

Utah State University

DigitalCommons@USU

All Graduate Theses and Dissertations

Graduate Studies

5-2006

Uncovering the Keys of Success In The Utah Medicaid Work Incentive Program: A Grounded Theory Study

Renee H. Nolan
Utah State University

Follow this and additional works at: <https://digitalcommons.usu.edu/etd>



Part of the [Psychology Commons](#)

Recommended Citation

Nolan, Renee H., "Uncovering the Keys of Success In The Utah Medicaid Work Incentive Program: A Grounded Theory Study" (2006). *All Graduate Theses and Dissertations*. 6236.
<https://digitalcommons.usu.edu/etd/6236>

This Dissertation is brought to you for free and open access by the Graduate Studies at DigitalCommons@USU. It has been accepted for inclusion in All Graduate Theses and Dissertations by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



ASSESSING COGNITIVE ABILITIES IN A SAMPLE OF SIOUX
CHILDREN UTILIZING TRADITIONAL AND NONVERBAL
MEASURES OF INTELLIGENCE

by

Norman Chris Johnson

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

2006

Copyright © Norman Chris Johnson 2006

All Rights Reserved

ABSTRACT

Assessing Cognitive Abilities in a Sample of Sioux Children Utilizing
Traditional and Nonverbal Measures of Intelligence

by

Norman C. Johnson, Doctor of Philosophy

Utah State University, 2006

Major Professor: Susan L. Crowley, Ph.D.
Department: Psychology

The disproportionate number of American Indian students receiving special education services indicates an ongoing need for research leading to improved assessment and placement practices with this population. Standardized tests are most often used to screen and select students for special education services. However, not all intelligence tests have been normed for use with all populations, especially where minority groups have been concerned.

While the merits of traditional intelligence tests must not be discounted, the emergence of new tests and assessment measures is encouraging, particularly for the assessment of American Indian students. A natural next step is to consider a traditional measure of intelligence, a more “culture fair” measure of intelligence, and behavioral indicators in the assessment of children to determine their utility with minority, in this case American Indian students. Thus, the present study investigated the Wechsler Intelligence Scale for Children–Fourth Edition and the Test of Nonverbal Intelligence–

Third Edition as measures of intelligence for American Indian children receiving special education services, gifted and talented services, and those attending regular education classes. The current study also examined whether two psychosocial variables, academic achievement and behavioral incidents, were predictive of group membership. The sample for this study consisted of 90 American Indian children from the Lake Traverse Indian Reservation in northeastern South Dakota.

The results indicated that there were differences in how American Indian students performed on the various measures of intelligence. Youths in the special education group tended to have more severe behavioral incidents than the other two groups. Youths in the gifted group were more likely to have exceptional achievement than individuals in the other two groups. Examining the means on the six measures of intelligence for the three groups indicated that gifted students had the highest scores, followed by regular education students, and then special education students.

Academic achievement and behavioral incidents differentiated between the three groups in the expected manner. Therefore, teachers and administrators should be mindful of the fact that the three groups of students do not differ solely in terms of intelligence.

(106 pages)

DEDICATION

YU-WAKAN-PI

Miya taku waste-wada qa wopida epa wacin de Tiwahe mitawa qa koda-wacawaye hena wopida tanka eciciyapi, tuka o-ma-ya-ki-yapi hcon woonsape wa-kan-tuya O'Canku wa-ku-wa kin wanna wa-dus-tan ce.

I-yo-tan-han Deksinom tah-pi esta wica-wek-suye, heced Deksi Norman Tasunka Ota Redwing, Sr qa Donald Culbertson, tuka O-wi-hanke-wanica Wok-sape, wo-okiyeyeqa wo-wa-sake ma-ku-pi ece.

Nakun, win-yan wan Lorraine German eci-yapi he wopida iwakiye, tuka Miye wica-ma-da qa wo-okiyeyema-ya-qu, o'ma-ya-ki-ye qa wanna Wo-on-spe wa-kan-tu-ya iwacu do.

Miye wo-onspe wa-kan-tuya wowapi kin de wo-wakn un Ate waye Christopher R. Johnson, Jr. wanna ed unsni sta, qa, Ina waye Shirley E. Johnson hena wica-waqu do. Ni-ye-pi un taku owasin wo-wah-yu-pi-ke unspe ma-ya-ki-ya-pi do, I-yo-tan-han wo-oh-ho-da, wo-yu-o-ni-han, wa-wi-ca-qu-pi, qa an-wan-mi-ci-hde-ke nakun Oyate an-wan-wi-ca-wa-bda-ke kta.

Pida ma-ya-ya-pi do

Norman C. Johnson

ACKNOWLEDGMENTS

I would like to thank Dr. Susan L. Crowley for her unending support and guidance on this research project. I need to extend my gratitude to my dissertation committee, Dr. Carolyn Barcus, Dr. Margaret Lubke, Dr. Melanie Domenech Rodriguez, and Dr. JoAnn T. Tschanz, for their hard work and professional guidance. I would also like to thank the support staff in the Psychology Department for their many hours of kind assistance throughout my career at Utah State University.

I would like to tell my family and friends how important they were throughout this academic endeavor. Without their emotional, financial, mental, and spiritual support, I may not have completed this project. I need to acknowledge Dr. Michael Williams and the many members of the Society of Indian Psychologist for their words of encouragement and direction.

I would like to express my gratitude to my dear friend and companion, Lila Kills In Sight, for bringing my children, Mauricia Rosario and Norman Noah, into my life. Their presence has brought my life into perspective and made me develop as a student, psychologist, and most of all a man.

I humbly send many thanks to all of you and remember you all in my prayers!

Mitakuye Oyasin,

Norman Chris Johnson

CONTENTS

	Page
ABSTRACT	iii
DEDICATION	v
ACKNOWLEDGMENTS	vi
CHAPTER	
I. INTRODUCTION	1
Background	1
Statement of the Problem	6
Research Objectives	9
Research Questions	10
Operational Definitions of Key Constructs	10
II. REVIEW OF LITERATURE	12
Introduction	12
Intelligence Testing in Schools	12
Intelligence and Culture	14
Psychosocial Factors Affecting AI Student Test Performance	15
Intelligence Testing and AI Students	18
Assessment Issues with AI Students	25
Special Education and American Indians	26
Nonverbal Measures of Intelligence	28
Alternative Assessments	32
III. METHOD	35
Introduction	35
Population and Sample	35
Procedure	36
Instruments	39
Analysis	44

	Page
IV. RESULTS	46
Descriptive Statistics	46
Inferential Statistics	47
V. DISCUSSION	60
Introduction	60
Summary of Findings	61
Conclusions and Implications	62
Recommendations for Future Research	70
Recommendations for Educational/Clinical Practice	72
REFERENCES	73
APPENDICES	80
Appendix A: Parental Consent and Child Assent Form	91
Appendix B: Demographics Form	85
Appendix C: Tiospa Zina Tribal School Broad Research Approval Letter	87
CURRICULUM VITAE	89

LIST OF TABLES

Table		Page
1	Descriptive Statistics for Gender and Psychosocial Variables as a Function of Group	47
2	Descriptive Statistics for Psychosocial and Intelligence Variables as a Function of Group	48
3	Correlations Among Intelligence Scores for Regular Education Students	49
4	Correlations Among Intelligence Scores for Special Education Students	49
5	Correlations Among Intelligence Scores for Gifted and Talented Students	50
6	Results of ANOVAs Comparing the Intelligence Scores of the Three Groups	52
7	Correlations Between Psychosocial Variables and Intelligence Scores for Regular Education Students	53
8	Correlations Between Psychosocial Variables and Intelligence Scores for Special Education Students	54
9	Correlations Between Psychosocial Variables and Intelligence Scores for Gifted and Talented Students	55
10	Results of Discriminant Analysis with Psychosocial Variables Predicting Group Membership	56
11	Results of Discriminant Analysis with All Study Variables Predicting Group Membership	58

CHAPTER I

INTRODUCTION

The disproportionate representation of minority students in special education, according to Hosp and Reschly (2004), has been a constant and consistent concern for nearly four decades. During the same time frame, the debate over the validity of conventional intelligence tests for use with minority individuals has gained national attention. It has been documented that American Indian (AI) students typically earn lower scores than other students on traditional intelligence tests (Bresica & Fortune, 1989), and they are referred for special education services more frequently than other student populations (Dauphinais & King, 1992). The disproportionate number of AI students receiving special education services indicates an ongoing need for research leading to improved assessment and placement practices with this population.

Background

One general requirement of all school systems is assessing whether students who struggle academically need special education services. As a result, standardized tests are most often used to screen and qualify students for special education services (Gregory & Lee, 1986). Characteristically, standardized, norm-referenced intelligence tests have been shown to have adequate reliability, and criterion and concurrent validity (Anastasi, 1988; Sattler, 1992). When properly used, intelligence tests can provide valuable diagnostic information about intellectual ability that might otherwise be overlooked or ignored (Flanagan, Andrews, & Genshaft, 1997). However, not all intelligence tests have

been normed for use with all populations, especially where minority groups have been concerned.

Reynolds (1982) argued that the problems most often attributable to the use of intelligence tests with minority individuals typically fall into the following categories: (a) the content in the test is such that minority children have not been exposed to it culturally (i.e., the tests are predominantly designed around the experiences of middle class Anglo culture); (b) ethnic minorities are not adequately represented in the normative sample; (c) language proficiency requirements of the test may result in the test assessing familiarity with the English language rather than cognitive abilities; (d) bias in psychoeducational testing may result in inequitable social consequences, such as disproportionate numbers of minority children being placed into "dead-end" educational tracks; and (e) tests are not predictive for minority children on a given criterion measure.

Given the limitations of traditional standardized intelligence tests, the assessment of minority students becomes problematic. For instance, tests developed and normed with majority populations have an inherent set of errors when used with AI children (Chavers & Locke, 1989). The problems that have been identified by researchers include low internal consistency, item bias, and different patterns among subtest factors for AI children (Dana, 1984). In general, when traditional intelligence tests are used with AI students, the tests usually produce lower scores for the AI test taker (Bresica & Fortune, 1989). Despite these and other numerous limitations, McShane and Plas (1982) found that the Wechsler scales, a standardized, traditional measure of intelligence, were the most commonly used tests of intelligence with AI populations.

To date, research examining the test profiles of AI students is limited (Suzuki & Valencia, 1997) and poorly integrated (Vraniak, 1994). When compared to other ethnic groups, relatively little research has been conducted regarding cognitive assessment with AI children (Dauphinais & King, 1992; Suzuki & Valencia). The limited research that is available indicates that traditional measures of intelligence may be limited in their fairness for use with AI children (Beiser & Gotowiec, 2000; Curran, Elkerton, & Steinberg, 1996; Ducheneaux, 2002).

When tested for "intelligence," AI children have demonstrated a pattern of performance that differs from national norms (Vraniak, 1994). That is, there have been numerous reports of discrepancies (i.e., Verbal < Performance IQ scores) in scores ranging from 10 to 20 points, which is considerably larger than the expected five- to seven-point difference described in the WISC-III Manual (Curran et al., 1996). In addition, a majority of the samples studied consisted of rural, off-reservation AI children in public schools. These samples were often described vaguely as "American Indian" with no specification of tribal group affiliation. When the tribal group was specified, the group studied most frequently was Navajo, followed by Chippewa/Ojibwa, Cree, Sioux, and Cherokee (Vraniak).

Many students who are not members of the dominant cultural group are at greater risk of being identified as having disabilities (Gritzmacher & Gritzmacher, 1995). These concerns and others have led to federal legislation like the Individuals with Disabilities Education Act (IDEA), Public Law 94-142. This law authorized the allocation of additional monies from the federal government to local educational agencies to provide

for the unique needs of students identified for inclusion in special educational programs.

More recently, the 1997 and 2004 Amendments to IDEA, citing the need for culturally appropriate assessment, established a process for dealing with the referral, assessment, and placement of students in special education, regardless of their cultural backgrounds. According to IDEA, the following guidelines must be enforced: (a) students must be tested in their native languages or primary modes of communication, (b) multiple forms of assessments must be used to ensure adequate assessment of suspected areas of disability, (c) tests and other evaluation materials are to be selected and administered in a manner that does not discriminate based on race or culture, and (d) students must be assessed in all areas of the suspected disability (IDEA, 1997; IDEIA, 2004). In addition, standardized tests must be: (a) validated for the purposes for which they are to be used, (b) administered by trained and knowledgeable personnel, and (c) administered in accordance with the instructions issued by the developers of the tests. Finally, assessments should incorporate tools and strategies that provide relevant information that can be used to determine the educational needs of the child. In accordance with IDEA guidelines, many researchers have begun to examine the assessment and placement issues unique to minority children, including AI students.

In more recent years, there have been attempts to develop alternative tests and methods of assessing intelligence with different cultural groups (Valencia & Suzuki, 2001). Nonverbal tests of intelligence have been developed and are purported to measure cognitive ability without an emphasis on language or cultural experiences and are, consequently, more culture-fair (Brown, Sherbenou, & Johnson, 1997). Measures of

nonverbal intelligence offer an alternative method for populations who traditionally have been difficult to assess, such as AI children (Coleman, Schribner, Johnson, & Evans, 1993).

The goal of culture-fair tests is to reduce the bias from the influence of language and cultural differences on the test score, thus increasing the fairness of the test. Coleman and colleagues (1993) suggested tests that measure nonverbal intelligence should possess three essential characteristics. First, the test should be administered by nonverbal means or by ensuring that the test is a homogeneous measure of nonverbal abilities. The tasks should require fluid reasoning abilities and should not depend upon the individual's culture. Second, the test must require subjects to use complex reasoning abilities. Tests that require analogies and concept formation are best suited for this purpose. Third, the assessment of nonverbal intelligence should require flexibility in the examinee's application of reasoning strategies. Various strategies may be employed to solve the same problem or may need to be altered as problems increase in difficulty.

Subsequently, several nonverbal tests of intelligence were developed, including the Universal Nonverbal Intelligence Test (UNIT; McCullum & Bracken, 1997), the Leiter International Performance Scale– Revised (Leiter-R; Roid & Miller, 1997), the Comprehensive Test of Nonverbal Intelligence (CTONI; Hammill, Pearson, & Wiederholt, 1996), and the Test of Nonverbal Intelligence–Third Edition (TONI-3; Brown et al., 1997). Such nonverbal tests hold some promise for testing with culturally different individuals. However, attempts to develop nonverbal instruments have not been without critical problems.

According to Plank (2001), nonverbal tests may be a good alternative for AI children, but there is negligible research supporting their use. Braden (2000) raised concerns about what nonverbal tests of intelligence are measuring, suggesting that there may be a problem of construct validity “underrepresentation” with nonverbal tests. Construct validity “underrepresentation” of a test essentially asks whether the test adequately measures the construct it purports to measure. Nonverbal intelligence tests run the risk of sampling too narrowly the behaviors indicative of intelligence. Conversely, Naglieri and Prewett (1990) suggested that nonverbal intelligence measures involve less achievement (i.e., specific ability) than do verbal tests of intelligence and are thus better measures of intelligence.

