R x C	0.411	1	0.411	0.463	---
R x S	0.535	1	0.535	0.603	---
C x S	0.195	1	0.195	0.220	---
R x C x S	0.028	1	0.028	0.032	---
Error	44.359	50	0.887		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.842	0.845	29	HIGH, ALL COLUMNS, ALL SLICES
4.128	0.939	29	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
4.363	1.060	26	ALL ROWS, MALE, ALL SLICES
4.585	0.862	32	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
4.506	0.848	35	ALL ROWS, ALL COLUMNS, EXP
4.453	1.112	23	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
4.626	0.901	13	HIGH, MALE, ALL TRIALS
5.018	0.753	16	HIGH, FEMALE, ALL TRIALS
4.099	1.138	13	LOW, MALE, ALL TRIALS
4.152	0.738	16	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.798	0.622	17	HIGH, ALL COLUMNS, EXP
4.905	1.082	12	HIGH, ALL COLUMNS, CNTRL
4.230	0.937	18	LOW, ALL COLUMNS, EXP
3.961	0.918	11	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
4.324	0.884	15	ALL ROWS, MALE, EXP
4.415	1.258	11	ALL ROWS, MALE, CNTRL
4.643	0.793	20	ALL ROWS, FEMALE, EXP
4.488	0.957	12	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
4.490	0.424	7	HIGH, MALE, EXP
4.786	1.225	6	HIGH, MALE, CNTRL
5.014	0.647	10	HIGH, FEMALE, EXP
5.023	0.902	6	HIGH, FEMALE, CNTRL
4.179	1.124	8	LOW, MALE, EXP
3.971	1.148	5	LOW, MALE, CNTRL
4.272	0.752	10	LOW, FEMALE, EXP
3.952	0.668	6	LOW, FEMALE, CNTRL


NON-WHITE AUTHORITARIAN SUBMISSION
HIGH GROUP VS. LOW GROUP
7
6
5
4
3
2
1
N=29 HIGH MEAN 4.842 LOW MEAN 4.128
NL-AS
NH-AS

APPENDIX S

White Authoritarian Scores
(AA & AS summary tables)

WHITE AUTHORITARIAN AGGRESSION SUMMARY TABLE

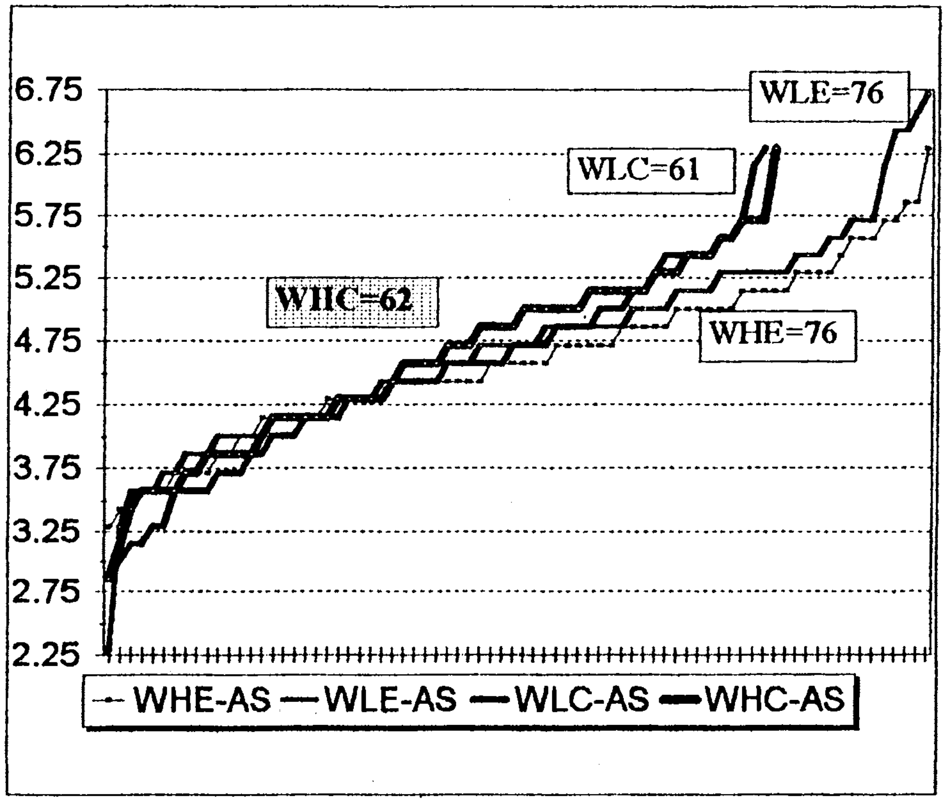
SOURCE	SS	df	ms	F	
Total	163.250	274			
Rows	0.026	1	0.026	0.045	---
Columns	0.016	1	0.016	0.027	---
Slices	0.906	1	0.906	1.549	---
R x C	1.045	1	1.045	1.787	---
R x S	2.663	1	2.663	4.553	p<.05
C x S	0.666	1	0.666	1.139	---
R x C x S	1.741	1	1.741	2.977	---
Error	156.186	267	0.585		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.690	0.795	138	HIGH, ALL COLUMNS, ALL SLICES
4.710	0.745	137	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
4.707	0.777	153	ALL ROWS, MALE, ALL SLICES
4.692	0.762	122	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
4.752	0.730	152	ALL ROWS, ALL COLUMNS, EXP
4.636	0.814	123	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
4.752	0.755	77	HIGH, MALE, ALL TRIALS
4.613	0.836	61	HIGH, FEMALE, ALL TRIALS
4.661	0.796	76	LOW, MALE, ALL TRIALS
4.770	0.672	61	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.831	0.736	76	HIGH, ALL COLUMNS, EXP
4.518	0.830	62	HIGH, ALL COLUMNS, CNTRL
4.673	0.715	76	LOW, ALL COLUMNS, EXP
4.756	0.778	61	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
4.716	0.742	92	ALL ROWS, MALE, EXP
4.693	0.826	61	ALL ROWS, MALE, CNTRL
4.806	0.706	60	ALL ROWS, FEMALE, EXP
4.581	0.798	62	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
4.899	0.716	46	HIGH, MALE, EXP
4.532	0.757	31	HIGH, MALE, CNTRL
4.725	0.752	30	HIGH, FEMALE, EXP
4.504	0.897	31	HIGH, FEMALE, CNTRL
4.533	0.722	46	LOW, MALE, EXP
4.858	0.860	30	LOW, MALE, CNTRL
4.887	0.647	30	LOW, FEMALE, EXP
4.657	0.675	31	LOW, FEMALE, CNTRL

WHITE AUTHORITARIAN AGGRESSION



NEUMAN-KEULS TEST

FOR R = 2 THE CRITICAL DIFFERENCES ARE:
0.271 AT THE .05 LEVEL AND 0.356 AT THE .01 LEVEL.

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 2	0.155	N.S.
2 VS. 3	0.083	N.S.
3 VS. 4	0.075	N.S.

FOR R = 3 THE CRITICAL DIFFERENCES ARE:
0.324 AT THE .05 LEVEL AND 0.403 AT THE .01 LEVEL.

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 3	0.238	N.S.
2 VS. 4	0.158	N.S.

FOR R = 4 THE CRITICAL DIFFERENCES ARE:
0.355 AT THE .05 LEVEL AND 0.431 AT THE .01 LEVEL.

COMPARISON	DIFFERENCE	P-VALUE
1 VS. 4	0.313	N.S.

WHITE AUTHORITARIAN SUBMISSION SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	148.580	274			
Rows	0.013	1	0.013	0.023	---
Columns	0.380	1	0.380	0.703	---
Slices	1.387	1	1.387	2.565	---
R x C	0.048	1	0.048	0.089	---
R x S	1.007	1	1.007	1.863	---
C x S	1.069	1	1.069	1.978	---
R x C x S	0.302	1	0.302	0.559	---
Error	144.373	267	0.541		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.601	0.679	138	HIGH, ALL COLUMNS, ALL SLICES
4.613	0.788	137	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
4.574	0.733	153	ALL ROWS, MALE, ALL SLICES
4.649	0.735	122	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
4.671	0.719	152	ALL ROWS, ALL COLUMNS, EXP
4.528	0.747	123	ALL ROWS, ALL COLUMNS, CNTRL
			R x C COMPARISONS
4.581	0.653	77	HIGH, MALE, ALL TRIALS
4.628	0.709	61	HIGH, FEMALE, ALL TRIALS
4.568	0.806	76	LOW, MALE, ALL TRIALS
4.670	0.760	61	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.611	0.642	76	HIGH, ALL COLUMNS, EXP
4.590	0.721	62	HIGH, ALL COLUMNS, CNTRL
4.731	0.783	76	LOW, ALL COLUMNS, EXP
4.466	0.768	61	LOW, ALL COLUMNS, CNTRL
			C x S COMPARISONS
4.593	0.682	92	ALL ROWS, MALE, EXP
4.546	0.803	61	ALL ROWS, MALE, CNTRL
4.790	0.756	60	ALL ROWS, FEMALE, EXP
4.511	0.687	62	ALL ROWS, FEMALE, CNTRL

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	R x C x S COMPARISONS
4.528	0.596	46	HIGH, MALE, EXP
4.659	0.722	31	HIGH, MALE, CNTRL
4.738	0.689	30	HIGH, FEMALE, EXP
4.521	0.712	31	HIGH, FEMALE, CNTRL
4.658	0.753	46	LOW, MALE, EXP
4.429	0.864	30	LOW, MALE, CNTRL
4.843	0.814	30	LOW, FEMALE, EXP
4.502	0.661	31	LOW, FEMALE, CNTRL

APPENDIX T

White vs. Nonwhite Authoritarian Scores
(AA & AS summary tables)

WHITE vs.NON-WHITE AA COMPARISON SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	71.671	115			
Rows	1.019	1	1.019	1.739	---
Columns	0.689	1	0.689	1.175	---
Slices	2.767	1	2.767	4.720	p<.05
R x C	0.497	1	0.497	0.848	---
R x S	0.802	1	0.802	1.368	---
C x S	2.164	1	2.164	3.691	---
R x C x S	0.414	1	0.414	0.706	---
Error	63.318	108	0.586		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). Computational handbook of statistics. Glenview, IL: Scott, Foresman.

