1-1-2009

Cognitive preference and ethnic identity among Anglo and Native American high school students

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2009

ABSTRACT

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M.A., Adams State University, 2004
B.A., University of Colorado, 1994

Dissertation Submitted in Partial Fulfillment
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Doctor of Philosophy
Department of Psychology

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ABSTRACT

According to the Office of Educational Research and Improvement: A Project of the Stanford Institute for Higher Education Research, graduation rates for Native Americans from both secondary and post secondary institutions are dismally low at 58% and 7%, respectively. Some research addresses cognitive preference and other ethnic identity, but research animating the cognitive preference – ethnic identity interplay for high school students is absent. These limitations in access to educational opportunities lead to abbreviated quality life experiences and a restriction in individual efficacy and collective agency. The following project assessed ethnic identity using Phinney's Multigroup Ethnic Identity Measure and cognitive preference using Kolb's Learning Styles Inventory version 3.1. The research used both the aforementioned metrics to analyze cognitive preference and ethnic identity for 73 high school participants through the use of both categorical and continuous variables. Analytical procedures utilized descriptive statistics, chi-square analysis, bivariate correlation, and analysis of variance. This research confirmed that Anglos and Native Americans have statistically different cognitive preferences, and those preferences were correlated with their ethnic identity. It is recommended that education better meet the needs of the Native American student by emancipating them from an educational system founded and perpetuated on an orientation to the majority's cognitive preference by including multiple information acquisition and processing modalities. Including a range of cognitive preference pedagogies in the classroom will lead to a more equitable educational landscape where the Native American student has the opportunity to be a more successful student.

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DEDICATION

I dedicate this research and dissertation to my parents, Larry Novak & Karol Jackson and James & Judy Perino. They have instilled within me the value of personal relationships for securing an empathic and healthy society. I am honored to thank my supportive wife, Jamie, and our two children, Cassidy and Jax. It is my hope that we will all continue to appreciate the joy and excitement borne of our experiences together.

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CHAPTER 1: INTRODUCTION TO THE STUDY

The study of cognitive preferences, often termed learning styles or thinking styles, has become widespread within the field of psychology. Experts as diverse as Gardner, Sternberg, Zhang, Carroll, Cattell and Horn, and Kolb have added to the corpus (Cohen & Swerdlik, 2004). Each theory and accompanying perspective elaborates or deviates from its contemporaries; this makes each position unique and specific. Each theorist's premise is, by virtue of his/her personal experience and the direction and history of their inquiry, a bit different, if not totally orthogonal from their collogues, and thus each theory maintains its own undergirding and utility under a variety of circumstances.

In addition to the study of cognitive preference, the study of ethnic identity is populated with a similar plethora of theorists: Marcia, Cross, Phinney, Tajfel, Quintana, and Cokley (Trimble, 2007; Kolb, 1984; Marcia, 1980) along with their respective positions. It is the aim of this project to better understand how ethnic identity impacts cognitive preference. Through this examination of the many theorists and their motivations, an exploration into divergent cultural syndromes, and the integration both cognitive and ethnic identity literature the following project describes the nexus of the ethnic-cognitive interplay.

An understanding of ethnic identity and cognitive preference will lead to overarching social change, a more accurate understanding of cultural norms, and changes in how individuals and institutions view thought processes and products.

The choice of integrating both cognitive preference and ethnicity is a direct product of my personal experience of working in public education as both a classroom teacher and school counselor for 10 years while working concurrently for 5 years as a

therapist with Native American foster children and their families. Both experiences have emboldened me to engage in a critical analysis of the both Native American thought processes and the structure of public education. In this pursuit I have certainly asked questions, become critical of minority educational opportunities, and sought to discover learning tendencies for both Native American and Anglo students. This project is a result of many answered and unanswered questions, the discovery of many faulty assumptions, and the prospect that a better understanding of Native American and Anglo students' interactions within the school environment may lead to more effective pedagogical practices and a catalyst for dialogue about the current state of schools and communities in our pluralist society.

Faulty assumptions surrounding cognitive preference have cost schools not only in dollars, but in educational outcomes. For marginalized populations, such inaccuracies have lead to dramatic decreases in both high school and college graduation rates and abbreviated occupational opportunities. A decrease in quality occupational opportunities contributes the cycle of poverty and to incarceration rates leading to increases in government subsidized food, medical care, and housing while simultaneously dislocating personal and cultural agency (Chaille, 2002).

Chapter Overview

In the review of the literature (Wilson, 1997; Ornstein and Hunkins, Skye, 2002; 2004; and Yamazaki, 2005) it is noted that Native Americans may have patterns of thought that are antithetical to a disconnected and independently motivated Eurocentric culture. Conversely, they have a culture high in meaning and subscribe to specific styles of learning that have been socialized and that focus on collective well-being rather than

individual prosperity. The research (Wilson, 1997) also shows that public schooling engages students with antipodal propensities and rewards thinking and learning styles different from those of the Native American culture. This process not only prunes Native students from higher education, but also forces those who do succeed into abandoning their traditions for less interconnectedness and reduced meaning.

Native American culture is steeped in metaphor, spiritually, and meaning (Skye, 2002). Looking at the literature, the Native American culture does not value individualism but rather emphasizes relational contexts and interactions. Further, within this culture, opposites are thought of existing in a circle that has no real beginning or end. Thus, in the traditional way, terms such as good and bad are seldom used in their pure or extreme sense, but rather are given a relative value. Within this frame, truth lies somewhere between the two poles, rather than at one of the two poles. In addition, Native American tradition focuses on transformation through harmony and balance via ceremony, sacred symbols, and meaning (Garrett & Barret, 2003). Moreover, the individual's negation of his/her culture and related cognitive preferences to serve educational ends may logically result in lowered levels of ethnic identity. Lowered levels of ethnic identity are correlated with reduced self-esteem, efficacy, and self-concept (Whitesell, Mitchell, Kaufman, & Spicer, 2006; Phinney & Chavira, 1992).

These cognitive and cultural differences may dictate abbreviated Native American graduation rates. Native American high school and post-secondary graduations rates are far lower than their Anglo counterparts and college graduation rates are even lower. The Bridge Project, a 6 year project of the Stanford Institute for Higher Education Research, found that for every 100 Native American and 100 White kindergartners, 58 and 93

respectively graduate from high school. Taking those same 100 kindergartners 7 and 49, respectively obtained at least a bachelor's degree (Office of Educational Research and Improvement, 2003). Within the research area there is a 21.5% graduation gap between Native American and Anglo students. In addition, the expulsion rate for Native American students is four-fold that of the Anglo students when calculated as a percent of each of their populations (Durango School District, 2006).

These graduation rates are drastically low at both the secondary and postsecondary level. One rationale is that education is primarily centered upon the cognitive styles of White males (Philbin, Meier, Huffman, & Boverie, 1995). Most if not all our institutions of learning were founded by White men who logically sought to convey their content commensurate with their cognitive preference. As a result the current educational model may inadvertently compromise women's' and minority's educational opportunities via misaligned cognitive preferences. More current education reform acknowledges students' many cognitive preferences and has attempted to address some of the former inequities by refining educational goals and objectives, and modes of delivery. These are all noble pursuits; and although these refinements may appear as though they are addressing the issue of education's awareness of multiple cognitive preferences they may more realistically reflect shallow changes to the existing Eurocentric educational paradigm rather than a shift in educational philosophy.

This project posited that ethnic identity and cognitive preference are related. The interplay of ethnic identity and cognitive preference is certainly relevant within schools, which was the specific focus of this project, but it is also a critical component in how one

observes and records historical events, constructs and enforces social norms and policies, and interacts personally under any number of circumstances.

A notable and directly comparable example of the pervasive impact of ethnic identity and cognitive preferences comes from Gandhi and one of his editors, Thomas Merton. Gandhi was chosen as an example to illustrate the breadth and impact of divergent cognitive preferences because he is not normally associated with the topic and yet cogently describes how the two have come together in light of the inequities he faced (Gandhi, 1964). Gandhi was engaged directly, physically, and unlike many of the cognitive theorists whose dialogue and retorts ride on the on pages of journals or in speaking tours, Gandhi's approach to the issue was confrontational in the literal sense. He saw inequities that affected people, he confronted the inequities, and his actions continue to echo. The inequities that exist today as a result of society's homage to a Eurocentric educational system are similar. They marginalize a specific population of individuals based upon their ethnicity, beliefs, and culture. Gandhi noted, as did Kolb (1984) and Phinney (1992), that certain ethnic identities may correlate with certain cognitive styles. Unfortunately, often a single dominant ethnicity and cognitive preference is promoted at the expense of others, resulting in a loss of balance that is necessary, while simultaneously leading to the marginalization of individuals who are left silenced in their perspective and their voice.

Gandhi and his editor Thomas Merton describe, in amazing parallel, many of the topics and theories found in the remainder of this project. They explain that the White man came into Africa, Asia, and America like a one-eyed giant. He brought with him the vision of a single truth and sense of superiority that were both his power and his end. He

was self-isolated and had a self-scrutinizing individual mind and he was the master of concepts and abstractions, rather than focusing global and collective well-being. Further, the White giant had an insatiable appetite for quantity, unbridled industrialism, and an excess of analytical thought – unfortunately without the counterpoint of relaxation, observation, and satisfying achievement (Gandhi, 1964).

The White man was also the driver of quantitative knowledge and that enabled him tactical supremacy void of understanding. He ruled his world without understanding and he wielded his power upon civilizations that had wisdom without science; civilizations where wisdom united the people, resided in the body, and made all life sacred and meaningful. This process continues today only under the banner of progress. Because of scenarios such as these, indigenous cultures have lost their voices and the wisdom of primitive America is nearly extinct (Gandhi, 1964).

Just as Gandhi was fascinated by western cultures, other cultures should allow themselves the opportunity to deviate from their entrenched modes of thought and to glean bits and strings of wisdom from what were once termed savage cultures, and now, unfortunately, remain only fractured pieces of great nations. Gandhi was clear; he understood that modern science and ancient wisdom call for one another – and that balance was necessary. Gandhi also noted that a synthesis of Eastern and Western religious and cultural philosophy is possible in our time (Gandhi, 1964). Few would argue that Gandhi had vision and a commitment to that vision. Attempts to understand Gandhi and his motivations have taken volumes to describe; this project has no intention to address his accomplishments and motivations.

The point of the summary was to introduce the notion that culture and ethnicity impact cognitive processes not just in cognitively related fields such as the sciences, academics, or in philosophy, but across political borders and between nations. Whether an individual or culture prefers to acquire information abstractly, or process information via observation, or whether he/she subscribes to collective or individual cultural syndromes, will not transfer to generalized outcomes or predictable profiles.

Cognitive preference and the implications that come from the dominance of a single style in society reach far beyond simple schooling and fairness in academia. Understanding cognitive preference aids the individual in better understanding history as well as the forces that help to shape the constellation of each culture. For some cultures, their preference, in a place and time, served them well and they prospered; for others the opposite may be true and they withered. These cultural syndromes and accompanying cognitive preferences are not static, for at any given time in history, the observer, may he/she be a historian or lay person, may notice the value in a culture having a collective cultural syndrome, while later, for that same observer and culture he/she may notice value in an independent cultural syndrome. For example the Israeli Kibbutzim have moved from a family or individual rearing system to a communal rearing system and back to a family or individual rearing system in the fairly short history of the country (and movement). As historians noted, the movements were delegated by the cultural demands of the era and in response to its members' needs (Maital & Bornstein, 2003).

The aim of this project is to compare the relationships between ethnicity and cognitive preferences. There are parallels in educational systems constructed on Eurocentric foundations that not only promote a certain way of perceiving the academic

material, but also negate other necessary and meaningful perspectives. As this project delves into the more specific educational comparisons it is of considerable import to recall this introduction and how cultures and nations have waxed and waned as a result of the interplay between ethnicity and cognitive preference.

Primary Theoretical Frameworks

The two primary theoretic frameworks that drove this proposed study: a) Experiential Learning Theory (ELT), which can be conceptualized as the bi-dimensional diametric between four learning modes: affective complexity in concrete experience, perceptual complexity in observation, symbolic complexity related to abstraction, and behavior complexity in experimentation (Kolb, 1984); and b) Multigroup Ethnic Identity Theory, which centers on the bi-dimensional scales of both individual and other group identification, as well as the uniform aspects of identity through many ethnic cultures such that the aforementioned scale can be compared across groups (Phinney, 1992).

Experiential Learning Theory

Learning theory finds its roots within behaviorist camp, a theory that clearly articulates the role of the environment in shaping the individual. The behaviorists' premise stands primarily on the intentionally shaping of behaviors via conditioning. From this perspective it can be deduced that conditioning, both intentional and unintentional, shape individuals' responses to stimuli and their environment. ELT explains an individual's experience in a similar way by describing how his/her experience impacts the ways in which they acquire and process information (Kolb & Boyatzis, 2001). Kolb and Boyatzis specifically focus on the term *experiential* in order to crystallize the difference between this and other theories of learning. ELT commingles cognitive,

affective, environmental, and developmental aspects of experiences to construct a holistic theory of learning. In this way, ELT is inclusive of the subjective and personal events that constitute an individual's circumstances (Sternberg & Zhang, 2001).

ELT is often framed as having a postmodernism and constructivist orientation, from this position it does not matter what actually occurred or is occurring, but rather, the individual's interpretation of that event and the meaning ascribed (Kolb & Kolb, 2005a; Moon, 2004). ELT is tethered to postmodernist tenets because both postmodernism and ELT subscribe to meaning being created rather than discovered. For the postmodernist reality may exist beyond the individual, But the understanding and perception of such a reality is filtered through the lens of personal experience and is thus subjectively constructed, rendering absolute knowledge of reality unattainable (Becvar, personal communication, 2006; Becvar & Becvar, 2006). Similarly, ELT suggests that learning and experience both center upon the ideal of individually validated realities, which are approximations rather than direct representations. ELT is a postmodern learning theory punctuated by the recognition of the unique individual who has innumerable learning predilections. These learning constellations and preferences are dictated from their experience and their orientation to a subjectively constructed worldview. Under this description individual variances in experience would precipitate similar variances in how one views and constructs meaning.

Multigroup Ethnic Identity Theory

Events can, as has been elucidated above, consist of any number of situations, dispositions, or interactions. Bringing together ethnic identity development within the context of ELT helps in crystallizing the role that an individual's culture plays in framing

events that precipitate learning and cognitive style. An individual's cultural environment provides unique experiences as well as interpretations of those experiences. Further, transgenerational attitudes and customs impact the ways in which individuals filter, select, acquire, and process information. A comprehensive understanding of ethnic identity in tandem with cognitive style should help in defining culturally contingent experience as it impacts Experiential Learning Theory.

Ethnic identity is defined broadly with no generally agreed upon definition (Phinney, 1990). Tajfel (1981) is cited most frequently with a working definition. Accordingly ethnic identity is "Part of an individual's self concept which derives from his knowledge of his membership of a social group together with the emotional significance attached to that membership (p. 255)." Phinney (1990) cites two distinct models of ethnic identity. The first model views ethnic identity as linear. From this orientation one end represents the highly ethnically identified individual, while on the other lay the individual with minimal identification with their ethnic group. The second takes under consideration both the prospect of ethnic engagement and the relations regarding the dominant culture yielding a four-quadrant classification system. Under this theoretical construct an individual may have either strong or weak connections with his/her own ethnic group membership while simultaneously having either strong or weak identification with the majority group.

Summary of Theoretical Frameworks

The purpose of this study is to look at ethnic identity within the Native American as it relates to cognitive preference. Phinney (1990) clarifies the difference between both state and stage models of ethnic identity and cognitive preference. She defines the *state*

of ethnic identity as an individual's ethnic identification at a particular time, where the *stage* of ethnic identification is more longitudinal and examines an individual over time and through the stages of ethnic identification. For the purpose of this research, state ethnic identity was examined; essentially the variable consisted of a measure of both ethnic identification and cognitive preference at a fixed point in time, with the understanding that age, social processes, and environmental factors do cause that particular state to fluctuate with time and under differing contexts. By examining state in a static sense the research included individuals who are at differing stages with regards to their ethnic identity. Under these conditions the following examination took the static factor of the two theories and identified how a particular state of ethnic identification per Phinney's theory correlates or interacts with a particular cognitive preference state per Kolb's theory.

It is important to note that in addition to Kolb's (1984, 2005) measure, the Learning Style Inventory (LSI 3.1), and Phinney's MEIM (1992), this project included the influences of field dependence, context, processing, the neuroanatomical correlates of processing, and collective and individual cultural syndromes and they relate to both Anglo and Native American populations. This project also included a brief history of ethnic identity movements, multiple definitions and perspectives that exist within the field, and viable avenues for the utility and conceptual integration of ethnic identity and cognitive preference.

Statement of the Problem

Academic material presented unilaterally assumes that there is a single mode of both acquiring and processing information. This assumption is false and leads to the

intellectual marginalization of individuals who endorse alternate acquisition and processing modalities. Currently, there is research centering on cognitive style in general as well as research on indigenous and aboriginal college students and their respective cognitive style; however, little is discussed regarding the Native American high school student (Wilson, 1997; Yamazaki, 2005). Although there is speculation about the rationale for lower graduation rates and student engagement; some of which include motivation, cultural difference, and numerous other ecological factors, there is a paucity of research regarding Native American high school students' cognitive style in relation to ethnic identity.

This research elucidates the role ethnicity plays in cognitive preferences so that modern education can meet the needs of the Native American student by emancipating them from education's current system. It is posited that a better understanding of the Native American student will lead to more accurate and beneficial pedagogical methods and strategies that offer reparations for what has resulted in an ethnically mediated injustice, leading to the augmentation rather than to the degradation of the educational experience.

Purpose of the Study

The purpose of this research was to compare Anglo and Native American high school students via Phinney's MEIM and Kolb's LSI 3.1, which gauge ethnic identity and cognitive preference, respectively. Categorical and continuous variables were recorded and used on both metrics. The data addressed the possible differences between the samples as well as the correlations that existed between the two samples regarding ethnic identity and cognitive preference.

Through the use of Kolb's theory, the research analyzed cognitive style differences in Native American students as compared with their Anglo counterparts. Further examination included correlations with Phinney's Multigroup Ethnic Identity Measure (MEIM). Research (Wilson, 1997) noted that Native Americans may subscribe to specific learning preferences and that those styles are proportionally inconsistent compared with norming samples and Eurocentric participants. This suggests that while individuals may have any number of thinking and learning preferences, Native Americans may generally subscribe to specific strategies. Furthermore, these styles may be beneficial to the participant. While such strategies may be high in meaning they may also be incongruous to academic performance in public education.

This comparison also highlighted the assumption that inequities in access to educational opportunities do result from educational material presented to a specific cognitive preference. Further, the results from this research support reparation that ultimately led to more direct and comprehensive educational opportunities for Native Americans as well as a global understanding of diversity in cognitive preference. Although this study may not be generalized due to the specific demographic sample, the research did flag specific educational shortfalls for this population and while it is likely that more research will be needed to affect drastic social reform, this research intended to set in motion a better appreciation of the concepts herein and their implications for education.

Research Questions and Hypotheses

There are two primary hypotheses:

H_{01}The Native American participants have cognitive preferences that are not categorically different or significantly different than the Anglo participants.

H_{a1}: The Native American participants have cognitive preferences that are categorically different and statistically significant from their Anglo peers.

H_{02}: The level of ethnic identity, recorded as a continuous and categorical variable, is unrelated to cognitive preference.

H_{a2}: The level of ethnic identity, recorded as a continuous and categorical variable, is related to cognitive preference.

The hypotheses, per the literature, suggested that the Native American sample would endorse a different cognitive preference as indexed by a cognitive preference metric when compared to the Anglo sample. It was also hypothesized that the level of ethnic identity and ethnic designation for Native American individuals would be positively correlated with a specific profile. This profile included a focus on concrete experience and reflective observation, as acquiring and processing preferences, respectively. This hypothesis suggested that Native American ethnic identity will be positively correlated at .30 or higher with a concrete learning preference which has, in previously research (Kolb, 2005), been negatively correlated with formal academic achievement.

This second hypothesis also suggested that if a difference in the two samples were present, then Anglo individuals should endorse a different cognitive preference profile. It was hypothesized the Anglo sample would align with a profile that includes abstract conceptualization and active experimentation as acquiring and processing preferences, respectively (see chapter 2 for discussion).

Operational Definitions

Cognitive Preference Terms:

1. Abstract Conceptualization (AC): AC is on the acquiring dimension and it represents the preference for understanding and attaining information via abstract referents.
2. Accommodating: Accommodating is the categorical identifier used when an individual endorsed CE on the acquiring dimension and AE on the processing dimension.
3. Acquiring Dimension: One of two theoretical ELT dimensions graphically illustrated by the vertical axis on a coordinate grid and represents the ways in which an individual prefers to acquire information.
4. Active Experimentation (AE): AE is on the processing dimension and it represents the preference for processing the acquired information via actively participating and through experimental manipulation.
5. Assimilating: The categorical identifier used when an individual endorsed AC on the acquiring dimension and RO on the processing dimension.
6. Concrete Experience (CE): CE is on the acquiring dimension, it is the preference for understanding and attaining information via concrete means.

7. Converging: The categorical identifier used when an individual endorsed AE on the acquiring dimension and AC on the processing dimension.

8. Diverging: The categorical identifier used when an individual endorsed CE on the acquiring dimension and RO on the processing dimension.

9. Experiential Learning Theory: A theory authored by David Kolb (1984) describing the many experiential components that impact the learning process. His daughter Alice Kolb has furthered this theory.

10. Processing Dimension: The second of two theoretical ELT dimensions – graphically illustrated by the horizontal axis on a coordinate grid and represents the ways in which an individual prefers to process information.

11. Reflective Observation (RO): RO is on the processing dimension it is the preference for processing the acquired information via reflection.

Ethnic Identification Terms:

1. Ethnic Identity (EI): EI is a subscale of the MEIM that gauges ethnic identity specifically.

2. Multigroup Ethnic Identity Measure (MEIM): The metric authored by Jean Phinney (1992) and amended by Roberts et al. and Phinney (1999). The instrument is used to compare ethnic identification between groups as well as an individual's orientation to other or majority groups.

3. Other Group Orientation (OGO): OGO is a subscale of the MEIM that gauges an individual's orientation to the majority or *other* group.

Limitations, Assumptions, and Scope

There are limitations to this research that stem from the socially constructed, theoretical concept of ethnic identity and cognitive preference, and the attempts to gauge each. It is impossible to directly measure both ethnic identity and cognitive preference and thus even the most accurate metric employs the process of gauging external responses to internal processes. In this translation it is possible that error befall the research. Further, error is inherent in every metric and even under the assumption of a perfect metric there is still the probability that the participants responded via demand characteristics or with response sets that may create inaccuracies in the measurement of the construct. Recruitment issues may have also limited the validity of the research. The sampled population was under the age of 18 and thus needed to have either parent or guardian assent. This may inadvertently create a sample with certain profile that align with a particular cognitive preference or with a specific level of ethnic identification leading to a under representation of those who do not assent and their corresponding cognitive preference and level of ethnic identification. Research also noted the socioeconomic status of the high school sample it did approach significance at p =.54 (Phinney, 1992), this facet could affect the results and will be addressed within the discussion section (chapter 5).

It could be argued that the utilization of two different sites for this project could confound the results because different community profiles lead to different participant characteristics. However, in this case, it is important that the participant's responses accurately reflect their cultural orientation and engagement such that the participant's measure of ethnic identification directly represents the differences in experiences, values

and mores that comprise culture. Using a single location would assume that experience and environment do not impact cognitive preference but that such differences are biological, using two different cites supports the premise that cognitive preference is a artifact of culture and that variances in the participant's cognitive preferences result from variances in their ethnic environment and experience.

Other assumptions address the generalization of the result to other populations. This research was conducted on a specific sample and thus the generalizability of the findings will be limited. Although the scope of this research and the results will be reserved for this particular sample the research will encouraging dialogue about ethnic identity and cognitive preference for a larger audience.

Significance of Study

Understanding cognitive preference has far-reaching benefit for multiple sectors of society. Assets gained through cognitive research enable professionals to provide more pointed education, effectively engage students, accurately generate therapeutic interventions, as well as achieve better precision in communication for a host of interpersonal relations. The assumption that individuals' preferences for acquiring and processing information are uniform is not only inaccurate but costly in terms of misappropriated educational resources, inequities via the underrepresentation of minorities and individuals from divergent ethnic backgrounds in higher education, and inadequately designed protocols for diverse student populations.