Statement of the Problem

Despite legal and legislative mandates to ensure nondiscriminatory assessment practices, confusion still persists among practitioners regarding the validity of commonly used intelligence tests with minority children and how to best assess children from different cultural backgrounds. Practitioners often do not have the training, experience, or tools to adequately assess intelligence and academic ability among ethnic minority students. This is particularly problematic when assessing to determine disability or special educational needs. Accordingly, the controversy continues regarding AI overrepresentation in special education. Donovan and Cross (2002) reported that, when using the Elementary and Secondary Schools Civil Rights Compliance Report of the U. S. Department of Education’s Office of Civil Rights (OCR), patterns of

overrepresentation have been documented every year that data have been gathered since 1968. They further reported that AI students are overrepresented in the learning disability (LD) category and AI students are underrepresented in the gifted and talented (GT) category. Also in 1998, the Office of Special Education Programs began collecting data and found similar patterns that corroborate those from the OCR survey (Donovan & Cross, 2002). Hosp and Reschly (2004) concluded “that despite variations in sampling procedures and more than 25 years of attention to the issue of disproportionate representation of minority students, the consistency of the findings demonstrates its importance and the urgency with which solutions are needed” (p. 194).

Therefore, it becomes paramount that the reliability and validity of IQ scores for different cultural groups (e.g., AI) be accurately understood, because psychoeducational assessment frequently determines school placement and access to educational services. Since the tests themselves grew from and are heavily embedded in the dominant culture, they are geared toward a population that has had different experiences than those of AI children (Greenbaum & Greenbaum, 1983; McShane, 1988). The tests attempt to measure a concept, intelligence, for which there is no common baseline or equivalent level of experience among those to whom they are administered (Chavers & Locke, 1989; Vraniak, 1994). One result is that a disproportionate number of AI students continue to be classified as “disabled” and placed in special education programs (Dauphinais & King, 1992).

An examination of the characteristics of AI students receiving special education services is necessary because of the challenges faced by school districts in assessing

students. In addition to the issues of test bias previously discussed, several other important factors may play a significant role in the performance of AI students, including environmental and social factors that may affect academic achievement and behavior, such as poverty, lack of stimulation, and limited educational opportunity (Gritzmacher & Gritzmacher, 1995). For example, one of the major factors accounting for intellectual differences within and between ethnic groups is socioeconomic status (SES; Suzuki & Valencia, 1997). With nearly one third (31%) of AI families living below the poverty level (U.S. Department of Health and Human Services; USDHHS, 1999), half of AI adults unemployed (Apple, 1996), and low levels of parental education, low SES is a key risk factor that may keep AI students performing below par if some intervention is not made (Chavers & Locke, 1989). As for environmental factors, many AI children live in communities that continue to experience long-term economic and social distress.

The dimensions of these pertinent factors are described in a Department of Justice study, *American Indians and Crime* (Greenfield & Smith, 1999), which reported that the rate of violence in Indian country was well above that for all other ethnic groups and more than twice the national average. High rates of alcoholism, drug abuse, domestic violence, child neglect, substandard housing, and lack of job opportunities were common conditions in Indian communities (Six Killer-Clarke, 2002). Eventually, these factors may hinder AI children from performing well on intelligence tests. This issue may seem to be separate from the notion of whether or not the tests themselves are biased, but it is, in fact, related (Common & Frost, 1988; McShane, 1988; Vraniak, 1994). As such, Common and Frost suggested that there is a pressing need to search for more appropriate

ways to assess the intellectual abilities of AI children because of the questionable validity of the IQ scales with this population.

Research Objectives

While the merits of traditional intelligence tests (e.g., Wechsler scales) must not be discounted, the emergence of new tests (e.g., TONI- 3) and assessment measures is encouraging, particularly for the assessment of AI students. A rational next step is to consider a traditional measure of intelligence, a more “culture fair” measure of intelligence, and behavioral indicators in the assessment of children to determine their utility with minority, in this case AI, students. Thus, the present study will investigate the Wechsler Intelligence Scale for Children–Fourth Edition (WISC-IV; Wechsler, 2003) and the Test of Nonverbal Intelligence–Third Edition (TONI-3; Brown et al., 1997) as measures of intelligence for AI children receiving special education services, gifted and talented services, and those attending regular education classes. More specifically, the study will focus on the WISC-IV Index scores (Verbal Comprehension Index, Perceptual Reasoning Index, Working Memory Index, and Processing Speed Index) and the Full Scale IQ score by comparing them with the TONI-3 composite score. Next, this study will investigate whether, in fact, the three groups (special education group, gifted and talented group, and regular education group) of AI students differ significantly with respect to IQ test performance. Finally, this study will investigate how the psychosocial variables are associated with each of the three educational groups and how they may best be distinguished from each other.

Research Questions

The current study answered the following research questions:

1. What is the magnitude and direction of the relationship between the WISC-IV (Index scores and FSIQ score) and the TONI-3 composite score for American Indian children currently placed in special education, regular education, and gifted and talented classes?
2. Are there differences in performance between children in the special education group, the gifted and talented group, and regular education group as measured by the WISC-IV and the TONI-3?
3. What is the magnitude and direction of the relationship between IQ scores and psychosocial variables identified?
4. Can the psychosocial variables identified reliably distinguish between the special education group, gifted and talented group, and the regular education group?

Operational Definitions of Key Constructs

American Indian (AI), Native American, or Native--Described as any group or individual who can demonstrate a blood quantum or ancestral lineage to any federal, state, or locally recognized tribe (Ducheneaux, 2002).

Cultural Test-Bias Hypothesis--The cultural test-bias hypothesis contends that minority children do not earn lower scores on intelligence tests due to less ability but rather

due to an inherent cultural bias of the tests that causes the tests to be artifactually more difficult for minority children (Reynolds & Kaufman, 1990).

Reliability--The trustworthiness of a measure. Common terms to describe reliability include consistency, generalizability, repeatability, and dependability (Grimm & Yarnold, 2002).

Validity--The extent to which a measure is labeled appropriately; that is, the extent to which it measures what it purports to measure (Grimm & Yarnold, 2002). Types of validity include: (a) construct validity--if a measure has high construct validity, then it is assessing some theoretical construct well, and (b) predictive validity--a measure has predictive validity if it correctly predicts some future state of affairs.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This section will discuss several areas relevant to testing and assessment issues with American Indian (AI) children. First, intelligence testing in schools will be presented, followed by a discussion of intelligence testing and culture. Third, research on the psychosocial factors influencing intelligence test performance for AI children will be presented. Fourth, existing research about AI student performance on intelligence tests will be reviewed. A fifth section examines other assessment issues with AI children, while a sixth reviews information about special education as well as gifted and talented programs, and AI students. The final section in this chapter will discuss alternative, non-traditional intelligence tests.

Intelligence Testing in Schools

Intelligence tests were originally designed for use in schools (Hilgard, 1987). At the turn of the 20th century, desire to predict academic success led Alfred Binet to design a test for placing Paris boys into appropriate educational settings. In the United States, efforts were underway as early as the 1890s to survey the abilities of “the white race” with the goal of predicting “success in schooling” (Boring, 1950). Presently, in elementary and secondary schools, educators use a battery of tests to assess how well a student can be expected to perform and to determine if special educational services are

necessary. Intelligence tests are a common part of the process by which students with disabilities are identified and are used to determine an appropriate educational program for these students (Gritzmacher & Gritzmacher, 1995). For example, in most states, a discrepancy between cognitive ability and achievement must be demonstrated in order to qualify for special education services. Thus, when a student is not achieving academically, the standard of practice is to administer an intelligence test to measure his or her current ability to learn, which is then compared with the same youth's level of academic achievement (IDEA, 1997). Once scores are obtained, then, a determination of appropriate services in the least restrictive environment is made.

One concern with this strategy is that it discriminates against children with low IQ scores and low academic achievement scores (Wigdoor & Garner, 1982). A child who is struggling academically, who is not cognitively impaired, and who has low IQ and achievement scores, but no discrepancy between the scores, does not qualify for assistance. It is arguable that this child needs assistance in order to do well in school but is likely to be denied assistance because, typically, no funds are available to support programs for children in this situation (e.g., DHHS Section 504; Donovan & Cross, 2002). Therefore, it is essential that school personnel and practitioners alike understand and become fully aware of assessment issues (e.g., test bias, normative data, and language bias), that may result in invalid or inaccurate test scores and consequently impact a child's qualification for special education services.

Intelligence and Culture

There is considerable agreement that not all cultural groups perceive intelligence in the same way, or consider a common set of behaviors to be representative of intelligence (Armour-Thomas, 1992; Beiser & Gotowiec, 2000; Senior, 1993; Suzuki & Valencia, 1997). Anastasi (1988) pointed out that cultures and subcultures consist of different values, beliefs, and behavioral norms that influence member preparedness to respond to demands that extend beyond their traditional environment. The definition of intelligence is a cultural artifact that describes the skills within a particular cultural group that are understood to be evidence of success within that group and/or environment. An assumption underlying verbal intelligence tests is that the tests sample a common body of experiences and more intelligent children extract more knowledge from this common body of experience than do less intelligent children (Common & Frost, 1988). Cultural differences between groups may exert a profound influence on the development of distinct patterns of mental abilities (Senior). For example, Brescia and Fortune (1989) emphasized that the individual may be required to understand the function of various objects that are uncommon because of his or her cultural background. Generally, when intelligence measures are used with AI students, the tests show lower scores (Brescia & Fortune). Ducheneaux (2002) suggested there is a lack of knowledge regarding the culture of AI students that may increase the potential for underestimation of intellectual abilities. Also, non-Indian clinicians need crosscultural knowledge and training when working with this population to help understand special issues affecting AI. Clinicians who are appropriately educated regarding the unique challenges that face AI are likely to

increase the likelihood of more appropriate assessment and remediation of this population (Dana, 1984).

Psychosocial Factors Affecting AI Student

Test Performance

There are many different factors that affect the performance of all children on standardized tests and academics. For AI students, there are some particularly significant psychosocial factors that may influence test performance, such as social (e.g., SES) and environmental factors (Dana, 1984; Dauphinais & King, 1992; McShane, 1988).

Native language and its ability to affect test outcomes is not very well understood (Chavers & Locke, 1989). According to Valencia and Suzuki (2001), it has been known for decades that the children who are most likely to be penalized on intelligence tests are those who have been raised in environments where English is not the first language. Even so, many researchers and clinicians administering tests over the years have simply ignored this issue. For many AI students and communities, heavy reliance on language for both communicating information and representing knowledge is simply not the norm. Even those who speak English as a first language are likely to speak a dialect whose syntax and conventions of use are strongly influenced by the Native language of their communities (Brescia & Fortune, 1989; Manuel-Dupont, 1990). Brandt (1984) explained youths who live on reservations may be monolingual in a Native language, completely bilingual, have varying degrees of fluency in the two languages, or be monolingual in English with varying degrees of standard English or a Native variety. According to

Phinney (1991), familial isolation from the dominant culture, including lack of fluency in English, may create difficulties for children who grow up in such circumstances and then enter a school system geared toward dominant culture norms.

Brandt (1984) suggested that cultural factors may affect test performance for AI children. Within ethnic groups, individuals and families vary in the importance they accord to the maintenance of traditional ways, and in their attitudes toward contact with, and adaptation to, the dominant culture (Oetting & Beauvais, 1990; Trimble, 1990). Some AI students from more traditional homes may display certain cultural characteristics that affect their success in the regular education classroom. Particularly among these students are many whose parents and grandparents may have attended government boarding schools or who may not have attended school at all. Boarding school education has often been perceived as not having contributed beneficially to the success of the individual or the family, nor was a lack of education necessarily considered detrimental. Consequently, these parents and grandparents may not value education and may not stress its importance to their children (Gilliland, 1992). For such families, standardized tests may be an index of the degree to which students have been acculturated to Western cultural knowledge rather than an accurate assessment of their intellectual abilities (Dana, 1984). As a rule, these students are less verbal and may seem less competitive than their classmates who are not AI (Gritzmacher & Gritzmacher, 1995). Additionally, some AI students fail to exhibit successful test-taking behaviors due in part to cultural beliefs pertaining to competing against others, that is, harmony within the group. Thus, the AI student may not realize the importance of doing his or her

personal best on intelligence tests (McShane & Plas, 1982). Furthermore, the use of speed in traditional intelligence tests is an important consideration that affects the ability scores of students from minority cultures, as opposed to patience and respect of others.

Socioeconomic status (SES) is a particularly powerful IQ correlate (Beiser & Gotowiec, 2000). According to Suzuki and Valencia (1997), low SES reliably predicts low IQ scores, both within and across ethnoracial groups. To better understand these correlations, Donovan and Cross (2002) conceptualized an understanding of the supports for child development and the ways in which these supports are compromised in low-SES family circumstances. Poverty and maternal education can affect these supports in a number of ways, including maternal depression, differential knowledge and beliefs that shape parent-child interactions, resources available to access quality child care and other educational materials and resources, and exposure to stressful events (Ceci & Williams, 1997). Jenkins and Ramsey (1991) reported that there are low numbers of college-educated American Indians. They also explained that there is a lack of social mobility within American Indian communities. The lack of social mobility has been viewed as a result of high unemployment and limited educational resources.

In addition to issues such as cultural factors and socioeconomics, children's environments may also affect individual performance on standardized IQ test scores (Neisser et al., 1996). Environmental factors include such things as how much time students spend studying at home, whether they have a designated place and time to study, whether they get tutoring, and factors like overcrowding, substance abuse, child abuse, and child neglect (Chavers & Locke, 1989).

As a final point, psychologists are encouraged to be aware of cultural, socioeconomic and other environmental differences and how these differences can influence test results, and more importantly, test interpretation. Therefore, more needs to be done to develop intelligence measurements and instruments for use that are culturally appropriate with an AI population.

Intelligence Testing and AI Students

A major criticism of standardized intelligence tests is their improper use in measuring the intellectual competence of culturally diverse children (Armour-Thomas, 1992). Common and Frost (1988) suggested that there is a pressing need to search for more appropriate ways to assess the intellectual abilities of AI children because of the questionable validity of these tests with these children. Test score differences between AI children and those for whom the test was normed have been a research topic for the last 70 years (Curran et al., 1996). As early as 1926, Fitzgerald and Ludeman found the median score of intelligence quotients for Indian students was 87.5. Although the variation in average intelligence from quarter-blood Indians to full-blood Indians was small, there seemed to be a slight decrease in intelligence as the percentage of Indian blood increased.

Recent research into the intellectual abilities of AI children has continued to be plagued with methodological problems and interpretive difficulties. The following section covers the research literature investigating the validity of traditional tests of intelligence like the Wechsler scales with AI students, specifically. The Wechsler scales

are the most commonly used and researched measure of intelligence with AI children (Ducheneaux, 2002).

Construct Validity of IQ Tests with AI Students

Zarske, Moore, and Peterson (1981) examined the factor structure of the WISC-R for a group of 192 learning disabled Navajo and 50 Papago Indian children ranging in age from 6 to 15. The two-factor solution for both groups closely resembled the WISC-R verbal and performance factors. The results supported a verbal and performance factor structure for AI students on the WISC-R.

McShane and Plas (1982) investigated the factor structure of the WISC-R with Ojibwa Indian children. Seventy-seven Ojibwa students were randomly selected from a reservation school. The students' ages ranged from 6 to 13. Two-factor analyses were conducted on two separate sets of subtests from the WISC-R. The first factor analysis was conducted on all 12 subtests. The results did not match the expected verbal/performance factor structure. A three-factor solution was evident, but half of the subtests (information, similarities, vocabulary, coding, picture arrangement, and picture completion) loaded on more than one factor. The first factor was composed of only the comprehension subtest. Arithmetic and digit span comprised the second factor. Finally, the third factor consisted of block design, object assembly, and mazes. McShane and Plas (1982) did not offer an interpretation of this analysis except to suggest that the verbal and perceptual organization factorial structure did not materialize for this group of AI students. The second factor analysis consisted of the eight subtests suggested by Naglieri, Kamphaus, and Kaufman (1983) that should be considered measures of

simultaneous and successive processing. Accordingly, the simultaneous processing factor is hypothesized to consist of similarities, picture completion, block design, and object assembly. The successive processing factor is expected to contain picture arrangement, coding, mazes, and digit span. The results from this study did not support the successive and simultaneous factor structure.

