Convergent and discriminate validity of acculturation and eating disorders measures in Northern Plains Native Americans

Mary J. Wilkie

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CONVERGENT AND DISCRIMINANT VALIDITY OF ACCULTURATION AND EATING DISORDERS MEASURES IN NORTHERN PLAINS NATIVE AMERICANS

by

Mary J. Wilkie
Master of Arts, University of North Dakota, 1998

A Dissertation

Submitted to the Graduate Faculty

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for the degree of

Doctor of Philosophy

Grand Forks, North Dakota
August
2002
This dissertation, submitted by Mary J. Wilkie in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

[Signature]
(Chairperson)

This dissertation meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

[Signature]
Dean of the Graduate School

Date: July 23, 2009
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ABSTRACT

Many cross-cultural researchers postulate that cultural orientation and competence have a profound impact on the thoughts, feelings, beliefs, and behaviors of all people and of cultural/racial/ethnic minorities in particular. Similarly, the Orthogonal Theory of Biculturalism (Oetting & Beauvais, 1990) suggests those more Bicultural minority-culture members (i.e. culturally competent in both realms) will experience greater life success, less psychopathology, and better physical health. Despite a great deal of interest and anecdotal writings, neither of these hypotheses has been conclusively demonstrated. It is my belief the largest challenge in clarifying the relationships between these constructs lies in enhancing our knowledge of the psychometric properties of the instruments used to measure them. Some research (Wilkie, 1998) suggests available measures of Biculturalism, such as the Northern Plains Biculturalism Inventory (NPBI: Allen & French, 1994), are hampered by construct and cultural validity weaknesses that limit their usefulness in significantly contributing to our increased understanding of the effects of Biculturalism on any dependent variable.

The purpose of my dissertation research was to analyze the convergent and discriminant validity of the NPBI by correlating its scores from 205 (79 male, 126 female) Native American participants with subsequent scores from another commonly-used Biculturalism measure, the American Indian Cultural Orientation Scale (AICOS) by LaFromboise and Rowe (1995), along with scores from two theoretically unrelated scales
measuring eating disorder attitudes and behaviors. It was hypothesized the NPBI and AICOS scores would be highly correlated with each other (displaying convergent validity) yet orthogonal to the eating disorder scales, thereby displaying discriminant validity. This effort was conducted using the Multitrait-Multimethod Correlation Matrix design proposed by Campbell and Fiske (1959). The hypothesis was supported as correlations between the NPBI and the AICOS were positive and significant, yet were statistically unrelated to either the Eating Attitudes Test (EAT-26) or the Eating Disorder Inventory-2 (EDI-2). Study limitations and suggestions for future research are also detailed.
CHAPTER I. INTRODUCTION

Many cross-cultural psychologists suggest psychological assessment instruments are biased against minority groups, particularly Native Americans (Dana, 1993). Many assessment tools are standardized on predominantly middle-class, Caucasian subjects (Dana, 1993; Sue & Sue, 1990). Elevated scale scores, which in turn may lead to misdiagnosis and over-pathologizing, occur when cultural and language differences are not accounted for in scale development, administration, scoring and interpretive processes (Hoffmann, Dana, & Bolton, 1985). Some have argued that culture is a significant mediator, if not a predictor, of human cognition and behavior (Matsumoto, 2000; McDonald, Morton, and Stewart, 1992). An assessment of a Native American client’s level of Biculturalism should therefore be among the most important clinical factors a mental health professional could seek, yet no appropriately standardized instruments exist. Research in the area of modifying and/or creating such assessment tools is obviously required. This area of Native American mental health research could greatly benefit both Native people and the field in general by recognizing cultural differences when assessing a client and the validity, or lack thereof, of measures often used with clients from all cultures but standardized on only a few. This study attempted some small but significant preliminary steps in that direction.
Definitions of Key Terms

McDonald, Morton, and Stewart (1993) define Native Americans/American Indians as anyone belonging to a federally, state, or locally recognized tribe through blood quantum or descendency, and/or anyone adopted into such a tribe through a tribal ceremony and attempts to live within the tribal customs. Oetting and Beauvais (1990) describe biculturalism as being immersed in one culture while acquainting with another, thus becoming highly identified with both cultures without losing the identity or competence of either. McDonald et al. describe biculturalism as possessing knowledge of two cultures' values and behaviors simultaneously without sacrificing identification with either.

LaFromboise, Coleman, and Gerton (1993, p. 396) offer the following list of criteria to achieve cultural competence: strong personal identity, knowledge of and facility with the beliefs and values of the culture, display sensitivity to the affective processes of the culture, communicate clearly in the language of the given cultural group, perform socially sanctioned behavior, maintain active social relations within the cultural group, and negotiate the institutional structures of that group. The Orthogonal Theory of Biculturalism (Oetting & Beauvais, 1990) suggests Bicultural competence, correlates positively with better mental health and overall functioning. If one's identification is low with both cultures (i.e. Marginal), mental health and functional problems will increase. More Traditional ethnic minorities highly identify with their culture of origin, but low in the Majority Culture. Finally, more Assimilated minorities identify less with their culture.
of origin and high with the dominant culture. Figure 1 shows the four Biculturalism quadrants proposed by Oetting and Beauvais.

![Orthogonal Theory of Biculturalism](image)

**Figure 1. Orthogonal Theory of Biculturalism (Oetting and Beauvais, 1990)**

EACT refers to European American Cultural Identification
AICI refers to American Indian Cultural Identification

Literature Review

There have been a limited number of studies seeking to develop acculturation measures for ethnic minorities in general and even fewer for use with Native Americans. Olmedo and Padilla (1978) attempted to provide construct validity of an acculturation measure for Mexican Americans. The measure was a 20-item self-report questionnaire asking about language, nationality, and occupational status as well as the strength of the concepts of mother, father, and male. The study’s participant sample consisted of 16
first- and 26 third-generation Mexican Americans as well as 26 White participants. Results suggested that White participants were (understandably) more Acculturated, followed by the third-generation Mexican Americans and, finally, the first-generation Mexican Americans scoring lowest on the acculturation subscale. Further analysis suggested those identifying as acculturated reported themselves as Mexican (43%), Catholic (88%), live in “single-family” households (75%), have minimal education (compared to the other 2 groups) (41%), and lower paying jobs (53%). The more acculturated Mexican Americans identified themselves to be Mexican American (20%) or White (53%), Protestant (47%) or atheist (12%), had higher educational levels (53%) and 13% had better paying jobs as compared to their less acculturated counterparts. It is interesting to note that the majority (53%) of the more acculturated groups also lived in nuclear households. One might hypothesize the more traditional families would refer to themselves as “extended family” households. This is possibly a result of acculturative stress brought on by adjusting to the American lifestyle and economic necessity. Buriel (1994) also tested generations of Mexican-Americans and Euro-Americans, examining the effects of acculturation and respect for cultural differences. Buriel’s study differed from Olmedo and Padilla’s in that he assessed grade school children, ages 7-9, and used teacher-rating scales as the database. The acculturation results were similar to those of Olmedo and Padilla. There were no significant differences with respect to cultural differences; the participants indicated an acceptance and appreciation of different cultures found in their environment.
Singh (1994) studied the relationship between mental health and acculturation among members of the Oraon tribe in India. Results indicated the more traditional participants reported fewer mental health problems, with females experiencing higher distress than males. The gender difference was interpreted as men having more freedom to acculturate while females assumed the more traditional and subservient role because of cultural gender role expectations. Damji, Clement, and Noels (1996) examined the variances in acculturation, self-esteem, and mental health of Anglophone natives in a Canadian university. In this study, the majority culture is Anglophones (English-speaking) and the minority culture being the Francophones (French-speaking). One significant facet of this study by Damji et al. was the observed stress associated with varying degrees of cultural identity. The authors wanted to know if bicultural identity was associated with increased or decreased stress. Two hundred ninety-five students at a bilingual university in Canada participated in this study. The majority (95.5%) of the participants identified themselves as Anglophones, with English as their primary language. The remainder of the participants considered French (3.4%) or being bilingual (1.0%) their linguistic identities. Results of this component of the study suggested those participants identifying with only one cultural group (particularly their original culture) perceived more stress than those reflecting additional levels of identity. Several simple analyses of variance (ANOVAS) were performed utilizing degree (high vs low) of cultural identification as grouping variables. These ANOVAs were followed by Tukey tests to ascertain any notable interactions. The number of participants from each identity category was unfortunately not provided. The results suggested those identifying
exclusively with their original group (Anglophones) had increased depressive symptoms, lower self-respect, and perceived a more stressful environment. Rissel (1997) also developed an acculturation scale to gauge patients’ choices for engaging in medical finding discussions. The participant sample consisted of 322 Arabic-speaking males and 526 Arabic-speaking females in Australia served by Arabic-speaking doctors. Acculturation scores were broken down into low, medium, and high levels. Internal reliability (Chronbach’s Alpha) tests revealed a slightly positive skew towards the low end of the acculturation scale score distribution. Scores showed less acculturated participants wanted the doctor to tell the family, but not the patient, if the patient had a life-threatening illness such as cancer (n = 213). Further, this same group also preferred the doctor to make such decisions as using life-supporting machines. A series of multiple regression analyses correlated acculturation with various factors such as age, gender, and education. Although age and gender were not separately correlated with acculturation scores, highest educational attainment was. The authors suggest higher education and facility with English were related to higher acculturation scores. Unfortunately, many cross-cultural researchers created acculturation measures exclusively for their particular studies. Few researchers have attempted to develop standardized scales for empirical use. Fewer still incorporate their measures to test with other cultural variables, particularly with Native American participants. The very few studies to attempt this feat are discussed below.
Cultural Orientation Studies with Native Americans

Lefley (1976) examined acculturation, maternal child-rearing practices, and self-esteem in two Florida tribes, the Miccosukee (n = 34 children, 13 mothers) and the Seminole (n = 38 children, 19 mothers). Acculturation levels were determined by behaviors, politics, and environmental conditions (i.e. proximity to nearest city). Based on these data, Lefley described the Seminole tribe as more acculturated than the Miccosukee. Analysis of variance results suggested the less acculturated tribe (Miccosukee) displayed relatively greater positive self-concept, globally as well as culturally. It should also be noted that this tribe had more similarity to majority culture child-rearing practices than the more acculturated tribe (Seminole). Rosenthal (1974) conducted a longitudinal study of Chippewa children of Wisconsin to record the development of the Native identity of the children. His conclusions suggested young children have very low self-esteem when asked about their Native identities, but self-esteem increases with age as the children gain a clearer identification with their heritage. Unfortunately, the author again did not utilize a standardized acculturation measure. Rosenthal's data-gathering efforts were mostly qualitative in nature, thus we learn little regarding empirical acculturation measurement processes.

