SCHOOL ACHIEVEMENT MOTIVATION AMONG NAVAJO HIGH SCHOOL STUDENTS:

A STUDY OF SCHOOL ACHIEVEMENT GOALS, ACHIEVEMENT VALUES, AND ABILITY BELIEFS

BY

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ABSTRACT

Navajo school students, it is believed, underachieve at school in terms of school attendance, dropout rates, and standardized performance tests. Among the many reasons proposed to explain the persistent school underachievement is that school culture is largely based on individualism, interpersonal competition, and other Western norms and values. These, it is argued, are an anathema to Native Americans. Hence, school culture may predispose many Navajo high school students to failure. To test this belief I constructed a model of school achievement motivation drawn from Western conceptualizations of achievement motivation. I then evaluated how well this Western model of achievement motivation described Navajo high school students achievement motivation.

Navajo students (N=829) from years 9, 10, 11, & 12 and 2 high schools (n=300 & n=529) participated in the survey. There were 391 males and 422 females, 243 students spoke Navajo at home and 557 spoke English at home, and 469 lived in towns and 329 in rural areas. Both schools generally follow mainstream state prescribed curriculum. In a bid to strengthen cultural identity among Navajo children, both schools have recently introduced Navajo language classes.

Using confirmatory factor analyses tests of equivalency were conducted that contrasted non-traditional Navajo students (speak English at home & live in towns) and females with near traditional Navajo students (speak Navajo at home & live in rural areas) and males. Using structural equation modeling, I examined the relations of the language, location, and gender variables on the achievement goal factors, mediated by school measures of achievement (GPA & absence), expectancy value (personal), ability beliefs (positive & negative), social goals (approval & concern), and achievement goals (mastery, approach, & avoidance).

The tests of equivalency revealed that there were no significant differences between the non-traditional and near traditional cohorts or between male and female cohorts. There were no direct relations of language or location on the achievement goals and there were indirect relations for language on mastery and avoidance mediated by the negative ability belief. Location on approach was mediated by approval. These were the only indirect relations for language and location on the achievement goals. Gender was indirectly related to mastery mediated by GPA, concern, personal value of school, and negative ability beliefs. Gender was also indirectly related to avoidance mediated by the negative ability belief factor. The more interesting results concern the students as a whole. For example, the ability belief factors mediated the effects of the school measures of achievement relations on the achievement goal factors. The mediation effects of social concern were much weaker than social approval. Students' personal value of school was unrelated to the school measures of achievement but was related to the achievement goal factor, mastery.

I concluded that non-traditional and near traditional Navajo students are more similar than dissimilar. Clearly this raises concerns regarding the making of policy based on assumptions regarding presumed differences

between non-traditional and near traditional Navajo high school students. I also concluded that, school achievement measures, the ability beliefs, and the social approval and social concern goals are important factors that influence the school achievement goals that Navajo students emphasize. This has implications for the manner in which schools and teachers emphasize these factors in classrooms.

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I think it an understatement to say that Structural Equation Modeling (SEM) is a difficult statistical strategy to come to grips with. Equally to say that learning the syntax for LISREL is difficult would also be an understatement. In this context, I would never have completed this dissertation without the help of two people. I thank Professor Herbert Marsh who, on many occasions, provided timely advice and guidance concerning SEM strategies. Dr Alex Yeung guided me and provided advice with the LISREL syntax whenever the need became apparent. Alex was most generous with his time and patience and I am grateful for this. Without the generous help of these two people, this dissertation would be the poorer.