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.574	0.797	58	HIGH, ALL COLUMNS, ALL SLICES
4.386	0.763	58	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
4.394	0.798	52	ALL ROWS, MALE, ALL SLICES
4.550	0.769	64	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
4.634	0.692	58	ALL ROWS, ALL COLUMNS, WHITE
4.326	0.842	58	ALL ROWS, ALL COLUMNS, NON-WHITE
			R x C COMPARISONS
4.561	0.814	26	HIGH, MALE, ALL TRIALS
4.584	0.783	32	HIGH, FEMALE, ALL TRIALS
4.228	0.746	26	LOW, MALE, ALL TRIALS
4.515	0.753	32	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.645	0.815	29	HIGH, ALL COLUMNS, WHITE
4.502	0.773	29	HIGH, ALL COLUMNS, NON-WHITE
4.624	0.541	29	LOW, ALL COLUMNS, WHITE
4.149	0.872	29	LOW, ALL COLUMNS, NON-WHITE
			C x S COMPARISONS
4.700	0.678	26	ALL ROWS, MALE, WHITE
4.088	0.792	26	ALL ROWS, MALE, NON-WHITE
4.581	0.698	32	ALL ROWS, FEMALE, WHITE
4.518	0.833	32	ALL ROWS, FEMALE, NON-WHITE

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			R x C x S COMPARISONS
4.850	0.823	13	HIGH, MALE, WHITE
4.272	0.694	13	HIGH, MALE, NON-WHITE
4.479	0.769	16	HIGH, FEMALE, WHITE
4.690	0.782	16	HIGH, FEMALE, NON-WHITE
4.551	0.445	13	LOW, MALE, WHITE
3.905	0.841	13	LOW, MALE, NON-WHITE
4.683	0.601	16	LOW, FEMALE, WHITE
4.346	0.846	16	LOW, FEMALE, NON-WHITE

WHITE vs. NON-WHITE AS COMPARISON SUMMARY TABLE

SOURCE	SS	df	ms	F	
Total	83.135	115			
Rows	8.926	1	8.926	13.356	p<.01
Columns	0.133	1	0.133	0.199	---
Slices	0.106	1	0.106	0.159	---
R x C	0.071	1	0.071	0.106	---
R x S	0.699	1	0.699	1.047	---
C x S	0.643	1	0.643	0.962	---
R x C x S	0.379	1	0.379	0.567	---
Error	72.177	108	0.668		

REFERENCE: Bruning, J. L. & Kintz, B. L. (1987). *Computational handbook of statistics.* Glenview, IL: Scott, Foresman.

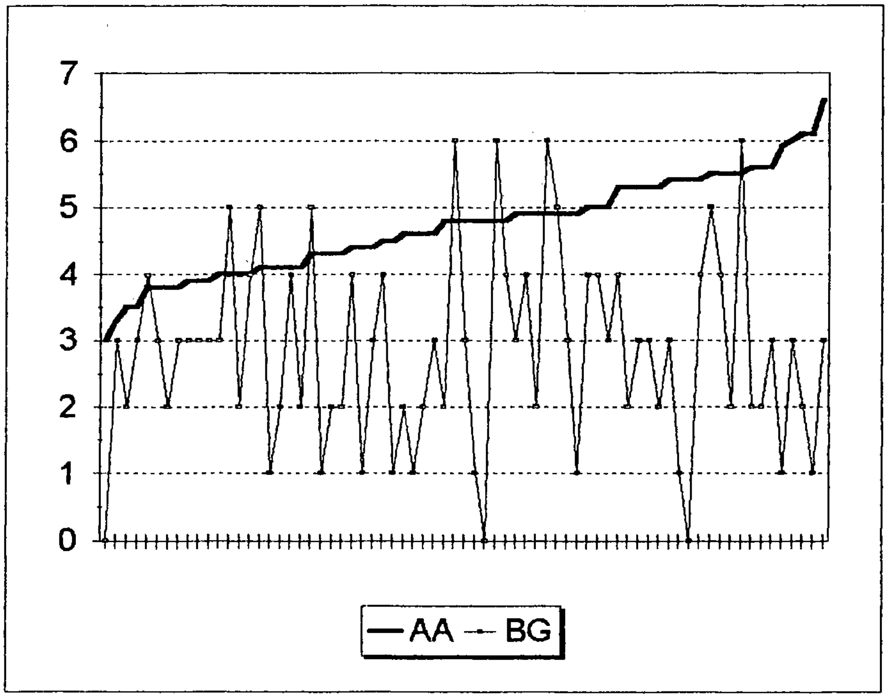
MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			ROW COMPARISONS
4.791	0.722	58	HIGH, ALL COLUMNS, ALL SLICES
4.236	0.871	58	LOW, ALL COLUMNS, ALL SLICES
			COLUMN COMPARISONS
4.476	0.915	52	ALL ROWS, MALE, ALL SLICES
4.544	0.785	64	ALL ROWS, FEMALE, ALL SLICES
			SLICE COMPARISONS
4.544	0.716	58	ALL ROWS, ALL COLUMNS, WHITE
4.483	0.958	58	ALL ROWS, ALL COLUMNS, NON-WHITE
			R x C COMPARISONS
4.726	0.720	26	HIGH, MALE, ALL TRIALS
4.843	0.720	32	HIGH, FEMALE, ALL TRIALS
4.225	1.016	26	LOW, MALE, ALL TRIALS
4.244	0.731	32	LOW, FEMALE, ALL TRIALS
			R x S COMPARISONS
4.743	0.579	29	HIGH, ALL COLUMNS, WHITE
4.838	0.838	29	HIGH, ALL COLUMNS, NON-WHITE
4.344	0.782	29	LOW, ALL COLUMNS, WHITE
4.128	0.939	29	LOW, ALL COLUMNS, NON-WHITE
			C x S COMPARISONS
4.588	0.726	26	ALL ROWS, MALE, WHITE
4.363	1.060	26	ALL ROWS, MALE, NON-WHITE
4.507	0.706	32	ALL ROWS, FEMALE, WHITE
4.581	0.854	32	ALL ROWS, FEMALE, NON-WHITE

MEAN SCORE	STANDARD DEVIATION	SAMPLE SIZE	
			R x C x S COMPARISONS
4.825	0.453	13	HIGH, MALE, WHITE
4.627	0.901	13	HIGH, MALE, NON-WHITE
4.677	0.657	16	HIGH, FEMALE, WHITE
5.009	0.741	16	HIGH, FEMALE, NON-WHITE
4.352	0.859	13	LOW, MALE, WHITE
4.098	1.138	13	LOW, MALE, NON-WHITE
4.337	0.713	16	LOW, FEMALE, WHITE
4.152	0.737	16	LOW, FEMALE, NON-WHITE

APPENDIX U

Correlations

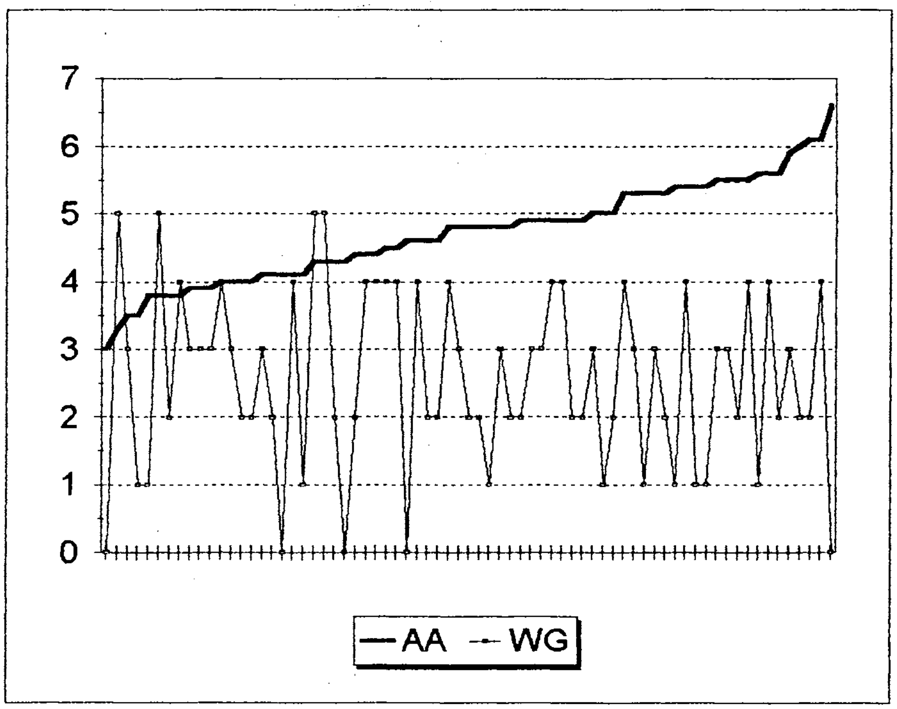
CORRELATIONS WITH AUTHORITARIAN AGGRESSION



	AA	BG
AA	1	
BG	0.012234	1

AUTH AGGRESSION & BEST GENERALIZATION

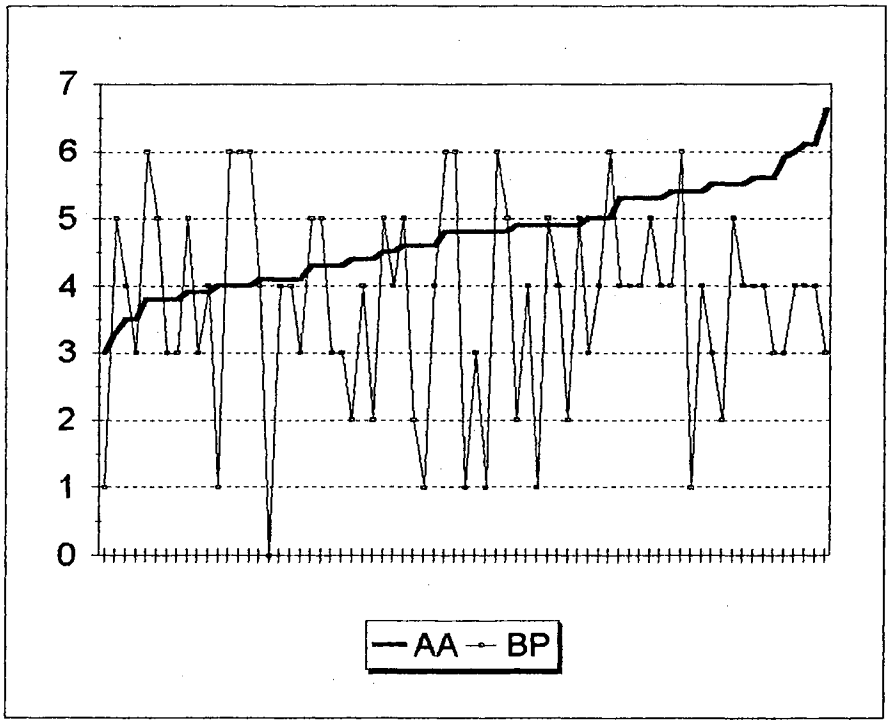
CORRELATIONS WITH AUTHORITARIAN AGGRESSION