Specifically, within our public educational system, this understanding will help to remedy the misconception of a one-size-fits-all approach to learning. Research has demonstrated that teaching orientation is primarily correlated with male (Philbin, Meier,

Huffman, & Boverie, 1995) and Eurocentric (Wilson, 1997) learning preferences, leaving excluded populations in less than equitable circumstance. In addition, Sternberg and Zhang (2001) posit that thinking styles are socialized; it thus becomes critical to encourage the educational system to better grasp these constructs and their implications for learning and academic performance. The task ahead is to better define divergent learning styles as they relate to ethnicity so that education can serve its students in formats commensurate with their propensities.

Sternberg and Zhang (2005) posit that ability only accounts for a small portion of individual differences in school performance and that other performance factors may lie in thinking style. They note that thinking style does not imply ability, nor is one style more advantageous than another. It is important to note that a school's adherence to a single modality does create inequities in access to information, grades, and academic promotion.

This research elucidated the role ethnicity plays in cognitive style so that modern education can meet the needs of the Native American students by emancipating them from education's current system; it is posited that a better understanding of Native American cognitive styles will lead to more accurate and beneficial pedagogical methods and social changes that offer reparations for what has turned out to be an ethnically mediated injustice.

Summary

This research is critical theory commingled with experiential learning theory, ethnic identity theory, and constructivism (see chapter 2). Looking at both the theories and the literature there are clear differences between minorities and cognitive styles and more specifically to Native Americans and cognitive styles. The problem of underachieving minorities is a problem most school districts face across our nation.

School districts often implement remediation programs to get their minority populations up to satisfactory levels. This is often accomplished with pull-out classes and test preparatory drills, while doing more of the same without a shift in the ways in which the information is presented and hence acquired and processed.

This project compared only a small component of a much larger system, yet the hope is that the momentum generated from this research may push its way onto the desks and dinner tables of steering committee members, school administrators, and concerned parents. Our educational system was built quickly with the perennial approach that there is, in fact, a single educational model that works effectively for all students. Today that is not the case and yet our interventions and best efforts are spent refining that dated and inapplicable educational model. Moreover, we are at a critical juncture, we are unwittingly yet systematically filtering out many wonderfully intelligent individuals with incredibly different approaches to solving problems. We are pushing to the top rungs of our leadership individuals, both politically and academically, who employ a Eurocentric philosophy. In a time where the stakes are getting larger and time is running quickly it may be to all our benefit to hold tight to those who think drastically different, to foster their cognitive preference, experience, and culture so that they may view today's problems through a different lens.

As iterated above there are eras where certain preferences may lead to prosperity and others to withering. This may be the time where a deviation is necessary, if the problems that face our society, country, and the world are not being addressed or solved with our current educational, scientific, and political paradigms, it may be the time for an

influx of some novel prospects. Simply, more perspectives not only lead to more options, but to the perpetual refinement of each individual's position.

Using the ethnic – cognitive interplay as promulgated above may appear a dramatic sidebar; however, it illustrates the need for multiple perspectives, perspectives that are currently left under nourished, unattended, discarded, and disengaged. A return to equity in education requires that each student is presented with equal opportunities to learn, progress, and share their experience, whether it is cultural, spiritual, or content centered in a safe and open venue where discussion cultivates complex questions, illuminates common and divergent positions, and builds curious and critical minds.

A better understanding of how individuals acquire and process information should also lead to more effective means for communicating content while simultaneously enriching the courses for each individual student. Students are all different, and the system has stifled a great number of them, now is the time to allow a revitalization of thought and discourse so that Native Americans, other minority students, as well as the many Anglo cultures and subcultures can engage in fruitful discussion and use their unique histories to color the pallet of the class with shades never before seen.

The following project addressed the ethnic-cognitive interplay as it exists between Anglo and Native American high school students. It began with a review of the literature and the relationship between the two variables, as they exist in comparable populations and in regards to the theoretical undergirding. Further, statistical analysis compared simple descriptive as well as aggregate and disaggregated scores and sub-scores on both metrics in order to better understand the relationship between the ethnic identity and cognitive preference. The results of the project will be presented and followed by a

discussion of both their significance and how they may best be viewed in light of the limitations of the study and the extant literature as well as how they relate to engendering change for this population.

In chapter 2, the review of the literature addresses the theoretical frameworks in detail, while incorporating the importance of several other influences. The review cites collective and individual cultural syndromes, field and context dependence, and the current state of public education. In addition, hemispherical, neuroanatomical correlates, and experience dependent neurology will be discussed in relation to cognitive preference and ethnicity. The review also addresses other research methods and metrics surrounding the two theoretical constructs and why the specific methodology was employed for this study.

CHAPTER 2: REVIEW OF THE LITERATURE

Chapter 2 is divided into three several sections. Section one begins with the strategy used for searching the literature, theoretical construct section, a description of the two theoretical frameworks that organize the study while further defining the roots and components of the first of the two theories. Experiential Learning Theory (ELT) dimensions and categories are addressed in the first subsection. Multigroup Ethnic Identity Theory and its structural dimensions and ethnic development are discussed and its integration with ELT elaborated upon in the second subsection.

The second section, content and research context, defines and compares research on both theoretical constructs, reviews the history, components and metrics of ethnic identity – MEIM and Native American populations. This section also includes a discussion surrounding the multiple definitions and perspectives within each field and possible avenues for melding the two theoretical constructs.

The third section, methodological choices and rationale, uses current literature to research methodologies that have been used in similar studies. This section is further defined into three subsections, specific Native American and LSI research methodologies, specific Native American and MEIM research methodologies, and the proposed LSI and MEIM research methodologies that will be used for this study.

Strategies Used For Search the Literature

In searching the literature I employed several databases as well as traditional published books and articles. I began with a search of Academic Search Premier, Ebsco, and Eric. Furthermore, I searched the private databases of Questia and Sage. I used specific key word searches centering cognitive style, learning style, David Kolb, Robert

Sternberg, Biggs, and Zhang, ethnic identity, ethnicity and education, culture and cognition, and cultural syndromes. I also used Native American, Indian, American Indian, Aboriginal, and indigenous in combination with the former cognitive word searches. I also contacted, via e-mail, Robert Sternberg, Alice Kolb, and Jean Phinney, all of whom returned my correspondence and provided additional references and journal articles.

Theoretical Constructs

The two primary theoretic frameworks that drove this study were a) Experiential Learning Theory (ELT) which can be conceptualized as the bi-dimensional diametric between four learning modes: affective complexity in concrete experience, perceptual complexity in observation, symbolic complexity related to abstraction, and behavior complexity in experimentation (Kolb, 1984); and b) Multigroup Ethnic Identity Theory, which centers on the bi-dimensional scales of both individual and other/majority group identification – addressing uniform aspects of identity through many ethnic cultures such that the aforementioned scales can be compared across groups (Phinney, 1992).

Experiential Learning Theory

From an ELT perspective it would be difficult to deny that individuals learn via experience. Learning theory finds its roots with behaviorist theory, a theory that clearly articulates the role of the environment in shaping the individual. The behaviorists' posture speaks to the intentionally shaping of behaviors via conditioning, within this frame it can also be deduced that conditioning, both intentional and unintentional, shape individuals' responses to stimuli and their environment. ELT sets to elucidate the role a person's experience in a similar way by describing how such experience impacts the

ways in which they acquire and process information (Kolb & Boyatzis, 2001). Kolb specifically focused upon the term *experiential* in order to crystallize the difference between this and other theories of learning. Other theories of learning tend to implicate a single modality as the primary vehicle for learning to occur. For example in cognitive learning theories learning is described as a purely cognitive process, one whereby the senses relay a stimulus to the sensory register, where it is either attended to or begins to decay. Further, the information is encoded into either short term or long term memory and the process of learning is complete without reference to social-situational, affective, behavioral, or symbolic processes (Sternberg & Zhang, 2001). As cognitive learning theory and other theories with insular orientations imply learning is attributed to only one of many possible mechanisms. By designating a primary conduit for learning the individual unduly creates a hierarchy whereby other experiences and modalities are sublimated as the learning theory employed promotes a unitary function over a set of other plausible factors**.** ELT is different in this regard. ETL commingles cognitive, affective, environmental and developmental aspects of experiences to construct a holistic theory of learning. In this way ELT is inclusive of the subjective and personal events that constitute an individual's circumstances.

In this broad sense ELT stands within a postmodernism and constructivist frame whereby it matters not what actually occurred or is occurring, but rather, the individual's interpretation of that event and the meaning ascribed (Kolb & Kolb, 2005a; Moon, 2004). ELT is tethered to postmodernist tenets because both postmodernism and ELT subscribe to meaning being created rather than discovered – for the postmodernist, reality may exist beyond the individual, however their understanding and perception of it is filtered

through the lens of personal experience and is thus subjectively constructed rendering absolute knowledge of reality unattainable (Becvar, personal communication, 2006; Becvar & Becvar, 2006). Similarly, ELT suggests that learning is a personally subjective experience and both center upon the ideal of individually validated realities, which are approximations rather than direct representations. Essentially, both ELT and postmodernism share the fundamental assumption that knowledge is created, based upon experience, and that each individual is unique in their interpretation of events and their environment. ELT is a postmodern learning theory punctuated by the recognition of the unique individual who has innumerable learning predilections and that such learning constellations are dictated from their orientation to a subjectively constructed worldview.

Roots of ELT. ELT has elements from several other theoretical frames. Specifically, ELT finds roots in the work of Piaget, Lewin, and Dewy; who focused on experience in cognitive development, Gestalt and social events, and pragmatism, respectively (Rainey & Kolb 1995; Kolb, 1984). In Kolb's seminal ELT text, Experiential Learning, Experience as the Source of Learning and Development (1984), he clearly cites the former theorists' contributions to his theory.

Piaget began his work in the field under Alfred Binet, the father of intelligence testing, where his interest in intelligence began to bifurcate sharply from a purely psychometric approach to one founded on understanding the reasoning children utilized in order to construct their responses. Under the investigation of this interest he noted age-related stages in reasoning processes. Kolb (1984, p. 12) stated, "Piaget's theory describes how intelligence is shaped by experience. Intelligence in not an innate internal characteristic of the individual but arises as a product of the interaction between the

person and his or her environment. And for Piaget, action is the key." Piaget's Model of Learning and Cognitive Development adds to ELT the bi-dimensional axes of concrete phenomenalism internalized reflection, abstract constructionism, and active egocentrism, which correspond to the axes of ELT's concrete experience, reflective observation, abstract conceptualization, and active experimentation, respectively.

Kurt Lewin, considered the founder of American social psychology, contributed to the understanding of behavior and learning as related to ELT (Kolb, 1984). Made famous through his training groups and action research, Lewin discovered that learning occurs best where there is a tension between direct concrete experience and the detachment an individual may utilize with analytic processes. This very premise primed Kolb for ELT, he used this diametric in his theory, model, and metric. In addition to discovering this necessary tension, Lewin also reinforced for Kolb, via his work with sensitivity training, the value of experience in learning. The Lewinian model of action research and laboratory training adds to ELT the recursive spiraling of concrete experience, observation and reflections, formation of abstract concepts, and the generalizing and testing of the new implications in novel situations. These stages also correspond to the four point circular format of ELT's concrete experience, reflective observation, abstract conceptualization, and active experimentation, respectively.

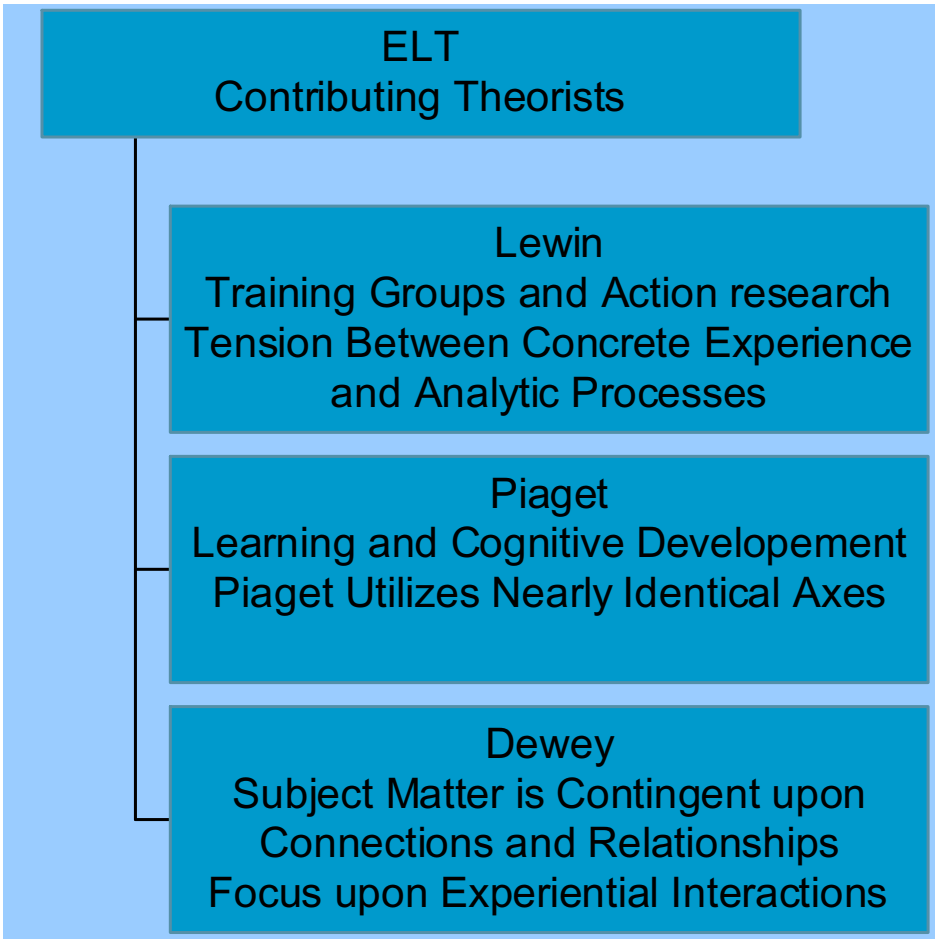

Figure 1. Contributing ELT Theorists.

According to Kolb (1984, p. 5), Dewey is "without a doubt the most influential theorist of the twentieth century, that best articulates the guiding principles for programs of experiential learning" Eames (2003) elaborates with her analysis of Dewey's premise that subject matter be interpreted in light of connections or relationships. She also cites Dewey's use of the term *interaction* to describe the relationship between individuals and their experience. Dewey's theory of experience pointedly addresses the necessary relations between actual experience and the educational process (Kolb, 1984). A large

part of Dewey's contribution to ELT lies in Dewey's proclamation that there exists a need to translate the abstract concepts of the formal academic world to the concrete realties of conventional life. In Dewey's model of experiential learning a circle is also employed with impulse, observation, knowledge, and judgment representing four points that are, as is the Lewinian model, readdressed repeatedly and which correspond to ELT's concrete experience, reflective observation, abstract conceptualization, and active experimentation, respectively.

Components of ELT. From each of the three theories and theorists ELT integrates the cognitive and developmental components of Piaget, complete with the subsumed processes of accommodation and assimilation; the recursive, cyclical, and diametric properties of Lewin; and the feedback and iterative processes involved in Dewey's model of experiential learning The character of all three theories and their authors are clearly preserved within ELT and presented below (Kolb & Kolb, 2005; Kolb 1984).

1. Learning is best conceived as a process, not in terms of outcomes. To improve learning in education the primary focus should be on engaging students in a process that best enhances their learning – a process that includes feedback on the effectiveness of their learning efforts. "…education must be conceived as a continuing reconstruction of experience... the process and goal of education are one and the same thing." (Kolb & Kolb, 2005 p. 79)

2. All learning is relearning. A process that draws out the student's beliefs and ideas about a topic so that they can be examined, tested, and integrated with new, more refined ideas best facilitates learning.

3. Learning requires the resolution of conflict between dialectically opposed ways of adapting to the world. Conflict, differences, and disagreements are what drive the learning process. In the process of learning, one is called upon to move back and forth between modes of reflection and action and feeling and thinking.

4. Learning is a holistic process of adaptation to the world. It is not just the result of cognition but involves the integrated functions of the total person – thinking, feeling, perceiving, and behaving.

5. Learning results for synergetic transactions between the person and the environment. In Piaget's terms, learning occurs through equilibration of the dialectic process of assimilating new experiences into existing concepts and accommodating existing concepts to new experience.

6. Learning is the process of creating knowledge. ELT proposes a constructivist theory of learning whereby social knowledge is created and recreated in the personal knowledge of the learner. This stands in contrast to the "transmission" model on which much current educational practice is based. Where pre-existing fixed ideas are transmitted to the learner.

From these six tenets it is clear that behaviors, thoughts, affect, and perception are inextricably linked, multidirectional, and integrated. An individual viewed through ELT may have all the former processes in varying degrees causing and influencing the other processes such that thoughts give way to emotions which impact perceptions and precipitate behaviors which interact with the environment to create what is termed *experience*. This cycle can be interrupted and initiated at any point and reconfigured such that behaviors are the antecedents to emotions, which lead to thoughts, and again, to perceptions. Learning is the product of this dynamic relation between an individual and the multiple components that constitute their environment; and learning is, at its very core, the process of creating rather than transmitting knowledge.

Sternberg and Zhang (2001) defined cognitive style as the way in which an individual processes information. Under this definition it is clear cognition as processing and learning can be considered unitarily the product of experience. It is important to clarify that learning is not to be viewed as synonymous with memory or other cognitive process, nor does this inclusive definition imply that the delineation between the two be

discarded, merely that experience is the root of knowledge and as events unfold the individual uses both knowledge of former events and learning processes to comprehend experience in order to create meaning and to adapt to their environment.

Knowledge is the product of acquiring and processing information and according to ELT an individual's preference can be scribed upon two interlocking dimensional continua. One involves the acquiring diametric between concrete experience (CE) and abstract conceptualization (AC), while the other processing diametric describes the individual in terms of either reflective observation (RO) or active experimentation (AE). These two dimensions are subject to the context of the situation and ideally an individual should cycle through each of the quadrants during a learning situation (Kolb & Kolb, 2005a).

Kolb and Kolb (2005) further defined ELT as the process that engages a creative tension among the four axes and learning modes based upon environmental demands. This process would be best viewed as a recursive process, where the learner experiences each information acquisition or processing orientation under any number of learning circumstances. Rainey and Kolb (1995) stated that the significance of ELT lay in its four learning modalities. The model also suggests that individual's transition through the each of the four poles on both the acquisition and processing dimensions and although individuals transition through these modalities they have general preferences as well as preferences that are context dependent.

As figure 2 illustrates each pole yields a classification on each of the two dimensions such that an individual will have a primary leaning on the vertical acquisition axis and primary leaning on the horizontal processing axis. In the first of Kolb's

dimensions, acquisition, CE can be equated with affective, immediate and intuitive meaning; while the counterpoint, AC centers more on cognitive, rational and symbolic processes and representations. The second dimension addresses the transformation of information with the perceptive, appreciative and diffuse properties of RO, and the behavioral, focused, and goal directed properties of AE. According to ELT it is the synthesis of these alternate forms of knowing that lead to higher levels of learning.

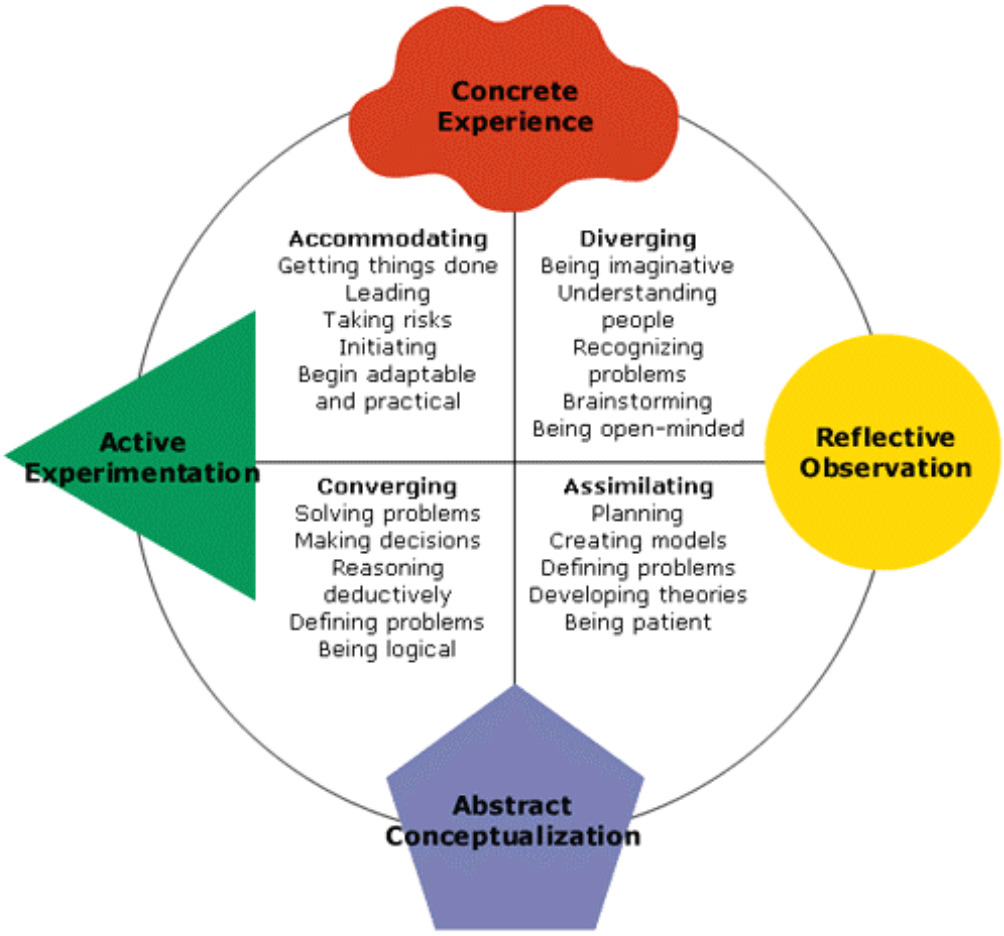

Figure 2. Structural dimensions of ELT (Kolb & Kolb, 2005b, p.1: permission to use see appendix B).

ELT can be elaborated upon in more detail by taking an individual's endorsement of each of the two dimensions such that the combination of the acquisition and processing dimensions yield a more specific and categorical label based upon their location in one of each of the four resultant quadrants (Kolb & Kolb, 2005b). Kolb enumerates and offers a

brief description of the following categories, while providing both academic and professionally aligned fields

Diverging.

Individuals who subscribe primarily to CE on the acquisition dimension and RO on the processing dimension are termed diverging under the ELT model. Individuals with this learning style have the preference for viewing concrete situations from multiple perspectives – the choice of the label diverging because an individual with the these traits generally performs best in situations that require the generation of novel ideas, prefers to gather multiple sources of information, has expansive cultural interests, and tends to be imaginative and emotional. Diverging individuals also enjoy working with others in groups, engaging different points of view and listening with an open mind. Academically, this quadrant is best associated with the humanities and social sciences with psychology, anthropology, philosophy, history, and foreign language. Those with high CE scores on the vertical axis may be more inclined to pursue work as a therapist, social worker, policeman, or waiter, while those lower on the CE axis but extended on the horizontal RO axis may be performers, artists, decorators, or stage hands (Kolb 1884; Kolb 2005b).

The following figure can be interpreted by adhering to the axes definitions in figure 2, while graphing the individual's endorsement on each axis – the higher the score the more peripheral the point will be noted on the intersecting number lines. Connecting the points along the axis creates a shaded form of an individual's learning profile as illustrated in the following quadrilaterals – all of which refer to a slightly differing diverging cognitive preference.

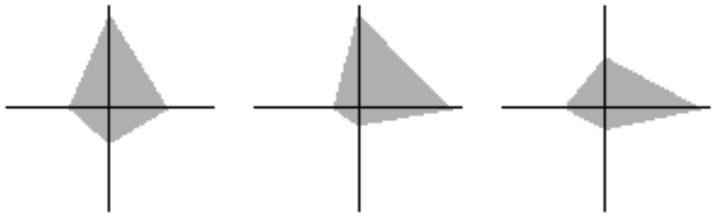

Figure 3. Diverging cognitive style quadrilaterals

Assimilating.

The individual with AC and RO learning predilections are generally better suited at understanding a range of information and converting or assimilating it into a logical and concise form; these individuals and this category is thus labeled assimilating. These individuals often find utility in theory over practicality, and in formal learning situations prefer analytical models, lecture and time to think and read. Academically, this quadrant is best associated with the natural sciences and mathematics. Those with high AC scores on the vertical axis may be more inclined to pursue work as nurses, dentists, technicians, or scientists, while those lower on the AC axis but extended on the horizontal RO axis may be clerks, teachers, reporters, or scholars (Kolb 1884; Kolb 2005b).

