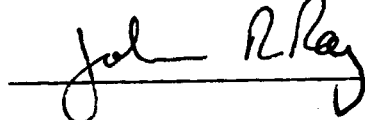


To the Graduate Council:

I am submitting herewith a thesis written by Mark Edmund Davidson entitled "The Effect of Tennessee Valley Authority on Selected Students' Political Orientation, Attitudes, and Cognitive Learnings." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Specialist in Education, with a major in Curriculum and Instruction.


L. O. Haaby, Major Professor

We have read this thesis and
recommend its acceptance:

Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

THE EFFECT OF TENNESSEE VALLEY AUTHORITY ON
SELECTED STUDENTS' POLITICAL ORIENTATION,
ATTITUDES, AND COGNITIVE LEARNINGS

A Thesis
Presented for the
Specialist in Education
Degree
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Mark Edmund Davidson

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Gratitude is especially extended to my wife, Janice Gregory Davidson, for the support she gave and the sacrifices she made while this project was being completed. Finally, appreciation goes to my mother, Elizabeth Hardy Davidson, and my father, John Clayton Davidson, who provided a home atmosphere that encouraged educational accomplishment.

ABSTRACT

The purpose of this study was to determine if an experiential, systematic method of instruction utilizing the Tennessee Valley Authority would have an effect on students in three areas. These three areas were political orientation, the attitude of students toward the Tennessee Valley Authority, and cognitive learnings associated with the agency.

The instruments used to evaluate change in the three areas included a newspaper headlines test to measure student interest in TVA. Also used were the Follett Conservative-Liberal Scale to obtain student political orientation and a ten question multiple choice test to determine cognitive learnings.

The procedure employed was to utilize two groups of students at William Blount High School, Maryville, Tennessee, in the Nonrandomized Control Group Pretest-Posttest Design. The control group, the fall semester 1979 civics class, was taught using an abstract, textbook method focusing on the theoretical nature of the Conservative-Liberal Concept. The experimental group, the spring semester 1980 civics class, was given a systematic experiential unit of study emphasizing the Tennessee Valley Authority to develop an understanding of the conservative-

liberal concept. The Tennessee Valley Authority was chosen as the vehicle in the experimental treatment because its history so closely parallels the development of the conservative-liberal concept in the United States since the 1930's and because of its relevance and proximity to the students involved in the study.

It was found that there was a slight conservative trend in the students' political orientation. Also found was a small increase in favorable attitude toward the Tennessee Valley Authority. The third result was an increase in cognitive learnings related to the Tennessee Valley Authority. However, none of these findings was proved by the analysis of covariance statistical technique to be statistically significant.

It was concluded that the use of the Tennessee Valley Authority is valuable as a tool in instruction, especially for students in the Tennessee Valley area. However, the main focus of the study was the political orientation of the students and in this instance, as was the case with some research in the field of political orientation of students, classroom activity does not seem to appreciably affect students' political attitudes.

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CHAPTER I

INTRODUCTION

For many years, while government played a smaller role in our lives, that debate (concerning the meaning of the term federalism) was mostly academic . . . But in recent years, particularly since World War II, when government has become so dominant a force in American life, federalism has moved steadily to the forefront among American political concepts, until it is recognized now as central to the entire scheme of American government.¹

Professor Richard H. Leach's statement concerning the present state of affairs is describing American society as a whole. This concept of government is reflected in political attitudes whether liberal or conservative.

Traditional civics courses evidently have not stirred an interest in the majority of students to become involved in the political process or to develop political principles. Voter apathy and the post-Watergate distrust of almost anything political indicate a lack of interest in such concepts.

In East Tennessee the Tennessee Valley Authority, the Appalachian Regional Commission, the Atomic Energy Commission and the United States Department of the Interior

¹Richard H. Leach, "Federalism in the Social Studies Curriculum," Social Education (Washington: National Council for the Social Studies, October 1972), p. 609.

are some of the most prominent examples of how people have been effected as government has increased over the years. It would seem that students exposed to such relevant topics would display a measurable reaction to concepts presented when these issues became part of the curriculum in that unit.

Therefore, it would be in order to attempt to evaluate cognitive learnings associated with such a unit on TVA. It follows that changes in political orientation should be evaluated. Political orientation is the students' response to the issue by exhibiting conservative or liberal attitudes.

I. PURPOSE OF THE STUDY

The purpose of this study was to determine attitudinal changes of students enrolled in a civics course at William Blount High School, Maryville, Tennessee.

These attitudinal changes were concerned with the students' interest in a certain unit topic (government involvement exemplified by the Tennessee Valley Authority), the students' political orientation evidenced by liberal and conservative responses and the students' responses to cognitive learnings.

It was postulated that such changes would be reflected in

(1) interest toward the subject matter as measured by the adapted Newspaper Headlines Test;

(2) conservative or liberal attitude response as measured by the scales extracted from the Follett Publishing Company textbook, Civics, Fifth Edition, 1978; and

(3) responses to a teacher-made test containing cognitive and affective questions concerning the unit topic.

II. HYPOTHESES

1. There will be no significant difference in political orientation between those students studying the topic in an abstract method and those subjected to a more systematic treatment of the topic. This will be shown in reviewing the results of the twenty-six question orientation scale.² The significant difference meaning the .05 level of significance.
2. There will be no significant difference between the interest level, as shown in the modified Newspaper Headlines Test, of students in the systematic method and those in the control group at the .05 level of significance.
3. There will be no significant difference between the factual test scores of students involved in a

²Grant T. Ball and Lee J. Rosch, Civics (Chicago: Follett Publishing Company, 1978), pp. 12-13, 16, 100, 363.

systematic, experimental treatment of the unit and in those in the control group at the .05 level of significance.

III. ASSUMPTIONS

1. Students have been influenced by the overall liberal national trend since the 1930's. Students have been influenced through music, movies, television, etc. to fit behavior of teenagers throughout the United States.
2. Multimedia teaching methods aid student test scores.
3. The guidance department used no different criterion in scheduling students for the classes involved in the study.

IV. LIMITATIONS

1. This sample was composed of predominately ninth grade students at William Blount High School.
2. There were no minority students in the study.
3. There were only two sections of civics available to students at William Blount during the school year 1979-1980. One was offered fall semester and one was offered spring semester.

V. DEFINITION OF TERMS

1. Liberal—a person who tends to view government as an equalizer in society. A liberal would have at least seventeen "no's" on the twenty-six question scale taken from the Follett Civics text. This is a 67 percent score of answering "as a liberal would."
2. Conservative—a person who tends to view increasing governmental involvement in society as an intrusion. A conservative is one who would have seventeen "yes's" on the above mentioned scale. This is a 67 percent score of answering "as a conservative would."
3. Moderate—a respondent whose yes or no answers on the liberal-conservative scale would not exceed thirteen.
4. Multimedia—the unit incorporates field experience, audio-visual, resource persons, printed page material, teacher-student discussions, etc.
5. Control group—the fall semester students who take civics without the systematic method of instruction.
6. Experimental group—the spring semester students who undergo the treatment which is the systematic approach to political orientation through the Tennessee Valley Authority.

7. Dependent variable—the treatment or the exposure to the TVA study by the students.
8. TVA—Tennessee Valley Authority.

VI. IMPORTANCE OF THE STUDY

In the late sixties and early seventies research indicated that students in the United States have little understanding of political principles and have had little exposure concerning these principles from conventional educational procedure.³ A public opinion poll released by The CBS Evening News the week of November 5, 1979, illustrates this unfamiliarity with political principle. The poll revealed that less than 10 percent of the sample surveyed considered the coordination of policy, between individual respondents and the current potential presidential candidates, as the most important criterion in choosing to vote for one of those candidates.⁴ Liberal and/or conservative principles, however, play a major role in the development of local, regional, and national policies.

³Dan B. German, "Political Attitudes and Education Stimuli—A Cross-National Case of Redundancy," in a paper presented at the Annual Convention, National Council for the Social Studies, Denver, Colorado, November 1971, ED 059 122.

⁴At that time Sen. Edward Kennedy had not announced his candidacy for the 1980 democratic party presidential nomination.

Therefore, it would seem logical that fuller understanding of this concept could be enhanced by utilizing more relevant learning materials. This would lead to more meaningful choices by voters. The impact of a candidate's physical appearance and charisma can be purposely or inadvertantly manipulated by the media to influence voters. Other benefits from increased student awareness of this concept would be (1) stability, (2) better student understanding of current events, (3) the ability to discern patterns or trends which is a useful skill in any intellectual endeavor, (4) better understanding of opposing viewpoints, and (5) increased opportunities to exercise critical thinking and its various subskills of located relevant information, detecting propaganda and conceptualization.

Stability meant that students need to develop a frame of reference from which to make decisions. Sid Simon⁵ and his colleagues have been lauded for helping students develop a reference base from which to make moral choices. It is therefore submitted that learning exercises and exposure to factual information would be beneficial in aiding students to formulate a set of objective principles from which to make political decisions.

⁵Sidney Simon, Leland B. Howe, and Howard Kirschenbaum, Values Clarification: A Handbook of Practical Strategies for Teachers and Students (New York: Hart Publishing Company, Inc., 1972).

Awareness of the world and national scene should be a goal of the social studies. If students develop a keen sense of what the liberal or conservative stand means and how they could be effected on a particular issue, they will more than likely keep up with current events in a more meaningful fashion.

The ability to detect trends or patterns is an invaluable intellectual skill. Obviously science and math come most readily to mind in this regard, but increased use of the problem-solving (scientific) method is one of the dominant themes in social studies education today. When it becomes necessary to make predictions, students would have some basis for trying to perpetuate or conclude whatever political trend was being examined.

Better understanding of opposing viewpoints could counteract such pitfalls in critical thinking as prejudice, assumptions, name calling, inadequate information, and analogies.⁶ It is apparent that, in a democracy, the ability not to view a conservative as a blue-blooded repressor of the masses or a liberal as a wild-eyed, long-haired extremist would aid in the function of that democratic society.

⁶"Objectives and the Social Studies," a handout by Dr. L. O. Haaby for social studies education courses at The University of Tennessee.

Critical thinking, along with conceptualization, will enable students to place a variety of facts in a systemized framework. Placing information from newspapers, people and television into conceptual categories will help students evaluate the vast amount of fact, opinion, and advice with which they are bombarded each day. As the technology advances and more and more information is distributed for students to examine, these political concepts will give students a means of classifying what is going on. This is better than making decisions based on whims, guesses and outward appearances.

VII. PROCEDURES

The following were the procedures for students taking part in the study:

1. The researcher administered the pretest and the posttest of the interest levels (Headlines Test) instrument, the pretest and posttest for political orientation, and the pretest and posttest for facts to the control and experimental groups. The control group was the fall semester students and the spring semester class comprised the experimental group.
2. The experimental group received a liberal-conservative instructional unit concerning the Tennessee Valley Authority while the control group

dealt with the liberal-conservative concept in a theoretical textbook method.