	AA	WG
AA	1	
WG	-0.09283	1

AUTH AGGRESSION & WORST GENERALIZATION

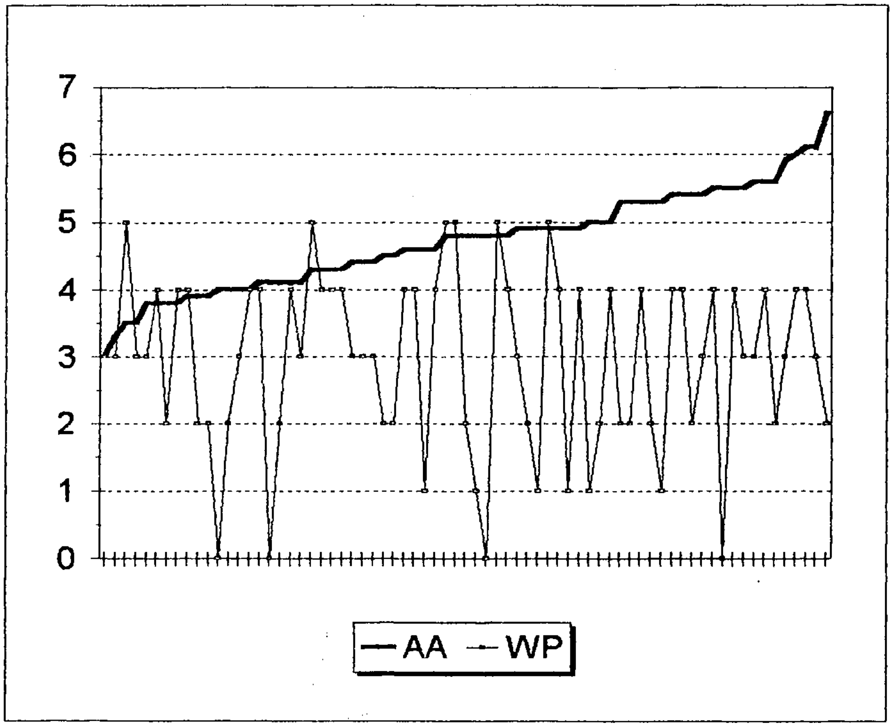
CORRELATIONS WITH AUTHORITARIAN AGGRESSION



	AA	BP
AA	1	
BP	0.003446	1

AUTH AGGRESSION & BEST SUPPORT

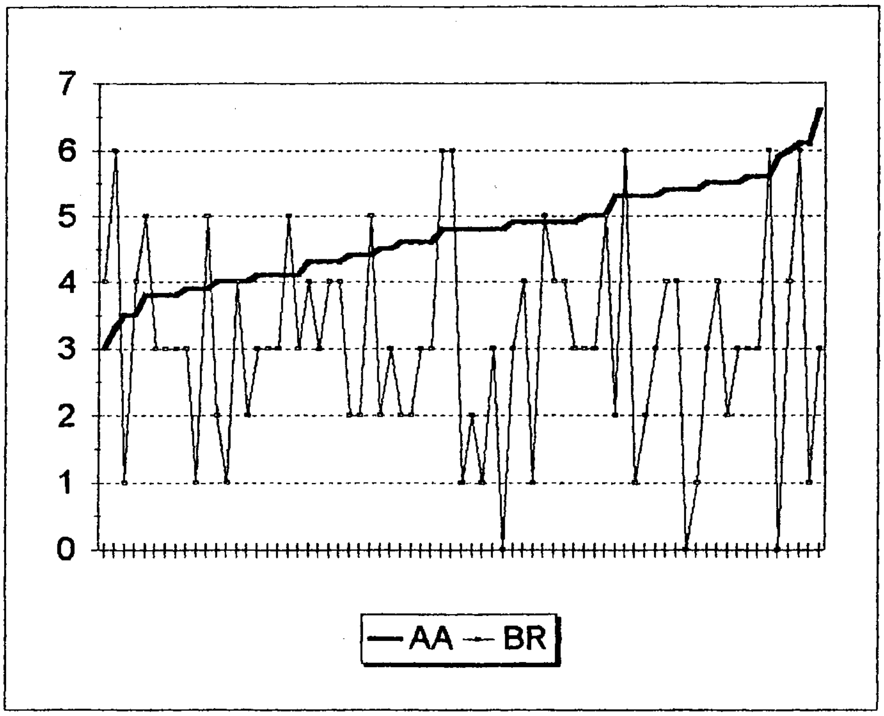
CORRELATIONS WITH AUTHORITARIAN AGGRESSION



	AA	WP
AA	1	
WP	-0.04725	1

AUTH AGGRESSION & WORST SUPPORT

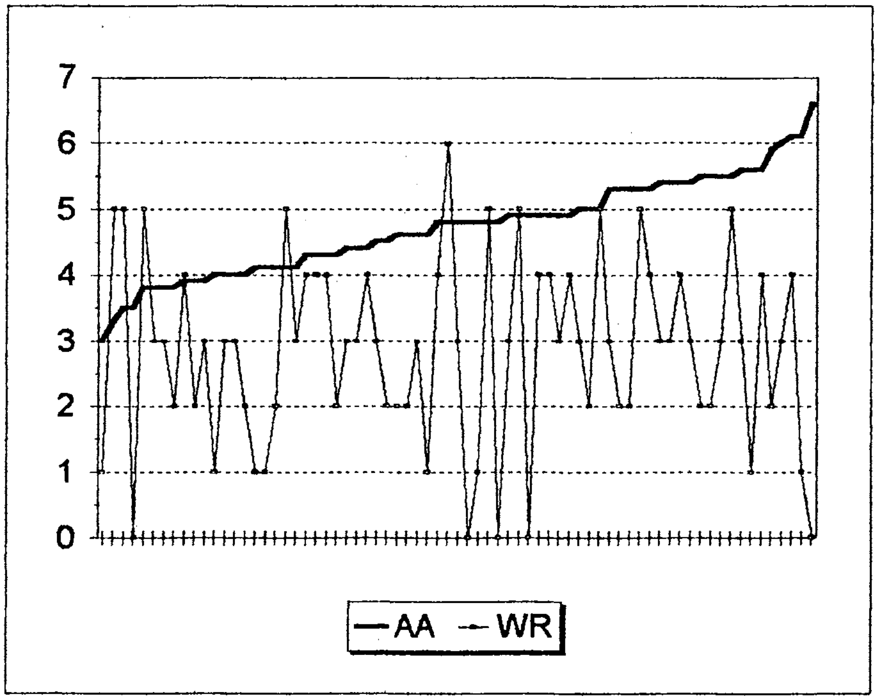
CORRELATIONS WITH AUTHORITARIAN AGGRESSION



	AA	BR
AA	1	
BR	-0.08114	1

AUTH AGGRESSION & BEST SOURCE

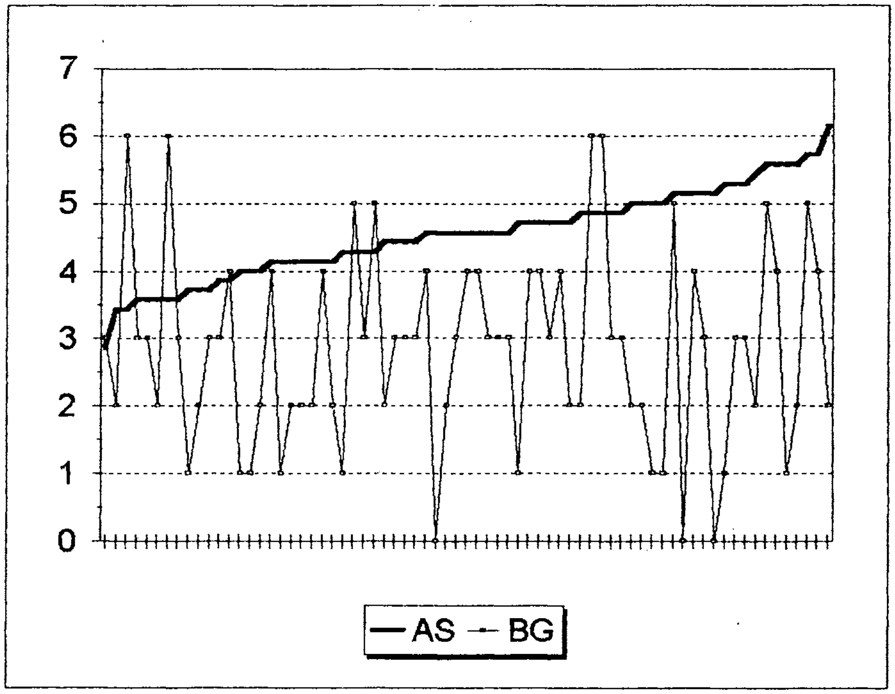
CORRELATIONS WITH AUTHORITARIAN AGGRESSION



	AA	WR
AA	1	
WR	-0.0389	1

AUTH AGGRESSION & WORST SOURCE

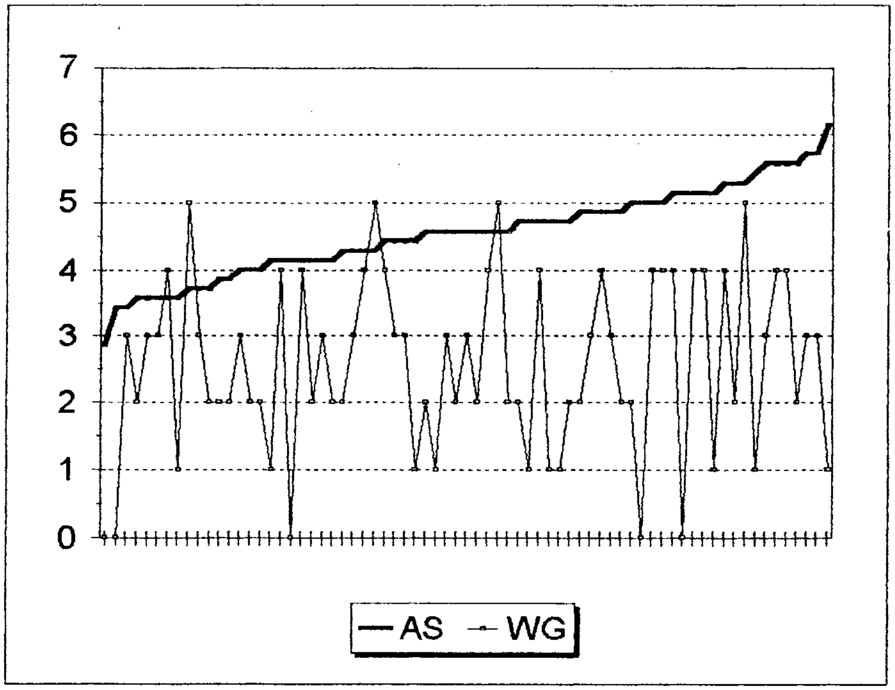
CORRELATIONS WITH AUTHORITARIAN SUBMISSION



	AS	BG
AS	1	
BG	-0.0275	1

AUTH SUBMISSION & BEST GENERALIZATION

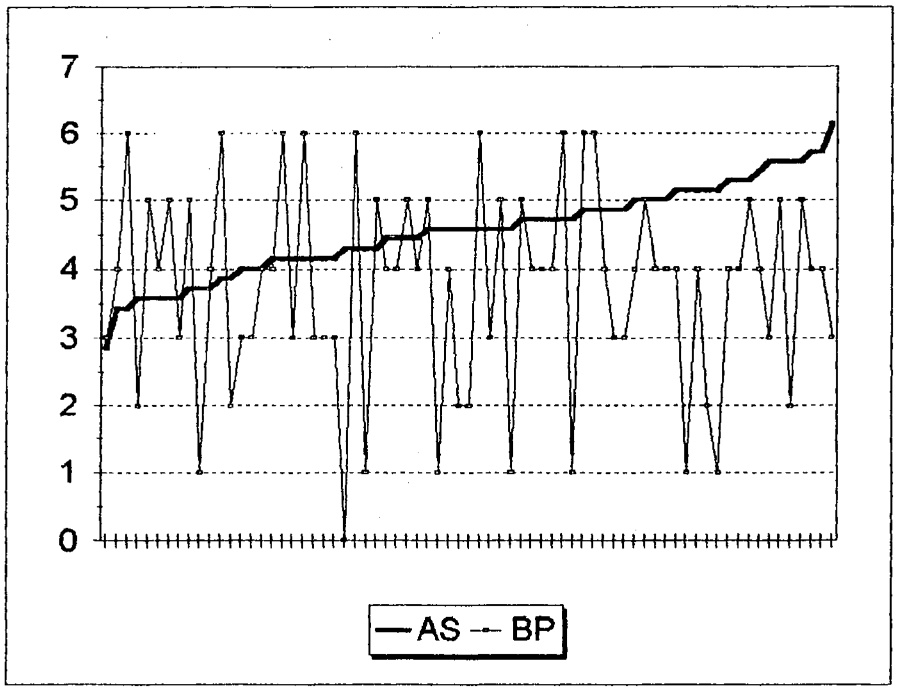
CORRELATIONS WITH AUTHORITARIAN SUBMISSION