Boyce and Boyce (1983) compared cultural incongruities between community and family life for 60 Native students (32 females, 28 males) attending boarding school for the first time and frequency of reported illnesses. Cultural incongruities were defined as the differences in levels of acculturation experienced in the community and within the family setting. Results suggested those students reporting the highest cultural
ncongruity (i.e. traditional family living in a contemporary town) also recorded the most clinic visits for mental or physical health issues.

Halpin, Halpin and Whidden (1985) compared Native American (n = 66) and White (n = 88) teenagers from the same school on aspirational levels when affected by varying failures, successes, or monetary incentives. Variable such as self-concept, gender, ethnicity, and locus of control were investigated as possible moderating variables. Self-concept (SS = 2.19, p< .05) was the only moderating variable which contributed to the effect of success on an aspirational level. This was discovered through factor analyses of the measures given.

Hoffman et al. (1985) hypothesized that more traditional Native Americans would have higher MMPI-168 scale scores than their more marginal peers. The participant population was comprised of 37 male and 32 female adult Lakota tribal members. The authors created an acculturation scale for their study. This 32-item scale examined five dimensions: social life/activities, values, blood quantum, language usage, and school/job status. Correlational analyses and one-tailed t-tests showed noteworthy correlations between the acculturation subscales of values, language, and school/job with scales 2 (Depression), 4 (Psychopathic Deviance), 7 (Psychasthenia), 8 (Schizophrenia), and 0 (Social Introversion) of the MMPI-168. The researchers’ hypothesis was confirmed in that more traditional participants had higher MMPI-168 scores. These studies offer support for the Orthogonal Theory of Biculturalism. Yet none were replicable since they utilized their own acculturation measures that were unique to that particular study alone.
Interestingly, the majority of studies examining the relationship between cultural identity and psychological distress for ethnic minorities can be found in the eating-disorder literature. A summary of these studies follows.

**Acculturation and Eating Disorders Among Ethnic Minorities**

Wildes, Emery, and Simons (2001) conducted a meta-analysis of studies on acculturation and eating disorders among various minority groups. They concluded that European-Americans still record a higher prevalence of eating disorders than their minority counterparts. They further interpreted the predictors for minority group members developing eating disorder symptomology vary greatly from their European-American counterparts. More specifically, they concluded some specific within-group cultural factors may effect body image and eating practices in ways characteristic of that specific culture and its history. Mean effect sizes of the minority members and eating pathology were positive for all minorities but the Asian subjects.

Davis and Katzman (1999) studied the impact of acculturation on eating disorders in male and female Chinese students studying in the United States. Ninety percent of those surveyed had been born in Hong Kong, while the remaining ten percent had been born in the United States. Slightly over half of the subjects had been in the United States for less than 5 years, 36% for 5-10 years, and the remainder longer than 10 years. No participants scored in the “Exclusively American” category; thus, the increased acculturation scores were located primarily in the “Bicultural” area and the low acculturation subjects were located in the “Mostly Asian” category. For the females in this study, the more acculturated to American culture the participants scored, the more
bulimic symptoms they displayed. For the highly acculturated females and the low acculturated males, scores were positively correlated with feelings of ineffectiveness.

Many studies have contrasted eating disorder symptomology between African-Americans and European-Americans (DiGioacchino, Sargent, & Topping, 2001; Petersons, Rojhani, Steinhaus, & Larkin, 2000; Pinkowish, 1995). Each study suggests that African-Americans display eating disorder patterns similar to their European counterparts, despite – as suggested by Wildes et al (2001) above – differing etiologies which were possibly due to cultural differences. Smith (1995) also found similar rates of binge eating disorder for African-Americans in her literature review, while noting the fewer studies done on other minority groups.

Pumariega (1986) suggested one’s degree of cultural identity was strongly related to Eating Attitudes Test (EAT) scores for 138 Hispanic adolescents. No similar relationships between SES (socioeconomic status) and EAT scores were observed, however. Pumariega created an acculturation scale based on United States residency, selection of dialect, food, apparel and music, kinship, and self-identity. This group of Hispanic adolescents was also compared to a group of 365 White adolescents from the southern United States. Mean scores on the EAT were similar for the two groups, 19.7 for the White group and 18.2 for the Hispanic group. The Hispanic adolescents as a whole scored relatively higher on the acculturation scale, indicating they highly identified with American society. Correlational analyses suggested that, as the Hispanic population identified itself as more acculturated, it reported more disturbing (i.e. anorexic) dieting behaviors. Pumariega (1997), in a later commentary, continues to suggest acculturating
to the American way of life "...increases the risk of developing an eating disorder" (p.1). Smith (1995) proposed many potential research variables related to binge eating among non-majority groups, including the effects of genetic factors, age of onset and course, and if culturally specific treatments would be more efficacious. Unfortunately, the questions have mostly gone unanswered in the literature, primarily due (again) to the lack of available standardized biculturalism and acculturation measures.

In reviewing the above studies, it is clear few cross-cultural eating disorder studies include Native Americans in their samples with other minorities. The few that have are discussed below.

Eating Disorders and Native Americans

Smith and Krejci (1991) investigated Eating Disorder Inventory (EDI) and Bulimia Test (BULIT) scores for 129 Native American, 327 Hispanic, and 89 White adolescents, which included 310 females and 244 males. Due to lack of norms for minority group members, the authors of this study used a combination of seven item responses from the EDI and BULIT for their analyses. The items analyzed included questions regarding binge eating, self-induced vomiting, laxative abuse, and crash dieting/fasting. Two methods were utilized for binge eating. The first was any positive response to a question indicating binge eating at any time. The second was a grouping of four items (including the item regarding binging) that identified those who binged more than once a month. In addition, those who responded "Always" to a question asking about fear of weight gain and those who responded "Never" to a question asking about body shape satisfaction were also analyzed. Weight was grouped into categories by
height (normal weight for height, above normal weight for height, or below normal
weight for height). Native American students responded higher than Hispanic or White
students on four of the seven items (items answered in the extreme to indicate eating
disordered patterns). This is the only study the author found which identified the need to
modify cut-off scores for minority participants rather than using norms standardized on
predominantly White participants. Smith and Krejci did indeed do so, yet
were not clear in their article in terms of criteria and statistical analyses utilized to
support their conclusions.

Crago, Shisslak, and Estes (1996) studied eating disorders and ethnicity by
conducting a literature review of current research. They suggested African-American and
Asian-American females had lower rates of eating disorders than Whites, with Hispanics
displaying roughly equal prevalence rates. Native American females, interestingly, also
recorded higher rates than other ethnic minority groups, but still lower ones than White
females. Risk factors for minority women and eating disorders include being younger,
heavier, more educated, and a greater identification with White, middle-class values.
This literature review included some of the previously discussed studies. The results of
this study may be misleading, and the authors acknowledge this, citing the very few
studies conducted with minority groups.

The work of Story et al. (1997) suggests comparable social and behavioral
pressures among Native American and White adolescents. They assessed 12,039 (6250
females, 5789 males) Native American/Alaska Native adolescents (grades 7-12) in eight
Indian Health Service (I.H.S.) service areas, across 12 states. Adolescent girls reporting
they did not diet displayed the healthiest psychosocial and behavior attitudes. Multivariate analyses were conducted for each group by gender. For females admitting to dieting (48.3%), dieting behavior was strongly correlated with psychosocial and health attitudes (i.e. worried about being overweight, unhappy with current weight, fear of bingeing). For females reporting purging (28%) at some point, emotional stress, bingeing, and fear of uncontrolled eating were significant psychosocial and attitude factors. For the boys, 30.5% reported they had dieted in the last year, with 8% dieting more frequently and 21% reporting purging behaviors. Male dieters had strong correlations with fear of bingeing, worried about weight gain, and perceived themselves as overweight. Many negative psychosocial factors and health attitudes were reported for the male purgers as compared to nonpurging males. These factors are poor body image, fear of uncontrolled eating, bingeing, culpable actions, alcohol, cigarette, and drug use, physical and/or sexual abuse, emotional stress, and suicidal ideation and attempts.

Garb, Garb, and Stunkard (1975) compared acculturation level and levels of obesity in 527 Navajo children aged 6-12 years. A breakdown by gender is not offered. Acculturation level was determined by seven variables for each geographical region. These variables included ethnic makeup of area, religious affiliation, neighbor proximity, presence or absence of plumbing and electricity, representative housing, and the local job market. Taking these variables into consideration, subjects were placed in either a high or low acculturation group. Obesity and thinness were looked at and were determined using Seltzer and Mayer's (1965) standard deviation criterion and by triceps skinfold measurement. $X^2$ results significantly suggested those more acculturated males up to 12
years of age were more obese than their traditional counterparts ($X^2 = 10.84$, df=1, $p<.005$). The more acculturated females were also more obese than their traditional counterparts, except for those who were 8 years old. This obesity trend for the females was also significantly different ($X^2 = 7.03$, df=1, $p<.01$).

