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ABSTRACT

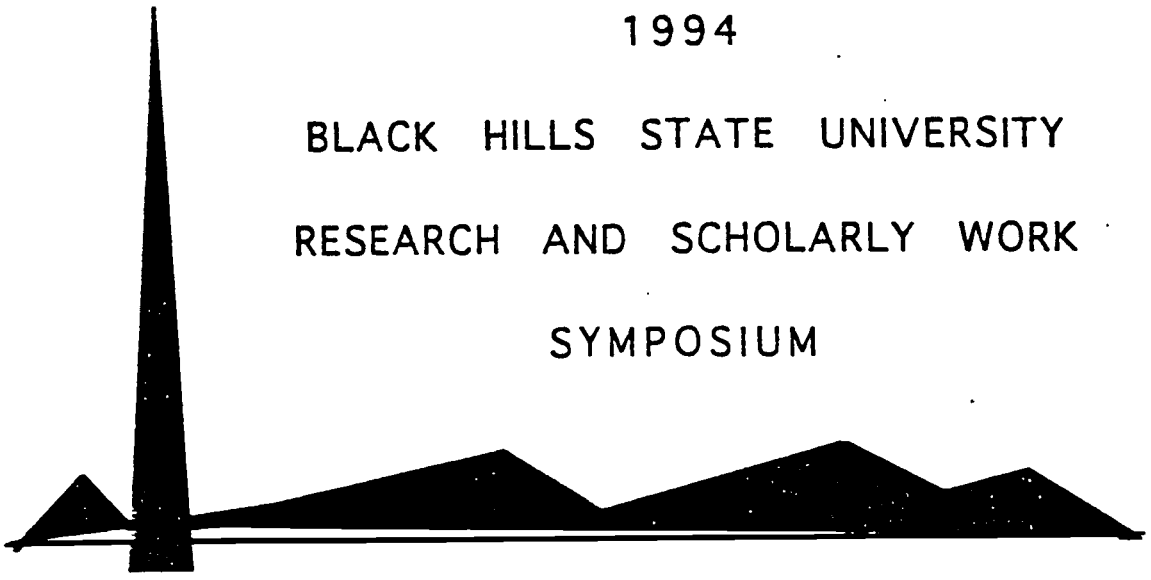
This proceedings contains papers from a symposium conducted to promote the professional sharing of scholarly accomplishments of Black Hills State University faculty and students. The symposium also provided a forum for discussion of current issues related to the presentations. The papers, representing a variety of disciplines, are as follows: "The Internationalization of Geography Departments in American Colleges and Universities" (Roger Miller); "Increasing Teaching Effectiveness with the Physical Education Assertive Teaching Instrument" (Betsy Torrence); "An Investigation of the Student Journal as a Tool for Identifying and Resolving Writing Problems of Undergraduate Students" (Roger Ochse); "Effect of Patriarchal Structuring on Diagnosis of Mental Illness" (Elanor Pearson-Mizel); "Choosing the Snake Husband: Moskogee Watersnake Mythology in Joy Harjo's 'Flood'" (Alice Bedard Voorhees); "Raman Spectroscopic Investigations of Alkali Silicate Glasses at Ultra-High Pressures" (Dan Durben); "The Status of Native American Hunting and Fishing Rights as a Product of Historical Use and Judicial Interpretation" (Cheryl Cosenza-Weiand and John Glover); "South Dakota Principals' Perceptions About, Attitudes Toward, and Knowledge of Law-Related and Civic Education Practices in Their Schools" (Roger Wolff); "Reader Response: The Affective Side of Critical Thinking" (Carol Hess); "Using Qualitative Research in Education (Kristi Pearce); "Modified Oligonucleotide Viability Assays Through the Use of Flanked Homopolymer Sequences" (Doug Dellinger, Peter deLannoy, and Joseph Howell); "Working Memory Limitations on Older Adults' Sentence Production" (Cheryl Anagnopoulos); and "Death, Taxes and Change: A Look at Life Transitions from a Counseling Perspective" (Mimi Tschida). (SW)

1994

BLACK HILLS STATE UNIVERSITY

RESEARCH AND SCHOLARLY WORK

SYMPOSIUM



Research and Scholarly Work
Symposium Proceedings
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PREFACE

The 1994 Black Hills State University Research and Scholarly Work Symposium was conducted on April 11, 1994 to promote the professional sharing of scholarly accomplishments of Black Hills State University faculty and students. The Symposium also provided a forum for discussion of current issues related to the presentations.

This document contains a myriad of topics spread through a variety of disciplines. We believe its publication will continue to serve as a forum to encourage professional dialogue and to acknowledge current, relevant research and scholarly work.

We gratefully acknowledge the office of the Vice President for Academic Affairs for its financial support of the Symposium and the publication of this document. The scholarly endeavors of the presenters are duly noted and honored as are the amanuensis efforts of Patti Kittel.

Cheryl Anagnopoulos, College of Applied Science & Technology
Roger Ochse, College of Arts and Humanities
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Black Hills State University
November, 1994

THE INTERNATIONALIZATION OF GEOGRAPHY DEPARTMENTS IN AMERICAN COLLEGES AND UNIVERSITIES

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By its very nature and by definition, geography is an international subject, but how many geography departments throughout the United States are really internationalized? Two hundred and ten (210) undergraduate programs were chosen from a possible 370 listed in the Guide to Departments of Geography in the United States and Canada (1989-1990) for a study dealing with this question. One hundred and thirty-eight (138) responded to the survey with some surprising results (or not so, depending upon your perspective). Only one-third of these departments were internationalized, based upon criteria formulated by the premiere geographical organization in the United States, the Association of American Geographers (A.A.G.).

Why should departments be internationalized?
Lambert used these succinct words in 1984:

> George Washington's injunction to America to avoid foreign entanglements may have been good advice in the eighteenth century, but in today's world, the cosmopolitanism of Jefferson and Franklin is more appropriate. Every day yet another international crisis on the front page of our newspaper reminds us that insular America disappeared with high-button shoes.

This country's changing attitude towards a global perspective urges that all citizens develop a better understanding of the world in which they live. The media constantly refer to global issues such as international terrorism, the ozone layer, climate changes, arms control, energy depletion, and human rights and needs.

"Why should American education be globalized? The question is comparable to asking 'why should we die[?]' The only real issues are when, how, and with what degree of dignity" (Anderson, 1982). One obvious approach to the problem of an insular attitude by the public is to broaden the school curricula in America and other nations' schools by intensifying student awareness of geographical considerations.

By definition, geography deals with the world and it is also well known that the exposure of students to other nations and peoples develops their sense of belonging to a global community and fundamental attitude upon which to build a better world. Interdependence, not independence, has become the banner word in the struggle to overcome apathy and indifference towards other cultures.

> The very future of the human species on this planet is closely related to how well people understand the relationships between themselves and their home, the Earth. No discipline is more important to this understanding than geography. It is the key element in the development of a global perspective, the central objective of education for international understanding.
>
> (Cogan & Nakayama, 1985)

Geographical education is vitally important to the world, a fact which is probably not lost on those interested in international and multicultural issues--again, an example of preaching to the converted! However, those of us who teach geography must not let their guard down or the discipline may again sink into the abyss it was relegated to only a few short years ago. A balanced approach is considered essential, including the appropriate treatment of mainstream views on all topics in the curriculum. Smith contended that a basic knowledge of other countries and a general knowledge of geography should not be controversial (Smith, 1989, p. 14).

As a humorous break from the barrage of criticism aimed at the country's students and, by implication, academic institutions as well, one solution emerged which had serious implications. World maps were taped to the sides of 150 campus bathroom stalls at Davidson College, in the hope that they would be beneficial in promoting geographic literacy ("Almost as good," 1990).

Muessig and Cirrincione impressed upon their audience that some societies only maintained partial linkages, thus contributing to the real challenge of placing geography in a global perspective, while still understanding distinct differences:

> The idea of a "shrinking world" is not a tired, overused cliche but a realistic acknowledgement of the impact of transportation and communication that has bound societies into a series of interlocking relationships. The economic, political, and cultural systems that have developed in the twentieth century all point toward an ever-increasing degree of interdependence among societies (Muessig & Cirrincione, 1980, p. 72).

It is not surprising to learn that the popular author James A. Michener was a professor teaching social studies at The University of Northern Colorado prior to World War Two, when one studies the complexity and geographical detail contained in his lengthy works. He wrote:

> The more I work in the social studies field the more convinced I become that geography is the foundation of all. . . . When I begin work on a new area . . . I invariably start with the best geography I can find. This takes precedence over everything else, even history, because I need to ground myself in the fundamentals which have governed and in a sense limited human development. . . . The virtue of the geographical approach is that it forces the reader to relate man to the environment. . . . It gives a solid footing to speculation and it reminds the reader that he is dealing with real human beings who are just as circumscribed as he (Michener, 1970, p. 48).

In its global role, the lack of a sound background in geography is blamed for much of the ignorance about the world because of its pivotal position within the

humanities. A reader could scarcely ignore the constant stream of rhetoric relating to the potential of geography and its essential standing for substantive international knowledge.

Before turning to the actual findings from this study the institutions surveyed and the criteria which formed the foundation for this report will be detailed. Figure 1 illustrates the locations of the 210 institutions that were surveyed, in conjunction with the 138 completed instruments that were returned. The five abbreviated criteria which formed the basis for the survey instrument are as follows:

1. Environmental/social relationships
2. Location and distribution through maps
3. Regional analysis
4. Spatial relationships
5. Global interconnections

Findings

The main purpose of this study was to determine the degree to which existing undergraduate geography programs in American colleges met AAG criteria for improving the role of geography in internationalization of the curriculum.

The second purpose of the study was to determine the extent of internationalization of those same programs as reported by department chairmen.

As a result of questions prepared by this author and based upon the five criteria mentioned earlier, only 44 (32 percent) of the geography programs were internationalized.

The two major findings follow:

Finding Number 1.

Based on responses to the five criteria, 44 (32 percent) of the geography programs in this study were internationalized and 94 (68 percent) were not.

Finding Number 2.

Part 1 of the Questionnaire--Environment/Social Relationships

Of the 44 internationalized institutions, 29 (66 percent) exceeded the requirements for this part, while 53 (38 percent) out of the total 138 respondents satisfied Part 1.

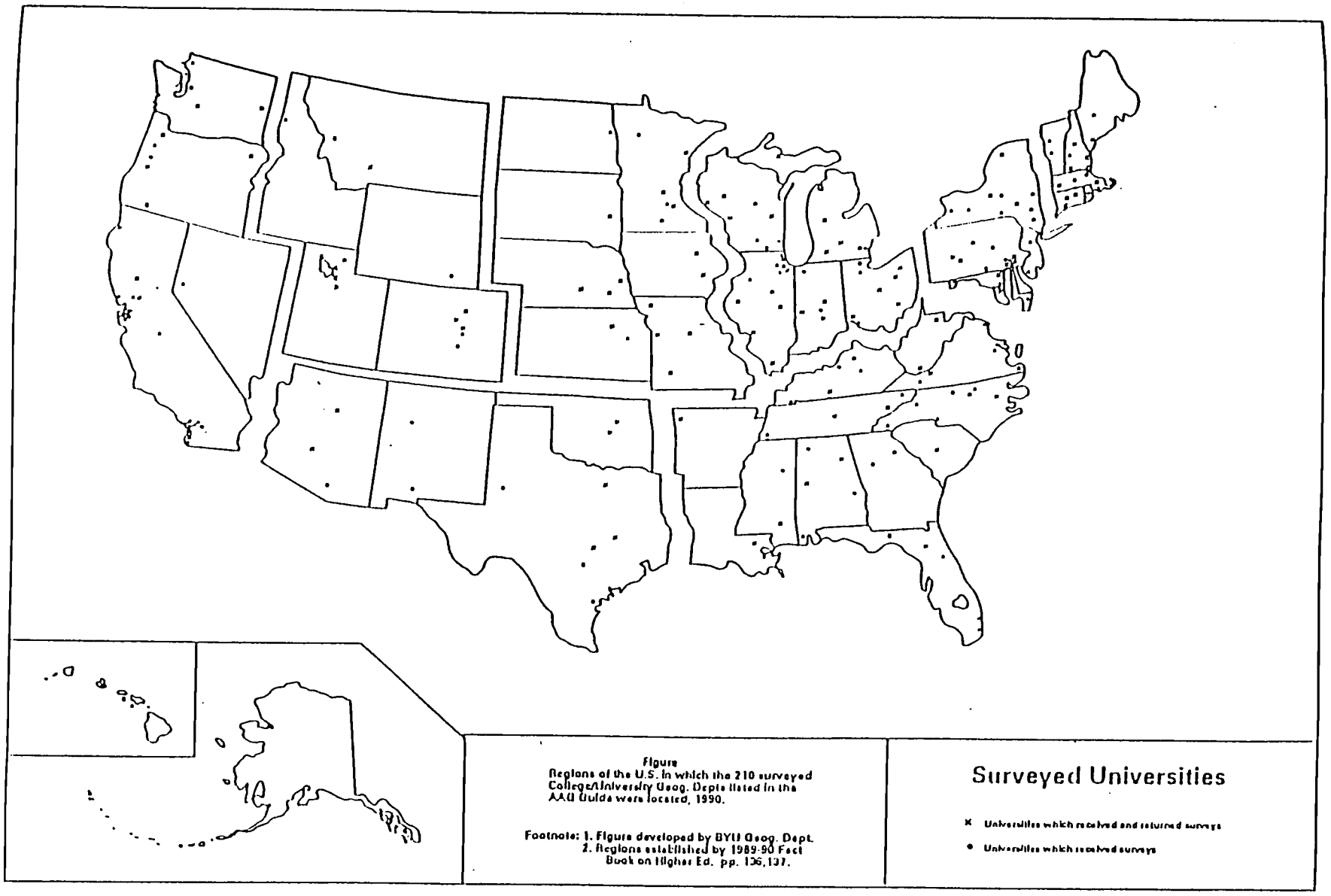

Figure
Regions of the U.S. in which the 210 surveyed College/University Geog. Depts listed in the AAG Guide were located, 1990.

Footnote: 1. Figure developed by BYU Geog. Dept.
2. Regions established by 1989-90 Fact Book on Higher Ed. pp. 136,137.

Part 2 of the Questionnaire--Location and Distribution Through Maps

The requirements for Part 2 were met by 42 (96 percent) of the 44, while 104 (75 percent) of 138 satisfied this part.

Part 3 of the Questionnaire--Regional Analysis

The requirements for Part 3 were also met by 42 of the 44, while 95 (69 percent) of 138 satisfied this part.

Part 4 of the Questionnaire--Spatial Relationships

The requirements for Part 4 were met by 31 (71 percent) of the 44, while 54 (39 percent) of 138 satisfied this part.

Part 5 of the Questionnaire--Global Interconnections

The requirements for Part 5 were met by 43 (98 percent) of the 44, while 94 (68 percent) of 138 satisfied this part.

Conclusion

As the typical U.S. undergraduate student is virtually ignorant in matters of geography, the subject may provide positive direction for the future of international awareness, particularly if geography departments and their programs are internationalized. A great deal of literature has revealed that internationalizing all areas of the curriculum is a desirable goal, while methods in achieving this end are largely absent. It is apparent that the role of geography and its progress or status in the internationalization of individual departments in institutions throughout the United States is of prime importance.

It is disappointing that geography, a subject with much to offer in regards to world knowledge, is not being taught to all American college students (or high school students), but it is even more devastating when one considers that departments of geography themselves are often ignoring the global view. Since only 32 percent of the surveyed geography departments were classified as internationalized, this situation can quite rightly be considered a disgrace. Such a state of affairs leads to the conclusion that many geography departments may not be able to provide the leadership so vital in developing a world community.

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INCREASING TEACHING EFFECTIVENESS WITH THE PHYSICAL EDUCATION ASSERTIVE TEACHING INSTRUMENT

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The process of evaluating effective teaching practices poses many difficulties such as frequency of visits, definition of 'effective,' and deciding upon quantitative and/or qualitative criteria. The purpose of this paper is to introduce readers to a collaborative three-step method that addresses each of these problem areas and builds professional rapport and personal confidence in the process. This process is used in part or whole with faculty and preprofessional students in the preparation of physical education teachers at Black Hills State University. The three-step method involves 1) videotaping lessons, 2) a quantitative assessment with the Physical Education Teacher Instrument (PEATI), and 3) a qualitative assessment with the Physical Education Assertive Teaching Instrument (PEATI).

Videotaping lessons provides both evaluator and teacher (not mutually exclusive roles) with a stable record that may be analyzed alone or as part of a progression of comparisons. Videotaping lessons provides the option of previewing several lessons and implementing changes thus enhancing effective teaching before an outside evaluator views one's teaching. This enables the teacher being evaluated for effective methodologies to become comfortable with the process of videotaping, evaluation and change, thus viewing the appraisal as an *opportunity for improvement*.

Establishing a comfort level with videotaping usually requires a progression from 'private' to 'public' viewing as demonstrated by the following:

-self analysis: only the subject view the tape
-co-analysis with a peer: a content knowledgeable colleague the subject trusts and respects analyzes/discusses with the subject
-each analyze separately then compare: the subject and peer avoid influencing each other/form individual analyses then discuss the results
-peer review: the subject and peer have developed an understanding and trust requiring only one individual to analyze the tape.

A videotaped lesson serves as the most objective form for quantitative analysis of effective teaching behaviors with the Physical Education Teacher Assessment Instrument (PETAI). The computerized PETAI quantifies time allocated to instructional and managerial tasks with a continuous timer. Behaviors quantified are alterable behaviors; thus, an intervention plan may lead to more effective teaching and subsequently greater student learning. The outstanding feature of the PETAI is that it assesses both teacher AND STUDENT behaviors. For example, a teacher's lesson may appear technically outstanding for effective instructional and managerial methodologies, but when the camera is 'turned around' to focus upon the potential learner, the student behavior fails to reflect learning! The PETAI enables analysis of this crucial measure of effective teaching.

The PETAI quantifies teacher instruction and management time and student allocated skill learning and management time. Specific behaviors that the instrument assesses are stated in the following six categories:

1. **Analyzing Student Needs**

awareness of skill level
knowledge of content
identifies objectives
utilizes testing
flexibility/adaptability
appropriateness of instruction

2. **Teacher Instruction**

planned presentation
response presentation
monitoring
performance feedback
motivation feedback

3. **Teacher Management**

beginning/ending class
equipment
organization
behavioral
other

4. **Student Management**

beginning/ending class
equipment
organization
behavioral
other

5. **Student Participation**

warm-up/review
affective
Allocated Skill Learning Time
- engaged skill learning
  - success
  - nonsuccess
- nonengaged skill learning
  - listening
  - assisting
  - waiting

6. **Evaluation**

psychomotor, cognitive,

The PETAI enables one to quantitatively analyze effective teaching, the qualitative analysis occurs with the Physical Education Assertive Teaching Instrument (PEATI). Educators of aspiring physical education teachers endeavor to determine which characteristics contribute most to a teacher's ability to provide effective physical education instruction. Utilizing objective instruments that analyze teaching behaviors provides information about the strengths and weaknesses of the teacher's effectiveness. Currently, analysis of teaching instruments focus upon specific process behaviors employed by the teacher (Darst, Zakrajsek, & Mancini, 1989). These process behaviors are measured objectively instead of the formerly investigated presage teaching characteristics which were

measured subjectively (Phillips, Carlisle, Hautala, & Larson, 1985). However, the possibility of important contributions for analysis of teaching instruments developed from reconsidered presage characteristics as process characteristics has been overlooked. This oversight has neglected the analysis of assertiveness as process assertive teaching behaviors that could be objectively analyzed.

Previous development of analysis of teaching instruments failed to consider assertiveness as a process behavior as opposed to a presage characteristic (Edwards & Westgate, 1987; Ruben, 1985). This oversight negates the objective analysis of how a pedagogy student implements physical education pedagogical knowledge in practical teaching situations. As a presage characteristic, evaluation of assertiveness is limited to subjective analysis; as a process behavior, assertive teaching can be manifested as specific measurable behaviors. The paradigm shift from presage to process is the crucial key to advancing analysis of assertive teaching into an objective analysis of behaviors versus subjective characteristics (Andrews, 1989; Hamilton-Wieler, 1988).

Awareness of the lack of evaluating assertive teaching behaviors and the need for such an objective instrument occurred throughout this researcher's experience as both a supervisor of physical education student teachers and evaluator of senior physical education majors during clinical experiences. The supervision and evaluation experiences brought to this researcher's attention some deficits in preservice teachers' effective teaching abilities. Observable teaching weaknesses of the preservice teachers included the absence of clearly stated objectives, inability to convey teacher expectations for student behavior, organization, physical performance, and an inability to maintain student's attention. Given the stringent and comprehensive university preparatory requirements that surpassed state and university requirements, the reasons for the deficit in effective teaching ability were unclear.

An investigation of the more and less effective preservice teachers' classroom and peer teaching performance, achievement of acceptable standards of teaching behaviors on the computerized Physical Education Teacher Assessment Instrument (Phillips & Carlisle, 1983), and attainment of comprehension, or lack thereof, in analysis and movement courses and clinical teaching experiences failed to predict the preservice teachers' actual teaching effectiveness (Torrence, 1992). However, careful observation indicated that 'how' the preservice teachers implemented similar knowledge of physical education course content appeared to predict effectiveness. This 'how' concept indicated that an additional factor required evaluation and investigation. If how a preservice teacher implements knowledge of content is an indicator of successful teaching, it was crucial that an instrument evaluating such behaviors become available for scholarly and practical use.

Defined. assertive teaching is positive behavior expressed either verbally or nonverbally that carries an unalterable message for implementing preimpact and impact teaching decisions (Torrence, 1992). The Physical Education Assertive Teaching Instrument (PEATI) qualitatively analyses the following teaching process

categories: (note: specific characteristics are not given).

Characteristics of Nonverbal Communication	**Characteristics of Verbal Communication**
posture	planned and response presentation
distance	reaction to questions or demands
movement	voice quality relative to 'natural'
hand gestures	volume
eye contact	rate

Characteristics of Verbal + Nonverbal Communication

head gestures
emotional control
reaction to questions or demands

Lesson Plans
organization
lesson
discipline

As with the Physical Education Teacher Assessment Instrument, analyzing teacher behaviors from a videotape allows the evaluator to accurately implement the Physical Education Assertive Teaching Instrument at the evaluator's convenience. The videotaping, PETAI, and PEATI constitutes a comprehensive evaluation process for effective teaching. Videotaping provides a stable record accessible at the evaluator's convenience for discussion, the Physical Education Teacher Assessment Instrument quantitatively determines the alterable teacher and student characteristics of the lesson, and the Physical Education Assertive Teaching Instrument qualitatively measures the teacher's process behaviors.

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AN INVESTIGATION OF THE STUDENT JOURNAL AS A TOOL FOR IDENTIFYING AND RESOLVING WRITING PROBLEMS OF UNDERGRADUATE STUDENTS

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Introduction

Journal writing has become a special concern for faculty in English departments, and to a lesser extent for faculty across the curriculum. What are the benefits to students and faculty of the journaling process? Can these benefits be extended to our under-standing of the learning process itself? How can teaching styles and outcomes be influenced through journaling?

These questions first arose from my teaching experience, which indicated that practice in a variety of writing modes, including journaling, was beneficial in itself. As I reviewed the research literature, I discovered that I had introduced student journals in my writing courses without really understanding how they worked. Yet to learn how journals could help improve student writing required an investigation of the entire writing process, including the complex variety of cognitive and linguistic activities involved in writing even a simple memo. So began the two year research project that led to the present study.

The research literature provided a theoretical basis for the study. Emig (1977) argued that writing was connected to learning in four ways: (1) The writing process is multi-representational and integrative; (2) writing is a powerful experience of both immediate and long-term self-provided feedback; (3) writing requires a deliberate restructuring of meaning; and (4) writing is active and personal. Based on the theories of Vygotsky (1962), Polanyi (1962), and Bruner (1966), Emig's research was extended by Flower and Hayes (1980), Yinger and Clark (1981), Bereiter and Scardamalia (1987), and Collins and Smith (1990). The pioneering research on the student journal was done by Fulwiler (1979, 1981, 1987), who followed Britton's (1975) concept that journal writing introduces students to expressive writing, an open-ended, exploratory, process-oriented language in which students gain an easy and systematic access to clarifying experiences and solving problems.

The study was also based upon the research on writing apprehension by Daly and Miller (1975), who documented "general tendencies to approach or avoid situations perceived to demand writing accompanied by some amount of evaluation" (Daly, 1978, p. 10). The writing apprehension construct has been found to predict quantitative measures and holistic ratings of writing. Walsh (1991) suggested that writing apprehension could be remediated by student journal writing and other forms of personal composition.

Writing problems of undergraduate students, according to Freisinger (1982) can be traced to difficulties in thinking abstractly, thinking critically, and structuring thoughts logically. Freisinger believed that the problems of young adult students unable to think abstractly or solve problems logically resulted from an overemphasis on transactional or "product-oriented" writing rather than expressive writing. White (1986) argued that teachers have traditionally stressed the socializing aspect of English–basic skills, including spelling, punctuation, and usage–to the detriment of the "discovery and elaboration of one's own thoughts."

In summary, the research literature suggested that student journals can play an important role in encouraging the personalization of learning, the development of critical thinking skills, and the improvement of writing techniques. While many studies stressed the importance of the student journal, few have indicated whether it can be used for the diagnosis and remediation of writing problems.

Method

Purpose. The purpose of my study was to determine whether student journals can be used as a tool for identifying and resolving writing problems of students in the college written communication classroom. Student writing problems are identified as being directly related to writing attitudes and writing skills. Two instruments were used to examine writing attitudes and skills: the Writing Attitude Scale (WAS) and the Holistic Analytic Scale (HAS). Using methods of naturalistic inquiry, the research design consisted of evaluating student journals against attitude and skill criteria contained in the WAS/HAS instruments to determine if problems and improvements in writing performance were evident. These findings were then compared with problems and improvements discovered from direct examination of the student journals.