3. Both groups were taught by the same instructor.
4. Data were tabulated and presented in Chapter IV.
5. The data were analyzed by the factorial analysis of covariance to determine if the difference in scores of the experimental and control groups was statistically significant.
6. A summary and recommendations were made, and are included in Chapter V.

VIII. ORGANIZATION OF THE STUDY

1. Chapter I serves as an introduction.
2. Chapter II provides a review of related literature.
3. Chapter III includes a description of the unit of instruction and of the instruments used in the study.
4. Chapter IV deals with an analysis of the data.
5. Chapter V develops a summary, list of recommendations and suggestions for further study.

CHAPTER II

REVIEW OF RELATED LITERATURE

Literature on the TVA as a factor in political attitudes of students was unobtainable. However, the literature relevant to student attitudes toward political liberalism or conservatism was divided into five categories.

These areas were as follows: (1) the effectiveness of teaching public issues and political concepts in secondary schools, (2) the understanding of the "liberal vs. conservative" concept, (3) student interest in political affairs or how often students follow what is going on . . .¹ in public affairs, (4) federalism in curriculums, and (5) information regarding the instrument used in discerning attitudes and interest.

I. TEACHING PUBLIC ISSUES IN SECONDARY SCHOOLS

Oliver and Shaver favored a jurisprudential approach.

It was not an uncommon experience after the conclusion of the Harvard Project to have students . . . attest to the interest provoked by the experimental curriculum, . . . On motivational grounds alone, as social studies educators have,

¹M. Kent Jennings and Richard G. Niemi, The Political Character of Adolescence (Princeton: Princeton University Press, 1974), pp. 47n, 256.

over the years, called for relevant curriculums to nurture student participation.²

They stated that even with a "good" curriculum the basic problem of assessing learning in the area of public affairs (or any area for that matter) is still an interaction among student personality, teaching style, and assessment instruments that makes the difference.³

The National Assessment of Educational Progress published findings concerning political attitudes and knowledge of representative groups of thirteen and seventeen year olds in United States high schools over the years 1969-1976. The findings released in 1978 show that a decline "in knowledge about the structure and function of government and the essential concepts underlying democracy"⁴ should cause a drastic reassessment of the social studies curriculum.

The majority of the items concerned with . . . the structure and function of the government, . . . and recognition of governmental officials measured political knowledge. Questions about political attitudes were concerned with valuing

²Donald W. Oliver and James P. Shaver, Teaching Public Issues in the High School (Logan: Utah State University Press, 1974), p. 237.

³Ibid., p. 324.

⁴Changes in Political Knowledge and Attitudes, 1969-76 by the National Assessment of Educational Progress (Denver: Education Commission of the States, 1978), p. 59.

constitutional rights, . . . and willingness to participate in the political process.⁵

Scores for both 13-year-olds and 17-year-olds declined in statistically significant numbers.⁶

Ehman (1969) found positive results for political concepts and controversial issues if the students perceived they were in an "open classroom" environment where they were free to enter into the classroom process and discussion.⁷ This type of classroom environment seemed to benefit blacks more than whites.⁸

German⁹ found, in analyzing test results from 1800 students in the United States, Sweden, West Germany, Italy and England, two significant results. Social studies courses have little effect on political orientation because course content is redundant. In other words, no different stimuli was used on students other than what they have

⁵Ibid., p. 69.

⁶Ibid.

⁷Lee H. Ehman, "An Analysis of the Relationships of Selected Educational Variables with the political Socialization of High School Students," American Educational Research Journal, in Robert W. Heath (ed.) (Washington: American Educational Research Association, 1969), p. 563.

⁸Ibid., p. 573.

⁹Dan B. German, "Political Attitudes and Educational Stimuli—A Cross-National Case of Redundancy," in a paper presented at the Annual Convention, National Council for the Social Studies, Denver, Colorado, November 1971, ED 159 122.

already experienced in earlier schooling. Also, German pointed out that subject content cannot appreciably effect secondary students because the students are too old to be affected by curricula concerning political attitudes.

Hess and Torney¹⁰ studied middle school age children and high school students. They contended no major change in the level of political interest was found during the high school years.

Jennings and Niemi made some positive statements concerning the teaching of public affairs and political attitudes. "When we investigated the student sample as a whole we found not one single case out of the ten examined in which the civics curriculum was significantly associated with students' political orientations."¹¹

II. STUDENT UNDERSTANDING OF THE LIBERAL-CONSERVATIVE CONCEPT

The literature concerning student understanding of the liberal-conservative concept was similar to the above literature in that it usually concluded that educational processes had little effect on student attitudes. Most of

¹⁰Robert W. Hess and Judith V. Torney, The Development of Political Attitudes in Children (Chicago: Aldin, 1967), pp. 68-70, 79.

¹¹Jennings and Niemi, op. cit., p. 205.

the literature implied that students didn't have a clear understanding of the concept. One exception is Merelman's study.

Merelman¹² found that ninth graders had cohesive policy conceptions. This information was gathered by comparing two school districts in the Los Angeles area. In totaling questionnaire scores from both districts, Merelman found the following results. Positive responses signified agreement; negative responses were disagreement.

Factor 3 is liberalism-conservatism and includes the following variables:

1. It is not up to the government to make sure that all Americans have jobs. (.737)
2. The government should see to it that every American has enough money to live on. (-.729)
3. The government ought to see to it that old and poor people get good medical care. (-.511)¹³

Other authors concluded that secondary students didn't have an adequate understanding of the liberal-conservative concept. Among these are Greenstein¹⁴, Langton and

¹²Richard M. Merllman, Political Socialization and Educational Climate: A Study of Two School Districts (New York: Holt Rinehart and Winston, Inc., 1971).

¹³Ibid.

¹⁴Fred I. Greenstein, Children and Politics (New Haven, Conn.,: Yale University Press, 1965), pp. 67-71.

Jennings,¹⁵ and Jennings and Niemi.¹⁶ According to Langton and Jennings, students with academic expectations were the only ones who comprehended this concept.

Langton and Jennings studied 1669 high school seniors in 1969. Their study involved 97 public and nonpublic schools. The authors found that the understanding of the liberal-conservative concept was only prominent in college-oriented seniors. This type of student was three times more likely to identify the liberal or conservative nature of the Democrat and Republican parties.¹⁷ Such students, according to the authors, already have different political orientations than those who aren't going to college when both types of students enter secondary school. Therefore, there must be changes in goals, content, methods, timing exposure, teacher training and school environmental factors if civics curricula were to have any impact on political socialization of American secondary students.¹⁸

Jennings and Niemi also submitted that the liberal-conservative concept was not comprehended very well by

¹⁵Kenneth P. Langton and M. Kent Jennings, "Political Socialization and the High School Civics Curriculum," American Political Science Review, 62, No. 3 (September 1968), pp. 852-868.

¹⁶Jennings and Niemi, op. cit.

¹⁷Langton and Jennings, op. cit., p. 866.

¹⁸Ibid., p. 867.

American students. Of the students they studied only one-third thought there were broad philosophical differences between the predominant political parties. Of this minority even fewer noted specific differences definite ideological aspects of that philosophy. Further examination of the data showed that concepts such as party stands on private enterprise, socialism and social welfare programs were not viable issues for most students.¹⁹ As far as being able to define either liberal or conservative in an appropriate way only one-third of the respondents could do so.

The following chart gives the percentage breakdown of the liberal-conservative understanding of the 2,026 high school seniors in the Jennings and Niemi study.²⁰

Liberal vs. Conservative Understanding

<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>	<u>Group 4</u>	<u>Group 5</u>	<u>Total</u>
37%	16%	13%	10%	24%	100%

Group one students had almost no grasp of the terms; groups two and three demonstrated slightly more understanding. Group four had concrete knowledge and group five had abstract knowledge of the terms.

III. STUDENT INTEREST IN POLITICAL AFFAIRS

As to the pattern of increased political interest on individual issues, age and time were more of a factor than

¹⁹Jennings and Niemi, op. cit., pp. 107-108.

²⁰Ibid., p. 112.

courses taken. For such specific issues as political campaign interest as shown by "having worn campaign buttons and having passed out campaign literature," "having read about candidates" and "having talked with parents and friends about candidates and political problems" nearly adult levels of interest have been reached by the end of the eighth grade.²¹ A Remmers' survey of high school students found that the proportion following a presidential campaign increased when results of ninth graders and twelfth graders were compared.²²

Our own data contains suggestive evidence that political interest rises during high school If the students' own reports are reliable, there is considerable increment in political interest during the high school years.²³

To summarize, the pattern of political interest seems to include fluctuations over much of the life span . . . absolute interest apparently decline(s) somewhat during the elementary years, . . . During high school, interest probably increases, perhaps a great deal.²⁴

The National Council for the Social Studies issued (1977) a bulletin devoted to research in the five year

²¹Hess and Torney, op. cit., pp. 10, 71, 88.

²²Herbert Hyman, Political Socialization (Glencoe: Free Press, 1959), p. 53.

²³Jennings and Niemi, op. cit., p. 255.

²⁴Ibid., p. 258.

period from 1970-1975. The publications mentioned many of the same authors and findings listed here. Additional studies include Marker (1970), Ehman (1972), and Long and Long (1973). Marker found that political interest was fostered when the teacher was not dogmatic. Ehman found that low authoritarianism encouraged political discussion in and out of class. He also found that the discussion of controversial issues tends to increase the frequency of attitude change in a study of 100 students. Somewhat conversely, according to Long and Long there was a negative relationship between amount of time on controversial issues and political efficacy of 588 students in Illinois.²⁵

IV. FEDERALISM IN CURRICULUMS

Federalism as a specific issue and its status in American schools was a topic of grave concern to Dr. Richard H. Leach.²⁶ Leach stated that federalism is a foggy notion to most students and usually taught only in conjunction with the constitution. He points out that understanding of federalism is vital to the American scheme

²⁵ Ehman, in "Review of Research in Social Studies Education: 1970-1975," National Council for the Social Studies Bulletin No. 49 (Washington: National Council for the Social Studies, 1977), pp. 68-70.

²⁶ Richard H. Leach, "Federalism in the Social Studies Curriculum," Social Education (Washington: National Council for the Social Studies, October 1972), pp. 609-614.

of government. He implied that the National Assessment of Educational Progress (as of 1972) had neglected the topic of federalism per se in its published reports.

Leach contended that curriculum materials do little to help the situation.

But careful study of . . . curricula and . . . instructional materials tend to confirm . . . that schools have done badly by federalism. Teachers, . . . administrators and consultants have given little attention to . . . federalism . . . teachers and teaching materials oversimplify federalism.²⁷

He then defined federalism.

Federalism is . . . a way of doing things, not an arbitrary set of principles. . . . It involves two major levels of government . . . each deriving its power directly from the people and acting directly on them . . . To this end, federalism (usually) requires a judiciary.²⁸

The next aspect of federalism was the methodology.