While these studies, as those in the previous section, have certainly contributed to the general eating disorder literature, their lack of standardization in measuring the construct of cultural identity weakens their contribution to cross-cultural psychology. More specifically, it may admittedly be useful for an isolated study to find and suggest "acculturation levels" are related to body image, psychopathology, or another dependent variable. But if the instruments used to measure cultural identity are so study- or sample-specific that external validity is difficult or even impossible, then they provide no contribution in terms of either understanding culture and its contributions, or the scales utilized in terms of validity and reliability. Until this is achieved, we will continue to have just a collection of isolated, non-generalizable studies that continue to propose many interesting questions for "future studies". The following section reviews literature relevant to the technique utilized in the present study to address this issue.

**Multitrait-Multimethod Review**

The Multitrait-Multimethod technique is a correlational analysis to investigate construct (convergent and discriminant) validity of a particular measurement tool. The theoretical and statistical origin for the Multitrait-Multimethod (MTMM) was established in a landmark article by Campbell and Fiske (1959). While controversial, the technique continues to be used, probably because few other methods as simple and sophisticated
have been developed since. What has been developed, however, are follow-up analyses, which will reviewed following Campbell and Fiske.

According to Campbell and Fiske (1959), there are two types of construct validity of a psychological test: convergent and discriminant validity. In order for convergent and discriminant validity to become established, a comparison of at least two theoretically related scales are correlated with at least two other scales conceptually unrelated to the first two, but related to each other. These relationships are discussed more specifically below.

Convergent validity is confirmed when high correlations are achieved between two measures that claim to measure the same trait or construct, yet they remain uncorrelated with scales measuring different constructs. A specific example of this would suggest Beck Depression Inventory (BDI) scores should correlate highly with subscale 2 (Depression) of the MMPI-2, yet both are statistically unrelated to two different measures of intelligence, say the Wechsler Adult Intelligence Scale and the Stanford-Binet.

Discriminant validity, conversely, is achieved when instruments measuring conceptually unrelated traits are indeed orthogonal when compared. An example of this comparison might include acculturation level and eating disorder behaviors, as will be examined in this study. While on some level some aspects of acculturation and eating disorders may be related, the scales themselves were developed based on two different constructs, which should therefore produce uncorrelated findings.
Campbell and Fiske (1959) provide a MTMM example utilizing three different traits with three different methods (see Table 1). The MTMM matrix organizes the intercorrelations of each trait measured by each method, all traits are measured by all methods utilized.

<table>
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Table 1. Example of Multitrait-Multimethod Matrix (adapted with fictitious numbers, Campbell & Fiske, 1959, p. 82). Validity diagonals are italicized, reliability diagonals are in parentheses. Heterotrait-monomethod triangles are bolded. Heterotrait-heteromethod triangles are underlined.

The authors discuss four dimensions of the MTMM matrix that must be met:

1. validity diagonals (same trait measured with different measures) should be significantly different from zero and sufficiently large to encourage further examination of validity (convergent validity)

2. validity diagonals should be higher than the values in its columns and row in the heterotrait-heteromethod triangle (different traits measured by different measures; dotted triangle)
3. variable should correlate higher with an independent effort to measure the same trait than with measures designed to measure different traits (compare validity diagonals with heterotrait-monomethod triangles (solid triangles)

4. some pattern of trait inter-relationship be shown in all of the heterotrait triangles of both mono- and hetero-method blocks (p. 83).

The authors also warn of high intercorrelations between conceptually unrelated tests. This is an example of discriminant invalidity (Campbell & Fiske, 1959). This occurs when the values in the heterotrait-heteromethod triangles are as high as those values in the validity diagonal. Another invalidation technique is within the monomethod block where the heterotrait values are as high as the reliabilities.

In 1960 MTMM literature was scarce. Today, there are many examples of the use of the MTMM model. Following are some of the criticisms and examples of this method.

Ferketich, Figueredo, and Knapp (1991) criticize Campbell and Fiske’s (1959) article, acknowledging their contribution to the study of validation but pointing out three specific problems encountered with the MTMM approach. Ferketich et al. criticize the criteria given by Campbell and Fiske. Campbell and Fiske do not give specific levels of magnitude criteria for the correlations, they simply suggest the correlation be “of a sufficient magnitude”. It is therefore the researcher that decides the definition of “sufficient magnitude”. A second problem discussed involves the measures researchers use for their MTMM study. The authors describe a discriminant trait as one that is
theoretically similar to what is being examined. Campbell and Fiske, as stated earlier, describe discriminant validity as conceptually unrelated. The example the authors of this article give suggests considering first anxiety and then identifying measures of fear and stress to "discriminate" from anxiety. In addition to the issue of which traits to consider, the types of methods utilized were also discussed. Ferketich et al. argue that methods must truly be different. One example of truly different measures might include self-report versus an independent observation. The authors also disagree with studies utilizing long and short forms of a questionnaire or multiple-choice and true/false questionnaires because of format difference and unaccounted-for effects.

Centra (1970) took Campbell and Fiske’s (1959) procedure one step further, expanding it from several scales per individual to several scales with several groups. Whereas Campbell and Fiske compared methods of measurement (self-report, interview), Centra replaced measures with comparing groups. Likewise, instead of individual traits, the author chose to look at scale scores on a group level. Centra tested his method on a college campus, including faculty, administrators, and student groups. The scale used had 11 subscales, of which students responded to six scales and the other two groups responded to all 11-scale items. Results showed this method of analysis (MTMM) to be valid for all but one of the 11 subscales; this one scale did not meet the criteria for convergent or discriminant validity. The author concludes by suggesting the MTMM matrix can assess how an instrument is functioning and how the instrument might further be improved.
Lowe and Ryan-Wenger (1992) reviewed published studies done in the field of nursing which utilized the MTMM procedures. The authors suggest some of the same problems with Campbell and Fiske's (1959) criteria as Ferketich et al. (1991). These authors also focused on examination of error variance of the MTMM matrix. Error variance is that variability that is left as unexplained after accounting for other types of variability. Subject-by-trait variance is the variability in differentiating between traits and across methods. This is discriminant validity. Subject-by-method variance refers to the variability across methods (also known as the halo effect) of each trait. After accounting for each type of variance, the interaction of the subject x trait x method therefore comprises the error variance. Lowe and Ryan-Wenger also criticize the use of analysis of variance (ANOVA) in assessing convergent and discriminant validity, stating that many times the ANOVA outcomes demonstrate a large error variance, thereby not truly displaying convergent and discriminant validities.

Lowe and Ryan-Wenger (1992) instead propose the use of confirmatory factor analysis (CFA), citing several advantages over ANOVA, such as the ability to demonstrate factor loadings, testing the null hypothesis, separating the trait and method variance, and removing random error. Thus, with these additional steps, they suggest a clearer picture of the convergent and discriminant correlations can be seen. While a MTMM technique was utilized in this study, it is certainly this author's hope others may follow up with related studies investigating the validity of Lowe and Ryan-Wenger's criticisms.
Van Tuinen and Ramanaiah (1979) provide a MTMM example with self-esteem measures. The authors utilized two different types of self-esteem traits, global and social, to assess for convergent validity. To assess for discriminant validity, the authors chose orderliness measures. Three different types of self-report measures (true/false, point scale, and self-rating scales) were used. All measures were put in a booklet format with subjects taking approximately one hour to complete, with the easiest measures first. The test administrator was an undergraduate research assistant. It was hypothesized this would prevent any social desirability confounds that might arise from using authority figures as administrators. The MTMM data was completed by obtaining intercorrelations among the nine measures. These intercorrelations were factor-analyzed, looking for an overall pattern instead of individual analyses. The dataset was analyzed by gender as well as the sample as a whole. Since the gender data were not significantly different, the overall pattern was discussed. Results showed strong convergent validity coefficients for global and social self-esteem. The two traits were more correlated with each other than with the measures of orderliness, thus showing discriminant validity.

Another study utilizing correlational analyses was conducted by Berland, Thompson, and Linton (1986). The authors examined the inter-relationships between four eating disorder inventories. The subject population (N = 81 females) for this study included anorexics, those with no eating disorder, and obese subjects. Inventories given included the Eating Attitudes Test (EAT), the Eating Attitudes Test-Short version (EAT-26), Eating Disorder Inventory (EDI), and the Eating Inventory (EI). Correlational analyses were done for each inventory on three main factors: Dieting (Factor I), bulimia
criteria and food preoccupation (Factor II), and oral control (Factor III). On Factor I, the EAT-26 and three EDI subscales were significantly correlated ($p \leq .0001$). On Factor II, the EAT-26 and five of the EDI subscales were highly related ($p \leq .0001$). The EAT-26 total score and Factor I were highly associated with the EI total score and one of the EI subscales ($p \leq .0001$). Factor II was associated with two EI subscales and the total EI score ($p \leq .0001$). Factor III was highly related to two EI subscales. These correlations provide evidence of concurrent validity.

Increased understanding of the validity of various measures as they pertain to minority cultures provided by this research project may help clinicians better relate to Native American clients. Non-Native counselors/psychologists may also become more aware of the uses and limitations of assessment instruments with the differing bicultural states that the Native client may present. With more information disseminated regarding level of biculturalism and its measurement instruments, it may allow therapists of all backgrounds one more step toward achieving cross-cultural competence.