Procedure. The study investigated the journals of 38 students enrolled in two sections of Technical Communication 1 (English 201) taught by the researcher during the fall semester 1991, in order to determine whether student journals can be used to identify and remediate writing attitude and writing skill problems. The research procedure was to obtain earlier samples and later samples from the student journals, using the WAS and HAS instruments in an effort to identify (1) positive and negative attitudes toward writing and (2) high, middle, or low levels of eleven writing skills–voice, theme, diction, syntax, spelling. The baseline and later writing samples were then compared so as to indicate improvements, if any, in attitudes and skills during the semester.

Using the approaches of naturalistic inquiry within qualitative research, the study used three independent raters who were professionally qualified and specifically trained to provide scorings of a 20 percent random sample from the student journals. These scores were then correlated with each other and with the scores for the same 20 percent sample obtained by the researcher. In addition, scores were examined in relation to demographic information: age, class, gender, writing experience, and grade in the course. Other demographic information was also examined so as to understand why the scores appear as they do. As the study continued, patterns of student learning styles and growth were explored by examining passages that appeared in the student journals. Of particular interest was the identification of critical events in teaching and learning–those exceptional illuminating events that occur during the journaling process and which enhance writing and learning.

Results

Findings from the study were as follows:

1. The WAS Instrument identified writing attitude problems mostly in the moderate range (65-91).
2. The HAS Instrument identified writing skill problems both in general qualities and mechanics.
3. A statistically significant reduction in mean WAS scores of 7.7 percent was found between earlier and later journal samples.
4. A statistically significant improvement in mean HAS scores of 9.7 percent was discovered between earlier and later journal samples. The most notable improvement was in syntax.
5. Examining demographic information (gender, age, ESL, course grade, prior writing experience), the primary factor in reduction in writing apprehension and improvement in writing skills was the grade the student received in the course.
6. Other information obtained from close reading of journal texts included:

    (a) Student comments were more precise than the WAS instrument; students tended, in fact, to describe their writing attitude problems in detail.
    (b) Student comments were less precise than the HAS instrument; that is, students were generally not aware of writing skill problems.
    (c) Reduction in WAS scores corresponded to improvements in writing attitudes described by students.
    (d) Students who adopted conscious strategies to cope with their anxiety appeared to be successful in improving their attitudes (measured by WAS scores and observable comments in their journals). These strategies included: personalizing the journal, encountering "critical moments" of revelation; evolving the journal into a "creative" or "inventive" mode; and learning by doing.
    (e) Those students "taking charge: of their journaling were more successful in resolving their writing attitude problems.
    (f) Students using specific strategies to improve their skills tended to show higher HAS scores. These strategies included: using the journal to develop drafts of papers; exploring topics of interest; analyzing the writing process; and solving problems. The study concluded that journals can be used as a tool for identifying and resolving writing problems of students in technical communication classrooms. Supplemented with descriptive data from the journals themselves, the WAS and HAS instruments can be used to identify writing attitudes and skills and their subsequent improvement

through the journaling process. Student journals can encourage students to develop their own critical thinking and in the process become better writers. Student journals can also help reduce writing apprehension. Through practicing writing in their journals–experimenting with ideas, drafting and redrafting formal assignments, asking what the subject matter means, and personalizing their learning–students become more engaged in the learning process.

Specific applications of this research include: (1) developing methods for integrating the student journal into writing courses; (2) designing unique, context-specific instructional strategies to follow through the journaling experience; and (3) discovering new approaches to improve student writing. Study of the student journal can point the way to improved teaching practice, better understanding of the writing process, and keener recognition of the power of individual thinking.

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EFFECT OF PATRIARCHAL STRUCTURING ON DIAGNOSIS OF MENTAL ILLNESS

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This study will trace patriarchial structuring of Western Civilization and the acculturation of females into androcentrism. It examines assimilation of cultural bias and expectations into traditional psychoanalysis. In addition, it probes the influence such a philosophy has on the validity of diagnostic labels and the resulting impact on women who struggle against pre-determined roles and cultural estrangement.

Western civilization is built on a history of patriarchy and hierarchy. We are a culture constructed on centuries of androcentrism, an ideology of male supremacy. During the last century, this structuring has continued within the mental health profession. Diagnosis of mental illness, in relation to women, has resulted in the preservation of patriarchy.

In his book, Western Civilization, Spielvogel (1991) introduces the Code of Hammurabi (1792 to 1750 B.C.) as one of the earliest known documentations of male dominance. The Code establishes the legality of a daughter being accountable for the actions of her father. Should the father cause the death of another man's daughter, his daughter, rather than he, is put to death as restitution (cited in Spielvogel, p. 13). Further demonstration of social and institutional male power is found later in the Twelve Tables of Roman codified law (cited in Spielvogel, p. 135). In their essence, the Tables assign females to the position of property, and as such, legal control of said property passes from father to husband. Family structure begins to change in the Second Century A.D. due to economic and political influences. Women are gaining more freedom, and the authority of the paterfamilias is deteriorating. As if in response to this shift, religion emerges, continuing patriarchy in its beliefs and hierarchy in the organizational structure.

Gender teachings abound in such a theoretical composition and are found in the three major religions. In Orthodox Judaism, which spans over 3,500 years, females and males have set and separately defined rights and obligations. A man's duties are religiously oriented, whereas the woman is excluded from this faithfulness. The woman's world is in the home, and centers around the family. Curran and Renzetti (1989) use Hyman's interpretation of the halakic prescriptions as evidence of restrictive measures which constrain women of the Jewish faith. According to the directives, a menstruating woman is impure. Physical contact, of any kind, is forbidden with a man until the female is free of discharge for seven days and has gone through a bath of purgation (cited in Curran and Renzetti, p. 270). Critics of the halakic laws say they are the product of religious authorities' aversion and suspicion of a function they are unable to understand. By implication of women being "dirty," the directives serve as a means of psychological control (Curran & Renzetti, p. 270). Christianity begins as a movement within Judaism and plays a large part in the emergence of Medieval Civilization.

In the Twelfth century, Gratian, author of the first systematic work on canon law, states females are subject to males by natural order; the lesser is to serve the greater. The great Thirteenth century theologian, Aquinas, continues

this theme in his teachings. He informs his followers that woman is defective, for woman is not made in God's image (cited in Spielvogel, p. 285). Christianity, in effect, relegates women to second-class citizenship, with the threat of eternal damnation for failure to accept the status of servant. Similar beliefs are found in The Koran (Radice, 1956), the holy book of the Islamic faith. By Allah's mandate, men are in charge as guardians of women (Radice, p. 374). Further, because men financially support women, they are a degree above the female sex (Radice, p. 370). Religiosity is a powerful influence on cultural formation, creating social order by setting behavioral standards and consequences for failure to adhere to the institute (Curran & Renzetti, p. 261).

Socialization to the culture is defined as a process by which society's values and norms, including those pertaining to gender, are taught and learned. Various theories exist to explain acculturation. Among these are: the behaviorist approach of social learning through reinforcement; Piaget and Kohlberg's cognitive development of learned gender by creation of mental categories; and Freud's identification theory. Without regard to which theory one adheres to, socialization occurs, resulting in a sex/gender system, a system supported by the superstructure of politics, law, education, and religion (Elster, 1986). This systematic order is manifested in relationships, work, language, media, and various microiniquities (Curran & Renzetti, 1989).

Gender differences begin at birth and continue through the life cycle. Parents are shown to interact differently with their children, based on the sex of the child. Boys are encouraged to be active and aggressive and are dressed appropriately to allow for movement. On the other hand, girls gain approval for playing quietly and interacting with adults. They are routinely dressed to inhibit activity, and admonished for unladylike behavior should the clothing fail to constrain their high spirits. Through verbal and nonverbal reinforcement, a female is conditioned into behavior which constitutes a subordinate role. This sex stratification is implemented throughout our institutions and is maintained through stereotyping, learned expectations, and labeling. One such demonstration is the mental health profession. This avocation has established itself as a modern day institution reflecting society's tendency toward sex/gender stereotyping and its dichotomous nature.

Chesler (1972), a feminist psychologist, contends in her book Women & Madness that the mental health field is hierarchial in structure, with men predominantly at the top, enabling continued control of women by establishment of rules and policies (Chesler, pp. 79-82). Support for her view is found in the Encyclopedia of Associations (1994). The American Psychological Association lists its membership at 70,000. The Association for Women in Psychology reports only 1,500 members. It is estimated only 20 percent of psychiatrists are women (Curran & Renzetti, p. 318). The majority of females seeking out or who are committed for psychoanalysis are being diagnosed by males who are saturated, both culturally and professionally, in traditional ideology (Chesler, p. 82). Women practitioners are not immune to androcentrism, for they receive the majority of

their training under male instructors (Curran & Renzetti, p. 303). The larger part of theories, approaches, philosophies and teaching tools are the creation of men. This being the case, diagnosis and labeling of mental disorder contain a subjective bias. Psychiatric labeling is enacted on a mere vote by the American Psychiatric Association. Guidelines for diagnostic identification are prolongated to other mental health practitioners through the Association's publication of the Diagnostic Statistical Manual III-R. Psychiatrists, both medically and legally, decide who is mentally ill and what should be done (Chesler, p. 80).

To date, psychiatrists have yet to form a consensus on what constitutes mental illness (Curran & Renzetti, p. 309). A continuum of belief for causation ranges from that of a biological basis to societal labeling of uniqueness. In The Myth of Mental Illness, Szasz (1974), a professor of psychiatry at the State University of New York, argues mental illness is not a medical definition, rather a political and moral one used to control behavior which goes beyond community tolerance.

Identification of mental disorders is a challenging and formidable task, as demonstrated by Rosenhan (1973). Rosenhan and seven cohorts admitted themselves to various mental hospitals purporting they were hearing voices. The symptoms, names, and occupations were falsified, but reporting of previous life history and confederates' regular behavior was not varied. The normal behavior and life history were interpreted by hospital staffs to match with a diagnosis of mental illness. All but one of those involved were labeled schizophrenic (Rosenhan, pp. 250-258).

The Rosenhan experiment postulates mental illness may exist in the selective perception of the viewer, rather than any disturbance in the mental processes or physiology of the individual being observed and judged (cited in Curran & Renzetti, p. 310). Further concern for diagnostic validity was documented by the research of Broverman and Broverman (Chesler, 1970, p. 86).

The Brovermans (1970) found a double standard exists in the mental health field (Curran & Renzetti, p. 310). In 1970, 79 male and female professionals were asked to describe "a healthy, mature, socially competent a) adult, sex unspecified, b) a man, or c) a woman" (Broverman, et al., pp. 1-7). The findings indicate characteristics of mental health differ according to the sex being described (Curran & Renzetti, p. 310). Traits considered healthy for an adult person correlated with those judged healthy in men (Broverman & Broverman, pp. 1-7). Characteristics classified healthy in a woman included submissiveness and dependency. Furthermore, a socially competent female adult is considered to display excitability and is conceited about her appearance. The Brovermans assert "this seems an extraordinary manner in which to describe any mature, healthy person" (cited in Chesler, p. 86). This study has been replicated a number of times over the years, the latest in 1985. All subsequent data supports the original findings (Curran & Renzetti, p. 310).

If ideal mental health is stereotypical, masculine behavior (e.g., independence, assertiveness, and adventuresomeness) to be a healthy, socially

competent and mature adult necessitates a woman to step out of an ascribed role of being submissive, dependent and excitable. Therein lies the danger, for in doing so she runs the risk of being labeled abnormal and diagnosed as mentally ill. Substantiation for such a hypothesis is expressed by Szasz (1974). In Heresies, Szasz (1974) writes that insanity is defined by dominant society as insubordination to rules of polite behavior to civilian authority: madness as mutiny. In effect, he is telling us that a person who displays any behavior beyond which is deemed correct by society runs the risk of being labeled pathological.

Throughout history, there are women who struggled against pre-determined roles. Joan of Arc, stepping out of the sphere of femininity, became a leader of men. Upon reviewing the account of her fate, the future Pope Pius the Second finds Joan's only crime was continuing to wear male clothing after being threatened with death should she do so (cited in Chesler, p. 50). In more recent times, Zelda Fitzgerald, wife of the famous author Scott Fitzgerald, not wanting to be financially or emotionally dependent, makes efforts to become a creative artist. The author's response is to commit her to a mental hospital, where psychiatrists attempt to re-educate Zelda to her role as a wife (Chesler, pp. 31-37). Reinforcement for women to continue their position within the patriarchial structure is evidenced by the negative consequences experienced by these women.

Modern day society is no less retributory. A woman who strives to succeed outside of the traditional cultural expectations, and does so, is not viewed as successful unless she has not neglected a marriage or child-care duties. Should these relationships not exist, or anything go wrong, the woman will be found at fault. To accomplish one task is not enough, a woman is expected to succeed in every area of her life (Chesler, p. 275). When autonomy battles societal expectations, an individual may seek or be committed for treatment to achieve resolution to any unhappiness created by cultural estrangement.

Under traditional clinicians, causation of any emotional disturbance is viewed as internal rather than external. Therefore, if a woman should, upon treatment, learn to accept instead of condemn external circumstances, in other words, conform to the role(s) assigned her, treatment is considered successful. To facilitate a cure, medication may be utilized.

Presenting data (1983) indicates half of all American women are using psychotropic drugs. Further research reveals 70 percent of women are taking habitual tranquilizers, and 72 percent are on anti-depressants (cited in Curran & Renzetti, p. 316). Research in 1980 cites 73 percent of psychotropic drugs prescribed are to women (cited in Curran & Renzetti, p. 309).

The direction of treatment under traditional practitioners, and the labeling of women as pathological, creates an environment in which women can either be "cured," rejecting autonomy, or concede to a label of mental illness. In acquiescing to such a label, they are able to absolve themselves of responsibility for rejecting their ascribed role(s). In doing so, the women invalidate their own efforts, thereby reducing society's negative response. Such a treatment scenario allows an individual to not make a choice.

Thomas Szasz (1974) writes in his book Heresies:

> Psychoanalysis teaches, correctly enough, that neurotic symptoms are due to unresolved, unconscious conflict. However, it would be more accurate to say neurotic symptoms are due to the fact that the subject (the so-called "neurotic") chooses indecisiveness in the face of conflict: Confronted with the necessity of having to choose between two things, both of which he wants but only one of which he can have, he refuses to choose, as if in hoping that by waiting only a little longer he would be able to have both . . . (Szasz, p. 147).

If Szasz is correct, then the patriarchial structuring of psychoanalysis lends itself to maintaining the status quo, conforming to dominant, white, middle-class male expectations, viewing any variance as a symptom of pathology or disorder. What is considered mental illness may solely be "the acting out of the devalued female role or the total or partial rejection of one's sex-role stereotype (Chesler, p. 75). Rather than being of help, psychoanalysis may be a hinderance, accessing women to an institution which enables them to not have to choose between autonomy and society. In doing so, the mental health profession avoids "mutiny" from the androcentrism of society. Without full-blown mutiny, there is no danger to societal structure, for change only comes about through those who have made a conscious choice and acted upon it.

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CHOOSING THE SNAKE HUSBAND: MUSKOGEE WATERSNAKE MYTHOLOGY IN JOY HARJO'S "FLOOD"

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In "Toward a More Feminist Criticism (1981)," Adrienne Rich (1986) addresses the place of the white woman critic in feminist criticism, arguing that to work with literature by writers of color in this role requires the unlearning of a number of academic and dominant cultural assumptions (p. 88). Included there is her reminder that in the best service to the power of a given writing we can remember Virginia Woolf's "common reader" who is interested in literature as "a key to life and not an escape from it" (Rich, 1986, p. 91). Both pieces of advice shape this discussion.

A central concern in American canonical or mainstream literature is that societal forces frustrate integration of self and that community threatens to usurp the self. This embodiment of self in conflict has changed with various literary periods, moving from victimization, to isolation, to alienation, to nihilism. Melville's Moby Dick, Crane's Maggie: A Girl of the Streets, Bellow's Dangling Man, Barth's End of the Road, Updike's Couples, Robert Stone's Hall of Mirrors are examples which evoke sympathy, empathy or angst at the outcomes of the main characters. Nonetheless, a limited number of responses are assigned to the protagonists, and situational conflicts only increase fragmentation of self.

Yet a noticeably different response exists in works by contemporary American writers Maxine Hong Kingston, Amy Tan, Alice Walker, Marge Piercy, Alberto Rios, and Rudolfo Anaya and Joy Harjo. They further develop the attitude of life's continuity of poets Lydia Huntley Sigourney and Emily Dickenson (Watts, 1976, p. 86) and draw from characterization depicted by Zora Neale Hurston's life-loving Janie (Washington, 1990, pp. vii-xiv). These new characters from a new generation of authors are allowed self-integration and entry into community in creating a literature of affirmation. Joy Harjo's narrative, "Flood" (1991) demonstrates artistic and cultural innovations characteristic of other American works in this category.

Literature of affirmation exhibits certain similarities in its artistic solutions to the threat to self by the mainstream community. Conceptualization of time, story and community are commonly employed in constructing literature which accomplishes the following: Protagonists are allowed exploration of the possibilities of self through an elastic viewpoint of time. Narrative techniques rooted in oral traditions shape the implications of time; plot developments serve as corrective record for the characters themselves, and in some cases for specific cultural experiences through revisionism. Legitimizing testimony results from the presence of voices heretofore unrepresented, and for the first time in American literature, community is constructed to include the self and support individuation.

Each of these writers challenges the expression of plot as linear time, choosing instead, time as transformation. Each utilizes time in a way identified by Alicia Suskin Ostricker (1986) as a shared characteristic of many female writers--time roughly translates into process that is ongoing, elastic (p. 199). In this way Joy Harjo names memory as "the present" (Joy Harjo, 1989). The very definition of time as change in these texts emphasizes the process of "becoming" over particular end results as the standard measurement at the end of that time period,

which characterizes most modern American literature.

Story assists the process of self-integration in a number of ways. First, the concept of story in each of these works expands the implications of elastic time in the way these works draw from oral traditions. Each writer allows for culture-specific content which includes myth and person-specific content in constructing plot. Laguna writer Leslie Silko talks about the placement of mythic reference next to ordinary conversation in societies based on oral tradition--the result becoming a sense of ongoing reassurance/reminder as to one's place and inclusion in a human continuum (Storytelling, 1976). Mythic information is also a means for characters to connect with values that assist/sustain the definition of self.

In these works, story also functions as the creation of record, a breaking of silence in some cases, and a legitimizing force. Q. Grigg (1992) identifies this function in a review of a work about Sarah Orne Jewett and Toni Morrison, saying individual voices may serve to correct inaccurate accounts about an experience, or provide a revisionist perspective.

Specific cultural references in the details of the story become communication links between the younger and older characters, demonstrating to the older generation that the old knowledge still feeds, comforts, and applies to the new generations. These references also remind the younger generations removed from the culture-in-transition process, of influences on their personal histories. The very act of telling a story serves a valuable purpose in defining community because when someone tells a story, she has found not only a voice, but a listener. Allowing the story to be told is the community's recognition of experience at a rational, legitimate level.

The idea of personal accounts is remarked upon by Leslie Silko in a literary documentary called Storytelling: Leslie Silko (1976). Silko makes the distinction between "idle gossip" and the value of these personal accounts in Pueblo oral traditions. Silko first says these accounts are anything but "idle gossip," explaining that the mix of myth and current information remind the listener of one's place in a tradition and a community, deplete isolation, and provide connection even in the reminder of one's human condition or folly (Storytelling, 1976). Maxine Hong Kingston (1977) additionally explains that the Chinese concept of "talk-story" includes the connection between individual condition and events (p. 60).

In this literary viewpoint, inclusion by community includes subversive membership and approval. When aforementioned modern, canonical protagonists are depicted under personal strain, the community is never allowed to answer the risk to self, and is more than likely due to the American hero/anti-hero constructs of those works. In contrast, subversive community functions as the model for survival of the self and instruct self integration through its approval of what can be called deviations. These deviations take two forms: one is the unexpected combinations of characters who provide support for each other; the other is the allowance of behaviors that break social norms. Yet it is not that the deviations are approved behaviors; rather, it is the process of valuing personal integrity over

all values that recognizes the necessary innovations to that end.

In examining how these literary elements follow through in a particular work in the literature, " Flood," a narrative by Muskogee poet Joy Harjo (1991) provides an example which draws specific information and insights from Muskogee culture.

In the basic plotline of "Flood," a female narrator who is the survivor of the flood relates the events leading up to the flood. "It had been years since I'd seen the watermonster, the snake who lived in the bottom of the lake, but that doesn't mean he'd disappeared in the age of reason . . . in the muggy lake was the girl I could have been at sixteen" (Harjo, 1991, p. 133). The story ends with the day the girl that had drowned in the lake comes up out of the lake into the town, into the convenience store where the narrator is. The narrator and others do not recognize the girl from the bottom of the lake, and the narrator concludes by saying, "It was beginning to rain in Oklahoma, the rain that would flood the world" (Harjo, 1991, p. 135).

These opening and closing events are the linear elements in this work. Within the framework are the stories of the two other girls, though story operates at four levels: The account of the girl from long ago, the story of the girl at the bottom of the lake, the narrator's experience, and Muskogee watersnake mythology.

The account of the long-ago girl provides a mix of the personal and mythic account referred to by Silko (Storytelling, 1976). It also demonstrates the vital potential of the myth, and registers the conformist pressure by the mainstream community in remarks made by the girl's elder. This account begins with "the water-monster stories had been going on for centuries--the first time in my memory I carried my baby sister on my back as I went down to get water" (Harjo, 1991, p. 134). After seeing the water monster as a beautiful young man (his original form), she falls into a fever and is brought to the water and bathed in offering for her life. She recovers and her father immediately marries her to a solid senior individual of the tribe (Harjo, 1991, p. 134-135). But that young woman goes back to the water "in need of a drink by a snake . . . and how did he know my absolute secrets, those created at the brink of acquired language?" (Harjo, 1991, p. 134). This fever is more that physical, and the narrator's reaction as a connectedness or relatedness can be read to mean she as has had a sense of this need for connection since her earliest memory of speech, or it could be read to mean she senses that this connection goes as far back human experience's memory of language, as other great mysteries in cultures. At the surface, rational level is this explanation, however: "The oldest woman in the tribe wanted to remember me as a symbol . . . of the girl who disobeyed . . ." (Harjo, 1991, p. 135).

In the other case, the girl at the bottom of the lake is described as "wrested from the torment of exaggerated fools . . . though the story at the surface would say car accident, drowning while drinking" (Harjo, 1991, p. 133). The narrator also reports, "Others saw the car . . . as it drove into the lake . . . they found the emptied six-pack" (Harjo, 1991, p. 135). The narrator connects the girl at the lake

with all girls at the edge of womanhood, announces "it wasn't that she decided to marry the watersnake . . . her imagination was larger than the small frame house . . . with the broken cars surrounding it like a necklace of futility, larger than the town itself" (Harjo, 1991, p. 135). The effect of the last narrative remark in this section, "The power of the victim is a power that will always be reckoned with, one way or the other" (Harjo, 1991, p. 135), accentuates the human tendency to insist on rational explanation or placement of blame on what cannot be understood, and calls attention to the tension created by the positive, subversive explanations of the narrator, ones which are in contrast to the disobedient-girl and drinking-and-driving accounts.

This omniscient narrator provides the structural means and consciousness to voice the integration and survival of all the experiences at the four levels of story. The narrator's survivor account brings to these experiences a sense vital process rather than a nostalgic one, an idea that Elaine Showalter (1991) forwards as" the meaning of an aesthetic heritage" (p. 165). Harjo's narrator illustrates the elastic time function and subversive approval in taking the identities of the two others, expressing their corrective explanation of events which include the watersnake mythology, and by stylistically expressing the experience of the others in taking the pronoun I and using verbs that shift from past tense in naming a past experience, returning to present forms to address the narrator's current state.

The resulting narrator provides a voice who says here I am, post-flood. I can tell you about those people, because I am part of that experience, and I recognize what we share as powerful. The voice corrects the record and approves of the deviations by explaining the girls' choices to answer subconscious patterns of their power. She is the voice of the chosen survivor, whole with its knowledge from rational and imaginative sources. The narrative authority is visionary and instructive in the process of both self and cultural integration; her account is a parable of the powerful woman and contributes a revisionist perspective to the watermonster mythology.

Accounts of the Cherokee and Muskogee variations of the watermonster stories appear in the Mooney papers which were gathered for ethnographic purposes and presented to the Secretary of the Smithsonian in 1897 (pp. 252-254,297-298). It is this material that informs interpretation of the watermonster mythology in Harjo's story.

The sun in this Native American mythology is female. She becomes angry with the humans and sends disease. The Little Men or magic workers of the tribe, turn a tribal member into a snake and send the snake to kill the sun. But the snake does not kill her, and for this is caste into the role of the watermonster--a creature who is dazzling and powerful. Another member is turned into the rattlesnake, and goes to the house of the daughter of the sun, and kills the daughter by mistake (Mooney, 1970, pp. 297-298).

The Little Men, fearing further consequences, go to the land of the dead to capture the spirit of the daughter of the sun, but before they get her back, she slips out of the box holding her, turns into a "red-bird" (Mooney, 1970, p. 253) and

flies away. At the report that the daughter has escaped in this fashion, the Sun weeps and weeps. Fearing that the people will be washed away in the flood, the Little Men choose the most handsome of young men and women to perform a dance. At first Sun does not respond; the drum changes beat however, and Sun looks up and likes what she sees and does not turn her face away (Mooney, 1970, pp. 252-254).

Additional watermonster mythology names the possible powers and dangers in the quest of the watermonster: If a warrior is able to capture the dazzling crest which shields the heart of the watermonster he will be lucky in hunting, love, never be without rain, and have the most important gift, the one of prophecy. If he fails, however, even his family will die for the warrior's having looked upon this power (Mooney, 1970, pp. 297-298).