Mishra (1982) conducted an item analysis of the WISC-R with 40 Anglo and 40 Navajo children to assess the degree of item bias. In this sample of children, ages ranging from 9 to 11 years, the results indicated that 19% of the 79 items in the information, similarities, and vocabulary subtests were biased against the Navajo children. All subjects in this study were individually administered 10 regular subtests of the WISC-R. According to Mishra, only these subtests were used in this study because items within these subtests seem to be more sensitive to cultural bias. Mishra suggested that AI children may not have an adequate opportunity to learn the vocabulary or concepts measured by these subtests relative to the experiences of the Anglo group.

Teeter, Moore, and Petersen (1982) explored WISC-R performance among 452 Navajo children. The children participating in this study came from three educational groups: 113 nondisabled (NH), 150 learning disabled (LD), and 189 emotionally disabled (ED). All three groups scored well below the normative mean on the Verbal IQ (NH = 66; ED = 60; LD = 58) and Full Scale IQ (NH = 79; ED = 75; LD = 70). The non-disabled group and the emotionally disabled group scored in the average range on the Performance IQ score (NH = 96; ED = 94). Teeter and colleagues suggested that Verbal IQ should be interpreted as a measure of linguistic and cultural differences, and that

Performance IQ is the least biased measure of intelligence on the WISC-R. The authors considered the possibility that intelligence tests underestimate the potential of Navajo children. Their research lends support to the conclusions that the Performance Scale of the WISC-R can be used as the least biased measure of potential for non-LD Navajo children. Also, due to the influence of language and interpretation of verbal IQ, the Full Scale IQ yields a biased measure of intelligence and should not be used as an overall index of intellectual functioning for Navajo children.

Mishra, Lord, and Sabers (1989) analyzed WISC-R subtests for successive and simultaneous processing factor structures with 45 learning disabled and 41 gifted Navajo students. The results suggested that the WISC-R is composed of a simultaneous factor, consisting of similarities, picture completion, picture arrangement, block design, and object assembly, and a successive factor, containing digit span and doding. Mishra and colleagues suggested that these results were not without interpretive difficulties. The gifted students appeared to use successive processing strategies on the similarities subtest and the learning disabled students used both successive and simultaneous processing methods to solve the picture arrangement subtest.

A decade later, Beiser and Gotowiec (2000) examined the verbal and performance WISC-R subscale scores from 691 AI and 234 non-AI children in second and fourth grades. The study revealed similar results as found in other research looking at patterning differences with AI children. The AI students' Verbal IQ scores were nearly 1.5 standard deviations lower than non-AI students' scores (AI VIQ = 79; non-AI VIQ = 101).

Ducheneaux (2002) examined patterning differences on the WISC-III between 89 AI and 70 Caucasian children, with a mean age of 10.8 for all subjects. The results suggested that AI children scored higher on Performance IQ than Verbal IQ within their own group. The Caucasian group had similar scores on Verbal IQ and Performance IQ within their own group. The results suggested that AI children may be stronger with intellectual skills in the performance IQ subscale domains when compared to verbal IQ subscale domains, though the same was not true for Caucasian students.

In sum, based on the existing literature, the construct validity of IQ test with AI students is mixed at best. The authors of the studies reviewed here, suggested their findings demonstrated a need for greater understanding of cultural differences and interaction with intelligence. They further argued that a question of ethics arises in considering whether AIs have been assessed, diagnosed, and treated with biased assessment techniques, and that more needs to be done to develop intelligence measurements and instruments that are culturally appropriate with this population.

Reliability and Predictive Validity of IQ Tests with AI Students

Mishra and Lord (1982) investigated the reliability and predictive validity of the WISC-R with a group of 40 randomly selected fourth- and fifth-grade Navajo students. Reliability coefficients among the WISC-R subtests for this sample ranged from a high of .86 for Performance IQ to a low of .40 for the information subtest. The average reliability coefficient for the Performance subtests was .81 and was .54 for the Verbal subtests. The predictive validity for all of the WISC-R subtests, as well as for the Verbal,

Performance, and Full Scale IQs, was low and nonsignificant ($N = 40$, $r = .304$, $p < .05$) when predicting scores on the Wide Range Achievement Test (WRAT) spelling, arithmetic, and reading subtests. The only significant correlation emerged between the WRAT Spelling and the WISC-R Block Design scores. Mishra and Lord reported that the low and nonsignificant validity coefficients for the WISC-R subtests and the IQ scores suggest minimal relationship with achievement measures for the Navajo sample.

McCullough, Walker, and Diessner (1985) investigated the verbal and performance abilities of 75 Native American students enrolled in tribally operated junior and senior high schools. The sample consisted of 88% Yakima Indian and 12% Great Plains Indian children whose ages ranged from 12 to 19 years. All of the children were administered either the WISC-R or the Wechsler Adult Intelligence Scale (WAIS), depending on the child's age. The results suggested a significant Verbal IQ and Performance IQ discrepancy for both junior and senior high students. For the junior high students the mean Performance Scale score was 99.19 ($SD = 8.22$), whereas the Verbal Scale score mean was 79.92 ($SD = 9.87$). For the senior high students the mean Performance Scale score was 106.21 ($SD = 8.34$), and the Verbal Scale score mean was 90.64 ($SD = 6.68$). The Verbal IQ and Performance IQ did not correlate significantly for either group. McCullough and colleagues advised the use of caution when interpreting Wechsler intelligence scores for AI children because significant Verbal-Performance deviations have been found across several tribes.

Whorton and Morgan (1990) compared the TONI and the WISC-R on a special education-referred group of 29 Anglo and 17 Native American children. The mean age

of the children was 11.4. The correlation between the TONI Quotient and the WISC-R Verbal IQ, Performance IQ, and Full Scale IQ were .86, .42, and .48, respectively. The two groups of children did not differ significantly on any of the IQ scores. The results suggested that the TONI gave a better estimate of intellectual ability for both Anglo and AI populations.

Atkinson (1993) compared the WISC-III verbal and performance scores from a nonreferred and a group referred for special education evaluation of Navajo children. The volunteer group consisted of 47 elementary school students and the referred group consisted of 45 children. For both groups, Verbal IQ was significantly lower than Performance IQ and Full Scale IQ. Atkinson suggested that this discrepancy supports the research suggesting that AI students may have better developed spatial abilities. Also, Atkinson suggested that the Full Scale IQ was clearly not a good representation of "g" for AI students due to the large verbal/performance discrepancy.

Summary

In sum, the construct validity, reliability, and predictive validity of the Wechsler scales for AI children have been questioned. For example, McShane and Plas (1982) did not find support for the expected verbal and performance factor structure, nor did they find support for the simultaneous and successive factor structure of the WISC-R. Therefore, the utility of these scores in predicting academic achievement still appears uncertain for AI children. Thus, the literature appears inadequate in describing the cognitive processing abilities of AI children by using traditional intelligence tests. The

next section will explore additional issues related to the assessment of intelligence for AI students.

Assessment Issues with AI Students

Despite questions about the validity of existing tests for AI students, this population is subjected to a great deal of testing and countless decisions are based on the results. As long ago as 1979, federal legislation was directed at improving testing practices with AI students, with few apparent resulting improvements (Estrin & Nelson-Barber, 1995). In 1988, the Indian Education Act made provisions for “a program of research and development to provide accurate and culturally specific assessment instruments to measure student performance in cooperation with Tribes and Alaska Native entities” (Chavers & Locke, 1989, p. 41). To date, however, there is no repertoire of standardized tests in Native languages or that draw upon Native cultural content and learning processes. As such, the testing of AI students using measures developed for majority American society represents a case of crosscultural testing that is likely to produce questionable results, such as the underestimation of student performance (Brescia & Fortune, 1989).

The factors that influence AI student test scores may be considered forms of bias and are well-documented (Beiser & Gotowiec, 2000; Dana, 1984; Hosp & Reschly, 2004; Plank, 2001; Utter, 1993). For example, content may be inappropriate, because common experience is wrongly presumed, jeopardizing construct validity (i.e., the ability of the assessment tool to test what it purports to test). The timed nature of the tests penalizes

students from communities that view time differently or value reflection over quick response. Reliance on verbal information and representation to the near exclusion of nonverbal, visual information, and representation is culturally incongruous. Further, formal, on-demand testing is alien to Native ways of demonstrating learning.

According to Brescia and Fortune (1989), the continued use of standardized assessment practices is inappropriate for educational program planning and evaluation. This is especially true when the problem is compounded by assessing young, culturally diverse children. Further, the literature on assessment issues with AI populations is very limited and additional research studies dealing with newly developed tests (e.g., WISC-IV and TONI-3) are needed.

Special Education and American Indians

AI students, historically and currently, have been overrepresented in special education programs and underrepresented in gifted and talented programs. Educational assessment practices have been identified as being critical to improving education for AI children (Banks & Neisworth, 1995). Recent legislation, such as the IDEA amendments of 1997 and 2004 (IDEA, 1997/ IDEIA, 2004), is indicative of a growing national awareness regarding the importance of early intervention programs that are amenable to the diverse interests and needs of AI children and families. The IDEA amendments also emphasized the importance of the federal government becoming more responsive to the growing needs of an increasingly more diverse society (Valencia & Suzuki, 2001).

Overrepresentation of AI students in SPED

The disproportionate representation of AI students in special education continues to be one of the most problematic areas in special education. Public Law 94-142 has enhanced sensitivity and caution on the part of administrators, psychologists, and diagnosticians in the placement of AI children into classes for handicapped students. According to the Elementary and Secondary Schools Civil Rights Compliance Report of the U. S. Department of Education's OCR, AI students are overrepresented in the LD category (Donovan & Cross, 2002).

According to Chinn and Hughes (1987), the evidence appears to be overwhelming that many AI children, both in the past and in the present, have been misidentified, and that this accounts, in part, for the overrepresentation of AI students. What remains uncertain is the extent to which AI students have been appropriately referred, diagnosed, and placed. Some AI children may be appropriately placed in special education classes and may be receiving intervention appropriate to their needs. In such situations, whatever benefits accrue should be recognized as such and continued as long as it is in the best interests of the child. However, the problem of disproportionate placement in special education due to faulty identification procedures must continually be attacked as long as it exists (Hosp & Reschly, 2004; Valencia & Suzuki, 2001).

Underrepresentation of AI Students in Gifted and Talented Programs

There has been little effort since the Marland Report of 1972, the founding document that initiated federal support for gifted and talented education, to include AI

students in the growing environment of gifted and talented education (Tonemah, 1991). The dependence on using standardized achievement and intelligence test scores as criteria for the selection of students into gifted and talented programs has limited AI participation (Kirschenbaum, 1988). As previously discussed, if one does not have a command of the English language, or life experiences similar to the normative population, it can be predicted that that person will not score well on standardized tests. Consequently, AI students do not score as well as others on these standardized tests and are not being identified as gifted and talented, resulting in their potentials not becoming fully developed (Woods & Achey, 1990).

According to the 1997 OCR Survey, AI students are underrepresented in gifted and talented programs by 23.08% on a national level (Donovan & Cross, 2002). The issue of disproportionately low numbers of AI students in classes for gifted students continues to be of major concern. If the problem is in identification, careful study is necessary to find out if the breakdown is in the referral process, in the assessment process, or both. According to Hosp and Reschly (2004), by being cognizant of the academic performances of different groups of students, and by taking steps to improve the achievement of all groups, educators can influence the alterable variables that predict disproportionate representation.

Nonverbal Measures of Intelligence

The controversies involved in the intellectual assessment of minority children with non-Native standardized intelligence measures have led to the search for alternative

assessment methods. This section will explore nonverbal measures of intelligence, including types of nonverbal intelligence and the benefits of using them.

Nonverbal tests of intelligence reduce the use of language in the test administration process, and typically employ mime and gestures to give instructions and interpret responses (Anastasi & Urbina, 1997). These characteristics make nonverbal tests of intelligence appealing to clinicians struggling with the difficulty of assessing individuals with language or cultural differences (Jensen, 1980). The goal of nonverbal test design is to reduce bias from the influence of language and cultural differences on the test score, thus increasing the fairness of the test.

Types of Nonverbal Tests of Intelligence

Several different tests exist that are intended to be nonverbal assessments of cognitive abilities. Some nonverbal tests require detailed oral presentation of verbal instructions (e.g., PPVT-III; Dunn & Dunn, 1997), a drawback when assessing individuals from different cultural backgrounds or individuals with limited English proficiency.

The TONI-3 (Brown et al., 1997), the Leiter-R (Roid & Miller, 1997), the Raven Standard Progressive Matrices (RSPM; Raven, Raven, & Court, 1995), and the Universal Nonverbal Intelligence Test (UNIT; Bracken & McCullum, 1997) are examples of nonverbal tests of intelligence. These tests can be administered without giving verbal instructions or with minimal verbal instruction. For example, the authors of the TONI-3 endeavored to design a test that did not require a person to speak English in order to take it. In the user's manual (Brown et al.), the authors stated, "The TONI-3 is clearly a

nonverbal, language free test” (p. 18). Certainly, there are several reasons for calling it a nonverbal intelligence test; the content, instruction format, and response format do not require reading, writing, speaking, or listening. The authors of the TONI-3 argued that it successfully removed the overt use of language from the test format.

Nonverbal tests of intelligence were developed with the intention of meeting the needs of crosscultural assessment (Anastasi & Urbina, 1997). Therefore, nonverbal tests have the potential to be extremely valuable in crosscultural assessment or in assessing individuals with disabilities because they reduce construct irrelevance. The concept of construct irrelevance is at work when the test does not assess with certain populations what it is supposed to assess (Braden, 2000), as is the case with standardized test and AI students.

Benefits of Nonverbal Tests of Intelligence

The usefulness of nonverbal tests of intelligence, like the TONI-3, extends beyond crosscultural use and reduced emphasis on language. Nonverbal measures of intelligence are of increasing interest as additions to other tests in a battery. Anastasi and Urbina (1997) highlighted that nonverbal IQ tests have provided useful information as additions to larger assessment batteries, particularly when testing people with various disabilities.

The novel problem-solving nature of the items typically found in tests of nonverbal intelligence offer notable benefits because these tests draw from information a person is not likely to have interacted with before. The person is required to solve something new that is less likely to be culturally bound. On tests like the TONI-3, the

examinee is presented with problems to solve that are unrelated to typical school learning, such as the use of numbers and words.

Naglieri and Prewett (1990) suggested that nonverbal measures of intelligence are better measures of intelligence because these tests involve less achievement than do the more traditional tests of intelligence. Intelligence scores tend to be highly correlated with achievement tests, which are specifically designed to measure how much an individual has learned in an academic environment. Yet, a possible limitation of such nonverbal tests is that there is no current research on these tests (Plank, 2001). Nonverbal measures hold some promise for testing culturally different individuals, though it continues to be unlikely that one test will accurately measure the intelligence of all culturally diverse children.

Research about the utility of nonverbal tests of intelligence with individuals who have disabilities or limited English proficiency that complicate assessment using traditional tests can be found in the literature. Yet, more studies examining the usefulness of nonverbal intelligence tests in assessing people with disabilities are needed. However, the lack of information about concurrent validity of these tests highlights the need to explore whether these tests are measuring similar constructs. Of equal importance are studies that contribute information about whether a nonverbal test of intelligence measures the construct it is intended to measure.