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CHAPTER 1

AN INTRODUCTION TO THE PRESENT RESEARCH

INTRODUCTION

The central concern of this thesis is the nature of Navajo high school students' school achievement motivation. Social scientists are familiar with arguments concerning the links between social and cultural factors and school underachievement. Yet, very little research examines school achievement motivation as an intervening factor. This is particularly so for Navajo high school students. The present research addresses this limitation. To facilitate this, drawing on Western conceptualizations of achievement motivation, I compare two contrasting theories of achievement motivation among a sample of Navajo high school students drawn from two high schools in the Navajo Nation. I also examine the relations of students' school measures of achievement, achievement values, ability beliefs, and social goals, as mediators of the relations of social and cultural factors on their school achievement goals. Finally, guided by theory concerning the deleterious effects of being a member of a stigmatized group, I examine the relationship of Navajo high school students' school ability beliefs with their school achievement goals.

Pavel and Padilla (1993) recommend that researchers use mainstream theories when investigating school achievement among American Indians. Such an approach builds not only on theory but also may result in a better understanding of American Indian students' school achievement. While there is a considerable body of theory and research concerning school achievement motivation much of this research has been conducted in mainstream schools (e.g. Murphy & Alexander, 2000). There has been far less theory and research concerning minority groups, and particularly minority groups who relatively underachieve at school. The research presented in this thesis adds to the literature concerning Navajo high school students' achievement motivation by demonstrating that there are no differences in kind between near traditional and non-traditional Navajo high school students. Despite this, I show that there are important differences of degree associated with particular socio-cultural variables. Together, these findings further our understanding of school achievement motivation among Navajo high school students. The research also demonstrates the utility of mainstream theories, such as achievement goal theory, among a minority group of high school students that most researchers agree relatively underachieve. Finally, I demonstrate the utility of structured equation modeling in understanding some of the complex and subtle interrelations of dimensions associated with achievement motivation.

There are important implications of these findings for Navajo high school education policy. In the active pursuit of a philosophy of self-determination many researchers stress the importance of individuals cultural identity related to school education (e.g. Deyhle & Swisher, 1997). Unfortunately, many recommendations concerning American Indian education policy reflect the notion that the culture of American Indians, and its relation with school learning, contrasts with the culture of school. This may not be in the best interests of American Indian students' education. The present research, while acknowledging important cultural differences, raises questions regarding the efficacy of education policies grounded in the notion of American Indian culture being the anathema of school culture.

In the United States there is persistent school underachievement among American Indian students (e.g. James, Chavez, Beauvais, Edwards, & Oetting, 1995; Pavel, Curtin, & Whitener, 1997; Vadas, 1995). This is great cause for concern and has led many researchers to investigate the potential causes. Among the many potential causes cited in the literature is students' cultural identity. The cultural identity hypothesis posits that American Indian culture contrasts with the culture of schools to the extent that American Indian students are disadvantaged. School culture, it is argued, reflects the dominant surrounding Anglo culture (e.g. Deyhle & Swisher, 1997; James, et al, 1995). That is, the culture of school is based largely on individualism, interpersonal competition and other Western norms and values (Deyhle, 1995; James. et al, 1995). These approaches, it is argued, may be the anathema of American Indians and particularly American Indian women (James, et al, 1995). Thus, for example, it has been suggested that group-based and cooperative forms of education may be more effective for American Indians than the individualistic competitive approaches found in American schools (e.g. Ledlow, 1992; Vadas, 1995).

Cited also are the historical and adult experiences of American Indians with the American education system as a potential source of negative attitudes to education (Chrisjohn, Towson, & Peters, 1988; Deyhle & Swisher, 1997). James, et al (1995) posit that the United States federal policies of promoting assimilation through education have contributed to this attitude. Often these policies were administered in circumstances in which many parents were coerced into sending their children to the Bureau of Indian Affairs boarding schools (Deyhle &Swisher, 1997). Cited also are structural inequalities and inequities. For example, negative school attitudes have been related to perceptions of the relationship of school success and success in adult life (e.g. Deyhle & Swisher, 1997; Ogbu & Matute-Bianchi, 1986). Beyond the preceding there is research concerning stereotype effects. Apparently members of negatively stereotyped groups are at risk of confirming the stereotype as self-characteristic and hence less likely to be successful at school (Steele and Aronson, 1995).