Present Study Hypothesis

I chose to investigate the convergent and discriminant validity of two measures of Biculturalism and two measures of eating disorders. It was hypothesized that the NPBI and the AICOS would correlate significantly higher with each other than with either of the eating disorder measures. Likewise, the EAT-26 and the EDI-2 would correlate higher with each other than with either of the acculturation measures. A secondary hypothesis was to examine the effect of biculturalism on eating disorders. The
Orthogonal Theory of Biculturalism suggests those more Biculturally competent would display a lower level of eating disordered cognitions and behaviors. It was therefore hypothesized those individuals in the sample scoring as more bicultural on both subscales of the NPBI and the AICOS would also record lower overall EAT-26 and EDI-2 total scores.
CHAPTER II. METHODOLOGY

Participants

The sample consisted of 210 (80 male, 130 female) Native American adults from predominantly Northern Plains tribes. Of these, 205 (79 male, 126 female) participants were retained and analyzed. The remaining participants (n = 5) were paid for their efforts but their research packets were not analyzed for various reasons including if they were under 18 years of age or had a large amount of missing data. Participants were not screened for age, tribal affiliation, socioeconomic status (SES), or any other demographic variable. These variables were included on the demographic sheet and analyzed. They will be described in the Results section. Subjects were not categorized into non-patient and eating-disordered groups since this was a statistical analysis of measures rather than a comparative study.

Materials

The research packet (see Appendix A) consisted of: (1) informed consent; (2) demographic questionnaire; (3) Northern Plains Biculturalism Inventory (NPBI); (4) American Indian Orientation Scale (AICOS); (5) Eating Attitude Test-Short Form (EAT-26); and (6) Eating Disorder Inventory - Second Edition (EDI-2) (The EAT-26 and EDI-2 are not included in Appendix A due to copyright laws). These are discussed in detail below.
Informed Consent

Participation was anonymous. The subjects' name appeared only on the Informed Consent Form. This information was secured in the Indians into Psychology Doctoral Education (INPSYDE) Program office by the investigator to ensure security and to prevent any association of individuals with the research. On this form, subjects were advised that participation was completely unforced, amount of time needed, potential disadvantages and advantages were listed, and extra credit slips for current University of North Dakota psychology classes were given to those who chose to complete the questionnaires or five dollars cash for those not attending UND psychology classes or those who preferred money over extra credit. Also included was my name (Mary J. Wilkie) and telephone number as well as my advisor’s name (Dr. J. D. McDonald) and telephone number in case any subject had questions regarding this research.

Demographics Sheet

Items on the demographic sheet assessed the participants' environment. The demographic survey established: age, gender, highest education level attained, major in school or occupation, height, weight, and specific tribal identity. These variables provided information regarding general characteristics of the sample and were examined for interesting covariations with scale items.

Northern Plains Biculturalism Inventory

The Northern Plains Biculturalism Inventory (NPBI: Allen & French, 1994) is a 30-item, four-choice inventory appraising Upper Midwest Native Americans and Midwestern White (EuroAmerican) cultural classification. The inventory emphasizes
social conduct, which is thought to be driven by basic attitudes that many have described as viewpoints, perceptions, Zeitgeist, and cultural identification. There are currently two different versions of the NPBI for use, depending on the population you are testing. The College version is meant for use with Native American college students and was not utilized in this study. The Community version is for use in Native American communities and was utilized in this study. The only difference noted between the two versions (found in the NPBI manual) refers to the reading level needed by each participant. The College version requires at least a high school reading level capacity whereas the Community version of the NPBI has questions rewritten for easier comprehension in case participants do not possess a high school reading level. The NPBI was developed in accord with the Orthogonal Theory of Biculturalism (Oetting & Beauvais, 1990).

Instead of a linear model of cultural identification, the NPBI proposes a circular model. Many researchers of Native Americans advocate that efficient coping in more than one culture leads to better mental adaptation and more self-esteem among Native Americans. A subject with strong, traditional ties would have high scores on the American Indian Cultural Identification (AICI) subscale. A participant who identifies more closely with the majority culture would obtain higher scores on the European-American Cultural Identification (EACI) subscale. If a participant scored highly on both the AICI and EACI scales, then he or she would be described as having a Bicultural Identification, whereas if a subject scored low on both scales, he or she would be described as Marginal (no clear identification with either culture). There is also a
Language subscale, but this scale was not utilized in this study. Response choices range from 1 (Not at All) to 4 (Very Much).

Raw scores are obtained by tallying the response number for each of the questions pertaining to each of the two scales that were used. Four items are reverse-keyed, one of which was used in the two scales of this study per the NPBI manual subscale construction. While the manual states no current reliability information for the community version (in process), a six-month test-retest reliability for the College version showed the AICI scale to have $r = .82$, the EACI scale $r = .70$, and the Language scale to have $r = .74$ (Allen and French, 1994).

**American Indian Orientation Scale.**

The American Indian Orientation Scale (LaFromboise & Rowe, 1995) is a 27-item, Likert-scaled inventory assessing cultural identification. Also taking its lead from Oetting and Beauvais’ (1990) Orthogonal Theory of Biculturalism, LaFromboise and Rowe propose four quadrants Native Americans could possibly identify with: Traditional, Assimilated, Diffused, or Bicultural. The Traditional and Bicultural labels are similar to the NPBI. the Assimilated is the same as Acculturated on the NPBI and Diffused is identified as Marginal on the NPBI. Response choices are mixed, depending on the type of questions asked. Questions relate to engagement, satisfaction, responsibility, acceptance, and attitude of both Native and EuroAmerican cultures. Response choices range from Very Comfortable to Uncomfortable, Very Successful to Unsuccessful, Very Strong to Not at All, and Never to A Lot. Extreme positive answers
(i.e. very comfortable, very strong) are labeled A through D, which are on the opposite end of the choice list (i.e. uncomfortable, not at all).

Raw scores are obtained by summing up the response number for each of the questions belonging to each of the scales. For items 1-11 and 13-19, a response A is given 3 points, B 2 points, C 1 point, and D zero points. For items 20-27, the scoring is reversed: D is given 3 points, C-2, B-1, and A zero points. The American Indian (AI) scale is comprised of the following items: i, 3, 5, 7, 9, 11, 12, 14, 16, 18, 20, 21, 24, and 25. The White American (WA) scale is comprised of the following items: 2, 4, 6, 8, 10, 12, 13, 15, 17, 19, 22, 23, 26, and 27. Item #12 is a double-loaded question (it asks about both cultures) and is therefore located on both scales and should be added to both scales with the following values: A is worth 6 points, B= 4 points, C= 2 points, and D= zero points. Reliability testing is currently in process. The manual does offer alpha coefficients of .80 for the WA scale and .89 for the AI scale (LaFromboise & Rowe, 1995).

**Eating Attitude Test-Short Form.**

The Eating Attitudes Test was originally a 40-item self-report questionnaire developed by Garner and Garfinkel (1979) to ascertain patterns of thoughts and actions of anorexic clients. In 1982, Garner, Olmsted, Bohr, and Garfinkel followed up their findings with a factor analysis, which revealed three stable factors in their original test. These factors are dieting, bulimia and food preoccupation, and oral control. Due to 14 of the original 40 items not fitting neatly into one of the above factors, they were dropped from the questionnaire, thus creating the Eating Attitudes Test-26 (EAT-26). The EAT-
28 has shown to be a reliable and economical substitute for the EAT-40 (Garner et al.). The norm group that provided the data for the EAT-26 included 160 anorexic female patients and 140 female first and second-year university college students. The EAT-26 is a 26-item self-report questionnaire with each item containing six possible choices for an answer in a Likert scale construction. Whereas Garner and Garfinkel (1979) established a clinical cut-off score of 30 for the EAT-40, a more conservative cut-off score for the EAT-26 was set at 20 for this sample to distinguish between the anorexics and controls. This cut-off score was obtained by summing the raw scores of the respondent’s answers. Possible answers include always, usually, often, sometimes, rarely, or never. Points are only given if the responses are always, usually, or often. The other three responses are scored zero. Always is scored 3, usually is scored 2, and often is scored 1. In reducing the EAT-40 down to the EAT-26, three factors became apparent. Factor I, dieting behavior, focuses on body image not related to bulimic behaviors. The items included on this factor include 4, 9, 10, 14, 15, 22, 25, 29, 30, 36, 37, 38, and 39. Factor II, bulimia and food preoccupation, also focuses on body image but looks at body weight and symptoms related to obsessionality and anxiety as well. Items that load on Factor II include 6, 7, 13, 31, 34, and 40. Factor III, oral control, is negatively related to weight and bulimia. Items included here are 5, 8, 12, 24, 26, 32, and 33. Scores may be obtained for these three subscales in the same manner as mentioned above for the total score. Reliability coefficients for the EAT-26 is high for the anorexic group (r = .90). For the current study, the total score was utilized.
Eating Disorder Inventory-2

The original Eating Disorder Inventory (EDI) is a 64-item self-report inventory developed by Garner, Olmsted, and Polivy (1983). The EDI has eight subscales that look at personality variables to define disordered eating patterns. These subscales include drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity fears. A total score and eight subscale scores can be derived from this scale. The Eating Disorder Inventory -2 (EDI-2) has an additional 27 items along with the original 64 EDI items, creating an additional three subscales (asceticism, impulse regulation, and social insecurity) (Garner, 1991). The subjects that provided norms for the EDI-2 consisted of 889 eating-disordered females and 205 female, first- and second-year university college students.