	AS	WG
AS	1	
WG	0.122509	1

AUTH SUBMISSION & WORST GENERALIZATION

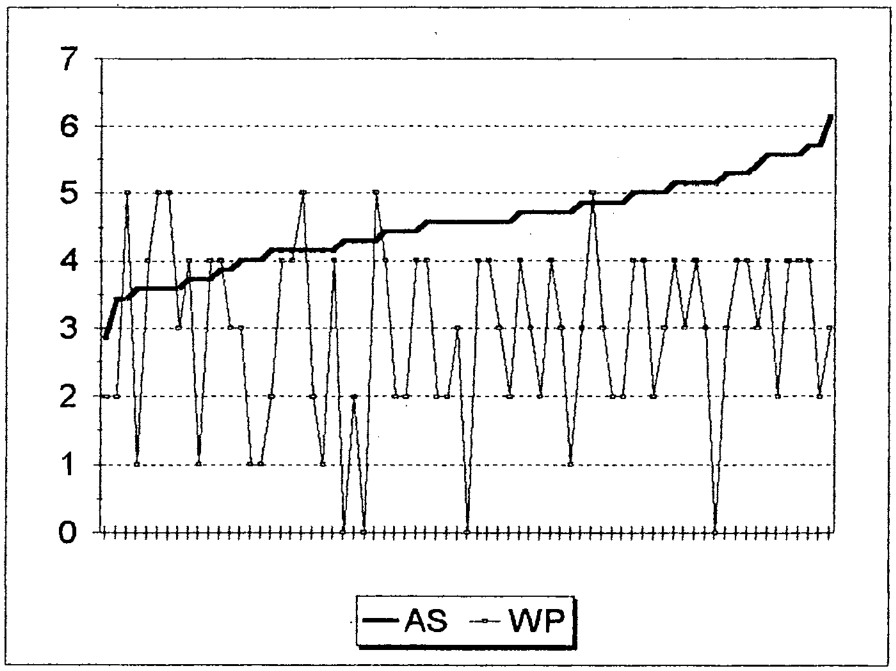
CORRELATIONS WITH AUTHORITARIAN SUBMISSION



	AS	BP
AS	1	
BP	-0.02331	1

AUTH SUBMISSION & BEST SUPPORT

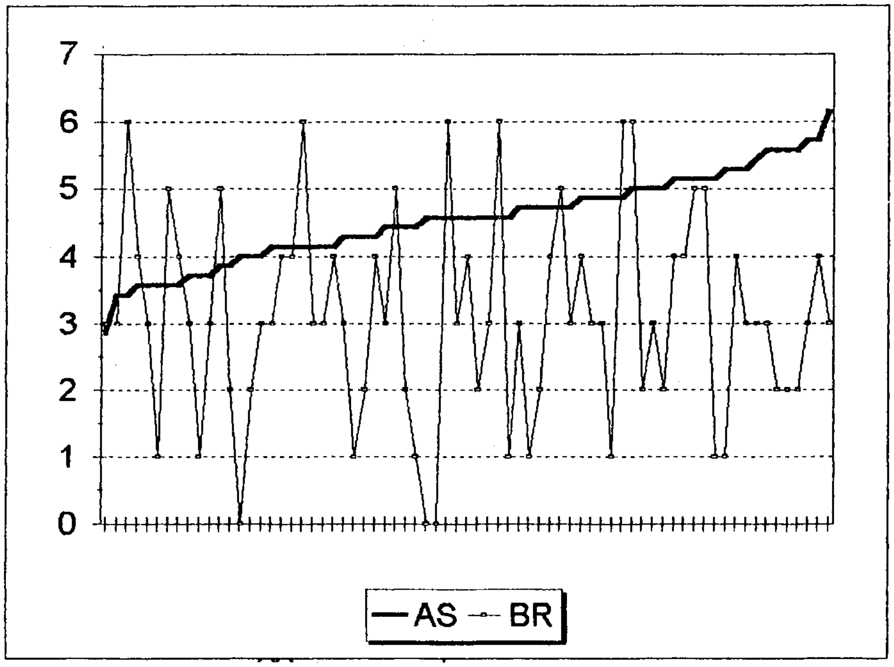
CORRELATIONS WITH AUTHORITARIAN SUBMISSION



	AS	WP
AS	1	
WP	0.051755	1

AUTH SUBMISSION & WORST SUPPORT

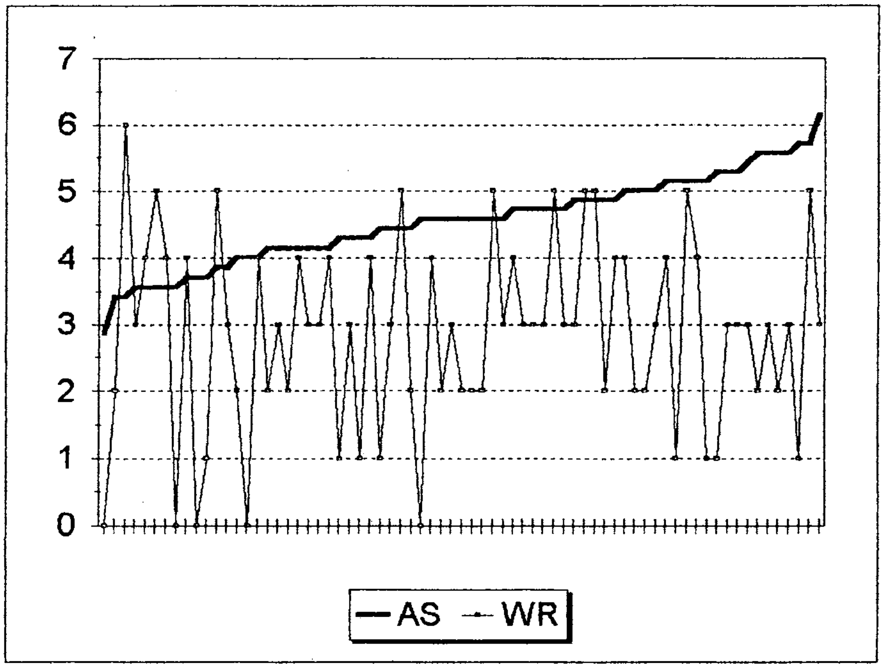
CORRELATIONS WITH AUTHORITARIAN SUBMISSION



	AS	BR
AS	1	
BR	-0.04451	1

AUTH SUBMISSION & BEST SOURCE

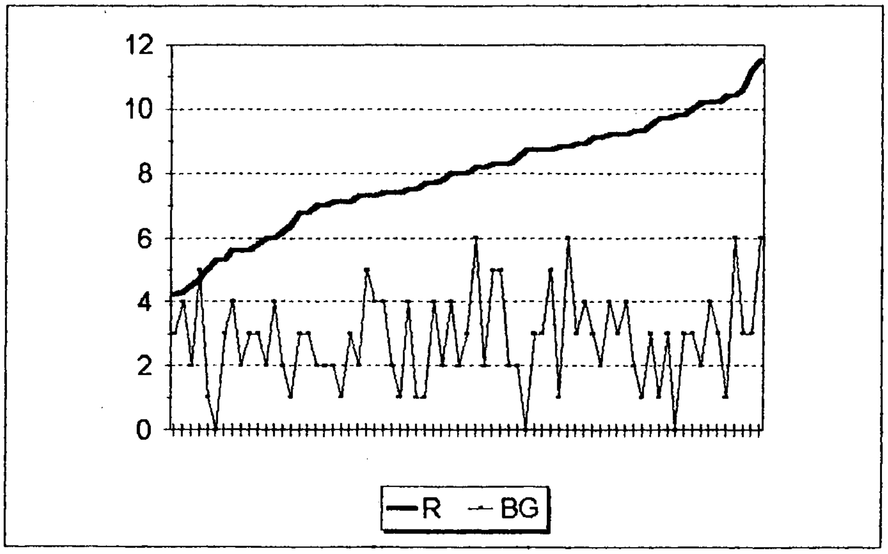
CORRELATIONS WITH AUTHORITARIAN SUBMISSION