The foregoing seems to suggest that the more American Indian students identify with their culture the more likely it is that they will underachieve. Yet, there is a contrary view. In the present research, I

refer to this contrary view as the social identity theory approach to school achievement motivation. Deyhle (1995), arguing against the structuralists' view (e.g. Ogbu & Matute-Bianchi, 1986) posits that "… Navajo youth who are better integrated into their home culture will be more successful students regardless of the structural barriers they face." Indeed, Oetting and Beauvais (1990) report that only American Indians who weakly identify with either American Indian or Anglo cultures showed poor adjustment. The implications of this view are readily apparent. Clearly, this view implies the notion that strengthening students' social identity will directly, or indirectly, lead to improved school achievement for American Indians.

Many researchers view variables such as language (English, Navajo), living location (town & rural) and gender as proxies for culture. James, et al (1995) argues that the use of traditional language is often associated with stereotyping and bias from peers and teachers. In addition, they suggest that students who use traditional language are more often associated with academic struggles than those who speak English. Indeed, Vadas (1995) found that students who speak Navajo at home were more likely than students who spoke English at home to underachieve or drop out of school. Deyhle (1995) and Deyhle and Swisher (1997) argue that students who live in a remote location in Navajo land are likely to be more traditional that students who live in towns or villages. The findings of Vadas (1995) seem to lend support to this notion. Vadas (1995) found that students who live in remote areas of the Navajo Nation were more traditional than students who lived in towns or villages. He also found that students who live in remote areas of the Navajo Nation were more likely than students who lived in towns or villages to underachieve or drop out of school. Finally, there is the question of gender differences. Vadas, (1995) found that it was more likely to be males than females that underachieve at school or dropped out of school. To account for this in cultural terms Vadas, (1995) argued that the impact on Navajo females of contact with the dominant Anglo culture was far less than for Navajo males. That is, Vadas (1995) believes that because the Navajo culture is matriarchal there was minimal change for females. Vadas (1995) argues this was not the case for Navajo males where the negative affects of inter cultural contact were more pronounced. The consequence for Navajo males according to Vadas (1995) was alienation. I refer to these factors of language, location and gender as socio-cultural variables.

However, establishing that there are group differences, or that these groups are reliable predictors of school achievement motivation seems an insufficient explanation. Of course, one can look to the interaction of these variables to elucidate understanding; e.g., language moderates the effects of gender (e.g. Baron & Kenny, 1986). However, we are still left with the question of why should speaking Navajo or English at home or, living in a town or rural location or of being male or female have a bearing on school achievement. The literature postulates many reasons. The concern of the present research is to look more closely at some of these posited reasons. Why is it that Navajo female students

fare better at school than Navajo male students? We might like to postulate a mediator that transcends gender (e.g. Baron & Kenny, 1986). For example, we could postulate that being female is a better predictor of school performance because they are more socially concerned than are males.

In the present research it is hypothesized that students' school achievement goals, school measures of achievement (Ames, 1992a; 1992b; 1992c), students' social goals (Anderman & Anderman, 1999; Blumenfeld, 1992; Urdan & Maehr, 1994), students' school achievement values (Eccles & Wigfield, 1995; Feather, 1982; Pintrich, Marx, & Boyle, 1993), and students' ability beliefs (Pintrich, et al, 1993; Urdan 1997) are related to Navajo students' school achievement motivation. It is further hypothesized that school measures of achievement, students' school achievement values and students' ability beliefs mediate the effects of the socio-cultural variables on students' school achievement goals. Understanding that the relations of the socio-cultural variables on the achievement goals as indirect is not only of theoretical interest but also may enable the development of practical interventions that benefit Navajo students' school achievement.