The EDI-2 is set up as a two-part form. The first part consists of the questions to be answered and the second part is the carbon answer sheet. The carbon answer sheet was created to aid in the scoring process. After the inventory is completed, the answer sheet is separated at it perforations and scored according to its subscales, which are coded on the reverse side of the answer sheet. The EDI-2 was modified by asking subjects to circle their answers on the questionnaire (A for Always, U for Usually, O for Often, etc.) to maintain consistency among measures. Subscale scores are obtained by summing up responses according to the following order: Always = 3 points, Usually = 2 points, Often = 1 point, Sometimes, Rarely, or Never = 0 points. Many items of the EDI-2 are reverse-keyed, that is Never = 3, Rarely = 2, and Sometimes = 1, the rest of the responses are equal to zero. These item numbers are: 1, 12, 15, 17, 19, 20, 22, 23, 26, 30, 31, 37, 39.
The items which correspond to the Drive for Thinness Scale include: 1, 7, 11, 16, 25, 32, and 49. For the Bulimia Scale: 4, 5, 28, 38, 46, 53, and 61; the Body Dissatisfaction Scale: 2, 9, 12, 19, 31, 45, 55, 59, and 62; the Ineffectiveness Scale: 10, 18, 20, 24, 27, 37, 41, 42, 50, and 56; the Perfectionism Scale: 13, 29, 36, 43, 52, and 63; and the Interpersonal Distrust Scale: 15, 17, 23, 30, 34, 54, and 57. Items for the Interoceptive Awareness Scale: 8, 21, 26, 33, 40, 44, 47, 51, 60, and 64, and the Maturity Fears Scale: 3, 6, 14, 22, 35, 39, 48, and 58. The provisional scales include the Asceticism scale: 66, 68, 71, 75, 78, 82, 86, and 88; the Impulse Regulation Scale: 65, 67, 70, 72, 74, 77, 79, 81, 83, 85, and 90; and the Social Insecurity Scale: 69, 73, 76, 80, 84, 87, 89, and 91. Alpha coefficients for internal reliability for the EDI-2 ranged from .80 - .92 for the eating disordered groups. Four studies of reliability (Garner & Olmsted, 1984; Raciti & Norcross, 1987; Shore & Porter, 1990; Vanderheyden & Boland, 1987) yielded coefficients of .65 - .93 for the nonpatient college group. Two separate test-retest studies show reliability coefficients ranging from .95 - .97 after 3 weeks (Wear & Pratz, 1987) and .41 - .75 after 1 year (Crowther, Lilly, Crawford, Shepherd, & Oliver, 1990). Both test-retest studies were done with nonpatient, college samples. Although Garner (1991) cautions use of a total score for the EDI-2, the total score was utilized in the current study to correlate scores with the EAT-26 (Garner et al., 1982). This method of using the total score has also been utilized by other researchers using the EDI (Morande’, Celada, & Casas, 1999; Rippon, Nash, Myburgh, & Noakes, 1988; Yates, Sieleni, & Bowers, 1989) and the EDI-2 (Tsai & Gray, 2000).
Procedure

After approval was secured from the Institutional Review Board (IRB), subject recruitment efforts included traveling to regional reservations and, with administrative permission, solicited Native American adults. Due to research protocol and time constraints, permission was granted at two schools and two colleges (other than UND). One school and one college are located on area reservations, the other school and college are not located on reservations but in more urban settings yet have a majority of Native American students and administrative staff. All other data collected was through research assistants soliciting at campus classes and gathering places, including a community sample the participants of which do not attend college. A mail-out effort was not necessary. Upon return of the research packet, subjects were given or mailed an extra credit slip or $5.00, documenting their participation in the study. Subjects could exchange the credit slip for academic research credit in their UND psychology course, if applicable.

Data Analysis

All returned questionnaires were coded and computer analyzed utilizing the SPSS statistical program. Descriptive Statistics were conducted on all variables. Such statistics recorded the appropriate mean, standard deviation, frequency, and percentages of demographic variables. Upon inspecting the questionnaire variable frequencies, it came to the investigator's attention that two questions on the EDI-2 had been deleted during reproduction. They are numbers 38 and 85. All data had not been gathered when the error was discovered. Independent t-tests and correlational analyses were completed on
the EDI-2 total score and the subscales affecting total scale scores. Given these analyses, the two missing items were not used in the final analyses.

After examining the descriptive statistics and correcting for the missing data, three other analyses were conducted. These include Pearson Product-Moment Correlational analyses, Multiple Regressions, and one-way Analysis of Variance (ANOVA) with post-hoc Tukey tests. The Pearson Product-Moment (PPM) analysis determined the strength and direction to which any of the subscales covaried, as well as their relationships with the demographic data. The Multiple Regression analyses observed the predictive power of the acculturation subscales on eating disorder patterns to test the Orthogonal Theory of Biculturalism. Finally, one-way ANOVAs investigated how the four quadrants of the scatterplot differ on demographic variables and eating disorder scores for each biculturalism measure.
CHAPTER III. RESULTS

Respondent Characteristics

The mean age for the sample was 32.17 years. The youngest participant was 18, the oldest 63. There were 79 (28.5%) males and 126 (61.5%) females. Education level was obtained by having participants choose from the following options: (1) 1-8th grades completed; (2) high school graduate/GED; (3) some college; (4) college graduate (including vocational programs); or (5) completion of a degree beyond a 4-year college degree. They were to provide their highest educational attainment level. The largest category was "some college", with 110 (53.7%) respondents. The next-highest endorsed choice was "college graduate" with 38 (18.5%), followed by "high school graduate/GED" with 27 (13.2%) respondents, 20 (9.8%) respondents with a degree beyond a 4-year degree, and lastly 9 (4.4%) participants responded they had completed 8th grade. The majority of the sample had some higher education beyond high school. For the sample as a whole, the mean weight was 187.7 pounds, with a minimum weight of 80 and a maximum of 345. Two hundred pounds was the most frequently reported weight (n=13, 6.3%). One participant did not report weight.

Many tribes of the Northern Plains region were represented, including Lakota (n = 80, 39.0%), Chippewa (n = 78, 38.1%), and Mandan, Arikara, and Hidatsa (n = 32, 15.6%) ancestry. Other tribes represented included Shoshone, Hopi, Nez Pierce,
Omaha, and Chamash (n = 14, 6.8%). Table 2 displays the demographic data on the total sample.

Table 2. Descriptive Demographics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M</th>
<th>SD</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>32.17</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>61.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest Education Completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-8th Grade</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School/GED</td>
<td>13.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>53.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Graduate</td>
<td>18.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree beyond Bachelor’s</td>
<td>9.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>187.7</td>
<td>46.1</td>
<td></td>
</tr>
<tr>
<td>Tribal Affiliation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lakota</td>
<td>39.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chippewa</td>
<td>38.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandan, Arikara, Hidatsa</td>
<td>15.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>6.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: females, n=126, males, n=79

To provide a clearer picture of participants from the sites data were collected, a description of each site will be reported with the total number of participants at that site, number of males and females, mean age for each area with standard deviation, mean educational level, and mean eating disorder measure scores. Subjects were categorized into six sites: (1) UND; (2) off-reservation urban college attended by mostly Native students; (3) on-reservation college mostly attended by Native students; (4) on-
reservation, small public school staff and administration; (5) off-reservation boarding school staff and administration; and (6) all other subjects who were not surveyed at these sites were compiled. Participant distribution by site is representative of area demographics. This information is detailed in Table 3.

Table 3. Descriptive Data By Site

<table>
<thead>
<tr>
<th>Site</th>
<th>N</th>
<th>M</th>
<th>F</th>
<th>Mean Age/SD</th>
<th>Mean Education</th>
<th>Mean EAT-26 Score</th>
<th>Mean EDI-2 Score</th>
<th># Tribes Repres.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UND</td>
<td>42</td>
<td>16</td>
<td>26</td>
<td>28.48/9.37</td>
<td>3.62</td>
<td>4.33</td>
<td>41.12</td>
<td>6</td>
</tr>
<tr>
<td>Urban Tribal</td>
<td>52</td>
<td>28</td>
<td>24</td>
<td>28.52/7.93</td>
<td>2.96</td>
<td>4.46</td>
<td>46.75</td>
<td>4</td>
</tr>
<tr>
<td>Res. Tribal</td>
<td>37</td>
<td>9</td>
<td>28</td>
<td>29.68/8.89</td>
<td>2.64</td>
<td>4.03</td>
<td>40.49</td>
<td>2</td>
</tr>
<tr>
<td>Res. School</td>
<td>25</td>
<td>7</td>
<td>18</td>
<td>44.24/12.37</td>
<td>3.24</td>
<td>2.80</td>
<td>47.68</td>
<td>2</td>
</tr>
<tr>
<td>Off-Res. School</td>
<td>12</td>
<td>2</td>
<td>10</td>
<td>36.08/10.13</td>
<td>3.75</td>
<td>3.67</td>
<td>38.58</td>
<td>4</td>
</tr>
<tr>
<td>Comm.</td>
<td>37</td>
<td>17</td>
<td>20</td>
<td>34.32/13.61</td>
<td>3.19</td>
<td>3.54</td>
<td>36.62</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: females, n=126, males, n=79

The Figures 3 and 4 scatterplots graphically represent how participants data fit with the orthogonal NPBI and AICOS subscales (biculturalism quadrants) respectively as theorized by Oetting and Beauvais (1990). Quadrant 1 lists those identified as Bicultural. Quadrant 2 identifies those of Traditional Native American orientation. Quadrant 3 identifies those whose identification is low in either culture or Marginal. Quadrant 4 identifies those who are of Majority culture orientation or Acculturated.
Figure 2. NPBI Subscale Scores Scatterplot
Q1 = Bicultural, Q2 = Traditional, Q3 = Marginal, Q4 = Acculturated
EACI refers to European-American Cultural Identification
AICI refers to American-Indian Cultural Identification

Figure 3. AICOS Subscale Scores Scatterplot
Q1 = Bicultural, Q2 = Traditional, Q3 = Marginal, Q4 = Acculturated
EACI2 refers to European-American Cultural Identification
AICI2 refers to American-Indian Cultural Identification
In examining the NPBI scores, it should be noted that the mean lowest scoring group on the EDI-2 is the Traditional group while the Marginal group had the highest mean score. For the EAT-26, the Traditional group had the lowest mean score while the Bicultural group had the highest mean score. The group with the lowest mean education score was the Marginal group while the Acculturated group had the highest mean education level. This information is detailed in Table 4.