In Harjo's revisionist version, the narrator is a woman who is dazzled rather than killed by gazing upon the crest, and sees the monster "in a human moment . . . a man who was not a man but a myth" (Harjo, 1991, p. 134), and takes him as a spouse: "When I walk the water into the abyss . . . I return . . . in blanket of time decorated with swatches of cloth and feathers from our favorite clothes (Harjo, 1991, p. 133). Later the reader is told the "proverbial sixteen-year-old woman" (Harjo, 1991, p. 135) does not go to the water to get married, but for the reason that "her imagination was larger" (Harjo, 1991, p. 135). She only returns as a bride. In addition, the woman is not only <u>not</u> destroyed by this power, but now shares in the gift of prophecy--the vision of the future. And by going to the water and marrying rather than killing, Harjo transfigures the mythic focus from hero quest to what comparative mythologists would term an integrative initiation rite (Quispel, 1990, p. 32).

Like other writers with an affirmative viewpoint, Harjo shows approval of the survival of the human spirit. What makes this possible is the non-Euro-American, non-technological viewpoint, and protagonist roles that name culture-specific rites of initiation rather than hero quests. The elements of literature examined here today allow for self-integration and inclusion by community, contributing a transformative dimension to American literature.

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RAMAN SPECTROSCOPIC INVESTIGATIONS OF ALKALI SILICATE GLASSES AT ULTRA-HIGH PRESSURES

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There has been considerable recent interest in gaining a more complete understanding of pressure-induced structural changes in the geologically and technologically important silicate glasses and melts. This interest is spurred in part by the unique behavior observed in many of the physical properties of these compounds, particularly the anomalous decrease in viscosity, despite an increase in density, observed in many highly polymerized silicates under compression (Angell, Cheeseman, & Tamaddon, 1983; Mean & Jeanloz, 1987). Models incorporating pressure-induced coordination changes of network cations (Waff, 1975) have been invoked to account for the anomalous high pressure behavior, but experimental evidence for pressure induced coordination changes has been relatively ambiguous. In addition, other possible structural responses of these systems to extreme compression have not been well characterized, and little is known about how these structural changes behave along the decompression pathway. This study is an effort to improve the understanding of the high pressure behavior of silicate systems, through *in situ* experimental probing of structural changes in a variety of tetrahedrally coordinated silicate oxide glasses during compression and decompression.

Diamond anvil cell (DAC) technology (Jephcoat, Mao, & Bell, 1987) provides invaluable tools and techniques with which to examine the properties of materials under extreme compression. The DAC (Figure 1) employs two opposing gem quality diamonds as anvils. The force applied to the relatively large area of the diamond table is transmitted to the small area of the diamond culet to generate extremely high, geologically relevant pressures at the sample. A distinct advantage of the DAC over other pressure generating devices is the optical window provided by the diamonds, allowing *in situ* access to the sample at high pressures. The ability to study materials *in situ* offered by the DAC is critical to understanding the nature of structural changes during compression and the reversibility of these changes during decompression.

A complete understanding of the relationship between structural changes and physical properties of silicate glasses and liquids at high pressures has been hampered by the limitations of direct structural probes, such as x-ray diffraction and nuclear magnetic resonance (NMR). Raman spectroscopy, while an indirect structural probe, offers several advantages over more direct structural probes. Raman spectroscopy can successfully probe the vibrational modes of disordered systems and has been used extensively to study the short and intermediate range ambient structures of silicate glasses, providing a "fingerprint" of specific structural features.

The glass systems studied belong to the large family of silicates whose ambient structures are derivatives of the α-quartz structure, characterized by a backbone of polymerized SiO_4 tetrahedra. The introduction of depolymerizers, such as alkali and alkaline earth cations, modifies or terminates bridging Si-O-Si linkages, breaking up the three-dimensional network of corner-shared SiO_4 tetrahedra and creating terminal $Si\text{-}O^-$ bonds. While fourfold coordination of Si with O is maintained during the depolymerization of silica, the silica tetrahedra

are distinguished by different numbers of bridging oxygens (BO) and terminal nonbridging oxygens (NBO) in each tetrahedron. These distinct structural units can be classified using the Q-notation. In this convention, individual SiO_4 tetrahedra are defined as Q^n species, where n (ranging from 0-4) represents the number of BO connecting the central Si to adjacent Si's. For example, a Q^4 species is an SiO^4 tetrahedron with four BO, While a Q^3 species is an SiO^4 tetrahedron with three BO and one NBO.

The general structure of the alkali disilicate glasses and the structural differences between different alkali cation compositions are reflected in the features of the ambient Raman spectra. The main spectral features of an alkali disilicate glass are most easily resolved in the ambient Raman spectrum of cesium disilicate, Cs_2O-$2SiO_2$ (Figure 2). The spectrum differs from that of the fully polymerized SiO_2 most strikingly in the high frequency region above 900 cm^{-1}, where two new strongly polarized bands appear in the spectrum of the disilicates. Bands in this high frequency region are generally associated with vibrations of SiO^4 tetrahedra containing NBO's and thus, reflect the degree of network depolymerization. The strong band observed at 1100 cm^{-1} in the Raman spectrum of Cs_2O-$2SiO_2$ has been assigned to stretching vibrations of Q^3 species. The strong intensity of the Q^3 band is consistent with a large population of Q^3 species is evident by the appearance of a Q^2 band near 927 cm^{-1} in the ambient spectrum.

Raman scattering below 500 cm^{-1} is generally associated with Q^4 species in six- or higher-membered ring structures (localized structures of closed rings of Si's connected by bridging oxygens). The structural origins of the two distinct low frequency Raman bands labeled $\propto$ and ß in Figure 2 are not well characterized. One interpretation is that these bands represent vibrations from different ring structures, with the higher frequencies reflecting tighter Si-O-Si intertetrahedral angles, i.e. smaller rings. Thus, the ß-band may be associated with more open, low density network structures, such as 4-rings, and the $\propto$-band with a population of tighter, more dense structures, such as 3-rings.

The general behavior of vibrational modes of the alkali disilicate series of glasses upon compression is qualitatively similar to that observed in the spectra of cesium disilicate, Cs_2O-$2SiO_2$ (Figure 3). Under initial compression of Cs_2O-$2SiO_2$ glass to ~6 GPa the low frequency bands shift to higher frequencies. The positive pressure derivative in these bands is consistent with a continuous tightening of the Si-O-Si intertetrahedral angles (θ) within the network in response to increasing compression. The ß-band shifts much more strongly than the $\propto$-band, suggesting the more open angles of lower density structures in the network decrease more strongly than the tighter θ associated with the $\propto$-band.

Significant changes in all of the Raman bands of Cs_2O-$2SiO_2$ begin above 7 GPa. In the low frequency range, the ß-band stops shifting and the $\propto$-band begins to broaden. Increasing compression changes the relative intensities of the $\propto$- and ß-bands until the ß-band disappears by 13 GPa. In the high frequency range, there is a significant decrease in the intensity of the Q^3 band. Most of the intensity of the Q^3 band is lost between 7-13 GPa. Above ~32 GPa, the Q^3 band

becomes indistinct. The relative intensity of the Q^2 band appears to be affected little by compression.

It is curious that the ß-band doesn't simply shift into the ∝-band; that the θ's in the more open structures don't close up continuously to values similar to those represented by the ∝-band. This behavior would be consistent with the assignment of the ß-band to vibrations of Q^3 species, a different structural unit than that producing the ∝-band. However, the ß-band is lost at much lower pressures than the Q^3 band in Li-K disilicates. Thus, the disappearance of the ß-band does not necessarily correspond to the disappearance of the Q^3 band (the decoupling of these two bands is also evident in the decompression spectra discussed later).

One explanation of the behavior of the ß-band is that its disappearance on compression represents a discontinuous conversion of low density ß-states to higher density ∝-states. In this two-state model, the ambient structure would be analogous to the two state model proposed by Vukcevich (1972) for the ambient structure of SiO_2 glass. Initial compression would decrease θ, gradually increasing cation-cation repulsions in the structure. One way the system can alleviate this steric crowding is through slight diffusion of alkali cations, leading to dissociation of the alkali cation from NBO's in favor of coordination with BO's. The increased coordination around the BO of the more open ß-states would cause a sudden decrease in the Si-O-Si angle, converting ß-states to ∝-states. This would be consistent with the loss of the ß-band and concurrent broadening of the ∝-band during compression.

The spectral changes above 7 GPa in Cs_2O-$2SiO_2$, including the decrease in the intensity of the Q^3 band, the loss of the intermediate frequency band associated with Si motions within the tetrahedral cage, and the overall decrease in the intensity of the low frequency bands can be interpreted as indicating a loss of tetrahedrally coordinated Si through the attack of the NBO's of Q^3 species (Figure 4) as proposed by Xue, et al (1991). In this mechanism, five- and six-coordinate Si species are formed by tying up the dangling NBO's. This mechanism thus creates coordination changes without requiring any bond breaking or disproportionation reactions.

At very high pressures, beyond where the Q^3 band is lost in the disilicates, the remaining low frequency band in the high pressure spectrum broadens further, primarily through an increase in intensity on its high frequency side, between ~700-900 cm^{-1} in Cs_2O-$2SiO_2$ above 25 GPa. Concurrent with the increased broadening is an increase in the pressure derivative of this band. This behavior may indicate a new compression mechanism in which Si coordination changes occur via BO's, similar to the proposed mechanism of pressure-induced coordination change in the fully polymerized SiO_2 glass near this same pressure (Stolper & Ahrens, 1987; Stebbins, Farnan, & Xue, 1992). This mechanism differs from the NBO mechanism in that the oxygens must also change coordination with Si, forming ^{III}O species.

In summary, the net effect of compression of alkali disilicate glasses is to "repolymerize" the structure, first through NBO and then through BO at higher pressures.

The *in situ* Raman spectra of the alkali disilicate glasses taken during decompression indicate that significant structural changes occur along the decompression pathway. The general changes in the Raman spectrum can be described using Cs_2O-$2SiO_2$ glass (Figure 5).

The high pressure broadening of the low frequency band that occurs during compression is largely reversible, with the intensity from 700-900 cm^{-1} lost near ~26 GPa. This is consistent with a reversible reversion of some of the high coordinated Si species during decompression as ^{III}O species revert back to ^{II}O bridging oxygens.

The broad high frequency band begins to increase in intensity below ~26 GPa and two bands become resolvable. The frequencies of these bands are consistent with vibrations of Q species. The Q-bands continue to grow with further decompression to ~10 GPa. The ratio of the intensities of these two bands does not appreciably change below 10 GPa.

These spectral changes are consistent with a decompression mechanism in which Q-species are reformed during the backtransformation of the high coordinate structure to fourfold coordinated Si species (Figure 6) as discussed by Wolf et al (1990). The reversion apparently occurs without a memory of the original Q speciation. The O's need not remain coordinated to their original Si's during the breakup of the high coordinate structure. Therefore, depending on which bonds are broken during the reversion, Q^3 or Q^2 species can form. The backtransformation, occurring while the sample is still under considerable compression, appears to favor a broader distribution of Q-species. In this mechanism, the ratio of Q-species would be established during the reversion of the high coordinate network, with no easy mechanism available to change speciation upon further decompression, consistent with the behavior of the Raman data.

The ß-band reappears during decompression, but not until well after the Q^3 band has been recovered. In contrast to the behavior of the Q-bands, the relative intensity of the ß-band continues to increase with decreasing pressure. The behavior of the low frequency region of the spectra suggests that the high density ∝-states are strongly favored during the backtransformation to fourfold coordinated species. It is only at much lower pressures that the spectra infer that ∝-states begin to convert back to the lower density ß-states.

A comparison of the Raman spectrum of pressure cycled samples with that of the uncompressed starting material show that permanent structural deformations have occurred upon pressure cycling (Figure 7). The redistribution of Q-species is evident in the high frequency region of the spectra of the pressure cycled samples. The Raman spectrum of pressure cycled Cs_2O-$2SiO_2$ displays not only a significant increase in the intensity of the Q^2 band, but also contains a band near 833 cm^{-1}, consistent with the formation of Q^0 species along the

decompression pathway. The relative intensities of the Q-bands in the other disilicates are similar to that in Cs_2O-$2SiO_2$. It appears that pressure cycling produces a comparable degree of disproportionation of Q species in pressure cycled samples across the alkali disilicate series.

The low frequency region of the spectra of the recovered samples indicates that a permanent densification of the glass has occurred upon pressure cycling. The intensity of the ∝-band remains enhanced relative to the ß-band, suggesting that there is a larger relative population of the denser ∝-states in the recovered sample than in the starting material. The difference in relative intensities of these bands becomes more pronounced as the size of the alkali cation is decreased. By Li_2O-$2SiO_2$, the ß-band is not recovered at ambient pressure. Residual frequency shifts in the Raman bands also indicate a densification of the sample. The especially strong residual frequency shift in the ß-band (22 cm^{-1} in Cs_2O-$2SiO_2$), suggests that θ in the more open ß-states remain significantly compressed relative to their initial angle.

In situ Raman spectra of alkali disilicate and tetrasilicate glasses suggest that pressure-induced coordination changes in network cations can be facilitated by the addition of depolymerizers into the network. The spectra provide evidence that Si coordination changes in these partially depolymerized structures occur at relatively low pressures via an attack of NBO's on adjacent Si's. The result is a repolymerization of the network at high pressures.

Once the structure has repolymerized during compression, it apparently retains little memory of the original structure. Therefore, important structural rearrangements can occur in the alkali silicate glasses along the decompression pathway, including a redistribution of Q-species and ring statistics. However, it appears difficult to recover, or at least to detect with Raman spectroscopy, high coordinated Si species at ambient pressure in any of the alkali silicate glasses compressed at room temperature. The Raman spectra are consistent with the formation of Q-species during the breakup of the high coordinated network to fourfold coordinated Si's on decompression. The backtransformation favors a deviation from the constrained binary distribution of Q species found in the original ambient structure toward a more statistical distribution of Q species in the pressure cycled glasses.

The Raman data from a range of studies provide evidence that polymerized tetrahedral oxide glasses undergo pressure-induced coordination changes at high pressures. In fully polymerized glasses the network cation is able to increase coordination by involving bridging oxygens (BO). The BO's are also required to increase coordination with Si from ^{II}O to ^{III}O. Thus, high coordinate Si species are formed without requiring any bond breaking or other major structural rearrangements.

The pressure at which Si increases coordination can be significantly lowered by introducing relatively low concentrations of nonbridging oxygens (NBO) into the network. In structures that are partially depolymerized by addition of alkali oxide, the dangling NBO's of the low pressure Q^3 species attack

fourfold coordinated Si's to form higher coordinated ^{V}Si and ^{VI}Si species.

The range of pressures over which the Si coordination change mechanism operates can be controlled by the size and concentration of the alkali cation. Coordination changes can be facilitated by optimizing the concentration of a particular alkali cation. When the concentration is too low, pressure-induced cation-cation repulsions can be relieved by the conversion of the large population of low density ß-states to high density ∝-states, driving up the pressure required by the network to change coordination. If the concentration or size of alkali cation becomes too large, the cations may begin to sterically hinder the approach of the NBO's toward adjacent Si's, again increasing the pressure required for coordination changes. The optimum balance between these factors appears to be near the tetrasilicate composition for K compounds. Na compounds may require further depolymerization to reduce the pressure at which Si coordination changes occur.

Significant structural changes occur along the decompression pathway of the tetrahedral network oxide glasses. Si coordination changes appear to be fully reversible in all the studies. Thus, it appears that trapping high coordinated Si species at ambient pressure is difficult in tetrahedral oxide glasses when they are pressure cycled at ambient temperature. However, other significant structural rearrangements occur during the backtransformation to lower coordinate Si species. Apparently, the structure retains no memory of its initial configuration. Rather, when the high coordinated network breaks up during decompression, the structure will rearrange into a configuration that is energetically the most stable at that pressure. The backtransformation of high coordinated Si's to fourfold coordinated species results in a change in ring statistics, favoring tighter intertetrahedral angles, and a redistribution of Q-species. The new distribution of Q species is established at high pressure and favors a broader distribution of Q species through an increase in the population of Q^2 species. This new configuration may not be the most favorable at lower pressures, but once the reversion is complete there is no longer a mechanism available to further redistribute Q-species.

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Fig. 1. Diamond anvil cell (DAC). The sample chamber is formed by drilling a preindented metal gasket. Ruby chips are placed in the sample chamber as a pressure calibrant. Condensed argon (Ar) is used as a pressure transmitting medium to ensure quasihydrostatic conditions during compression. Sample size is typically 100 x 100 x 10 um.

Fig. 2. Raman spectrum of cesium disilicate glass (Cs_2O-$2SiO_2$) taken at ambient conditions.

Fig. 3. Series of *in situ* Raman spectra of cesium disilicate glass (Cs_2O-$2SiO_2$) under increasing compression.

Fig. 4. Compression mechanism of Si coordination changes via non-bridging oxygens.

Fig. 5. Series of *in situ* Raman spectra of cesium disilicate glass (Cs_2O-$2SiO_2$) under decompression.

Fig. 6. Backtransformation of high coordinate Si species during decompression. Both Q^3 and Q^2 species can be formed during the breakup of the network.

Fig. 7. Comparison of the Raman spectra of cesium disilicate glass (Cs_2O-$2SiO_2$) pressure cycled to a peak pressure of 34.4 GPa with that of the normal unpressurized glass.

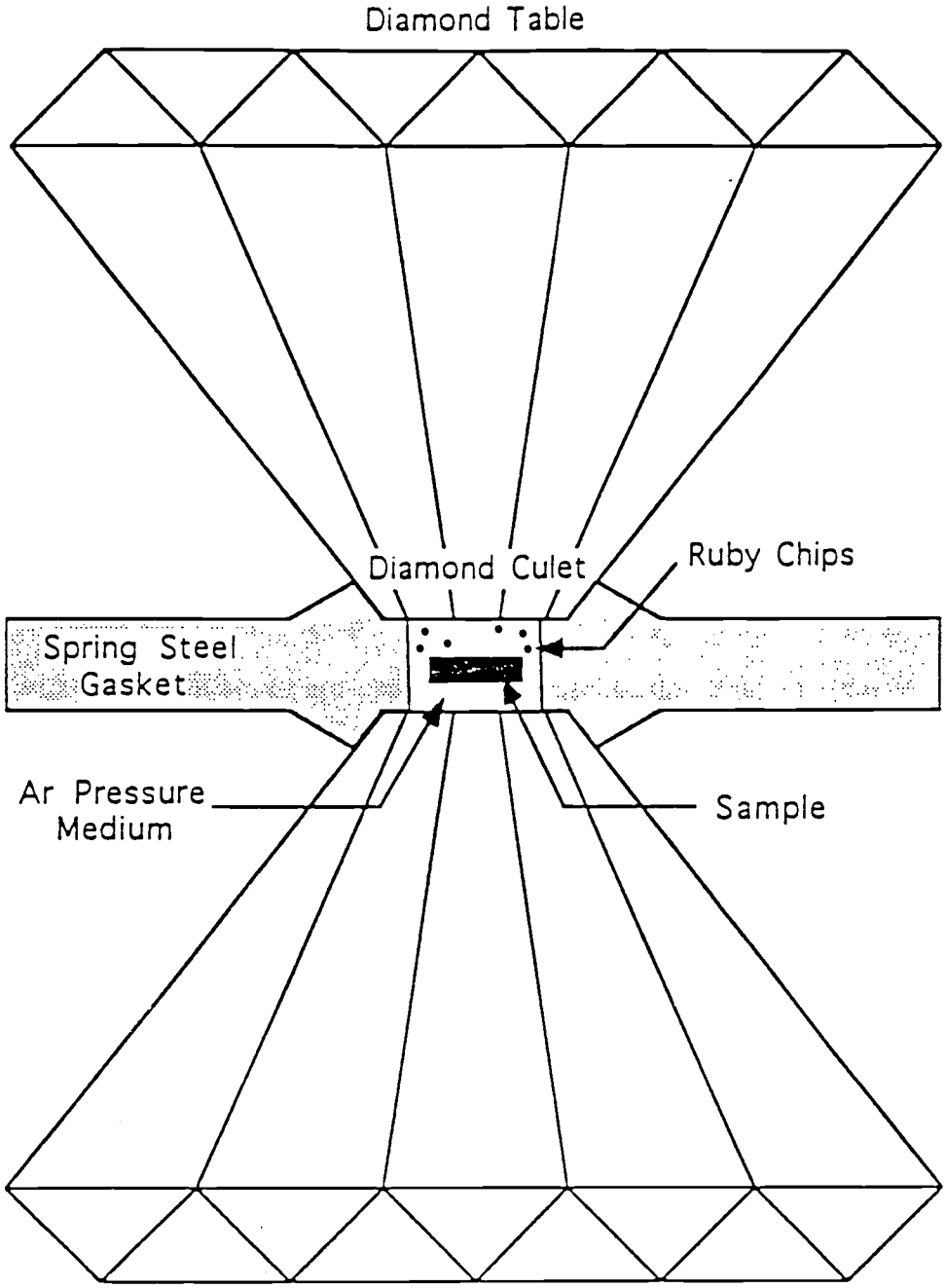
Diamond Table
Diamond Culet
Ruby Chips
Spring Steel
Gasket
Ar Pressure
Medium
Sample

Figure 1

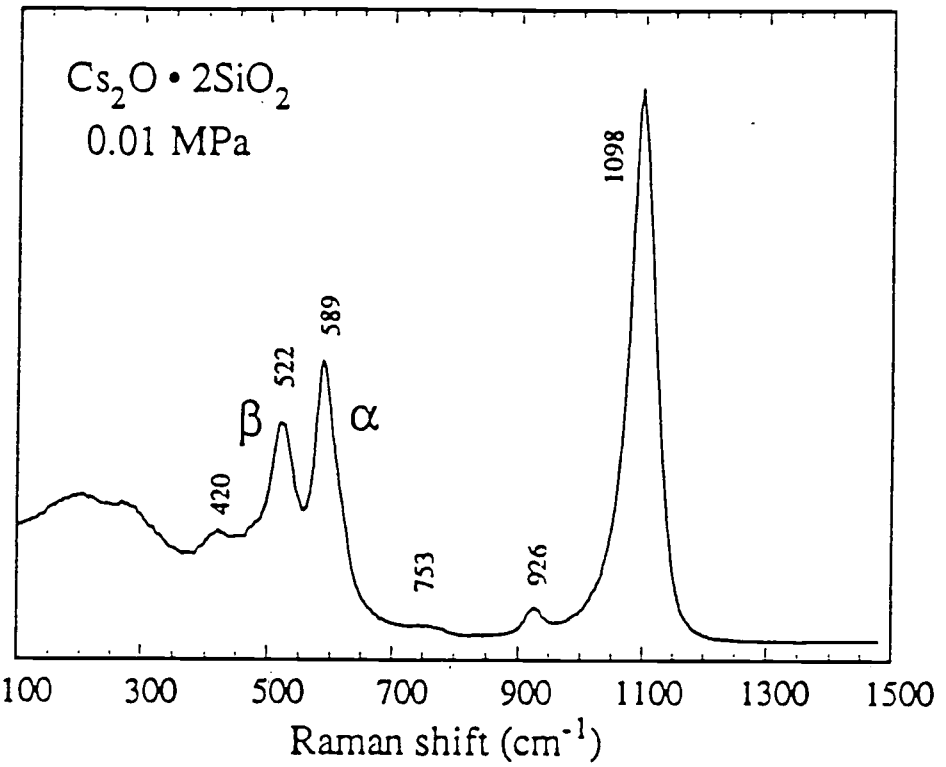
$Cs_2O \cdot 2SiO_2$
0.01 MPa
1098
589
522
β
α
420
753
926
100
300
500
700
900
1100
1300
1500
Raman shift (cm^{-1})

Figure 2

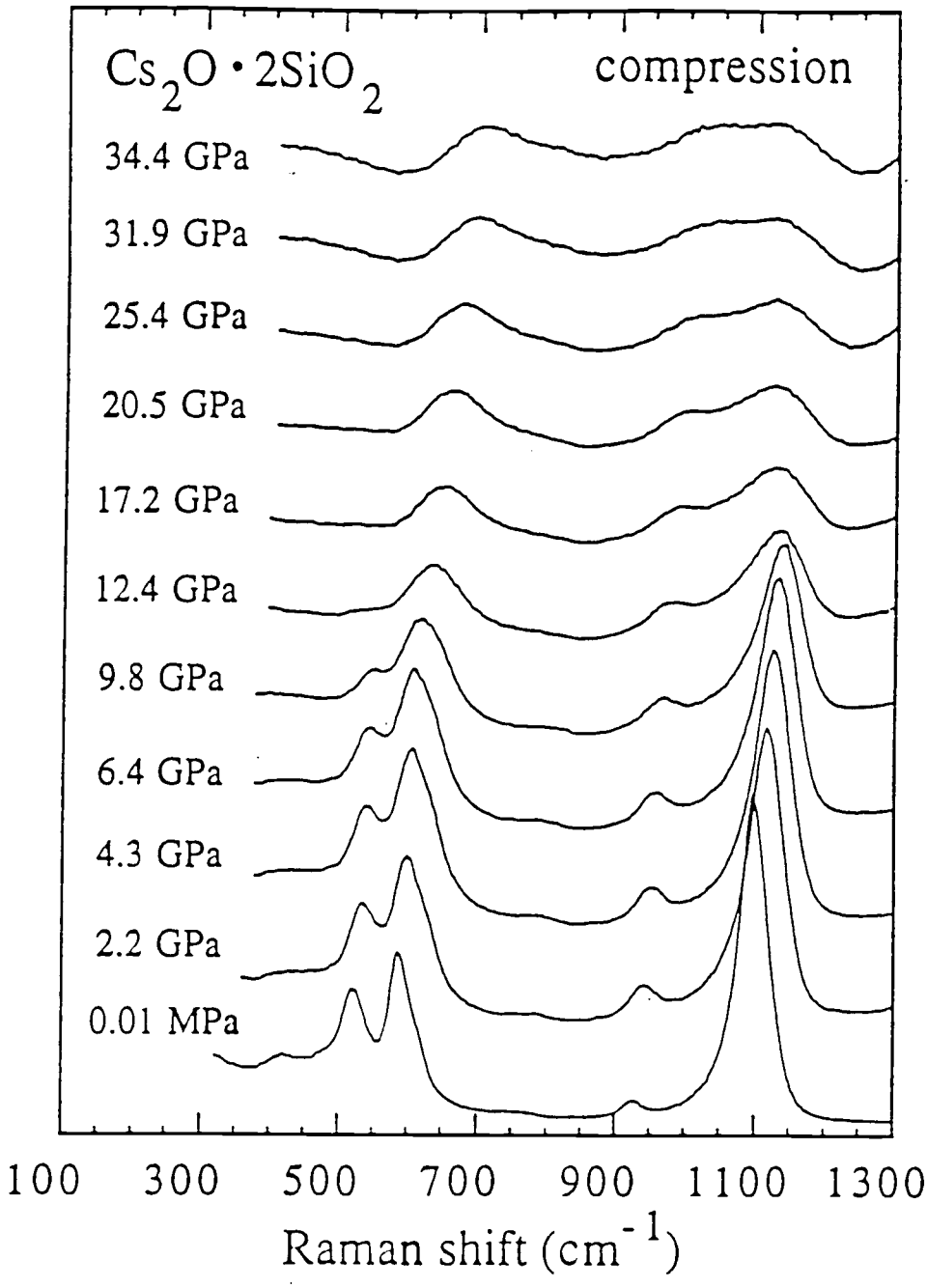
$Cs_2O \cdot 2SiO_2$
compression
34.4 GPa
31.9 GPa
25.4 GPa
20.5 GPa
17.2 GPa
12.4 GPa
9.8 GPa
6.4 GPa
4.3 GPa
2.2 GPa
0.01 MPa
100
300
500
700
900
1100
1300
Raman shift (cm^{-1})