Teaching . . . It is open-ended, always in flux, marked by change rather than rigidity . . . The teacher is thus forced to use contemporary sources for illustrations of federalism at work . . . teaching federalism challenges the teacher to look for out-of-the-classroom experiences as teaching aids . . . All students live in a local governmental context . . . (It is not) hard to find federal government involvement as well.²⁹

The Raleigh, North Carolina, school system implemented a social studies curriculum that devoted what the author considered enough time to federalism. Professor Leach

²⁷Ibid., p. 610.

²⁸Ibid., p. 611.

²⁹Ibid., p. 612.

praised the Raleigh school system for that action. He closed by saying federalism is vitally important for American students to understand their role in a democracy. He mentioned that many careers in such areas as law and industry are involved with federalism. He felt, at that time (1972), the trend of giving the proper position to federalism in curriculums could be dawning.³⁰

V. INSTRUMENTS USED TO DISCERN ATTITUDES AND INTERESTS

An instrument that could be modified to partially determine the degree of students' interest in federal agency involvement in their lives was the Columbia University Citizenship Education Project's Newspaper Headlines Test.³¹ In this test, the student ranked thirty sets of newspaper headlines due to his interest in reading them.

There are thirty sets of headlines. For each set put on your answer sheet a plus (+) beside the letter of the headline most interesting to you, a minus (-) beside the . . . least interesting, and leave the line beside . . . the third headline blank.

Following is an example of an item:

- ☐ a. New Church Dedicated on Park Avenue
- ☐ b. Many Miners Jobless, Families Suffer
- ☐ c. Four French Dressmakers Design Original Style.³²

³⁰Ibid., p. 613.

³¹Oliver and Shaver, op. cit., p. 282.

³²Ibid.

The Harvard Headlines Test³³ contained three items:

(1) "Project Items" consisted of . . . headlines closely to a topic studied in the experimental curriculum. (2) "General Items" . . . based on a problem-topic not studied as part of the experimental curriculum. (3) "Dummy Items" consisted of human interest stories, e.g., "Twenty Men Saved After Seven Hours Among Sharks." These three types of items were randomly ordered in a single questionnaire. It was administered to the experimental . . . and . . . control groups.³⁴

As to the effect of the experimental curriculum that Oliver and Shaver were testing with the Headlines Test, the results are confusing.

It appears that the experimental group gained little interest in topics studied as part of the experimental curriculum . . ., while the control group not only gained interest . . . when compared with the experimental group.³⁵

In summary, the literature supported the claim that experimental curricula in the area of political attitudes, or specific topics such as federalism, had little effect on students. Some writers, especially German, seem pessimistic about current pedagogical procedures. The "optimistic" researchers (Leach and Merelman) dealt with limited numbers of students. They did not, however, project their conclusions over representative national samples such as those studied by Langton and Jennings and by Niemi and Jennings.

³³Ibid.

³⁴Ibid., pp. 282-283.

³⁵Ibid., p. 283.

More research concerning teaching methods and their effect on student attitudes is obviously needed. It is doubtful that educators will or should stay contented with the status-quo as described by such scholarly endeavors as the National Assessment of Educational Progress. It should be of concern to social studies educators, especially, to foster attitudes, knowledge, and interests among students that help them function in a democracy.

CHAPTER III

DESCRIPTION OF CONTROL AND EXPERIMENT GROUPS

There were only two civics classes at William Blount High School in 1979-1980. In the experimental design employed, Nonrandomized Control-Group Pretest--Posttest design, the fall semester class at William Blount High School, Maryville, Tennessee, became the control group. These students were subjected to a traditional textbook-centered method of instruction. The major concept involved was the makeup of conservative and liberal political attitudes. Such topics as Appalachian poverty, gun control, freedom of speech, guaranteed annual income, etc. were discussed frequently. Very little audio-visual material was made available to this group.

The 1980 spring semester class became the experimental group. By being exposed to an in-depth study of TVA they received a different type of instruction. Resource persons, a field trip, questionnaires, video cassettes of news stories involving TVA, films, film strips, group projects, etc. were some of the methods used in the experimental semester. These students' primary exposure to the conservative-liberal concept was that of seeing the conservative nature of the Tennessee Valley region in the 1930's and comparing that situation with that of the 1980's.

Since the 1930's, many of the programs of TVA have been considered liberal in varying degrees, depending on the particular program involved. For example, TVA's wide usage of its constitutional powers of eminent domain have been interpreted by many of the landowners and farmers in the Little Tennessee Valley as being too far-reaching, as exhibiting too much governmental control, as being too liberal. These landowners were forced to sell their land at a court appointed price to TVA so that the agency could complete the Tellico Dam project by flooding the Little Tennessee Valley and creating Tellico Lake. The students were exposed to such controversial questions by experiencing a farmer's thoughts on the Tellico Project and by hearing TVA personnel give their views on the project when the class made a field trip to TVA headquarters in Knoxville, Tennessee. Thus, a more flexible nature of instruction was provided for the experimental group.

Both the experimental and the control groups were in their respective classes as a result of registering for Civics 151 which was a one semester, elective subject. Both groups were instructed by this researcher. Ninth-graders made up the vast majority of both sections. The control group did have two tenth-graders, while the experimental group had three tenth-graders. The civics course, being an elective, drew students from all scholastic achievement levels.

Both groups had little experience with group work or special projects. When given a choice between group/individual projects and paper and pencil tests, both groups preferred the latter. The majority of students in both groups tended to show more results, as far as grading was concerned, when traditional structured activities were undertaken. William Blount was in its first year of existence and the administration projected a rigid disciplinary atmosphere compared to some of the smaller grade schools and high schools that the students had previously attended.

I. INSTRUCTION FOR CONTROL GROUP

In the third week of the semester these students completed the liberal vs. conservative scale as taken from the Follett text.¹ During the next week the class also completed the modified newspaper headlines test to determine interest in the topic to be dealt with by the experimental group. Through the remainder of the fall these concepts were mentioned as they surfaced in textbook lessons or current event filmstrips.²

¹See n., p. 3.

²VEC News Program, Richard DiPrima ed., (VEC, Inc., Madison, Wisconsin).

Introduction to the conservative vs. liberal concept came from the Follett text. This included Unit 1, pages 12-19; Unit 2, pages 98-106; and Unit 7, pages 362-369. Terms discussed included socially disadvantaged, environment, censorship, equal opportunity, reforms, attitudes. Students and the teacher evaluated the results to see where the scores of the class were centered. This tabulation was informal and students were not encouraged to remember the results.

Another text, American Civics,³ was also used because of short features scattered throughout the book. Two features relevant to political attitudes were studied. One entitled "The Right To Bear Arms" was discussed after reading the second amendment to the United States Constitution. The article gave arguments for and against gun control laws. The students then applied conservative and liberal labels on the sides of the issue as they discussed the article. The companion feature, "Health Care: A Right or Luxury?," was then studied. It was mentioned that national health insurance would be a liberal trend in that it would require more government regulation and would be a change from the present situation where health care is primarily a private enterprise.

³William H. Hartley and William S. Vincent, American Civics (New York: Harcourt Brace Jovanovich, 1979), pp. 38-40, 470-472.

A weekly news filmstrip was presented to fall semester class. One edition dealt with the current presidential campaign. Five candidates were placed on a continuum. Reagan was classified as conservative on the Republican side, while Baker and Bush were portrayed as moderates. For the Democrats, Carter was considered moderate and Jerry Brown more liberal than Carter. Kennedy had not announced as a candidate at that time. By analyzing his stand on national health insurance, gun control, ERA, etc. the students considered Kennedy to be a liberal.

Theoretical understanding of the concept was set aside near the end of the semester with a study of the United States Constitution. Of particular relevance was the sixteenth amendment. The sixteenth amendment was presented as an attempt to redistribute income among the United States citizenry by using revenues for social projects. The power of "turn of the century" names such as Vanderbilt, Carnegie, and Rockefeller was mentioned as background for the sixteenth amendment.

During the semester, the control group participated in a small unit on the legal system in the United States: court decisions such as Brown vs. Board of Education, Miranda vs. Arizona, along with the James Earl Gideon case were read and discussed. Present issues such as cryonics, medical advances in prolonging life, and "test tube" babies

also played a role in defining conservatism and liberalism to these students in the control group.

At the conclusion of the semester, the Follett scale and the newspaper headlines test were readministered. The opportunity to view a specific manifestation of a governmental agency with broad authority and impact was not available for this class. With the exception of short segments from filmstrips, the idea of conservative vs. liberal was only dealt with in traditional manner, on the intellectual level and in oral mode.

In the description of the experimental group, there is also some theoretical discussion. The boldness of Roosevelt's plan and the far-reaching nature of planned communities are but two examples. But in contrast with the control group, the spring semester class met an entity face to face that could influence their attitudes. They completed an in-depth study on the Tennessee Valley Authority.

II. INSTRUCTION FOR EXPERIMENTAL GROUP

Completing the pretest evaluation instruments and an introduction to the conditions in the Tennessee Valley in the 1930's consumed the first day in the experimental unit.

The instructor attempted to motivate the experimental group by exposing them to the spirit of the region in 1933. On the second day of the unit the class began viewing the

feature length film Wild River.⁴ Three class periods were needed to complete viewing and discussion of the film. Among themes applicable to the concept of political orientation and TVA were the following: original attitudes of the Tennessee Valley population toward outside interference; the economic situation of the 1930's; modern attitudes toward big employers such as TVA, AEC, Union Carbide, etc.; the effect of the back to nature movement of the 1960's and 1970's; and the energy crisis of the 1980's.

This was followed by a discussion of ideas depicted in a commercial transparency, "Tennessee Valley Authority."⁵ This transparency includes a teacher guide which promotes, through probing questions, student interest in the benefits and/or drawbacks to federal intervention. The remaining time in this fifth day of the unit was used to organize topics for team presentations to be given near the conclusion of the unit. Each team consisted of three students. Deadlines were set for the fifth week of the unit. Team presentations were limited to ten minutes. Topics were as follows:

TVA's effect on forestry

TVA's effect on flood control

⁴Films, Inc., 476 Plasamour Drive, Atlanta, GA 30324.

⁵Civic Education Service, Washington, D.C. 20006.

TVA's effect on air quality
TVA's effect on employment
TVA's effect on health and education
TVA's and endangered species
TVA's effect on property owners
TVA's effect on recreation
TVA's effect on navigation
TVA's effect on fishing and wildlife
TVA's effect on lifestyle of people
TVA and Indian religious freedom

On the sixth day of the unit the instructor quoted section 23 of the TVA Act.⁶ Students reacted to the meaning of the economic and social well being of the people of the region as mentioned in the above passage. Next, the students were presented with a graph depicting the efforts of TVA to control fly ash emissions at its coal-fired generating plants.⁷ Upon ascertaining the student understanding of the graph, the instructor then encouraged the students to look at two other articles on the subject of air quality. One article, by Carson Brewer, explains the effect sulfur dioxide emissions produce on plant life in the region.⁸ The

⁶Marguerite Owen, The Tennessee Valley Authority (New York: Praegar Publishers, 1973), p. 21.