Table 4. Descriptive Data by Group on the NPBI

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Age</th>
<th>Educ. Level</th>
<th>Mean EDI-2 total score</th>
<th>Mean EAT-26 total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bicultural</td>
<td>63</td>
<td>28.63</td>
<td>3.14</td>
<td>41.97</td>
<td>4.70</td>
</tr>
<tr>
<td>2. Traditional</td>
<td>49</td>
<td>34.53</td>
<td>3.16</td>
<td>38.41</td>
<td>2.45</td>
</tr>
<tr>
<td>3. Marginal</td>
<td>50</td>
<td>32.44</td>
<td>2.86</td>
<td>50.20</td>
<td>3.24</td>
</tr>
<tr>
<td>4. Acculturated</td>
<td>43</td>
<td>34.35</td>
<td>3.53</td>
<td>44.05</td>
<td>4.63</td>
</tr>
</tbody>
</table>

Note. (1) N refers to total number of subjects in each quadrant. 
(2) Educ. Level refers to highest education grade completed. 
(3) EDI-2 refers to the mean Eating Disorder Inventory-2 (EDI-2) total score for each quadrant. 
(4) EAT-26 refers to the mean Eating Attitudes Test-26 (EAT-26) total score for each quadrant.

In examining the AICOS scores, it should be noted that the mean lowest scoring group on the EDI-2 is the Bicultural group while the Marginal group had the highest mean score. For the EAT-26, the Marginal group had the lowest mean score while the Acculturated group had the highest mean score. The Marginal group also had the lowest mean education level and the Bicultural group had the highest mean education level. This information is detailed in Table 5.
Table 5. Descriptive Data by Group on the AICOS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Age</th>
<th>Educ. Level</th>
<th>Mean EDI-2 total score</th>
<th>Mean EAT-26 total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bicultural</td>
<td>73</td>
<td>30.75</td>
<td>3.33</td>
<td>39.03</td>
<td>3.62</td>
</tr>
<tr>
<td>2. Traditional</td>
<td>40</td>
<td>34.73</td>
<td>3.10</td>
<td>41.98</td>
<td>4.08</td>
</tr>
<tr>
<td>3. Marginal</td>
<td>36</td>
<td>33.03</td>
<td>2.97</td>
<td>50.33</td>
<td>2.44</td>
</tr>
<tr>
<td>4. Acculturated</td>
<td>56</td>
<td>31.64</td>
<td>3.11</td>
<td>46.25</td>
<td>4.68</td>
</tr>
</tbody>
</table>

Note. (1) N refers to total number of subjects in each quadrant. (2) Educ. Level refers to highest education grade completed. (3) EDI-2 refers to the mean Eating Disorder Inventory-2 (EDI-2) total score for each quadrant. (4) EAT-26 refers to the mean Eating Attitudes Test-26 (EAT-26) total score for each quadrant.

In comparing the two bicultural measures, it is interesting to note that for both measures the Traditional quadrant had the oldest participants and the Bicultural quadrant had the youngest participants. The only other similarity saw the mean EDI-2 total scores highest in the Marginal quadrant for both groups. For the UND sample, there were 28 participants (67%) that scored in the same quadrant for both samples on the NPBI and the AICOS. For the off-reservation college sample, there were 39 (75%) participants that scored in the same quadrant; for the on-reservation college, there were 25 (67.6%); for the on-reservation school, there were 15 (60%) scored in the same quadrants; for the off-reservation school there were 9 (75%); and for the community sample, there were 21 (57%) who scored in the same quadrants. For 205 participants, both measures of biculturalism scored participants in the same quadrants 137 times or approximately 67% of the time. It is a little more difficult to say this with the same amount of accuracy for the eating disorder measures as there is some debate as to the cutoff scores of each measure using...
the total score, particularly with the EDI-2. There is no available empirical research to date examining the EDI-2 total scores. The manual suggests various cutoff scores for each subscale, but no cutoff scores are suggested for the use of the total score.

Correlational Analyses

As can be seen in Table 6, several weak correlations were noted. These correlations were between weight and education, the NPBI AICI subscale and weight, the NPBI EACI subscale and education, the NPBI EACI subscale and age, and the AICOS AICI subscale and the EDI-2 total score. There were strong correlations between age and education and between gender and weight.

Table 6. Pearson Correlations For All Variables

<table>
<thead>
<tr>
<th>Item</th>
<th>NPBI EACI</th>
<th>EACI AICI</th>
<th>EACI EACI</th>
<th>AICI AICI</th>
<th>EDI-2 Total Score</th>
<th>EAT-26 Total Score</th>
<th>AGE</th>
<th>GENDER</th>
<th>WT. EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPBI EACI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AICI</td>
<td>.054</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AICOS EACI</td>
<td>.704**</td>
<td>-.087</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AICI</td>
<td>.063</td>
<td>.754**</td>
<td>.118</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDI-2 Total Score</td>
<td>-.075</td>
<td>-.106</td>
<td>-.109</td>
<td>-.155*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAT-26 Total Score</td>
<td>.192**</td>
<td>.025</td>
<td>.061</td>
<td>.035</td>
<td>.457**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>-.142*</td>
<td>-.113</td>
<td>-.116</td>
<td>-.032</td>
<td>-.107</td>
<td>-.061</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENDER</td>
<td>.022</td>
<td>-.003</td>
<td>-.032</td>
<td>.017</td>
<td>.083</td>
<td>.119</td>
<td>.076</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEIGHT</td>
<td>.050</td>
<td>.148**</td>
<td>.063</td>
<td>.126</td>
<td>.088</td>
<td>-.035</td>
<td>.073</td>
<td>-.430*</td>
<td></td>
</tr>
<tr>
<td>EDUCATION</td>
<td>.174**</td>
<td>.018</td>
<td>.127</td>
<td>.130</td>
<td>-.077</td>
<td>.068</td>
<td>.370*</td>
<td>-.037</td>
<td>.140**</td>
</tr>
</tbody>
</table>

Note: NPBI refers to the Northern Plains Biculturalism Inventory. AICOS refers to the American Indian Cultural Orientation Scale. EDI-2 refers to the Eating Disorder Inventory-2. EAT-26 refers to the Eating Attitudes Test-26. EACI refers to the European-American Cultural Identification. AICI refers to the American Indian Cultural Identification. WT. refers to weight.

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level
Between the acculturation subscales and the eating disorders total scores, there were strong positive correlations for the EDI-2 total score and the EAT-26 total score as well as for the NPBI subscales and their corresponding subscales of the AICOS. One other strong correlation exists between the NPBI EACI subscale and the EAT-26 total score. These correlations are listed in Table 7 in the Multitrait-Multimethod Matrix.

Table 7. Multitrait-Multimethod Correlational Matrix

<table>
<thead>
<tr>
<th>Item</th>
<th>NPBI</th>
<th>AICOS</th>
<th>EDI-2 Total Score</th>
<th>EAT-26 Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EACI</td>
<td>AICI</td>
<td>EACI</td>
<td>AICI</td>
</tr>
<tr>
<td>NPBI EACI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AICI</td>
<td>.054</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AICOS EACI</td>
<td>.704**</td>
<td>-.087</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AICI</td>
<td>.063</td>
<td>.754**</td>
<td>.118</td>
<td></td>
</tr>
<tr>
<td>EDI-2 Total Score</td>
<td>-.075</td>
<td>-.106</td>
<td>-.109</td>
<td>-.155*</td>
</tr>
<tr>
<td>EAT-26 Total Score</td>
<td>.192**</td>
<td>.025</td>
<td>.061</td>
<td>.035</td>
</tr>
</tbody>
</table>

Note: NPBI refers to the Northern Plains Biculturalism Inventory. AICOS refers to the American Indian Cultural Orientation Scale. EDI-2 refers to the Eating Disorder Inventory-2. EAT-26 refers to the Eating Attitudes Test-26. EACI refers to the European-American Cultural Identification. AICI refers to the American Indian Cultural Identification.

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level
Multiple Regression

Linear multiple regression analyses utilizing the two subscales of the NPBI as predictor variables for the EAT-26 and EDI-2 total scores were also conducted. As shown in Table 8, the NPBI European-American Cultural Identification (EACI) was a significant predictor of EAT-26 total scores. The positive Beta weights lend strength to the study, indicating that as a participant scored higher on the NPBI EACI subscale, the EAT-26 score also increased.

Table 8. Multiple Regression Analyses for NPBI Subscales Predicting Eating Disorders with the EAT-26

<table>
<thead>
<tr>
<th>Item</th>
<th>Coefficient</th>
<th>Beta</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAT-26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EACI</td>
<td>.146</td>
<td>.191</td>
<td>2.77</td>
<td>.006</td>
</tr>
<tr>
<td>AICI</td>
<td>1.12E-02</td>
<td>.014</td>
<td>.208</td>
<td>.835</td>
</tr>
</tbody>
</table>

Note. (1) NPBI refers to the Northern Plains Biculturalism Inventory.
(2) EACI refers to European American Cultural Identification.
(3) AICI refers to American Indian Cultural Orientation.
(4) EAT-26 refers to the Eating Attitudes Test-26 Total Score.
(5) For the combined predictors (EACI and AICI), R = .193, R² = .037, F = 3.88, with p < .022.

The same did not hold true for the EDI-2 and the NPBI subscales, as shown in Table 9.