However, before proceeding to address these issues I first had to identify an appropriate model of school achievement motivation. I turn now to a brief introduction to school achievement motivation

THE STRUCTURE OF ACHIEVEMENT MOTIVATION

Recent literature suggests that theory and research regarding academic achievement motivation is alive and robust. Issues have arisen that have tested the robustness of theories related to students' school achievement motivation. Some important issues in need of attention have been addressed and progress has been made. Two examples of this are, first, the traditional view of a mastery goal and a performance goal (an approach orientation) as bipolar. Whereas it has now emerged that their relations may be complementary (e.g. Elliot, 1999; McInerney, Yeung, & McInerney, 2000; Urdan, 1997; Urdan, 1997). For example, a performance goal may have a consequence of enabling students to compare their objective performance with their subjective standards (a mastery goal) and hence the need for greater effort. Second, is the greater clarification of the performance construct through its partitioning into approach and avoidance components (e.g. Elliot, 1999; Urdan, 1997).

There has also been a sharper focus on the structure of the concept of achievement motivation. This has manifested itself in a variety of approaches to the phenomenon. For example, some view the structure of achievement motivation in terms of a hierarchical structure (e.g. McInerney et al, 2000; Marsh, Craven, McInerney, 2000). That is, conceptually, motivation is understandable in terms not only of the individual and unique contribution of dimensions but also in terms of the quality that these dimensions hold in common. Other theorists favor a multi-facet approach. Here the focus is on the interrelations of dimensions (e.g. Pintrich, 2000; McInerney, Hinkley, Dowson, & Van Etten, 1998;

Urdan & Maehr, 1995). In addition, it is argued, it would be useful to bring together key motivational constructs into a single model (e.g. Bong, 1996; Pintrich, 2000; Urdan, 1997) despite their emergence from different philosophical assumptions (Bong, 1996; Pintrich, 2000). This would assist in determining redundancy among the burgeoning array of motivational constructs (Bong, 1996, Wigfield, 1994).

INTEGRATION OF CONSTRUCTS FROM DIFFERENT PERSPECTIVES

It appears from the literature on academic achievement motivation that models of motivation are sometimes informed by constructs from different theoretical perspectives (e.g. Bong, 1996; Pintrich, 2000). Examples of the perspectives I refer to are Maehr's personal investment theory (Maehr, 1984; Maehr & Braskamp, 1986; see also McInerney, Roche, McInerney & Marsh, 1997 & Urdan, 1997), Covington's (1992) self-worth theory, achievement goal theory (Ames, 1992a;1992b;1992c; McInerney et al, 1997; Urdan & Maehr 1995, Pintrich, et al, 1993), and expectancy value theory (Feather, 1992; Eccles & Wigfield, 1995; Wigfield, 1994; Garcia & Pintrich, 1994; Pintrich et al, 1993). I would be remiss if I did not include the construct of self-efficacy (Bandura, 1986), the multidimensional notions of self-schema (Garcia & Pintrich, 1994; Eccles & Wigfield, 1995; Markus & Nurius, 1986; Markus & Wurf, 1987) and attribution theory (Weiner, 1985). The early seminal works of current theories of achievement motivation appeared around the mid-eighties (e.g. Maehr, 1984). Over the years these theories have understandably been massaged and modified to accommodate and assimilate new findings or insights (e.g. Ames, 1992a, 1992b, & 1992c).

All of these theories have informed, and continue to inform us, about the nature of academic achievement motivation. In some instances one approach has taken up an insight or finding of another. Perhaps one such example was the partitioning of the performance goal construct into approach and avoidance goal constructs. Thus academic avoidance behaviors (Covington, 1992) were accommodated in achievement goal theory (e.g. Elliot, 1999; Urdan, 1997). Examples of using the explanatory power of constructs from different theoretical perspectives are research that demonstrates linkages between students' ability beliefs and achievement goal orientations (Middleton, Kaplan, & Midgley, 1998). Other examples are those that demonstrate links between ability beliefs and expectancy-value achievement values (Eccles & Wigfield, 1995). Hence, it seems clear that more than one perspective may accommodate conceptualizations of psychological constructs from different perspectives. Yet, it seems there are few attempts to integrate key constructs into a single perspective such as a self-schema perspective. This is an issue I will return to shortly.