	AS	WR
AS	1	
WR	0.059832	1

AUTH SUBMISSION & WORST SOURCE

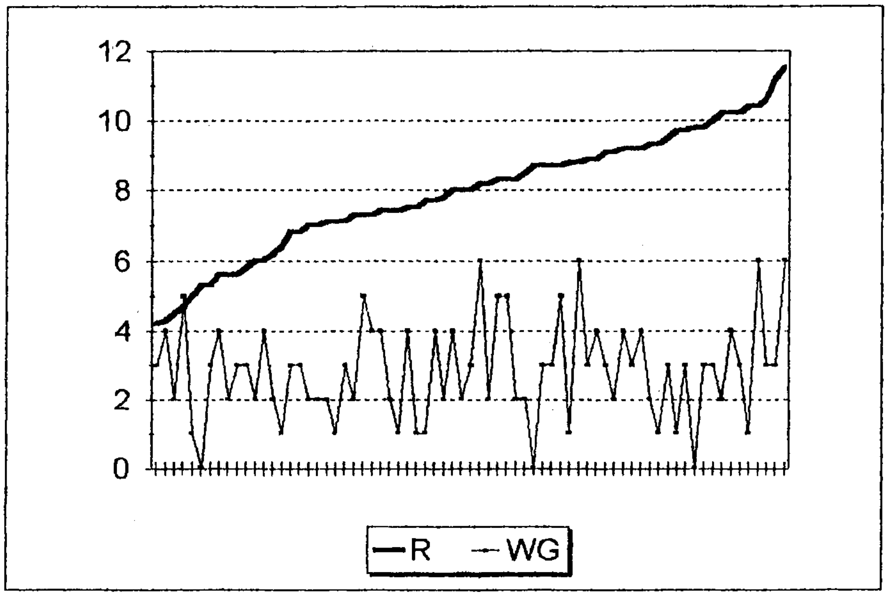
CORRELATION



	^R	BG
^R	1	
BG	0.114306	1

READING GE & BEST GENERALIZATION

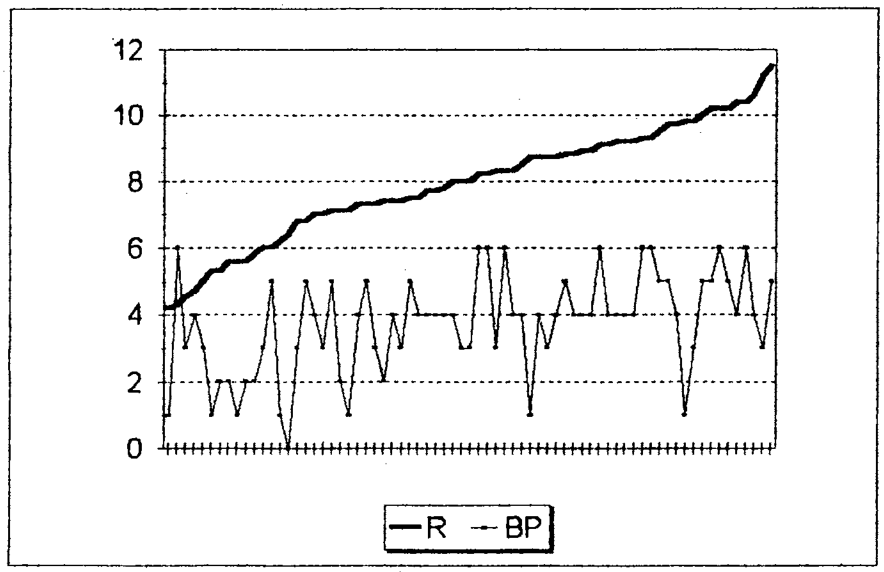
CORRELATION



	^R	BG
^R	1	
BG	0.114306	1

READING GE & WORST GENERALIZATION

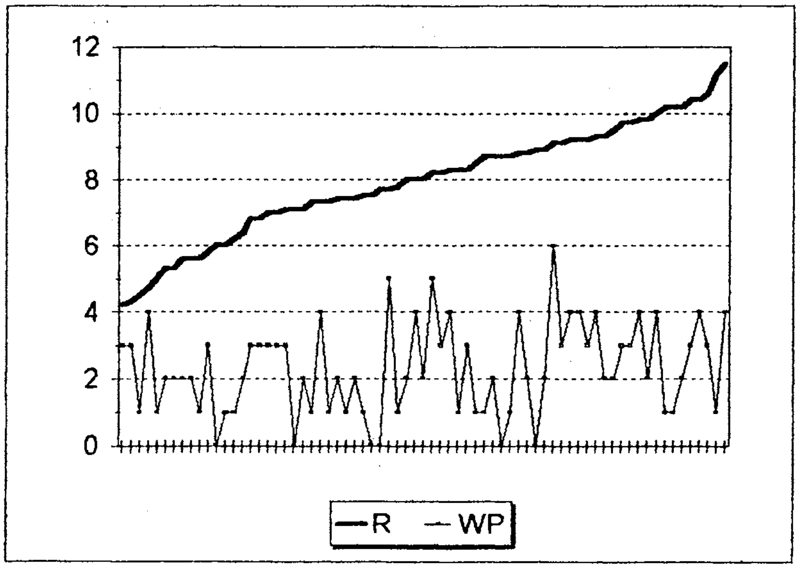
CORRELATION



	^R	BP
^R	1	
BP	0.438113	1

READING GE & BEST SUPPORT

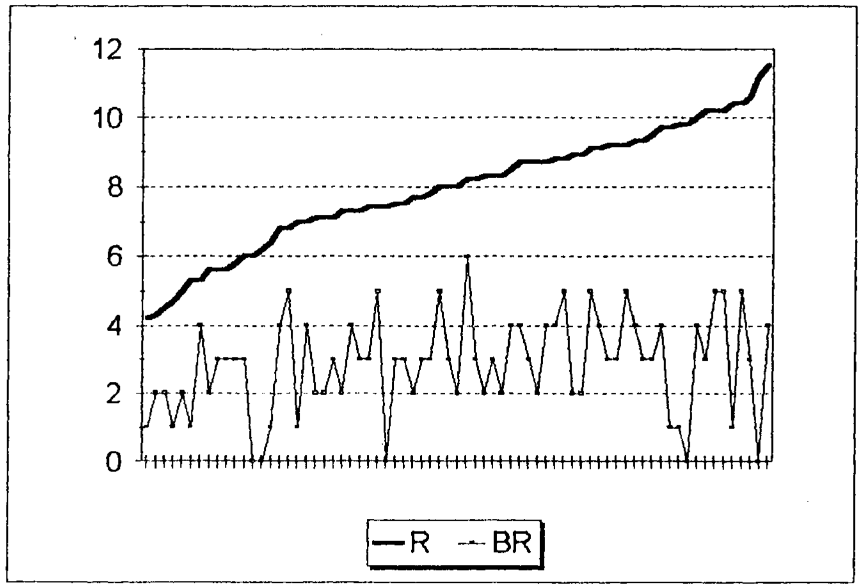
CORRELATION



	^R	WP
^R	1	
WP	0.19437	1

READING GE & WORST SUPPORT

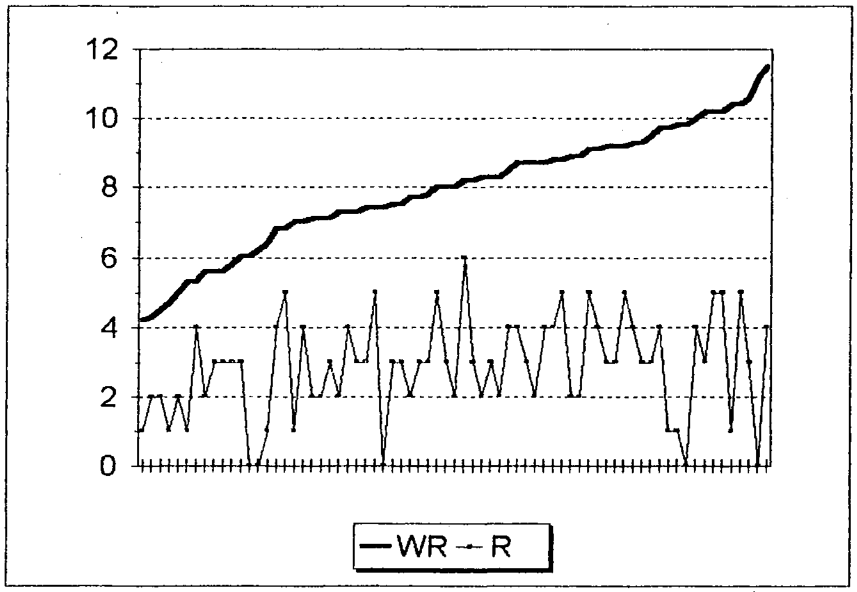
CORRELATION



	^R	BR
^R	1	
BR	0.262833	1

READING GE & BEST SOURCE

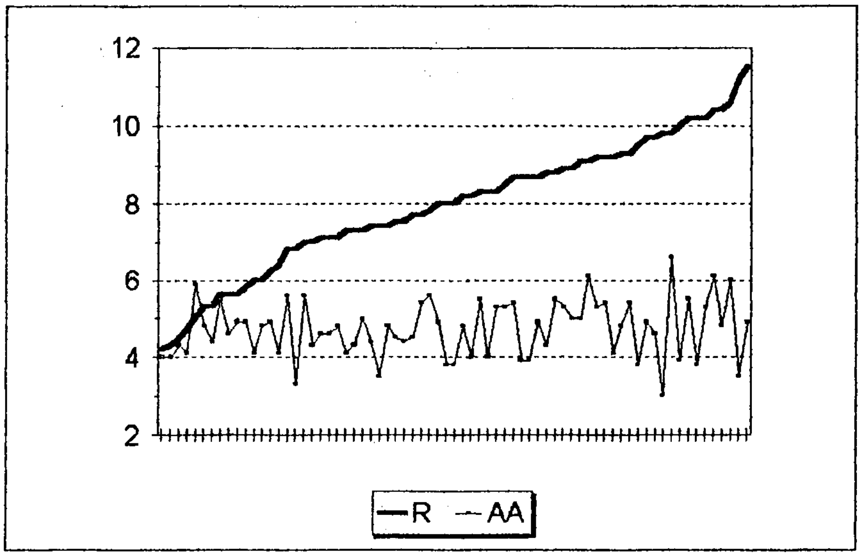
CORRELATION



	^R	WR
^R	1	
WR	0.262833	1

READING GE & WORST SOURCE

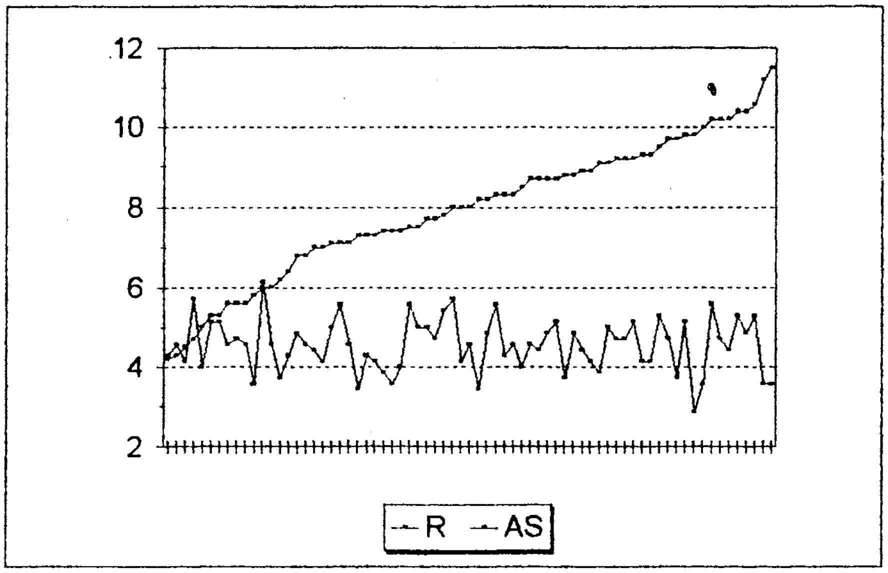
CORRELATION



	R	AA
R	**1**	
AA	**0.150433**	**1**