Table 9. Multiple Regression Analyses for NPBI Subscales Predicting Eating Disorders with the EDI-2

<table>
<thead>
<tr>
<th>Item</th>
<th>Coefficient</th>
<th>Beta</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDI-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EACI</td>
<td>-.329</td>
<td>-.069</td>
<td>-.988</td>
<td>.324</td>
</tr>
<tr>
<td>AICI</td>
<td>-.497</td>
<td>-.102</td>
<td>-1.47</td>
<td>.145</td>
</tr>
</tbody>
</table>

Note. (1) EACI refers to European American Cultural Identification.
(2) AICI refers to American Indian Cultural Orientation.
(3) EDI-2 refers to the Eating Disorders Inventory-2 Total Score.
(4) For the combined predictors (EACI and AICI), R = .127, R² = .016, F = 1.64, with p < .196.
Analysis of Variance

One-way analysis of variance (ANOVA) of the EAT-26 total scores on each of the four NPBI Quadrants of the scatterplot was significant, $F (3,202) = 3.89$, $p < .02$. For the NPBI groups (i.e. Bicultural, Traditional, Marginal, Acculturated), there were statistically significant differences in age and education. A subsequent Tukey test revealed that these differences were found between the Bicultural and Traditional groups for age and between the Marginal and Acculturated groups for education. The statistical differences for age show the Traditional group to be older than the Bicultural group. A trend approaching statistical significance for age is also noted between the Bicultural and Acculturated groups, with the Acculturated group older than the Bicultural group. For education, the statistically significant differences show the Acculturated group had more education than the Marginal group. A trend approaching statistical significance was noted between the Bicultural and Marginal groups, with the Bicultural group reporting higher levels of education. The total score for the EAT-26 also demonstrated statistically significant differences between the Bicultural and Traditional groups, with the Bicultural group endorsing more eating disordered behaviors than the Traditional group. There were no other statistically significant differences. A summary of the post-hoc analyses for the EAT-26 and NPBI groups can be found in Table 10. There were no statistically significant findings when comparing the EDI-2 total scores and the NPBI groups.
In the one-way ANOVA for the AICOS groups (Bicultural, Traditional, Marginal, and Acculturated), there was a statistically significant between-group difference in student year, $F(3, 126) = 3.506, p < .02$. Post-hoc tests reveal this difference was between the Marginal and Bicultural groups, with the Bicultural group achieving a higher education level than the Marginal group. There was a trend approaching statistical significance for the EAT-26 total score and the AICOS between the Marginal and Acculturated groups, with the Acculturated group scoring higher on the EAT-26 than the Marginal group. There were no other statistically significant differences. A summary of the post-hoc analyses for the EAT-26 and AICOS groups can be found in Table 11.
Table 11. Post-Hoc Tukey Test Comparing AICOS Groups on EAT-26 Total Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Compared With (Group)</th>
<th>Mean Difference</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicultural</td>
<td>Traditional</td>
<td>-.459</td>
<td>.952</td>
</tr>
<tr>
<td></td>
<td>Marginal</td>
<td>1.17</td>
<td>.558</td>
</tr>
<tr>
<td></td>
<td>Acculturated</td>
<td>-1.06</td>
<td>.526</td>
</tr>
<tr>
<td>Traditional</td>
<td>Marginal</td>
<td>1.63</td>
<td>.373</td>
</tr>
<tr>
<td></td>
<td>Acculturated</td>
<td>-.604</td>
<td>.911</td>
</tr>
<tr>
<td>Marginal</td>
<td>Acculturated</td>
<td>-2.23</td>
<td>.084</td>
</tr>
</tbody>
</table>

**Note:** There were no significant findings at the .05 level.
CHAPTER IV. DISCUSSION

Many authors in both mainstream and cross-cultural psychology have suggested culture plays an important role in human cognition and behavior. The research examining culture’s role in these processes has remained unfortunately sparse, and what is available is fraught with methodological difficulties or other problems as discussed. Perhaps the most significant obstacle in achieving a greater understanding of culture’s impact lies in the measurement tools – and the reasons for which they are used- utilized to measure cultural identification and competence. To date, there have been no published empirical studies focusing on efforts toward norm development, psychometric establishment or otherwise validating an acculturation or biculturalism measurement tool for use with Native Americans. It was the intent of this study to make a small, yet important step in that direction by imposing a MTMM matrix on two biculturalism measures and two eating disorder measures to ascertain convergent and discriminant construct validity.

In reviewing the demographics of site data collected, it was observed that mean age and education level were comparable at each site. The youngest sample was from UND. While this group of participants is older than average when compared to their non-Indian counterparts, it is younger and more educated than those of other sites, with the exception of the off-reservation school participants. The on-reservation and off-reservation colleges had similar age and education levels. This is understandable as
both colleges are entry-level colleges and offer programs to help students transfer into the more mainstream universities. The next oldest population was the community sample. This group had the greatest variability of all the sites in regard to age and education. One reason for this could be that all non-students in the sample were contained in this group. Some participants were laborers, while some were college graduates. The on-reservation and off-reservation schools comprised the remainder of the participants. The mean ages of these two groups are older than those of the other groups and their education levels are higher than those at the other sites (with the exception of the UND sample which is higher than the on-reservation group). These groups were comprised of staff and administrators at their respective schools, thus accounting for their higher education levels, and many have been working for several years, accounting for their higher ages. These demographic characteristics are typical of those in the Northern Plains area and suggest adequate subject representativeness in this sample.

Campbell and Fiske’s (1959) criteria and procedures for determining convergent and discriminant construct validity using a multitrait-multimethod correlational matrix was employed in this study. The first criterion for determining convergent validity is to examine the validity diagonals, which is the same trait measured by different methods, and “ensure they are significantly different from zero and sufficiently large enough to warrant further examination” (Campbell & Fiske, 1959: p. 103). For the acculturation measures, the validity diagonal consists of the .704 and .754 and .457 for the eating disorder measures. These values are statistically significant and sufficiently large to
warrant further investigation. “Further investigation” within this study consisted of the follow-up multiple regression, ANOVAs, and post-hoc analyses.

The second through fourth criteria were engaged to determine discriminant validity. The second criterion requires the validity diagonal values to be higher than the values in its corresponding rows and columns. In this study, the only corresponding value is .063 and it is lower than the validity diagonal values. The third criterion requires the validity values be the highest values in the correlational matrix; this was confirmed. The fourth criterion requests a pattern of intercorrelations among the validity diagonals. Since there is only one validity diagonal in this study, there was no pattern to detect due to the limited number of measures and traits. There is convergent and discriminant validity of the measures utilized in this study as described by Campbell and Fiske (1959).

The results of this study did support the primary hypothesis in that the two eating disorder measures were more highly related to each other (thereby displaying convergent validity) while remaining orthogonal to either of the acculturation measures’ subscales. There were strong positive correlations between the two eating disorder measures’ total scores. There were also strong correlations for the EACI and AICI subscales of the NPBI with their similar AICOS subscales. A weak positive correlation between the NPBI EACI subscale score and the EAT-26 total score was observed. Yet, this was not true for the EDI-2 and the EACI. A weak negative correlation existed between the EDI-2 total score and the AICI subscale of the AICOS. Although these coefficients were weak, they do suggest there is something subjects perceive as related, inversely, in the content of
these otherwise conceptually orthogonal subscales. One possible explanation could be, as the literature suggests, the more assimilated an ethnic minority group member becomes, the more their response patterns will correspond with their majority culture peers.

Since the NPBI and the AICOS are so highly correlated, further discussion will focus on only one of these measures, the NPBI. The highest EDI-2 total score was found in the Marginal group. The lowest EDI-2 total score was found in the Traditional group. For the EAT-26, the highest total score was found in the Bicultural group and the lowest total score in the Traditional group. These findings also corroborate those discussed in the literature suggesting that, the more acculturated an ethnic minority member is, the more their scores will mimic those of majority-culture members. The high EDI-2 scores among the Marginal group provide support for the Orthogonal Theory of Biculturalism (Oetting and Beauvais, 1990), in that those with low cultural identification and competence in both cultures will also experience higher levels of distress and psychopathology.

This study has several notable limitations. First, one must consider the basic criticisms of the MTMM matrix model itself as discussed earlier. Any research effort whose database is analyzed with a controversial statistical method cannot escape the subsequent criticisms. Another limitation regards the degree to which these findings have external validity for other Native American tribes. Participants were also from predominantly rural areas, thus they may not generalize entirely to urban cohorts.
Culture plays an important role in one’s perceptions and subsequent behaviors. If we assume the Orthogonal Theory of Biculturalism is valid, then it becomes even more important to accurately determine the levels of cultural orientation in both realms for Native American patients, students, clients, prospective job-seekers, or anyone else who might be administered an instrument such as the NPBI. This study represents a small step toward using the NPBI with some confidence that it is actually measuring what it claims. We may subsequently have greater confidence in our efforts to assist Native Americans. Future researchers may then take the additional step in developing tribally-specific norms for placing the scores of individuals into a more meaningful context in efforts to help them.

Suggestions for future research include further analyses of the eating disorder measures with Native Americans to create a norm sample for these measures. Smith and Krejci (1991) was the only available study that utilized the original version of the EDI with a Native population. Other studies (Rosen et al., 1988; Snow and Harris, 1989; Story et al., 1997) have also examined disordered eating in Native populations but have either used other measures or devised their own instruments.

Other suggestions for research could be to replicate this study using more of the subscales offered by the eating disorder measures. Researchers have found a 3-factor matrix for the EAT-26 (Garner et al., 1982; Berland et al., 1986). Yager, Kurtzman, Landsverk, and Wiesmeier (1988) and Yates et al. (1989) report elevations of certain subscales of the EDI when researching disordered eating patterns. Raciti and Norcross
(1987) looked at only one EDI subscale in their research. Utilizing total scores for the eating disorder measures might arguably be too narrowly focused.