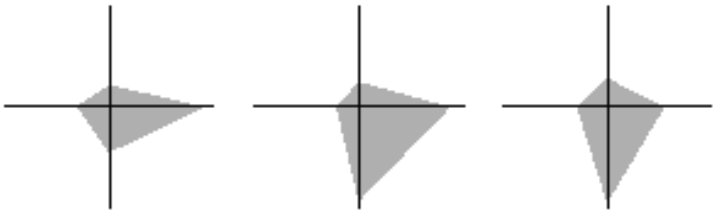

Figure 4. Assimilating cognitive style quadrilaterals

Converging.

Subscription to an AC and AE dominant learning are best at finding practical uses for ideas and for theories, they have a preference for solving problems that stem from tangible questions. Individuals with and AC and AE learning profile are labeled converging, they prefer to interact with technical tasks rather than on issues with personal or social valance. In formal learning situations they prefer to experiment and simulate, while engaging in projects with practical applications. Academically, this quadrant is best associated with the science-based professions. Those with high AC scores on the vertical axis may be more inclined to pursue work as craftspersons, labors, engineers, or applied scientists, while those lower on the AC axis but extended on the horizontal AE axis may be prefer outdoor occupations such as farmers, county agents, and also applied science positions (Kolb, 1884; Kolb, 2005b).

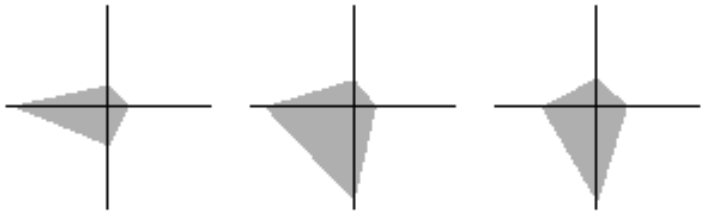

Figure 5. Converging cognitive style quadrilaterals.

Accommodating.

The last of the four quadrant categories consists of individuals with a CE and AE learning profile. According to ELT these individuals are labeled accommodating and gravitate towards situations that require or enable the learning by engaging in hands-on experience. They prefer to follow plans and have challenging experiences; furthermore, they may rely on their gut (Kolb & Kolb, 2005) rather than logical analysis. Individuals

with an accommodating learning orientation seek information from other persons rather than resting on their own analysis. In formal learning situations, Accommodating learners prefer to focus on task completion directives, goal setting, and fieldwork. Academically, this quadrant is best associated with the social professions. Those with high CE scores on the vertical axis may be more inclined to pursue work in public relations, retail, sales, or promotion, while those lower on the CE axis but extended on the horizontal AE axis may prefer more organization occupations such as bankers, accountants, or supervisors (Kolb 1884; Kolb 2005b).

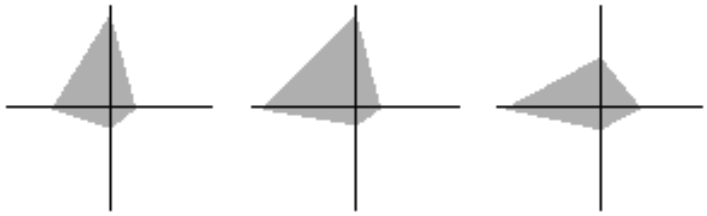

Figure 6. Accommodating cognitive style quadrilaterals.

In discussions of learning style and cognitive preference there are often overlapping and divergent definitions of the two. For the purpose of this research cognitive style will refer to the ways in which an individual approaches a task, the resources they choose to allocate in acquiring and processing the information they encounter, and the means by which those resources are selected and employed. Kolb's ELT is an inclusive model – it does not merely include simple attentive mechanisms, nor does it speak directly to the specific and common cognitive definitions surrounding memory, decay, or sensory inputs. Kolb's model describes in overarching detail the preferences individuals possess for different tasks under alternate situations. Cognition is

often framed as the mechanism in which knowledge is put into action while learning style focuses upon the creation of knowledge via experience.

According to ELT, cognition and learning are both based upon an individual's experience. The implementation of mental actions based upon both stored knowledge and the demands of the current task influence the ways new circumstances are approached. Operationalizing cognitive style to be the product of both learning and cognition, ELT is better able to address the total of both the constructs and account for the individual's choice of task engagement based upon prior experience, which, in and of itself, forms preference. Kolb (1984) also modeled the forces that shape preference. His model incorporates movement between previous experience, habits, and current circumstance while incorporating the typologies of psychological personality, education specialization, profession, current occupation, and adaptive competencies. It is the combination of both inner and outer variables in junction with situational context, which both prune and encourage specific cognitive preferences.

Role of Experience in Learning. Experience, under Kolb's model, is a referent to any social, environmental, filial, educational, or cultural event, which, impacts the ways in which the individual will orient himself or herself to a problem, event, or interaction. Essentially, as a person experiences he/she uses both novel and iterative exposure to adjust their mental scaffolding in order to either, contradict, enforce, or extend their former schema in light of the newly encountered material.

Other theorists have heralded the role of the socially situated individual, where learning and human functioning are the result of interdependent, dynamic, and contextualized interactions between a person's culture, his/her society, and innumerable

nested and interlocking systems (Bandura, 2001). Although not specifically titled an experiential learning theory per se, Bandura's aforementioned statement does underscore that learning occurs beyond any insular process. Tappan (1998) also addressed the role social relations play in mental functioning, he communicates quite clearly that Vygotsky's social cultural psychology centers on the processes between individuals, their interactions and experiences, and how those processes become internalized into mental operations within the individual. His particular phrasing cogently explains how social and cultural influences come to impact an individual's cognitive predilections; he states that intermental processes between persons become intramental processes within persons. This implies a deductive route to socialized cognitions, where social interactions become mirrored internally from external circumstance. McNamee and Gergen echo Vygotsky's address to the social aspects of learning while providing a postmodern tone, "beliefs held by individuals construct realities and realities are maintained through social interaction which, in turn, confirms the beliefs that are then socially originated" (McNamee & Gergen, 1992, p.43). However, their avenue is more inductive, originating within the individual and projecting outward. Both speak to the interwoven aspects of social and cognitive relationships and how social situations come to impact cognitive patterns while beliefs and cognitive patterns create social realities.

Multigroup Ethnic Identity Theory

Kant clearly addressed experience as not the passive absorption of sensations, but rather, the result of our own active cognitive processes (Rohmann, 1999). Under this analysis experience is created not unearthed, and therefore, it is contingent upon other events which stage and frame current circumstance in a manner commensurate with

previous circumstance. Events can, as has been elucidated above, consist of any number of situations, dispositions, or interactions. Commingling identity development, primarily ethnic identity development, within the context of ELT helps in crystallizing the role an individual's culture plays in framing events that precipitate learning and cognitive style. An individual's cultural environment provides unique experiences as well as interpretations of those experiences. Further, transgenerational attitudes and customs impact the ways in which individuals filter, select, acquire, and process information; therefore a comprehensive understanding of ethnic identity in tandem with cognitive style should help in defining culturally contingent experience as it impacts the *experience* in Experiential Learning Theory.

Ethnic identity is defined rather broadly with no generally agreed upon definition (Phinney, 1990). In two-thirds of the 70 studies Phinney reviewed, the authors did not provide an explicit definition of ethnic identity as a general construct. In this body of literature Tajfel (1981, p. 225) was cited most frequently with a working definition of ethnic identity, "that part of an individual's self concept which derives from his knowledge of his membership of a social group together with the emotional significance attached to that membership" Moreover, both Tajfel and Lewin addressed the difficulty for individuals within ethnic groups and their subsequent identity formation when they subscribe to two different groups, when one group is held in esteem, and when conflict is beliefs, behaviors, and attitudes are present (Phinney, 1990).

Phinney (1990) also cites two distinct models. The first model views ethnic identity as linear where on one end lay the highly ethnically identified individual and on the other the individual with minimal identification with his/her ethnic group. Under this

theory, an individual cannot both simultaneously identify with their own ethnic group and the ethnic group of the dominant culture. The second takes under consideration both the prospect of ethnic engagement and the relations to the dominant culture yielding a four-quadrant classification system. The latter of which will be employed for the definition pertaining to this research. Under this theoretical construct an individual may have either strong or weak connections with their own ethnic group membership while simultaneously having either strong or weak identification with the majority group. Graphically, much like the comparative metric use in ELT, an individual may reside in one of four distinct ethnically defined classifications (see Table1).

Acculturated, integrated, and bicultural individual. An individual who has a strong endorsement for both the majority group and his/her own ethnic group, yields a strong-strong classification. These individuals tend to be acculturated, integrated, and bicultural (Phinney, 1992). One who has both pride in their own culture, an understanding of how cultural influences affect their personal experience. These individuals also understand how it is that differing cultural backgrounds interacts in social relations. These persons do not feel slighted by their identification nor do they relegate blame to their own or to other cultural groups. They simply understand that difference is inevitable and that such difference can be better viewed as an asset with ethnic or multiple groups contributing to the overall wellbeing of society. Furthermore, a strong-strong endorsement indicates an appreciation of diversity and that such diversity should be valued over homogeneity.

Table 1

Majority group orientation and ethnic group identification matrix

	Ethnic Group Identification	
Majority Group Orientation	**Strong**	**Weak**
Strong	Acculturated Integrated Bicultural	Assimilated
Weak	Ethnically Identified Ethnically Embedded Separated Dissociated	Marginal

Ethnically identified, embedded, separated, and dissociated. A weak identification with the majority group and a strong identification with his/her own ethnic group suggest an individual is ethnically identified, embedded, separated, and dissociated (Phinney, 1990), This individual has incorporated his/her culture within the formation of their self-concept; and although they have come to value the unique composite of their ethnic and cultural qualities, histories, and experiences, they have not realized the value in divergent cultural backgrounds. If one were to view the process of ethnic identification from a stage rather than a state model, this individual has transitioned from what many theorists (Atkinson, Morten, & Sue, 1983; Marcia, 1980; Phinney, 1989) have described as the initial stage of foreclosure, to the intermediary stage of crisis or moratorium, a stage in which the individual seeks to understand their own ethnicity and its impacts while awakening to social and political influences as they pertain to ethnic identity development (Phinney, 1990). Often this classification is characterized by the rejection of the dominant culture as either being oppressive or restrictive in terms of the availability of opportunities and resources as well as iniquitous in terms of procedural, distributional, and transactional justice.

Assimilated. Similarly a weak-strong orientation, with respect to ethnic group and majority group, respectively results in an assimilated classification (Phinney, 1990). The assimilated individual many have an unexamined view of their cultural heritage, lack motivation for ethnic exploration while simultaneously conforming to the values and norms of the dominate culture. This state used within a stage model would most closely align with what many theorists (Atkinson et al, 1983; Marcia, 1980; Phinney, 1989) would describe as identity foreclosure. The assimilated individual may appear to discount

their own culture and ethnic heritage in favor of those of the majority group. These attempts to replace or alter their ethnic identity via a closer association with the dominant culture group may be rooted in the assumption that the appearance of homogeneity is socially protective or that said assimilation results from an individual's difficulty in navigating an environment that may differ substantially from their personal cultural history.

Marginal. The endorsement of weak on both dimensions results in a marginal classification (Phinney, 1990). An individual with this label lacks interest in ethnicity in general. Phinney (1989) places the individual with marginal status near those with an assimilated classification, but further defines their interaction by noting that the desire to become a part of the dominant culture is entirely absent. This individual may appear apathetic, uninformed, or may lack motivation with regard to identity formation. Ethnicity and the cultural environment constitute a substantial and influential portion of identity development as such their void of interest may be the result of delays in typical identity development or, framed within a stage model, signify early or pre-contemplative indicators of ethnic identity development.

Ethnic Identity Development

In addition to the static definition and typology of ethnic identity theory, it is of considerable import to note that identity formation, or more specifically ethnic identity formation is a dynamic process whereby the individual, usually in adolescence, is faced with certain decisions and possible developmental stages (Broderick & Blewitt, 2003; Phinney, 1990). Although Erik Erikson addressed the importance of culture in an individual's identity development, his model has not been widely applied in ethnic

identity research (Phinney, 1990). Specifically, Broderick and Blewitt (2003), enumerate the four stages of Erikson's identity status: diffusion, moratorium, foreclosure and achievement, and although others (Atkinson et al., 1983; Phinney, 1989) use sections of his ego identity theory as a template for ego identity statues, each theorist adjusts Erikson's model to fit their theory of ethnic identity (Phinney, 1990). The focus of ethnic identity for this study utilizes the theoretical frameworks of Phinney, with the three ethnic identity stages: unexamined, identity search (Moratorium), and achieved ethnic identity.

Summary of Theoretical Frameworks

The purpose of this study was to look at ethnic identity within the Native American as it relates to cognitive preference. Both ethnic identity and cognitive preference are complex theoretical constructs and even within a single authored model of ethnic identity there are multiple factors that influence both the state and stage of ethnic identification. Phinney (1990) clarifies the difference between both state and stage models of ethnic identity. She defines the state of ethnic identity as an individual's ethnic identification at a particular time, where the stage of ethnic identification is more longitudinal and examines an individual over time and through the stages of ethnic identification. For the purpose of this research state ethnic identity will be examined; essentially the variable will consist of a measure of ethnic identification at a fixed point in time, with the understanding that age, social processes, and environmental factors do cause that particular state to fluctuate with time and under differing contexts. It was the hope that by examining state in a static sense the research will include individuals who are at differing stages with regards to their ethnic identity. It is also important to realize that cognitive preference can be viewed as both state and stage dependent – where *state* is

a referent to a fixed point in time and stage, a referent to a longitudinal progression. Under these conditions the following examination took the static factor of the two theories and identified how a particular state of ethnic identification per Phinney's theory correlated or interacted with a particular cognitive preference state per Kolb's theory.

Content and Research Context

The theoretical context section described the two theoretical frames, which ground the metrics used to describe the interplay between cognitive style and ethnic identity. These theories suggest that experience and thus culture and ethnic identity are fundamental in the development of the individual. Furthermore, that in this development an individual's environmental experience dictates the ways in which they select, filter, and process information. Essentially, experience and cognitive style are omnidirectional components. Experience predisposes individuals to certain types of cognitive patterns, while an individual's cognitive style lends structure to experience. Specifically, experiences and experience contingent tendencies shape an individual's perceptions and modes of acquiring and processing information. The following review of the literature will elucidate the relationship between ethnic identity and cognitive style specific to Native American adolescents and their Anglo counterparts. It is hypothesized that Native American teens have divergent cognitive predilections as compared to Anglos and that the relationship between ethnic identity and cognitive style is correlated. The hypotheses will be explored via extant literature on both ethnic identity and cognitive style as gauged by Phinney's Multigroup Ethnic Identity Measure Revised (MEIM-R) and Kolb's Learning Style Inventory version 3.1 (LSI 3.1), respectively. Moreover, this review

stands to attend to the impacts of ethnically dependent cognitive preference within educational, social, and individual domains.

Learning Style Inventory version 3.1 Research

The LSI 3.1 categorizes individuals based upon both information acquisition and processing preference on two dimensions. In Wilson's (1997) comparison of Native American college students and their Anglo peers she found dramatic differences in their cognitive preferences as indexed by Kolb's metric. She surveyed 60 students, 28 of whom self-referred as Native American, which included Alaska Native, Aleut, Eskimo, American Indian, or Hispanic, the remaining 32 students self-referred as white or American. The Anglo contingent had a fairly normal distribution of scores on acquisition dimension of the LSI; however not a single Native American endorsed abstract conceptualization (AC), while the majority favored active experimentation (AE). It is important to note that Wilson's (1997) use of the LSI did not employ the integration of both dimensions but simply measured each individual's primary preference. This methodology led to flawed inferences. The LSI is designed to yield two preferences, one from each an acquisition and a processing dimension, rather than a single preference as utilized by Wilson. In light of these limitations it is still possible to note a main observation; AC was not endorsed for any Native American, while AC did align with the norming sample for the Anglo population. It would be spurious to conclude that Native American's primarily endorse AE in terms of cognitive style because the measure is ipsative and designed to include the endorsement of one acquiring and one processing categorical designation. If scores on either dimension are close the larger is noted, thus including either an acquiring or processing descriptor rather than one of each. For

example, an individual could have had the highest score on CE and the second on reflective observation (RO), resulting in a diverging cognitive preference and only the CE would have been included in her analysis. However, to use the finding as Wilson has suggested accurately indicates that that not a single individual in the Native Americans sample endorsed AC as their most primary cognitive preference while it was the highest for the Anglo sample. This finding speaks to the profile of AC individuals who are more oriented towards words, symbols, and impersonal learning situations that focus on analysis (Wilson, 1997) and those characteristics are valued in most public and formal educational venues. Although it could also be assumed that because AE was the most prevalent choice for Native Americans their profile must encompass the attributes suggestive of AE individuals. Wilson (1997) suggested that a high score on the AE dimension is indicative of an active and doing posture regarding learning and that it is very different from and AC orientation. Again she has mixed her dimensions, ELT and the corresponding LSI do allow for an individual to prefer both AE and AC in acquiring and processing, respectively, resulting in a converging learning style. However, as the following research and literature will show this is not the case.

Field Dependence, Context, and Processing.

Wilson (1997), Ornstein, and Hunkins (2004) suggest that Native Americans have receptive, experience-based, feeling-based, empathetic, and people centered profiles, which accurately align with CE acquisition preferences. Further, Ornstein and Hunkins specifically address the Native American individual's preference for verbal instruction, exploratory play, and concrete learning as well as field depended circumstance. From Wilson's research it can be concluded that on the acquiring dimension the Native

American sample favored concrete experience (CE) and the Anglo slightly favored abstract conceptualization (AC) as their primary learning orientation, while her results on the second or less endorsed processing dimension cannot be used due to the aforementioned limitations and inaccurate distribution.

Kolb (1984) explains that individuals who endorse CE prefer to acquire information via high context situations indexed by the preference for circumstance that lend to environmental field sensitivity and adherence to feelings and intuition. Yamazaki (2005) expands upon Kolb's definition by explaining that effective communication for those with CE predilections prefer to be situated in specific surroundings which lend to the use of tacit knowledge necessary for using covert communicative clues. Furthermore, Yamazaki posits that individuals who endorse CE prefer acquiring information via interpersonal relationships and that it would be accurate to deduce that such characteristics necessitate proximity and actual experience rather than an abstract conceptualization (AC) mode of acquiring information. The CE profile illustrated above supports Ornstein and Hunkins (2004) findings regarding context and field sensitivity preference concerning Native American populations.

Conversely, if taken within Kolb's ELT, the alternative acquiring orientation, AC would be less field sensitive, low context, and less concerned with proximity; while preferring explicit, logical, and symbolic representations (Yamazaki, 2006). Moreover, Yamazaki notes that the duration and importance of relationships for high context and low context individuals last for relatively longer and shorter time periods, respectively. This observation supports Wilson's (1997) qualitative observations that the Native American students in her sample who continually noted the importance of the

relationships in their academic lives, relationships with their professors primarily as well as the impact of relationships that have been attenuated as a result of their attending a culturally removed campus.

Looking at research from Wilson (1997), Ornstein and Hunkins (2004), and Yamazaki (2005), a profile begins to emerge that descriptively illustrates how preferences in information acquisition dramatically affect success in multiple environs, particularly formal institutional education which is typically characterized by topical abstraction, the rapid cycling of professors and content, resulting in a lack of personal connection, and the minimization of nonverbal cues and the relational components of communication.

It is valuable to reiterate that this review intends to illuminate public education's discrepant orientation towards Eurocentric acquisition and processing dimensions. Over a quarter of a century ago the U.S. Commission on Civil Rights on quality education stated the interaction between the teacher and the student should be the heart of the educational process and that such interaction depends upon the understanding of cognitive preferences (Graybill, 1997). Further, Graybill specifically noted both field independent and field sensitive cognitive styles, which are sometimes equated to analytical and relational learning styles in terms of organizing and processing information, respectively.

The research presented formerly suggest that Black, Hispanic, and Native American students are generally more relational and field sensitive while being less analytical. In addition, these populations demonstrate a preference for working with people rather than with things and thrive in educational environments that are loosely structured and where attention is placed on the global or general concept. These

individuals generally prefer to focus on the whole rather than the parts that constitute the whole. Moreover, they also prefer cooperative learning to competitive learning that characterizes Eurocentric schools, which are field independent, task-oriented, and focus on the parts rather than the whole (Grant, 1999).

Sequential and Simultaneous Processing.

A focus on the part and the whole can also be equated to sequential and simultaneous processing mechanisms, respectively. Field independence and low context learning situations that are common in education often break down a concept into its linear parts such that understanding follows a Eurocentric logical path of connecting the points or building upon prior concepts. The very process of decontextualizing parts from a whole results in a reduction in overarching thematic connections and defines a concept, theory, or activity in terms of a sequence rather than the holistic conglomerate that it truly constitutes. This reductionistic posture is touchstone in Eurocentric educational models and serves those with sequential or successive predilections well. However, by that very note it also compromises those who prefer to acquire and process information simultaneously.

Neuroanatomical correlates of sequential and simultaneous processing.

D'Amato, Fletcher-Janzen, and Reynolds (2005) stated that any stimulus can be processed via simultaneous or successive processes; however certain mental functions are more efficiently processed through one over the other. The authors also noted that cognitive processes are contingent upon numerous factors including cultural traditions. They stated that although there are exceptions, as a generality, language is processed most efficiently successively as it is dependent upon a linear sequence of spoken or

written composition, while solving visual analogies and copying figures are more efficiently processed simultaneously.

From a neuropsychological perspective (D'Amato, Fletcher-Janzen, Reynolds, 2005), simultaneous processing is linked to the occipital and parietal lobes, primarily of the right hemisphere, which aid in the manufacture of mental images, conversations in relationships, inductive reasoning, and for formal cognitive measures such as the Graham-Kendal Memory for Designs Tests, Similarities sub test on the Wechsler Scales, and Backward Digit Span Test. Successive or sequential processing is linked to the frontotemporal areas, primarily of the left hemisphere. Successive processing is linear and sequential which makes this processing modality most efficient for the syntactical structure of language and formal metrics including Digit Span Forward, serial recall tests, and sequential visual short-term memory tests.

Hale and Fiorello (2004) discussed hemispherically related differences in processing. They have concluded that the left hemisphere is specialized for tasks requiring representations that have a single modality, are routine, standardized, or well known, while the right hemisphere has a greater capacity for dealing with complex representations that may be multi-modal, more global, holistic, or novel. Hale and Fiorello also addressed the organic hemispheric differences. The right hemisphere is generally heavier and contains more white matter, while the left hemisphere has disproportionately more gray matter. White matter is charged with communication related tasks, and gray matter, with information storage. The difference in hemispheres with respect to white and gray matter results in the left hemisphere having more primary

cortex and more within hemisphere processing and the right hemisphere having more association cortex and employing more between hemisphere processing.

D'Amato, Fletcher-Janzen and Reynolds (2005) added to Hale and Fiorello's (2004) hemispheric processing description via their discussion of the functional neuroanatomical structure of the neurons in each hemisphere. From their work with traumatic brain injuries and recoveries D'Amato, et al echoed Hale and Fiorello and stated that the left hemisphere contains more gray matter and the right more white – gray matter is made of nuclei of neurons and white, the myelinated axonal tracts that move neural impulses. Furthermore, the left hemisphere has short fibers that process information sequentially, while the right has longer white mater connections that allow for simultaneous and holistic processing. Both authors noted that each hemisphere was originally thought to address a different set of stimulus and that currently the hemispherical relationship can be more accurately described in terms of types of processes and that the hemispheric division of labor is dictated by these neuropsychological processes not the mechanism of input nor the mode of output (D'Amato, Fletcher-Janzen, & Reynolds, 2005; Hale and Fiorello, 2004).

It is important to note that according to ELT the neurological correlates of both simultaneous and sequential processing are not predetermined genetically, but rather rest upon both biophysical loadings and the wide range of factors that constitute an individual's experience. Although the left and right hemispheres have specific leanings regarding processing and the research indicates that Native Americans are typically CE and RO, which primarily utilize right hemispheric function, this does not suggest that an individual or culture is necessarily prone to use either simultaneous or successive

processes. This can be further explained from research on learning disabilities. D'Amato, Fletcher-Janzen, and Reynolds (2005) found that specific interventions aimed to develop left hemisphere language centers were successful, thus illustrating that environment can and does impact an individual's utility of hemispheres. Translating their learning disability research to ELT and Native American populations suggests that processing preference and the biophysical correlates may be mediated by an individual's experience. Under this model, cognitive predilections such as, simultaneous and successive processing, field dependence and independence, and levels high and low contexts are inherited in the sense that they are derived from genetics as well as from inherited experience, tradition, and culture.