READING GE & AUTHORITARIAN AGGRESSION

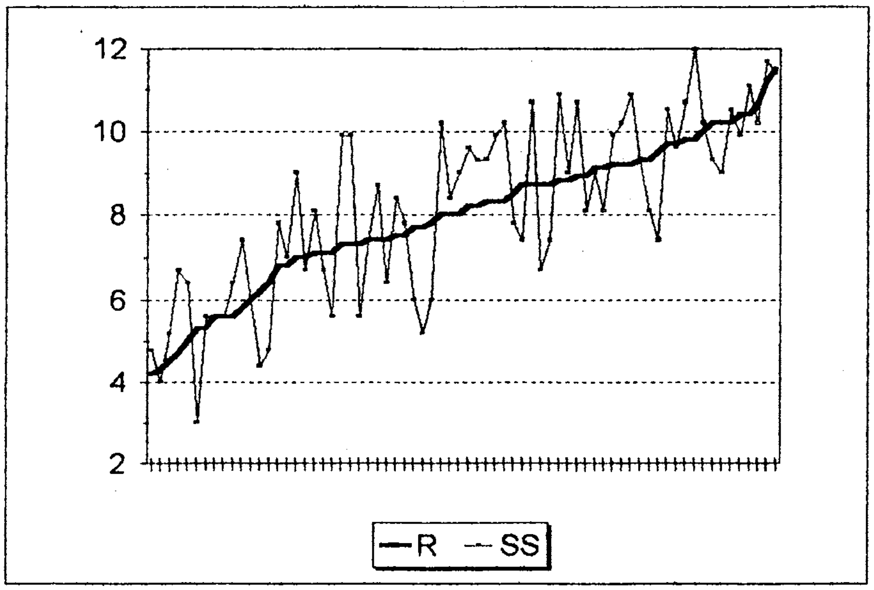
CORRELATION



	^R	^AS
^R	1	
^AS	-0.08661	1

READING GE & AUTHORITARIAN SUBMISSION

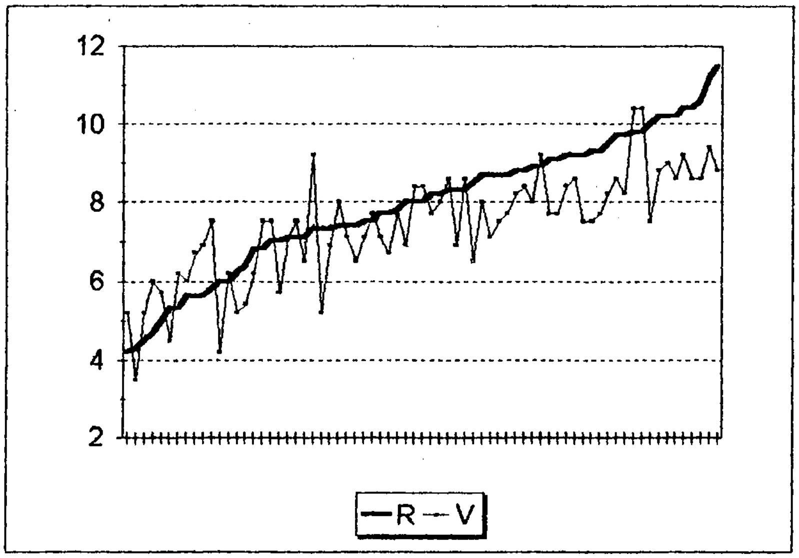
CORRELATION



	^R	SS
^R	1	
SS	0.788623	1

READING GE & SOCIAL STUDIES GE

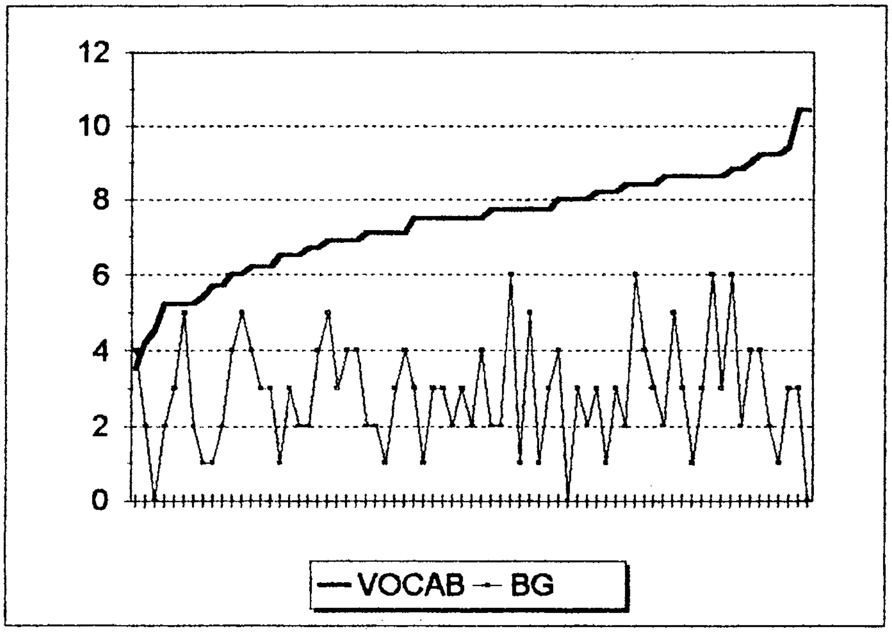
CORRELATION



	^R	^V
^R	1	
^V	0.797702	1

READING GE & VOCABULARY

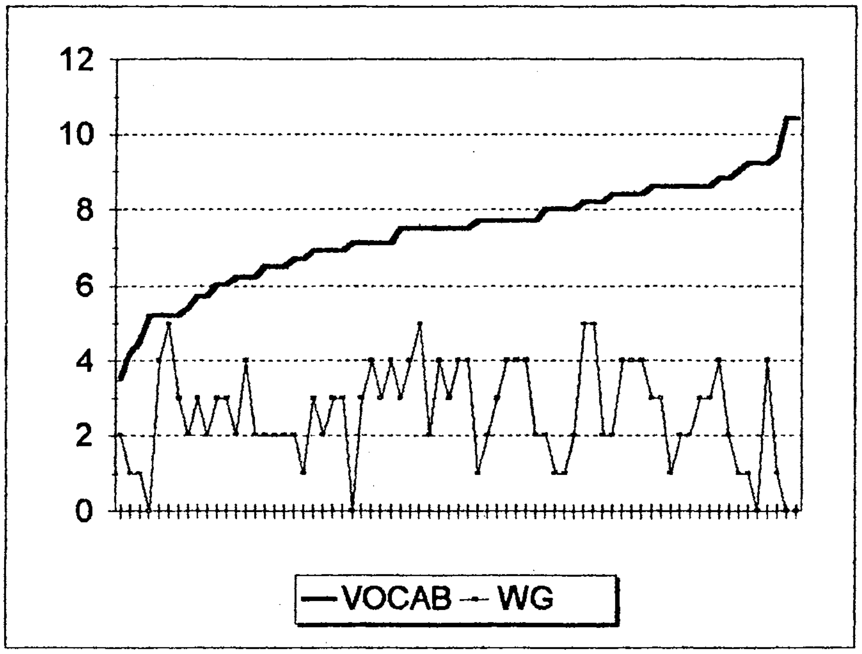
CORRELATION



	^VOCAB	BG
^VOCAB	1	
BG	0.04576	1

VOCABULARY GE & BEST GENERALIZATION

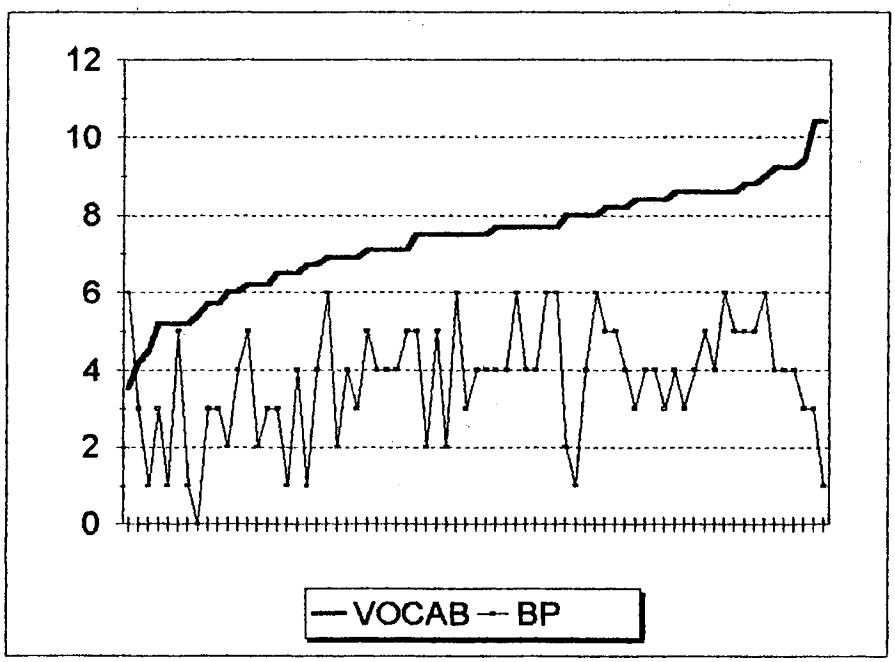
CORRELATION



	^VOCAB	WG
^VOCAB	1	
WG	-0.0761	1

VOCABULARY GE & WORST GENERALIZATION

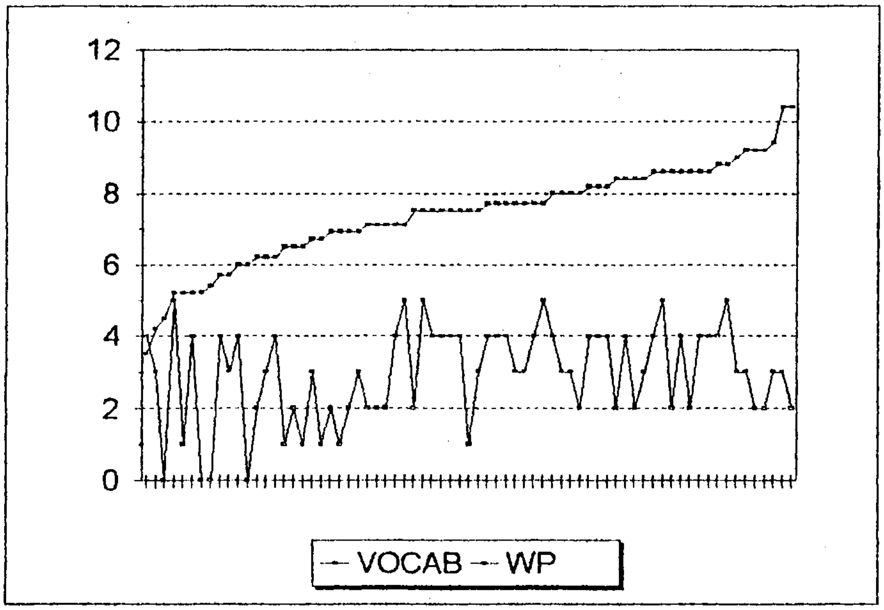
CORRELATION



	^VOCAB	BP
^VOCAB	1	
BP	0.238319	1

VOCABULARY GE & BEST SUPPORT

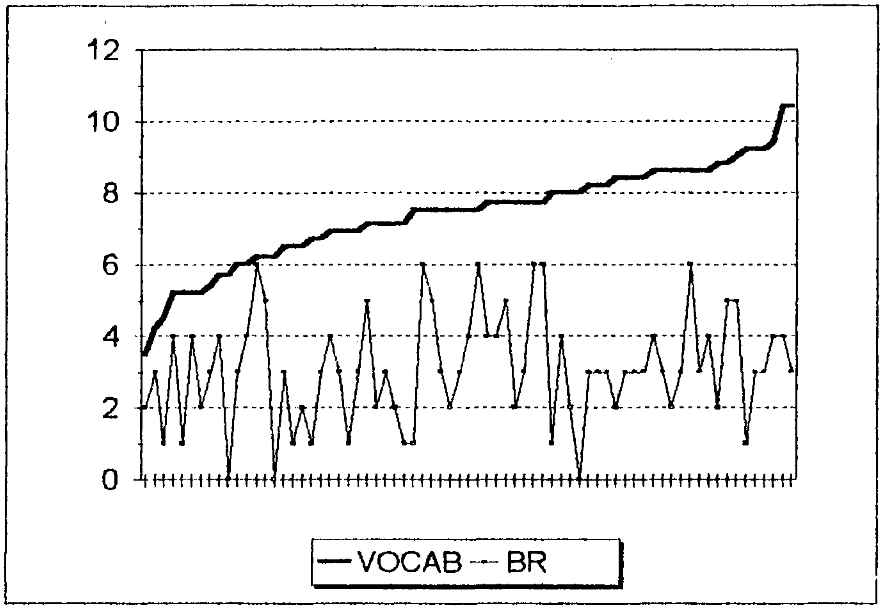
CORRELATION