Figure 3

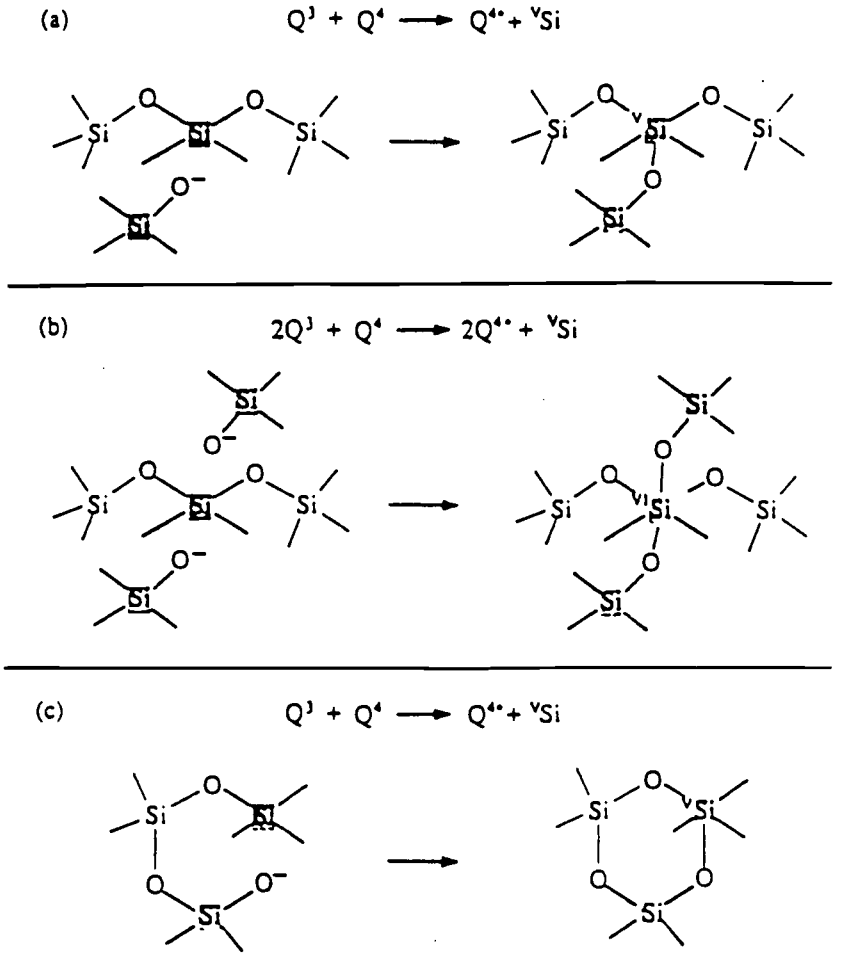
(a)
$Q^3 + Q^4 \longrightarrow Q^{4*} + {}^{V}Si$
(b)
$2Q^3 + Q^4 \longrightarrow 2Q^{4*} + {}^{V}Si$
(c)
$Q^3 + Q^4 \longrightarrow Q^{4*} + {}^{V}Si$

Figure 4

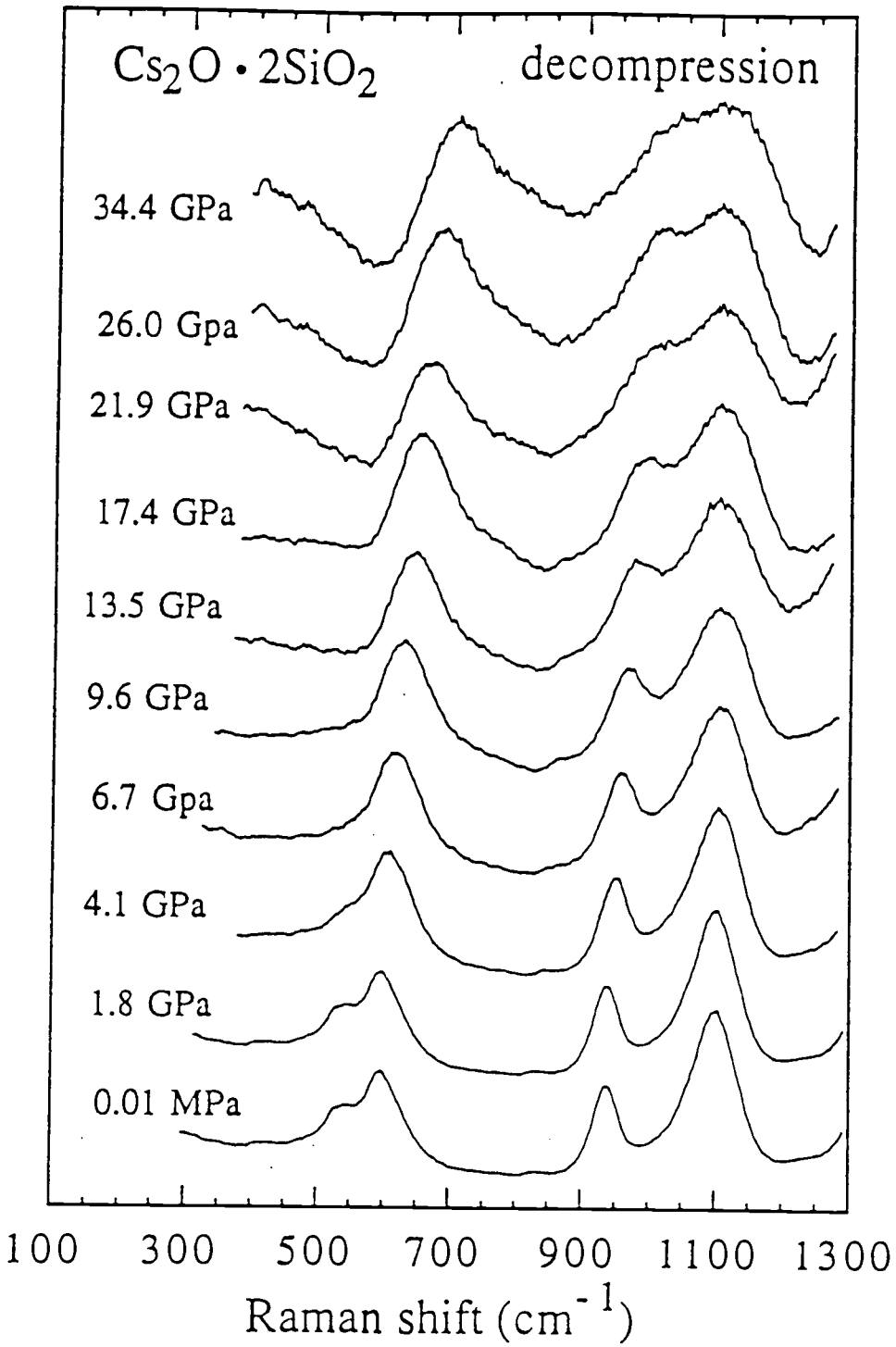
$Cs_2O \cdot 2SiO_2$
decompression
34.4 GPa
26.0 Gpa
21.9 GPa
17.4 GPa
13.5 GPa
9.6 GPa
6.7 Gpa
4.1 GPa
1.8 GPa
0.01 MPa
100
300
500
700
900
1100
1300
Raman shift (cm^{-1})

Figure 5

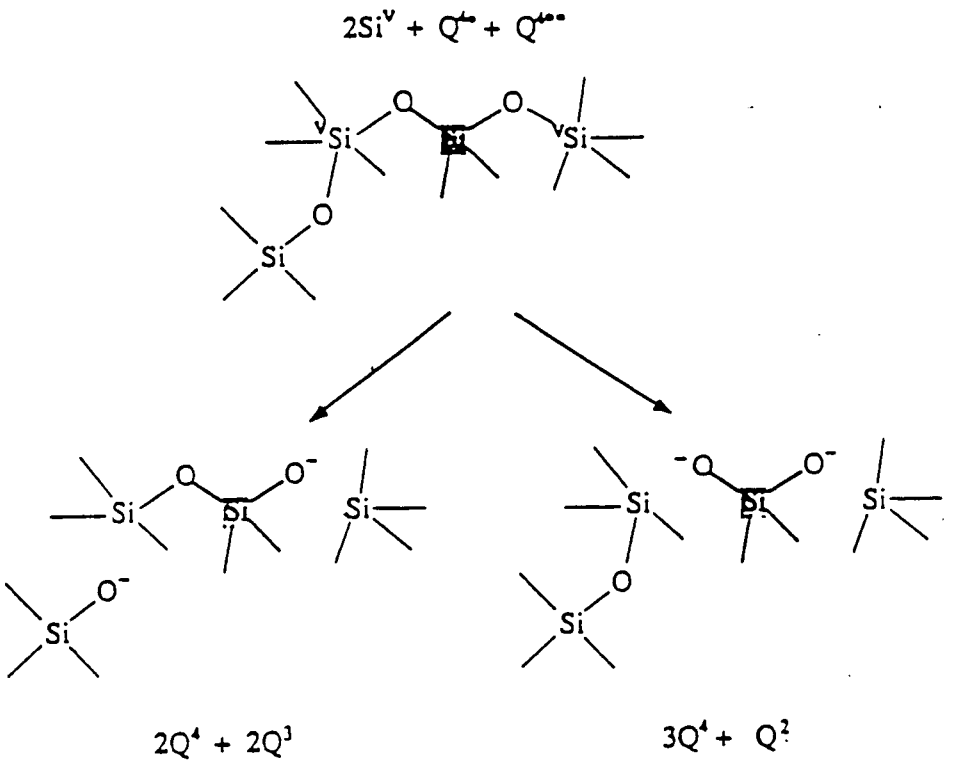

Figure 6

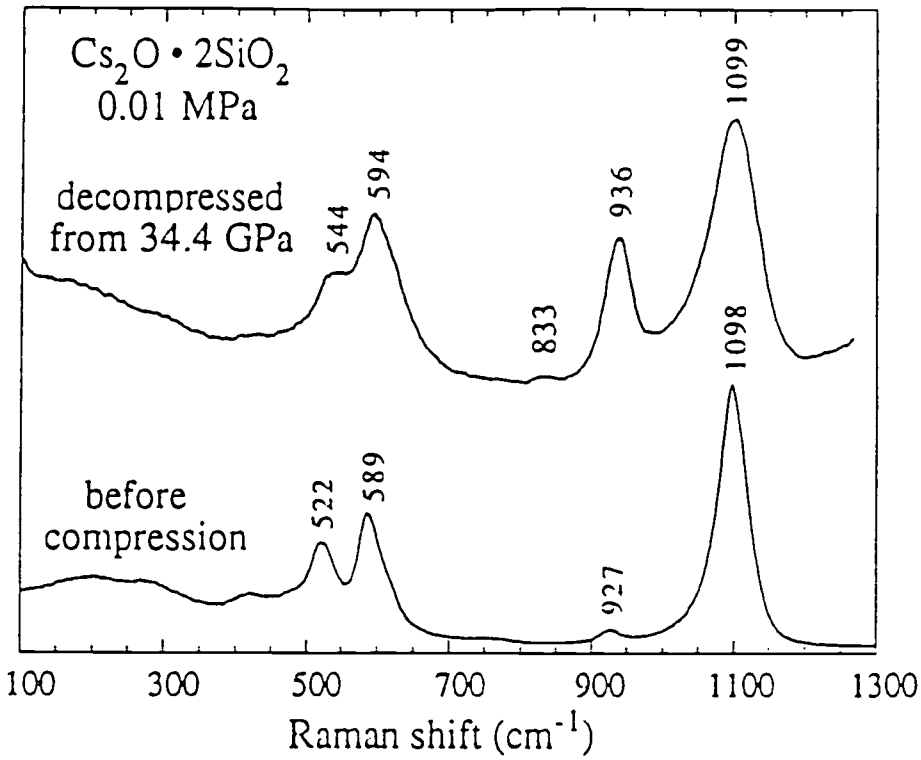

Figure 7

THE STATUS OF NATIVE AMERICAN HUNTING AND FISHING RIGHTS AS A PRODUCT OF HISTORICAL USE AND JUDICIAL INTERPRETATION

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In 1905, Supreme Court Justice McKenna, best summed up the importance of hunting and fishing to the Indian people when he concluded, access to wildlife for the Native American "was not much less necessary to the existence of the Indians than the atmosphere they breathed" (U.S. v. Winans, 1905, p. 104). There are four aspects which illustrate the importance of Indian hunting and fishing rights and the relevance of using history as a tool in the litigation of those rights will be addressed. Specifically, they include the various sources of right, treaties and the problems incurred during treaty negotiations, the nature of right, and finally what value does history have in the litigation of Indian hunting and fishing rights.

Before examining these four areas, it is imperative to analyze the total significance of hunting and fishing to Indian people. Namely, that fish and game provided food, commerce, and necessary tools for survival. Historically, Indian peoples engaged in trade and made excellent use of available resources. In fact, many techniques used by Indian people, especially in regards to fishing, were precursors of modern technology (Reader's Digest, 1978, p. 189). For example, tribes along the Columbia river in Washington used weirs, fences, to catch salmon and other fish (Reader's Digest, 1978, p. 284). Similarly, the Tlingit tribe fashioned an elaborate hook used to help catch halibut. More significant was the fact halibut were known to weigh up to four hundred pounds (Reader's Digest, 1978, p. 298).

Another fact about Native American hunting and fishing was that they used every part of fish and game for tools, clothing, shelter, recreational items, and even fuel. For example, buffalo hides were used as tepee covers, bullboats, leggings, shirts, dresses and gloves. (Reader's Digest, 1978, p. 171-172). Likewise, "euchalon, or candlefish, . . . when dried, (and) a string run through it, would burn like a candlewick" (Reader's Digest, 1978, p. 289), while seal or walrus skin covered umiaks, or boats used by Alaskan tribes (Reader's Digest, 1978, p. 378). Even rabbit hair was intertwined into a strand and made into a coat (Reader's Digest, 1978, p. 258).

In addition to furnishing tools, fish and game were often times an indispensable component of Indian spirituality. Expressing a profound respect for nature, many tribes held religious ceremonies prior to and after hunting or fishing. One example are the Hopi tribes who have and continue to utilize snakes in their Snake Dance, held in late August, to ensure a good rainfall and plentiful crops (Reader's Digest, 1978, p. 213). Had not the Hopi been able to use the snake, their religious ceremony would not have been performed. Hence, the snake was an essential aspect of the culture with the tribes and the right to take the snake being crucial. Likewise, the Hupa shaman, which were holy women, carried in their medicine bag, coyote feet, dried lizards and snakeskins (Reader's Digest, 1978, p. 273). Again, had not the tribe had the right to take these animals, the Hupa could not have practiced their religion, and in this case, their medicine. Numerous examples are to be found amongst virtually all Native American cultures.

While the importance of hunting and fishing to Indian people was and is crystal clear, sources of right are not so easily seen. The fundamental source of right for Indian peoples to hunt and fish is derived from the United States Constitution. Within this document were four areas influencing Indian people and two clauses which mentioned Indian people directly.

First, the Enumeration Clause states that Indian people are excluded from being taxed on Indian held land (U.S. CONST., art I). Secondly, the Commerce Clause, in Article I, Section 8, explicitly gives Congress the power to "regulate commerce with foreign nations and with the Indian tribes" (Berkey, 1992, p. 287). Third, the President has the "Power, by and with the Advice and Consent of the Senate, to make Treaties" (U.S. CONST., art II, sect 2). Fourth, the Treaty Clause states that ". . . all treaties made shall be the Supreme law of the land" (U.S. CONST., art. VI). Finally, the Fifth Amendment of the U.S. Constitution, protects Indian people in two ways. Specifically, "No person shall be deprived of life, liberty, or property without Due Process of Law, nor shall private property be taken without Just Compensation" (U.S. CONST., amend. V).

In addition to the U.S. Constitution, such rights stem from treaties (the process formerly terminated by Congress in 1871), Executive Orders, state and federal statutes, and state and federal court rulings. In 1787 the first treaty with the newly formed United States government involved the Delaware tribe. From 1787 until 1871, there were approximately 413 treaties between the U.S. government and Indian tribes (A chronological list of treaties, 1973, p. 3). Following treaties, approximately 97 Executive Agreements involving Indian tribes and the U.S. government were negotiated (A chronological list of treaties, 1973, p. 3).

Throughout the history of treaties, Indian people encountered several problems during negotiations. To begin, all treaties were written in English. Consequently, the federal government employed interpreters who, in many cases, were merely hunters or gatherers and not fluent in either english or the native language used by negotiating tribes. Another common complication was the use of alcohol, bribery, and coercion employed by the representatives of the U.S. federal government. In the Washington territory for example, "between 1843 and 1852 the Washington territorial governor, Isaac Stevens, conducted a marathon of treaties . . . cajoling, bribing, and threatening them, (the tribes involved), he managed to negotiate 52 treaties by which the natives of Idaho, Oregon, and Washington lost 157 million acres of land" (Reader's Digest, 1978, p. 287).

In addition, both parties to the negotiations had difficulties regarding appropriate exercise of authority. Specifically, the lack of authority of the federal agent misled Indian people into believing requests made during the negotiations would be written into the final draft. In contrast however, the federal agent, while claiming to have authority to ensure the tribe's requests be included in the treaty, could not fulfill this obligation during the treaty ratification process. In fact, treaties had to be ratified in the Senate where numerous changes were made without the consent or advice of the tribe. As a result, tribes often signed treaties

which in no way reflected their requests and instead depleted or totally extinguished many of their rights.

A similar problem during treaty negotiations occurred as a result of the common place consensus form of government utilized by many Native groups. In this type of government, every member of the tribe was informed as to any and all decisions regarding the tribe. During treaty negotiations, however, only a few tribal members represented the entire tribe and therefore not all members of the tribe were consulted about decisions affecting their tribal rights. Another problem arose when women in the negotiating tribe owned property or played an integral part in tribal affairs. For example, the women of the Navajo tribe owned and continue to own much of the stock and possessions of the family. Historically, women during the treaty negotiations were not included in the process, nor were they consented as to decisions regarding their rights or property.

An even more complex dilemma occurred as a result of the trust relationship established by treaties between Indian people and the United States federal government. Primarily, this trust responsibility meant that Indian people were considered wards of the federal government, whereby the federal government in turn acted as trustee. In 1854, accordance with that concept, the Supreme Court held that the purpose of the trust status was to "ensure the survival and welfare of the Indian tribes and people" (Pevar 1993, p. 27).

In reality, however, many conflicts arose due to the conflicting interest held by the federal government in regards to Indian peoples. Problems originated when the federal government appeared to seek the end of Indian peoples while at the same time aspiring to uphold their rights. As a result, many conflicts occurred over Indian hunting and fishing rights.

Another crucial aspect regarding Indian hunting and fishing rights was nature of right. Specifically, the rights Indian people hold in regards to hunting and fishing, as well as where the rights are applicable. As a product of federal acts, executive orders and judicial interpretations, various "rules" have been established. Namely, Indian people have the right to: modernize equipment and techniques (Pevar, 1993, p. 193); take fish or game which was not readily available at the time of the treaty. In addition, to taking fish or game for religious purposes (Pevar, 1993, p. 193); hunt or fish on land which was not necessarily a part of their traditional hunting or fishing areas (Pevar, 1993, p. 190); and to continue taking enough fish or game to sustain commercial purposes, even if the fish or game was taken on the reservation and sold off the reservation (Pevar, 1993, p. 193).

These rights pertain to Indian peoples on reservations created by treaty and also those created by Executive Order (Pevar, 1992, 193). However, there were only two significant limitations in the exercise of those rights. First, a tribe or member of a tribe, may not take so much fish or game that it endangers the continuation of the species, nor an amount which violates a federal conservation law or a similar state law which has survived continual constitutional challenge. Second, a tribe or member of a tribe can not take fish or game which has been

placed on the Endangered Species list by the federal government, as demonstrated by Dwight Dion, Sr. a member of the Yankton Sioux Tribe who was convicted of shooting four bald eagles on the Yankton Sioux reservation in South Dakota in violation of the Endangered Species Act, 87 Stat. 884, as amended, 16 U.S.C. * 1531 et seq. (U.S. v. Dion, 1986, p. 735).

Primarily, most Indian hunting and fishing rights stem from state and federal court rulings. Perhaps the most influential court ruling regarding these rights was United States v. Winans, (1905). Indeed, this was the first case where the court examination went beyond only the tangible documents of the treaty but also considered relevant testimony, as well as outside evidence, specifically, oral tradition.

Winans pertained to the Yakima tribe and local non-Indians who possessed fishing wheels, a device capable of catching an entire ton of salmon during their run. The wheel was capable of destroying fishing for the Yakima who were dependent on fishing the Columbia river. Obviously, the Yakima felt their rights were being infringed upon by the use of this device.

After examining the treaty and listening to the oral traditions, the Supreme Court held that, "The United States is bound, . . . to deal with the Indians on the most liberal doctrines of construction and the most generous rules of duty and obligation to inferiors known to our national principles and in international law" (U.S. v. Winans, 1905, p. 1904). Likewise, the court held "we will construe a treaty with the Indians as 'that unlettered people' have understood it, and 'as justice and reason demand, . . . without regard to superior justice" (U.S. v. Winans, 1905, p. 1092). These rulings established the "Liberal Construction Rule," which provides that treaties are to be interpreted liberally in favor of the Indian people due to their unfavorable bargaining position at the time of treaty negotiations. Also significant is the Court's observation that "a treaty was not a grant of rights to the Indians, but a grant of rights from them . . ." (U.S. v. Winans, 1905, p. 1092).

Another case which affected Indian hunting and fishing rights was Washington v. Washington State Commercial Passenger Fishing Vessel Association, (1968). In this lawsuit, seven Northwest Coast tribes litigated for the right to regulate hunting and more importantly fishing along the Columbia river. Up to that point, the State of Washington had exerted its authority over the tribal hunting and fishing rights along the Columbia river.

Once again, the Court examined written evidence (i.e., the treaty pertaining to the tribes involved), and also oral tradition surrounding the treaty and the tribes' traditional hunting and fishing areas. After examining all evidence regarding the claim, the Supreme Court ruled in favor of the tribes and held that "the tribes at the time of the treaties were heavily dependent on fish as a source of food, commerce, and cultural cohesion " (Getches, et al 1993, p. 748). The Court also held that the tribes were allowed to fish at all their "usual and accustomed grounds and stations" (Washington v. Washington, 1968, p. 838).

Another crucial aspect was the Court's ruling that "the purpose and

language of the treaties are unambiguous; they secure the Indians' right to take a share of each run of fish that passes through tribal fishing areas" (Washington v. Washington, 1968, p. 679). Indeed, the Court, in this case, legally allowed the tribe to take a "maximum possible allocation (of fish) . . . is fixed at 50 percent" (Washington v. Washington, 1968, p. 846). Perhaps the most crucial finding was that, "the U.S. as the party with the presumptively superior negotiating skills and superior knowledge of the language has a responsibility to avoid taking advantage of the other side" (Washington, v. Washington, 1968, p. 839).

A third case regarding involving hunting and fishing rights of Indian peoples was Menominee v. United States, (1968). This litigation was brought on by the Menominee tribe from Wisconsin whose reservation was extinguished by Congress in 1954 by the Termination Statute. Primarily, the tribe sought to retain their hunting and fishing rights even though their reservation had been "eliminated."

In this case, the Supreme Court examined the Termination Statute Act, the 1854 Wolf Treaty, along with oral tradition. After reviewing all evidence, the Court held that "although federal supervision of the tribe was to cease and all tribal property was to be transferred to new hands, hunting and fishing rights, granted by the Wolf River Treaty of 1854 survived the Termination Act of 1954" (Menominee v. U.S., 1968, p. 703). Consequently, the Court ruled in favor of the tribe, reaffirming "the principle that every tribe retains its original hunting and fishing rights unless (in clear terms) those rights are extinguished by Congress" (Pevar, 1993, p. 191). Possibly the most important facet of this case was the fact that Indian hunting and fishing rights were maintained even after the reservation had been terminated.

While the above cases illustrated the application of the Liberal Construction Rule, Montana v. United States, (1981), illustrated an instance which differed significantly from these cases. This case pertained to the Crow tribe, of Montana and their right to regulate fishing along the Big Horn river. In addition, this lawsuit illustrates the long standing problem Indian peoples have had with state government's attempting to exert authority over their right to hunt and fish. At the outset, it is imperative to recognize that the Crow gave up over 1.3 million acres of land upon signing the 1868 treaty.