PERSPECTIVES ADOPTED IN THE PRESENT RESEARCH

The key constructs used in the present research are drawn from literature on achievement goal theory, expectancy-value theory and writings regarding students' ability beliefs. In the present research,

I first fit to the data a model of school achievement motivation that draws on these writings. In successive chapters, I then progressively demonstrate how the relations of these constructs inform our understanding of achievement motivation among Navajo students. In the following part of the introduction, I briefly outline the constructs evaluated beginning with those drawn from achievement goal theory.

ACHIEVEMENT GOAL THEORY AND SOCIAL GOALS.

Recently achievement goal theory has extended its conceptualization of achievement goals from mastery and performance goal constructs to mastery, performance approach and performance avoidance goal constructs (e.g. Elliot, 1999; Urdan, 1997). In the early nineties theorists advocated that achievement goal theory incorporate in its research agenda social goals and their relations with academic achievement (e.g. Blumenfeld, 1992, Urdan & Maehr, 1995). Theorists suggested that social goals might have an influence on students' cognition, affect, and behavior because of feelings of belonging and social responsibility (Anderman & Anderman, 1999; Blumenfeld, 1992; Triandis, 1997; Urdan & Maehr, 1995). Importantly, social goals have been linked with adaptive learning strategies such as cooperative learning strategies and portfolio assessment (Ames, 1992a; Blumenfeld, 1992). They have also been linked with maladaptive academic outcomes such as purposively doing poorly at school to retain group membership (Urdan & Maehr, 1995). We have come to accept that social approval in the form of parent and teacher praise for good schoolwork will have positive affects for students' future academic behavior. Yet, theory suggests that social approval has the potential to misdirect students into emphasizing ability and social comparison over effort and determination (Ames, 1992a; Anderman & Anderman, 1999; Covington, 1992). In circumstances of failure, a corollary of this misdirection of focus may be that students seek to avoid academic engagement. Beyond this, there are suggestions that the social purpose of academic achievement may vary with culture (Urdan & Maehr, 1995). Thus, it appears that social goals have an important bearing in students' academic life.

Recently Anderman and Anderman (1999) examined the relations of students' perception of social goals (sense of belonging and responsibility goals) and perceptions of achievement goals (task and ability). They concluded that future research should look at the relations of social goals, achievement goals and adaptive learning strategies. Specifically they posit that the adoption of social goals have an indirect effect on learning strategies, mediated through students achievement goal orientations. This raises questions concerning Navajo high school students' social goals. For example, it is believed the Navajo eschew aggressive individualism inherent in the Anglo educational system in favor of cooperation with the group (Deyhle, 1995). Hence, in my research I examine whether social concern is positively related to a mastery goal and unrelated to performance approach. In addition

whether social approval is positively related to a performance approach goal and unrelated to a mastery goal.

ACHIEVEMENT VALUES

A further focus of the present research is on the value component of expectancy-value theory and I refer to this as achievement values (Eccles & Wigfield, 1995; Wigfield, 1994; Wigfield & Eccles, 2000). Expectancy-value theorists generally hold a different conception of goals to that held by achievement goal theorists (e.g. Urdan & Maehr, 1995; Wigfield, 1994). Briefly, for expectancy-value theorists a goal is specific (e.g. improve my math results by 10%) and may be short or long term (Eccles & Wigfield, 1995). However, whereas a goal for expectancy-value theorists is specific, for an achievement goal theorist a goal is more abstract such as successful learning (Urdan & Maehr, 1995). Wigfield (1994), when discussing the definitions of goal structures adopted by expectancy-value theorists compared to those adopted by achievement goal theorists, pondered whether the achievement goal construct of mastery and the expectancy-value of utility are dissimilar constructs or whether they have the same underlying meaning. In the present research, they are posited as different constructs that differ in their strength of association with other motivational constructs. It seems quite reasonable that a student who adopts a mastery (or learning) achievement goal toward a task could do so independently of any perceived utility expectancy-value. However, this does not imply that these are mutually exclusive constructs. For example a student may also hold a mastery goal orientation as well as perceive the utility value for future college or career purposes of the task engagement. Thus, there are questions as to the nature of the relations between these two constructs. For example Pintrich, et al, (1993) posit that the relations of achievement values and achievement goals might be that achievement values influence the types of achievement goals that students adopt.