⁷See Appendix B.

⁸Carson Brewer, "Outlook Not Rosy for People Who Fish, Eat, or Pay Electric Bills," Knoxville News-Sentinel, May 6, 1979, p. C-4.

companion article imparts newer research on the effect of sulfur dioxide emissions.⁹ The lesson was concluded as the students developed positive aspects and negative aspects of coal-fired steam plants as a student listed them on the chalkboard. Concluding this day was the introduction of a trip to Norris, Tennessee. Permission slips were distributed and the details of the trip were discussed.

Continuing the preparation for the field trip to TVA headquarters and Norris Dam took a few minutes on the seventh day. The students then viewed a filmstrip and accompanying audio cassette furnished by TVA called "The Story of TVA" which is available from the agency's Knoxville information office. The filmstrip emphasized TVA contributions in the areas of flood control, conservation, navigation, energy and standard of living of the people. Upon completion of the discussion to conclude the filmstrip, students and the instructor began to develop a questionnaire for older, continuous residents of the valley. It was designed for citizens fifty-five years old or older.¹⁰ The content centered on how the respondents perceived the TVA impact on life and the environment in the valley over the past forty-five years.

⁹Maryville-Alcoa Daily Times, February 18, 1980, p. 1.

¹⁰See Appendix C.

Students completed the questionnaire on the eighth day of the unit. Students were then assigned to find two respondents with which to survey and to then share their findings with the rest of the class near the end of the unit. Money and permission slips were also collected during the first part of this class. In order to provide students with an opportunity to work in groups, the teams then cooperatively completed a puzzle, "Word Lake."¹¹ Each team who completed the puzzle in the allotted fifteen minute period was given ten additional points to their group presentation to be presented during the last week of the unit.

Final preparations for the field trip to Norris Dam and the TVA headquarters in Knoxville were made on the ninth day. This included a check to see that all students had returned transportation costs and parental permission slips. Then the instructor led the class in an orientation to the background of Norris Dam and Roosevelt's view of the TVA in 1933. Concepts included were the new agricultural ideas (crop controls, price supports), private power companies' fear of their market loss, community planning (Norris in 1930's, Timberlake in 1980's), and rural industrialization in order to relieve urban crowding.

¹¹See Appendix D.

The students then completed a worksheet that dealt with skill development. This worksheet was designed to increase student abilities on reading and interpreting maps and tables.¹²

On the tenth day, the class went on a field trip to TVA headquarters in Knoxville. The trip included a tour of Norris Dam, TVA's first project. The TVA information office helped plan the trip and provided guides at the dam. The trip consumed an entire school day; arrangements for the instructor's normal classes had to be worked out in conjunction with the department chairman and the school principal.

On the eleventh day of the unit, the students critiqued their field trip from the day before. Facts were then listed on the chalkboard and categorized. From these categories concepts were deduced in a teacher-facilitated manner. Concepts included the expense and expanse of such an undertaking, benefits for standard of living, and change of lifestyle. Also on this day, students viewed the fourteen minute film Tennessee River: Conservation and Power.¹³ Themes emphasized were TVA's role in soil conservation, which greatly benefited farming and forestry, and power production.

¹²See Appendix E.

¹³Produced by Bailey Film Associates, Chicago, 1971.

In order to present balanced material an "anti-TVA" activity was undertaken on the twelfth day of the unit. Mike Peery, member of a family displaced by Tellico Dam, came to the class and gave a thirty minute presentation. Being associated with the Save the Little T organization, he bemoaned the loss of rich farmland when such commodities are so scarce. He listed other losses such as the historical and scenic appeal of the valley of the Little Tennessee. At the conclusion of the presentation students questioned Peery about his efforts to stop the dam and what it was like to relocate prior to November 1979, when the gates closed and Tellico Lake was created.

In order to continue the balanced nature of the unit, the students did some research on a report dealing with benefits of reservoir development of the Little Tennessee Valley vs. a river development project aimed at increasing the social project value of a free flowing river. This document, which was prepared by the TVA and used (interestingly enough) by various anti-dam groups, was helpful to most students.¹⁴ After allowing time for the students to read the document, the students examined the various aspects of development, i.e., electricity, flood

¹⁴"Alternatives for Tellico Project," A TVA Staff Report, December 1978.

benefit, industrial development, recreation and fishing, agriculture, and historical and cultural sites. A map, attached to the document, showing the various archaeological and historic sites was then examined. The instructor asked the class questions involving the map legend and scale of miles in order to practice needed social studies skills. This concluded the thirteenth day of the unit.

Since William Blount High School had outstanding audio-visual facilities, the following activity was possible. Through WBIR-TV, Knoxville, Tennessee, the instructor obtained a collection of file tapes on the Tellico Project. They highlighted the main events in the last months prior to the closing of the gates in November of 1979. These tapes obviously brought to the surface many issues that apply to governmental involvement in the lives of the populace. Issues such as the imminent domain, constitutional religious rights of Indians, the unemployment of a region and government's responsibility were some of the issues involved. Two class periods were spent in viewing these file tapes which were originally to be molded into a documentary. However, Channel 10 changed its plans when the gates of the dam were closed somewhat quickly in an attempt to end the legal battles that had entangled the project for several years. At the end of each one of these two class periods, the teams were given time to meet and

continue planning for their presentations. This consumed the fourteenth and fifteenth days of the unit.

For the sixteenth day, the instructor set up a library schedule so that the teams could research their topics. Information had also been gathered from the various class activities and the instructor shared many newspaper articles on the various topics with the teams on this day. Appropriately the students returned to the library the next day to continue research. After the seventeenth day, library passes were granted to teams that had available time in their daily schedule to go as individuals or as sub-groups. The students had been made aware from the beginning that each presentation would be evaluated by their peers and their instructor and that their presentations would be video-taped.

On the eighteenth day of the unit the instructor used a teacher directed method in order to emphasize the effect of TVA on people's lives in the Tennessee Valley over the past half century. The method was to construct a time-line¹⁵ using the overhead projector. The time-line stops at 1980 and one of the main goals of the lesson was to determine the students' view of the role of TVA in the future. As the dates were printed on the transparency the instructor

¹⁵See Appendix F.

questioned the students deductively in order to get them to supply the corresponding event.

The last input of information was presented on the nineteenth day. A film entitled "Power from Paradise" was obtained from the TVA film services office and shown to the class. It centers on the construction of a coal-fired steam plant in western Kentucky. At the conclusion of the film a record, "Paradise,"¹⁶ by John Denver is played for the students, who were asked to compare record theme to the film. The theme is centered upon the environment in the region around the plant due to the great demand for coal to fuel the generators.

The twentieth day was a break from the routine. The VEC weekly news filmstrip, which the class had not viewed recently, was seen during this period. Keeping up with current events is an objective of any social studies course. The students were then reminded of their team and individual projects which were to be presented during the next week. The class was aware that, each six weeks grading period, part of their evaluation was an individual project. The instructor had mentioned the individual project frequently during the unit. The due date for the questionnaire was set

¹⁶Originally recorded by John Prine, in 1971 for Cotillion Music, Inc. & Sour Grapes Music, 1841 Broadway, New York, N.Y. 10023.

for a week away (the twenty-fifth day). The individual project was the order of business on the twenty-sixth day.

The group projects were presented to start the fifth week of the unit. With nine groups involved, three days were required to complete the presentations. Each group received evaluation forms from their peers. Student audio-visual aides conducted the video taping. During the fourth day of the week excerpts of each group were shown over a video monitor. Constructive suggestions were given in the ensuing discussion as well as statements of praise for good aspects of the presentations. On the last day of the fifth week, questionnaires were brought back and results tabulated. Students then compared these results to the findings of Carson Brewer in an article entitled "Overall, Area Dams Seem to Have More Support Than Opposition."¹⁷ The students were reminded of the individual projects due on the next class day, which was the start of the sixth week. The post-test was set for the second day of the sixth week.

On the first day of the last week the students briefly shared their individual projects with the class. Limited time was available so that some review could take place. The last half of the class was spent in review for the

¹⁷Carson Brewer, "Overall, Area Dams Seem to Have More Support than Opposition," Knoxville News-Sentinel, June 17, 1979, p. C-4.

posttest to be given the next day. A version of the television game show Password was used to build interest in the review lesson. The posttest was given on the twenty-seventh day of the unit. On the third day of the week the students completed the posttest form of the newspaper headlines test, which was actually an interest inventory. The tests were returned on the twenty-ninth day to conclude the unit. The conservative-liberal scale was given later to coincide with the pattern for the control group that had the students completing the scale at the beginning of the semester and near the end of the same semester.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this chapter is to examine the responses of the experimental and control groups to the instruments used in this study to determine if the treatment given the experimental group (taught by the systematic experiential method) had an effect on that group. The control group was taught in a traditional, textbook method.

The data analysis technique utilized to interpret the data was the analysis of covariance. This technique was employed to determine if significant differences were present in three areas. These areas were differences between the control and experimental groups in the manner of political orientation as measured by the conservative-liberal scale, differences between groups in the matter of interest toward the topic being examined (TVA), and differences in responses to a cognitive test. This last area involved the experimental group only.

In determining the significance of differences in these responses, the .05 level of significance was the standard used. The null hypotheses were that there would be no significant differences in responses in each one of the three areas mentioned above. A variance ratio of less than one was considered insignificant. If a variance ratio was

greater than one, it had to be determined if that F (variance ratio) was statistically significant for the size of population.

I. DIFFERENCES IN POLITICAL ORIENTATION

A first objective was to compare the student scores on the pretest and posttest of the conservative-liberal scale. One point was given for "agree" answers, which were called conservative answers, and liberal ("disagree") answers received two points. On the scale a score of 26 was the extreme conservative score 39 was the moderate score (median) and 52 became the extreme liberal score. This scale was given to both groups early in the semester and near the end of each semester.

Table I (Pretest and Posttest scores on the Conservative-Liberal Scale) contains, among other data, the mean scores of the experimental and control groups individually and as a total. Other information recorded in Table I includes the range of scores, the standard error of estimate, the maximum and minimum scores for the scale, and the sum of scores.

Both groups exhibited the same trend. That is both groups moved in the conservative direction. The mean scores for both groups went from 39.15 to 38.00. Each group also exhibited a within group drop of approximately one point on

TABLE I
PRETEST AND POSTTEST SCORES ON CONSERVATIVE-LIBERAL SCALE

Name of Group	Mean Score	Standard Error of Estimate	Variance	Range	Minimum Score	Maximum Score	Sum
Pretest Control	39.77	0.56	6.85	9.00	35.00	44.00	875.00
Pretest Experimental	38.62	1.68	72.97	47.00	0.0	47.00	1004.00
Posttest Control	38.36	0.93	19.20	19.00	26.00	45.00	844.00
Posttest Experimental	37.69	1.73	77.74	50.00	0.0	50.00	980.00
Pretest Both Groups Total	39.15	0.94	42.21	47.00	0.0	47.00	1879.00
Posttest Both Groups Total	38.00	1.02	50.04	50.00	0.0	50.00	1824.00

Note: Control group contained 22 subjects, experimental 26; total groups contained 48.

the scale. However, it should be noted that all the mean scores were very close to the "perfect" median score which indicates a moderate political stance.