The problem that erupted between Montana and Crow tribe was the State's attempt to exercise jurisdiction on the reservation based on its claim of title to the bed and banks of the Big Horn River upon entering into the Union. Consequently, the State felt authorized to exert authority over the Crow tribe's use of the river. In this particular case, the Supreme Court did rule in favor of the State and held that "the Crow at the time of the treaty were a nomadic tribe dependent chiefly on buffalo, and fishing was not important to their diet or way of life" (Montana v. U.S., 1981, p. 556). The Court also concluded that "the language of the 1868 treaty provides no support for tribal authority to regulate hunting and fishing on land owned by non-Indians" (Montana v. U.S., 1968, p. 558). Hence, the State secured its authority over Indian hunting and fishing along the Big Horn

River.

Clearly, Montana v. United States, (1981), depicted an instance where the Supreme Court ruled without considering the Liberal Construction Rule. First, the Court failed to take into account that while the Crow were dependent upon buffalo at the time of the treaty, that did not mean that at some point in the future the tribe would not be forced to turn to another food source such as fish. Second, the court chose not to interpret the treaty liberally, nor in favor of the Indian people. Despite the Court's lip service to the rule that "any ambiguities in governing treaties should be resolved in favor of the Indian tribes" (Montana v. U.S., 1968, p. 567), it appeared to do otherwise.

. Another interesting aspect of Montana v. U.S, 1968, were the dissenting arguments from Justices Blackmum and Marshall. The justices joined in and concluded that the Supreme Court in this case "disregards the settled rule of statutory construction" (Montana v. U.S., 1968, p. 569). More importantly, the justices found that the "the U.S. intended and the Crow nation understood that the Beds of the Big Horn was to belong to the Crow Indians. . ." (Montana v. U.S., 1968, p. 569).

As pointed out earlier, the right to hunt and fish for Indian peoples is a long established right. The sources of rights are taken from the U.S. Constitution, treaties, Executive Orders, state and federal statutes, and state and federal court rulings. Further, it is the Court rulings that have been crucial in the nature of the rights as well as the significance of histories in establishing the rights.

History, in this context, does not simply mean the analysis of legal cases. Instead, history is to include oral tradition. This allows the "Liberal Construction Rule" to be employed to effectively demonstrate how histories provides a more developed and well-rounded interpretation of the facts. If oral history were not included in court cases, the liberal construction rule would not serve to give a proper interpretation of the treaty as it was negotiated.

History has also been shown to supplement facts and present an articulate account of the past. As a result, history provided objectivity by illustrating both sides of treaty negotiations. Likewise, history portrayed a clearer picture of what really occurred during treaty negotiations, what was actually understood by the tribes involved in treaty negotiations and what events shaped the negotiations.

Beginning with Winans in 1905, a new view regarding Indian hunting and fishing rights was first used in the court's system. After Winans, treaties were to be construed, not according to the actual terms of the treaty, but how Indian people would have "understood" the treaty. Thus, Courts have concluded that oral tradition is admissible evidence which serves to affirm and establish Indian peoples' right to hunt and fish. Although the fight to secure and maintain Indian hunting and fishing rights is far from over, history, applied as a tool in the litigation of those rights, has cleared many roadblocks and established rules in the interpretation of Indian hunting and fishing.

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SOUTH DAKOTA PRINCIPALS' PERCEPTIONS ABOUT, ATTITUDES TOWARD, AND KNOWLEDGE OF LAW-RELATED AND CIVIC EDUCATION PRACTICES IN THEIR SCHOOLS

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The purpose of this study was to ascertain South Dakota public and Bureau of Indian Affairs (BIA) school principals' perceptions about, attitudes toward, and knowledge of law-related and civic education practices in their schools.

Review of the literature indicated that the training of citizens is essential to any form of government and, most specifically, to representative forms as exist in the United States. Philosophers and educators throughout history placed the responsibility of citizen preparation at the feet of teachers, admonishing them to consider that the essence of education was to prepare citizens (Adler 1988; Dewey, 1916; Proctor, 1988).

Within the United States, civic education began as the instilling of passions for liberty and patriotism, evolved into emotional nationalism, and finally progressed to rational evaluation of political structures and values. Current practices of law and civic education developed rapidly in response to calls for curriculum restructuring (Butts, 1980; Patrick & Hoge, 1990; Pulliam, 1991).

Research in the area of law and civic education was limited and focused primarily on evaluation of teaching and program administrative practices. Experimental research was virtually nonexistent, but the research conducted revealed positive results through the democratic interactive teaching of law and civic education. Most recent studies analyzed the teaching practices and attitudes of teachers and administrators. These studies were used to examine trends and plan projects and materials for the future (Buzzell 1992; Hardin, 1991; Johnson & Hunter, 1986; Naylor, 1992; Social Science Education Consortium, 1990; Social Science Education Consortium, 1992).

Since 1971, organizations designed to coordinate and promote law and civic education increased in number and spread to all 50 states. National organizations, both federally and privately funded, were established to provide training and materials to practitioners of law and civic education. Based upon results of research in the behavioral sciences, materials were developed for instructional purposes. The proliferation of these printed and audiovisual materials was substantial. The South Dakota Center for Law and Civic Education, in its infancy stage, began coordinating efforts to inform and instruct educators in South Dakota. Due to the center's short history, research has not been conducted and printed material has been limited to items of correspondence. The South Dakota Center for Law and Civic Education has sought data to assess needs for planning future services (American Bar Association Special Committee on Youth Education for Citizenship, 1992; Anderson, 1987; Arbetman, 1991; Butts, 1980).

A questionnaire consisting of twenty-four items was sent to all elementary and secondary South Dakota public and BIA principals. The questionnaire was comprised of four sections. The first section sought personal information about the principal and his/her school. The second section assessed the principals' perception of law and civic education by having them define each of the two subjects. A third section requested that principals report teaching strategies and materials used in his/her school. A final section of the questionnaire requested

responses reflecting his/her attitude regarding law and civic education.

A population of 497 principals was identified and included in the survey. The population was apportioned into three groups based upon student enrollment. The response rate for small districts, enrollment between 1 and 300 students was 78 percent. The response rate for medium districts, enrollment from 300 to 1199, was 75 percent. The large districts, enrollment 1200 or greater, had a response rate of 76 percent. The total response rate was 76 percent. After gleaning unusable questionnaires, the final usable response was 71 percent.

Included in these response totals were Bureau of Indian Affairs (BIA) principals. Response rates of BIA principals are shown in Table 1.

Table 1
Response Rate of All Elementary, Junior/Middle and High School

Bureau of Indian Affairs (BIA) Principals

	Total number of principals	Number of responses	Percentage of responses
Total BIA elem. principals	16	9	56%
Total BIA jr/mid. principals	3	1	33%
Total BIA high principals	11	5	45%

The reporting of data utilized frequencies of responses, percentages and means for reporting Likert-type scales. Apportioned groups of district size provided observation of percentage range for a specific survey question.

Summary of Findings

1. When ranking the definition of law-related education (LRE), as defined by the U.S. Department of Health, Education and Welfare (1978, p. 1), "Lessons for students that inform and develop skills that pertain to the legal system, its process and the principles and values upon which they are based," 57 percent of the principals identified that definition as being their first choice. The definition for civic education, as defined by Langton (1988), "Classes and opportunities motivating students to participate in public life," was ranked first by 18 percent of the principals. The definition which received the highest percentage (32 percent) ranking as the best definition reflected knowledge based instruction in governmental functions.
2. Seventy-five percent of 357 principals indicated that law-related education, in some form. was being taught in their schools. Ninety-two percent of the principals reported that civic education was being taught in some form.

3. Principals reported that the most frequently used materials for teaching law and civic education were those developed by the teacher, and secondly those developed by national publishers. The least used materials were those developed by state projects.
4. Financial support for teaching law and civic education comes primarily from the local school district. Funds were primarily used for material purchases and ongoing expenses such as field trips.
5. Importance of teaching law and civic education increased with the education level of the students. A moderate degree of importance was placed upon the teaching of law and civic education at the elementary level and escalated to a degree of being very important for students at the high school.
6. Teaching of American Indian tribal law was viewed as moderately important, 3.56 on a six-point scale.

Data would indicate that principals viewed civic education as an activity to obtain knowledge rather than stimulate participation in citizenship behaviors. The high percentage of schools offering law and civic education would seem to imply there would be availability of numerous publications and contacts with national and state organizations. This assumption was not supported by the data of this study. Data does not indicate infusion of law and civic materials into the curriculum of many of the schools reporting law and civic education instruction.

The higher degree of importance placed upon teaching law and civic education in the upper grades was congruent with the national study by Hardin (1991). Hardin would suggest that more effort should be made to implement the basic concepts and strategies of teaching law and civic education at the lower grade levels.

Research data indicated that although principals believe that law and civic education was offered in their schools, the number of teachers to supply the instruction was very limited. Teachers appeared to be responsible for developing the material used for instruction; however, minimal financial support was provided for teacher training or release time for developing lesson plans and materials used for law and civic education. Principals viewed the teaching of American Indian tribal laws of moderate importance, 3.56 on a six-point scale; however, the number of teachers under the supervision of principals teaching tribal laws was quite small; 88 percent of the principals have fewer than three teachers under their supervision teaching about American Indian tribal laws. This data may indicate a major need for teachers trained in tribal laws.

Literature reviewed in this study indicates that participatory training in law and civic education positively influences the behaviors and attitudes of students. The reports of principals indicated that the successful teaching strategies developed by national law and civic education organizations are used infrequently.

Taking into consideration the literature dealing with the necessity for civic education, it would seem expedient for principals to reevaluate their educational philosophy as it relates to participatory citizenship for students. As indicated by

the principals' perceived definition of civic education, participatory teaching strategies should be incorporated into the curriculum. Civic education should move from the level of instruction to participation.

The lack of principals' knowledge about publications and resources would indicate actions be taken by state and national organizations to inform and disseminate materials to principals in all regions of South Dakota.

The apparent lack of teachers involved in the teaching of law and civic education should motivate principals, school districts, universities and state officials to implement requirements for teacher training in these areas. Literature, past and present, espouses the need for training citizens. Civic officials should heed the call to action and support law and civic education growth through public support and financial commitment.

It is recommended that the next level of assessment research be initiated. An assessment of teacher needs would complement this study and add an additional perspective to the law and civic education needs in South Dakota. A comparison of principal and teacher responses might reveal specific concerns.

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READER RESPONSE: THE AFFECTIVE SIDE OF CRITICAL THINKING

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self expression and makes the writing purposeful as well as functional. Use of the reader response journal assumes that meaning is not contained in the text, but derived from the author's message and the experience of the reader. Use of the reader response journal offers students a way to use the written text and personal reflections about the text to explore thinking, feeling, and values as well as provide a means to reason, to synthesize, and to make connections to their own lives. The response journal represents a compromise between autonomy of student directed learning and structure of curriculum restraints (Sanford, 1988).

The Nature of the Study

The purpose of this study was to better understand if a child can learn to describe his/her internal feelings to which no one else has access. During the nine month study, responses of 24 students with differing abilities in a self-contained fifth grade classroom were examined in an attempt to answer the following questions:

1. Does a response journal allow students to identify and give expression to personal feeling?
2. Does a student's level of cognitive functioning affect the ability to respond to literature affectively?

The responses were evaluated using a naturalistic inquiry approach. Naturalistic inquiry assumes that reality is multiple, constructed, and holistic and that inquiry is value-bound (Lincoln and Guba, 1985). The data collection procedures included 1) reader response journals, 2) student-teacher interviews and questionnaires, 3) teacher observations, and 4) the Language Arts Performance Assessment. These procedures were cross checked for transferability of information.

Reader Response Journals

These journals were the researcher's primary source of information. Students were assigned to one of three literature groups determined by reading ability from information provided by the previous year's teacher. Titles of the novels used in the study were taken from award winning authors, award winning titles, and children's classics. Upon completion of reading assigned sections of novels, students were asked to respond using a personal narrative format at least two times weekly. These responses were discussed in small groups and were read periodically to assess progress of the student. The journals were formally assessed twice during the school year--one time in November and one time in May. After randomly choosing a writing sample from each journal, the sample was then

Reading as Transaction

The teaching of reading and writing in the elementary classroom is steeped in tradition. Many of these traditions are based on the basal text, which has been the mainstay of the elementary reading curriculum for almost one hundred years (Goodman, 1986; Jensen, 1987). These basal texts suggest that students be taught to read and write using a hierarchy of skills and that mastery at one level must be achieved before progressing to another level of skills instruction (Anderson, Heibert, Scott, & Wilkinson, 1985). Current research indicates that these traditional beliefs cannot be supported by empirical data. Trelease (1989) says that "in concentrating exclusively on teaching the child how to read, we have not taught the child to want to read" (p. 6).

Within the last decade, more researchers and educators have moved away from the traditional methods of teaching and writing, recognizing that students learn more effectively in a natural language environment (Holdaway, 1979; Newman, 1985; Weaver, 1988). Gentry (1987) states that using a whole language approach promotes language development by emphasizing the purpose of language: communication of ideas and meaning. Presenting language as something to be studied, rather than to be used, defeats the purpose of language.

Holdaway (1979) has provided a foundation for new ways to study children's literacy. He has determined that literacy can no longer be regarded as simply a cognitive skill but as a complex activity with social, linguistic, and psychological aspects. Children come to school with a variety of experiences and a variety of feelings tied to those experiences. These experiences, whether positive or negative, become a memory only because of the feelings that stay with the child (Bleich, 1975). Classroom practices must include methods to present literacy in a way that allows children to focus on their affective responses while gaining knowledge.

Smith (1984) states that in terms of good language patterns, worthwhile literature becomes an excellent meaning of presenting learners with a powerful role model. When teachers focus on literature and its effect on the reader, children can be encouraged to think and write about what has been heard or read from a personal point of view. It is this *transaction* (Rosenblatt, 1938, 1978) that allows a reader to bring meaning to and take meaning from a text. Squire (1989) concluded that "the task of the teacher of literature. . . is to focus on the transaction between the book and the reader. . . and on ways to extend and deepen the understanding of the literary experience" (p. 9).

Just as reading is an active, creative process, so is writing an active, creative process. It, too, is transactional as it focuses on the individual meaning and involvement with the text. Parson (1990) discusses the role of the reader response journal in conjunction with literature. He defines a reader response journal as a notebook in which students record their personal reactions to, questions about, and reflections on: What they read, view, listen to, and discuss (p. 3). Encouraging an affective response to literature allows writing to become a form of

assessed using a holistic scoring guide. A score of one (1) indicated that the student lacked competence in understanding and responding to the literature. A score of two (2) indicated that the student demonstrated some understanding of the literature and some competence in writing with specific flaws. A score of three (3) indicated that the student had significant competence in understanding and responding to the literature with occasional errors. A score of four (4) indicated that the student had a high degree of competence in understanding and responding to the literature even though the journal may have had minor errors.

Journals were also assessed twice during the school year to determine if students were responding to literature at higher cognitive and affective levels as the school year progressed. Content analysis categories, as determined by Applebee (1978) and Galda (1983), were used to provide data to answer the research questions. These hierarchial categories were descriptive of Piaget's (1932), Bloom's (1956), and Krawthwohl's (1964) stages of cognitive and affective development and were used to assess the degree to which the students were applying critical thinking to the reading and writing activity.

Retelling, as a form of response, received a score of one (1). This type of response is comparable to the preoperational stage (ages 2-6) of development. The responses tended to be a retelling of the story focusing upon specific details. If this kind of evaluation was elaborated upon at all, the child usually made reference to a favorite part of the story.

A score of two (2) was representative of a categoric response and is comparable to the concrete state (ages 6-11) in Piagetian Theory. The children typically provided summaries that were short and used words to describe attributes of personal response such as "dull," "exciting," "nice," and so on. Whole texts were also categorized into themes such as "adventure." At this stage response was systematic, focusing not on details but categories to support the evaluation.

A score of three (3) indicated an analysis response and was comparable to Piaget's formal operations - Stage I (ages 12-15). Responses scored in this category were concerned with discovering how the text worked as a whole and how personal responses were influenced by the text. Children at this level were able to articulate a more personal response and could analyze beyond what is and respond to what might be. Cause-effect relationships, empathy with the characters, and specific reasons for reactions were used in this stage of evaluation.

The final stage builds on Stage II of formal operational thought (16 to adult). A score of four (4) was given when the child responded by making generalizations from the meaning of the text and discussed issues relevant to them in gaining understanding of their world. The evaluation focused on what might have been as well as what did happen.

Language Arts Performance Assessment

A third form of evaluation, the Language Arts Performance Assessment, was used to provide confirmation and triangulation of the holistic methods used within the journals. This evaluation was provided by trained scorers employed by a psychological corporation not familiar with the participants of the study. The scorers holistically scored student written products one time in May. This evaluation provided information about the students' abilities to synthesize a variety of sources into one complete response. Scorers provided ratings of the products in three areas: response to reading, management of content, and command of language.

Presentation of Data and Findings
Does a Response Journal Allow Students to Identify and Give Expression to Personal Feeling?

Applying Piaget's stages of cognitive and affective development, these fifth graders could respond at the retelling (preoperational) level or concrete (categoric) stage of development. Other possible response patterns are formal operations - Stage I (analytic), and formal operations - Stage II (evaluation). Content analysis scoring of the response journals indicated that most students in this study could identify and give expression to personal feelings. The following journal entries represent typical responses for each of the categories of content analysis used in the study. The entries have not been edited and represent the actual writing style and development of the writer.

Retell (Preoperational)
Josh's May entry to Danny, Champion of the World:

I like Chapter 10. Danny watched Doc Spencer Drive off around the corner until he could not see him anymore. Then he unwraped the present that Doc Spencer gave him. It was a pie his dad slept for just about twenty four hours his dad woke up and he said he feels great. I can walk you to school no Dad no But danny you haven't missed one day of school yet not now danny its only two miles each way.

Categoric (Concrete)
Shane's May entry to The Black Stallion:

I think it was very smart when Alec gave sugar to the Black while Henry put on the saddle. When the Black fell over on his back trying to get off his sadle, I thought it was funny. and I think that the Black will be a good race horse.

Analysis (Formal Operations - Stage I)
Shauna's May entry to Sounder:

I didn't really like the way the man at the jail was treating the boy. I wonder if he would have treated the boy diferent if he wan't Black? May be is he shouldn't have so much power just because he is white.

Evaluation (Formal Operation - Stage II)
Pam's May entry to Sounder:

I don't see why the boy doesn't like going to town. You would think he wanted to go somewhere other than stay home. I guess I'm forgetting their value system, but it's hard to let go of ours just for a book.

The written responses of all but two of the students responded at the categoric, analytic, or evaluation level. Table 1 presents the results of the individual journal entries. Table 1 indicates that two students responded at the retelling level, representative of a preoperational level of cognitive and affective response and that three students decreased in the level of higher order responding between the two writing samples. Additionally, the results indicated that by May, twenty-two of the twenty-four participants responded at or above levels developmentally appropriate for students ten and eleven years of age.

Tables 2 and 3 present the percentages of content analysis by groups for November and May. The findings indicated that in November, 25 percent of the **Below grade level** students were utilizing analysis (formal operations-Stage I) to respond to literature, the **Average grade** level students were utilizing formal operations 33 percent of the time, and 20 percent of the **Above average** learners were providing responses at the analysis level. Sixty percent of the **Above average** learners responded to the literature with evaluation (formal operations-Stage II) compared to 0 percent for either of the other groups of students.

The findings in May showed significant changes for all three groups of students. The **Below grade level** students increased from 25 percent to 60 percent of students utilizing some formal operation, **Average** learners increased from 33 percent to 56 percent, and the **Above average** learners increased from 20 percent to 30 percent. The **Above average** learners also showed an increase in those responses categorized as evaluation from 60 percent to 70 percent. The findings of the content analysis indicated that a journal allowed the ten- and eleven-year-olds in this study to respond to literature at developmental levels of cognition and affectivity higher than those described by Piaget.

Table 4 is a summary of percentage totals of content analysis for November and May. The results reported in this table indicated that by May students utilized higher order thinking of analysis, synthesis, and evaluation 75 percent of the time. Seventeen percent of the students responded at the categoric (concrete) level of response and 8 percent remained at the retelling (preoperational) level of

response. These findings supported the statement that the journal did allow students to express their personal feelings about literature and these responses were provided at higher levels of cognition and affectivity.

Table 1. Individual Journal Content Analysis November (*) and May (#)

	Retell	Categoric	Analytic	Evaluation
Kenny		*	#	
Tim			* #	
Jay		* #		
Randy		*	#	
Josh	#			
Shane		* #		
Jessica	#	*		
Casey			* #	
Mindy		* #		
David		*	#	
Justin		#	*	
Crystal			* #	
Marc		*	#	
Kala		*	#	
Nick				* #
Pamela				* #
Michelle				* #
Jacob				* #
Lesley			*	#
Shauna			* #	
Kim			*	#
Brian		#	*	
Brittnie		*	#	
Brooke		*		#

Table 2. November Content Analysis Percentages by Group

	Retell		Categoric		Analysis		Evaluation	
	n	%	n	%	n	%	n	%
Below Grade Level	4	0	4	75	4	25	4	0
Average Grade Level	9	0	9	67	9	33	9	0
Above Grade Level	10	0	10	20	10	20	10	60

Table 3. May Content Analysis Percentages by Group

	Retell		Categoric		Analysis		Evaluation	
	n	%	n	%	n	%	n	%
Below Grade Level	5	20	5	20	5	60	5	0
Average Grade Level	9	11	9	33	9	56	9	0
Above Grade Level	10	0	10	0	10	30	10	70

Table 4. Summary of Percentage Totals of Content Analysis for November and May

	November		May	
	n	%	n	%
Retelling	0/23	0	2/24	8
Categoric	11/23	48	4/24	17
Analysis	6/23	26	11/24	46
Evaluation	6/23	26	7/24	29

Does the Student's Level of Cognitive Functioning Affect the Ability to Respond to Literature Affectively?

Student journals were scored by the researcher in November and again in May using the Holistic Scoring Guide. Scoring was determined as follows:

(1) indicated an incompetence in writing, (2) indicated some competence in writing with obvious flows, (3) indicated competence in writing with occasional errors and (4) indicated a high degree of writing with minor errors. Results of the scoring are reported by groups in Table 5.

All but one student in the **Below grade** level groups indicated a positive improvement in capitalization, punctuation, mechanics, and style from November to May. This occurred because this student received only one score as no November entry was available from the journal.

The **Average grade** level group also indicated a positive change from November to May with the exception of two students. These students, while not improving, did not report a negative difference but stayed the same for both assessment periods.

The **Above average** group all stayed the same or changed positively from November to May. Following are samples of journal entries for each rating of (1) through (4). The entries have not been changed and reflect authentic student writing.

Rating (1) - general incompetence in writing
Kenny's November entry taken from Aldo Applesauce:

The book makes me read and read. I red 1 and 1/2 capters sorry but I cautent help it. Aldos sister makes me Laught speshly her freanch class Also Applesauces in the lunchroom he falls and spills applesauce so they gave the neckname. It made me laught so bad

Rating (2) - some competence in writing style with obvious flaws:
Kala's November entry taken from Sign of the Beaver:

Well, on the first page Matt throught that Atian would never come back. But he was wrong again. The next morning Atian was ther and he said "give me another chance" he pleaded, and in that paragrah I know that this time might be a o.k. time because they are getting to know each other. So Atian decided to take matt fishing and Atian tought Matt his. And Matt tought Atian the way Matt do it. I guess they are doing ok with there relationship. And Matt is starrting to get frrushrated with Atian.

Rating (3) - competence in writing with occasional errors:
Brittnie's November entry taken from Sing Down the Moon:

In chapter one of Sing Down the Moon, I was confused at first, the I started to understand it a little better. I felt happy in chapter one and I wanted to re ad on until i found out what happened. I like how Scot o'dell wrote this book even if it was kind of confusing. If you read on, you can kind of figure out what is going on, I really like his descriptive words

because they helped me to understand it better.

Rating (4) - high degree in writing with minor flaws:
Lesley's November entry from Sing Down the Moon:

> Sing down the moon is a awsome book the first chapter was kinda of confuesing tho i like This one paragraph when it talked about the water rushing down. It made me fell good inside and puts me there.

The Language Arts Performance Assessment was used in May to provide confirmation and triangulation of the ratings determined by the Holistic Scoring Guide and researcher. Results of this evaluation are reported in Table 6. Scores in the column labeled "management of content" represent the ratings given for capitalization, punctuation, and mechanics. Scores reported in this column are consistent with the May ratings determined by the researcher 50 percent of the time. The remaining 50 percent of the students received scores one rating lower than those of the researcher with the exception of three students. This may be due to the nature of the writing. While the journals were narrative, the Language Arts Performance Assessment product was expository in nature. The findings of the Holistic Scoring Guide were confirmed that cognitive functioning does affect the ability of children to respond to literature. The **Below average** learners, while improving in writing style and ability from November to May, consistently responded below the remainder of the class.

Summary

For more than 40 years, researchers have suggested that reading curriculums need to encourage students to provide more than "correct" responses to literature. These researchers have supported the ideas that meaning is individual and the reader must be actively involved in a process--a transaction--with the text in order for understanding to occur. However, most elementary children are still taught to read through a series of skills applied to a fill-in-the-blank worksheet. This approach to reading instruction does little to encourage active student involvement nor does it facilitate the use of higher order thinking skills of analysis, synthesis, or evaluation.

The purpose of this study was to examine a holistic approach to reading and writing, specifically, reader response. Students were actively involved with reading whole texts and writing affective responses to what had been read. This approach to teaching reading and writing allowed students to build on previous experiences and encouraged thinking beyond the literal levels of knowledge and comprehension, moving them toward higher levels of response, both cognitively and affectively.