At present, no studies exist in the literature examining the relationship between the recent revisions of the WISC-IV and the TONI-3. Research examining the correlation of the WISC-IV and the TONI-3 should contribute to substantiating that these

tests have convergent validity with each other and are measuring similar cognitive ability constructs. Because the literature on nonverbal measures of intelligence with AI children is very limited, there is a need for research studies dealing with newly developed traditional tests like the WISC-IV. The present study addressed this need.

Alternative Assessments

In place of the traditional method(s) previously reviewed, a number of authors as well as the President's Commission on Excellence in Special Education recommended that the student's response to intervention (RTI) be used as an alternative or replacement of the IQ-achievement discrepancy approach (Gresham, 2002).

In the Commentary and Explanation to the proposed special education regulations, the U. S. Department of Education describes reasons why discrepancy models should be abandoned:

[T]he “wait to fail” model does not lead to “closing the achievement gap for most students placed in special education. Many students placed in special education as SLD show minimal gains in achievement and few actually leave special education. (Donovon & Cross, 2002).

Response to Intervention (RTI)

The use of RTI to identify students with learning disabilities is based on a dual-discrepancy model. First, the student must be significantly below same-grade peers on measures of academic performance. This criterion is based on a discrepancy from grade-level performance without reference to an assessment of the student's ability level (i.e.,

IQ). The second criterion is that the student performs poorly in response to carefully planned and precisely delivered instruction. The data used for this aspect of the determination are developed through ongoing progress monitoring of the student's performance on a critical academic measure during the course of an individually designed intervention.

Using RTI in the identification process has most frequently been embedded in a multi-tiered model of assessment, intervention, and progress monitoring (Herbert, 2005). This model can be conceptualized as consisting of three phases: (a) determining whether effective instruction is in place for groups of students, (b) providing effective instruction to the target student and measuring its effect on performance, and (c) referring students whose RTI warrants additional or intensive continuing interventions.

Benefits of the Dual Discrepancy Model

The dual-discrepancy model that incorporates RTI as its core procedure has been advanced because it appears to address many of the problems that were unintended negative consequences of previous approaches. Potential benefits of the approach include: (a) prevention of the development of significant academic deficiencies by intervening in the early grades, (b) improvement of instructional practices for large groups of students in general education, (c) increased fairness in the assessment process, particularly for minority students, (d) closer match between the assessment process and activities undertaken to address the academic deficiencies, and (e) closer relationship between the assessment measures and procedures of effective instruction.

Summary

Response to intervention appears to be a promising alternative to the traditional IQ-achievement discrepancy model for identifying students with learning disabilities while improving classroom instruction in general education. Though there have been some systematic attempts to use RTI in this way in individual states and school systems, large-scale adoption of the practice has only recently been considered.

CHAPTER III

METHOD

Introduction

This chapter describes the sample in the present study and the population from which the sample was selected. Additionally, this chapter describes the method in which participants were identified, the procedure used for collecting data, and the instruments used in the study. Finally, the methods used to analyze the data are reviewed.

Population and Sample

The sample for this study consisted of 90 American Indian (AI) children from the northeastern South Dakota. The ages of the participating students ranged from 6 years 0-months to 16 years 10-months ($M = 11.09$, $SD = 2.68$). The target population was all students enrolled at the Tiospa Zina Tribal School (TZTS), a Bureau of Indian Affairs funded school. All the children in the sample were identified as a member of a Federally recognized tribe (as reported by parents on demographics form) and resided on or near the Lake Traverse Indian Reservation.

All the participants met the following criteria before being recruited for this study. First, each participant was identified as an AI student whose dominant language was English. The information regarding ethnicity and English language dominance came from the parent demographic sheet (Appendix A). Second, students needed to be in one of three groups representing three levels of educational support. One group was

comprised of 30 students that were currently receiving special education services and had a valid Individualized Education Plan (IEP). The next group was comprised of 30 students who were currently accepted and participating in the gifted and talented program at TZTS. The final group consisted of 30 students who were in neither special education nor the gifted and talented programs, and who attended regular education classes. The sample was not randomly selected but was selected based on availability.

The process of identification, evaluation, and eligibility will be briefly described. Referral to special education and gifted and talented programs follow a similar eight stage process: (a) Child find/prereferral activities, (b) referral to consider an evaluation, (c) written notice and parental consent, (d) evaluation and eligibility determination, (e) Individual Educational Plans (IEP) development and implementation (i.e., both special ed and gifted and talented students), (f) review/revision of IEP and placement decision, (g) reevaluation, and (h) discontinuation of services.

Procédure

Prior to beginning of this study, Institutional Review Board (IRB) approval was obtained at TZTS and Utah State University (USU). At TZTS, the research study proposal was submitted to the Sisseton Wahpeton School Board for review and approval. In February, 2004 the research study was approved by the school board (see Appendix B). Next, the proposal was submitted to and approved by the dissertation supervisory committee membership. Then, in July, 2004 the study was submitted to the USU IRB for

review and approval of the current study. Upon securing approval from TZTS and USU's Institutional Review Board, the next phase of the study commenced.

Informed consent was obtained prior to any testing. A copy of the consent form is included in Appendix C. Initial parental consent was elicited during registration week for the 2004-2005 academic year, which was scheduled in early August, 2004. The informed consent form was included in the formal registration packet that every TZTS parent/guardian was given for enrollment purposes by the respective administrative assistant (i.e., elementary, middle, and high schools). TZTS requires that each student (returning or new) complete an enrollment packet at the start of each academic school year.

However, when the researcher returned to TZTS, only a small portion of the informed consent forms (12 forms) were returned signed and approving their child to participate in the current study. With the assistance of school personnel (e.g., administrative assistants, attendance secretary, special education director, and school counselors), the researcher then took blank forms and went into the community and met with as many parents as possible to obtain consent. This effort resulted in the collection of a data pool of enough students for each group (i.e., 30 per group). Next each student was cross referenced with the list of students provided by the special education director to determine what level of educational support the student was receiving (e.g., special education, gifted and talented, or regular education group) for assignment to the appropriate group for the current study.

For those parents who gave their consent, a demographic data form (Appendix B) was obtained. Archival data was also obtained from the student's cumulative academic file. Before administration of the intelligence measures began, a child assent form was presented and explained, and then obtained from each child who agreed to participate in the study.

Testing sessions were conducted throughout the 2004-2005 academic school year and at the beginning of the 2005-2006 school year, as the researcher could schedule trips to TZTS and the testing was completed in a special education testing room at TZTS. The researcher received training in administration and scoring of the WISC-IV and the TONI-3 intelligence measures. The order of administration was WISC-IV first, then the TONI-3. The ten core subtests of the WISC-IV (block design, similarities, digit span, picture concepts, coding, vocabulary, letter-number sequencing, matrix reasoning, comprehension, and symbol search) were administered in the order in which they appeared in the protocol. The directions and administration of the TONI-3 were given using pantomime and gestures according to standardized instructions. The researcher was aware of the student's inclusion into each respective group. Ninety Sioux children were tested in this manner and all 90 participants were included in all the statistical analyses.

Following the testing and data collection phase of this study, there was an opportunity for feedback to the parents/guardians pertaining to their child's results. In addition, a referral procedure was established for any study participant who may have had any unusual scoring patterns (e.g., at least one standard deviation from the mean). In

collaboration with the director of special education, this referral process was in place at the beginning of this research study. The first step in this referral process was to forward any name(s) of students that appeared to have unusual scores to the special education director. Then, the special education director assessed if any further intervention or referral was needed. It is important to note that the information obtained in the present study was not sufficient for diagnostic purposes and did not provide an adequate evaluation for recommending a specific course of action. A total of three students from the regular education group were referred to the special education director due to low performance on the intellectual assessments.

Instruments

Wechsler Intelligence Scale for Children—4th Edition (WISC-IV)

The WISC-IV is an individually administered, comprehensive clinical instrument for assessing the intelligence of children ages 6 years 0 months through 16 years 11 months (6:0 – 16:11). The WISC-IV provides composite scores that represent intellectual functioning in specified cognitive domains, including a verbal comprehension index, perceptual reasoning index, working memory index, and processing speed index. It also provides a composite score that represents a child's general intellectual ability (i.e., Full Scale IQ). The WISC-IV has ten core subtests and five supplemental subtests. Similarities, vocabulary, and comprehension are the three core subtests that comprise the verbal comprehension index (VCI). The three core perceptual reasoning (PRI) subtests are block design, picture concepts, and matrix reasoning. Digit span and letter-number

sequencing are the two core working memory (WMI) subtests, and coding and symbol search are the two core processing speed (PSI) subtests. All ten core subtests comprising the four indices contribute equally to the full scale IQ (FSIQ).

The scoring of the WISC-IV is done by completing the summary page of the record form. After the responses are scored for each subtest administered, there are several steps to determining the child's total raw and scaled scores for each subtest. Raw scores are calculated and converted to scaled scores. Scaled scores are summed and these sums are used to derive the composite scores (i.e., VCI, PRI, WMI, PSI, and FSIQ). The types of scores yielded are as follows: FSIQ is a measure of overall ability, the index scores provide a breakdown of abilities, and the subtest scores provide information on individual strengths and weaknesses of the child. The WISC-IV index scores have a mean of 100 and standard deviation of 15, and the scaled scores have a mean of 10 and standard deviation of 3.

The reliability coefficients for the WISC-IV composite scales range from .88 (processing speed) to .97 (full scale). The interscorer agreement is very high, ranging from .98 to .99. The corrected correlation between the WISC-III VIQ and the WISC-IV VCI is .87 and .74 between the WISC-III PIQ and the WISC-IV PRI. The lower correlation between PIQ and PRI reflects important changes made to this composite in the WISC-IV. According to the WISC-IV Technical and Interpretive Manual (Wechsler, 2003), evidence of the convergent and discriminant validity of the WISC-IV is provided by correlational studies with the following instruments: WISC-III, WPPSI-III, WAIS-III, Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), WIAT-II,

Children's Memory Scale (CMS; Cohen, 1997), Gifted Rating Scale (GRS; Pfeiffer & Jarosewich, 2003), BarOn Emotional Quotient Inventory: Youth Version (Bar-On & Parker, 2000), and the Adaptive Behavior Assessment System-Second Edition (ABAS-II; Harrison & Oakland, 2003, p. 11).

*Test of Nonverbal Intelligence—
Third Edition (TONI-3)*

The TONI-3 (Brown et al., 1997) is a 45-item nonverbal measure of abstract and figural problem solving, in which a series of matrices of increasing difficulty are presented to the examinee. Each examinee is required to identify the correct figure to complete the sequence. The TONI-3 makes use of matching skills and analogies to solve novel problems. The goal of Brown and colleagues was to design a test that would be a strong measure of general intelligence, focusing on abstract reasoning and problem solving.

The scoring of the TONI-3 produces raw scores and three kinds of normative scores, that is, deviation quotients, percentile ranks, and age equivalents. Two types of normative scores are reported in the TONI-3 Examiner's Manual: deviation quotients and percentile ranks (Brown et al., 1997). The deviation quotients have a mean of 100 and a standard deviation of 15; percentile ranks reflect the percentage of subjects scoring above or below the score in question.

According to the Examiner's Manual (Brown et al., 1997), "The TONI-3 taps a single intelligent behavior, namely a person's ability to solve novel, abstract problems" (p. 29). The TONI-3 has a high degree of reliability and validity with the following

results reported: overall reliability coefficient of .96 for both Forms A and B and criterion-related validity correlation coefficients ranging from .63 for the TONI-3, Forms A and B, and the WISC-III to .73 for the TONI-3, Form A, and the WAIS-R.

Furthermore, the Examiner's Manual (Brown et al., 1997) provided evidence of the convergent and discriminant validity of the TONI-3 by correlational studies with the following instruments: Comprehensive Test of Nonverbal Intelligence (CTONI; Hammill et al., 1996, WISC-III (Wechsler, 1991), and the WAIS-R (Wechsler, 1981, p. 98).

Demographic Questionnaire

Items on the demographic sheet assessed the participant's background, and each subject was given a data code number in lieu of putting names on the tests. The demographic questionnaire established age, gender, year in school, and race. These variables were examined to provide information regarding general characteristics of the sample.

Archival Data

Archival data were collected on the total sample of the study. These data included the child's most recent academic achievement. Because the middle and high schools at TZTS assigned traditional letter grades (i.e., As, Bs, Cs, Ds, and Fs) and the elementary school assigned E = Exemplary; S = Skilled; P = Proficient; & I = In Progress to their student, an operational definition was created and coded as follows:

Operational definition:

- 4 = 5 of 7 classes are As or Es,
- 3 = 5 of 7 classes are Bs or Ss or higher,
- 2 = 5 of 7 classes are Cs or Ps or higher,
- 1 = 3 of 7 classes are Fs or Is.

Coding as:

- 4 = Had an exceptional academic achievement,
- 3 = Had no major academic problems,
- 2 = Had minor academic problems,
- 1 = Had many academic problems.

Additional archival data were collected on the number of behavioral incidents recorded in the school computer data base (i.e., Administrator Plus). The behavioral incidents variable consisted of the number of incidents reported for each student in the database. An operational definition was created and coded as follows:

Operational definition:

- 4 = No reports on record,
- 3 = Report (s) included such incidents like tardiness,
- 2 = Report (s) included such incidents like OHODA (disrespectful toward teacher or staff), skipping classes,
- 1 = Report (s) included assaults, weapons, drugs, alcohol

Coded as: .

- 4 = Had no behavioral incidents,

- 3 = Had only minor behavioral incidents,
- 2 = Had frequent behavioral incidents,
- 1 = Had severe behavioral incidents.

Analysis

Data analysis consisted of both descriptive and inferential analyses. Initially, descriptive statistics were computed for all study variables. Descriptive statistics were computed separately for each group and for the entire sample. Frequencies and percentages were tabulated for gender, behavioral incidents, and academic achievement. Means and standard deviations were computed for the WISC-III Full Scale IQ, the WISC-III Index Scores, and the TONI-3 IQ.

For the inferential analyses, alpha was set at the .05 level and two-tailed tests were performed. The first research question was: What is the magnitude and direction of the relationship between the WISC-IV (Index scores and FSIQ score) and the TONI-III composite score for each group? To address this research question, Pearson correlation coefficients were computed separately for each group.

The second research question was: Are there differences in performance between children in the special education group, the gifted and talented group, and regular education group as measured by the WISC-IV and the TONI-3? To address this question, six one-way ANOVAs were performed, one for each of the six measures of intelligence. Where the ANOVAs were statistically significant, follow-up tests were

performed comparing each pair of groups using the Tukey Honestly Significant Difference (HSD; Turkey, 1977) test.

The third research question was: What is the magnitude and direction of the relationship between IQ scores and psychosocial variables identified? Two psychosocial variables (behavioral incidents and academic achievement) were examined. Pearson correlations were computed between the intelligence scores and the two psychosocial variables. Separate analyses were conducted for each academic group.

The fourth research question was: Can the psychosocial variables identified distinguish between the special education group, gifted and talented group, and the regular education group? To address this question, a discriminant analysis was performed with the two psychosocial variables as the independent variables and group membership as the dependent variable. Results are presented in Chapter IV, while Chapter V explores the meaning and conclusions that can be extracted from the results.