American Indian historical and adult experiences of the American education system have been posited as a potential source of negative attitudes to education (Chrisjohn, et al, 1988; Deyhle & Swisher, 1997). This suggests questions regarding the relations of Navajo students' personal value of school and their school achievement goals. In addition, shared cultural knowledge of the community about the relationship of school success and success in adult life have also been cited as reasons for American Indians school underachievement (e.g. Deyhle & Swisher, 1997; Ogbu & Matute-Bianchi, 1986). This also directs our attention to questions regarding the relations of Navajo students' utility values for school and their school achievement goals.

ABILITY BELIEFS

In the present research, ability beliefs are seen in a different light to the traditional single dimension. Generally the focus of past research has been to view ability beliefs such as self-efficacy

(Bandura, 1986) as a continuum along which individuals vary between each other and/or in different situations. Clearly, individuals manifest behaviors that suggest confidence or doubt in their capabilities. These are contrasting concepts and the salience of one or the other may have different consequences for the achievement goals that individuals adopt. The evidence regarding the relations of ability beliefs with performance achievement goals is inconsistent. There are findings that suggest that ability beliefs have positive, negative and no relation with performance approach and avoidance achievement goals (Anderman & Young, 1994; Middleton & Midgley, 1997; Middleton, et al, 1998; Midgley & Urdan, 1995; Skaalvik, 1997).

It seems reasonable to suggest that in terms of ability beliefs that the stereotype threat (Steele & Aronson, 1995) would be operative. The stereotype threat hypothesis posits that members of a stigmatized group are at risk of confirming that stereotype as true. In this sense, Navajo students generally are at risk. However, among Navajo high school students there may also be differences between groups. For example there may be differences between near traditional and non-traditional Navajo high school students concerning the effects of stereotype threat.

In the present research, I explore the relations of ability beliefs with other constructs of academic achievement motivation by positing positive and negative ability beliefs. I argue that stereotype threat manifests itself in students' ability beliefs. Moreover, these negative ability beliefs will be more associated with near traditional Navajo students than non-traditional Navajo high school students. While it is true that a review of the literature would reveal the predominance of single positive conceptions of ability beliefs there are precedents in the self-concept literature for positing a dualistic conception of positive and negative ability beliefs (Markus & Wurf, 1987).

A SELF-SCHEMA MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

Markus and Wurf (1987) posit a multi-dimensional self-concept that contains goals and self-schema elements. Garcia and Pintrich, (1994) see self-schema elements as the knowledge and beliefs component of motivation. For Garcia and Pintrich (1994) self-schema include ability beliefs and achievement values. Thus, the self-schema concept provides a framework that gathers three of the dimensions of concern together (goals, values and ability beliefs). Indeed, Pintrich, et al, (1993) posit a model that comprises the dimensions of social goals, school measures of achievement, achievement values, and ability beliefs all of which influence the achievement goals students adopt. Thus, the self-schema concept provides a conceptual framework that gathers all the dimensions of school achievement motivation of interest into a single coherent model.

In summary, there seems to be little empirical work that links the three perspectives outlined earlier into a single psychometric model of school achievement motivation. There is evidence that

suggests meaningful associations between achievement goals and ability beliefs, between ability beliefs and achievement values and between social goals and achievement goals but there appears only a theoretical question (Wigfield, 1994) that links achievement goals with achievement values. Nor is there research that integrates these essential concepts into a single coherent model of school achievement motivation.