Table 5. Holistic Scores of Journals As Reported by Group

Below Grade Level	November	May	Difference
Kenny	1	2	+1
Tim	2	3	+1
Jay	2	3	+1
Randy	1	2	+1
Josh	---	2	---
Average Grade Level			
Shane	2	3	+1
Jessica	2	2	---
Casey	3	4	+1
Mindy	2	3	+1
David	2	3	+1
Justin	3	3	---
Crystal	3	4	+1
Marc	2	3	+1
Kala	2	3	+1
Above Grade Level			
Nick	3	4	+1
Pamela	4	4	---
Michelle	4	4	---
Jacob	3	4	+1
Lesley	2	4	+2
Shauna	3	3	---
Kim	2	3	+1
Brian	3	3	---
Brittnie	3	4	+1
Brooke	2	3	+1

Table 6. Results of Language Arts Performance Assessment Reported by Groups

Students by Group	Response to Reading	Management of Content	Command of Language
Below Grade Level:			
Kenny	2	2	2
Tim	2	2	2
Jay	2	2	2
Randy	1	2	1
Josh	---	---	---
Average Grade Level:			
Shane	3	2	3
Jessica	1	2	2
Casey	3	3	3
Mindy	3	3	3
David	2	2	3
Justin	4	4	4
Crystal	3	3	3
Marc	1	1	2
Kala	3	3	3
Above Grade Level:			
Nick	2	2	2
Pamela	4	4	4
Michelle	4	4	4
Jacob	4	4	4
Lesley	2	1	2
Shauna	3	3	3
Kim	2	2	3
Brian	4	3	3
Brittnie	4	4	4
Brooke	2	2	2

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USING QUALITATIVE RESEARCH IN EDUCATION

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patterns" (Biklen & Moseley, 1988; p. 155). The phenomenological basis for qualitative design is presented by Biklen and Moseley (1988) when they suggest that the learners' interpretations assume a prominent place in qualitative research. The qualitative researcher describes what the learners do and the meaning they make of it (Taylor & Bogdan, 1984).

Remember, the purpose of qualitative research is not to prove a particular hypothesis or test for the effect of a set of variables, but rather to come to understand learning experiences from the perspective of the individuals involved. Biklen and Moseley (1988) state that language, whether written or oral, is central to most qualitative research because of the emphasis on understanding and communication. Consequently, qualitative data takes the form of narrative rather than numbers. And, because qualitative methods are labor-intensive they demand that the researcher spend substantial time in the environment under study in order to gain the learner's trust and to understand individual learning (Biklen & Moseley, 1988). It is for this very reason that a qualitative research stance is most appropriate for educators.

Qualitative Research Strategies

Having reviewed qualitative research approaches developed by Taylor and Bogdan (1984); Burgess (1984); Denzin (1978); Lincoln and Guba (1985); Foster and Seltzer (1986); and Husband and Foster (1987), it seems most logical and beneficial for educational evaluation to utilize a multiple design of (1) contextualization, (2) naturalistic inquiry, and (3) analytic induction. . .

Contextualization as presented by Husband and Foster (1987) recognizes the importance of viewing human behavior within its immediate context, within its social context, and within a broad cultural context. They note that learners not only act in immediate, often psychologically determined ways, but also in relation to roles, norms, conventions, and social structures. When evaluating learning, it is important to consider multi-cultural values and mores.

Naturalistic Inquiry (Lincoln & Guba, 1985) is a qualitative research strategy which recognizes that human activity must be studied in its natural setting. For example, Foster and Seltzer (1986) examined achievement in the urban ghetto by adopting the perspective of the group under study. Naturalistic inquiry is described by Lincoln and Guba (1985) as the process of social, intrapersonal and interpersonal interpretation of the person (learner) as s/he experiences the situation (learning event).

Analytic Induction is defined by Denzin (1978) as a qualitative research strategy to provide a systematic attempt to code data while generating "casual propositions" (p. 27). In addition, this strategy makes comparisons within the sample under study. Given the descriptive information to be collected, analytic induction provides for synthesizing the data and making judgments concerning evaluation findings.

When educational evaluation needs to be student-centered, methodology for assessing and determining effective teaching requires a continuous, interactive monitoring and adjustment system to provide specific direction for personalized instruction. However, traditional tools from behavioral science research do not seem appropriate. Husband and Foster (1987) reflect this concern quite exactly when they describe:

> *In the desire to quantify and more precisely explain human experience, researchers using traditional psychological and educational research methods have often simplified the mosaic of personal and shared human experience to the point that the unique, rich character of human activity is lost in the pursuit of empirical generalizations and replicable results (p. 50).*

Qualitative research procedures have been developed within the social sciences of anthropology and sociology to recognize and record such human experience (Lincoln & Guba, 1985). In fact, the disciplines of sociology, anthropology, and journalism examine a variety of human issues that relate general themes for educational use (Husband & Foster, 1987; p. 52):

1) *a foundational assumption for the interpretative, creative, and subjective nature of learning;*
2) *a commitment to the discovery and uncovering of multiple meanings in learning; and,*
3) *a concern with understanding human action from the learner's own frame of reference.*

Beyond the creative and interpretative dimensions of human activity and search for meaning, the need to understand human behavior from the learner's own perspective has been the most noted reason for using qualitative research methods in education (Denzin, 1978; Garfinkel, 1967; Husband & Foster, 1987; Pearce, 1989). Husband and Foster (1987) suggest that understanding another person's point of view is the major driving force in all research that is truly qualitative. Such an approach demands researchers to attempt to know the learner personally and to observe them as they develop and use their own unique definitions of the world (Burgess, 1984; Denzin, 1978; Garfinkel, 1967; Lincoln & Guba, 1985; Taylor & Bogdan, 1984; and Pearce, 1989).

Qualitative Research Methods

Biklen and Moseley (1988) suggest that qualitative research methods are designed for the study of human perspectives. Such "methods document patterns of people's lives and reveal how research subjects construct meaning around these

Consequently, the use of triangulation (multiple strategies) strengthens the qualitative research design. The probability for accounting the totality of the learning experience is improved (Denzin, 1978; Lincoln & Guba, 1985; Husband & Foster, 1987).

Qualitative Research Activities

Specific activities provide systematic procedures to implement the research strategies for the qualitative design (e.g., naturalistic inquiry, contextualization, and analytic induction). The following activities are the most commonly used and frequently cited in qualitative research studies:

(1) Participant as observer. The researcher makes her/his presence known, and establishes relationships with others so the students being observed serve as respondents and informants. Taylor & Bogdan (1984) describe this participant observation method as flexible; allowing the researcher to become intimately familiar with the people under study. The researcher frames questions in general terms and enters the field of study without specific hypotheses (Lincoln & Guba, 1985). Participant observation refers to research characterized by a period of intense social interaction between research and objects of study in the natural setting, such as the teacher and students in a classroom (Husband & Foster, 1987).

(2) Conversational analysis. Interactions which occur in every day school activities become the focal point of the study. This qualitative research method is utilized for study of interpersonal interactions such as the teaching/learning relationship. Garfinkel (1967) suggests that naturalistic inquiry is reflected with the researcher's choice of examining common interactions, such as student discussions, the educational process, and natural conversations in the classroom. Husband & Foster (1987) suggest that formal descriptions of interactions be developed that "lead to an understanding of natural properties of [learning] activities and how [students] go about organizing such activities through interactions" (p. 59).

(3) Historical and life history. Personal documents are one of two methods considered to be the mainstay of qualitative research (Denzin, 1978; Lincoln & Guba, 1985). Such documents include materials in which people report life, character, understanding of themselves, another individual, a group, or an organization (Husband & Foster, 1987). Educational materials could include: student biographical information, psycho-educational assessments, classroom performance records, academic achievement results, class attendance, incidents of behavior problems, and medical notations. Such information helps the teacher understand individual differences.

(4) Unobtrusive measures. Webb, Campbell, Schwartz, and Sechrest (1966) describe non-reactive measures of observation which remove the researcher

directly from the set of interactions (or events) being studies as unobtrusive measurement. Such measures in education could be reports completed by parents, guardians, social services, special education, court services, or mental health professionals.

(5) Interviewing. Face to face verbal exchange is employed to gather information and opinions from the respondents. Denzin (1978) suggests that the interview is the favorite tool of a qualitative researcher. A standardized interview schedule is the most structured format. That is, the wording and order of all questions remain exactly the same for each interview. This standardized method obtains comparable responses from people (Denzin, 1978). Another interview technique developed by Garfinkel (1967) in conducting studies in ethnomethodology is the open-ended interview. The following interview questions are appropriate for qualitative research in education:

A) Assess student needs. What do you need to learn? What do you want to learn? What motivates you to learn? What do you plan to learn?
B) Identify written and measurable learning goals and objectives. How do you learn best? What are the personal conditions necessary for you to learn? What are the environmental conditions necessary for you to learn? How much time do you need to learn?
C) Recognize limitations, restrictions, and/or potential obstacles which may hinder learning. What prevents you from learning? What could get in the way of learning?
D) Brainstorm possible learning objectives for each goal. What are your strengths? What kinds of teaching support do you need?
E) Determine best method for demonstrating student achievement. How will you apply your learning?

In conclusion, qualitative research provides a continuous evaluation of the educational process to emphasize the student's perspective and involvement. It is a natural research practice for educators!

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MODIFIED OLIGONUCLEOTIDE VIABILITY ASSAYS THROUGH THE USE OF FLANKED HOMOPOLYMER SEQUENCES

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Discussion

Antisense therapies are directed towards the inhibition of expression by messenger RNA strands coding for aberrant proteins in cellular systems. In principle, therapies will operate by hybridization of a sequence-dependent oligodeoxyribonucleotide to a unique code which is part of a targeted messenger RNA strand (Figure 1 a). The resulting DNA/RNA duplex structure will then be recognized by RNase H, a cellular enzyme (Figure 1 b), and the oligonucleotide's complementary mRNA sequence will be cleaved out, leaving the mRNA unable to undergo translation and open to degradation by cellular nucleuses (Figure 1 c). Oligonucleotides for use as antisense therapeutics must meet certain criteria in order to be effective toward blocking expression of their target messenger RNA (Milligan et al., 1987). Past attempts to use nucleotides, both modified and unmodified, as inhibitors of mRNA translation have shown them to be subject to limitations, including an inability to penetrate cell membranes, failure to support RNase H activity and degradation by cellular nucleuses. To that end, work currently underway in this laboratory is aimed at developing modified nucleotides that can be used to synthesize antisense oligonucleotides which will overcome these difficulties.

To justify the extensive amount of work and resources needed to move each type of modification through various phases to clinical testing, we needed to develop an efficient and economical way to screen the ability of novel modified oligonucleotides to meet each of these criteria. The subject of this paper is a simple assay that can be used to test hybridization, the formation of the DNA/RNA duplex, by use of T7 bacteriophage polymerase-transcribed RNA.

Procedure

Use of T7 polymerase as a means of synthesizing RNA oligonucleotides was described by Milligan, et al (1987). A DNA synthesizer was used to synthesize the promoter region recognized by T7 polymerase plus an extended template for the desired RNA strand.

$^{5'}$-TAATACGACTCACTATAG-$^{3'}$
$^{3'}$-ATTATGCTGAGTGATATCCCCTCGCTTTTTTTCGC-$^{5'}$

We wanted to transcribe RNA of the sequence $^{5'}$-GGGAGCGAAAAAAAGCG-$^{3'}$ to hybridize with complementary modified oligonucleotides we had synthesized. The template shown above was combined with T7 RNA polymerase under conditions described by the manufacturer (Ambion, Inc.). After transcription the reaction mixture was fractionated by denaturing polyacrylamide gel electrophoresis and the full length RNA oligonucleotide was gel purified by standard procedures.

To screen the viability of the different types of modifications, we synthesized two control molecules; a DNA strand of seven nucleotides of modified thymidine flanked by G/C-rich sequences of 2'-O-methyl RNA nucleotides (hereafter called **T-oligo**), and a RNA strand of seven 2'-O-methylated uridine nucleotides, similarly flanked by 2'-O-methyl G/C nucleotides (**U-oligo**). The RNA-flanked DNA homopolymer, when hybridized to the T7 RNA transcript, creates a DNA/RNA duplex, recognizable to RNase H; thus it is the positive control for that assay. The U-oligo, on the other hand, forms an RNA/RNA duplex, ignored by RNase H, hence it is the negative control.

Melting studies were performed on the duplexes described above to determine whether correct hybridization had occurred, and if so, that the duplexes remain stable at temperatures in excess of body temperature (37°C). These data, drawn from UV absorbance, are reflected in the graphs (see Figs. 2-5). The successful hybridization to the RNA molecule is shown by the smooth sigmoid curve, reflecting a single melting point for each duplex (Saenger, 1984). The point of inflection in each graph describes the melting temperature (T_M) of the duplex structure, or the point at which one-half of the duplexes have dissociated into single strands. In each case the melting temperature is well in excess of body temperature. As a control, the same experiment was performed using the T-oligo single strand (Fig. 2). As expected, no hyperchromatic shift is seen.

Summary

The assay described here, using T7 polymerase-transcribed RNA, is an efficient and simple way to screen the hybridization viability of modified oligonucleotides. We have shown, through test hybridization of control molecules, that this method is effective for assaying the successful hybridization of complementary oligonucleotides. Melting point studies done in this manner can quickly justify, or eliminate the need for, more complex testing of these molecules. Further experimentation will be done using oligonucleotides, with various types of backbone modifications, designed and synthesized in our laboratory.

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Figure Legends.

Fig. 1

a) Simplified eukaryotic cell diagram showing antisense oligonucleotide and target mRNA.
b) The antisense oligonucleotide binds in a sequence-dependent manner to the targeted mRNA.
c) Cellular enzyme RNase H recognizes the DNA/RNA duplex and cleaves out the complementary portion of the mRNA. The mRNA is cannot express its aberrant protein and is left open to degradation by nucleases.

Fig. 2

UV absorbance and T_M data for single strand DNA oligonucleotide with methylated RNA flanks.
Top: UV absorbance wavelength gradient showing normal nucleic acid peak absorbance at 260nm.
Bottom: Absorbance of constant 260nm wavelength across temperature gradient. Absence of curve indicates no duplexes were present to melt.

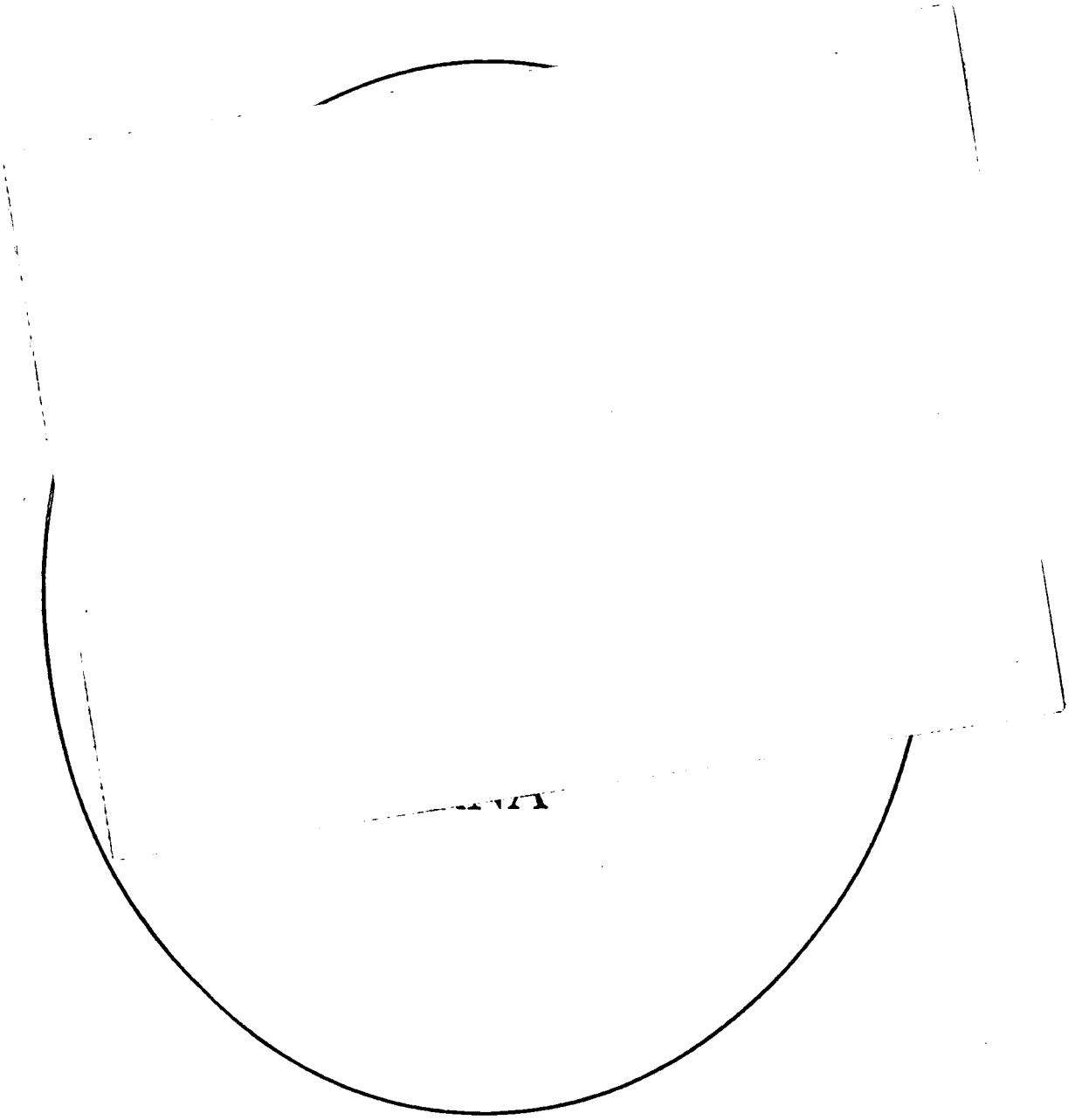
Fig. 3

UV absorbance and T_M data for T7 promotor DNA/DNA duplex.
Top: Nucleic acid peak at 260nm.
Middle and Bottom: The sigmoid curve is indicative of the melting of a single type of nucleic acid duplex. This shows that there was no errant hybridization present in the sample.

Fig. 4

UV absorbance and T_M data for positive control DNA/RNA duplex. Again, note that the sigmoid curves show that complementary hybridization was successful. The T_M is at the inflection of the graphs.

Fig. 5
UV absorbance and TM data for negative control RNA/RNA duplex.



3' ——————— 5'

antisense oligonucleotide

Figure 1 (a)

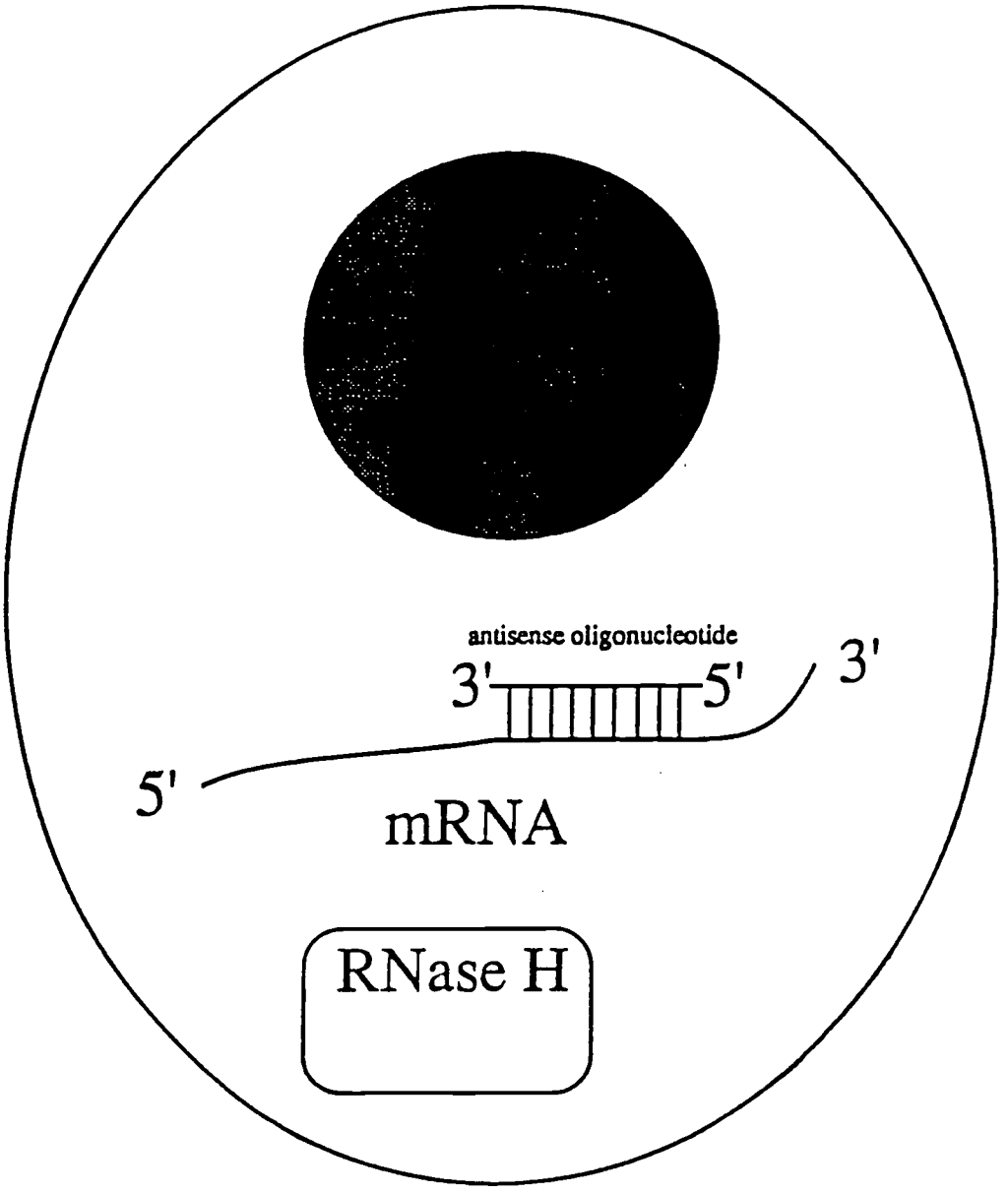


Figure 1 (b)

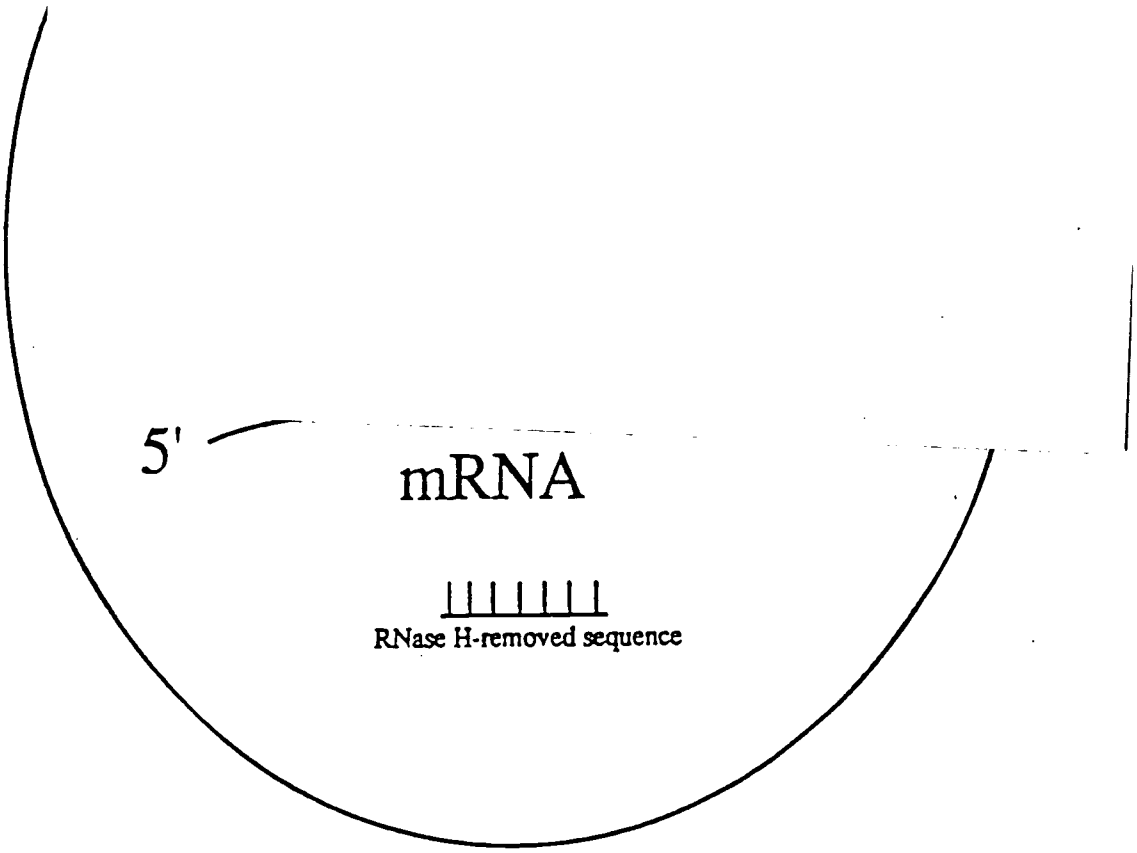
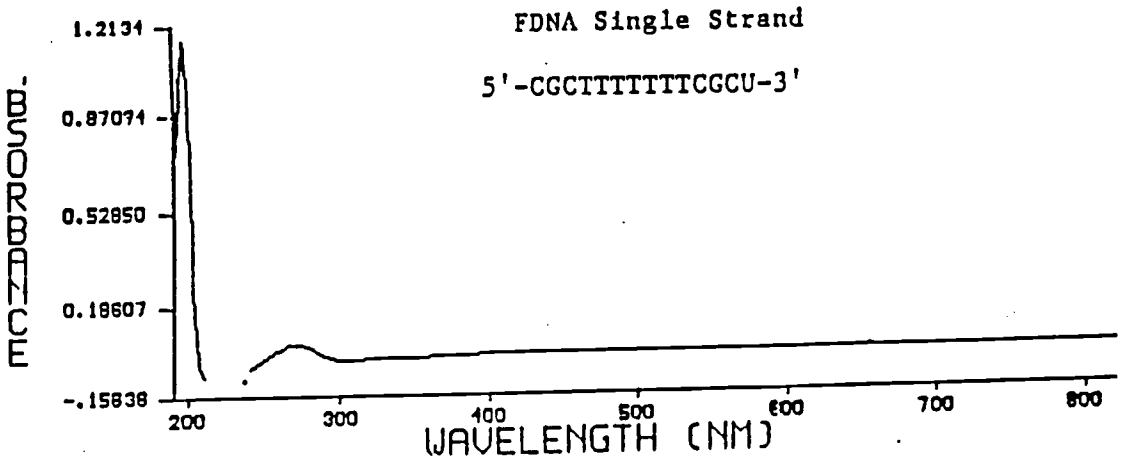
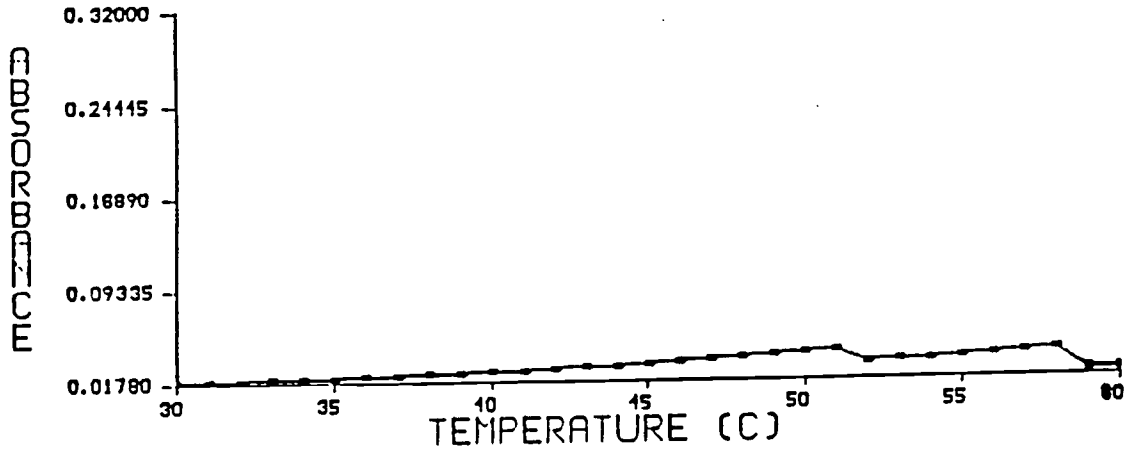