Research related to cognitive preference

Many studies have correlated Kolb's LSI with other related instruments. The research has shown relationships to specific types of academic majors both before and after courses (Engleberg, Schwenk, & Gruppen, 2001), cognitive style representation in occupational fields (Stutsky, 1995), correlations with age (Truluck, 1999), the effects of cognitive style on academic performance under both distributed and local educational instruction (Suliman, 2006; Helena, De Jesus, Almeida, & Watts, 2005; Wessel, & Williams, 2004; Loo, 2002; Cano-Garcia, & Hughes, 2000), leadership style (Little, 2004), and many other relationships spanning numerous disciplines. And while this research is valuable and applicable for the individual as well as academic specialty and profession, it may be that experience and culture mediate the aforementioned relationships. If the attributes of specific types of cognitive styles are distilled into a fundamental element such as field dependence, preference for abstraction, or context, as

was illustrated with Yamazaki (2005) it is possible to tether broad research to specific traits and tendencies which may be indicative of an individual's location on Kolb's ELT four quadrant grid.

Sugarman (1985) illustrated this relationship with the Myer-Briggs Type Indicator (MBTI). The MBTI addresses and classifies the ways in which an individual interacts with their environment and in this sense provides a similar and concurrent measure of an individual's preference for interacting and processing their surroundings. Where Kolb focused directly on two dimensions, one of information acquisition and the other information processing, the MBTI focuses on four. The ways in which an individual takes in information are referred to as the sensing–intuition dimension; the modes of reaching a conclusion are referred to as the thinking-feeling dimension.

Sugarman's research (1985) underscores Kolb's (1976) research in that his metric correlates with the MBTI on several fronts. Beginning with the CE pole of the acquiring dimension, he suggested that individuals who scored high in this dimension would tend to gravitate toward sensation as a mode of perceiving and feeling as a mode of judging. Conversely, individuals who endorsed the other pole of the acquiring dimension, AC on Kolb's metric, use intuition and thinking on the MBTI's dimensions of perceiving and judging, respectively. On Kolb's information processing dimension those who endorse AE and the counterpoint RO, were best correlated with extroverts and introverts, respectively.

Using this information in junction with Yamazaki's (2005) field and context dependent and independent cultural typologies reiterates the point that individuals who endorsed CE tend to prefer high context circumstance, which yields the desire to acquire

information via more personal and relational avenues. This supports Sugarman's (1984) research, which correlates CE individuals with sensation and feeling on the MBTI. Further, Sugarman's findings support the aforementioned methodological error whereby Wilson (1997) suggested via her research that Native Americans endorse AE as their primary processing modality. If her data were accurate on this dimension it would suggest that Native American individuals were primarily extroverts; moreover, Kolb (2005) describes AE individuals as risk takers, egocentric, focus on influencing people and events through action rather than the other pole of the dimension, RO, which is characterized by careful observations, collectivism, multiple perspectives, and meaning.

Other research (Skye, 2002; Garrett & Barret, 2003) speaks directly to the position of meaning within Native American culture. Native American tradition focuses on harmony and balance via meaning seeking. Meaning is central in Native American Culture. These cultural attributes support a RO preference for processing. Skye (2002) also posits that Native American culture does not value individualism but rather emphasizes relation contexts and collective interactions. This is antipodal to most Eurocentric cultures, those that value individualism and competition. Framed within ELT's processing dimension this would suggest that Native American individuals would prefer to acquire information via concrete experience as has been supported and to process information by reflective observation – a position that does align with Wilson's (1997) acquiring dimension findings but suggests an alternate preference for processing.

Triandis (1995) noted that nearly all contemporary psychological theory and data come from Eurocentric populations (Australians, North Americans, or Europeans) and yet this minority population accounts for 30%, with the remaining 70% of the world's

population living in divergent settings with alternate cultural beliefs, and with differing psychological foundations. Triandis cogently suggested that if the field of psychology is to become universal then it must not only account for this diversity, but also must value and incorporate such diversity into its theory and practice.

Krueger and Clement (1997) introduced the term false consensus effect (FCE). The fundamental assumption grounding this effect is the result of numerous cognitive and motivational factors in which individuals project their own worldview, responses, and positions upon others. This effect is significant ($p < .0000000001$) with effect sizes ranging from .3 to 1.3 (Krueger & Clement, 1997). The FCE states the majority slightly underestimates the size of their group, while the minority strongly overestimates the size of their group and that most individuals, regardless of whether they are actually members of the majority, believe themselves to be in the majority. Furthermore, Triandis (1996) notes that all humans are ethnocentric and are unable to fully appreciate the subjective worldview of other individuals and societies and thus fail to make accurate assumptions regarding other cultures, their motivations, norms, and traditions. Essentially, theories that involve another's culture are filtered through one's own culture and its tenets. This results in observations that are described in terms of one position and working definitions as opposed to actually describing accurately the targeted culture's behaviors, emotions, and cognitions (Triandis, 1996). The commingling of Triandis (1995, 1996) with Krueger and Clement (1997) lend to the overarching assumption that a minority of the world is unwittingly promulgating psychological principles for the remaining majority. This may appear adequate based upon the minorities FCE, but in actuality it only reflects filtered observations of the minorities, which may be quite distal from the actual events and

characteristics of the observed culture. Awareness of this effect should not thwart attempts to understand culturally mediated processes but rather inform decisions and encourage the observer to pointedly address his/her own cultural position when describing another's.

Collective Cultures and Cognition

Skye (2002) stated that Native Americans value relations and are more collective centered than their Eurocentric counterparts. This primary difference in cultures – the individual and collective, for Eurocentric and indigenous persons, respectively, can be located and aligned with general traits and with specific dimensions as on the LSI as described by Kolb (1984, 2005a, 2005b). Primary in this endeavor is to briefly review the overarching characteristics of each an individual and collective culture. Triandis (1995) cited a number of tests and measures using the construct and he stated that individualism and collectivism are *cultural syndromes.* As such they are the conglomerates of basic individual and social cultural antecedents, which are dictated from experiential and situational components.

Triandis' (1995) defined the individual and collective constructs with four universal dimensions that distinguish the two cultural syndromes:

1. The definition of the self is interdependent in collectivism and independent in individualism. This is reflected in various aspects of daily life, including the extent to which individuals share resources with group members and conform to the norms of the group.

2. Personal and communal goals are closely aligned in collectivism and not at all aligned in individualism. One can identify collectivism when group goals have priority and individualism when personal goals have priority. When in-group and personal goals are compatible, one has collectivism; when they are not, individualism is the result.

3. Cognitions that focus on norms, obligations, and duties guide much of the social behavior in collectivist cultures. Those that focus on attitudes, personal needs, rights, and contracts guide social behavior in individualistic cultures.

4. An emphasis on relationships, even when they are disadvantageous, is common in collectivist cultures. In individualist cultures, the emphasis is on rational analyses of the advantages and disadvantages of maintaining a relationship

The individualistic culture stands on private ownership and a production and consumption models of existence. Further, this model employs a supply and demand philosophy whereby a person's value or worth can be gauged by their acquisition of a limited set of resources. Triandis, the preeminent expert on collective and individual cultures (Gibson & Caldeira, 1996) clearly distinguished between the two syndromes. Individualist cultures are self-reliant, value individual autonomy, value diversity, are confident and generally affluent, socially mobile, have high exposure to the mass media, and a living that may require individual pursuits; moreover, individualistic cultures are oriented toward market economics and are willing place responsibility and blame (Triandis, 1996). This definition does parallel Kolb's (2005a) points pertaining to AC and AE such as utilizing logic, planning systematically and acting on an intellectual understanding of the situation as well as showing the ability to get things done, taking risks, and influencing people and events through action, regarding both the acquiring and processing dimensions respectively.

Conversely, Triandis (1996) describes collectivist cultures in terms that center on the family, belonging, and solidarity, while hinging upon common fate, agrarian centered economies, nurturing, and cooperation. These descriptors align with Kolb's (2005a) CE on the acquiring dimension and RO on the processing dimension. Learning form specific

experiences, relating to people, and being sensitive to feelings and people are characteristics of the CE acquiring dimension. Similarly, The RO processing dimension is defined by careful observation before making decisions and judgments, employing multiple perspectives, and an emphasis on the search for meaning in things or events.

It is of considerable import to note that neither the literature nor Kolb suggest that one cognitive preference is more desirable that the other, and while it could be argued that collectivist goals are more communally based and thus beneficial for a healthy social system, such a position remains one of values rather than of science and equity in education.

Wessel, Loomis, Rennie and Brook (1999) conducted a study in which perceived problem solving ability and cognitive preference were compared. The intent of their research was to illuminate whether a particular learning style was more advantageous in relation to problem solving and to identify a specific learning style that would characterize their sampled population. Their research is relevant because its methodology compares cognitive style via Kolb's LSI to another multi-axial measure and because the results are iterative of the former statement which clearly indicates that a hierarchy does not exist with respect to cognitive style – in this case problem-solving.

The authors (Wessel, Loomis, Rennie, & Brook, 1999) administered Kolb's LSI and Heppner and Petersen's Problem Solving Inventory (PSI) to a sample of 158 physical therapy students. The results iterate the aforementioned statement regarding a lack of hierarchy with respect to cognitive style while illuminating the dominant cognitive style endorsed by this sample. The eta-squared coefficients ranged from 0.018 to 0.044 indicating that only 1.8 to 4.4% of the variability on the PSI could be explained by the

student's LSI score – a value small enough, under these circumstances, that no association between cognitive preference and perceived problem-solving ability could be concluded. However, the research did indicate that the majority of students were classified as either *assimilators* or *convergers* on the LSI. In addition to noting a lack of any perceived problem solving advantage linked to a specific LSI category it is imperative to acknowledge that both *assimilators* and *convergers* endorse the AC pole on the information acquisition dimension of the LSI. This information suggests that the format of public education and post-secondary education are bent toward benefiting the student who is more able to conceptualize and acquire information via abstraction over concrete experience. There are, as is the case with research in general, limitations: from the possibility that perceived problem-solving and actual problem-solving are less related than the test authors suggest, that physical therapy students do not characterize higher education students in general, or the possibility that educational programs do not benefit a specific cognitive style so much as they create, via their curriculum, a specific type of learner. The authors (Wessel, Loomis, Rennie, & Brook, 1999) address this later statement with the notation that physical therapists transition from abstract to more concrete learning preferences after graduation. Further, the subject of physical therapy lends to concrete experience given that the practice of the profession relies entirely upon the concrete interaction among the individual and the therapist – these last two statements taken in tandem suggest the possibility that pedagogical methods are misaligned and are deconstructing the acquisition strategies that are prominent in the field and necessary for the practicing physical therapist.

History, Components, and Metrics of Ethnic Identity

The aforementioned research points to several mechanisms that affect and are affected by an individual's cognitive preference. Further, the research indicates that specific cognitive style classifications are linked to certain individual and cultural traits. In addition, this relationship is bidirectional and as such, specific individual and cultural experiences can eventuate cognitive preference classifications. This omni-directional interplay between an individual's cultural background, experience, and cognitive style is the basis from which an individual interacts and translates their world. Each component maintains a dynamic tension that disposed the individual to acquire and process information in ways that align with the above classifications. It could be argued that cognitive style does not impact an individual's cultural background; however, such an assumption neglects to acknowledge the premise that cognitions and employed methods of translating experience into meaning not only birth personal understanding, but provide a structure from which an individual's social and personal events can be incorporated into a broader sociocultural framework. Therefore, cognitive style becomes the lens through which the individual acquires, processes, and adds meaning to their experience. This research demonstrates that processing style, field dependence-independence, collectivism-individualism, and high-low context preferences can be correlated with specific cultural typologies. Research also suggests that the aforementioned characteristics are the result of specific cultural typologies. This relationship leads to the fundamental assumption that culture and cognition are omni-directional forces - where each factor impacts the other. Therefore, it could be deduced that an individual's specific cognitive preference can be correlated with their cultural setting.

Brief History of Cultural Movements.

Understanding multicultural research within the psychological setting necessitates a query into its historical undergirding. Ponterotto and Mallinckrodt (2007) addressed five key modern movements in psychological multicultural research. The first major movement can be described by the absence of cultural issues in counseling, education, research, and theory. This period termed Benign Neglect by the authors comprises the years up to 1960. The 1960s and 1970s contained the civil rights movement and began to establish multicultural awareness; this period comprising both decades is aptly termed Birth of a Movement. During this era scholars began to publish widely on the topic, while multiculturalism and the study of culture, primarily race and ethnicity became utilized as variables in research between groups surrounding a variety of psychological constructs. The third movement was characterized by rapid growth in research and theory. In addition to comparisons between groups, this era in multicultural research began to unearth and turn inquiry towards within-group differences and also began to study mental health issues among ethnic groups. This third stage, Gaining Momentum and Establishing a Specialty, was defined by the authoring of metrics tethered to theory. From this third stage, Black and White, Hispanic, and Asian American acculturation theories were tested while prominent theorists developed and refined assessments that were to tandem their scholarship. The 1990's witnessed exponential growth in multicultural literature, research, and theory. This movement, Maturation and Expansion of a Specialty, was defined by an increased focus on the constructs of worldview, acculturation, and racial identity as well as the refinement of existing theory and expansion of multiple models to describe racial consciousness. The years beginning 2000 and extending to the present

extends theory, practice, and research, into international venues. Beyond Borders and Disciplines stands upon interdisciplinary cooperation while encouraging more research within qualitative domains. This final stage is cumulatively inclusive by maintaining a focus upon the tenets that defined the former stages while forging anew into uncharted territory. The former stages are specific to the study of multiculturalism, and yet within science as a discipline there are other stages that seem to align closely.

Ponterotto and Mallinckrodt (2007) stated that scientific progress is not a linear process but is more accurately described in nonlinear terms with periods consisting of plateaus and other periods of intense growth that are correlated with technological advances in associated metrics. Scientific progress in general can be distilled into four distinct stages: the Flowering of Theory, Theory in Search of Measurement, Flowering of Measures, and a Winnowing of Measures. Ponterotto and Mallinckrodt's review of the literature suggested multicultural research may be leaving the Flowering of Measures stage and entering into the Winnowing of Measures. Further, research on ethnic identity has reached a threshold that mandates the cautious examination of the interrelated nature of theory, metrics, and methodology. Differing metrics are to some degree representative of competing versions of what may appear to be a unified theoretical platform (Ponterotto & Mallinckrodt, 2007).

Issues of Multiple Definitions.

Trimble (2007) discussed the issues that stem from a specialty impregnated with multiple measures. These multiple measures are indicative of multiple perspectives regarding common lexicon. The field centers on ethnic identity and in that description nearly all the research sets to add or define some aspect or relationship within; however,

it cannot be assumed that lexical congruence is synonymous with conceptual congruence. There are many metrics that have been created to gauge ethnic identity; and in their construction they reflect the authors' overarching assumptions regarding the construct and within each metric resided a perspective and an ideal of ethnic identity theory which is embedded as an artifact of the authors' experience and intent surrounding their interpretation of the topic. Trimble cogently expressed:

> If we cannot come to an agreement on what the construct measures, then we have no business developing scales to measure them… incongruities and confusion in the field should not deter of dissuade the scholar, scientist, and counselor from conducting further inquiry into the topic. Quite the contrary, the field is in desperate need of structure and order. To accomplish orderliness and structure, scholars and practitioners are challenged and encouraged to probe deeper into the topic to sort out and smooth over the discrepancies and incongruities (p. 256)."

What is more, in the discussion of ethnic identity and culture, broad ethnic labeling or as Trimble (2007) termed, *ethnic gloss*, is counter to adequately and accurately describing the depth that is inherent within cultures. Glosses are general misrepresentations that muddle scientific inquiry while simultaneously promoting the public's misunderstanding of multiculturalism in a pluralistic society. This can be illustrated with the demographic variable *White.* The designation White does not lend to description or to dimension regarding ethnic identity, because it does not refer to a distinct cultural or ethic group, but rather refers to a person of European ancestry. Often the issue of inadequate ethnic labeling is the result of a forced choice process by which an individual is posed with a series of ethnicities and chooses the label that best fits. Under these circumstances *glosses* are employed and obfuscate the dynamic composition of an individual's cultural and ethnic identity. In 2000 the census bureau allowed individuals to

report more accurately their ethnicity and the results pointedly illustrate an individual's preference for identifying with their ancestral or national origins rather than predetermined glosses. The results indicated that the largest ethnic group in the United States was German, with 42.8 million, followed by Irish (30.5 million), African (24.9 million), English (24.5 million), American (20.2 million), Mexican (18.4 million), and Italian (15.6 million), to list those over 15 million. Ultimately there were 500 different ancestral classifications. *White* accounted for only 1,799,711 or 0.7% of the responses and Caucasian with less than 100,000 persons (U.S. Census Bureau, 2004). These results speak to ethnic and cultural research that employ the use of glosses such as, and how such a label creates a conglomerate that does not represent culture, ancestry, nor ethnicity – while clouding research and marginalizing those who would, given the opportunity, report more specific cultural identities. Trimble (2007) reinforced the importance of accurately understanding cultural identities – which are the heart of lifeways and thoughtways, ethnocultural ways of living and being and group specific ways of thinking, respectively. Trimble's declaration, taken with the results of the U.S. Census, suggests mass inadequacies and fissures in multicultural and ethnic identity research. In addition to *glosses,* adequate and appropriate labeling, which appears oxymoronic, but will stand for the sake of argument, were exercised, the issue of contextual labels for the individual becomes relevant. Under these situations, individuals use different labels to describe themselves under divergent circumstance and contingent upon their peer groupings (Phinney & Ong, 2007). This very point illustrates as well as iterates the social constructionist premise of ethnic identities (Cokley, 2007), one where an individual's surroundings, histories, and experiences, collide at any given moment to shift ethnic

descriptions of the self. There are many other challenges in conceptualizing and individual's ethnic identity, beginning with the aforementioned situational variables and glosses, to the fundamental artifact that language, and more specifically, the concepts of ethnicity and race, are socially constructed and continue to change over time (Cokley, 2007). Regarding race and ethnicity, race appears more static, due in large to the biophysical correlates that accompany designations, where ethnicity is more variable and hinges upon direct situational events and more distal political tides. Cokley observed a general trend in racial and ethnic identity research; when research intends to understand how individuals or groups view themselves as a product of their behaviors, values, and cultural histories, the term ethnicity is generally utilized. Conversely, when research centers upon understanding oppression and the individual's and group's responses thereof, the term racial identity is generally utilized.

Ethnic identity research is peppered with both conceptual and methodological concerns. Many of these concerns are addressed within a special section of the *Journal of Counseling Psychology*. In this section, contemporary experts in the field of ethnic identity: Trimble, Phinney, Cokley, Mallinckrodt, Ponterotto, Helms, Quintana, Ong, and Park-Taylor describe the current state, volley discussion, refine constructs, and offer suggestions and rationale for continuing research.

The most frequently used metric to date is Phinney's Multigroup Ethnic Identity Measure (MEIM) (Helms, 2007). It is important to note that her metric intended to measure the same construct across groups rather than between them; while other measures such as the White Racial Identity Attitude Scale (WRIAS), the Black Racial Identity Attitude Scale (RIAS), or the Cross Racial Identity Scale (CRIS), by Helms and Cross,

respectively intended to measure differences within groups (Cokley, 2007). For the purpose of this research the MEIM is a more appropriate metric, as the intent is to compare multiple groups with respect to ethnic identification, notably Native American and Anglo students.

In the literature the terms racial and ethnic are often interchanged without an address to the specificity of their meanings. Primary in this discussion is the concern that those who gauge or use racial identity and ethnic identity as interchangeable referents may be addressing differing constructs. If this is the case then differing constructs are being compared under the same banner and such comparisons lead to spurious results that only confound the field. Helms (2007) described the difference between race and ethnicity – racial groups are political and social designations that others use to classify and measure people based upon their explicit biophysical characteristics. Further, racial identity is not based upon psychological characteristics nor do racial classifications represent common behaviors or histories. Conversely, notes Helms, ethnic identity refers directly to an individual's cultural group, their shared histories, common beliefs, and common psychological constructs rather than simplistic overt identifiers. More accurately, race refers to biogenetic classifications; and very few individuals – those in only the most remote parts of the planet are born to parents of identical stock. Moreover, under these rare conditions it may be that the isolation and proximity that precede the genetically *pure* individual may also coexist with cultural similarities lending to common ethnic identities. Under these circumstances race and ethnicity may be highly correlated, and yet even under these situations it is still clear which aspects of the individual are racial and which are cultural.

It becomes clear that a correlation with race and cognitive style would not be inclusive of the experience that is the heart of ELT; while correlation with ethnic identity, which is the product of a multitude of experiences and cognitive style can studied. This is based on the premise that both ethnicity and cognitive style are contingent upon an individual's constellation of perspectives, histories, and encounters rather than their physiognomy.

The discussion pertaining to the efficacy of comparing race and ethnicity may be easier to establish than that of item bias, response patterning, and cultural equivalence. Where the delineations between race and ethnicity may become clear upon investigation and upon noting the attributes of each; item bias, response patterning, cultural equivalence have not been established within the corpus of literature (Trimble, 2007). The aforementioned triumvirate speaks to multigroup measures such as the MEIM that intend on comparing ethnic identification between rather than within groups. The concern is founded on multicultural research and exploratory factor analysis where scales are unstable across cultural groups. Cokley (2007) notes that factor analysis conducted upon culturally heterogeneous groups may mask differences in defining the construct of ethnic identity. Heterogeneous groups are, by definition, different and have alternate values and histories – some of oppression and discriminations and others of void of prejudice. This fact suggests that specific ethnic groups may respond in similar ways such that distinctions between groups may be covert thus foundering the equivalence of multigroup metrics. In addition, common experience and history precipitate common response patterns and those responses are not equal across cultural groups, this inequity in

responses creates bias – where each cultural group is prone to pattern responses based upon their shared experiences.

There are certainly concerns when attempting to gauge ethnic identity and it is plausible that response sets, item bias, glosses, and metric and methodological incongruence underestimate the complex construct that is ethnic identity (Quintana, 2007); however, to deduce that those concerns render the research invalid may be a more onerous error. It could be convincingly purported that comparing Cross's BRIAS with Phinney's MEIM would result in monumental errors in the scientific understanding of ethnic identity as they are single and multigroup as well as Black and open metrics, respectively. This assumption rests on the modern or positivist orientations to science, where the comparing of differing constructs is largely prohibited as they probe using alternate definitions and instrumentation. Quintana (2007) offers another position and suggests a postmodern / post-positivist approach where different measures of similar constructs are encouraged with the intent of promoting multiplism. This multiplism more completely represents and aids the researcher in understanding the conceptual underpinning that is often inadequately described by utilizing a single metric.

Quintana (2007) offered the following example:

> An apt metaphor is the proverb of the blind men describing different parts of an elephant. Each different vantage point (or measure) provides [a] different perspective on the underlying phenomenon with a fuller understanding being provided by integrating findings across the different perspectives. I [Quintana] posit that the different measure of racial and ethnic identity provide different vantage points for understanding the development of sociocultural identity that is better approximated in applying the principles of critical multiplism." (p. 261)

Depending upon the metric and corresponding theoretical tenets there may be many foci for ethnic identity development. Quintana (2007) suggests that ethnic identification precede a positive in-group affiliation, while preparing the individual for bias. Within this frame, ethnic identity developmental model stages or states reflect the individual's orientation towards one or both of these two assumptions. Interestingly, Phinney's MEIM does not include items that directly address discrimination, but focus on in-group belonging and other-group orientation. Helms (2007) suggested that racism or discriminatory encounters force the individual to address their ethnic identity and thus accelerate ethnic identity exploration. The two former statements illustrate how taking a postmodern or post-positivist approach to ethnic identity can better aid the researcher in understanding the construct and its developmental trajectory. Utilizing a postmodern posture supports a more dynamic understanding of ethnic identity while aligning with ELT's premise that knowledge is constructed and that multiplicity is of immeasurable value. Although this research will utilize only two measures, Phinney's MEIM and Kolb's LSI 3.1, it will include referents to other similar metrics, their fundamental assumptions and pertinent findings – in this vein, the researcher is freed from the monogamous relation to a single perspective and encouraged to report from beyond the confines of a single theoretical orientation. This posture lends to more comprehensive interpretations of ethnic identity and the inclusion of valuable research that could be neglected based upon trite differences and unexamined conceptual loyalties.

Methodological Choices and Rationale

As iterated within the former sections, Phinney's Multigroup Ethnic Identity Measure (MEIM) and Kolb's Learning Style Inventory (LSI3.1) are the two metrics that

will be utilized in the comparison of non- Native and Native American cognitive style in relation to ethnic identification. Searches of psycARTICLES, Academic Search Premier, and SocINDEX as well as Questia Database did not yield any results with all three markers: Native American or American Indian, LSI or Kolb, and MEIM and/or Phinney. However, using only the key markers Native American and Kolb's LSI yielded three studies. Wilson (1997) compared the cognitive styles of Native American students and their Anglo peers using the LSI; Murk, Place, and Giever (1994) overlapped traditional medicine wheel perspectives with the LSI; and Philbin, Meier, Huffman, and Boverie (1995) used the LSI in comparisons of gender while including in their sample 5 Native Americans.