The range of scores increased from pretest to posttest with each group as well as for both groups combined. This pattern of wider differences in scores over time was also evident in the variance both within groups and for combined groups. The variance for the combined groups went from 42.21 to 50.04.

Of course, the key statistic was how significant these differences in scores really were at the .05 significance level. Table II, Analysis of Covariance by Group, Pretest Conservative-Liberal Scale with Posttest, was crucial for the study. Sources of variation, listed in the table, were Main Effects Group, Explained, Residual and Total. An F was calculated for each source of variation.

The source of variation that examined the treatment on the dependent variable was "Main Effects Group." The calculation of F produced a number less than one, 0.50. Therefore, the systematic method utilizing the TVA did not have a statistically significant effect on the political orientation of the students.

II. DIFFERENCES IN INTEREST TOWARD TVA

The newspaper headlines test was the means of observing the interest in the systematic method's focus, TVA. If a

TABLE II
ANALYSIS OF COVARIANCE BY GROUP
PRETEST CONSERVATIVE-LIBERAL
SCALE WITH POSTTEST

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F (Variance Ratio)
Main effects	4.39	1	4.39	0.50	0.48
Group	4.39	1	4.39	0.50	0.48
Explained	1588.11	2	794.05	90.26	0.0
Residual	395.87	45	8.80		
Total	1983.98	48	42.21		

NOTE: Covariate raw regression coefficient for posttest Conservative-Liberal Scale was 0.82. All 48 subjects were processed in the analysis.

student responded most favorable in all items in the newspaper headlines test the highest score would be 45. If a student responded unfavorable toward headlines about TVA in all cases the lowest score would be 15. The sets of headlines were ranked 3, 2, 1, with the ranking (3) being the most favorable response.

Interest toward the experimental treatment was examined in Table III, Pretest and Posttest Scores on Newspaper Headlines Test. The most important aspect of this table was the mean scores column.

An interesting pattern was evidenced here. For the combined groups as well as for the groups separately, there was a slight increase in interest toward TVA. The mean score for the combined groups went from 29.35 in the pretest to 29.79 in the posttest. As before, in the matter of political orientation, the results were centered in the "middle of the road." A hypothetical respondent giving 2's on all the items would have scored 30.

There was no clear pattern in the range of the scores over a period of time. The range decreased from the pretest to the posttest for the control group and increased for the experimental group. The combined groups showed a slight decrease in range, from 43.00 to 42.00.

The variance also exhibited lack of a pattern. The variance for the combined groups went from 73.17 to 69.11.

TABLE III

PRETEST AND POSTTEST SCORES ON NEWSPAPER HEADLINES TEST

Name of Group	Mean Score	Standard Error of Estimate	Variance	Range	Minimum Score	Maximum Score	Sum
Pretest Control	29.73	2.04	91.54	43.00	0.0	43.00	654.00
Pretest Experimental	29.04	1.53	60.44	41.00	0.0	41.00	755.00
Posttest Control	29.96	1.83	73.76	41.00	0.0	41.00	659.00
Posttest Experimental	29.65	1.62	67.92	42.00	0.0	42.00	771.00
Pretest Both Groups Total	29.35	1.24	73.17	43.00	0.0	43.00	1409.00
Posttest Both Groups Total	29.79	1.20	69.11	42.00	0.0	42.00	1430.00

NOTE: Control group contained 22 subjects, experimental 26; total groups contained 48.

The statistical significance of the data on interest in TVA is shown in Table IV, Analysis of Covariance by Group Pretest and Posttest Scores on Newspaper Headlines Test. Other sources of variance were analyzed, but the one that shows the effect of the treatment on the students was "Main Effects Group."

F was calculated to be 0.11. Therefore the hypothesis, that the treatment given the experimental group would not effect the subjects' interest in TVA, was confirmed.

III. DIFFERENCES IN TVA FACTUAL (COGNITIVE) TEST

The experimental group was the only group involved here since their treatment included the experience with TVA. The multiple choice pretest and posttest scores were tabulated on a one point per question basis. There were ten questions in each segment of the cognitive (factual) test.

Table V, Pretest and Posttest Scores on TVA Test Experimental Group Only, relates the scores of the students on multiple choice, factual questions. The increase in the sum column and the increase in the mean scores column indicate higher scores for the classes, individually and combined.

When the mean scores of the combined groups were examined, there was found an increase from 5.89 in the pretest to 7.39 in the posttest. This was a sizeable

TABLE IV
ANALYSIS OF COVARIANCE BY GROUP
PRETEST AND POSTTEST NEWSPAPER
HEADLINES TEST

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F (Variance Ratio)
Main Effects	2.12	1	2.12	0.11	0.74
Group	2.12	1	2.12	0.11	0.74
Explained	2560.39	2	1280.19	65.57	0.0
Residual	878.59	45	19.52		
Total	3438.98	47	73.17		

NOTE: Covariate raw regression coefficient for Posttest Newspaper Headlines Test was 0.89. All 48 subjects were processed.

TABLE V
PRETEST AND POSTTEST SCORES ON TVA TEST
EXPERIMENTAL GROUP ONLY

Name of Group	Mean Score	Standard Error Of Estimate	Variance	Range	Minimum Score	Maximum Score	Sum
Pretest TVA Facts	5.89	0.30	2.35	5.00	3.00	8.00	153.00
Posttest TVA Facts	7.39	0.36	3.37	6.00	4.00	10.00	192.00
Pretest TVA Attitudes	25.54	0.64	10.58	12.00	18.00	30.00	664.00
Posttest TVA Attitudes	24.15	0.55	7.82	9.00	19.00	28.00	628.00

NOTE: The scores on TVA attitudes used here were a separate entity than that of the newspaper headlines test and were not expressly mentioned in the null hypotheses. The newspaper headlines test, which effected both experimental and control groups, was used to provide similar data. As with the newspaper headlines test, the difference in scores was not found to statistically significant for the size of the sample.

increase in scores. It is logical that when a person sees and hears relatively new information and is exposed to first hand evidence of an entity that there will be some retention of material. It has not been determined what methods, or what material, is best for retention. But the fact that exposure to information should lead to some level of retention is an accepted part of science and education.

In the range of scores there was an increase of one point. Nothing can be proved from this datum. However, the maximum score did increase from 8.00 to 10.00. This fact, taken together with the sizeable increase in the mean scores over a period of time, made it possible to state that some learning did take place within the experimental group.

Observation of the variance resulted in an increase over a period of time which corresponded to the increase displayed by the range. The variance increased 1.02 points from pretest to posttest.

Because of the sizeable increase in mean scores the analysis of covariance statistic became very relevant. Thus Table VI, Analysis of Covariance Experimental Group Only Pretest and Posttest Scores on TVA Facts, revealed whether the treatment significantly effected retention of content. The F value and the significance of the F value are shown in Table VI.

TABLE VI
ANALYSIS OF COVARIANCE--EXPERIMENTAL GROUP ONLY
PRETEST AND POSTTEST SCORES ON TVA FACTS

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F (Variance Ratio)
Main Effects	31.71	1	31.72	25.09	0.00
Group	31.71	1	31.72	25.09	0.00
Explained	414.41	2	207.21	163.88	0.00
Residual	56.90	45	1.26		
Total	471.31	47	10.03		

NOTE: Covariate raw regression coefficient for Posttest on TVA facts was 0.77.

The F of 25.09 implied that the treatment (the experiential method utilizing TVA) had an effect on the subjects. However, after taking the degrees of freedom and the F of the dependent variable (Main Effects Group) from the table and finding the corresponding significance value on a distribution of F table, it was determined the F was not statistically significant for the size of the sample.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was to determine what effect a "concrete" (experiential) unit of study in TVA, as an example of everyday federal involvement in peoples' lives, would have on selected students at William Blount High School, Maryville, Tennessee. Two classes were involved. One received a traditional exposure and the other received the first hand experience in a planned unit of study. There were three questions involved in analyzing student responses:

1. What effect did the treatment on the subjects have on their political orientation? Did the treatment cause students to become more liberal/conservative or less liberal/conservative in their views?

2. What effect did the treatment on the subjects have on their attitude/interest in TVA?

3. What effect did the treatment on the subjects have on their achievement on a cognitive test over the unit of study? This aspect of the study involved the experimental group only.

The statistical method to determine any significant difference in all three questions was the analysis of

covariance method. After processing the data there were three statistically proven conclusions.

There was no statistically significant effect on the political orientation of the students. Although the mean scores of the subjects over time showed a slight conservative trend, this movement was not enough to merit a causal status for the treatment administered the experimental group. Also the mean scores indicated an overall moderate stance by the students throughout the study.

Secondly, there was a slight increase in attitude/interest toward TVA at the conclusion of the study. This is somewhat surprising when compared to the findings concerning political orientation. However, as was the case with political orientation, the analysis of covariance revealed no significant difference in attitude change for the sample as a whole.

In the cognitive area of the study the treatment on the experimental group did have an effect. The F for the pretest-posttest comparison was 25.085, but this value still was not statistically significant for the size of the sample. A larger sample would have certainly been beneficial for this aspect of the study.

II. RECOMMENDATIONS

After observation of the data, these recommendations concerning students' political attitudes, interest level, and content retention are seemingly relevant:

1. Social Studies Teachers, especially in the Tennessee Valley region, should place more emphasis on the TVA in social studies curriculums. It has come to have a large impact on the valley population.

2. Teachers should be objective when dealing with political orientation and the TVA. Provide time for the dissenting voice including the anti-nuclear groups, the conservationists, and the farmers. Separating fact from opinion is a possible result that will benefit the students as long as they live.

3. Any study of any aspect of government should involve the question, "How does this affect me?" The attitudinal side of a student is a stimulus to further affective and cognitive learning, once the student is motivated.

4. Students and teachers outside the TVA region could examine another governmental agency more relevant to their situation. Getting a first-hand look at a federal agency can help students see their ranking on a conservative/liberal scale. For example, students near military bases could use those bases as a study in governmental trends in the United States. Students living near a national park could do an in-depth study of the philosophy changes over time of the park superintendents.

5. Social studies teachers should consider emphasizing the conservative/liberal concept. This could be an

interdisciplinary objective as well. It may serve as a framework from which students can dissect problems.

III. FURTHER STUDY

Some of the things the investigator feels would yield valuable information if examined are the following:

1. The same study to include many more adolescent students in the TVA region would be enlightening.
2. A detailed analysis of the twenty-six question conservative-liberal scale portends interesting results. How did students respond to questions in certain areas? For example, some of the questions dealt with freedom of speech issues, some dealt with property rights, some dealt with moral judgments. Which questions received the most liberal responses; which received the most conservative responses?
3. An analysis of the students responding to the scale indicates another set of possibilities. What about self-concept and political orientation? What about scholastic achievement and political orientation? What about the relationship between these personal factors and the issues, in the analysis of the scale, described in the preceding paragraph?
4. Another possibility would be building a unit on three or four federal agencies, in which TVA played a

supporting role instead of a preeminent role. Then the effect on political orientation could be analyzed.