Figure 1 (c)

Figure 2





Temperature File: DEFAULT.DIA
Operator: WRBR-1
Sample: FDNA-SS
Solvent: Iris 7.5
Molarity: .85 mol/L

Start Time: 13:54:22
Date: 03-21-1994

Figure 3

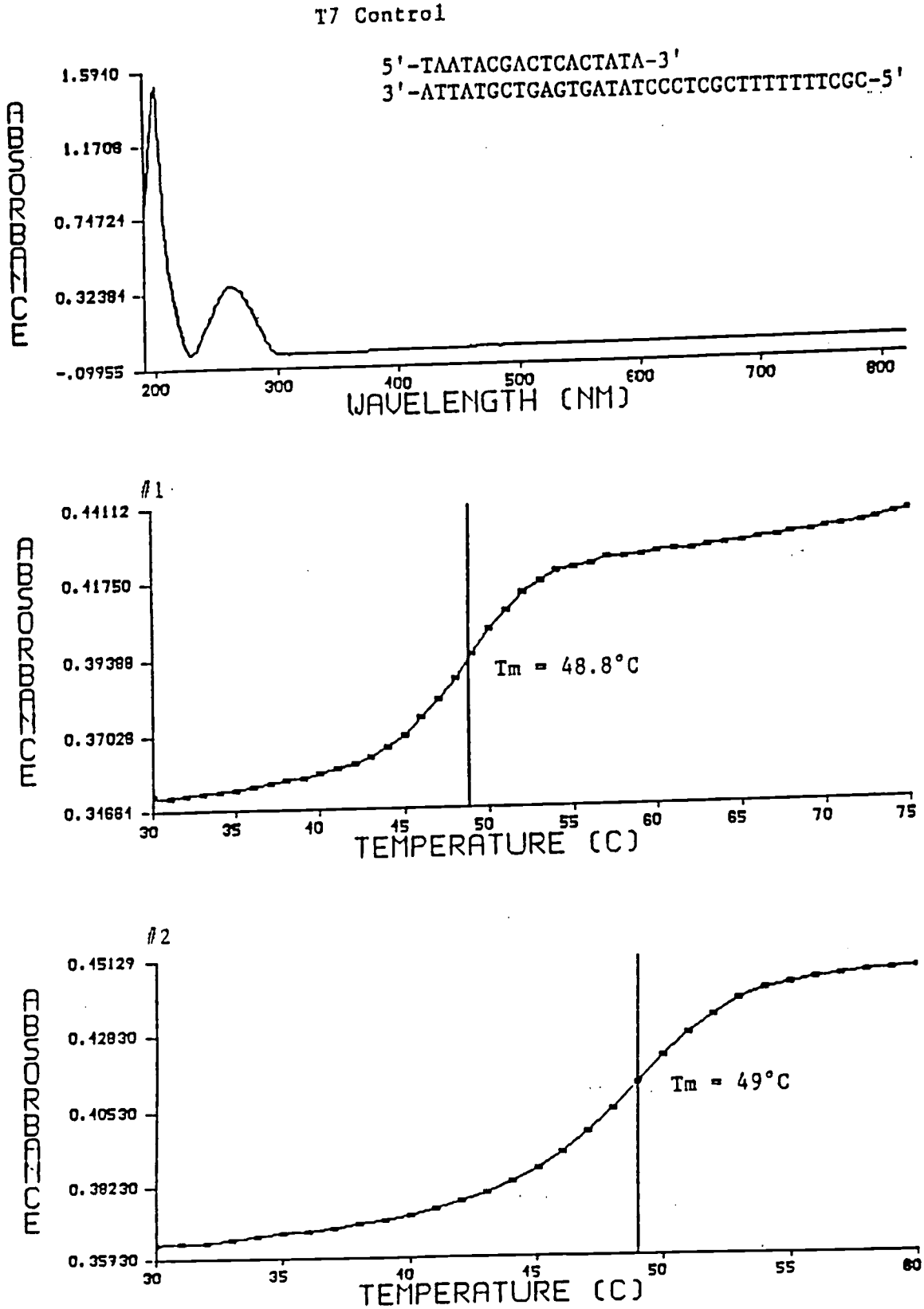
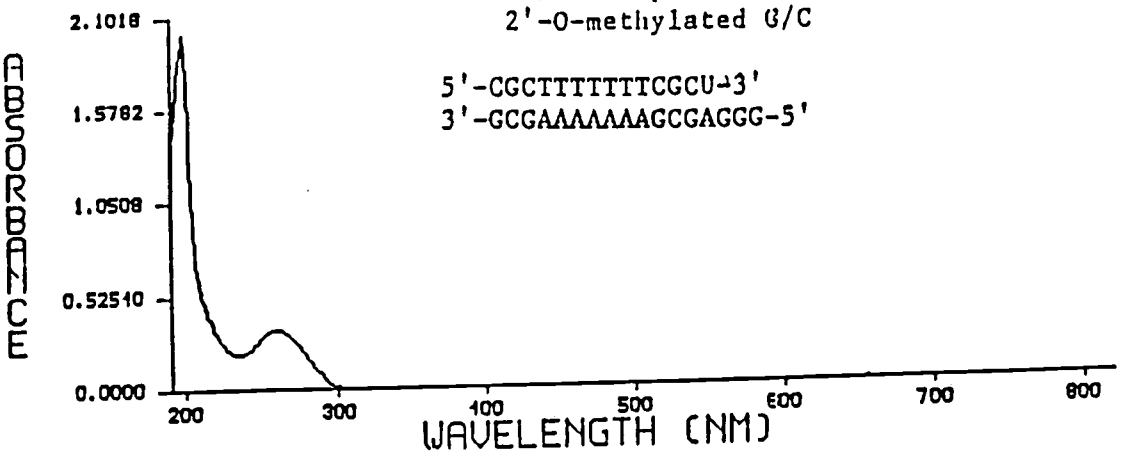
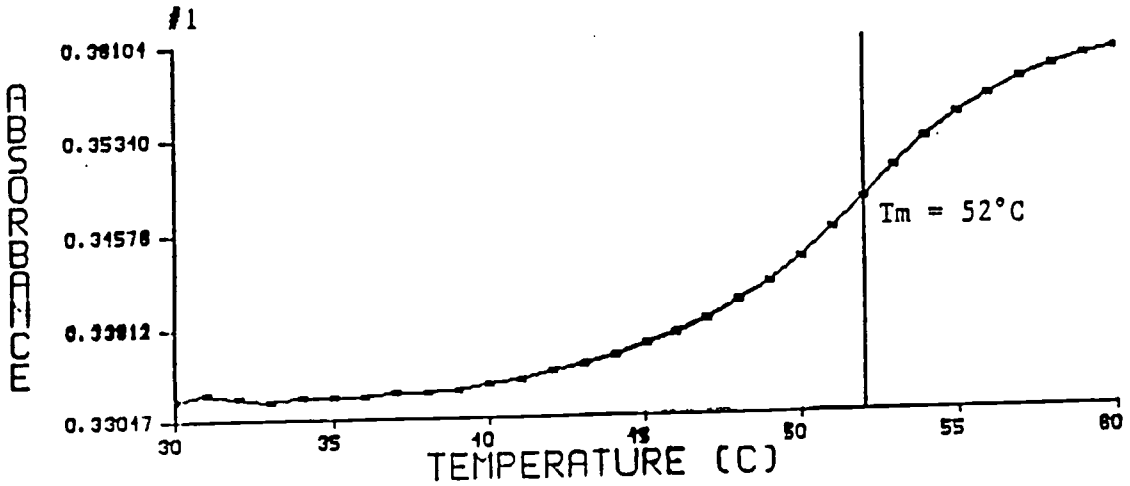


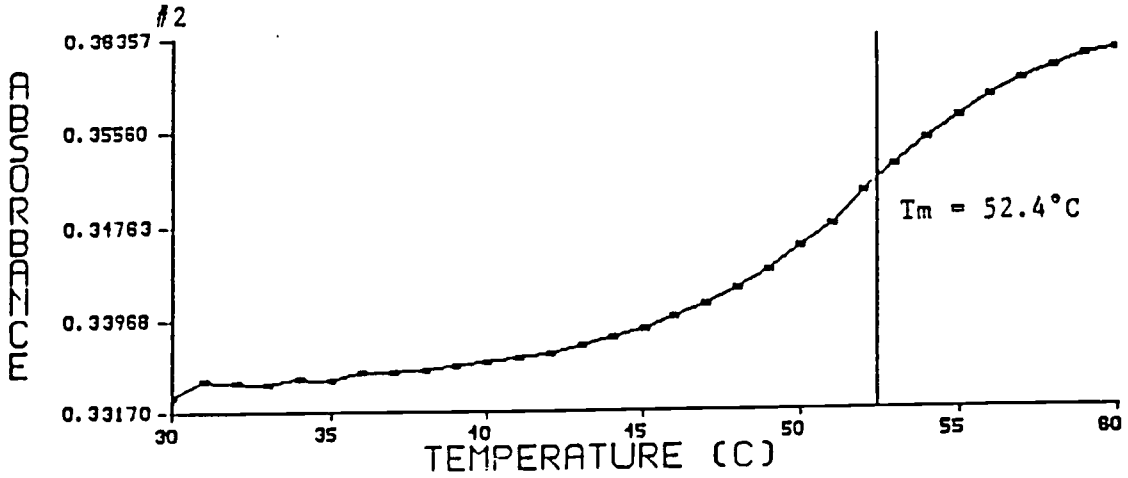
Figure 4

POSITIVE CONTROL
FDNA/RNA Duplex - Unmodified T flanked by
2'-O-methylated C/C

5'-CGCTTTTTTTCGCU-3'
3'-GCGAAAAAAAAGCGAGGG-5'



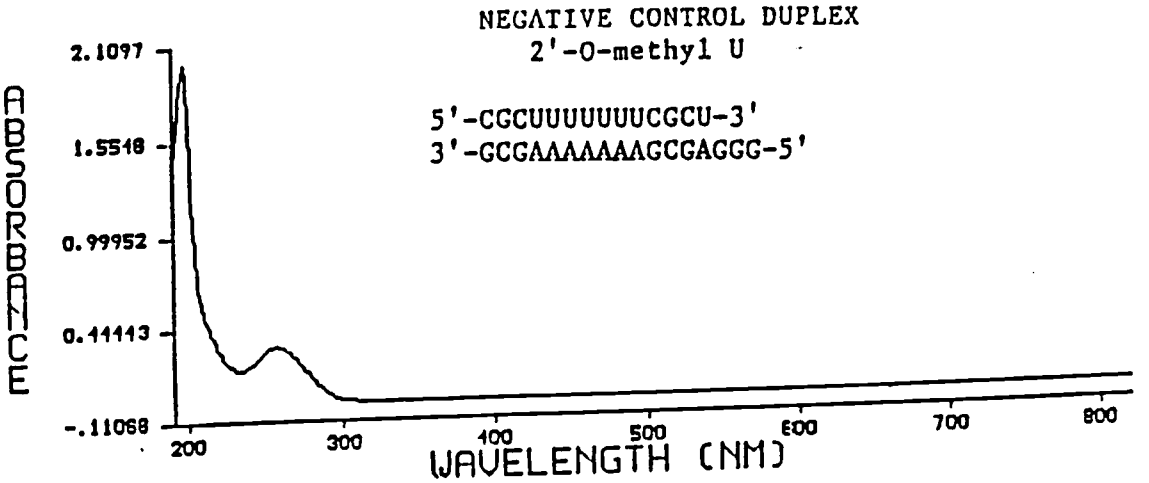


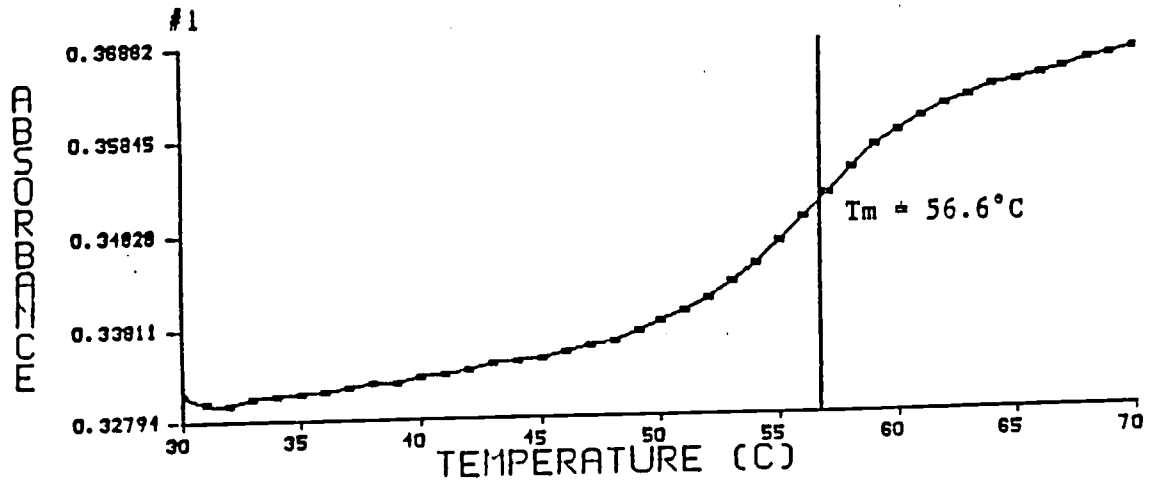


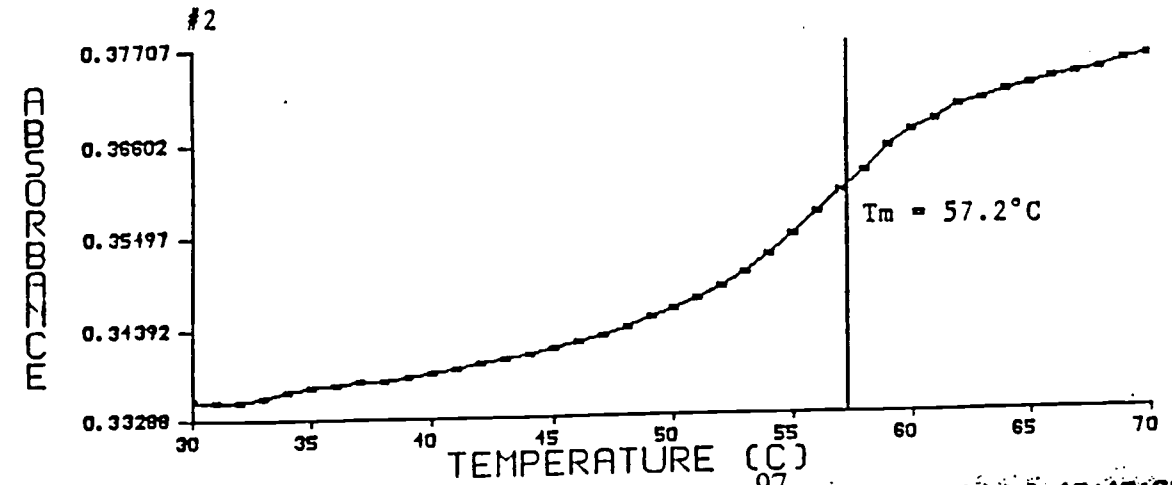
Temperature File: DEFAULT.DTA
Operator: WRDR-1
Sample: FDNA/RNA
Solvent: Tris 7.5
Molarity: .85 mol/L

Start Time: 17:38:53
Date: 03-24-1994

Figure 5







Temperature File: DEFAULT.DTA
Monitor: ScumGen
Cell: URBR-1
Buffer: Tris 7.5
Molarity: .85 mol/L

Start Time: 19:17:39
Date: 03-25-1994

WORKING MEMORY LIMITATIONS ON OLDER ADULTS' SENTENCE PRODUCTION

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Introduction

Over the years, a literature has been accumulating documenting age-related reductions in working memory capacity (Babcock & Salthouse, 1990; Lahar, 1992; Stine & Wingfield, 1990). Working memory plays a vital role in language processing. Thus, a reduction in working memory capacity has widespread consequences for older adults' ability to comprehend and produce language. Many age-related declines in performance on language processing tasks have been attributed to the changes in working memory capacity (Cohen, 1979; Spilich, 1983; Stine & Wingfield, 1987; Stine & Wingfield, 1990; Stine, Wingfield, & Poon, 1986).

While there are several theories of working memory in the literature, one of the most prominent is Baddeley's (1986) model. According to Baddeley (1986), working memory is viewed as a tripartite system consisting of two slave systems - the articulatory loop and the visuo-spatial scratchpad - and a central executive. The articulatory loop comprises a phonological store where information can be stored temporarily in an acoustic form; the visuo-spatial scratchpad generates and manipulates visual images. The central executive performs a number of functions including: selecting strategies, allocating attention, and integrating information from different sources. This system performs both processing and storage functions and has a limited capacity.

The role of working memory in comprehension has been addressed on many levels. However, this same issue has been virtually ignored with regards to language production. One reason for the virtual neglect of this area is the considerable difficulty controlling the relevant variables in language production tasks. The dilemma is how to allow "spontaneous" or natural speech production yet maintain control over relevant task or stimulus variables.

This experiment uses a dual task technique in which the primary task loads working memory to examine the effects on the secondary task. In this experiment, working memory is loaded with digits to examine the effects on language production. A naturalistic sentence production task is combined with a secondary task of digit recall. The only constraint on the primary production task was that two verbs were used as primes in the sentence.

Method

Participants.

Twenty-four undergraduates and twenty-four older adults were tested. Undergraduates were between 18 and 35 years of age with a mean of 19.6. The older adults were divided into two subgroups: a 60-74 group of "young-old", and the 75-90 group of "old-old" adults. In the young-old group, the participants were between 66 and 74 years old with a mean age of 71.5. In the old-old group, the participants ranged between 75 and 87 years of age with a mean age of 79.1.

Materials.

Digit preloads were selected using a random number table to form the three and five digit conditions. The digits were used to pre-load working memory. Higher digit preload conditions were expected to elicit more errors for digit recall.

Verb pairs were selected and paired randomly. Then, each verb in the pair was given either in the past tense (e.g., walked) or in the participle form (e.g., walking), producing four possible combinations of verb pairs. Using verbs was expected to force the subjects to produce at least two syntactic clauses. Varying the tense of the verbs was expected to affect complexity of the sentence. All materials were printed on 4 by 6 inch cards.

These factors were completely counterbalanced and crossed with three levels of digit preload. The design was a three age groups by three digit loads by two first verb by two second verb combinations design. There were 120 trials yielding ten data points per cell.

Procedure.

Subjects were tested individually in one hour sessions. In the sentence production task, subjects were told that they would see a card with zero, three, or five digits printed on it. They were asked to memorize the digits. The card was removed and revealed a card with two verbs printed on it. Subjects were told to create a sentence containing both verbs in the order and tense presented. After producing a sentence, subjects saw a blank card. They were told to recall the digits when signalled by the blank card.

Results

This experiment examined the role of working memory in language production by older adults. The key issue was whether a simultaneous memory load would impair older adults' language production.

Correct Responses.

This analysis examined the number of trials on which the subjects repeated the digits correctly and produced a grammatical sentence. The design was a 3 age groups X 3 digit load levels (zero, three, and five) X 2 first verb levels (participle-participle, participle-past) X 2 second verb levels (past-participle, past-past) ANOVA.

The basic pattern of results is given by the First Verb X Digit Load interaction, $F(2,90) = 22.09$, seen in Figure 1. When there were no digits to retain, the verb tense manipulation had no effect on correct response. With a preload of three digits, the number of correct responses decreased, particularly for

the participle form. When the digit preload increased to five digits, correct response further decreased.

The Age Group X Digit Load interaction, $F(4,90) = 37.07$, seen in Figure 2, shows that when there was no digit preload to retain, the young and the young-old adults responded equally well but the old-old produced slightly fewer correct responses. When the preload increased to three digits, the young-old and old-old adults had fewer correct responses and dropped below 50 percent correct responses although the young adults responded correctly 64 percent of the time. When the digit preload increased to five digits, both the young-old and the old-old dropped below 20 percent correct responses but young adults responded correctly 41 percent of the time. None of these groups were differentially affected by the verb tense manipulations.