CHAPTER IV

RESULTS

Descriptive Statistics

Table 1 contains descriptive statistics for the gender and psychosocial variables in the current study as a function of group membership and for the total sample. The regular education group was equally split between males and females, while the special education group contained more males (70.0%) than females (30.0%) and the gifted group contained more females (66.7%) than males (33.3%). Individuals in the special education group tended to have more severe behavioral incidents with 40.0% of the sample having severe incidents compared to the regular education group (20.0%) or the gifted group (16.7%). In terms of academic achievement, individuals in the gifted group were more likely to have exceptional achievement (36.7%) than individuals in the regular education (6.7%) or the special education group (3.3%). Note that the observed differences between the groups in terms of behavioral incidents and academic achievement will be examined below for statistical significance in the analyses related to the fourth research question. Table 2 provides descriptive statistics for the continuous variables in the current study for each group individually and for the entire sample. Because behavioral incidents and academic achievement were used as quasi-interval variables in subsequent analyses, they are also included in Table 2. For these two variables, those in the gifted group tended to have the fewest behavioral incidents and best academic achievement) while those in the special education group had the most

Table 1

Descriptive Statistics for Gender and Psychosocial Variables as a Function of Group

IQ scores and psychosocial variables	Regular ed (n = 30)		Special ed (n = 30)		Gifted (n = 30)		Total sample (N=90)	
Gender								
Male	15	50.0	21	70.0	10	33.3	46	51.1
Female	15	50.0	9	30.0	20	66.7	44	48.9
Behavioral incidents								
No incidents	3	10.0	2	6.7	14	46.7	19	21.1
Minor incidents	10	33.3	7	23.3	4	13.3	31	23.3
Frequent incidents	11	36.7	9	30.0	7	23.3	27	30.0
Severe incidents	6	20.0	12	40.0	5	16.7	23	25.6
Academic achievement								
Many problems	2	6.7	6	20.0	0	0.0	8	8.9
Minor problems	13	43.3	15	50.0	11	36.7	39	43.3
No problems	13	43.3	8	26.7	8	26.7	29	32.2
Exceptional	2	6.7	1	3.3	11	36.7	14	15.6

behavioral incidents and poorest academic achievement). For all six of the intelligence measures, gifted students had the highest scores, followed by regular education students and then special education students. Again, the statistical significance of these differences will be addressed below in the section on inferential statistical analyses.

Inferential Statistics

The first research question was: What is the magnitude and direction of the relationship between the WISC-IV (Index scores and FSIQ score) and the TONI-3 composite score for each group? Tables 3, 4, and 5 contain the correlations among the six measures of intelligence for the regular education, special education, and gifted students, respectively. For the regular education students, the WISC-IV full scale IQ was

Table 2

Descriptive Statistics for Psychosocial and Intelligence Variables as a Function of Group

IQ scores and psychosocial variables	Regular ed. (<i>n</i> = 30)		Special ed. (<i>n</i> = 30)		Gifted (<i>n</i> = 30)		Total sample (<i>N</i> = 90)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Behavioral incidents	2.67	.92	3.03	.96	2.10	1.18	2.60	1.69
Academic achievement	2.50	.73	2.13	.78	3.00	.87	2.54	.86
WISC full scale IQ	88.93	9.73	84.33	10.90	108.47	12.81	93.91	15.29
WISC verbal comprehension	89.70	10.82	88.83	11.67	108.27	13.12	95.60	14.83
WISC perceptual reasoning	96.00	11.25	89.67	12.52	108.53	11.09	98.07	13.95
WISC working memory	87.30	11.93	85.23	11.71	100.57	13.71	91.03	14.11
WISC processing speed	91.50	13.03	85.37	12.14	106.37	14.89	94.41	15.94
TONI-3 IQ	91.67	11.30	85.20	10.55	100.50	10.19	92.46	12.31

positively correlated with the four index scores from the WISC-IV and the TONI-3 full scale IQ ($r = .54$ to $.73$). Scores on the TONI-3 were positively correlated with all of the WISC-IV index scores ($r = .50$ to $.54$) except for processing speed ($r = .22$). The only other statistically significant correlation was between the perceptual reasoning and working memory index scales of the WISC-IV ($r = .39$).

For the special education students, the WISC-IV full scale IQ was again positively correlated with all of the WISC-IV index scores and the TONI-3 full scale IQ ($r = .49$ to $.81$). Also, the TONI-3 full scale IQ was again positively correlated with all four of the WISC-IV index scores ($r = .44$ to $.58$) except for processing speed ($r = .33$). In addition, the verbal comprehension index score was positively correlated with both

Table 3

Correlations Among Intelligence Scores for Regular Education Students

IQ scores and psychosocial variables	1.	2.	3.	4.	5.	6.
1. WISC full scale IQ	1.00					
2. WISC verbal comprehension	.62*	1.00				
3. WISC perceptual reasoning	.72*	.19	1.00			
4. WISC working memory	.73*	.34	.39*	1.00		
5. WISC processing speed	.54*	-.01	.29	.24	1.00	
6. TONI-3 IQ	.70*	.53*	.54*	.50*	.22	1.00

* $p < .05$.

Table 4

Correlations Among Intelligence Scores for Special Education Students

IQ scores and psychosocial variables	1.	2.	3.	4.	5.	6.
1. WISC full scale IQ	1.00					
2. WISC verbal comprehension	.79*	1.00				
3. WISC perceptual reasoning	.81*	.45*	1.00			
4. WISC working memory	.72*	.60*	.45*	1.00		
5. WISC processing speed	.49*	.06	.36	.09	1.00	
6. TONI-3 IQ	.67*	.58*	.55*	.44*	.33	1.00

* $p < .05$

Table 5

Correlations Among Intelligence Scores for Gifted and Talented Students

IQ scores and psychosocial variables	1.	2.	3.	4.	5.	6.
1. WISC Full Scale IQ	1.00					
2. WISC Verbal Comprehension	.77*	1.00				
3. WISC Perceptual Reasoning	.78*	.46*	1.00			
4. WISC Working Memory	.71*	.41*	.38*	1.00		
5. WISC Processing Speed	.76*	.34	.54*	.46*	1.00	
6. TONI-3 IQ	.54*	.50*	.32	.59*	.21	1.00

* $p < .05$.

perceptual reasoning and working memory ($r = .45$ and $.60$, respectively), and perceptual reasoning and working memory were positively correlated ($r = .45$).

For the gifted students, as with the other two groups, the WISC-IV full scale IQ was positively correlated with the WISC-IV index scores and the TONI-3 full scale IQ ($r = .54$ to $.78$). The TONI-3 full scale IQ was positively correlated with the verbal comprehension and working memory index scores from the WISC-IV ($r = .50$ and $.59$, respectively), but not with the perceptual reasoning or processing speed index scores ($r = .32$ and $.21$, respectively). All of the WISC-IV index scores were positively correlated within the gifted sample ($r = .38$ to $.54$) with the exception of processing speed and verbal comprehension ($r = .34$).

The correlations between behavioral incidents and academic achievement were also computed. For the total sample, the correlation was $-.35$. The correlation between behavioral incidents and academic achievement was $-.35$ in the regular education group

but was not statistically significant in either the special education group ($r = .13$) or the gifted group ($r = -.30$).

The second research question was: Are there differences in performance between children in the special education group, the gifted and talented group, and regular education group as measured by the WISC-IV and the TONI-3? The results of the six ANOVAs performed to address this question are shown in Table 6. In each case, the ANOVA was statistically significant, indicating that there were differences between the three groups on all six intelligence measures. Therefore, follow-up tests (Tukey HSD tests) were performed for all six measures to determine which group differed from which others.

Eta squared (η^2) was used to calculate the effect sizes for intelligence measures. Eta squared is defined as a measure of effect size that indexes the proportion of variance in the dependent variable as explained by the independent variable.

For the WISC-IV full scale IQ, the regular education ($M = 88.93$) and special education groups ($M = 84.33$) did not differ ($p = .256$), but had lower means than the gifted group ($M = 108.47$; $ps < .0005$). For the verbal comprehension index, the result was the same, with students in the regular education ($M = 89.70$) and special education groups ($M = 88.83$) having equivalent means ($p = .957$), while both of these groups had lower scores than students in the gifted group ($M = 108.27$; $p < .0005$). The same pattern was observed for the perceptual reasoning index scores, with students in the regular education ($M = 96.00$) and special education groups ($M = 89.67$) not differing ($p = .094$), but with both having lower means than those in the gifted group ($M = 108.53$; $p < .0005$).

Table 6

Results of ANOVAs Comparing the Intelligence Scores of the Three Groups

IQ scores and psychosocial variables	<i>F</i>	η^2	Differences
WISC full scale IQ	39.14	.47	R/Sp. < Gifted
WISC verbal comprehension	25.49	.37	R/Sp. < Gifted
WISC perceptual reasoning	20.41	.32	R/Sp. < Gifted
WISC working memory	13.33	.24	R/Sp. < Gifted
WISC processing speed	19.48	.31	R/Sp. < Gifted
TONI-3 IQ	15.49	.26	R/Sp. < Gifted

Note. All *F* tests were statistically significant ($p < .0005$) with 2 and 87 degrees of freedom.

The same pattern was observed for the remaining intelligence measures. For the working memory index, the regular education ($M = 87.30$) and special education groups ($M = 85.23$) did not differ ($p = .798$), but both had lower scores than those in the gifted group ($M = 100.57$; $p < .0005$). For the processing speed index, the scores of those in the regular education group ($M = 91.50$) and the special education group ($M = 85.37$) did not differ ($p = .185$), but both groups had lower scores than those in the gifted group ($M = 106.37$; $p < .0005$). For the TONI-3 full scale IQ, those in the regular education ($M = 91.67$) and special education groups ($M = 85.20$) did not differ ($p = .055$), but both had lower scores than those in the gifted group ($M = 100.50$; $p < .0005$). Because the probability level approached statistical significance for TONI-3 scores of special ed and regular ed groups, a standard mean difference (SMD) effect size was calculated. The

SMD between the two groups was $d = .59$. This a oderate effect size and indicated that the two groups differ by approximately one half a standard deviation.

The third research question was: What is the magnitude and direction of the relationship between IQ scores and psychosocial variables identified? Table 7 shows the correlations between behavioral incidents, academic achievement, and intelligence scores for regular education students. The only statistically significant correlation between behavioral incidents and intelligence scores was a negative correlation with the WISC-IV working memory scale ($r = -.39$). None of the correlations between academic achievement and intelligence were statistically significant, but some approached statistical significance (e.g., academic achievement correlated somewhat with the full scale IQ ($r = .35$), working memory ($r = .34$), and processing speed ($r = .33$)).

Table 7

Correlations Between Psychosocial Variables and Intelligence Scores for Regular Education Students

IQ scores and psychosocial variables	Behavioral incidents	Academic achievement
WISC full scale IQ	-.23	.35
WISC verbal comprehension	-.13	.19
WISC perceptual reasoning	-.10	.08
WISC working memory	-.39*	.34
WISC processing speed	-.02	.33
TONI-3 IQ	-.09	.23

* $p < .05$.

The correlations between the behavioral incidents, academic achievement, and intelligence scores for special education students are shown in Table 8. None of these correlations were statistically significant ($r = -.26$ to $.28$). The same correlations for the gifted group are shown in Table 9, where it can be seen that there are two statistically significant correlations. First, behavioral incidents were negatively correlated with WISC-IV working memory scores ($r = -.37$) as was the case for the regular education students. Second, academic achievement was positively correlated with WISC-IV full scale IQ scores ($r = .37$). In addition, several of the other correlations between academic achievement and the intelligence approached statistical significance ($r = .30$ to $.35$).

Table 8

Correlations Between Psychosocial Variables and Intelligence Scores for Special Education Students

IQ scores and psychosocial variables	Behavioral incidents	Academic achievement
WISC full scale IQ	.15	.00
WISC verbal comprehension	.17	-.26
WISC perceptual reasoning	.25	.17
WISC working memory	.13	-.11
WISC processing speed	-.15	.28
TONI-3 IQ	.06	.10

Table 9

Correlations Between Psychosocial Variables and Intelligence Scores for Gifted and Talented Students

IQ scores and psychosocial variables	Behavioral incidents	Academic achievement
WISC full scale IQ	-.29	.37*
WISC verbal comprehension	-.22	.30
WISC perceptual reasoning	-.23	.19
WISC working memory	-.37*	.30
WISC processing speed	-.08	.32
TONI-3 IQ	-.24	.35

* $p < .05$.

The fourth research question was: Can the behavioral incidents and academic achievement reliably distinguish between the special education group, gifted and talented group, and the regular education group? Table 10 presents the results of the discriminant analysis performed to address this question. Due to the fact that there are three groups in the analysis, there are two discriminant functions. The first function was statistically significant, $\chi^2(4) = 21.62, p < .0005$, while the second was not, $\chi^2(1) = .01, p = .915$. This indicates that the ability of behavioral incidents and academic achievement to differentiate between the three groups is contained in the first function. Therefore, the description of the results will focus on the first discriminant function.

Table 10

*Results of Discriminant Analysis with Psychosocial Variables Predicting Group**Membership*

Discriminant analysis	Function 1	Function 2
Eigenvalue	.28	.00
Canonical correlation	.47	.01
Percentage of variance explained	100.0	0.0
Chi-square (<i>df</i>)	21.62 (4)	.01 (1)
<i>p</i> -value	< .0005	.915
Standardized function coefficients		
Behavioral incidents	-.54	.88
Academic achievement	.72	.73
Functions at group centroids		
Regular education	-.08	.02
Special education	-.60	-.01
Gifted and talented	.68	-.01

The canonical correlation of .47 is the correlation between the first discriminant function and the original variables, and this indicates that the function and the original variables share substantial variance. The standardized function coefficients are the weights that are applied to the behavioral incidents and academic achievement scores to arrive at the first function. The results show a negative weight for behavioral incidents and a positive weight for academic achievement. The first discriminant function is thus defined as $-.54$ times the behavioral incidents score and $.72$ times the academic achievement score, indicating somewhat more influence for the academic achievement

score in terms of its ability to differentiate between the three groups. The functions at the group centroids are the mean scores for the three groups on the discriminant function. It can be seen that the regular education group has a mean near zero (i.e. performed in the middle on the composite of behavioral incidents and academic achievement), while the special education group has a large negative mean (i.e., performed poorly on the composite of behavioral incidents and academic achievement) and the gifted group has a large positive mean. Overall, 48.9% of the cases were correctly classified as regular education, special education, or gifted.

In addition to the analyses described above to address the research questions of the current study, two additional discriminant analyses were performed. First, a discriminant analysis was performed to determine if behavioral incidents and academic achievement could distinguish between the special education and regular education groups. The discriminant function from this analysis was not statistically significant, $\chi^2(2) = 4.61, p = .100$. This indicates that it was not possible to reliably distinguish between the regular education and special education students in this sample based on behavioral incidents and academic achievement.

The second analysis was performed using all study variables (with the exception of the WISC-IV full scale IQ as it is essentially a linear combination of the WISC-IV index scores) to predict group membership. The results of this analysis are presented in Table 11. The first discriminant function was statistically significant $\chi^2(14) = 67.76, p < .0005$, but the second was not, $\chi^2(4) = 7.80, p = .253$. Therefore, interpretation will focus on the first discriminant function.

Table 11

Results of Discriminant Analysis with All Study Variables Predicting Group Membership

Discriminant analysis	Function 1	Function 2
Eigenvalue	1.04	.10
Canonical correlation	.71	.30
Percentage of variance explained	91.5	8.5
Chi-square (<i>df</i>)	67.76 (14)	7.80 (6)
<i>p</i> -value	< .0005	.253
Standardized function coefficients		
Behavioral incidents	-.25	.25
Academic achievement	.16	-.18
WISC-IV VCI	.55	.86
WISC-IV PRI	.28	-.31
WISC-IV WMI	-.02	.45
WISC-IV PSI	.39	.01
TONI-3	.00	-.88
Functions at group centroids		
Regular education	-.43	-.41
Special education	-.96	.32
Gifted and talented	1.39	.09

The canonical correlation of .71 indicates that the function and the predictor variables share substantial variance. The largest positive standardized function coefficients are .55 for the verbal comprehension index, .39 for the processing speed index, and .28 for the perceptual reasoning index. Behavioral incidents (-.25) had a substantial negative weight. Also, the function had negligible contribution for the TONI-3 and the WMI. Thus, the first function is defined primarily as .55 times verbal comprehension scores plus .39 times processing speed scores plus .28 times perceptual

reasoning scores minus .25 times behavioral incidents. The functions at group centroids illustrates that the gifted group has a large positive mean on this function (1.39), indicating higher scores on the three intelligence test scores and low scores on behavioral incidents. The regular education group has a modest negative mean (-.43), while the special education group has a large negative mean (-.96). Overall, 66.7% of the cases were correctly classified as regular education, special education, or gifted.