5. Also the influence of the instructor would be worth examining. Do the students perceive him/her as moderate, conservative, or liberal?

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BIBLIOGRAPHY

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APPENDICES

APPENDIX A

INSTRUMENTS USED IN EVALUATING STUDENT RESPONSE
IN POLITICAL ORIENTATION, ATTITUDES, FACTS

INSTRUMENTS USED IN EVALUATING STUDENT RESPONSE
IN POLITICAL ORIENTATION, ATTITUDES, FACTS

Four instruments (including the posttest form on the TVA Unit) were used in this study.

The political orientation of the students in the study was measured by the Follett Conservative-Liberal Scale, pretest and posttest. The attitude toward content was measured by the Newspaper Headlines Test, pretest and posttest. The factual knowledge for the experimental group only was measured by two teacher-made tests given before and after the treatment (the TVA unit) on the experimental group.

1. Follett Conservative-Liberal Scale.

1. The government is bringing about too many changes.
2. We should not study ideas that are opposed to democracy.
3. We learn more by past experience than by experimenting.
4. Our country's greatness lies in its past.
5. People who are not loyal should not be allowed freedom of speech.
6. We will probably never again have presidents as great as Washington and Jefferson.
7. The congress of the United States should have the power to ban certain books from the mails.
8. The police should have the power to hold a person in jail for two days without placing a charge against him or her.
9. The courts have gone too far in their efforts to protect the rights of criminals.
10. A public school teacher should be allowed to lead their classes in prayer.
11. A black should be denied the right to rent a house or apartment because of race.
12. A movie should be banned if it attacks a particular race or religion.

13. Public school students should be segregated according to race.
14. The police should have the power to "bug" telephone conversations of suspected criminals.
15. People should have to fight in wartime if their church teaches that it is wrong for them to take part in war.
16. Students should have to swear that they are loyal to the United States in order to get scholarships from the federal government.
17. The police should be permitted to keep someone from handing out communist literature.
18. A lawyer who knows that her or his client is guilty should refuse to defend that client in court.
19. Most of our problems, such as poverty and slums, would be taken care of if people would just try to help themselves.
20. Busing is not a reasonable method of achieving integrated schools.
21. It is impossible to give equal rights and opportunities to all Americans because people are not all equal in ability.
22. Americans should be able to choose whether or not they want to participate in the Social Security system.
23. If a person really tries hard enough, he or she will be able to succeed in school.
24. Americans should not have to pay taxes for schools if they have no children or do not send their children to public schools.
25. When people grow too old to work, their family, rather than the government, should be responsible for their well-being.
26. If people who are selling their homes wish to show them only to persons of one race, nationality, or religion, they should be allowed to do so.

2. Modified Newspaper Headlines Test

For each of the following sets of headlines write #1 beside the one you like best, #2 beside the one you would read next, and #3 beside the one you would read last.

1. TVA wants: Region's Income to Equal National Level _____
 Book Recalls Story of Will and Slaves _____
 Housework May Cause Rash _____

2. Smokies Haze Includes Pollutants _____
Clear Conscience—TVA's Freeman Says Cherokees
Waited Too Long in Burial Pleas _____
Bus Driver Beaten by Rider _____
3. Bear and Truck Meet—With Grizzly Result _____
Gold Jumps \$25 to Record \$648.50 _____
TVA Tellico Gates Close _____
4. Hostages Here Forever, Ghotbzadeh Warns U.S. _____
Tellico Dam May Signal "Prelude to Prosperity" _____
Dying, He Makes Every Day Count _____
5. Cherokees Angry with TVA for Tellico _____
Honeymooning Prospectors Survive 17-Day Alaskan
Ordeal _____
Middle-Aged Women Smokers Suffering Variety of
Serious Ailments _____
6. America's Super Love Boat _____
Tellico Lake Waters Rising _____
Two American Climbers Feared Frozen _____
7. Relief for Insomniacs _____
Youth Picks Most Admired Leaders _____
The Tennessee River Before TVA _____
8. EPA Charges TVA with Failure to Meet Pollution
Standards _____
Acupuncture Produces Pain Killer, Doctor Says _____
West Losing Tons of Soil due to Erosion _____
9. Moser Bitter about Eviction over Tellico Dam _____
Microwave Ovens Offer Hazards to Users _____
Republicans Map out Campaign Strategy _____
10. Congress Votes Funds for Gasohol Research _____
Little T: The Toughest Bite TVA Ever Chewed _____
Tour Bus Visits Eagle Nesting Grounds _____
11. Five Groups Seek to Join Cherokee Fight Against
Dam _____
Freedom of Business at Stake in America _____
Finds mother 32 years later _____
12. House being Moved blamed for Traffic Accident _____
Tenn. Interest in Iran Overwhelming _____
TVA Director says Solar and Nuclear Power Both
Needed _____

13. Will TVA Headquarters go to Muscle Shoals?____
Bicycle Sales Booming Nationwide____
Rosa Parks given Martin Luther King Prize____
14. Tellico Lake Long-Time Dream for Mrs. Sheets____
Con Artist Takes \$2,500 from Local Couple____
Raising Social Security Age May Be Only Way to
Keep System above Water____
15. Russians to Remove Young People from Moscow
during 1980 Olympics____
TVA Criticized for Rate Increase____
Shah Dislikes Panama____
16. Government Pushes for Detroit to Build Small
Cars____
TVA World's Largest Coal Buyer____
Students Build Christmas Shop for Children____
17. Citizens Oppose Shopping Center in Neighborhood____
Fishing on Tellico Uncertain at Present____
Jogging Fights Heart Disease____
18. Clement Says New Industry May Come to Vonore
due to New Available Electricity____
Church Splits over Role of Women____
Coaches Fight over Use of Gym____
19. Indians Sue U.S. Government for Millions of
Acres in Maine____
TVA Helps Coeburn, Virginia, Beat Floods____
Dog Show to be Held at Coliseum____
20. TVA Offers Home Insulation Checks to
Homeowners____
Carter Halts Russian Grain Sales____
Rich Recluse Dies, Leaves House of Garbage____
21. "Future of Valley Bright" says Director
Freeman____
State Passes Child Restraint Law____
Shrub Rustlers?____
22. Church Seeks Court Order to Remove Pastor____
TVA Works on Cleaner Coal Fired Generating
Plants____
Family Adopts "Boat People"____

23. Chattanooga Spared Millions of Dollars of
Flood Damage by Dams _____
Squirrels Build Nest in Store, Hoard Candy _____
TVA Builds Bridge for Small Town _____
24. Soviets Invade Afghanistan _____
Last Tellico Area Homes Bulldozed _____
New "Startrek" Premiers _____
25. TVA Develops Fund for Energy Ideas _____
Expo's First Shovel of Dirt Lifted _____
Twiggy the Water Skiing Squirrel _____
26. Thousands of Acres of Pulpwood Owned by TVA _____
Alexander's Budget Cuts State Spending _____
Hundred Year Old Woman Celebrates Birthday _____
27. Prime Farmland in Little T Valley Disappears _____
Judge Throws Out Son's Case against Parents _____
Hiker Meets Grizzly in Back Country _____
28. Wheel Chair Patients Form Basketball Team _____
TVA Starts Program to Hire Minorities _____
Mayor Fires Two Fire Officers _____
29. Valley Rainfall and Climate Studied by TVA
Scientists _____
Federal Government Loans Chrysler over One
Billion Dollars _____
Tucker Launches New Career _____
30. County Chamber Backs TVA in Quest to Finish
Dam _____
Vermont Ski Resorts Need Snow _____
Iowa Farmers Uneasy over Grain Embargo _____

3. TVA Unit Pre-Test

1-12. Read each statement. Then decide whether each statement would be providing "for the economic and social well being of the people of the valley."

1. Conservation programs; planting trees, etc.;
(would be, would not, not sure).
2. Building parks, boat ramps and landings, picnic
areas near lakes (would be, would not, not sure).

3. Causing air pollution from large smokestacks (would be, would not, not sure).
4. Stocking fish in lakes (would be, would not, not sure).
5. Making people give up their homeplaces so that new power and jobs can be generated (would be, would not, not sure).
6. Flooding the sacred burial grounds of a small minority of Americans in order to generate more energy and jobs, etc. (would be, would not, not sure).
7. Using tax dollars to conduct agricultural research, experiments, as well as to produce new and beneficial fertilizers (would be, would not, not sure).
8. Using tax dollars to conduct experiments on solar heating for homes and industries (would be, would not, not sure).
9. Destroying the only natural habitat (home) of an endangered species in order to provide energy and jobs for the public (would be, would not, not sure).
10. Using tax dollars on large flood control programs (would be, would not, not sure).
11. Using tax dollars on large scale mosquito control programs in order to cut down disease (would be, would not, not sure).
12. Losing many hundred acres of rich farmland in order to provide new factory sites, energy, and recreation areas for the public (would be, would not, not sure).

Questions 13-22. Deal with multiple choice answers of factual questions.

13. Which one of the following is not a primary purpose of TVA? (recreation, conservation, education, flood control, provide power).

14. In the 1930's the Tennessee Valley was troubled by (blizzards, disease(epidemics), tornadoes, floods, droughts).
15. TVA buys more (gas, coal, oil, wood) than any organization in the world.
16. Some dams have devices traveling from one side of the dam to the other side by boat makes necessary. These devices are called (locks, turbines, generators, channels).
17. TVA lowers the water level in its lakes in the (summer, fall, winter, spring).
18. Approximately one-half of all electricity produced by the TVA in the early 1960's went to (Nashville, Atlanta, Oak Ridge, Memphis).
19. Most of TVA's electricity is produced by (solar energy, nuclear energy, hydroelectric plants-dams, coal fired steam plants).
20. Which state does not have any part in the Tennessee River Valley? (North Carolina, Kentucky, South Carolina, Alabama).
21. What gives the federal government the right to buy private lands if it pays a fair price? (Declaration of Independence, U. S. Constitution, Monroe Doctrine, Endangered Species Act).
22. As TVA has become bigger and bigger and become involved in more aspects of peoples lives over the past 45 years, we would say that this has been a (conservative, moderate, liberal) trend.

Questions 23-25. Short essay questions (one paragraph or so each).

23. Should Tellico Dam have been completed? Explain.
24. TVA steam plants put a lot of sulfur dioxide (pollution) into the air. TVA directors have said that if TVA spends the money needed to stop this pollution, our electric rates would have to go up to pay for this extra expense. What should be done?
25. Explain how TVA effects you everyday.

4. Posttest—TVA Unit

1-12. Read each statement. Then decide if each statement is fulfilling the needs of the people in the Tennessee Valley.