	^VOCAB	WP
^VOCAB	1	
WP	0.234954	1

VOCABULARY GE & WORST SUPP0RT

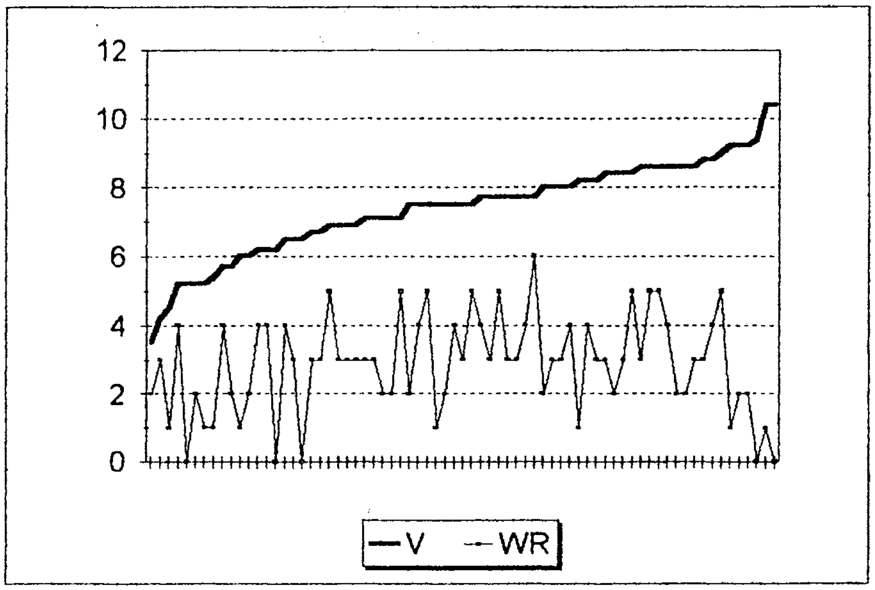
CORRELATION



	^VOCAB	BR
^VOCAB	1	
BR	0.181625	1

VOCABULARY GE & BEST SOURCE

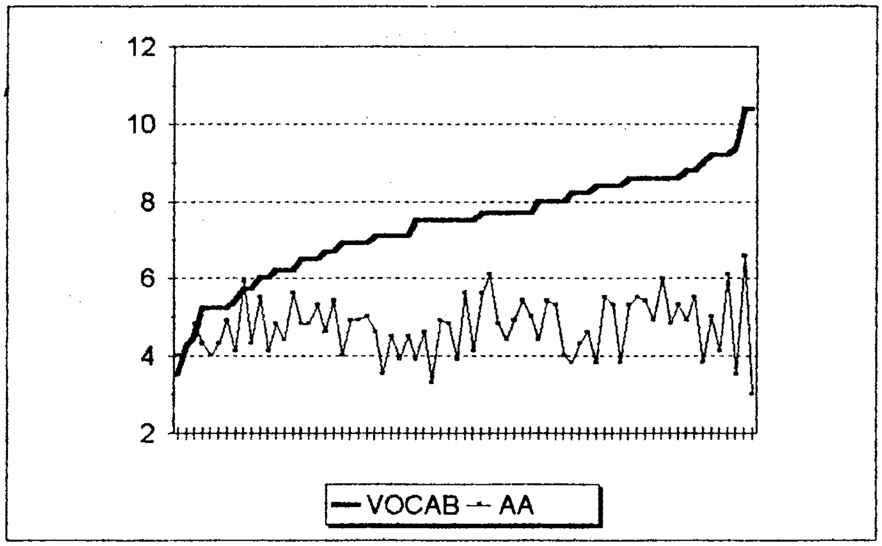
CORRELATION



	VOCAB	WR
VOCAB	**1**	
WR	**0.095604**	**1**

VOCABULARY GE & WORST SOURCE

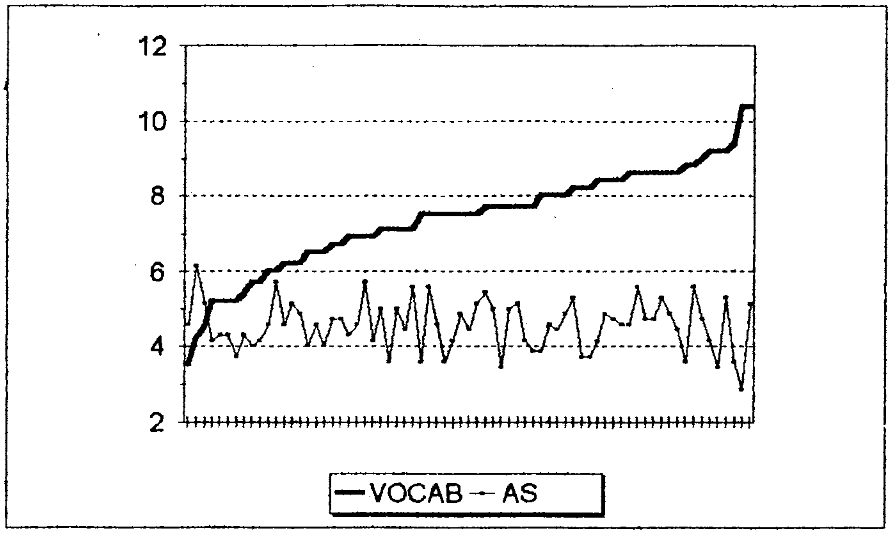
CORRELATION



	^VOCAB	AA
^VOCAB	1	
AA	0.145158	1

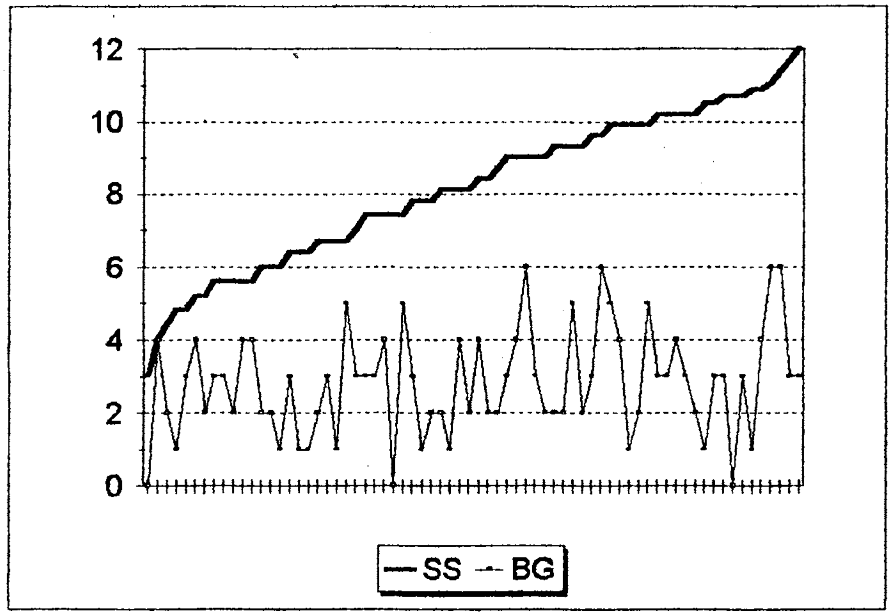
VOCABULARY GE & AUTH AGGRESSION

CORRELATION



	^VOCAB	AS
^VOCAB	1	
AS	-0.12479	1

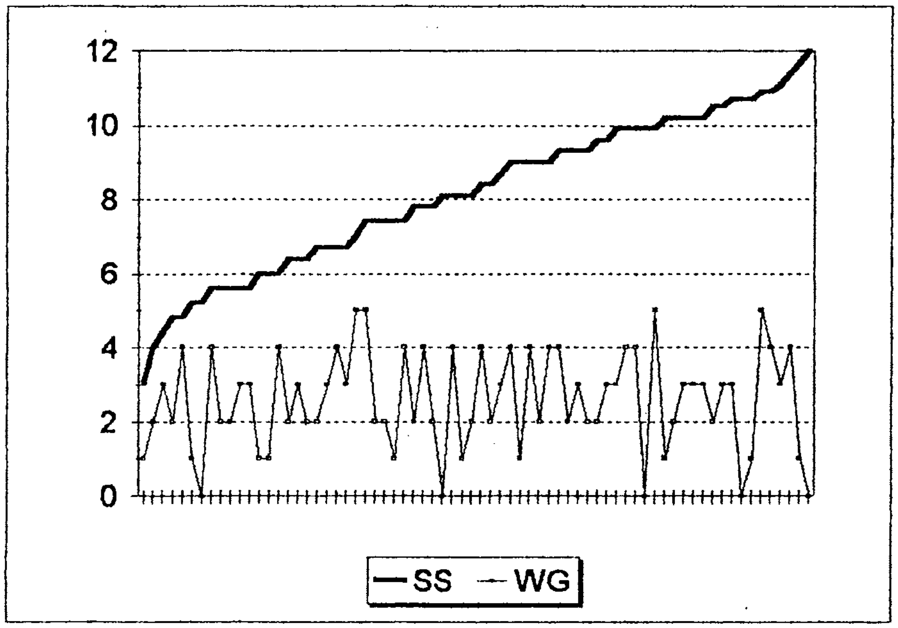
CORRELATION



	SS	BG
SS	1	
BG	0.232997	1

SOCIAL STUDIES GE & BEST GENERALIZATION

CORRELATION



	SS	WG
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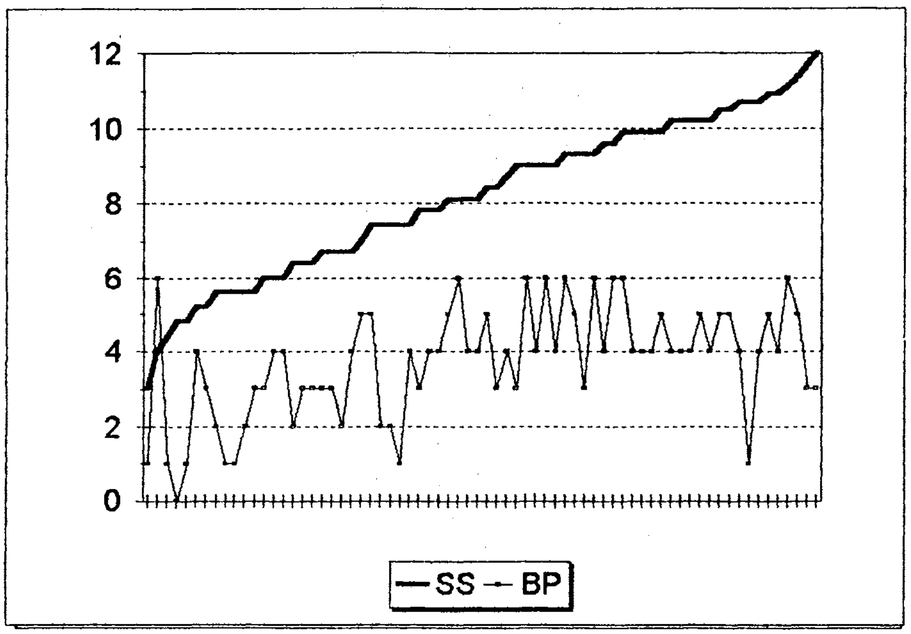
SOCIAL STUDIES GE & WORST GENERALIZATION