CHAPTER V

DISCUSSION

Introduction

This chapter will discuss several relevant areas of the research study and results specific to this sample of American Indian children. First, a summary of findings will be presented, followed discussion of conclusions and implications. Then recommendations for future research will be reviewed. Finally, a discussion of recommendations for educational and clinical practice will conclude this chapter.

Summary of Findings

Descriptive analyses of the study data revealed the following. In terms of demographic data, the regular education group was equally split between males and females, while the special education group contained more males than females and the gifted group contained more females than males. Individuals in the special education group tended to have more severe behavioral incidents than the other two groups. As would be expected, individuals in the gifted group were more likely to have exceptional achievement than individuals in the other two groups. Examining the means on the six measures of intelligence (Toni-3, WISC-IV full scale, and the four WISC-IV index scores) for the three groups indicated that gifted students had the highest scores, followed by regular education students, and then special education students.

The WISC-IV full scale IQ score, for all three groups, was positively correlated with all other intelligence measures. For the regular education and special education groups, the TONI-3 full scale IQ score was positively correlated with all WISC-IV index scores except processing speed. For the gifted students, the correlational pattern for the TONI-3 was the same except that the correlation between the TONI-3 full scale IQ score and perceptual reasoning was not statistically significant. Differences between the three groups on all six measures were identified with an omnibus test. Follow-up tests showed that regular and special education groups did not differ significantly, and both had lower scores than the gifted group.

There were some differences among the groups in the relationship between IQ scores and the psychosocial variables. For regular and gifted students there was a statistically significant negative correlation between behavioral incidents and the WISC-IV working memory scale. Full scale IQ scores and academic achievement scores were positively correlated for the students in the gifted and talented program. Interestingly, none of the correlations between the intelligence measures and the psychosocial measures were statistically significant for special education students.

The results of the discriminant analysis identified one statistically significant function that indicates that the psychosocial variables can, in fact, distinguish between the three groups. One discriminant function defined by negatively weighting behavioral incidents and positively weighting academic achievement was able to distinguish the three groups. On the discriminant function, the special education group had low scores and the gifted group had high scores, with the regular education group scoring in between

the other two. Further analysis revealed that it was not possible to reliably distinguish between regular and special education students based on the psychosocial variables. Using all of the psychosocial variables and intelligence test scores indicated that discriminant function defined by verbal comprehension, processing speed, and perceptual reasoning on the one hand and behavioral incidents on the other, reliably distinguished between the three groups.

Conclusions and Implications

Six primary implications of the current study are as follows. First, gifted and talented children are more similar to typical majority populations than either regular education or special education students. Second, special education and regular education individuals in this sample were very similar and could not be distinguished in terms of group membership. Third, while it is possible to statistically predict group membership the ability of such predictions in this sample were weak at best. Fourth, number of behavioral incidents as well as with academic achievement was positively correlated with IQ scores in the special education group but negatively correlated in the gifted and talented and the regular education groups. Fifth, the relationship between scores on the TONI-3 and the WISC-IV varies across groups but is worth investigating. Finally, several broader assessment issues surfaced while examining the sample data. Each of these major implications is discussed below.

*Gifted And Talented Children Are More Similar
To Typical Majority Populations*

The WISC-IV appears to be a good measure for the gifted and talented student's evaluation. The WISC-IV full scale IQ for the gifted students was positively correlated with the WISC-IV index scores and the TONI-3 full scale IQ score ($r = .54$ to $.78$). Also, there was a positive correlation between the TONI-3 and the verbal comprehension and working memory index scores from the WISC-IV. These relationships are consistent with those reported for majority children Wechsler (2003). Thus, it appears that for those children with higher levels of intelligence, the assessment measure chosen may be a less critical decision than with special education children.

*Difficult to Distinguish Special and Regular
Education Group Membership*

Although the TONI-3 was the best at distinguishing special and regular education group membership, it was weak at best. Assuming that a majority of the students in the special education group were diagnosed as Specific Learning Disabled (SLD), and that a normal intelligence score is required for classification as SLD, it would be expected that the two groups have similar intelligence scores. That is, the Individuals with Disabilities Education Improvement Act (2004) requires that students classified as having a specific learning disability must score above the intellectual disabilities range on a test of intellectual ability using a reliable, valid, individually administered and standardized instrument. Approximately 50% of all students classified as having a disability under IDEIA (2004) nationally are classified as having a specific learning disability. The Office of Special Education Programs data reports that that number was up to 63% of

BIA students in the 2001-2002 data report. The results of the current study can be integrated with existing research primarily in terms of the utility of nonverbal measures of intelligence among AI students. One of the motivating factors for the current study was the poor performance of AI students on conventional measures of intelligence such as the WISC-IV full scale IQ. Specifically, potential bias of tests like the WISC-IV against minority groups may result in overidentification of specific learning disabilities (SLD) and subsequent special education placements among AI students (Donovan & Cross, 2002; Gritzmacher & Gritzmacher, 1995). For this reason (among others), nonverbal measures of intelligence that would be more “culturally fair” have been developed (Valencia & Suzuki, 2001). On the other hand, according to the federal definition of a specific learning disability, students must have a normal intelligence score on an IQ test and a severe discrepancy between their ability as measured by the IQ score and their achievement scores in order to be classified as SLD. Thus, if the IQ test scores are below normal because the IQ test is biased against AI students then there is less of a chance that the gap between ability and their achievement will be considered severe. So why is there a higher percentage of special education students classified as SLD especially considering that students are not to be classified as SLD if their learning problems are primarily the result of visual, hearing, or motor disability, intellectual disability, emotional disturbance or environmental, cultural, or economic disadvantage. One possibility is that as Hosp and Reschly (2003) reported,

research generally shows that approximately one-half of the students identified as SLD do not meet their state discrepancy criterion. Educators

often use the team override clause in state regulations when the student does not exhibit a severe discrepancy, but the team believes the student has demonstrated a need for services. (p. 16)

Although this would apply to all students, perhaps it is the teams who are overriding the discrepancy criterion or perhaps teams are ignoring the requirement that children should not be classified as SLD because of visual, hearing, or motor disability, intellectual disability, emotional disturbance or environmental, cultural, or economic disadvantage.

However, in the current study, differences between the special education students and the regular education students were not statistically significant in terms of mean scores on any of the measures of intelligence, verbal or nonverbal. Although the TONI-3 would presumably be a fairer measure of intelligence when used with AI students and thus perhaps better distinguish RE and SE children, no evidence of IQ differences on the TONI-3 were found in the current study. This, then, suggests that perhaps the TONI -3 is no better or worse than the WISC-IV in assessing AI children. At this time, however, such a conclusion would be premature. If, as previously noted, the majority of children were SLD, then no differences would be expected between the two groups on a measure of intelligence. Nevertheless, a number of other disabling conditions may qualify children for special education services. For children who meet other eligibility requirements for special education services, the two measures of intelligence may provide more disparate results.

While the direction of the differences of the mean scores on the six measures of intelligence were consistent with expectations (i.e., the regular education students had

higher means than special education students), they were not statistically significant.

Although the sample size could be an issue, more likely a number of other factors could be at work. For instance, results could be associated with a successful special education program in which students are receiving the assistance they need to be competitive.

Studies focused on special and regular education students and the differences between them may provide insight into this issue.

Prediction of Group Membership Statistically Possible but Poor

Academic achievement and behavioral incidents were shown to have the ability to differentiate between the three groups in the expected manner, with higher academic achievement and lower behavioral incident scores being more likely for students in the gifted group and less likely for students in the special education group, with those in the regular education group falling in between. This is important because the results indicate that several psychosocial variables may aid in the detection and proper identification of students who are struggling and are in need of more educational resources. This type of broader view of disability (e.g., consideration of other psychological risk factors, comorbidity with other mental health disorders) may be particularly important with culturally diverse children, such as American Indians.

While it was statistically possible to predict group membership in this sample, the prediction hit rate was poor at best, and probably not practically relevant. The inability to predict group membership by intellectual, achievement, and behavioral incidents raises a number of important questions in the assessment of AI students. First and foremost, this

highlights that many AI students continually fail to exhibit successful test-taking behaviors and this is likely associated with a multiplicity of underlying causes. While it would be desirable to identify a single “key” factor to distinguish SE from RE children, this is not likely to happen. Further, global indicators of achievement and behavior problems are unlikely to be sufficiently sensitive to distinguish these groups. This challenges research and practitioners to more fully investigate factors that could be used to better identify children in need of services. As is well known, a single intelligence test is not likely to provide a sufficient level of predictive validity to be psychometrically defensible. Of course, as many authors have pointed out, when testing ability, aptitude, and intelligence, one should ensure that the student has had exposure to the experiences assumed in the design of the test, the opportunity to develop the requisite skills, and the circumstances they need in order to value a successful test performance (Armour-Thomas, 1992; Beiser & Gotowiec, 2000; Valencia & Suzuki, 2001). Clearly, this is not the case for many AI and other culturally diverse children, and this provides an on-going challenge for practitioners in the field.

*Behavioral Incidents Positively Correlated
in Special Education*

The demonstration of differences on both of the behavioral incidents and academic achievement scores examined in the current study suggests that there may be other psychosocial differences between students currently placed in the special education, regular education, and gifted programs that should be investigated. In the present sample,

for example, it appears that greater intelligence is associated with stronger relationships between psychosocial variables and intelligence.

*Relationship Between TONI-3 and WISC-IV
Worth Investigation*

Regardless of student group (special education, regular education, or gifted), the WISC-IV full scale IQ test was positively correlated with all other measures of intelligence employed in the current study. Scores on the TONI-3, on the other hand, were not correlated with the WISC-IV processing speed score in any group, and were not correlated with the perceptual reasoning score in the gifted group. Furthermore, there were several differences in the interrelationships among the WISC-IV index scores in the three groups. That is, more of the WISC-IV index scores (all pairs except for processing speed and verbal comprehension) were significantly correlated in the gifted group than in the regular education group (in which only the perceptual reasoning and working memory index scores were correlated) or the special education group (in which the verbal comprehension index score was positively correlated with both perceptual reasoning and working memory, and perceptual reasoning and working memory were positively correlated). As expected, index scores for the gifted students were significantly higher than those obtained by the other two groups. For that reason, these results provide moderate support to the conclusion that the WISC-IV provides scores that are useful in the assessment of intellectual giftedness. However, the differences in relationships are intriguing and worthy of further investigation. Particularly interesting is the differential relationships with the processing speed index score. Culturally, AI children are taught to

value taking one's time, being thoughtful, and not responding too quickly. These characteristics may impact assessments in which speed is an important aspect. Additionally, unlike majority children who value doing well and (if possible) being "first," AI children are taught to not stand out, finish first, or up-stage other children. These cultural differences may have a particularly important impact on some aspects of intelligence testing.

Broader Assessment Issues

Given the fact that the six measures of intelligence examined in the current study were not interchangeable, multiple measures of intelligence could be employed whenever there are questions about the results of a single assessment. It is recommended that when using multiple measures of intelligence, include a verbal measure and a nonverbal measure. Equally important, however, is that psychological examiners should avoid over assessment of AI students. IDEIA (2004) now allows eligibility determination teams to use existing data when conducting initial evaluations if appropriate and when conducting re-evaluations. The teams must consider each child individually, but for a child who has a normal IQ score, the chances of the IQ score changing much over time is small. Furthermore, the individual index scores should be considered when evaluating this population because the data may provide insight into each student's strengths and weaknesses.

This puts practitioners in a true double bind—the need to provide additional, diverse assessments, and the inability and lack of resources to be able to do it. The results of the present study provide little empirical evidence to guide assessment

decisions. However, it appears that the assessment measure chosen to evaluate gifted and talented children may be less critical.

Of course, these types of challenges in the field have resulted in a focus on alternative assessment measures that move away from standardized testing. RTI is one such strategy that may be particularly helpful with AI children. Because many of the students in the special education group may have been classified as SLD, consideration of new assessment practices may prove beneficial (i.e., Response to Intervention). The National Center for Culturally Responsive Educational Systems (NCCRESt, 2006) in the fall of 2005 released a position statement indicating that RTI models do hold potential for the assessment of minority children but only if they are based on students receiving adequate opportunity to learn (as reported in the *Utah Special Educator*, April 2006).

Recommendations for Future Research

The current results indicate that there are a variety of directions for future research. First, the current study focused on AI students, but there are a variety of other minority groups for which an examination of these research questions would be of interest. Despite the fact that AI students are an understudied group, this is also the case with Hispanic and Black students. While the purpose of the current study was to examine the functioning of measures of intelligence in AI students, comparisons with Caucasian samples or samples of other minority groups (e.g., Hispanics or Blacks) would also be of interest.

Second, the current study focused on AI students from a single reservation (the Lake Traverse Reservation in northeastern South Dakota). It would be interesting to determine if the current results are specific to students on this reservation or if they generalize to other AI groups. There are substantial differences between different American Indian reservations and their educational systems. For example, the isolated, rural environment of many reservation settings, the restrictive poverty of many families, and the cultural ties that promote continued identification with the tribe deny students important knowledge of the outside world. AI students' lack of assumed experiences or cognitive structures necessary to respond to certain test items may be caused both by the culture and by the setting in which many children are reared.

Third, the current study employed two of the more popular measures of intelligence (the WISC-IV and the TONI-3), but there are many other measures of intelligence that are used to assess student intelligence. Examining the functioning of other measures of intelligence in AI student groups would be of important to further understanding the optimal way to assess AI children.

Fourth, the current study examined two variables in addition to intelligence and group membership: academic achievement and behavioral incidents. In order to increase our understanding of how intelligence tests function and the ability to make good placement decisions, it would be worthwhile to examine additional psychosocial variables such as socioeconomic status, parental education levels, or personality attributes. Further, as previously mentioned, the academic achievement variable and the behavioral incidence variables were measured in a very broad, global way. Such an

omnibus measure may not been sufficiently specific to be helpful. The inclusion of these two variables provided a first attempt at improving the ecological validity of our assessment measures. However, particularly for the behavioral incidence, more specific information collected over time would like be more useful.

Recommendations for Educational/Clinical Practice

The results of the current study warrant a few recommendations for educational practice involving AI students. As such, the lack of statistically significant differences between the regular education and special education groups in terms of mean scores on the six measures of intelligence indicates that teachers and administrators should be aware that the differences between these groups of students may be negligible regarding IQ. As with any system that involves creating discrete groups, there may be a tendency to consider regular education students and special education students to be entirely different types of students. However, the results of the current study indicate that there may be more similarities among regular education and special education students than there are differences when it comes to scores on intelligence measures but not in other areas such as academic achievement. This may be because these groups of students encounter similar struggles living in rural, reservation environments.

Furthermore, teachers and administrators should be mindful of the fact that the three groups of students do not differ solely in terms of intelligence and that many factors can contribute to group differences. For example, a disorder or disability may compound the effects with increased educational and environmental demands as the child ages.