Specific Native American and LSI Research Methodologies

Wilson's (1997) use of both Anglo and Native American groups and their cognitive preference will be modeled in the following research and where her sample used a total convenience sample of 60 participants the following research will use a total of 73 participants; in addition, her research only utilized one of four points on the LSI, the proposed research sets to combine both the acquisition and processing dimensions as suggested by Kolb (1984, 2005a, 2005b).

Meier, Huffman, and Boverie (1995) used a 72 participant convenience sample to study gender and learning style. They used chi-square analyses to compare the participant's categorical designation on the LSI with their gender. According to their research there is a significant difference between male and female learning style as well as another domain of concern for others on the comparing metric. Females endorsed the concern for others while the males in the sample primarily responded with concern for

self. Furthermore, the authors state that Eurocentric education aligns most closely with the Assimilator the junction of AC and RO), and it is this very cognitive style that fits women and those who endorse the concern for others dimension the least (Philbin, Meier, Huffman, & Boverie, 1995). Interestingly, concern for others also signifies a more collective rather than individualistic cultural syndrome – a framework that was formerly addressed. The authors made a point of noting how females and their success in higher education may be impacted by their endorsement of cognitive predilections that are antipodal to a Eurocentric educational model. The following research will also use Chi-square analysis to identify differences between categorical dimensions on the LSI 3.1 and categorical ethnic identity per the MEIM.

Murk, Place, and Giever (1994) compared the traditional medicine wheel with the circular and bi-dimensional nature of the LSI. In their research they first describe the nature and utility of the medicine wheel while noting that the classification *Native American* includes over 350 tribes with multiple subgroups and micro-cultures within each tribe. The authors further noted that Native American culture has a strong tradition of allowing each individual to express his or her own personalities and evolve into a unique individual free from the confines of conflicting views from the tribe in general. To explain this perspective the metaphor of a medicine wheel is used. The medicine wheel consists of endless points or perspectives around a circle, where each point represents the individual's differing and yet valid perspective of reality. Although there are innumerable points upon the medicine wheel there are four cardinal directions. Much like the LSI 3.1's intersecting dimensions, the medicine wheel consists of four major points, colors, animals, and attributes. The northern most point is represents by the color white, the

buffalo, and wisdom, while the southernmost point is green, innocence, and the mouse, respectively. The east sees the sun rise with the color yellow, the eagle, and illumination; and the west with the setting sun, is characterized by the color black, the bear, and introspection (Murk, Place, & Giever, 1994). Upon examination it is clear that although there are multiple points there also consists of a diametric between the two dimensions - wisdom /innocence and illumination/introspection. Using this construct the authors compare Kolb's learning style research to align the medicine wheel with Kolb's related dimensions and poles. The following research will capitalize upon the use of Kolb's intersecting continuums and resultant quadrants while comparing it to Phinney's four-quadrant model. This methodology will also capitalize upon the presence of multidimensional-four-quadrant frameworks that are used to explain both cognitive and ethnic identity phenomenon.

Specific Native American and MEIM Research Methodologies

A Search of Phinney's MEIM and Native Americans within the same databases resulted in similar findings. No articles were flagged with the Phinney or MEIM with Native American; however, using the terms Phinney and American Indian the search produced two relevant results. One article focused primarily on The MEIM and Navajo college students and the relation between the MEIM and culturally related stress. The authors (McNeil, Kee, & Zvolensky, 1999) used a sample of 160 undergraduate students from the southwestern United States – a sample locale that will fall within 100 miles of the prospective research. The study used both the MEIM and an American Indian cultural anxiety instrument. A valuable aspect to their research concerns their additional work with the MEIM as it relates to American Indians and reliability. They noted that the

MEIM has not been extensively studied with this specific population and therefore the authors conducted a reliability and factor analyses from their sample – their results tandem Phinney's (1992) results with adequate internal consistency and an overall reliability of .92 for the scale. Moreover, the authors conducted an unrotated principal-axis factor analysis for the MEIM's factors, indicated, as had Phinney (1992), that the metric's items loaded on either Ethnic Identity (EI) or Other Group Orientation (OGO).

The second article compared private regard, public regard, and centrality - the latter of which is pertinent for this research. Johnson, Robinson, Rayle, Arredondo, and Tovar-Gamero (2005) comment how research on ethnic identity and self-esteem for Native Americans is limited. Their investigation was to better understand multiple ethnic groups in relation to the three aforementioned factors. The authors reinforce the concept of collectivism and identification with one's clan as well as the importance of interconnectedness. Specific to the concept of *centrality,* which is operationalized as the extent to which ethnic identification is important to one's self concept, Native Americans were statistically significantly higher than the others in the sample (Black, Latino, and Euro-Americans). This was realized by conducting an ANOVA for each dependent variable with probabilities set at .01.

Proposed LSI and MEIM Research Methodologies

Helms (2007) noted another methodological practice that is of considerable import. She describes how aggregating or collapsing data across multiple ethnic groups, as inferred by the use of an multigroup measure, compromises the ability of the research to locate and describe the characteristics of diverse ethnic groups and the resultant categories as well as results in a loss in statistical power. Moreover, and in respect to both

the MEIM and LSI 3.1 aggregating the total of scores allows for broad categorical comparisons. And while these comparisons have utility it is also efficacious to use the disaggregated data such that subgroups and subscales can be compared both within and across the metrics on multiple levels.

In light of this review this research used convenience samples to compare the two groups. An ANOVA was used to observe similarities and patterns between both the MEIM and LSI's bi-dimensional four-quadrant design. Furthermore, other researchers who have employed the use of the LSI have chosen descriptive correlation study (Suliman, 2006; Zubin, 2004; Lawson & Johnson, 2002; Cano-García & Hughes, 2000) and ANOVA with correlations (Wessel & Williams, 2004). The research explored frequencies and other descriptive statistics, compare means, conducted a chi-square analysis, compute a bivariate correlation, and run an ANOVA in examining aggregate and disaggregated, whole and subscale values, with the intent of better illustrating the relations between Anglo and Native American cognitive style and ethnic identity.

Chapter Summary

Chapter two pointed to very specific issues within the study of ethnic identity and cognitive preference, while providing examples from both historical and current literature. Moreover, the chapter's content suggests that there is a relationship between ethnic identity and cognitive preference and that such a relationship can be illustrated in the cited related research and more accurately defined by conducting this study. There are, as is the case with dynamic constructs and psychological principles that served in describing individuals, difficulties and limitations; however, the former chapter has addressed those concerns and offered solutions from various sources that will embolden

rather than disable this pursuit. The research method was conducted on a pilot of Native American students to vet any culturally insensitive language or content. Chapter 3 explores these process and the intentions behind each of the analyses, procedures, administration protocols, metrics, and materials, while arriving at a methodology that is best suited for this particular research.

CHAPTER 3: RESEARCH METHOD

Chapter Overview

The chapter begins with the research design including a description of the research design and the justification for using the methodology. Section two focuses on the setting and the sample. It includes a description of the participants and the sampling design and size. Instrumentation comprises section three, with discussions of reliability and validity of both the LSI 3.1 and the MEIM. Recruitment and procedures, sections five and six, address sample selection and instrument administration, respectively. Section six consists of data collection; descriptions of the different variables, how the variables will be used and how new variables will be created. Section seven, analyses, illustrates the many SPSS statistical procedures that were employed. Section eight speaks to the measures taken to protect the participant's rights, and how the result of the research will be presented to the participants and related parties. The final section points to the limitations of this research.

Research Design

This quantitative research utilized a cross-sectional, matched, convenience sample, dual-metric design. Both of the metrics, Kolb's Learning Style Inventory Version 3.1 (LSI 3.1) and Phinney's Multigroup Ethnic Identity Measure (MEIM) were employed. The LSI 3.1 and MEIM can be used in a longitudinal manner to gauge changes over time and through the lifespan via multiple administrations occurring at different intervals. For the purpose of this research they were used to describe the attributes of an individual at a specific time via a single administration. Both cognitive

style and ethnic identity do oscillate over time and often research aims to measure this change as a product of lifespan development, age, or in relation to other sociocultural stages. However, the objective of this study was to compare an individual's level of ethnic identity at a specific point in time with his/her cognitive preference at that same point. With this objective it is most efficacious to take a single sample at a fixed point and to use each instrument to capture ethnic identity and cognitive preference at a state rather than as a stage in an individual's development. The data from single administration from a cross-section of the population will be gathered. The goal was to ascertain whether the level of or category of ethnic identity for Native American individuals correlated with a specific cognitive style and if that style differs from Anglo individuals. The samples were matched according to school grade and taken by convenience from two differing locations.

It could be argued that two samples from different locations would include social and cultural differences that may moderate the interaction between the independent and dependent variables. It is accurate to note that social and cultural differences will moderate the variables. The aim is to understand the impact of enculturation as a concept beyond the confines of the school walls it is essential to use two different locations that also have communities that parallel the school's demographic profile. With this in mind, samples taken from two distinct locations can be viewed as a necessity rather than a liability. The samples were taken from the same location the issue of cultural assimilation may confound the primary principle that centers on the difference in cultures. Native American student who are educated in a predominately Anglo setting may also reside in predominately Anglo communities and thus not accurately represent the impact of the

Native American experience as it occurs in a Native American community inclusive of social and cultural influences. It is this facet of dual location samples that intends to capture the primary tenet of experience as modeled in ELT.

The variables measured on the LSI 3.1 included an acquiring and processing preference, their numeric equivalent as scored on each of the four dimensions, as well as the resultant global classification (see chapter 2). The variables measured on the MEIM with included two scales, EI and OGO. EI also consists of two factors, ethnic identity search (a developmental and cognitive component) and affirmation, belonging, and commitment (an affective component), both of which were included in this research.

The research stands illuminated the difference and relationship between ethnic identity and cognitive preference with respect to the two samples: Anglo American and Native American students. Through the use of the aforementioned metrics and a single cross-sectional convenience sample the quantitative results allowed the researcher to accurately gauge the many facets of the ethnic identity/cognitive style interplay.

Setting and Sample

The two samples were taken from two similarly sized schools from the Southwestern United States and were matched according to grade level. The Anglo sample was taken from one school, while the Native American sample was taken from another. Each sample was selected from standard level language arts courses to minimize the potential for confounding variables that could exist in elective, remedial, or advanced course offerings. The project included special education inclusion students who are participating in the regular education classroom, while naturally excluding those students who are receiving services outside the regular classroom.

Although the reading level of the instruments is 7.2 according to the Flesch-Kincaid grade level metric this project also included a pilot. The pilot mirrored all sections of the procedure. A group of 12 students were given the LSI 3.1, MEIM, and a cover letter explaining the intent of the research. The cover letter was also read aloud. Following the administration a debriefing session guided discussion, probed readability, and gauged understanding. Further, a brief statistical analysis of the results compared the two samples to ascertain if the purpose of the study was addressed thoroughly and accurately. The cover letter delivery was adjusted to reflect the needs and concerns from the pilot.

The findings from these samples generalize to the two schools and grade specifically. Although the findings may not be completely generalized to other ages or locations they should help in illuminating the difference in cognitive preference that may exist between the samples. This design provided the researcher with the opportunity to first compare whether Anglo American and Native American students differ in cognitive preference and secondly whether that difference was correlated to a level of ethnic identity or ethnic category.

Sample Size

Using an ANOVA to compare one IV, ethnicity, with one of four cognitive preferences results in three degrees of freedom and using a power of .80 with an alpha of .05 and a conservative eta squared of .20, a sample of 16 participants per site is required (Jaccard & Becker, 2002).

Correlations require larger sample sizes. Jaccard and Becker (2002) suggest that in the behavioral sciences correlations of .20 to .30 (and -.20 to -.30) are often considered

important (p. 140). A Pearson direction test with a power of .80 and an alpha of .05 with an estimated correlation of .25 requires a sample size of 22 participants. Converting this correlation or coefficient of determination to a percentage of variability requires that the correlation be squared (Jaccard & Becker, 2002). With a sample of 22 participants, a power of .80, and an alpha of .05, a .25 correlation equates to a percent of variability of 6.25%. In light of both hypotheses the largest of the three samples was utilized, therefore the following project employed a sample of 32 or more total participants.

Instrumentation

Learning Style Inventory Version 3.1

Both the LSI 3.1 and MEIM have demonstrated reliability and validity as well as broad utility within their respective fields (Helms, 2007; Kolb & Kolb, 2005b). It is important to understand that in selecting a metric the researcher first selects a theory or theorist that is best able to address the problem and purpose of the study. Regarding cognitive preferences several models were researched before Kolb's ELT and corresponding LSI 3.1 were selected. Sternberg's (1997) theory of mental self government was studied, its function, forms, levels, scope, and leanings are certainly applicable and his metric the Thinking Style Inventory (TSI) has worked successfully in numerous studies. The TSI has been used widely and with large samples and often correlates certain aspects of thinking style with academic performance or with a particular sample's demographic profile (Sternberg & Zhang, 2001).

The Study Process Questionnaire (Biggs, 1988; Sternberg & Zhang, 2001) by Biggs was among the top three cognitive preference or approach measures narrowed for this project. Biggs gauges surface, deep, or strategic learning tendencies and the

implications for their use. In some cases (Sternberg & Zhang, 2001) the SPQ and TSI are employed together to determining if a specific endorsement under Sternberg's measure correlates with a cognitive approach per Biggs measure. This Metric is also sound and could be used in an extension of the current study to determine if a particular cognitive preference per Kolb's LSI 3.1 correlates with a specific strategy in Biggs model.

There are several thinking style, cognitive, and academic approach theorists and accompanying measures. For the purpose of this project the top three are discussed. The choice to employ Kolb's LSI 3.1 stems directly from his ELT model, which centers on the creation of knowledge via experience. Further, it is a postmodern theory rooted in the work of Dewey, Lewin, and Piaget (Kolb, 1984). This model and metric works well with the problem and purpose of the study and while it was selected because of the soundness of ELT the instrument itself stands alone on its own merit. The LSI 3.1 has been normed and revised several times in its history, its scores on each interlocking dimensional scale can be use as either categorical or as continuous variables, and it has ease of administration.

The Learning Style Inventory 3.1 manual documents both internal consistency and test retest reliability. Using Cronbach's coefficient alpha for several administrations of the measure with items in random order yielded reliability values for each of the four classifications as well as the two dimensions. The internal reliability coefficients for the LSI 3.1 ranged from .77 to .84 and represent good internal reliability. Two test-retest reliability studies yielded two similar reliability coefficients. The first study administered the LSI 3.1 three times in 8 week intervals to samples of 711 and 1042 arriving at correlations above .9, in addition a separate study administered the LSI twice to a sample

of 253 and found reliability coefficients between .37 and .61 (Kolb & Kolb, 2005). Although these coefficients may appear discrepant it is important to note that the later was Kappa and the former Alpha; each is calculated differently and yield numeric coefficients that are not equally scaled, while they do represent similar findings.

Internal validity was established through the use of both a first order correlation matrix of the six LSI scales and via a factor analysis of the scales and inventories. Theoretically, the ELT model purports dialectical poles with regard to a combination of dimensions, and thus classification of each pole should be negatively correlated, but not absolutely – because the relationship between the classifications could indicate developmental integration of seemingly antipodal approaches and processing modalities (Kolb & Kolb, 2005). As predicted, both abstract conceptualization (AC) and concrete experience (CE), which comprise the acquiring dimensions and active experimentation (AE) and reflective observation (RO), which comprise the processing dimension, are negatively correlated, at -.44 and -.43 respectively. In addition, a factor analysis did yield two bipolar factors, with AC and CE and AE and RO as the poles on each factor.

The LSI technical manual and norming procedures showed that learning by abstraction (abstract conceptualization, AC) increases with age as indexed by the AC-CE scale, where learning by action (active experimentation AE) showed increase until middle age and then a post middle age decrease as indexed by the endorsement or reflective observation (RO) on the AE-RO scale. Further, a predicted and illustrated positive linear relationship between level of education and abstraction from elementary to high school to university to graduate degree was demonstrated as a function of classification and normative sampling data. In addition, concurrent validity comparisons were conducted.

The Adaptive Style Inventory (ASI), which was developed to assess situational variability in learning, uses a paired comparison method to rank learning preferences for learning modes in personalized learning contexts. The theoretical assumption is that those who were more balanced on the LSI dimensions would also be more balanced in their learning orientation and exhibit greater flexibility and adaptability related to the ASI. The results supported these hypotheses indicating that people with balanced learning profiles in both dimensions of the LSI are more adaptive and flexible learners as indexed by the ASI. In addition, correlations with respect to similar categories ranged from .37 to .53 indicating a high level of concurrent validity (Kolb & Kolb 2005).

Multigroup Ethnic Identity Measure

The MEIM originally contained 20 items but has been refined and condensed per the author to include only 18 items and a slight change in the descriptions of the scales. It is of considerable import to note that there is, as of 2007, a Multigroup Ethnic Identity Measure – Revised (MEIM-R) (Phinney & Ong, 2007); however, because of a more extensive history with the amended MEIM was retained the for the purpose of this study.

A study of 5,423 adolescents from the southwestern United States used exploratory and confirmatory factor analysis and indicated that two of the items did not fit the model and were subsequently removed (Roberts et al., 1999). The modified MEIM contains items 18 items, 12 items assess two aspects of ethnic identity (EI), while the remaining 6 assess other group orientation (OGO). As indicated the EI scale is further delineated into two subscales; ethnic identity search (termed *exploration* on the 2007 MEIM-R), consisting of six items. The second subscale affirmation, belonging, and commitment (termed *affirmation/belonging* on the 2007 MEIM-R) consist of seven items

(item 3 loads on both subscales). The metric is self-scored from 4 to 1, high to low, respectively. Cronbach's alpha was calculated from a sample of 417 high school students and 136 college students on the MEIM's EI subscales as well as OGO. The original instrument contained 14 rather than 12 EI questions and yielded alphas of .81 for the high school sample and .90 for the college sample. The 7 item belonging subscale yielded alphas of .75 and .86. The 6 item ethnic identity search/achievement subscale alphas were .69 and .80, respectively (Phinney, 1992). Regarding the OGO scale, Cronbach's alphas were calculated at .71 and .74, for high school and college students. The two items that were excluded in the amended metric were under a third scale titled ethnic behaviors and because reliability cannot be calculated from only two items they were not included in the original calculation of the aforementioned alphas and thus, in their absence, do not affect the current amended MEIM alpha values.

In addition, a factor analysis using multiple correlations was employed. By exploring multiple correlations it is possible to isolate how many factors are loaded on the MEIM. Initially, three factors were identified; however, two of those factors were highly correlated and were therefore combined resulting in the current two-factor model. The EI factor accounts for 30.8% of the variance and the OGO factor for 11.4%. It is of import to note that the OGO and EI variables were unrelated which supports the use of the MEIM's current two-factor model.

Comparisons between gender for both the high school and college samples indicated that there were no significant differences between the genders on the belonging and achievement subscales. The socioeconomic status of the parent and the grade of the students were also explored. For college students the former was statistically

insignificant, while for the high school sample it did approach significance at p =.54, with students who had unskilled workers as parents exhibiting lower scores. Grades were associated with higher EI; students who reported a grade of A or B scored significantly (p <.01) higher than those students who reported grades of C or D (Phinney, 1992).

Helms (2007) notes that the Cronbach's alpha for the entire EI scale is .90, which is larger than any of the subscales – she suggests that this is indicative of the interrelatedness of the subscales. She also notes that because the aggregate EI alpha is higher than the subscales it is often used in the places of subscale data, which results in the loss of potentially valuable data. Her suggestion of not only using aggregate data, but also disaggregated subscale data was heeded in data collection and in analyses. Regarding instrumentation and measurement it is appropriate to conclude with Cokley's (2007) statement in which he suggest that there is no perfect measurement of any construct, a variable such as ethnic identity is not directly observable, but can only be indirectly gauged through indicator variables on metrics such as the MEIM. Therefore, there will always be measurement error simply because metrics are imperfect at measuring complex variables. This can also translate to Kolb's LSI 3.1 and led the researcher into a position whereby both ethnic identify and cognitive preference are inaccurately measured due to the inescapable artifact of using a indicator variable to access a latent variable.

Recruitment

Access to the schools and hence the population began with a phone call to the building administrator entailing a description of the project, a guarantee of school anonymity, and the potential social and local benefits. It was also clearly communicated

that the results in no way measure ability or any other facet that could be compared in an ordinal manner against another sample. Upon receiving building approval I requested the names of two or three junior standard level English teachers per site. From this pool I contacted the individual teachers and explained the project, I then scheduled a meeting on site where I can better engage the teacher with the details. I clearly explained why their building has been selected and the intentions motivating the study. It was the hope that with two or three class sections per site an appropriate sample size of 32 or greater be attained, together both sites yielded 73 participants. The students had the opportunity and right not to participate in this project and that was communicated both in the cover letter disseminated prior and on the day of administration. In place of this survey those students who choose not to participate were provided an alternate activity. This activity was constructed by their classroom teacher and was an activity that ensured an environment conducive for those taking the survey.

Procedures

As indicated the samples were accessed from two different locations. Within each location three high school junior standard leveled English classes were used. This procedure ensured relative developmental consistency, minimized confounding academic variables, and provided a sample size that met the aforementioned criteria for power and effect sizes. Each of the classes was given the LSI 3.1, MEIM, and a cover letter explaining the intent of the research and how to access the final results. The cover letter was also provided to each participant in each of the classes. The administrations took less than one standard 45-minute class period each.

Pilot Study

Prior to the administration of the formal study, post school administration, and Institutional Review Board (IRB) approval (#06-09-08/0302918), a pilot study was conducted to assess the most effective administration protocols, cultural sensitivity, participant understanding of informed consent, confidentiality, and participant time needed for the completion of both metrics. The IRB approved assent, cover letter, and color coded measures were presented to a convenience sample comprising 1 Pacific Islander, 1 Hispanic, and 10 Native American high school students, and included a discussion of content, format, and suggestions for clarity.

Of the 12 participants 6 were read the directions and each question to the metrics. The remaining 6 participants were giving the assent form, cover letter, and measures and instructed to read and complete the following survey. All 12 participants presented as having taken the process seriously and followed the directions to the best of their ability. Following the pilot a discussion the primary investigator and the participants engaged in a discussion centered on culturally sensitivity, of which the participants indicated that neither the introductory materials nor the metrics contained any insensitive lexicon or content. The participants did not note any clarity concerns with either metric. The participants did understand confidentiality and their opportunity regarding non-participation or cessation of participation once the administration process began. The participants preferred the directions to be read both on the metrics and then allowing the students the opportunity to work at their own pace. Moreover, the pilot group suggested that the cover letter be read aloud. This change was realized in the administration by to

the purpose of the study, their rights and role, and directions for a successful completion rather than beginning prematurely.

A review of the questionnaires yielded supporting evidence for the change in administration protocols. All of the participants completed the MEIM accurately; however the LSI yielded different results. Of the six who had the directions and questions read to them five completed the LSI and utilized the four-point scale accurately with one participant completing the survey, but misusing the four-point scale. Of the six who were given the materials without oral directives, 1 completed the LSI and utilized the scale correctly, while the remaining five completed the survey misusing the four-point scale. From both the discussion and the review of the surveys it is clear that an emphasis on the scale and directions was paramount in securing accurate data.

In the review of the following pilot data, it is of import to note that only 6 of the 12 LSI 3.1 inventories were completed correctly and thus only 6 were included in the following discussion. It is also important to note that the convenience sample was intentionally drawn from a Native American weekly lunch group from an Anglo high school. This sample was chosen in the interest of unearthing culturally sensitive or inconsistencies in meaning that may have resulted from the two metrics. The group was voluntary – attendance therefore indicated an interest in one's culture; and living and schooling as a minority within an Anglo majority culture yielded a specific participant profile. All six in this sample had both strong OGO and strong EI signifying an acculturated, integrated, and bi-cultural individual according to the Phinney's MEIM. Of the six participants surveyed, four endorsed CE on the LSI's acquisition dimension indicating affective complexity and five of the six endorsed RO on the processing

dimension indicating perceptual complexity. The participant who endorsed AE on the processing dimension was the one self reporting Hispanic. Therefore, five of five or 100% of the Native American participants in this pilot endorsed RO preference in processing, while four of six or 66.7% endorsed CE preference in acquisition. These findings are consistent with the review of the literature and with the hypothesis of this paper.

Data Collection

There were two primary hypotheses:

First, that the Native American sample will endorse a different cognitive preference as indexed by the LSI 3.1 when compared to the Anglo sample.