1. Encouraging landowners to plant trees and to put hilly land in pasture (would be, would not, not sure).
2. Building beachfronts, marinas, etc. on TVA lake shorelines (would be, would not, not sure).
3. Reserving certain areas as waterfowl sanctuaries; trying to increase duck, geese populations near TVA lakes (would be, would not, not sure).
4. Relocating farming communities to replace them with industrial parks and resort homes (would be, would not, not sure).
5. Causing coal miners to increase production faster than the land can be reclaimed—in some cases (would be, would not, not sure).
6. Experimenting in order to find a pesticide to stop pine beetles (would be, would not, not sure).
7. Experimenting, which of course means using tax dollars, in order to develop electric cars for future use (would be, would not, not sure).
8. Spending time and money to move an endangered species to a new habitat when its old one was being destroyed (would be, would not, not sure).
9. Spending tax dollars to recruit more doctors to the mountainous and isolated parts of the valley (would be, would not, not sure).
10. Moving a river channel away from a small town to stop flooding to the business district (would be, would not, not sure).
11. Spending money to build water treatment plants to decrease pollutants entering streams (would be, would not, not sure).

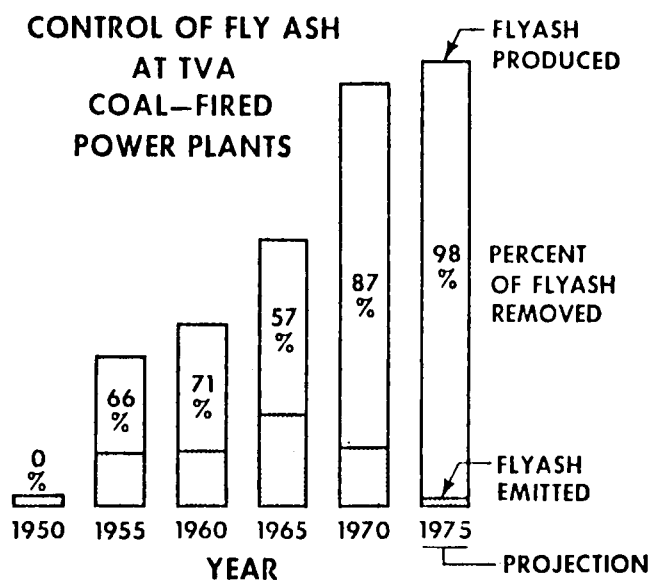
12. Losing famous historical sites in order to provide space for factories, businesses, etc. (would be, would not, not sure).
- 13-22. Multiple choice questions dealing with factual information.
13. Which of the following is not a primary purpose of TVA? (conservation, flood control, building electric cars, provide electricity, improve navigation).
14. In the 1930's the Tennessee Valley was troubled by (blizzards, poor soil, tornadoes, drought, plague).
15. The highest dam east of the Mississippi River is (Tellico, Chilhowee, Douglas, Fontana).
16. Most of the TVA dams have propellor-like devices, in power houses, which spin around when water is dropped on them. These devices are called (sluice ways, locks, turbines, dynamos).
17. TVA lowers its lakes in the fall in order to prevent (droughts, ice jams, navigation, flooding).
18. The first TVA dam was (Fontana, Ft. Loudon, Norris, Cherokee).
19. Most of TVA's energy is produced by (solar power, nuclear reactors, hydro-electric plants, coal-fired steam plants).
20. Indian site that was center of controversy in the Tellico "fight" (Tucaseegee, Chota, Nickajack, Sequoyah).
21. What requires the federal government to consider environmental factors before it starts a project? (Declaration of Independence, U.S. Constitution, Monroe Doctrine, Endangered Species Act).
22. Presently more people, in the Tennessee Valley, approve of TVA action than they did in the 1930's. This would be a (liberal, radical, conservative) trend.

23-25. Short essay questions. Give one paragraph answers.

23. TVA only has one nuclear plant, Brown's Ferry, in operation. Should it complete any others? Explain.
24. TVA steam plants (like Paradise Kentucky) require much coal to be mined. Miners, especially strip miners, claim that it costs too much to reclaim the land to meet TVA standards. What should be done?
25. TVA has been in existence 47 years. How has it helped and/or hurt this area?

APPENDIX B

CONTROL OF FLY ASH AT TVA
COAL-FIRED POWER PLANTS



Installation of more efficient ash collectors at TVA coal-fired power plants is reducing ash emissions even though production is increasing. The view below shows Shawnee Steam Plant at a time when new electrostatic ash collectors had been installed on four of the ten stacks, but were not yet in operation on the other six stacks. The stacks with the more efficient ash control can be identified from the difference in smoke plumes.

Figure 1. Control of Fly Ash at TVA Coal-Fired Power Plants.

Source: Tennessee Valley Authority, TVA Today 1972 (Knoxville, Tennessee: Tennessee Valley Authority, January 1972), 25.

APPENDIX C

QUESTIONNAIRE FOR RESIDENTS OF TVA REGION THOSE
WHO HAVE RESIDED FORTY YEARS OR MORE

QUESTIONNAIRE FOR RESIDENTS OF TVA REGION THOSE
WHO HAVE RESIDED FORTY YEARS OR MORE

1. Can you remember yourself or any body else changing their political party because of TVA?
2. Do you think TVA has had any effect on housing?
3. Do you think transportation has improved because of TVA? (Roads, Railroads)
4. Do you remember if your family had a phone before TVA?
5. If you or your family owned property can you remember if its value increased after TVA?
6. Do you think there are more health personnel available because of TVA? (Doctors, Dentists, Nurses, etc.)
7. Has TVA increased job chances?
8. Do you think the water quality has improved?
9. Do you think that the recreation opportunities have improved?
10. Are more people practicing conservation now? (Taking care of land, water, tree, wildlife)

APPENDIX D

TVA "WORD LAKE" PUZZLE WORKSHEET

C D A T O B U V M B X Q D C H A N N E L
 D V B V E N A S A C R Y D O T O M U T N
 F E R A A O N T R I B U T A R Y B I B A
 X S G S R X V E T G O T A L M L H E T R
 A U T O U S T A S O I L K O K O M E E O
 A A R X V H R M J G E N E R A T O R N S
 U G Z U X P O P Q B A C A T A C T I N C
 V H Y A C D F L O O D R E D O V S G E O
 F F V B O O H A S L E B U N O R R I S T
 G U U C N R L N I T J U J A C D I Y S Z
 N X C T S O J T S Z O H I O F A C O E Y
 M I A D E R R S E A K N O X V I L L E T
 I N F O R K O F R E N C H B R O A D A I
 A O H R V M T E O J K S H O A L K O B C
 S X I A E O F D C R H U B I N T E C C I
 T U R B I N E A T B E A Q W L O C K D R
 R O O S E V E L T W D S A Y E H W C E T
 D A M R O G E R B A C A T B I M O B F C
 F I L F O R T L O U D O U N A K H W G E
 O K A I B R I V E R V N O D O Y G I E L
 W E O A S O R E D N O P O N Q R X T Z E

steam plants, Tennessee, Holston, French Broad, coal, dam,
 Fontana, river, forest, lake, Chilhowee, Ohio, shoal, conserve,
 tributary, electricity, Fort Loudoun, flood, soil, lock, TVA,
 generator, turbine, Roosevelt, Norris, channel, Knoxville

Figure 2. TVA "Word Lake" Puzzle Worksheet.

APPENDIX E

MAP OF TENNESSEE VALLEY REGION

FACTS ABOUT TVA STEAM PLANTS

FACTS ABOUT MAJOR TVA DAMS AND RESERVOIRS

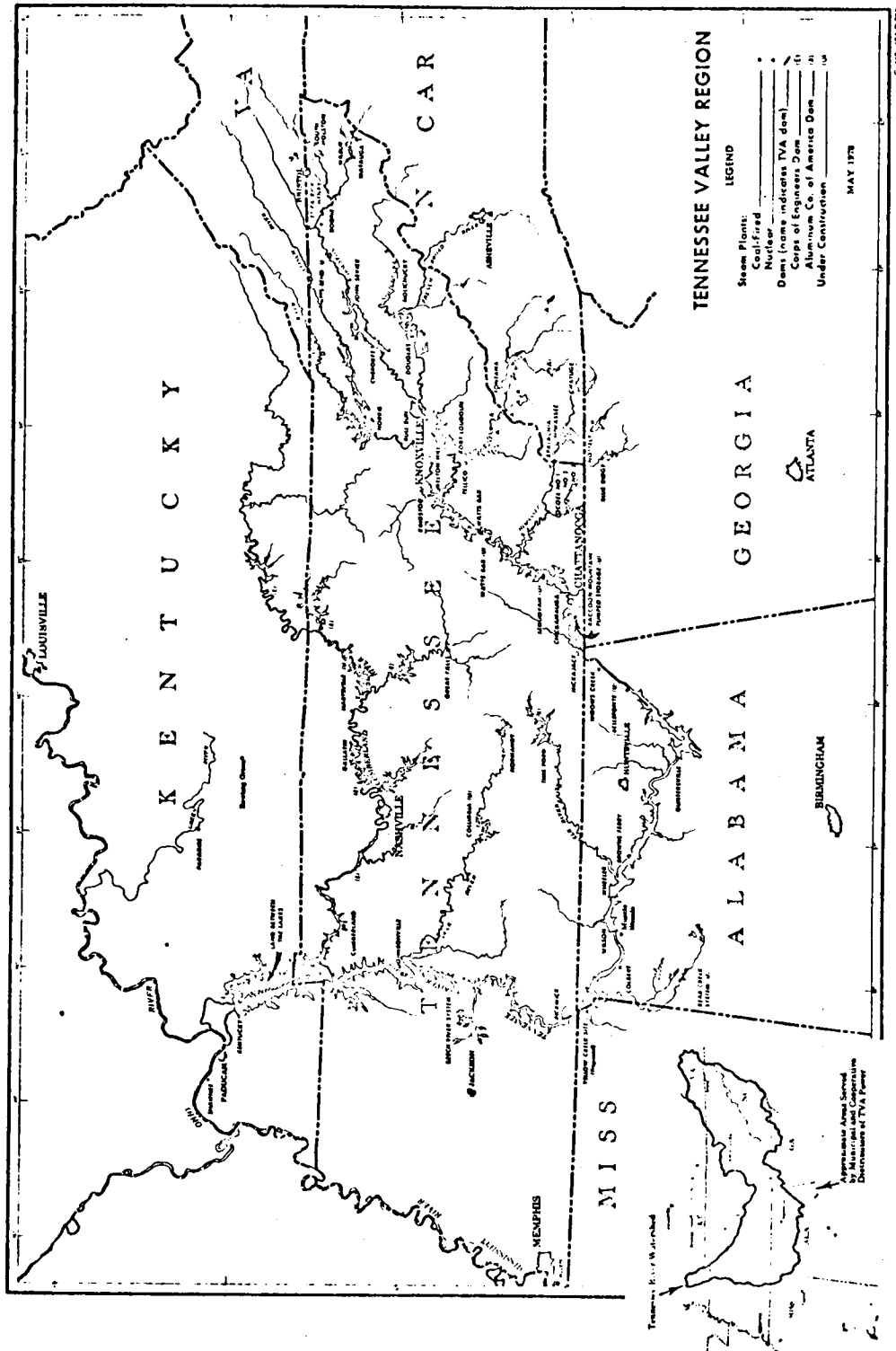


Figure 3. Map of Tennessee Valley Region.