CULTURAL AND SOCIAL CONTEXT

Invariably writings concerning all three perspectives, achievement goals, achievement values, and ability beliefs, show an overarching concern with context in which achievement motivation occurs and this extends to social and cultural factors. With few exceptions (e.g. Anderman & Anderman, 1999; Maehr & Midgley, 1996; McInerney, et al, 1997) this concern for context has also resulted in a focus on domain specific contexts such as mathematics and English (e.g. Martin, Marsh, & Debus, 2000). Murphy and Alexander (2000) posit that American school achievement in mathematics and science being problematic has influenced theorists and researchers in focusing on domain specific contexts. In the present research, I adopt the term School Achievement Motivation to distinguish from the domain specific approach to academic achievement motivation.

Many theorists (Maehr, 1984; Maehr and Braskamp, 1986; Markus & Nurius, 1986; McInerney, et al, 1997, Urdan, 1997; Urdan & Maehr, 1995) express concern that models of academic achievement motivation should demonstrate their cultural validity. These concerns are embedded in the universalist/relativist issue. It is not my intention to digress into the complexity surrounding this issue. Theory and research undertaken into minority group academic achievement by Fordham and Ogbu (1986) and Steele and Aronson (1995), concerned with the relations between the cultural and social environment and sense of self, tend to support the advisability of being concerned for cultural and social factors.

Recent research regarding Navajo students' school achievement outcomes has shown that they are related to language spoken at home (Navajo, English), living location (town, rural), or gender constructs (Deyhle & Swisher, 1997; Ledlow, 1992; James, Chavez, Beauvais, Edwards, & Oetting, 1995; Vadas, 1995). In the present research, these same background factors are presumed to represent cultural and social factors (e.g. Triandis, Bontempo, Kwok, and Hui, 1990).

Structural factors such as limited employment opportunities (there is among the Navajo chronic unemployment: see Chapter 4 and Appendix A) make a case for considering students' perceived relations between school and societal success. For example, in the face of such limitations, what are the incentives for students to choose to expend time and effort on education if in the end this effort will not result in employment (achievement value)? In addition, what happens when the culture does not respect

and admire school learning (achievement value). That is, school learning is considered the anathema of being Indian (Deyhle & Swisher, 1997). One reason could be to please one's friends or bring honor to one's group (social goals). Further, as already cited, apparently members of negatively stereotyped groups are at risk of confirming the stereotype as self-characteristic (Steele and Aronson, 1995). This concept is applicable to Navajo students insofar as their school achievement is concerned and may relate to Navajo students' beliefs about their capabilities regarding school (ability beliefs). There seems little doubt among Navajos that generally Navajo students do not fare as well as mainstream America in terms of school achievement and school retention. In the present research, these factors were viewed as underlying the intervening variables of social goals, achievement values, and ability beliefs that mediate the effects of the three background variables, language spoken at home, gender, and geographic living location on students achievement goals.

A STATISTICAL METHODOLOGY

Van de Vijver and Leung (2000) suggest psychological research on culture lack ways of integrating within-culture and cross-cultural theorizing and findings. To assist the bridging of this gap they propose viewing current research as comprising two types of research. The first is concerned with establishing generalizations or universals. The focus of concern in this type of research is often cross-cultural differences and similarities, i.e., cultural differences on psychological constructs. There is a concern to validate the instrument cross-culturally. The other type of research is where the focus is within the culture; i.e., monoculture. This type of research contributes to our understanding of social and cultural influences from within. It is suggested by van de Vijver and Leung (2000) that the most appropriate statistical method to address the methodological issues related to both types of research is Structural Equation Modeling (SEM). Regarding this issue of universal and particulars in cross-cultural research see also McInerney (1988). Pavel & Papilla (1993) propose the use of mainstream theories in cultural research as this approach contributes to theory development. Using mainstream theories, such as in the case of the present research, later offers the opportunity to compare these results with those collected from a different cultural groups. That is, by using a mainstream theory I offer the opportunity for comparison with other cultures. They, like van de Vijver and Leung (2000), suggest that the most appropriate statistical method to use is SEM.