Secondly, that the level of or category of ethnic identity for Native American individuals as indexed by the MEIM will be positively correlated with a *diverging* LSI 3.1 profile, which includes concrete experience (CE) and reflective observation (RO), as acquiring and processing preferences, respectively.

This second hypothesis also suggested that if a difference in the two samples were present then Anglo individuals would endorse a different cognitive preference profile than their Native American counterparts. For the purpose of this research the Anglo sample was hypothesized to align with a *converging* LSI 3.1 profile, which includes abstract conceptualization (AC) and active experimentation (AE) as acquiring and processing preferences, respectively (see chapter 2 for discussion and chapter 4 for results).

In addition to the two primary hypotheses, an exploration between the variables created by scores on each independent pole and on each dimension of both metrics was

employed to discover in any other correlations or differences were present. It was noted that differences and correlations regarding the information acquisition dimension and the information processing dimension were found separately as well as through the use of the LSI 3.1 categories. This exploration identified which of the four poles on two dimensions of the LSI 3.1 were related to the two subscales of EI and to the four quadrants of the OGO matrix (see chapter 2 and chapter 4 for discussion and results, respectively) and the significant relationships that existed.

To test the aforementioned hypotheses the data from both instruments was collected and converted into multiple variables with the overarching intent of exploring the relationship between the various axes and dimensions between the two theoretical models. The raw score on each of the LSI 3.1's four dimensions and the categorical classification resulting from the intersection of the two dimensions was also recorded. On the MEIM the EI subscale values and categorical result was recorded as well as the OGO scale scores and their categorical result. These variables were compared with SPSS using the following analyses.

Analyses

Statistically, this research employed descriptive elements of SPSS, chi-squared analysis, ANOVA, bivariate correlation, and regression. Through the use of SPSS version 14.0 frequencies, percentiles, and measures of central tendency were calculated and compared the two samples. The use of descriptive statistics grounded the analyses because the results animated the raw data by converting the values into frequencies, relative frequencies, and means, allowing for clear comparisons between each of the two samples. Chi-squared analysis was also utilized by retaining the value of the computed

variables in their intended nominal state. Variables were either *Anglo* or *Native American* and the categorical results of the LSI 3.1 - *diverging, assimilating, converging,* or *accommodating.* Statistically, the chi-square analysis works under the assumption of expected frequencies and from deviations thereof the relationship between the observed samples responses and their expected responses allowed for both a level of significance and a phi statistic, which reflected the chance likelihood and the strength of the relationship, respectively.

In addition, variances and standard deviations, skewness, kurtosis, and standard errors were calculated. An ANOVA compared the Anglo and Native American samples. The grouping variables were Anglo and Native American ethnicity, while the dependent variables included the respondent's score on the EI and OGO sub-scales of the MEIM and their raw scores on the CE, RO, AC, and AE dimensions of Kolb's LSI 3.1. Understanding each sample's variability allowed for a more accurate interpretation of the results and corresponding ranges and deviations. The use an ANOVA also provided the researcher with Cohen's d and eta-squared values and a more comprehensive summary of the relations between the two samples. It is of considerable import to note that although the LSI 3.1 was not designed for dimensional disaggregation, under these circumstances it allowed for a more pointed comparison between each of the variables with respect to both the Anglo and Native American samples.

Ethical Considerations

The administration of the LSI and MEIM, like other instruments, mandates that the individuals who took the measure were aware of the possible risks and untoward problems that may arise from the test itself and from the results. The LSI is ipsative, it

does not rate individual against others, but rather the strength of their responses are calibrated in an intra-individual process. This reduces the propensity for harm and malfeasance, but in no way removes the ethical responsibilities of the administrator. The MEIM has the potential to unearth culturally related anxieties, histories, and transgenerational trauma. When individuals are exposed to any event that causes reflection into one's self there is always the possibility that the result will lead to a painful awareness that may otherwise remain dormant. It was the responsibility of the researcher to clearly define these possibilities prior to test administration and to provide access to services that can aid the participant in processing and gaining an acceptable level of comfort with the new information. Furthermore, the researcher communicated that the test is completely voluntary and may be stopped without recourse at any point in the process. For this research, the collected data will be anonymous and stands not to compare ability, achievement, or potential success between Anglo and Native American participants, but rather the interplay between cognitive preference and ethnic identity – this was communicated in the cover letter and orally prior to administration. With transparency and clarity was the intent of the researcher to make known all the foreseeable risks, avenues for the remediation of any harm, and to secure the participants rights to confidentiality.

The results of this research will be made public via electronic access to an explanation of the results and during an open forum where teachers, students, parents, and other community members will be able to ask questions and where the researcher will explain the intent along with the results in both professional and lay person formats. This process will be conducted by the primary researcher via a presentation of the

numeric outcomes with interpretations and overarching implications that result. This presentation and dissertation will be also be made available to all interested parties in addition to an extension to present the material again at a different locations or to different populations.

The methodology is sound, been piloted, and compared with other similar studies. The results from the research confirm the review of the literature and the relationship between ethnicity and cognitive preference. As illustrated in chapter 4, the significant findings confirm the hypotheses and animate the cognitive and cultural differences between the Anglo and Native American participants.

CHAPTER 4: RESULTS

The purpose of this research was to compare the cognitive preferences of Anglo and Native American high school students. Data was collected using Phinney's Multi-Group Ethnic Identity Measure (MEIM) and Kolb's Learning Style Inventory, Version 3.1 (LSI 3.1). Categorical and continuous variables were recorded and used on both metrics. The data addressed the possible differences between the samples as well as any correlations between the two samples regarding ethnic identity and cognitive preference. This research compared Native with their Anglo counterparts through the administration of both metrics on a sample of 73 high school juniors. The limited research (Wilson, 1997) noted that Native Americans may subscribe to specific cognitive preferences and that those styles are incongruent when compared with Anglo cognitive preferences; the research suggests that while individuals may have any number of thinking and learning preferences, Native American's may generally subscribe to a specific cognitive preference.

Hypotheses Revisited

There were two primary questions and hypotheses in this study:

1. Do Native American individuals have cognitive preferences that are different from their Anglo peers? An individual's preference can be charted upon two interlocking dimensional continua. One involves the acquiring diametric between concrete experience (CE) and abstract conceptualization (AC), while the other processing diametric describes the individual in terms of either reflective observation (RO) or active experimentation (AE). Endorsement of CE on the acquiring dimension can be equated with affective,

immediate and intuitive meaning; while the counterpoint, AC centers more on cognitive, rational and symbolic processes and representations. The processing dimension addresses the transformation of information with the perceptive, appreciative, and diffuse properties of RO, and the behavioral, focused, and goal directed properties of AE. The hypothesis for this study was that that the Native American sample would endorse a different cognitive preference than the Anglo sample. Anglo and Native American cognitive preferences will be compared categorically as the combination of both an acquiring and processing endorsement. The combination will yield one of four different cognitive preferences. Endorsing CE and RO results in a Diverging cognitive preference; endorsing CE and AE, Accommodating; AC and RO, Assimilating; and AC and AE, a Converging cognitive preference. For this first hypothesis a chi-squared analysis was used to see if there is a statistically significant difference between Anglo and Native American cognitive preference.

2. The second research question inquired whether the level of EI as measured on the MEIM or ethnicity as a designation is related to cognitive preference. It was hypothesized that Native American Ethnic Identity, as indexed on the MEIM, would be positively correlated with CE and RO, as acquiring and processing preferences, respectively. While the first hypothesis compared cognitive preference as the combination of an acquiring and processing dimension, this hypothesis will be tested via a correlation between the different cognitive preferences on each dimension and categorically, the ethnicity of an individual, and the individual's level of Ethnic Identity.

To test these hypotheses SPSS was employed. Chi-Squared analysis was utilized to compare the two samples and to ascertain whether Native American and Anglo high

school students differ categorically with respect to cognitive preference. An analysis of variance and bivariate correlations were calculated to explore other statistical relationships between the variables. Furthermore, frequencies and measures of central tendency were calculated and compared between the two samples through the use of SPSS's descriptive statistic function. Moreover, 39 different variables were used, created, and compared for each of the 73 participants; mean-split, trimmed mean, raw and scale score, and rank were used to distill the data such that any relationship between the variables be noted – only those of statistical significance will be addressed.

Sample Demographics

To compare Native American and Anglo cognitive preferences two schools were selected. The purposes of this study the schools will be referred to as School A and School B. Both schools are located in southwestern Colorado and are approximately 17 miles apart, they both fall under the same Board of Cooperative Educational Services (BOCES), and were selected because their demographic profile and geographical proximity. This study employed a matched convenience sample of junior level high school participants. School A, $N = 40$, was predominately Anglo with consisting of 85% Anglo, 10% Hispanic, and 5% Native American students with an average age of 16.3. School B, $N = 33$, was tri-ethnic with 39.4% Native American, 33% Anglo, 21% Hispanic, and 6% other, with an average age of 16.36.

Combining the samples from both sites yielded the following tabular data for frequency, percent, with regards to participants, their gender, age, and ethnicity (Table 2). There were three primary ethnicities. For the purpose of comparing Anglo and Native American cognitive preferences only the Anglo and Native American students were

included in said analysis. Other analysis not directly related to the two primary hypotheses tested whether or not the Hispanic sample was statically significantly different from both the Anglo and Native American samples separately, as well as from a combined Native American and Hispanic sample in relation to the Anglo sample. The results were not statistically significant. Other analyses comparing rank, trimmed mean, etc. were conducted to compare the Hispanic sample with the Native American and the Anglo Sample and also yielded non-significant results. Because this was not the intent of the research it is of import to note that a lack of statistical significance must not be misinterpreted as a lack of any relationship, the Hispanic sample was not primary in this research and as such garnered a smaller sample size. Under other research with a larger Hispanic sample statistical significant results may well be observed.

The purpose of this research was not to compare schools, but to compare cognitive preferences for samples with differing ethnicities. With this in mind it is of value to note that in several statistical comparisons School A and School B did not endorse different cognitive preferences when compared with one another. This supports the first hypothesis, which attributes cognitive preference to ethnicity rather than to location, pedagogical orientation, or district educational delivery policy.

Table 2.
Demographic Characteristics (*N = 73*)

Characteristic	*N*	%
Ethnicity		
Native American	15	20.5
Anglo	45	61.6
Hispanic	11	15.1
Other	2	2.7
Gender		
Male	38	52.1
Female	35	47.9
School		
School A	40	45.2
School B	33	54.8
Mean age 16.31 standard deviation .52379		
16	52	71.2
17	19	26.0
18	2	2.7

Assumptions and Pretest Analyses

Skewness and Kurtosis

Prior to testing the two primary hypotheses Phinney's MEIM, complete with subscales OGO and EI, were analyzed for both skewness and kurtosis (Table 3, Figures 7, 8, 9). According to George and Mallery (2006) a skewness and kurtosis coefficient between –1 and + 1 is considered excellent, while a value between –2 and +2 is also

acceptable. The LSI 3.1 by Kolb was also analyzed for skewness and kurtosis (Table 4). The figures provide a graphical representation of the distribution, on the EI graph the standard distribution curve is easily discernable, where on the OGO and MEIM figures it is less apparent. The distribution curves on the four LSI 3.1 graphs also show a standard distribution pattern that is visibly identifiable (Figures 10, 11, 12, 13). Clearly having both skewness and kurtosis coefficients in concert with distribution graphics allows the consumer of this research an opportunity for a more comprehensive analysis.

The skewness and kurtosis for the EI subscale were -.407 and .329 respectively; and the skewness and kurtosis for the MEIM were -.593 and 1.474, respectively. All the values fall within the excellent range with except for the kurtosis of the MEIM, which is 1.474, which is still well within the acceptable range. The values for the LSI 3.1 and its subscales fall within the excellent range. The skewness and kurtosis for the CE subscale were .737 and .219 respectively for the RO subscale .089 and -.653, respectively; for the AC subscale -.076 and -.688, respectively; and for the AE subscale -.313 and -.295, respectively.

Table 3.
Skewness and Kurtosis for the MEIM and Subscales

		OGO	EI	MEIM
N	Valid	73	73	73
	Missing	0	0	0
Skewness		-.800	-.407	-.593
Std. Error of Skewness		.281	.281	.281
Kurtosis		.600	.329	1.474
Std. Error of Kurtosis		.555	.555	.555

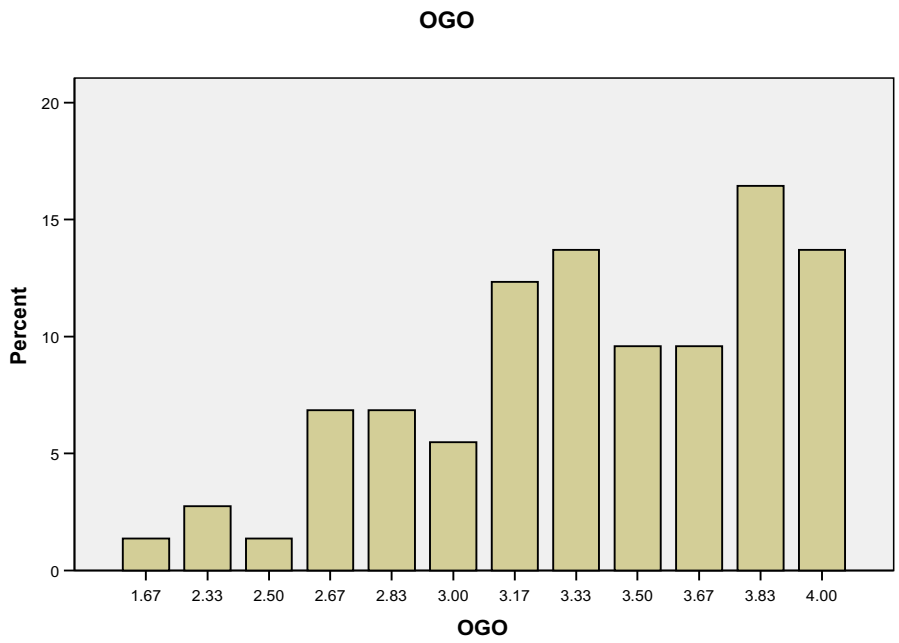

Figure 7. Distribution of scores for the OGO subscale of the MEIM

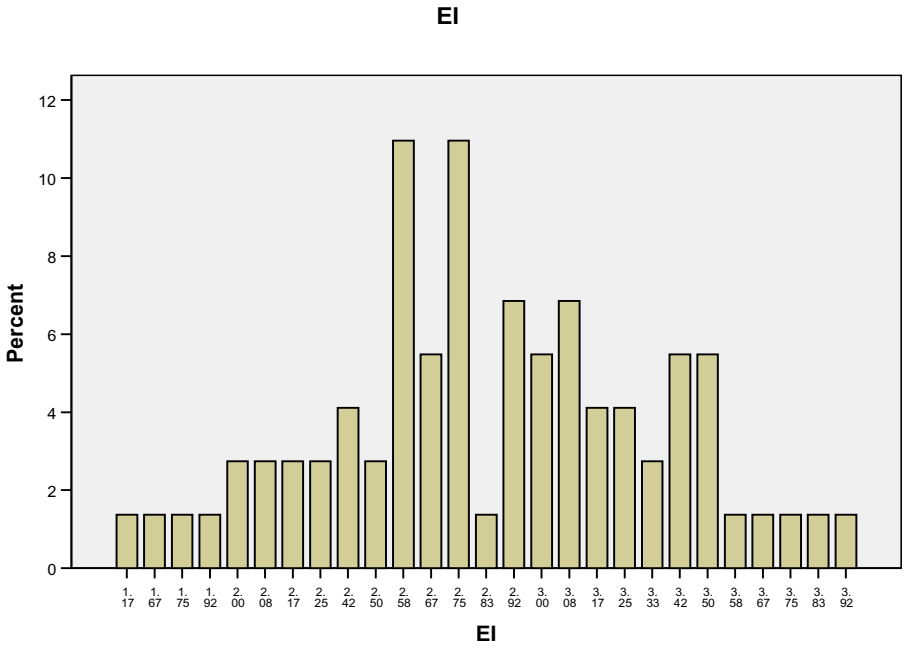

Figure 8. Distribution of scores for the EI Subscale of the MEIM.

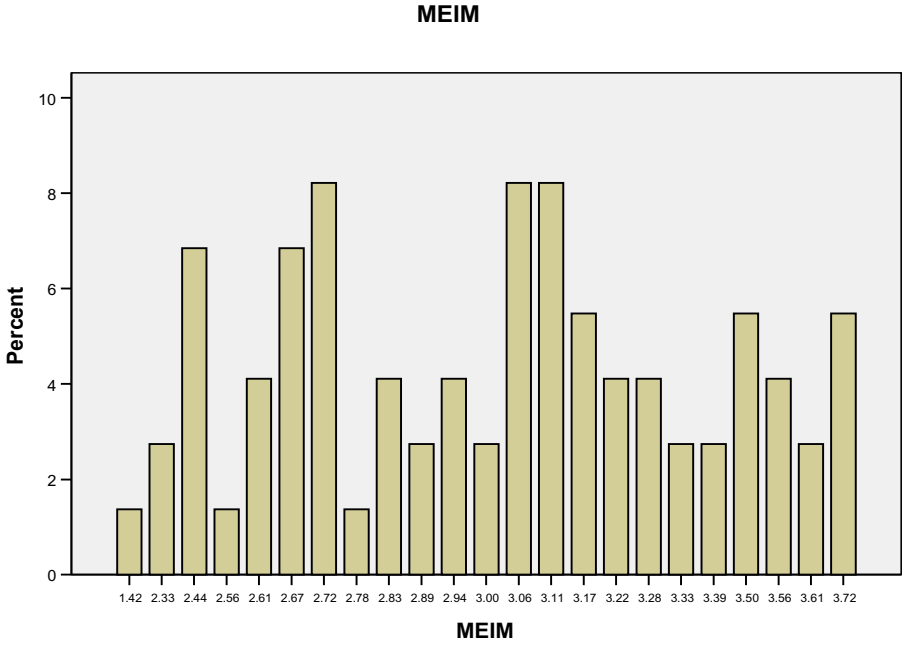

Figure 9. Distribution of scores for the MEIM.

Table 4**.**
Skewness and Kurtosis for the LSI 3.1 Scales

		CE	RO	AC	AE
N	Valid	73	73	73	73
	Missing	0	0	0	0
Skewness		.737	.809	-.076	-.313
Std. Error of Skewness		.281	.281	.281	.281
Kurtosis		.219	-.653	-.688	-.295
Std. Error of Kurtosis		.555	.555	.555	.555

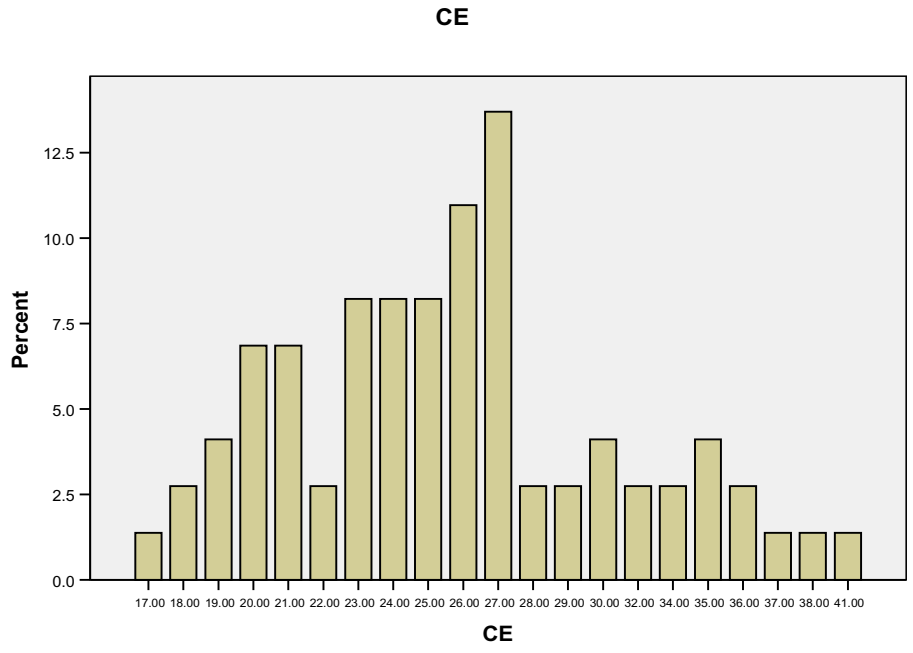

Figure 10. Distribution of scores for the Concrete Experience (CE) scale of the LSI 3.1.

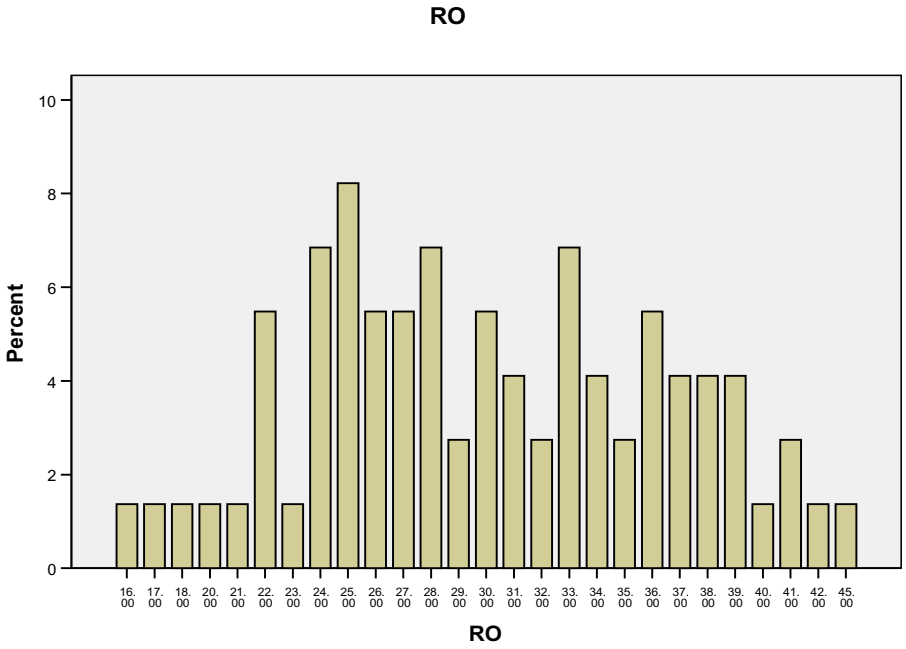

Figure 11. Distribution of scores for the Reflective Observational (RO) scale of the LSI 3.1.

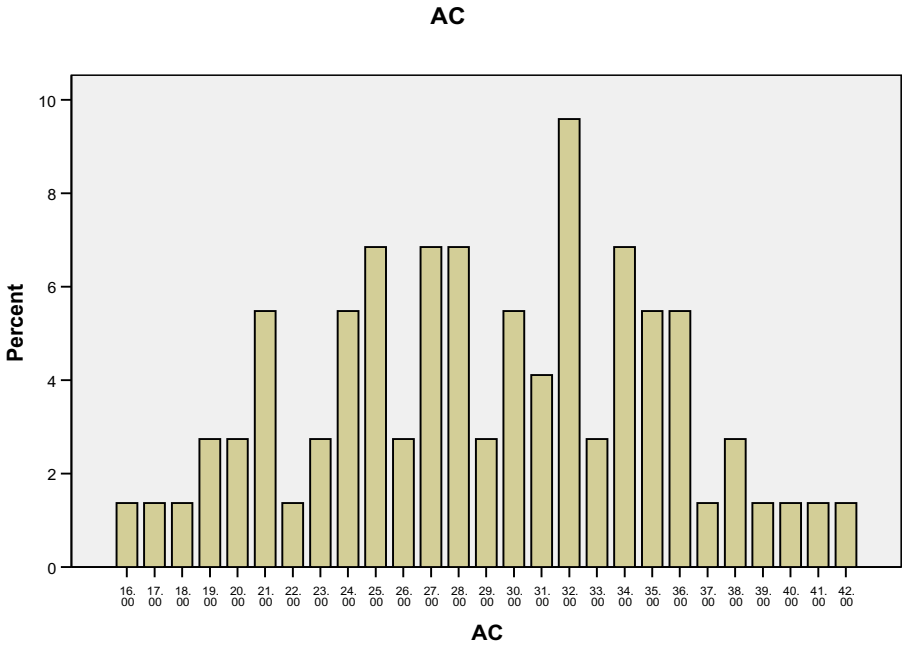

Figure 12. Distribution of scores for the Abstract Conceptualization (AC) scale of the LSI 3.1.