Although the Orthogonal Theory of Biculturalism was only moderately supported in this study, the consideration of a Native American client or student’s level of bicultural competence is still considered a germane and vital clinical assessment practice. It is my belief that cultural association does indeed play a significant role in every individual’s sense of identity and, ultimately, their behavior. Perhaps the best lesson learned from this study is not that assessments of biculturalism is insignificant, but that our measurement tools are still not adequately standardized or understood in order to accurately and consistently use them on this population. It is my sincere hope this study can provide one small step in that direction.
APPENDIX

RESEARCH PACKET
INFORMED CONSENT

You are invited to participate in a study that is attempting to examine validity issues related to assessing biculturalism and eating disorders. This study will also examine the relationship between biculturalism and eating disorders among Native Americans. The purpose of this study is to increase the understanding of the relationship between biculturalism and eating disorders and its validity in using these measures with Native Americans. Research in this area is scarce, especially research including Native Americans. The benefits will make non-Native counselors/psychologists more aware of the uses and limitations of assessment instruments with the differing bicultural states that the Native American client may present.

All information is strictly confidential and anonymous. You will be assigned a subject number and at no time will your name be used in the data collection process. All consent forms and completed answer sheets will be stored in a locked file cabinet in the psychology department at the University of North Dakota. The consent forms will be stored separately from the completed research packet to ensure that no one looking at the research packet could determine any of the names of the individual subjects who participate in this study. The consent forms will be kept for three years, after which time they will be destroyed. It will take approximately 15-30 minutes to complete the packet of questionnaires.

In return for your participation, you will be given $5.00 (or class credit according to the system that your instructor employs). If you decide to participate, you are free to quit at any time without penalty.

If you have any further questions regarding this study or related matters, or if in the future you have questions or want to know the results, please contact the investigators. The principle investigator, Mary Wilkie, is a University of North Dakota clinical psychology graduate student and can be reached at (701) 777-4497. Dr. McDonald is the supervisor of this study and can be reached at (701) 777-4495.

I have read the above information and I am willing to agree to participate in this study.

Signature of Subject ____________________________ Date ____________ Phone Number ____________

Signature of Investigator ____________________________ Date ____________ Phone Number ____________

Please check your preference:

_____ I would like extra credit in a Psychology course
Name: __________________________________________
Address: _______________________________________
Psychology Course in which you are enrolled: _______________________

_____ I would like to receive $5.00 for my participation (give name and address to mail $5 to)
Name: __________________________________________
Address: _______________________________________

Demographic Questionnaire

Please complete the following information as accurately as possible. All information is strictly confidential and anonymous. This form will not include your name, only a subject number and at no time will your name be used in the data collection process. This will ensure that you will not be linked to the information given. Please complete all questions. Thank you.

Your age: _______________

Your gender (check one): Male _____ Female _____

Your tribal affiliation: __________________________

What is your current height (in feet and inches)? __________

Current weight (in pounds)? ___________

What is the highest education level attained:

_____ a. 1st - 8th grade completed  
_____ b. high school graduate/GED  
_____ c. some college (including vocational)  
_____ d. college graduate  
_____ e. degree beyond 4-year college graduate

What is your current occupation? (if student, write major) __________________

If a student, what is your current class ranking? (Check only one)

_____ a. Freshman  
_____ b. Sophomore  
_____ c. Junior  
_____ d. Senior  
_____ e. Graduate  
_____ f. Other (please specify): ______________________
NPBI (Northern Plains Biculturalism Inventory) Community

These questions ask you to describe your attitudes, feelings, and participation in Indian and White culture. Some of the questions may not apply to you. In these cases, one of the possibly answers allows you to note this.

Read each question. Then fill in the number above the answer that seems most accurate for you, as in the example below.

Example: How comfortable are you with paper and pencil questionnaires?

1. ___ 2. ___ 3. X ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

In this example, the person felt moderate but not complete comfort with paper and pencil questionnaires, so filled in 3.

In the case of attitudes and feelings, your first impression is usually correct. We are interested in how much you are influenced by Indian and White culture regardless of your own ethnic background, keeping in mind that Not two people have the same background.

1. Do you like to be around White people?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

2. Do you like to be around Indian people?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

3. How interested are you in participating in Indian culture?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

4. How interested are you in participating in White culture?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

5. How often do you think in English?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

6. How often do you think in your tribal language?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

7. When you are sick, do you believe a medical doctor can help you?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much

8. When you are sick, do you believe the medicine man/woman can help you?
   1. ___ 2. ___ 3. ___ 4. ___
   Not at All  Somewhat  Moderately  Very Much
9. How much is your way of tracing ancestry White (focus on biological relative, descent through father)?

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<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
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10. How much is your way of tracing ancestry Indian (cousins same as brothers and sisters, descent more through mother)?

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<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Much</td>
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11. How often do you attend Indian religious ceremonies (Sweatlodge, Indian Peyote churches, Sundance, vision quest)?

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<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
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12. How often do you attend Christian religious ceremonies (Christenings, Baptisms, Church services)?

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<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
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13. How often do you participate in popular music concerts and dancing?

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<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
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14. How often do you go Indian dancing (Indian, Owl, Stomp, Rabbit, etc.)?

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<tr>
<td>Not at All</td>
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15. How often do you go to groups where most members are Indian?

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<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
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16. How often do you go to groups where most members are non-Indian?

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<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
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17. How often do you attend White celebrations (White ethnic festivals, parades, barbecues)?

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<td>4.</td>
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<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
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18. How often do you attend Indian celebrations (Pow-Wows, Wacipi, Indian rodeos, Indian softball games, Indian running events)?

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<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
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19. How often does your family speak your tribal language?

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<td>4.</td>
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<tr>
<td>Not at All</td>
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<td>Very Often</td>
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20. How often does your family speak English?

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<td>3.</td>
<td>4.</td>
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<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>Moderately</td>
<td>Very Often</td>
</tr>
</tbody>
</table>
21. How often do you speak English?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Often

22. How often do you speak your tribal language?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Often

23. How much does your family use traditional last names (like “Kills-in-Water”)?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Much

24. How much does your family use last names that are not traditional Indian last names (like “Smith”)?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Much

25. How often do you talk about White topics and White culture with friends?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Often

26. How often do you talk about Indian topics and Indian culture with friends?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Often

27. How often do you wear White fashion jewelry?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Often

28. How often do you wear Indian jewelry (bracelets, belts, and beads)?
   1. ___  2. ___  3. ___  4. ___
   Very Often  Moderately  Somewhat  Not at All

29. How Indian is your style of dressing (Dressing in bright colors, clothes with Native artwork)?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Much

30. How White is your preference in clothing (dress according to White style and fashion)?
   1. ___  2. ___  3. ___  4. ___
   Not at All  Somewhat  Moderately  Very Much
Darken the circle of the letter on the answer sheet that best applies to you.

1. How would you rate your involvement or connection to American Indian culture?
   A. Very Strong  B. Strong  C. Not Strong  D. Not at all

2. How would you rate your involvement or connection to White American culture?
   A. Very Strong  B. Strong  C. Not Strong  D. Not at all

3. How comfortable are you in a group of all Indian people?
   A. Very Comfortable  B. Comfortable  C. Not very comfortable  D. Uncomfortable

4. How comfortable are you in a group of all White people?
   A. Very Comfortable  B. Comfortable  C. Not very comfortable  D. Uncomfortable

5. How well do you understand your native history and traditions?
   A. Very well  B. Quite well  C. Not very well  D. Not at all

6. How much do you live by or follow the White American way of life?
   A. Very much  B. Quite a lot  C. A little  D. Not at all

7. How well do you understand your native language?
   A. Very well  B. Quite well  C. Not very well  D. Not at all

8. How sure are you that your White friends would help you out when you need it?
   A. Very sure  B. Sure  C. Unsure  D. Very unsure

9. How many of the people you hang around with are Indian?
   A. Most all  B. Many  C. A few  D. Practically none

10. How many of the people you hang around with are White?
    A. Most all  B. Many  C. A few  D. Practically none

11. How strong is your sense of belonging to your native culture?
    A. Very Strong  B. Strong  C. Not Strong  D. Not at all

12. How important is it for you to feel good toward both Indian and White cultures?
    A. Very important  B. Important  C. Not very important  D. Unimportant
13. How strong is your sense of belonging to White American culture?
   A. Very Strong   B. Strong   C. Not Strong   D. Not at all

14. How confident are you that you can be successful in the Indian world and still be yourself?
   A. Very confident   B. Confident   C. Not very confident   D. Not at all confident

15. How confident are you that you can be successful in the White world and still be yourself?
   A. Very confident   B. Confident   C. Not very confident   D. Not at all confident

16. How comfortable are you joking around and teasing (in good humor) with Indian people?
   A. Very comfortable   B. Comfortable   C. Not very comfortable   D. Uncomfortable

17. How comfortable are you joking around and teasing (in good humor) with White people?
   A. Very comfortable   B. Comfortable   C. Not very comfortable   D. Uncomfortable

18. How successful are you at being a contributing member of the Indian community?
   A. Very successful   B. Successful   C. Not very successful   D. Unsuccessful

19. How successful are you at being a contributing member of the White community?
   A. Very successful   B. Successful   C. Not very successful   D. Unsuccessful

How often do you take part in the following activities? **Darken the circle** that applies best.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>Seldom</th>
<th>Often</th>
<th>A lot</th>
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<tbody>
<tr>
<td>20. Pow Wows</td>
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<tr>
<td>21. Indian religious activities</td>
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<tr>
<td>22. Non-Indian dances</td>
<td></td>
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<td></td>
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<tr>
<td>23. Non-Indian religious activities</td>
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How much do you enjoy the following? **Darken the circle** that best applies to you.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not at all</th>
<th>Not much</th>
<th>Much</th>
<th>A lot</th>
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<tbody>
<tr>
<td>24. Indian music</td>
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<tr>
<td>25. American Indian kinds of places</td>
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<tr>
<td>26. Non-Indian music</td>
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<td>27. Non-Indian kinds of places</td>
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REFERENCES