REFERENCES

- Anastasi, A. (1988). *Psychological testing* (6th ed.). New York: Macmillan.
- Anastasi, A., & Urbina, S. (1997). *Psychological testing* (11th ed.). Upper Saddle River, NJ: Prentice-Hall.
- Apple, M. W. (1996). *Cultural politics and education: The John Dewey lecture series*. New York: Teachers College Press.
- Armour-Thomas, E. (1992). Intellectual assessment of children from culturally diverse backgrounds. *School Psychology Review*, 21, 552-565.
- Atkinson, M. H. (1993). Comparison of volunteer and referred children on individual measures of assessment: A Native-American sample. *Dissertation Abstracts International*, 56(01), 139A.
- Banks, S. R., & Neisworth, J. T. (1995). Dynamic assessment in early intervention: Implications for serving American Indian/Alaska Native families. *Journal of American Indian Education*, 34(2), 27-43.
- Bar-On, R., & Parker, J. D. A. (2000). *BarOn emotional quotient inventory: Youth version*. North Tonawanda, NY: Multi-Health Systems Incorporated.
- Beiser, M., & Gotowiec, A. (2000). Accounting for Native/Non-Native differences in IQ scores. *Psychology in the Schools*, 37(3), 237-252.
- Boring, E. G. (1950). *A history of experimental psychology* (2nd ed.). New York: Appleton-Century-Crofts.
- Bracken, B. A., & McCullum, R. S. (1997). *The Universal Nonverbal Intelligence Test*. Chicago: Riverside.
- Braden, J. P. (2000). Editor's introduction: Perspectives on the nonverbal assessment of intelligence. *Journal of Psychoeducational Assessment*, 18, 204-210.
- Brandt, E. A. (1984). The cognitive functioning of American Indian children: A critique of McShane and Plas. *School Psychology Review*, 13, 74-82.
- Brescia, W., & Fortune, J. C. (1989). *Standardized testing of American Indian students*. Las Cruces, NM: ERIC Clearinghouse on Rural Education and Small Schools.

- Brown, L., Sherbenou, R. J., & Johnson, S. K. (1997). *Examiner's Manual Test of Nonverbal Intelligence: A languagefree measure of cognitive ability* (3rd ed.). Austin, TX: Pro-Ed.
- Ceci, S. J., & Williams, W. M. (1997). Schooling, intelligence, and income. *American Psychologist*, 52, 1051-1058.
- Chavers, D., & Locke, P. (1989, April). *The effects of testing on Native Americans*. Paper commissioned by the National Commission on Testing and Public Policy.
- Chinn, P. C., & Hughes, S. (1987). Representation of minority students in special education classes. *Remedial and Special Education*, 8(4), 41-46.
- Cohen, M. (1997). *Children's Memory Scale*. San Antonio, TX: The Psychological Corporation.
- Coleman, M., Scribner, A. P., Johnsen, S., & Evans, M. K. (1993). A comparison between the Wechsler Adult Intelligence Scale-Revised and the Test of Nonverbal Intelligence-2 with Mexican-American secondary students. *Journal of Psychoeducational Assessment*, 23, 250-258.
- Common, R. W., & Frost, L. G. (1988). The implications of the mis-measurement of native students' intelligence through the use of standardized intelligence tests. *Canadian Journal of Native Education*, 15, 18-30.
- Curran, L., Elkerton, D., & Steinberg, M. (1996, March). *Assessment of American Indian children as measured by the SON-R and WISC-III*. Paper presented at the 28th annual convention of the National Association of School Psychologists, Atlanta, GA.
- Dana, R. H. (1984). Intelligence testing of American Indian children: Sidesteps in quest of ethical practice. *White Cloud Journal*, 3(3), 35-43.
- Dauphinais, P., & King, J. (1992). Psychological assessment with American Indian children. *Applied & Preventive Psychology*, 1, 97-110.
- Donovan, M. S., & Cross, C. T. (2002). *Minority students in special and gifted education*. Washington, DC: National Academies Press.
- Ducheneaux, T. W. (2002). *WISC-III performance patterning differences between Native American and Caucasian children*. Unpublished doctoral dissertation, University of North Dakota, Grand Forks.

- Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test—Third Edition*. Circle Pines, MN: American Guidance Service.
- Estrin, E. T., & Nelson-Barber, S. (1995). Issues in cross-cultural assessment: American Indians and Alaska Native students. *Journal of American Indian Education, 5*, 1-20.
- Fitzgerald, J. A., & Ludeman, W. W. (1926). The intelligence of Indian children. *Journal of Comparative Psychology, 6*, 319-328.
- Flanagan, D. P., Andrews, T. J., & Genshaft, J. L. (1997). The functional utility of intelligence tests with special education populations. In D. P. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 457– 483). New York: Guilford Press.
- Gilliland, H. (1992). *Teaching the Native American* (2nd ed.). Dubuque, MN: Kendal/Hunt.
- Greenbaum, P. E., & Greenbaum, S. D. (1983). Cultural differences, nonverbal regulation, and classroom interaction: Sociolinguistic interference in American Indian education. *Peabody Journal of Education, 61*, 16-33.
- Greenfield, L. A., & Smith, S. K. (1999). *American Indians and crime*. Retrieved May 15, 2004, from the U. S. Department of Justice, Bureau of Justice Statistics, archived at <http://www.ojp.usdoj.gov/bjs/pub/pdf/aic.pdf>
- Gregory, S., & Lee, S. (1986). Psychoeducational assessment of racial and ethnic minority groups: Professional implications. *Journal of Counseling and Development, 64*, 635- 637.
- Gresham, F. M. (2002). Teaching social skills to high-risk children and youth: Preventive and remedial strategies. In M. R. Shinn, H. M. Walker, & G. Stoner (Eds.), *Interventions for academic and behavior problems II: Preventive and remedial approaches* (pp. 403-432). Bethesda, MD: National Association of School Psychologists.
- Grimm, L. G., & Yarnold, P. R. (2002). *Reading and understanding more multivariate statistics*. Washington, DC: American Psychological Association.
- Gritzmacher, H. L., & Gritzmacher, S. C. (1995). Referral, assessment, and placement practices used in rural school districts with Native American students in special education. *Rural Special Education Quarterly, 14*(1), 11–19.

- Hammill, D. D., Pearson, N. A., & Wiederholt, J. L. (1996). *Comprehensive Test of Intelligence--Examiner's Manual*. Austin, TX: Proed.
- Harrison, P. L., & Oakland, T. (2003). *Adaptive behavior assessment system--second edition*. San Antonio, TX: The Psychological Corporation.
- Herbert, M. (2005). Understanding responsiveness to intervention in learning disabilities determination. *The Utah Special Educator*, 26(1), 40-43.
- Hilgard, E. R. (1987). *Psychology in America: A historical survey*. San Diego, CA: Harcourt, Brace, Jovanovich.
- Hosp, J. L., & Reschly, D. J. (2003). The identification of specific learning disabilities: Where it's been, where it's going. *The Utah Special Educator*, 20(1), 6-18.
- Hosp, J. L., & Reschly, D. J. (2004). Disproportionate representation of minority students in special education: Academic, demographic, and economic predictors. *Exceptional Children*, 70(2), 185-199.
- Individual with Disabilities Education Act (IDEA) Amendments of 1997, 20 U. S. C. § 1414, 1997.
- Individual with Disabilities Education Improvement Act of 2004 (IDEIA), H.R. 1350 §614, 2004.
- Jenkins, J. O., & Ramsey, G. A. (1991). Predicting academic success for American Indian students. *Journal of American Indian Education*, 34(2), 11-16.
- Jensen, A. R. (1980). *Bias in mental testing*. New York: Free Press.
- Kirschenbaum, R. (1988). Methods for identifying the gifted and talented American Indian student. *Journal for the Education of the Gifted*, 11(3), 53-63.
- Manuel-Dupont, S. (1990). Literacy skills of American Indian children: Home-language literacy vs. school-language literacy. *Journal of Navajo Education*, 7 (3), 3-16.
- McCullough, C. S., Walker, J. L., & Diessner, R. (1985). The use of Wechsler scales in the assessment of Native Americans of the Columbia River Basin. *Psychology in the Schools*, 22, 23-28.
- McCullum, R. E., & Bracken, B. A. (1997). The Universal Nonverbal Intelligence Test. In D. P. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 3-16). New York: Guilford Press.

- McShane, D. A. (1988). The relationship of intellectual and psycholinguistic abilities to the achievement gains of American Indian children. *Canadian Journal of Native Education, 15*, 66-86.
- McShane, D. A., & Plas, J. M. (1982). Wechsler scale performance patterns of American Indian children. *Journal of Psychology in the Schools, 19*(1), 8-17.
- Mishra, S. P. (1982). The WISC-R and evidence of item bias for Native American Navajos. *Psychology in the Schools, 19*, 458-461.
- Mishra, S. P., & Lord, J. (1982). Reliability and predictive validity of the WISC-R with Native American Navajos. *Journal of School Psychology, 20*, 150-154.
- Mishra, S. P., Lord, J., & Sabers, D. L. (1989). Cognitive processes underlying WISC-R performance of gifted and learning disabled Navajos. *Psychology in the Schools, 26*, 31-36.
- Naglieri, J. A., Kamphaus, R. W., & Kaufman, A. S. (1983). The Luris-Das simultaneous-successive model applied to the WISC-R. *Journal of Psychoeducational Assessment, 2*, 25-34.
- Naglieri, J. A., & Prewett, P. N. (1990). Nonverbal intelligence measures: A selected review of instruments and their use. In C. R. Reynolds & R. W. Kamphaus (Eds.), *Handbook of psychological and educational assessment of children: Intelligence and achievement* (pp. 348-370). New York: Guilford Press.
- National Center for Culturally Responsive Educational Systems (NCCRESt). (2006). *Cultural considerations and challenges in Response-to-Intervention models*. Retrieved August 1, 2006, from <http://www.updc.org/frame.html?content=http%3A//www.updc.org/library/speducator/index.htm>
- Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., et al. (1996). Intelligence: Knowns and unknowns. *American Psychologist, 51*, 77-101.
- Oetting, E. R., & Beauvais, F. (1990). Orthogonal cultural identification theory: The cultural identification of minority adolescents. *International Journal of Addictions, 25*, 655-685.
- Pfeiffer, S., & Jarosewich, T. (2003). *Gifted rating scale*. San Antonio, TX: The Psychological Corporation.
- Phinney, J. S. (1991). Ethnic identity and self-esteem: A review and integration. *Hispanic Journal of Behavioral Sciences, 1*, 193-208.

- Plank, G. A. (2001). Application of the cross battery approach in the assessment of American Indian children: A viable alternative. *American Indian and Alaska Native Mental Health Research*, 10(1), 21-33.
- Raven, J., Raven, J. C., & Court, J. H. (1995). *Manual for Raven's Progressive Matrices and Vocabulary Scales-Section 1: General overview* (1995 ed.). Oxford, England: Oxford Psychologists Press.
- Reynolds, C. R. (1982). The problem of bias in psychological assessment. In C. R. Reynolds & T. B. Gutkin (Eds.), *The handbook of school psychology* (pp. 178-208). New York: Wiley.
- Reynolds, C. R., & Kaufman, A. S. (1990). Assessment of children's intelligence with the Wechsler Intelligence Scale for Children-Revised (WISC-R). In C. R. Reynolds & R. W. Kamphaus (Eds.), *Handbook of psychological and educational assessment of children: Intelligence and achievement* (pp. 127-165). New York: Guilford.
- Roid, G. H., & Miller, L. J. (1997). *Leiter International Performance Scale-Revised*. Wood Dale, IL: Stoelting.
- Sattler, J. M. (1992). *Assessment of children* (3rd ed., rev.). San Diego, CA: Author.
- Senior, S. (1993). Canadian native intelligence studies: A brief review. *Canadian Journal of Native Education*, 20, 148-156.
- Six Killer-Clarke, A. (2002). *Social and emotional distress among American Indian and Alaska Native students: Research findings*. Retrieved May 08, 2004 from Indian EduResearch.Net, Eric Digest, from <http://www.ael.org/snaps/edorc01-11.htm>
- Suzuki, L. A., & Valencia, R. R. (1997). Race-ethnicity and measured intelligence. *American Psychologist*, 52(10), 1103-1114.
- Teeter, A., Moore, C. L., & Peterson, J. D. (1982). WISC-R verbal and performance abilities of Native-American students referred for school learning problems. *Psychology in the Schools*, 19, 39-44.
- Tonemah, S. A. (1991). Philosophical perspectives of gifted and talented American Indian education. *Journal of American Indian Education*, 31(1), 3-14.
- Trimble, J. E. (1990). Ethnic specification, validation prospects, and the future of drug use research. *International Journal of Addictions*, 25, 149-170.
- Turkey, J. W. (1977). *Exploratory data analysis*. Reading, MA: Addison-Wesley.

- Utter, J. (1993). *American Indians: Answers to today's questions*. Lake Ann, MI: National Woodlands.
- U. S. Department of Health and Human Services. (1999). *1998-1999 trends in Indian health*. Retrieved May 15, 2004, from the Office of Planning, Evaluation, and Legislation, Indian Health Service, via their website at <http://www.his.gov/PublicInfo/Publications/trends98/trends98.asp>
- Valencia, R. R., & Suzuki, L. A. (2001). *Intelligence testing and minority students: Foundations, performance, factors, and assessment issues*. Thousands Oaks, CA: Sage.
- Vraniak, D. (1994). Native Americans. In R. J. Sternberg (Ed.), *Encyclopedia of human intelligence* (pp. 747-754). New York: MacMillan.
- Wechsler, D. (1981). *Wechsler Adult Intelligence Scale-Revised*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (1991). *The Wechsler Intelligence Scale for Children-Third Edition*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (1999). *Wechsler Abbreviated Scale of Intelligence*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (2003). *The Wechsler Intelligence Scale for Children-Fourth Edition: Technical and interpretive manual*. San Antonio, TX: Harcourt Assessment.
- Whorton, J. E., & Morgan, R. L. (1990). Comparison of the Test of Nonverbal Intelligence and Wechsler Intelligence Scale for Children-Revised in rural Native American and White children. *Perceptual & Motor Skills*, 70, 12-14.
- Wigdoor, A. K., & Garner, W. R. (1982). *Ability testing: Uses, consequences and controversies* (Pts. 1 & 2). Washington, DC: National Academy Press.
- Woods, S. B., & Achey, V. H. (1990). Successful identification of gifted racial/ethnic group students without changing classification requirements. *Roeper Review*, 13 (1), 21-26.
- Zarske, J. A., Moore, C. L., & Peterson, J. D. (1981). WISC-R factor structure for diagnosed learning disabled Navajo and Papago children. *Psychology in the Schools*, 18, 402-407.

APPENDICES

Appendix A:
Parental Consent and Child Assent Form

INFORMED CONSENT

Assessing the Cognitive Abilities in a Sample of Dakota Sioux Children Utilizing Traditional and Non-Verbal Measures of Intelligence

Introduction:

Dr. Susan L. Crowley (Principal Investigator) in the Department of Psychology at Utah State University, and Norman C. Johnson (Doctoral Student), would like to conduct research to investigate if new intelligence tests are good tools to use with American Indian children.

Purpose:

The purpose of this project is to look at the way new tests measure intelligence. The Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV) and the Test of Nonverbal Intelligence – Third Edition (TONI-3), are reported to be good measures of intelligence in children and will be used in this research. Approximately 90 students will be involved with this study.