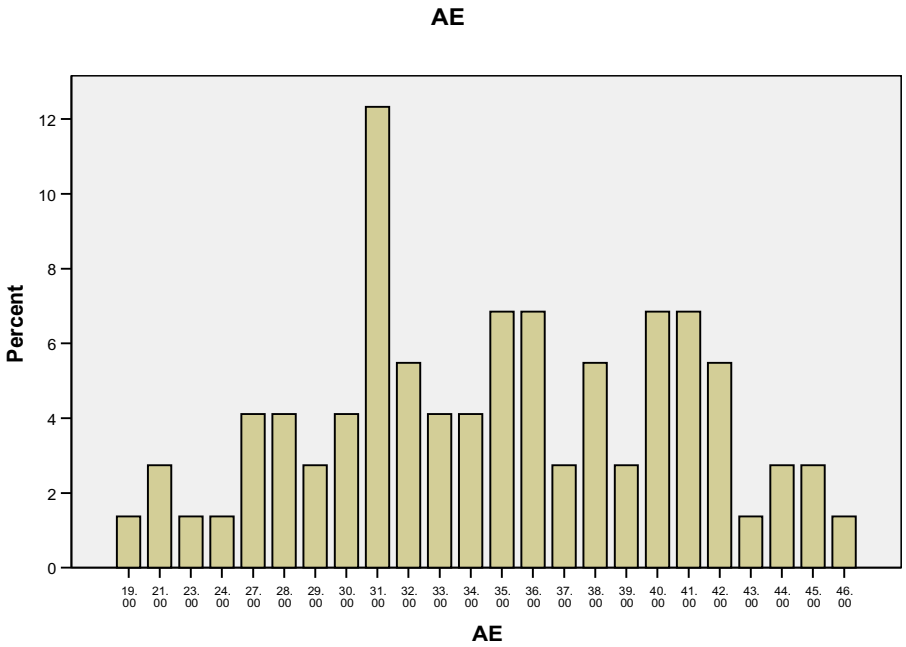

Figure 13. Distribution of scores for the Active Experimentation (AE) scale of the LSI 3.1.

Analysis

Chi-Squared

A chi-squared analysis was used to test the primary hypothesis. This analysis compared the Anglo Sample from School A with the Native American Sample from School B and was statistically significant with an alpha of .05, χ^2 (3, N = 47) = 8.718, p = .033. In addition to a statistically significant Chi-Squared analysis it is valuable to graphically illustrate the different percentage of each sample that endorsed a specific cognitive preference, these bar graphs animate the statistical results and, again, add dimension to the data and analysis (see figure 14 for cognitive preference percents for School A and School B, respectively). In the categorical comparison of cognitive preference between Anglo and Native American cognitive preference the null hypothesis was rejected and the alternate hypothesis accepted. This indicated that the Anglo and

Native American high school juniors from this sample did differ significantly with respect to their cognitive preference.

A second chi-squared analysis was used to test the primary hypothesis, but used a different sample. The second chi-squared test was used to compare the Anglo and Native American samples at School B in order to ascertain if these same differences existed within the same community and within the same school and sample. This chi-squared test was also statistically significant with an alpha of .05, χ^2 (3, N = 25) = 12.552, p = .006. Under these same conditions it is sound to see the percentages of the sample that endorsed a specific cognitive preference. By comparing the first and second chi-squared analysis and the cognitive style percent bar graphs the difference becomes apparent. (see figure 14 and 15) Cognitive style preference for both Anglo and Native American participants from School A and School B, and for cognitive preference percents for Anglo and Native American student at School B, respectively. Both Φ and Cramer's V were .431 for the first Chi-Squared analysis which analyzed cognitive preferences and ethnicity at two different schools. Both Φ and Cramer's V were .709 for the intra-school analysis of ethnicity and cognitive preference. It is of import to note that although both analyses rejected the null hypothesis, School B's chi-squared analysis indicated a more substantial effect size. These findings support the primary focus of this research, which posited that Native American students and Anglo students endorse different cognitive preferences, and further, that this occurs both between schools and also within identical educational settings.

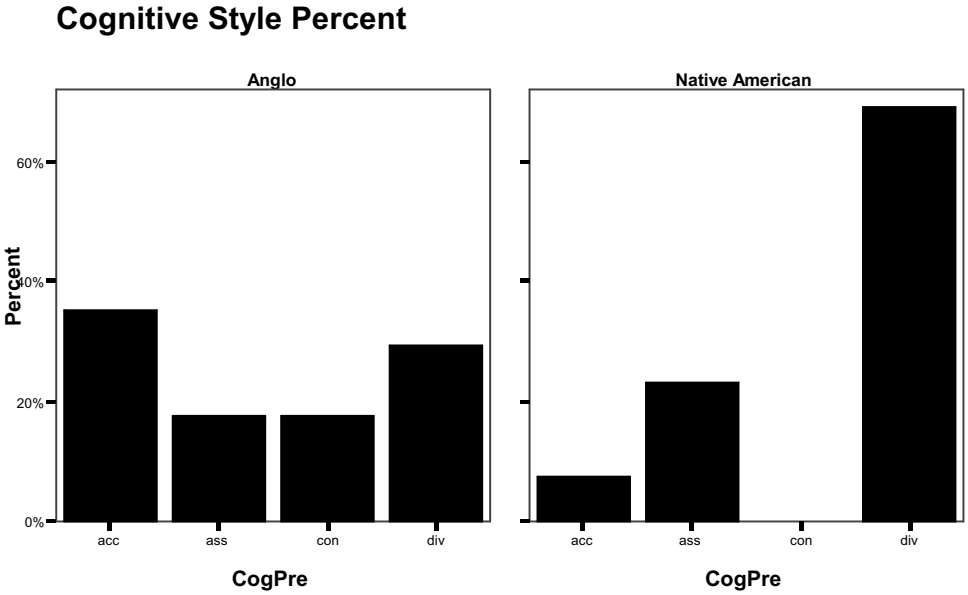

Figure 14. Cognitive style percentages for the Anglo and Native American sample at School A and B, respectively.

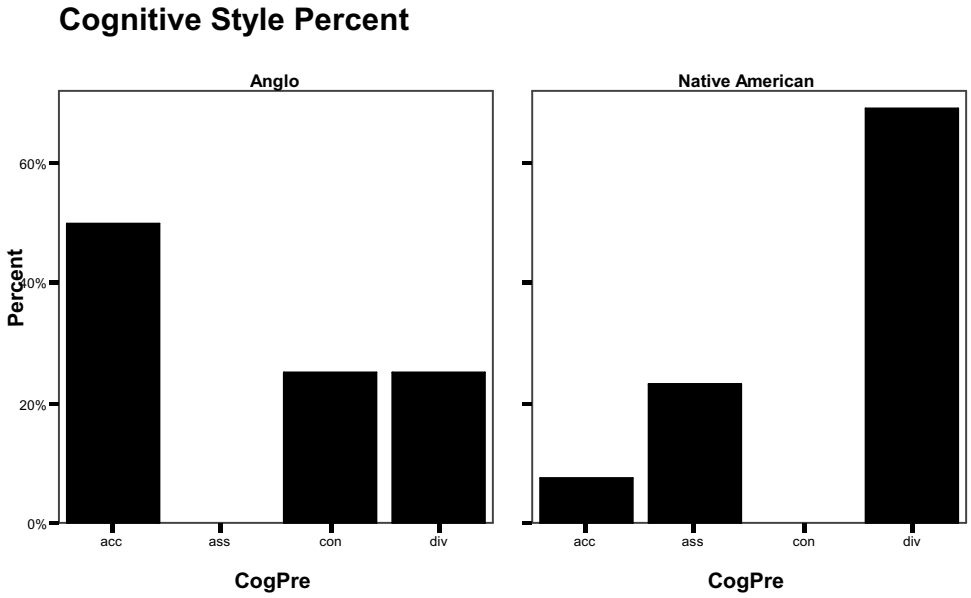

Figure 15. Cognitive style percentages for the Anglo and Native American sample at School B.

Analysis of Variance

The second hypothesis was tested by first using a one-way analysis of variance (ANOVA) to distinguish which means were significantly different. After the ANOVA a bivariate correlation was used to determine the direction, correlation coefficient, and the significance of the related variables. The ANOVA compared the mean scores on the LSI 3.1. Although the tests were not found to be statistically significant it is important to note the trajectory of the means with respect to the hypothesis and ethnicity (figures 16 and 17). When comparing these means it is valuable to acknowledge that although the comparison did not yield a significant difference at an alpha of .05, Native American ethnicity was associated with a Concrete Experience (CE) mode of acquiring information and a Reflective Observational (RO) mode of processing information. An examination of the data revealed that a comparison of CE rank is marginally significant at an alpha level of .05, $F(1, 50) = 3.835$, $p = .056$. A comparison of RO also yielded a positive relation to Native American ethnicity, and although not significant at an alpha level of .05, $F(1, 50) = 2.794$, $p = .101$, it did demonstrate that both CE and RO are moderately related to ethnicity and flagged these sub-scales for the following bivariate analysis. The lack of significance between the means may be an artifact of the number of Anglo participants who also endorsed these two modalities rendering the results of the ANOVA non-significant and marginally significant; it is plausible that with an identical response profile and a larger sample size, statistical significance would be noted. In addition to the trajectories shown in the following figures, the antipodal modalities of Abstract Conceptualization (AC) and Active Experimentation (AE), showed a non-significant negative relation to Native American ethnicity.

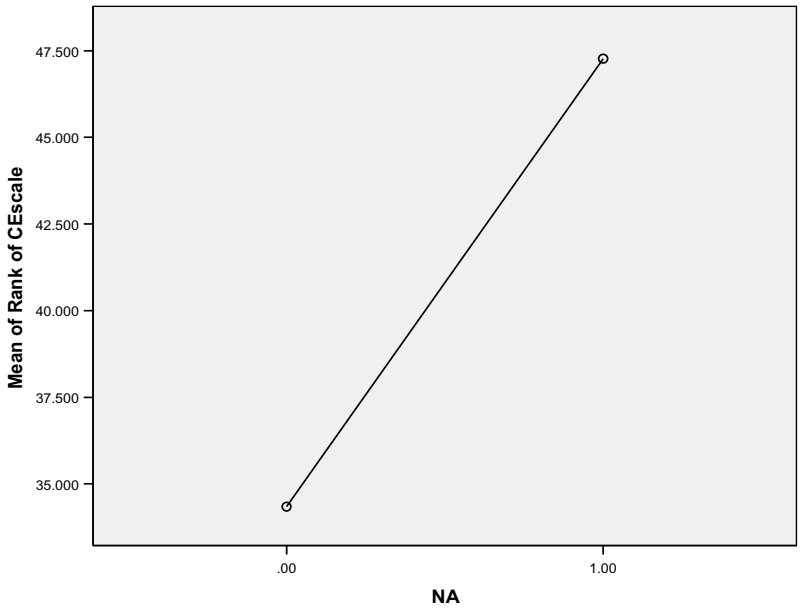

Figure 16. Mean rank of Concrete Experience (CE) mode of acquiring information.

A one-way analysis of variance also compared the mean of Ethnic Identity (EI), as well as EI rank, and EI mean split. EI was statistically significant at an alpha of .05, F (1, 50) = 5.645, p = .021. EI rank was statistically significant at an alpha of .05, F (1, 50) = 5.361, p = .025, and the mean split for EI was statistically significant at an alpha of .05, F (1, 50) = 5.141, p = .028.

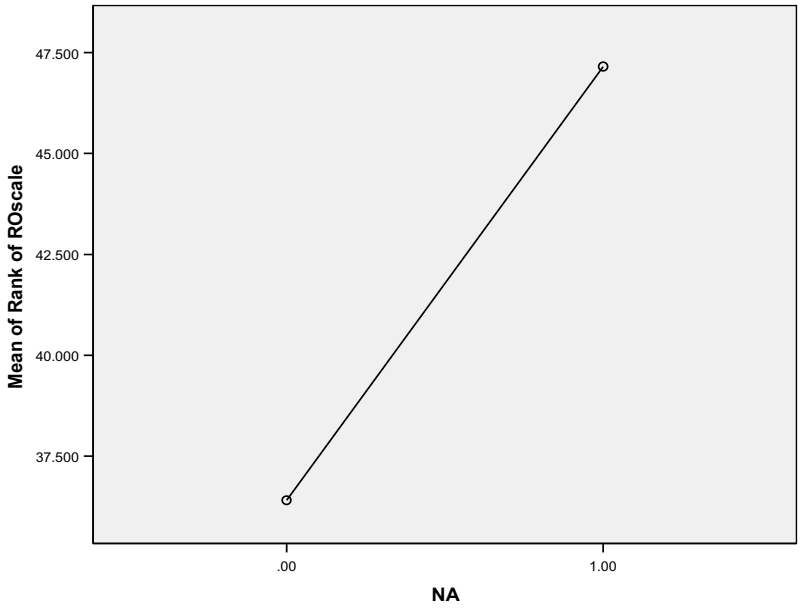

Figure 17. Mean rank of Reflective Observational (RO) mode of processing information.

Single-tailed Bivariate Correlation

A single-tailed bivariate correlation was calculated for the CE and RO scales. The comparison of the Native American sample and the Anglo sample yielded the following correlations. The Native American sample was significantly correlated with the endorsement of CE mode of acquiring information at .255, p = .042 and RO was significant at .25, p = .045. When both CE and RO scales were ranked both were statistically significant, CE had a Pearson Correlation of .273, p = .032, and RO had a Pearson Correlation of .263, p = .037. These results add dimension to the ANOVA and support the hypothesis that the Native American sample endorsed specific cognitive preferences on both the acquiring and processing dimensions as measured by Kolb's LSI.

A single-tailed bivariate correlation was calculated for Native American Ethnic Identity (EI), EI on a median split, and EI rank. The Native American Sample had higher

scores on the Ethnic Identity scale with correlation coefficients of .327, $p = .012$, EI on a median split, .334, $p = .011$, and EI rank .319, $p = .014$, all of which were statistically significant. Calculating EI on a median split and then graphing the percentage of Anglo and Native American participants above the median show that over 60 percent of the Native American sample and less than 40 percent of the Anglo sample were above the median mid-point (figure 18). Regarding correlations, Jaccard and Becker (2002) state that in behavioral science research correlations of .20 to .30 are often considered important; the correlations for CE, RO, and the various EI scales stated above were either within or exceed this range.

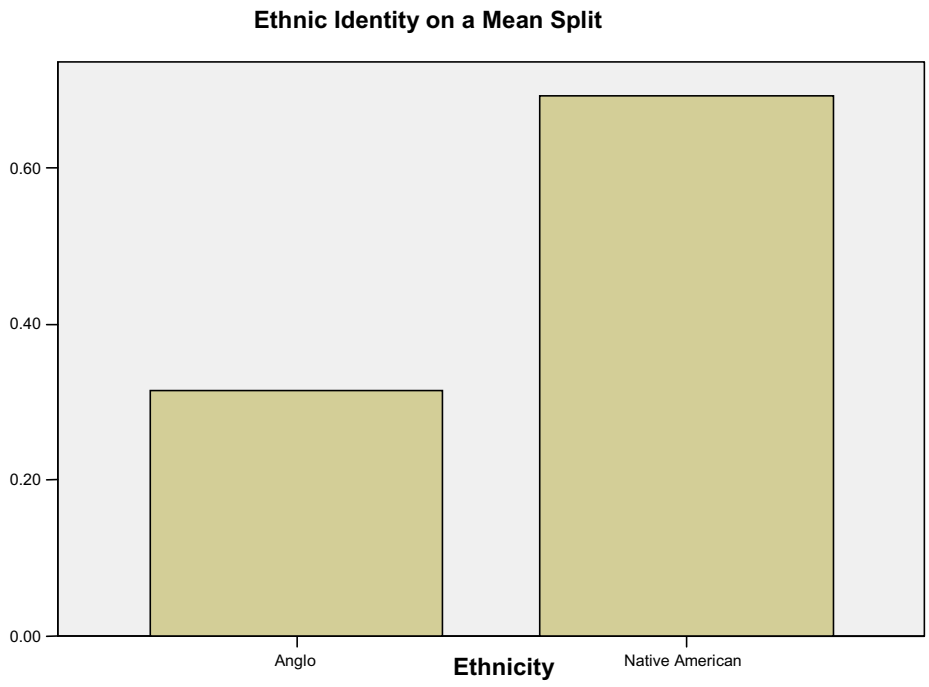

Figure 18. Comparison of Anglo and Native American High School Juniors

Conclusion

The results of the chi-squared analysis, ANOVA, and bivariate correlations support the hypotheses posited in this paper. First, the sample of Native American junior students did differ significantly with respect to cognitive preference when compared with the sample of Anglo junior students as illustrated by both the between-school and within-school chi-squared analyses. Second, the sample of Native American Juniors endorsed a specific cognitive preference comprising Concrete Experience (CE) on the acquiring dimension and Reflective Observational (RO) on the processing dimension which resulted in an overall Diverging classification on Kolb's LSI 3.1. And third, the Native American sample had significantly higher scores than the Anglo Sample with respect to Ethnic Identity, EI rank, and EI on a median split as indexed by Phinney's MEIM.

The outcome of this research speaks directly to the hypotheses; the Native American student sample had different modes of acquiring and processing information as compared with the Anglo student sample. The research endorsed the hypothesis and confirmed that the Native American sample prefer concrete experience and reflective observational modes of acquiring and processing information, respectively. The Native American sample produced significantly higher ethnic identity scores when compared to the Anglo sample.

The results speak directly to the review of the literature and to the hypotheses. These finding were significant. The following chapter addresses the statistical analyses and readdresses the causes for the results by citing references in the literature review. In Chapter 5 there will be a summary of the project, implications, and limitation. There will also be areas where more research is needed and recommendations that can better serve

those who are in both majority and minority institutions and who have differing cognitive preferences.

CHAPTER 5: SUMMARY, IMPLICATONS, AND RECOMMENDATIONS

Introduction

The primary purpose of this research was to determine if Native American students differ with respect to cognitive preference when compared to their Anglo counterparts. In addition, this research intended to ascertain whether Native American students endorse a specific cognitive preference profile. To achieve these ends, a convenience sample was taken from two different locations. To minimize disturbance and confounding variables, the locations chosen were in close geographic proximity, the samples were matched to grade level and held populations that enabled both cognitive and ethnic analysis. Prior to metric administration a pilot study was conducted on a Native American sample to refine protocols and to vet any culturally biased or insensitive lexicon; as a result minor changes were made in administration, while no changes were made with the content of the two instruments.

The review of the literature suggested that divergent cultural backgrounds would precipitate differing cognitive preferences. Further, it is noted in chapter two that majority cognitive preferences are fostered in our current educational system, while minority cognitive preferences are undernourished and uncultivated. This adherence to a single dominant cognitive preference inadvertently prunes individuals who employ minority preferences from higher education and meaningful career opportunities. These limitations lead to abbreviated quality life experiences and a restriction in individual efficacy and collective agency.

This research elucidated the role ethnicity plays in cognitive style so that modern education can meet the needs of the Native American student by emancipating them from

an educational system founded and perpetuated on an orientation to the majority's cognitive preference. It is logically posited that a better cognitive understanding of Native Americans would lead to more accurate and beneficial pedagogical methods and to social changes that offer reparations for what has turned to be an ethnically mediated injustice.

Summary of Findings

The assumptions generated via a thorough review of the literature commingled with the tenets of Kolb's Experiential Learning Theory (ELT) proved to be accurate and statistically significant. Primary was the finding that Native American Students do acquire and process information in ways that are different from Anglo students. There may be any number of reasons why this research noted these differences. Interpreting these differences through the ELT framework would credit experience as the antecedent to the difference.

As experience dictates behavior and behavior, in this case, refers to preferences in information acquisition and processing, the research noted three significant results. The Primary hypothesis queried: Do Native American junior level high school students have cognitive preferences that are different from their Anglo peers? A chi-squared analysis compared the samples from the two different schools and was statistically significant with an alpha of .05, χ^2 (3, N = 47) = 8.718, p = .033. These results indicate that the Native American students do subscribe to different cognitive preference than Anglo students.

Although not part of the original hypotheses, a second chi-squared test was used to compare the Anglo and Native American samples at School B. This chi-squared test was also statistically significant with an alpha of .05, χ^2 (3, N = 25) = 12.552, p = .006.

Both Φ and Cramer's V were .431 for the first chi-squared analysis which analyzed cognitive preferences and ethnicity at two different schools. Both Φ and Cramer's V were .709 for the intra-school analysis of ethnicity and cognitive preference.

The results from these two analyses demonstrate that Native American students have different cognitive preferences than Anglo students when the comparison takes place at two separate locations and when the comparison is made within the same school. The second analysis is valuable and does not simply mirror the former; rather it illustrates that even within the same community and school students who have different cultural experiences have cognitive styles that are reflective of said experiences.

The research was intentionally divided into two separate hypotheses with the intent of first determining whether a statistical significant difference existed between these two samples, and secondly, and more specifically, determining if the Native American sample endorsed a specific cognitive preference profile. The former hypothesis, both the original and ancillary, were significant and thus the second hypothesis could be examined.

The second hypotheses inquired whether the level of ethnic identity as measured on the MEIM or ethnicity as a categorical designation is related to cognitive preference. It was hypothesized that Native American ethnic identity, as indexed on the MEIM, would be positively correlated with concrete experience (CE) and reflective observation (RO), as acquiring and processing preferences, respectively resulting in a diverging classification.

The Native American sample was significantly correlated with the endorsement of CE mode of acquiring information at .255, $p = .042$ and RO was significant at .25, $p =$

.045. When both CE and RO scales were ranked both were statistically significant, CE had a Pearson Correlation of .273, $p = .032$, and RO had a Pearson Correlation of .263, $p = .037$. These correlations resulted in a diverging classification thus confirming the second hypothesis.

A second component to this hypothesis was to gauge EI as it relates to cognitive preference. A single-tailed bivariate correlation was calculated for Native American EI, EI on a mean split, and EI rank. The Native American sample had higher scores on the EI with correlation coefficients of .327, $p = .012$, EI on a mean split, .334, $p = .011$, and EI rank .319, $p = .014$, all of which were statistically significant.

Interpretations

As indicated previously, there may be any number of reasons for the aforementioned results; however, it is important to note that the literature addressed fundamental differences between these two populations with regards to experience (see chapter 2). Native Americans generally ascribe to a universal meaning to life, collective well-being, have beliefs steeped in metaphor, are highly spiritual, gain truth through harmony, place a high value on relationships and use circularity while avoiding extremes. Anglos generally ascribe to multiple meanings to life, value individual prosperity, have beliefs that are empirically based, are pragmatic, find truth via logic, are focused on the intrapersonal, and think along a linear continuum which utilizes polarity and extremes.

When interpreting these results it is valuable to look at why the difference between Anglos and Native Americans was first posited. The cultural characteristics mentioned above align closely with specific profiles on the LSI 3.1, which grounded the hypotheses empirically. In addition, it is worthy to address collective and individual

cultural syndromes, field dependence, context, simultaneous and sequential processing as components of culture, which dictate cognitive preference (see chapter 2 for discussion).

Taking the former characteristics and filtering them through both ELT and the descriptions of the four poles it becomes clear how the second hypothesis was generated. Endorsement of CE on the acquiring dimension can be equated with affective, immediate and intuitive meaning; while the counterpoint, AC centers more on cognitive, rational, and symbolic processes and representations. The processing dimension addresses the transformation of information with the perceptive, appreciative, and diffuse properties of RO, and the behavioral, focused, and goal directed properties of AE. Looking at the qualities of CE and RO and the characteristics of the Native American culture it becomes apparent that such a relationship could exist and as the research demonstrated the relationship does exist.

Experience is constant, it occurs in the mind, home, school, and greater society. As individuals develop cognitively they filter and focus on specifics aspects of their surroundings, conversations, their actions, and those of others. Together this culture of experience mediates and influences the ways in which individuals prefer to think, act, and emote. Essentially, we attend to that which we have been conditioned, and in this case Native American cognitive preference has been conditioned by cultural experience.

When interpreting the statistically significant difference in ethnic identity it is sound practice to take into account several factors. First, and per the hypothesis the difference could be attributed to the fact that Native Americans identify with their ethnicity more so than Anglos and according the MEIM this is certainly the case with the sampled population. However, there may be several reasons for this result. It may be that

minority groups identify with their cultural group as a protective mechanism in order to insulate and guard from majority group influence. At both locations the Native American sample was a third or less of the student body and therefore was a minority; further, Native Americans are a minority within the Southwest and within the United States. Another moderating factor could be the resources available to the Native American students at both locations. Both schools offered and successfully populated Native American groups or clubs that recognize the importance of their culture and the need for transmitting norms, stories, and history to the new generation of tribal members. These clubs reinforce the importance of keeping with tradition, socializing with other Native American students, and respecting and honoring their culture; this was not the case for the Anglo sample. Another factor could be that within these communities and schools there are resources in the form of grants, recreation facilities, and businesses that openly and proudly define their operation as tribally affiliated; along this same cord, the tribe is very wealthy and can filter employment based upon tribal membership. All these factors may contribute to the significant difference between an Anglo's level of EI and a Native American's level of EI.