CORRELATION



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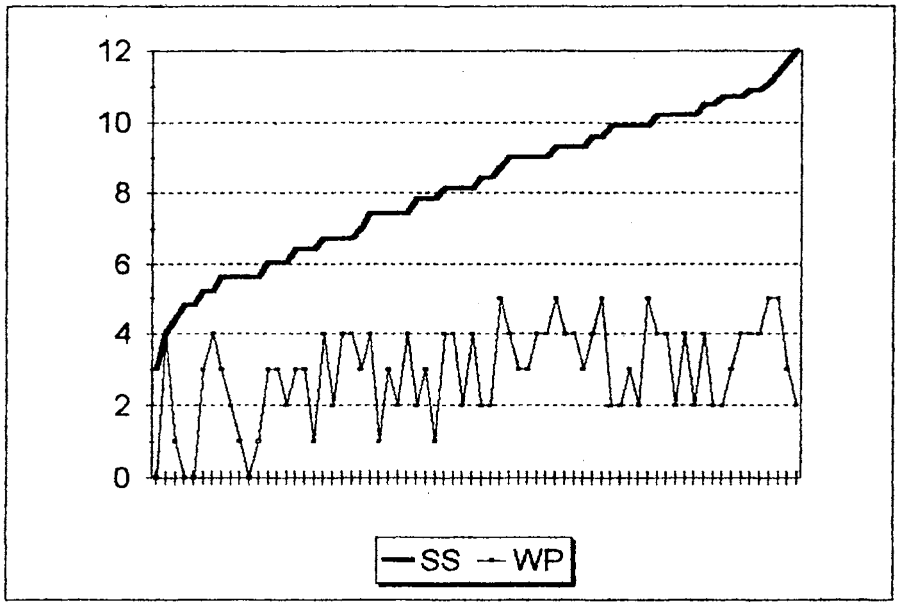
BP	0.503193	1

SOCIAL STUDIES GE & BEST SUPPORT

CORRELATION



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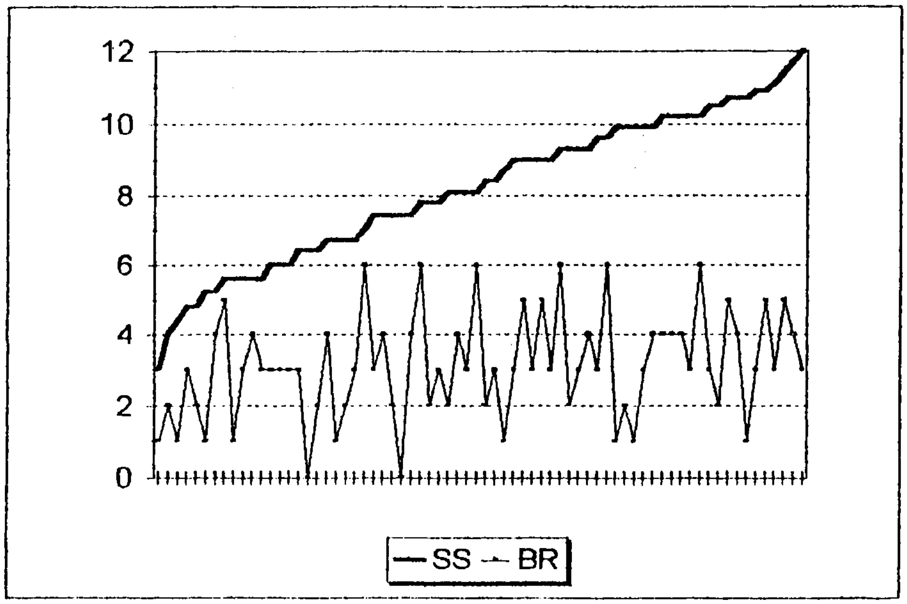
SOCIAL STUDIES GE & WORST SUPPORT

CORRELATION



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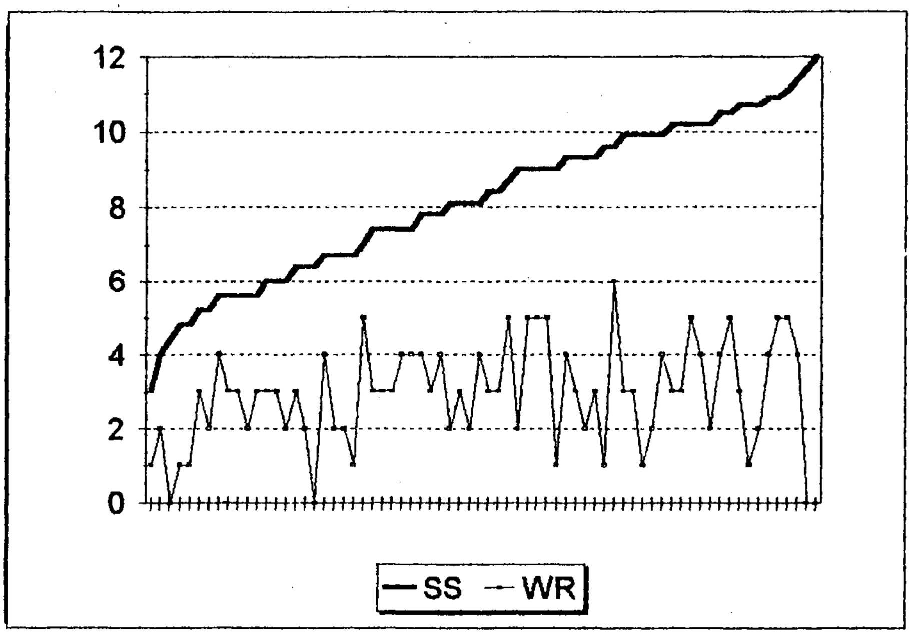
SOCIAL STUDIES GE & BEST SOURCE

CORRELATION



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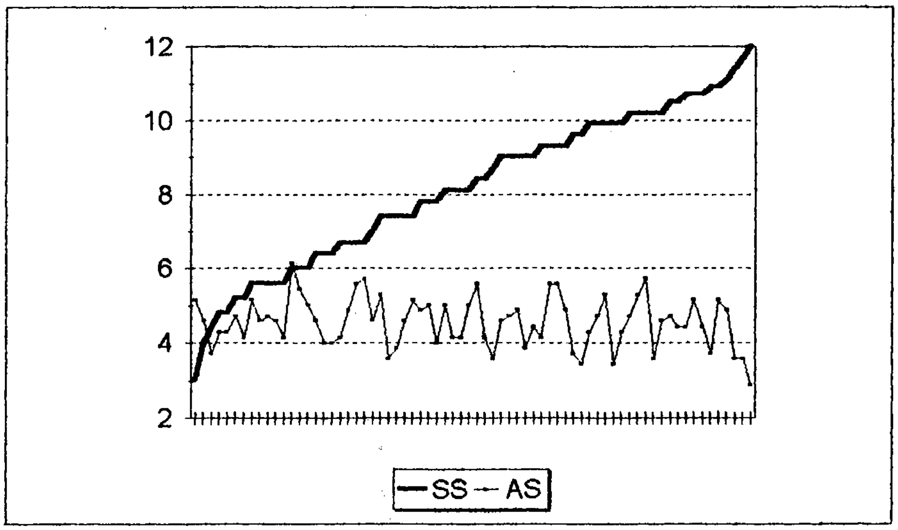
SOCIAL STUDIES GE & WORST SOURCE

CORRELATION



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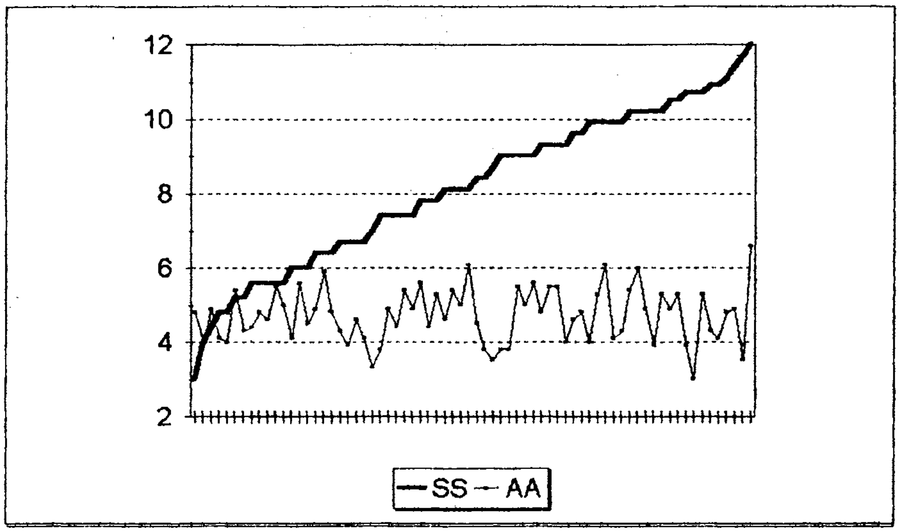
AS	-0.18557	1

CORRELATION



	SS	AA
SS	1	
AA	0.06874	1

SOCIAL STUDIES GE & AUTH AGGRESSION

VITA

Clarance Henri Benes

Candidate for the Degree of

Doctor of Education

Thesis: EFFECTS OF A KNOWLEDGE CONSTRUCTION EXERCISE ON THE FORMATION AND EVALUATION OF SOCIAL STUDIES GENERALIZATIONS AND STUDENT AUTHORITARIAN ATTITUDES

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Biographical:

Personal Data: Born in Pawnee, Oklahoma, December 15, 1950, the son of Edward Altman and Alice Leah Benes.

Education: Graduated from Morrison High School, Morrison, Oklahoma, May, 1969; received Bachelor of Science degree in Secondary Education and received Master of Science degree in Curriculum and Instruction from Oklahoma State University, Stillwater, Oklahoma in July, 1982 and in July, 1989 respectively. Completed the requirements for the Doctor of Education with a major in Curriculum and Instruction in December, 1994.

Professional Experience: Social studies teacher, Morrison Public Schools, Morrison, Oklahoma, August, 1982 to May, 1990; Teaching assistant, Department of Curriculum and Instruction, Oklahoma State University, August, 1990 to December, 1991; Supervisor, Entry Year Assistance Program, College of Education, Oklahoma State University, September, 1990 to May, 1992. Student Teacher Supervisor, Department of Curriculum and Instruction, Oklahoma State University March, 1991 to May, 1994.

Professional Membership: Association for Supervision and Curriculum Development.