Procedure:

If you give permission, and if your child agrees to participate, the following procedures will take place:

1. My child will take two intelligence tests which will take approximately one and a half hours.
2. The researchers have your permission to obtain your child's GPA scores from the Registrar's office.
3. The researchers have your permission to obtain the number of behavioral incidents (if any) from the Registrar's office.
4. Data will be coded to link child to their GPA scores, behavioral incidents and test results.
5. Identifiable information will be kept until completion of the study, approximately 12 months, then destroyed at that time.
6. The study will take place at Tiospa Zina Tribal School and will be take place during school hours. If parents would like their child to participate but not be taken out of class time, then testing may be completed after school hours at the parents convenience.

Risks:

There are no anticipated risks to this research.

Benefits:

The potential benefits your child may receive for participating in this study include an increased knowledge about how they solve problems, and if these measures are a better way to assess intelligence in children.

Voluntary nature of participation and right to withdraw without consequences:

Your choice to have your child participate is a voluntary one. Your child may withdraw at anytime without consequences.

Confidentiality:

All test information collected will be kept confidential. The data collected will be stored in a locked filing cabinet in the student researcher,s office. Those students receiving Special Education services, their protocols will be turned over to the Special Education department to be included in the students file and/or destroyed. The other students in the study, there protocols will be destroyed upon coding of their data. The researcher is available to answer any questions or concerns with this study. If you have any questions concerning your child's rights as research subject, you may call Susan L. Crowley, Ph.D. (Doctoral Advisor/Chairperson) at 435-797-1460 or Norman C. Johnson (Student Researcher) at 866-880-2145.

IRB Approval Statement:

The Institutional Review Board (IRB) for the protection of human participants at Utah State University (USU) has reviewed and approved this research. If you have any questions or concerns about your rights as a participant or your child's rights, you may contact the IRB at (435) 797-1821.

Copy of Consent:

Two copies of the Informed Consent have been provided for your signature. Please sign both copies and retaining one for your files and returning the second copy to Norman C. Johnson.

Investigator Statement:

I hereby certify that to the best of my knowledge, the person who is signing this Informed Consent understands clearly the nature, demands, benefits, and risks involved in his/her child's participation in this study and any questions have been answered.

Student's Name (please print)

Parent/Guardian Signature

Date

- I would like a copy of my child's results sent to me.

Child Assent:

I understand that my parent (s)/guardian is/are aware of this research study and that permission has been given for me to participate. I understand that it is up to me to participate even if my parents say yes. If I do not want to be in this study, I do not have to and no one will be upset if I do not want to participate or if I change my mind later and want to stop. I can ask any questions that I have about this study now or later. By signing below, I agree to participate.

Name:

Date:

Appendix B:
Demographics Form

Appendix C:
Tiospa Zina Tribal School Board
Research Approval Letter

TIOSPA ZINA TRIBAL SCHOOL

PO Box 719, Agency Village, SD 57262-0719
 Telephone (605) 698-3954 Fax (605) 698-7766 [Http://www.wambdi.bia.edu](http://www.wambdi.bia.edu)



Serving the
 Educational
 Needs
 of the
 Seven Districts
 on the
 Lake Traverse
 Reservation

June 16, 2004

Norman Johnson
 8 Aggie Village Apt J
 Logan, Utah 84341

Iyakaptapi
 (Big Coulee)

Dear Norman,

Congratulation, your Proposed Dissertation Research Study has been approved as presented to the Sisseton Wahpeton School Board.

Caniyonsapapi
 (Buffalo Lake)

I have attached a copy of the board minutes that reflects that motion.

If you have any questions please call to (605)698-3953 ext. 3207

Toka Nuwan
 (Enemy Swim)

Sincerely,

Dr. Roger Bordeaux,
 Superintendent

Ileipa
 (Veblen)

Bhedhda
 Kinyan
 (Lake Traverse)

Kaksiza
 Hanska
 (Long Hollow)

Ateyapi Tipi
 (Old Agency)

Home of the Wambdi

CURRICULUM VITAE

NORMAN CHRIS JOHNSON

P.O. Box 854
Rosebud, SD 57570
Home: (605) 208-6516
E-Mail: Indian Prayer@hotmail.com

EDUCATION

- Ph.D. 2006 Utah State University
 Logan, Utah
 Professional-Scientific Psychology Program
 (APA approved combined clinical-counseling-school)
- M.S. 2000 Utah State University
 Logan, Utah
 Psychology
- B.A. 1995 University of North Dakota
 Grand Forks, ND
 Social Sciences
- A.A. 1992 Sinte Gleska University
 Rosebud, SD
 Psychiatric Technology / Human Services

AWARDS AND HONORS

Indian Health Service – Health Professions Scholarship, 1997 – 2001
 Member of Native American Tasks Force, Utah State University 1997 – 2000
 USU Native American Student Council, Treasurer, 1997 – 1998
 Sinte Gleska University AVT Scholarship, 1998 & 2000
 Bureau of Indian Affairs Graduate Scholarship, 1996 & 1997
 American Indian Affairs, Inc. Health Professions Scholarship, 1996
 Indian into Medicine (INMED), Vice-President, University of North Dakota, 1994-1995
 National Presbyterian American Indian Scholarship, 1993 – 1995
 Sinte Gleska University Human Services Scholarship, 1990 – 1991

Dissertation

Dissertation: Assessing the Cognitive Abilities in a Sample of Sioux Children Utilizing Traditional and Non-Verbal Measures of Intelligence.

Advisor: Susan L. Crowley, Ph.D.

PROFESSIONAL EXPERIENCE

Predoctoral Internship, Veterans Administration Black Hills Health Care System Predoctoral Psychology Internship Program

Ft. Meade, SD. (09/2005 to 08/2006)

Supervisor: Mary Clearing-Sky, Ph.D.

- ❖ Provided individual psychotherapy to Native American clients
- ❖ Provided family and group counseling to Native American clients
- ❖ Provided seminar's and presentations to Native American communities
- ❖ Collaboration and Consultation with Tribal, State, and Federal agencies
- ❖ Received and provided training in cultural diverse mental health issues

Faculty Member, Sinte Gleska University

Mission, SD. (08/2004 to 08/2005).

Supervisor: Marion Pusateri, Ph.D.

- ❖ Faculty for Master's of Arts Degree in Human Services Department
- ❖ Administrator of Employee Assistance Program
- ❖ Administrator of Student Assistance Program
- ❖ Academic Advisor for Undergraduate Mental Health Program

Academic Counselor, Sisseton Wahpeton College

Agency Village, SD. (09/2003 to 02/2004).

Supervisor: Ms. Diana Canku, Director of Voc. Ed. Program

- ❖ Provided career and academic counseling to students
- ❖ Provided financial aid counseling with students
- ❖ Administered Student Emergency Relief Funds
- ❖ Provided guidance to SWC Student Council
- ❖ Provided individual counseling and referrals to students
- ❖ Taught "Ethics for Counselors" Fall Semester 2003

School Counselor, Tiospa Zina Tribal School

Agency Village, SD. (08/2002 to 09/2003).

Supervisor: Principal Ron Campbell

- ❖ Provided student scheduling of classes
- ❖ Provided career and academic counseling to students
- ❖ Directed SD state and BIA testing
- ❖ Provided individual counseling for students
- ❖ Provided group counseling for students
- ❖ Provided training to staff on issues related to students
- ❖ Member of school grievance committee

Program Director, Little Voices Group Home

Agency Village, SD. (05/2001 to 06/2002).

Supervisor: Michael E. Peters, SWO Secretary

- ❖ Provided program planning and to participate in the formulation and carrying out of new and current policies and procedures.
- ❖ Responsible for interpreting the program's policies and financial needs to the appropriate persons and/or agencies for making budgetary appropriations.
- ❖ Provided supervision, advice, counseling, and guidance to Family Therapist, Child Care Worker Supervisor, and any other staff on a weekly basis or as needed.
- ❖ Maintained a record system for filing of confidential client information, financial, and personnel records.
- ❖ Conducted weekly staff meetings with all employees together regarding policies, procedures, client treatment, and in-service training.

Graduate Student Intern, Bear River Mental Health, Inc.

Logan, Utah. (09/2002 to 05/2001).

Supervisor: Leland J. Winger, Ph.D.

- ❖ Provided individual therapy.
- ❖ Provided group therapy.
- ❖ Provided psychological evaluations for the 1st Judicial Court of Utah, Logan School District, and the Department of Social Services.
- ❖ Provided consultation with Dept. of Social Services Child Protective Services Division.

- ❖ Provided consultation with Cache County Jail.
- ❖ Provided consultation with mental health Day Treatment Program.
- ❖ Provided crisis-call coverage one day per week.
- ❖ Provided crisis counseling at Behavioral Health Unit, Logan Regional Hospital.
- ❖ Involved in weekly staffing meetings of emergency mental health placements.

Graduate Assistantship SRL Monitoring, Center for Persons with Disabilities.

Logan, Utah. (09/1997 to 06/ 2000).

Supervisor: Margaret Lubke, Ph.D.

- ❖ Compliance monitoring of the Bureau of Indian Affairs schools special education regulations.
- ❖ Training of BIA special education directors on new IDEA '97 regulations.
- ❖ Development of implementation plan for new IDEA '97 regulations for BIA schools.
- ❖ Compliance monitoring for the States of Washington and Hawaii.

Teaching Assistant, Department of Psychology, Utah State University.

Logan, Utah. (09/1999 to 05/2000).

Professor: Carolyn Barcus, Ed.D.

- ❖ Provided assistance with approximately 30% of lectures.
- ❖ Tracked all student assignments.
- ❖ Provided tutorial assistance on as needed basis.

Native American Liaison, Office of Multicultural Student Affairs, Utah State University.

Logan, Utah. (02/1998 to 02/1999).

Supervisor: Jim Barta, Ph.D.

- ❖ Provided advisement services for Native American students on campus (academic, financial, and career).
- ❖ Provided recruitment and retention services for Native Americans interested in USU.
- ❖ To provided a liaison between the Native American students and administration at USU.

Graduate Assistantship, American Indian Support Project, Dept. of Psychology, USU.

Logan, Utah. (09/1996 to 09/1997).
Supervisor: Carolyn Barcus, Ed.D.

- ❖ Contributed to proposals for funding of the AISP.
- ❖ Developed a video for the AISP.
- ❖ Updating of the AISP library.
- ❖ Provided technical assistance to Project Director.

Graduate Assistantship, Center for Persons with Disabilities, USU.

Logan, Utah. (10/1995 to 06/1996).
Supervisor: Richard Roberts, Ph.D.

- ❖ Conducted research and data collection on Navajo Early Intervention Project.
- ❖ Contributed to the development of National Early Childhood Conference for Navajo Early Intervention Project.

Peer Counselor, University of North Dakota, Native American Programs.

Grand Forks, ND. (09/1994 to 05/1995).
Supervisor: Leigh Jeanotte, Ed.D.

- ❖ Worked with incoming Native American freshmen with adjustment to college life.

Alcohol/Drug Counselor, Tekawitha Adolescent Treatment Center.

Sisseton, SD. (01/1993 to 05/1993).
Supervisor: Clayton Hough, M.S.

- ❖ Provided group and individual therapy with Native American clients.

Alcohol/Drug Counselor, Dakota Pride Center.

Agency Village, SD. (09/1992 to 10/1992).
Supervisor: Susan Thompson

- ❖ Provided group and individual therapy.
- ❖ Provided case management of inpatient clients.

Alcohol/Drug Counselor, Little Hoop Lodge.

Mission, SD (10/1991 to 9/1992).

Supervisor: Robert Swimmer, CCDC-III.

- ❖ Provided group and individual therapy.
- ❖ Provided case management of inpatient clients.
- ❖ Provided intake counseling.
- ❖ Provided aftercare services for clients.

SUPERVISED EXPERIENCE

Doctoral Practica (8 quarters & 2 semesters).

Settings: Utah State University, Dept. of Psychology Community Clinic
Utah State University, Student Counseling Center
Oakwood Elementary, Preston, ID
Tiospa Zina Tribal School, Agency Village, SD

Populations: Children, adolescents, adults with psychological, developmental, adjustment, and personality disorders.

Duties: Individual therapy, group therapy, marital counseling, family therapy, psychological assessment and evaluation, and school psychology consultation.

Supervisors: Susan L. Crowley, Ph.D.; Kevin S. Masters, Ph.D.; David W. Bush, Ph.D.; David Forbush, M.S.; & Sharon Johs, M.S.

RESEARCH EXPERIENCE

Undergraduate Research Assistant, University of North Dakota.

Grand Forks, ND. (09/1994 to 06/1995).

Supervisor: J.D. McDonald, Ph.D.

“Measurement of acculturation levels among Native Americans.”

Undergraduate Research Assistant. University of North Dakota.

Grand Forks, ND. (09/1993 to 05/1994).
Supervisor: Jeff Holm, Ph.D.

“Measuring of pain differences among athletes and non-athletes.”

Undergraduate Research Assistant. University of North Dakota.

Grand Forks, ND. (06/1993 to 09/1993).
Supervisor: Linda Gourneau, M.D.

“Differences in learning styles among Native Americans.”

NATIONAL & STATE PROFESSIONAL PRESENTATIONS

Johnson, N.C. (June, 2006). Assessing cognitive abilities in a sample of Sioux children utilizing traditional and non-verbal measures of intelligence.

Poster presentation at Society of Indian Psychologists and Graduate Students 19th Annual Conference, Logan, UT.

Lubke, M. & Johnson, N.C. (July, 1998). What is Special Education Monitoring and Why?

Presentation at National Indian School Board Association Conference, Minneapolis, MN.

Johnson, N.C. (June, 1998). American Indians and Mathematics.

Presentation at summer Enrichment Program for New Teachers, Utah State University, Logan, UT.

Johnson, N.C. & Menlove, R. (January, 1998). Implications of the Individuals with Disabilities Education Act (IDEA) '97 on Individualized Education Plans (IEP) for special educators.

Presentation at National On-site visit of Office of Special Education and Bureau of Indian Affairs – Branch of Exceptional Education, Albuquerque, NM.

Johnson, N.C. & Thomas-Morris, C. (February, 1997). Report of Tribal Part H & Part B

Services of IDEA.

Presentation at 1996 National Early Childhood Conference, Albuquerque, NM.

LOCAL PRESENTATIONS GIVEN

Johnson, N.C., Matt, G., & Capitan, M. (June, 2000).

Counseling Native Americans.

Non-stereotypic Counseling (Psy 6290)

Utah State University

Johnson, N.C. & O'Leary, B. (December, 1997).

Counseling Native Americans.

Multicultural Counseling (Psy 550)

Utah State University

Johnson, N.C., Williams, M.S., & Thomas, C. (January, 1996).

Counseling Native Americans.

Non-stereotypic Counseling (Psy 629)

Utah State University

PROFESSIONAL MEMBERSHIPS

Society of Indian Psychologists (Graduate Student Member), 1996 –2006.

American Psychological Association (Graduate Student Affiliate), 1996 – 2000; 2005-2006.

National Association of School Psychologists, 1998 – 2000.

APA Division of Clinical Psychology (Student Affiliation), 1999.

American Indian Science and Engineering Society (AISES), 1997 – 1999.

REFERENCES

Carolyn Barcus, Ed.D.
Department of Psychology
2810 Old Main Hill
Logan, UT 84322-2810
(435) 797-1460

Margaret M. Lubke, Ph.D.
Summit Research
2811 Old Main Hill
Logan, UT 84322-2811
(435) 797-4536

Roger C. Bordeaux, Ed.D.
Tiospa Zina Tribal School
P.O. Box 719
Agency Village, SD 57262
(605) 698-3953

Doctoral Advisor: Susan L. Crowley, Ph.D.
Department of Psychology
Utah State University
Logan, UT 84322
(435) 797-1251