Implications for Social Change

Cognitions translate experience into meaning leading to the birth of an individual's understanding. Furthermore, cognitive style provides a structure from which an individual's social and personal events can be incorporated into a broader sociocultural framework. Therefore, cognitive style becomes the lens through which the individual acquires, processes, and ascribes meaning to their experience. It is not simply a

conscious change in choice or preference, but a physical and neurological shift in the brains structure.

According to Cozolino (2006), there are two components that provide for the structure and function of the brain. The first, the genetic template, organizes the brain stem and the nervous system and is relatively unaffected by experience. The second genetic component is called genetic transcription, and accounts for approximately 70 percent of the brains structure that is added after birth. These transcription genes are charged with controlling the experience-dependent components of the brains organization and allow the brain to be shaped and reshaped by experience.

Tan and Seng (2008) also discuss the biological differences between cognitive styles and while they do not use identical descriptors to designate their preferences the connection is clear. Tan and Seng note that there is greater activity in the left hemisphere for those who have a preference for Practical styles of acquiring and processing information. They also note that Practical preference can be illustrated by greater activity in the left hemisphere and preference for an Imaginative style can be illustrated by greater activity in the right hemisphere. It is of import to note that chapter two discusses lateralization of both the left and right hemispheres and their relation to sequential and simultaneous processing, respectively. According to this research and the review of the literature, Native Americans ascribe to an Imaginative preference while research (Tan & Seng, 2008) shows that teachers and school officials endorse a preference for Practical styles. It could be logically expected for the teachers and school officials to reflect said preferences in curriculum design, educational delivery, and teaching style. Continuing with this reasoning, it would be accurate to deduce that such qualities in cognitive

preference would be required in order to be successful with such a school system. Essentially, schools today have been established by European descendents, been founded on Eurocentric ideals, and employ teachers and administrators who favor cognitive preferences that are antipodal to those of Native Americans. It becomes the charge of the educators of today to become aware of the inequities, to learn about minorities, their different cognitive preferences, and to design strategies that differentiate material.

Interestingly, while no one cognitive preference is categorically more beneficial than the other, Tan and Seng (2008) noted that students with an Imaginative style hold consistently higher SAT and GRE scores. Although an Imaginative category is not a descriptor on the LSI 3.1 it has similar attributes to the diverging classification. Research (Skye, 2002) also shows that Native American culture is steeped in metaphor, spiritually, and meaning. The Native American culture does not value individualism but rather emphasizes relational contexts, interactions, and the collective good. In addition, Native American tradition focuses on transformation through harmony and balance (Garrett & Barret, 2003). The Native Americans in this research demonstrated that they have significantly different cognitive preferences and research has shown that students with like styles perform consistently better on valid nationally normed measures. Research has also identified a constellation of attributes that comprise the Native American culture – attributes that are necessary for a healthy global society. And yet, with this clear difference in cognitive style, clear advantageous attributes, and clear necessity, very little is being done to transform our archaic educational system.

This educational system was built and perpetuated with the flawed assumption that a single educational model works effectively for all students. Today we know that is

not the case and yet our interventions and best efforts are spent refining a dated and inapplicable educational model. As discussed in chapter one, we are at a critical juncture; we are unwittingly yet systematically filtering out many wonderfully intelligent individuals with incredibly different approaches to solving problems. In a time where the stakes are massive and global crisis rampant, it may be to all our benefit to hold tight to those who think drastically different, to foster their cognitive preference, experience, and culture so that they may view today's problems through a different lens.

This research illustrates the need for multiple perspectives, perspectives that are currently left under nourished, unattended, discarded, and disengaged. Returning equity to education requires that each student be presented with equal opportunities to learn, progress, and share their experience, whether it is cultural, spiritual. Content must be presented in a safe and open venue where discussion cultivates complex questions, illuminates common and divergent positions, and builds curious and critical minds.

Change must come. The results from this research speak directly to the inequities, and the discussion, to the value in diversity. It not merely enough to encourage lunch time groups and clubs - or to relegate Native American culture and cognitive preference to after school tribal gatherings, it must be that minorities are given a level field from which to stage their life's goals and aspirations. When a section of society is marginalized it becomes society's duty to remedy such circumstance.

In our society liberty is fundamental. If our young people are disadvantaged because of a quality beyond their choice action must be taken. Schools should teach lessons in each of the four cognitive preference modalities. Teachers should be educated on how individuals in each of the four modalities prefer to acquire and process

information, while assessments should have a variety of representative components. School boards should be made aware that such discrepancies exist, while school districts should implement curricula that incorporate the full range of preferences. Communities and government should employ specialists to design a scope and sequence as well as standards that address curricular activities and content which is developmentally appropriate, culturally accurate, and engaging.

Recommendations for Further Study

There is certainly a need for cognitive preference diversity curricular support. Research into best practices, generation of lessons and units, and the formation of valid assessments must be done to animate the findings from this research and to give the findings utility. It is also recommended that similar studies be done with other minority populations and with Native populations in other areas. An interesting research area to pursue is to replicate this research in inner city communities and small intimate suburbs and towns to ascertain if collective or individual cultural syndromes exist and to identify specific cognitive preferences for such locations. It may be that trans-generational living in certain communities creates an almost "Tribal Mentality" where attributes and cultural syndromes, similar to those of the Native Americans, are present.

As with any research it is always important to replicate the study with a similar population to test the results from this research. It is also critical to replicate this study with a much larger sample; which should, if this research and findings are correct, support the results while achieving larger correlations and more significant results. Yet another similar recommendation is to use the same research methodology with a larger

sample and examine correlations between the levels of Ethnic Identity with specific cognitive preference for a variety of ethnicities and cultures.

As indicated in chapter three this research focused on an individual's *state* on the MEIM and LSI 3.1 rather than their *stage*. With this objective the comparison centered on an individual's level of ethnic identity at a specific point in time with their cognitive preference during that same point in time. It would be fruitful to use these two metrics and to focus on an individual's *stage*, studying longitudinally changes that occur during adolescence and across the life span.

Still other areas of interest and prospects for further study surround developing countries. As these countries become more active participants in the global market it would be fascinating to research changes in Ethnic Identification as they modernize, while simultaneously charting changes in cognitive preference as well as the interplay. In addition, with similar countries, it would be valuable to compare Other Group Orientation (OGO) as it relates to the influx of foreign business, employees, imports, and income.

Conclusion

This research has clearly demonstrated that there is a relationship between culture and cognitive preference. The discussion has delineated the problem, why the hypotheses were created, examined extant literature and theory, conducted sound and statistically significant research, interpreted the results, and noted the importance of the need for change. There are many implications that can and should be drawn from this paper. Primary is that equity must enter into education, schools, and businesses. Society must understand and appreciate diversity. Secondly, there is a powerful benefit to having a

multiplicity of perspectives in attempting to address global concerns, crisis, and collaboration.

According to the partnership for 21st century skills (2009) the 20th century educational paradigm is obsolete; it focused on time, memorization, passive learning, and the individual. The partnership which consists of 38 business including, Adobe, Dell, Microsoft, National Educational Association, and Verizon have developed a unified, collective vision for 21st century learning that is committed to ensuring that today's high school graduate will thrive in today's global economy. As opposed to the skills necessary for the 20th century, the partnership acknowledges that the successful student and citizen will be presented with a constant barrage of information and in order to manage these enormous quantities the student must have cultural competence and be creative. Further, education must transition from time based instruction to outcome based instruction, from memorization to global capacity, from passive learning to active learning, and focus on collaboration rather than the individual. It is clear that the Eurocentric model closely aligns with 20th century needs while Native American cultural syndromes and attributes described in the Concrete Experience (CE) acquisition dimension and Reflective Observational (RO) dimension align with the partnership's skill set.

Not only must education address the needs of today's students but must anticipate the relevance of education as it pertains to the future. The Native American culture is naturally set to address this new skill set and yet today's education is tethered to a tradition of learning from passive and abstracted texts and pedagogies. This shift is crystallized with the category created from a CE and RO endorsement: Diverging. It may that through history and during the industrial revolution individuals must have had

converging skills, skills similar to the specialization of labor that made factory production possible, but today an entirely new set of attributes is mandated. These skills require that successful and productive members of our global community think in divergent ways, take in massive amounts of information, and creatively construct collaborative relations with enumerable cultures.

This is engaging work, and as such causes the individual to examine their assumptions, their motivations, and their position on many topics and social processes. These forces mandate a continual stream of critical analyses. Accordingly, assumptions may, through the course of one's work, be created, refined, and in some cases disregarded entirely.

The world is moving forward and education must prepare its constituents. This preparation not only enables a more versed citizen, but emancipates those who have had their cognitive preferences and skills stymied for eons. The shift is happening and how thankful education should be to have cultures that have held fast to their traditions in spite of marginalization, because now the time has come where minorities with divergent thought processes have much to add to the classroom, to the construction of a new educational paradigm, and to the benefit of our ever tightening global village.

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APPENDIX

Appendix A: Permission for the use of the Learning Style Inventory 3.1

Hi Chad;

I reviewed your proposal and you are granted free usage of the LSI. Amy will contact you and guide you through the procedure to obtain the research version of the LSI.

Good luck on your research I look forward to reading it when it is completed.

Best,
Alice Kolb Ph.D.
President
Experience Based Learning Systems, Inc.
website: www.learningfromexperiencecom
e-mail: aykolb@msn.com
dak5@msn.com
phone/fax: (216) 321-0597
Faculty, Master of Positive Organizational Development
Case Western Reserve University

Hi Chad,

Congratulations! Your research request regarding use of the *Learning Style Inventory* (LSI) has been approved. Attached you will find two documents (.pdf files--Adobe Acrobat 4.05):

* LSItest.pdf - This is a copy of the LSI test. You may print or copy this document as needed for your research.

* LSIprofile.pdf - The profile sheet contains the answer key for the test as well as the profiling graphs for plotting scores. This document may also be reproduced as necessary for your research. The AC-CE score on the Learning Style Type Grid is obtained by subtracting the CE score from the AC score. Similarly, the AE-RO score = AE minus RO.

These files are for data collection only. **This permission does not extend to including a copy of these files in your research paper.** It should be sufficient to source it.
If you have any further questions, please let me know.

Appendix B: Permission for the use of the Learning Style Inventory 3.1 Figures

From:	"Alice Kolb" <aykolb@msn.com> Add Mobile Alert
To:	"Chad M. Novak" <chad.novak@yahoo.com>
Subject:	Re: Permission to use two figures - Novak
Date:	Mon, 18 Feb 2008 10:58:52 -1000

Alice	Kolb	aykolb@msn.com	http://us.f306.mai

Hi Chad:

We will grant you permission to reproduce the part of the report in your dissertation. Please make sure you do not reproduce the LSI test items.

Best regards,
Alice Kolb Ph.D.
President
Experience Based Learning Systems, Inc.
Adjunct Professor of Organizational Behavior
Case Western Reserve University
website: www.learningfromexperiencecom
e-mail: aykolb@msn.com
dak5@msn.com
phone/fax: (216) 321-0597

Dr. Kolb & Amy O'Brien,

First of all, again I would like to thank you for the use of your instrument. My first three chapters are currently with my committee for revisions and my oral defense of the first three chapters - the proposal, should take place next week. I will certainly send you the entire dissertation when completed. Originally, I asked for the use of some of your figures in addition to the metric, and it was indicated that it was important that I specifically identify which figures and where they were found. I have attached two documents one is the interpretive manual I received when I took the LSI on line and the second attachment is the figures from that document I hope to use in my project. Please let me know your thoughts on my request. All the figures come from that single attached document.

Appendix C: Multigroup Ethnic Identity Measure

In this country, people come from many different countries and cultures, and there are many different words to describe the different backgrounds or **ethnic groups** that people come from. Some examples of the names of ethnic groups are Hispanic or Latino, Black or African, American Indian or Native American, Asian American, Chinese, Filipino, American, Mexican American, Caucasian or White, Italian American, and many others. These questions are about your ethnicity or your ethnic group and how you feel about it or react to it.

Please fill in: In terms of ethnic group, I consider myself to be
_____

Use the numbers below to indicate how much you agree or disagree with each statement.

(4) Strongly agree (3) Agree (2) Disagree (1) Strongly disagree

1. I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs…… _____
2. I am active in organizations or social groups that include mostly members of my own ethnic group……..… _____
3. I have a clear sense of my ethnic background and what it means for me……. _____
4. I like meeting and getting to know people from ethnic groups other than mine..… _____
5. I think a lot about how my life will be affected by my ethnic group membership... _____
6. I am happy that I am a member of the group I belong to……..… _____
7. I have a strong sense of belonging to my own ethnic group……..… _____
8. I understand pretty well what my ethnic group membership means to me……..… _____
9. I sometimes feel it would be better if different ethnic groups didn't try to mix together…….. _____
10. In order to learn more about my ethnic background, I have often talked to other people about my ethnic group…….. _____
11. I have a lot of pride in my ethnic group…… _____
12. I often spend time with people from ethnic groups other than mine……. _____

Use the numbers below to indicate how much you agree or disagree with each statement.

(4) Strongly agree (3) Agree (2) Disagree (1) Strongly disagree

13. I participate in cultural practices of my own group, such as special food, music, or customs…… _____

14. I don't try to become friends with people from other ethnic groups……... _____

15. I feel a strong attachment towards my own ethnic group…… _____

16. I am involved with activities with people from other ethnic groups…… _____

17. I feel good about my cultural or ethnic background……. _____

18. I feel enjoy being around people from ethnic groups other than mine. …… _____

Write in the number from the list below that gives the best answer for each question.

19. My ethnicity is:……. _____

(1) Asian or Asian American, including Chinese, Japanese, and others

(2) Black or African American

(3) American Indian/Native American

(4) White, Caucasian, Anglo, European American; not Hispanic

(5) Hispanic or Latino, including Mexican American, and Central American

(6) Mixed; Parents are from two different groups

(7) Other (write in): _____

20. My father's ethnicity is (use numbers above)…… _____

21. My mother's ethnicity is (use numbers above) …… _____

Age _____	Circle Gender: female or male

Appendix D: Permission for the use of the Multigroup Ethnic Identity Measure

Phinney, J. (1992). The Multigroup Ethnic Identity Measure: A new scale for use with adolescents and young adults from diverse groups. *Journal of Adolescent Research*, *7*, 156-176.

Phinney's statement with an addition by the researcher to include both scales within a single instrument.

The MEIM has been used in dozens of studies and has consistently shown good reliability, typically with alphas above .80 across a wide range of ethnic groups and ages and a factor analysis of a large sample of adolescents (Roberts, R., Phinney, Masse, Chen, Roberts, C., & Romero, 1999) reinforced the two-factor model. It appears that the measure can best be thought of as comprising two scales, Ethnic (EI) Identity and Other Group Orientation (OGO). There are also two factors within the EI scale, ethnic identity search (a developmental and cognitive component) and affirmation, belonging, and commitment (an affective component). Two items have been dropped and a few minor modifications have been made. Further, the OGO scale has been included by the researcher, which resulted in the change of several of the question numbers. Attached is the current revision of the measure with the amended corresponding question numbers. The two factors, within the EI scale, are as follows: ethnic identity search, items 1, 2, 5, 10, and 13; affirmation, belonging, and commitment, items 3, 6, 7, 8, 11, 15, 17; item 3 loads on both subscales (None of the items are reversed.) Although the modified MEIM does not address Other Group Orientation, as did the original the research did include the 6 items from in the measure. This factor, Other Group Orientation, utilizes question numbers: 4, 9, 12, 14, 16, and 18, (both 9 and 14 being reversed). The preferred scoring is to use the mean of the item scores; that is, the mean of the 12 items for an over-all score for the Ethnic identity scale, and, if desired, the mean of the 5 items for search and the 7 items for affirmation. Thus the range of scores is from 1 to 4. With the similar process for the OGO scale adhering to reversals.

No written permission is required for use of the measure. However, if you decide to use the measure, please send me a summary of the results and a copy of any papers or publications that result from the study.

Jean S. Phinney, Ph.D.
Department of Psychology
California State University, Los Angeles

Roberts, R., Phinney, J., Masse, L., Chen, Y., Roberts, C., & Romero, A. (1999). The structure of ethnic identity in young adolescents from diverse ethnocultural groups. *Journal of Early Adolescence, 19*, 301-322.

Appendix E: Informational Assent Form

Hello, my name is Chad Novak and I am doing research to learn about culture and to see if different cultures prefer different ways of thinking. I am inviting you to join my project. I picked you and your school for this project because your school has a good mix of the students I would like to study. I am going to read this form with you. You can ask any questions you have before you decide if you want to do this project. . I will be in your class on Thursday to answer any concerns or questions you may have. No part of these surveys asks you sensitive information or protected health information.

WHO I AM:

I am a student at Walden University. I am working on my Doctorial degree. I am also a school counselor and have a private counseling practice where I work primarily with Native American foster children and their families.

ABOUT THE PROJECT:

If you agree to join this project, you will be asked to:

- Read this assent form and show it to your parents.
- Complete a learning style survey (12 statements you put into order)
- Complete a cultural survey (21 statements that you rate from 4 to 1)
- Total time will be one class period or about 45 minutes

IT'S YOUR CHOICE:

You don't have to join this project if you don't want to. You won't get into trouble with your school, teacher, or parents if you say no. If you decide now that you want to join the project, you can still change your mind later just by telling me. If you want to skip some parts of the project, just let me know.

It's possible that being in this project may cause you to examine the ideas of learning and ethnicity in more detail. This awareness may or may not be comfortable. It is the hope that this project will help others by creating a more realistic view of how learning works best. In addition, this project hopes to promote new and engaging kinds of learning that better match each individual's learning style.

PRIVACY:

Everything you tell me during this project will be kept private. That means that no one else will know your name or what answers you gave – in fact your name will not appear on any of the surveys. The only time I have to tell someone is if I learn about something that could hurt you or someone else.

ASKING QUESTIONS:

You can ask me any questions you want now. If you think of a question later, you or your parents can reach me, Chad Novak, at (970) 247-1418 ex 2804 or my professor, Dr. Stephanie Cawthon, at stephanie.cawthon@waldenu.edu. If you or your parents would like to ask my university a question, you can call Dr. Leilani Endicott. Her phone number is 1-800-925-3368, extension 121

Appendix F: Cover letter

Participant,

Please allow me the opportunity to introduce myself, the purpose of my why I am here, the research I plan on conducting, and how I believe this research will benefit you personally. I would also like to note the potential impacts this activity may have on students and the ways in which education is structured in the future. My name is Chad Novak, I hold a masters in counseling and am a board certified counselor, more importantly, I work in both the schools as a counselor and with Native American youth in my private counseling practice. I have noticed throughout the years in both of these positions that the ways in which individuals from different cultures get and process information changes with their individual experience. There are many different ways an individual may engage their world and how they make sense of it may be at least partially determined by these personal experiences.

The purpose of my research is to try and understand how personal experience shapes the ways in which an individual prefers to think. By gaining a better grasp of this process it is my hope that teachers and others involved in education may create more opportunities for students that better match the way, or style, in which they choose in understanding their schooling and their world. Many of you have been in situations where the information presented in a lesson was difficult to understand and you may have thought how much easier it would have been if schoolwork were to be explained differently. This research intends to explore the many ways in which individuals prefer to receive information. The benefits are far reaching. The results are very important and will be published for others to read and reference; in addition it is my hope that the brief forms you are about to complete will help other educators and myself in creating new and exciting opportunities for learning.

Sincerest Thanks,

Chad M. Novak, MA, NCC

Appendix G: Explanation of Administration procedures

There are two parts to the surveys. One part measures your individual preferences for learning. In this section several statements are presented and you are to put them in order based upon your likes and dislikes (4 being most like you – 1 being lest like you). The second part of the survey focuses on culture and your individual experiences, in this section you will be asked to rate a statement on a scale from 4 to 1 (again, 4 is strongly agree – with 1 being strongly disagree). Both surveys should not take more than this single period. Once you are finished please turn your surveys over on your desk and when everyone is done I will come by and collect the papers. It is very important for you to be as honest and true to yourself so that this project reflects your interests and styles truthfully. The surveys do not in any way measure how smart you are or if one of you is better on some task than another and are no way tests of your ability.

You will also notice that the survey does not have a place for your name. The surveys will in no way be connected to you individually. I want you to be aware that if you choose not to participate or at any point wish to stop the survey you have that right. The results will be presented to teachers and building leaders in the four corners areas in the hopes that the results will cause changes that will benefit you directly as well as future students. I appreciate your taking the time to work with me on this project and hope that you understand the value and impact of your responses.

Appendix H: Curriculum Vitae 2009

Chad Martin Novak
2907 West 3rd Avenue
Durango, Colorado 81301
headwatertherapy@gmail.com
(970) 385-1003 Home
(970) 769-2219 Mobile

NARRATIVE:

Throughout my life I have fostered kindred relations with the outdoors. My wife, four year old daughter, two year old son, and I are continually amazed with the wonders of this beautiful planet; as such, we mark as our top priority experiences with both our families centered in the natural environs. We count as our neighbors the birds, dear, and occasional bear – these factors, coupled with our desire for personal awareness, make us appreciative and our lives extremely rewarding. I occupy my life with fly tying and fishing, philosophy, and critical perspectives on history and politics as well as the related social implications.

SUMMARY STATEMENT**:**

I am a passionate, engaging, and thoughtful individual who is committed to education, learning, and social change. Further, I believe experience and relationships are the primary vehicles for constructing meaning. Philosophically, this translates to validating the realities and histories of my students and clients, while providing and encouraging a multiplicity of perspectives. It is my firm conviction that, as an individual and a member of this society, it is my responsibility to provide students and clients with a base from which they are able to understand and critique the nature and origins of knowledge. In addition, I support education as the primary means for enabling individuals to transform rather than to perpetuate existing circumstance. Ultimately, I envision an autonomous self-regulating learner who defines themselves not by their ability to acquire facts but by their ability to conceptualize their world as it continues to evolve. As a therapist I intend on enabling the client to be less impulsive and more deliberate in their actions and relationships

EDUCATION:

Walden University, College of Social, Behavioral & Health Sciences, Baltimore, MD
Doctorate of Philosophy, Psychology, 2009
Dissertation: Cognitive Preference and Ethnic Identity Among Anglo and Native American High School Students.

Adams State College, Alamosa, Colorado
Masters, Counseling, 2004

Fort Lewis College**,** Durango, Colorado
Post Bachelors, Educator Licensure, 1998

University Colorado, Boulder, Colorado
Bachelors, Business Administration, Emphasis: Marketing, 1994

LICENSURE/CERTIFICATION

2004	National Certified Counselor	# 91384
2004	Public School Counselor License	# 0342291
1998	Public School Educator License	# 0338607

PROFESSIONAL/RELEVANT EXPERIENCE

School Counselor
Escalante Middle School, Durango
2007 - Current

Therapist, 2004 - current
Private, Durango, Colorado
Work primarily with Native American foster children and their families employing individual, family, and crisis counseling. Eclectic commingling of social constructivism, systems theory, and postmodernism framed within a person-centered context.

Educator, 1998 - 2007
Miller Middle School, Durango, Colorado
Highly Certified, K-6 Multi-Subject
Highly Certified, K-12 Social Studies
Highly Certified, K-12 Math
Mathematics & Latin, U.S., and European Geography
Work on collaborative classroom learning/teaching methods, standards in curriculum, child study, IDEA - section 504, team and building leadership roles, athletic coaching, and response to intervention special education model.

HONORS AND DISTINCTIONS:

2009 - Current	Psi Chi, lifetime member of the National Honor Society in Psychology
2009	Speaker Durango High School Baccalaureate
1998 – 2005	Nominations: Durango Middle School Year

PROFESSIONAL SOCIETIES:

American Psychological Association
National Board of Certified Counselors
National Teachers Association
Durango Educational Association

EDUCATIONAL TRAVEL**:**

Atlanta, Ga.	2006	Seminar	Exploring Systems Theory Postmodernism Constructivism and Social Constructivism
Bloomington, In.	2006	Seminar	Psychoneuroimmunology & Stress Management
Atlanta, Ga.	2007	Seminar	Research Intensive Dissertation fundamentals
Minneapolis, MN	2008	Seminar	Globalization vs. Localization Dissertation to presentation

MAJOR RESEARCH INTERESTS:

Learning and cognition
Enculturation & ethnicity related to cognitive styles
Critical theory and postmodernism in contemporary education
Psychoneuroimmunology

GRANTS AWARDED

DFEE	2009	Equine Assisted Therapy	$6,000
Author			
DFEE	2008	Equine Assisted Therapy	$6,000
Author			
Tony Grampsas	2007	Social Emotional Learning	$80,000
Contributing committee member			