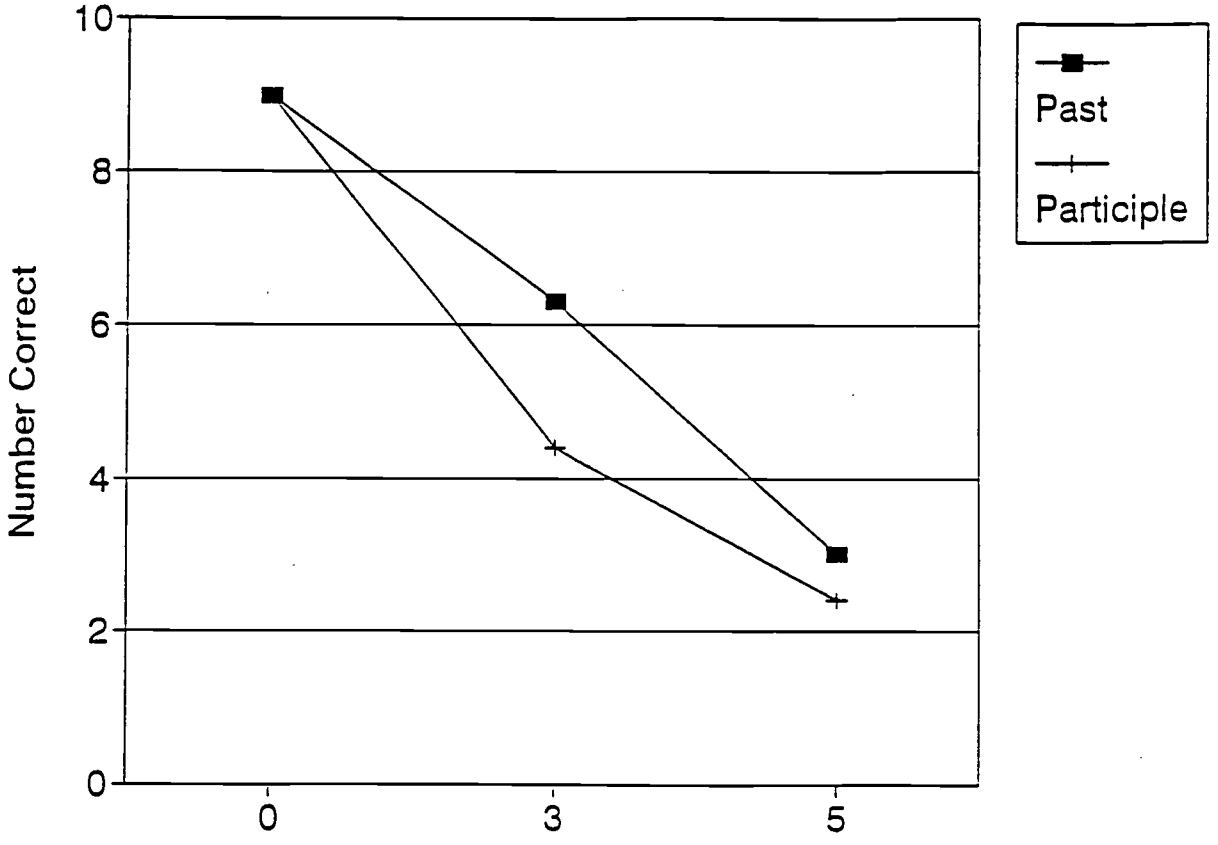

Figure 1: An interaction between First Verb and Digit Load for Number Correct

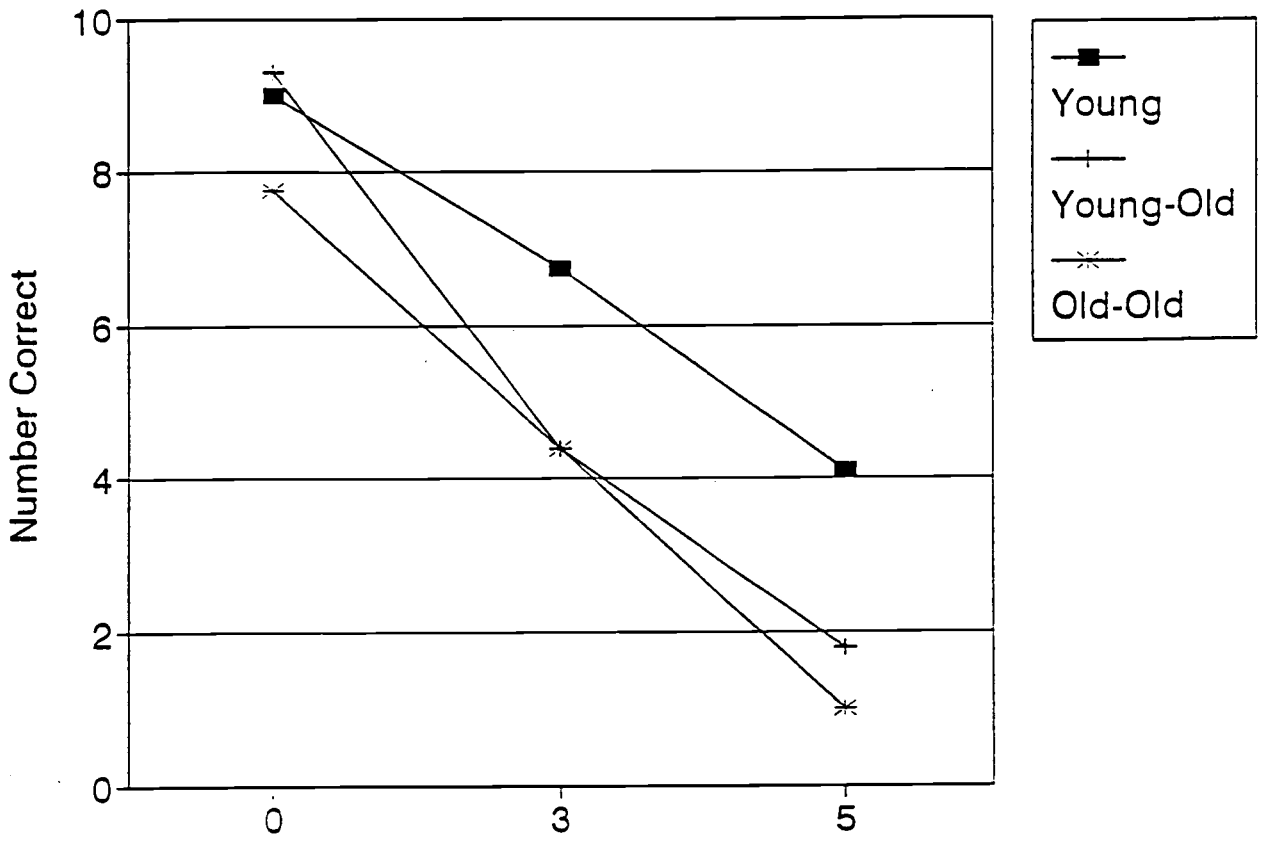

Figure 2: An interaction between Age and Digit Load for Number Correct

The Age Group X First Verb X Second Verb interaction, $F(2,45) = 4.90$, seen in Figure 3, shows a decrease in the number of correct responses with increased age and also for participles in the first verb position. The older adult groups made differentially more errors when the first verb was a participle, but were virtually unaffected by the second verb.

The subsequent analysis of complexity was contingent on correct responses. Since older adults performed poorly under increased digit preload conditions, numerous empty data cells resulted. The three and five digit preload conditions were combined to form a condition referred to as the "load" condition to compare to the "no load" condition. One older subject had zero correct trials and was lost from this analysis.

Developmental Sentence Score Analysis.

The Developmental Sentence Scoring (DSS) index of complexity was used to score complexity of the sentences. This index (Lee, 1974) assigns point values to verbal constructions based upon appearance in children's speech with later forms receiving higher point values indicating greater complexity. Only correct responses were scored with the DSS index.

The First Verb X Second Verb X Memory Load interaction, $F(1,44) = 5.09$, seen in Figure 4, indicated a decrease in complexity in the memory load condition. Sentences produced under no memory load were more complex than those produced under memory load. Sentences produced with a participle in the first verb position were more complex than those produced with a past tense verb in the first position. Furthermore, those produced with a participle in the second verb position were also more complex than those produced with a past tense verb in the second verb position. The participle verb tense appeared to drive complexity of the sentences higher than the past tense verb form.

Age did not interact with memory load. The complexity of the older adults' sentences was not differentially affected by memory load. However, it is important to keep in mind that this analysis is contingent upon getting the digits correct. The older adults had dramatically fewer correct responses than the younger adults. If the older adults were able to recall the digit preload correctly, they were able to produce sentences which were as complex as those of the younger adults.

Discussion

This experiment attempted to examine the role of working memory in language production processes of older adults. By requiring subjects to retain a digit preload while formulating sentences, working memory load was directly manipulated. Further, the difficulty of sentence formulation was controlled by manipulating the tenses of the verbs given as sentence prompts. The key

questions were: 1) Did the working memory load affect sentence production? 2) Were the older adults differentially affected by the working memory load?

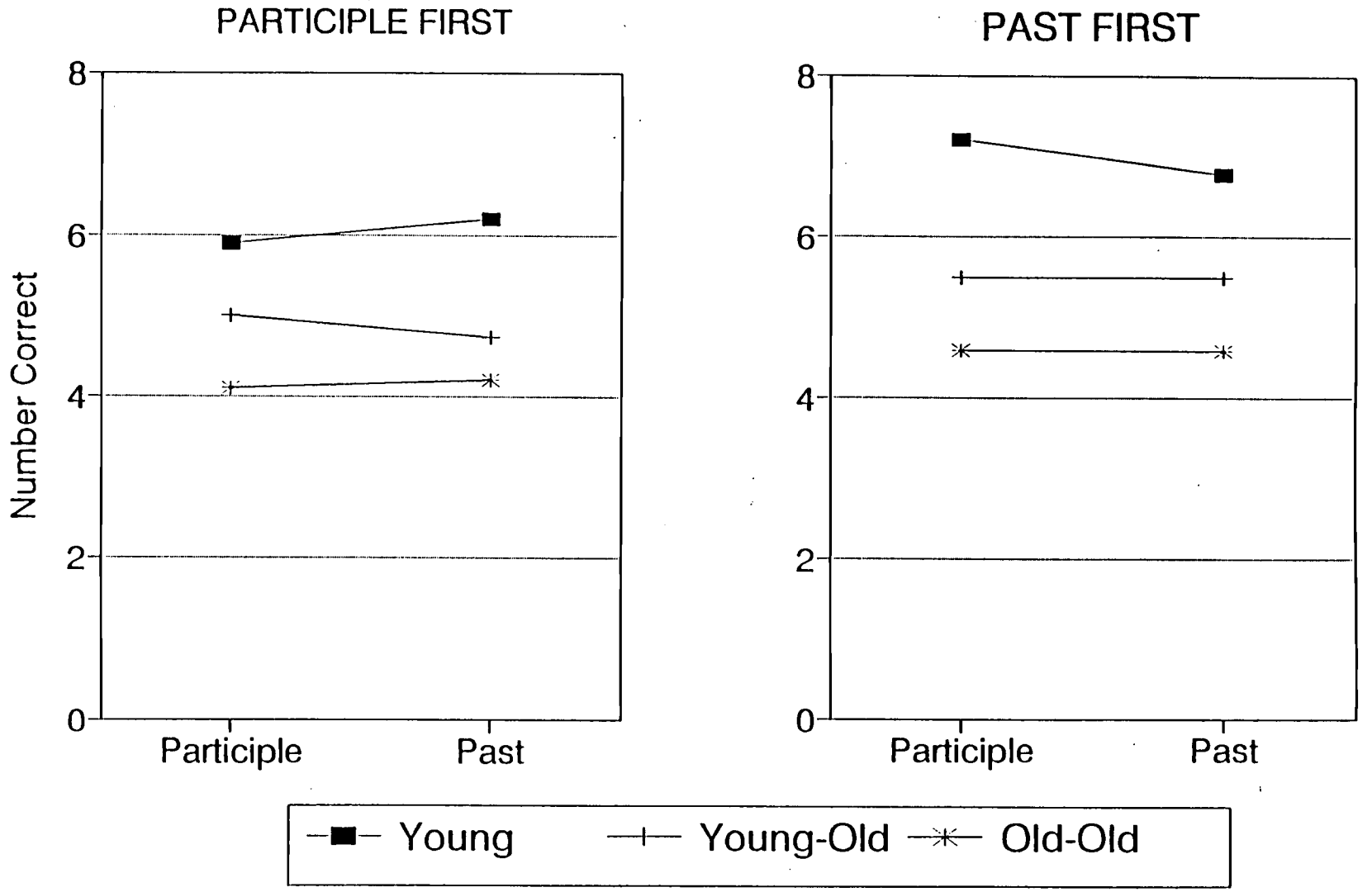

Figure 3: An interaction between Age, First Verb, and Second Verb for Number Correct

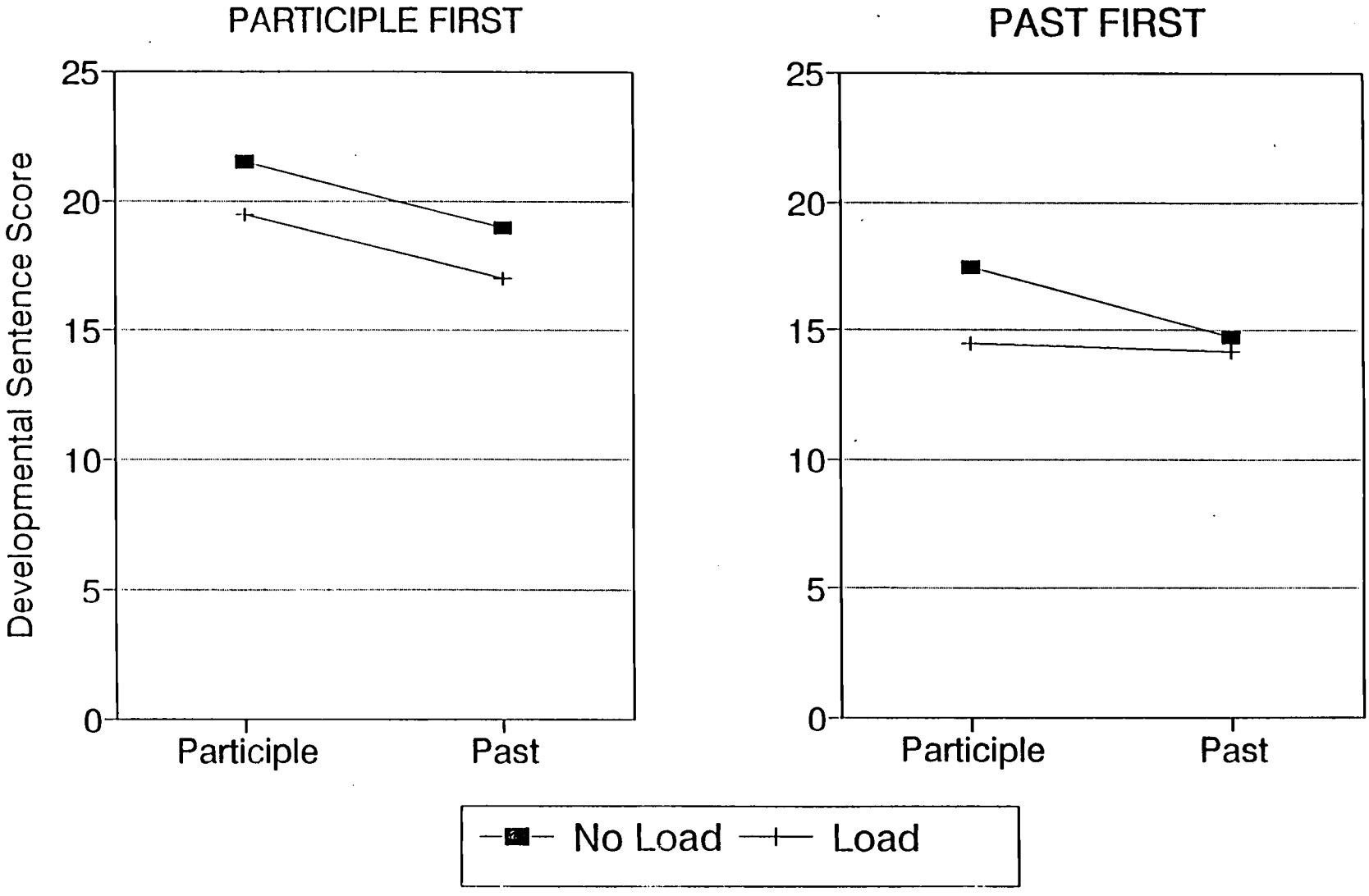

Figure 4: An interaction between First Verb, Second Verb, and Memory Load for Number Correct

Clearly, the digit preloads affected the number of correct responses. Increased digit preloads led to decreased correct responses. Older adults were differentially affected by the higher digit load conditions. In fact, the older adults respond correctly less than 20 percent of the time in the very difficult five digit preload condition.

The verb tense manipulations also affected correct responses. In the absence of a preload, the verb tense manipulations had no effect on the number of correct responses. However, as preloads increased, a pattern emerged. Formulating a sentence with a participle in either the first or second position was more difficult than formulating one from two past tense verbs. At the highest digit preloads, formulating a sentence from two participles was even more difficult. Verb pairs beginning with participles caused great difficulty. However, older adults were not differentially affected by the verb form manipulation.

The older adults were far less likely to have a correct response than the younger adults. They made significantly more errors on digit recall than the younger adults. But, the older adults produced sentences that were as complex as those of the younger adults. Further, the complexity of their sentences was unaffected by either the verb tense manipulations or the memory load manipulation. The older adults appeared to formulate complex sentences at the expense of digit recall. This suggests that the older adults approached the task in a different way than the young adults. Young adults were able to rotely recall the digits and perform the sentence production task in a routine manner. Older adults were unable to simultaneously retain digit preloads and produce appropriate sentences so they abandoned the digit recall component and focused on sentence production.

This experiment demonstrates that older adults have difficulty with the memory component of the sentence production task. But, if they are able to retain the digit preloads, they are also able to produce complex sentence responses.

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DEATH, TAXES AND CHANGE: A LOOK AT LIFE TRANSITIONS FROM A COUNSELING PERSPECTIVE

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Student Development Counselor
Student Support Services
Black Hills State University

Since I was born a lot has happened to me.

Most of what has happened, if not all, is to be expected, not unusual and in fact quite ordinary. I learned to walk, read, went to school, moved, graduated from school, fell in love, got married, had kids, moved a few times, spent years in school, worked a lot of different jobs, lost a couple of jobs, paid a lot of taxes - FICA, federal and property. My grandparents died. My father died. A friend died. Recently my oldest child got a driver's license which reminds me of an essay I was reading, "How I Came to Be Middleaged" (Kalish & Huych, 1989). The whole premise of the essay is that becoming older is, ". . . as easy as getting sunburned. By the time you really begin to feel it, it is too late to do anything about it." (The authors do go on to say that middle age and sunburns differ in that middle age is not universally painful.) So, here I am, poised on the precipice of middle age - an ordinary woman who has seen life changes and transition, not only her own but those of loved ones and colleagues and students and clients and I thought, what is more common than death and taxes? Change.

According to Bridges (1980), many Americans have lived their lives in a state of transition--looking for a better job, looking for a better way of life, "drawn forward by the faith that better things lay just beyond the horizon, they lived a life marked by frequent transition" (1989, p. 2). But he states that the pace of life has accelerated and many Americans now wonder if transition and change will bring desired rewards. For example, George & Gold (1989) report that since the early 1980's, a career change or job loss may mean a longer layoff or the inability to be re-employed in the same profession especially for the middle-aged worker. Statistics also show that professional workers, who were previously safe from the unemployment rolls, are finding it more difficult to find work in the same field once laid off. So it seems that life may be changing for the average American. The belief that there are greener pastures, better relationships, better jobs, just plain better life over the next horizon may no longer be a truism.

Egan (1985) states that most of the people who come to see counselors or therapists are experiencing a time of crisis or transition which is defined as, "a turning point, juncture, virtually important stage in the course of anything" and "a passage from one position, state, stage to another" (American College Dictionary, 1966, pp. 287 & 1287). These individuals are in the midst of a divorce, have experienced the death of a spouse, parent, child, are recovering from chemical dependency, lost a job, got a new job, gave birth to a child, were recently diagnosed with a terminal or life-altering disease, the list goes on. As a counselor, understanding transition, "is helpful in trying to understand how individuals progress through periods of major change in their live" (Chiriboga, 1989, p. 54). However, as Bridges states, not much is in the literature regarding transitions. There is a lot written about divorce, changing careers, grief, and specific age transitions and life development. But there is very little on the, "underlying process that is common to all transitions" (Bridges, 1980, p. 4).

One way to better understand the concept of transition is to view it as being a whole made of a series of stages. Many of us are familiar with the work of Elizabeth Kubler-Ross. In her book, On Death and Dying (1970), she discusses the transition from life to death and outlines five stages through which patients progress in facing the reality of dying. The first of the five stages is denial. Kubler-Ross notes that often an individual's first reaction to catastrophic news is, "No it's not true, no, it cannot involve me" (1970, p. 38). The second stage of transition is typified by the logical question of, "why me?" During the third stage, the individual bargains believing if he/she is the best they can be, maybe they will be cured. Kubler-Ross marks the fourth stage as one of depression. There can no longer be a denial of what is happening. Coming to terms with the reality of dying marks the fifth and final stage, acceptance.

Kubler-Ross states that the individual may not progress through all five stages and may not come to terms with death. However, she states that there is a process of transition that seems to progress through a series of stages.

Hilda Lee Dail also addresses stages of transition in her book dealing with career change, The Lotus and the Pool (1989). In working with clients who are in the midst of a career change, Dail outlines ten specific stages of transition. The first stage is one of chaos. Dail states that once an individual has lost a job or chosen to change professions, there is a state of confusion. The person may question who they are and feel a lack of identity. Other stages include finding clues for success through the past, clarifying new goals, strategy planning and making the new career path part of individual identity. As with Kubler-Ross, Dail states that individuals appear to deal with a process as they bridge the gap between who they were and who they are now.

Bridges (1980) talks extensively about stages of transition. The first stage is one of ending. During this stage there is a period of disengagement or disappearance of the old life or system such as a job loss, relocation or divorce. Bridges also states that individuals bring with them a certain style that they have developed for dealing with endings and that this style or response to an ending can hinder the process of change. For example, a person may go on to something new but create the same situation. As Bridges points out, the cast may be different but the play remains the same. The second stage of transition is one of being in limbo, feeling lost or one of confusion. "I ain't what I ought to be, I ain't what I'm going to be, I ain't what I was." He describes this as disidentification. There is also a disenchantment with old roles during this second stage. A person can't remember what ever attracted them to their spouse, or what was so appealing about a job. In addition, an individual may feel that life is no longer going anywhere. Bridges third and final stage is one of beginning anew. It is here that the individual begins to reconstruct their lives.

To conclude, it appears that it would be important to understand the underlying process of transition since most clients present to therapists and or counselors during times of transition and crisis. Though little has been explored in the literature, a few therapists have written about the time of transition. What

these writings appear to have in common is a description of a series of stages that cross the bridge from the old way to the new. These stages may include suffering feelings of confusion about identity, depression, learning to cope in new ways and accepting the new self.

It seems reasonable that understanding the transitional process would be important in a college setting. Robert A. Friday in his book, Create Your Own College Success (1988) entitles his first chapter, "The Transition to College." In the first few paragraphs he discusses the differences between college populations now and those during the first half of this century. Currently, he states, across the nation's campuses there are, "more women, more racial minorities, more first generation college students, more international students, more economically and culturally disadvantaged students and . . ." more and more are returning students with advanced age, experience, and a set of needs very different from that of the 18-year-old freshman" (1988, p. 1). Gardner & Jewler (1989) also talk about the transition to college and state that, "So critical is the transition from high school to college that we open this book by reminding you of the differences between the two" (1989, p. vii). They also state that for older-than-average students, ". . . any change (even good change) is stressful" (1989, p. 297).

On observation it appears that Black Hills State University (BHSU) has also been affected by national trends discussed above. However, according to the results of the 1992 Cooperative Institutional Research Program survey (CIRP), a questionnaire given to freshman students throughout the nation, the BHSU college population has some differences that would seem important in order to more fully understand transitional problems at BHSU. For example, according to the CIRP results, BHSU students are less likely than counterparts to feel confident intellectually, are less likely to feel a need to achieve, are less likely to believe in themselves academically, are less likely to believe that they will find a "good job" upon graduation, are less likely to believe they will obtain a bachelor's degree, etc. BHSU students also responded more frequently than counterparts that they must work an outside job while attending college and that they receive little to no financial support from family. And while more BHSU freshman female students responded negatively to the question that a "woman's place is in the home" compared to state and national counterparts, more BHSU freshman males responded positively to the same question compared to state or national counterparts.

Other possible pertinent information to BHSU counselors, advisors and other staff include recent enrollment statistics which find that 60 percent of students qualify to be on the rosters for Student Support Services (SSS), a federal grant program targeting "at risk" students. Students qualify for SSS by fulfilling one of the three following criteria: first generation college student, disabled and/or low income. According to statistics, these students are more likely to drop out of college (Student Support Service grant information, 1993).

It appears that college campus populations have changed over the past 30 or 40 years including more women, minorities, older-than-average, etc. It also

appears that attending college is a real time of change for most people and that understanding this time of transition, the underlying processes, coupled with an understanding of national college enrollment trends plus individual college population character may be beneficial for the college counselor and/or other college personnel. For example, if a freshman woman student presents for counseling at BHSU, whether 18 or 45, transitional issues may be many. If she is in a relationship with a man, his support for her education and career goals or lack of it may be an important factor in her initial success (Gardner & Jewler, 1989). If the CIRP survey is an indicator, it may appear that women attending BHSU will receive less support from a significant other than freshman counterparts both nationally and statewide. Similarly, a non-traditionally-aged male student, injured on the job and attending college as a freshman may encounter resistance from significant others who relied on him as a wage earner. Again, support from a spouse or significant others is often tantamount to the success of the freshman or returning student (Gardner & Jewler, 1989). A counselor may be dealing with many transitional issues with either one of those students including change in employment status, change in economic status, change in relationships, change in self-concept as the individual learns to be a successful college student.

To conclude, it appears that it would be important for counselors to understand that there is an underlying process to times of transition. Individuals progress through a series of stages that bridge the gap between an old way of life to a new. In addition, it's important to know and understand where an individual has come from and where they are headed. As in the case of BHSU, while there are many factors that make it similar to other schools in the nation, there also appears to be many factors that make it different. To have this knowledge can only be helpful in aiding students through their times of transition.

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APPENDIX A

1994 RESEARCH AND SCHOLARLY WORK SYMPOSIUM

April 11, 1995
Young Center: Hall of Fame Room
Black Hills State University

PROGRAM

9:00 - 9:20 **Roger Miller**

The Internationalization of Geography Departments in American Colleges and Universities

9:00 - 9:50 **Betsy Torrence**

Increasing Teaching Effectiveness with the Physical Education Assertive Teaching Instrument

10:00 - 10:20 **Roger Ochse**

An Investigation of the Student Journal as a Tool for Identifying and Resolving Writing Problems of Undergraduate Students

10:30 - 10:50 **Ellie Mitzel**

Effect of Patriarchial Structuring on Diagnosis of Mental Illness

11:00 - 11:20 **Alice Voorhees**

Choosing the Snake Husband: Muskogee Watersnake Mythology in Joy Harjo's "The Flood"

11:30 - 11:50 **Dan Durben**

Raman Spectroscopic Investigations of Alkali Silicate Glasses at Ultra-High Pressures

12:00 - 1:00 LUNCH BREAK

1:00 - 1:20 **Cheryl Weiand and John Glover**

The Status of Native American Hunting and Fishing Rights as a Product of Historical Use and Judicial Interpretation

1:30 - 1:50 **Roger Wolff**

A Report of South Dakota Principals' Current Perceptions About, Attitudes Toward, and Knowledge of Law-Related and Civic Education Practices in Their Schools

2:00 - 2:20 **Carol Hess**

Reader Response: The Affective Side of Critical Thinking

2:30 - 2:50 **Kristi Pearce**

Using Qualitative Research Methods in Education

3:00 - 3:50 **Joseph Howell, Doug Dellinger, & Pete deLannoy**

Thymidine Homopolymers: A Method for Screening Novel Oligonucleotide Backbones

3:00 - 3:50 **Cheryl Anagnopoulos**

Working Memory Limitations on Older Adults' Sentence Production

4:00 - 4:20 **Mimi Tschida**

Death, Taxes and Change: A Look at Life Transition from a Counseling Perspective

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Author(s): Cheryl Anagnopoulos, Roger Ochse, Roger Wolff (editors)

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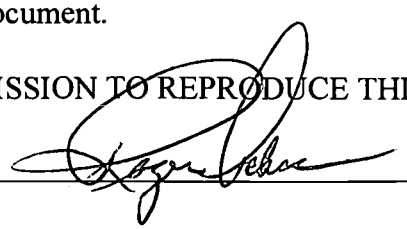

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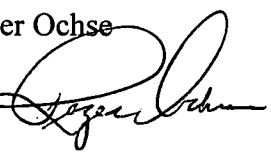
Signature: 

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