Source: Tennessee Valley Authority.

TABLE VII
FACTS ABOUT TVA STEAM PLANTS

	Number of Units	Construction Started	Units Placed in Service	Maximum Capacity (kilowatts)	Cost (millions)
Watts Bar (coal fired)	4	1940	1942-1945	240,000	\$ 22
Johnsonville	10	1949	1951-1959	1,485,200 ^b	\$197
Widows Creek	8	1950	1952-1954, 1961-1965	1,977,985	\$342
Shawnee	10	1951	1953-1957	1,750,000	\$253
Kingston	9	1951	1954-1955	1,723,250	\$263
Colbert	5	1951	1955, 1965	1,419,750 ^b	\$185
John Sevier	4	1952	1955-1957	846,500	\$118
Gallatin	4	1953	1956-1959	1,255,200 ^b	\$180
Thomas H. Allen ^a	3	1956	1959	990,000 ^b	^a
Paradise	3	1959	1963, 1970	2,558,200	\$446
Bull Run	1	1962	1967	950,000	\$174
Cumberland	2	1968	1973	2,600,000	\$445
Browns Ferry Nuclear	3	1967	1974-1977*	3,456,000	\$920
Sequoyah Nuclear	2	1970	1978-1979*	2,442,160	\$1,100*
Watts Bar Nuclear	2	1973	1979-1980*	2,539,800	\$1,075*
Belleville Nuclear	2	1974	1980-1981*	2,664,000	\$1,300*
Hartsville Nuclear	4	1977	1983-1984*	5,148,000	\$3,500*
Phipps Bend Nuclear	2	1977*	1984-1985*	2,574,000	\$1,800*
Proposed Yellow Creek Nuclear	2	1978*	1985-1986*	2,750,000	\$2,150*

*Under Construction or scheduled. Costs estimated.

a. Allen Plant built by Memphis Light, Gas & Water Division, leased by TVA in 1965.

b. In addition, combustion turbine peaking units have been installed at Allen (620,800 kW), Colbert (476,000 kW), Johnsonville (1,084,800 kW) and Gallatin (330,800 kW).

Source: Tennessee Valley Authority.

TABLE VIII
FACTS ABOUT MAJOR TVA DAMS AND RESERVOIRS

Main River Projects	Dam Max. Height (feet)	Dam Length Feet	Length of Lake (mi)	Area of Lake at Full Pool (acres)	Shore line at Full Pool (mi)	Lake Elevation (feet above sea level)		Lake Volume (acre-feet)		Construction Started	Closure of dam	Cost (millions)	Ultimate Generating Capacity kW and No. of Units (1)
						Normal Min.	Top of Gates	Top of Gates Elev.	Useful Controlled Storage				
Kentucky*	206	8,422	184	160,300	2,380	354	375	6,129,000	4,008,000	1938	1944	\$119	175,000(5)
Pickwick Landing*	113	7,715	53	43,100	496	408	418	1,105,000	417,000	1934	1938	46	220,040(6)
Wilson (d)*	137	4,541	16	15,500	154	505	508	640,200	53,200	1918	1924	110	629,840(21)
Wheeler*	72	6,342	74	67,100	1,063	550	556	1,071,000	351,000	1933	1936	89	359,100(11)
Guntersville*	94	3,979	76	67,900	949	593	595	1,052,000	172,300	1935	1939	54	101,700(4)
Nickajack (c)*	81	3,767	46	10,370	192	632	635	252,400	32,300	1964	1967	71	100,350(4)
Chickamauga*	129	5,800	59	35,400	810	675	685	739,000	347,000	1936	1940	40	117,000(4)
Watts Bar*	112	2,960	96	39,000	771	735	745	1,175,000	379,000	1939	1942	35	156,600(5)
Fort Loudoun*	122	4,190	61	14,600	360	807	815	393,000	111,000	1940	1943	41	135,590(4)
Tributary Projects													
Normandy	110	2,734	17	3,160	73	859	880	127,000	60,400	1972	1976	38	—
Columbia (b)	105	2,325	54	12,400	236	603	635	363,000	283,000	1973	(1983)	(142)	—
Tims Ford	175	1,484	34	10,600	246	865	895	608,000	282,600	1966	1970	52	45,000(1)
Apalachia	150	1,308	10	1,100	31	1,272	1,280	57,800	8,800	1941	1943	24	82,800(2)
Hilwassee	307	1,376	22	6,090	163	1,450	1,527	434,000	306,000	1936	1940	23	117,100(2)
Chatuge	144	2,850	13	7,050	132	1,905	1,928	240,500	122,500	1941	1942	9	10,000(1)
Ocoee No. 1 (d)	135	840	8	1,890	47	818	838	86,500	32,500	1910	1911	10e	18,000(5)
Ocoee No. 2 (d)	30	450	—	—	—	—	1,115	—	—	1912	1931	3	21,000(2)
Ocoee No. 3	110	612	7	480	24	1,413	1,435	4,040	3,770	1941	1942	9	28,800(1)
Blue Ridge (d)	167	1,000	11	3,290	65	1,590	1,691	195,900	183,900	1925	1930	5	20,000(1)
Nottely	184	2,300	20	4,180	106	1,735	1,780	174,300	117,100	1941	1942	8	15,000(1)
Melton Hill*	103	1,020	44	5,690	173	790	796	126,000	31,900	1960	1963	39	72,000(2)
Norris	265	1,860	129	34,200	800	960	1,034	2,552,000	1,922,000	1933	1936	32	100,800(2)
Tellico (b)*	129	3,238	33	15,860	373	807	815	447,300	126,000	1967	(1978)	(116)	(a)
Fontana	480	2,365	29	10,640	248	1,580	1,710	1,443,000	946,000	1942	1944	77	238,500(3)
Douglas	202	1,705	43	30,400	555	940	1,002	1,475,000	1,252,000	1942	1943	45	120,600(4)
Cherokee	175	6,760	54	30,300	393	1,020	1,075	1,541,000	1,148,000	1940	1941	36	132,780(4)
Fort Patrick Henry	95	737	10	872	37	1,258	1,263	26,900	4,200	1951	1953	11	36,000(2)
Boone	160	1,532	33	4,310	130	1,330	1,385	193,500	148,500	1950	1952	27	75,000(3)
South Holston	285	1,600	24	7,580	168	1,675	1,742	764,000	438,000	1947	1950	31	35,000(1)
Watauga	318	900	16	6,430	106	1,915	1,975	677,000	354,000	1946	1948	32	50,000(2)
Great Falls (d) (in Cumberland Valley)	92	800	22	3,080	120	780	805	51,300	37,000	1915	1916	12	31,860(2)
Pumped Storage													
Raccoon Mountain	230	8,500	—	528	—	1,530	—	38,180	36,340	1970	(1978)	(310)	1,530,000(4)
Totals				653,400	11,401			24,182,820	13,715,310				4,775,460

*All main river dams and Melton Hill Dam are equipped with locks to pass barge traffic. A canal will give traffic access to Tellico Lake.

(a) Tellico project has no powerhouse. Streamflow through navigable channel to Fort Loudoun Reservoir will increase average annual energy through Fort Loudoun powerhouse by 200 million kWh.

(b) Under construction or scheduled. Cost and closure date estimated. District Court has enjoined TVA from closing Tellico Dam.

(c) Nickajack Dam replaced the old Hales Bar Dam 6 miles upstream.

(d) Acquired: Wilson by transfer from U.S. Corps of Engineers in 1933; Ocoee No. 1, Ocoee No. 2, Blue Ridge, and Great Falls by purchase from TEP Co. in 1939. Subsequent to acquisition, TVA heightened and installed additional units at Wilson.

(e) Ocoee No. 1 Rehabilitation began April 1973, Completed Nov. 1975.

Source: Tennessee Valley Authority.

APPENDIX F

TIME-LINE—EFFECTS OF TVA OVER THE YEARS

TIME LINE—EFFECTS OF TVA OVER THE YEARS

- I. 1913—Hale's Bar
 - A. First dam in area
 - B. Private power company
- II. 1918—Wilson Dam
 - A. Muscle Shoals
 - B. Munitions plant
- III. 1920's—Henry Ford
 - A. Offers to buy Wilson Dam
 - B. Congress balks
- IV. 1930's—George Norris
 - A. Committee—to use Wilson Dam
 - B. Great Plan—develop Tennessee Valley
- V. 1933—TVA Act
 - A. Experiment—Regional planning
 - B. Norris Dam—Named for
- VI. 1936 (Norris Dam Completed)
- VII. 1942-1944—Twelve Dams constructed
 - A. "Manhattan Project"—Oak Ridge
 - B. ALCOA north plant—war effort
- VIII. 1945—Hiroshima
- IX. Coal-fired steam plants (1949)
- X. Power demands boom (1950's)
 - A. Industry—growth
 - B. Standard of Living—rises
- XI. 1960's—Demand for power
 - A. Air Conditioning expands
 - B. Convenience—appliances

Figure 4. Time-Line—Effects of TVA Over the Years.

- XII. 1967—Brown's Ferry
 - A. 1st TVA nuclear fueled generator
 - B. Expense for operation
- XIII. 1973
 - A. David Etnier—snail darter
 - B. Arab oil embargo
- XIV. Mid-70's—Argument
 - A. Cost?
 - B. Environment?
- XV. 1978—Supreme Court Decision
 - A. New Board
 - 1. open attitude
 - 2. Environmentally aware
 - B. EPA law suit
 - 1. Install scrubbers
 - 2. Increase rates
- XVI. 1979—Energy Programs
 - A. Conservation
 - B. Solar research
- XVII. 1980's—?

Figure 4 (continued)

VITA

Mark Edmund Davidson was born in Maryville, Tennessee, on December 31, 1950. He grew up in nearby Alcoa where he attended Springbrook Elementary and was graduated from Alcoa High School in May 1968. The following September he entered Carson-Newman College. In September 1970 he transferred to The University of Tennessee, and in June 1972 he received a Bachelor of Science degree in Social Science Education.

In August 1972 he began teaching in the Blount County school system. He has continued in that system and is now teaching at William Blount High School near Maryville.

The author entered the Graduate School of The University of Tennessee, Knoxville, in October 1974. He completed a Master's degree in August 1977. In June 1978, Mr. Davidson started work on a Specialist in Education degree in Social Studies Education which was awarded in August 1980.

The author is a member of Phi Kappa Phi, National Education Association, Tennessee Education Association, and the Blount County Education Association. Mr. Davidson holds Tennessee teaching certification for all subject areas, grades one through nine and for social studies, grades seven through twelve.

He is married to the former Janice Gregory of Alcoa, Tennessee.