In the present research, in addition to examining the structural validity of the constructs and before an examination of the role of the intervening factors, an important consideration is that students are responding to the items in similar ways across the groups (e.g., male, female). This offers confidence that the items are perceived to have similar meaning by the different groups. Where parallel data exists for more than one group a Confirmatory Factor Analysis (CFA) offers a powerful test of equivalency of solutions across multiple groups (Marsh, 1993). This is because the researcher is able to

constrain any single, set, or all parameters equal across groups and thus contrast the structural relations of parameters between groups. A further strength of the SEM methodology for the present research is that the usefulness of ANOVA is limited because not all paths are tested. In the present research, I consider multiple regression as limited because measurement error is not controlled for and this may produce results that mislead. Instead, to address these limitations, many researchers recommend the use of SEM methodology (e.g. Baron and Kenny, 1986). I present a more detailed description of the SEM methodology adopted in the present research in Chapter 4.

Following this chapter there are two literature review chapters. Chapter 2 focuses on the relationship of American Indians and education. That is, it draws linkages between the literature regarding American Indians and education and the prime elements in the present research (socio-cultural factors, the intervening variables and achievement goals). It also provides a backdrop to assist in understanding Navajo high school students' school achievement motivation. Chapter 3 focuses on achievement motivation theory. That is, it highlights theory and research pertinent to the present research. Following the literature reviews in Chapter 4, I present the methodology and statistical analyses used in the present research. In Chapter 5, I present the results and conclusion of the examination of two contrasting models of school achievement motivation for Navajo high school students. The next three chapters focus on the indirect effects of factors on the Navajo students' achievement goals. Where the data exists concerning mainstream schools, I also draw attention to the similarity and differences as these may imply cultural differences. I present a review of relevant theory and research in the respective supplementary chapters. A brief outline of these chapters follows:

Chapter 6 introduces achievement goal theory, mastery goals, performance approach goals, performance avoidance goals, social goals and school measures of achievement. Chapter 6 addresses the research questions of the present research in terms of social goals and school measures of achievement as intervening variables.

Chapter 7 introduces achievement values and reviews the literature concerning these concepts. . Chapter 7 addresses the questions of the present research in terms of achievement values as intervening variables.

Chapter 8 introduces ability beliefs and reviews the literature concerning these concepts. It addresses the research questions of the present research in terms of ability beliefs as intervening variables.

SUMMARY

It is postulated that understanding Navajo students' school achievement motivation will shed light on the issue on Navajo high school students school underachievement. To facilitate this illumination an examination of the relations of cultural and social variables with psychometric constructs representing a multidimensional model of school achievement motivation would be useful. In summary, the primary focus of the present research is:

a) The empirical examination of a multidimensional model of school achievement motivation reflecting key psychological constructs derived from theories about students' achievement goals, social goals, achievement values, and ability beliefs.

b) An examination of students' school achievement motivation across cultural and social groups (e.g. language, location & gender).

c) The examination of the role of intervening factors as mediators of cultural and social groupings on students' school achievement goals.

d) A demonstration of the use of SEM methodology as an effective means of examining a, b, and c.

CHAPTER 2

A REVIEW OF THE LITERATURE CONCERNING AMERICAN INDIANS AND EDUCATION

INTRODUCTION

In this chapter I set out a review of relevant literature concerning the relations of American Indian students and education. Where practical I emphasize Navajo students. The chapter introduces a number of important concepts and issues that one needs to be aware of when thinking or writing about American Indian and Navajo students and education. While I am fortunate that there are a number of small scale and ethnographic studies to draw on, there are far less concerning large-scale psychometric studies. Nevertheless, I attempt to develop a number of themes that are relevant. A central concern of this chapter is to broadly link socio-cultural factors believed to be determinants of Navajo students' school achievement (e.g. Vadas, 1995) with constructs of school achievement motivation. I define socio-cultural in terms of culture, social and demographics below.

SCHOOL ACHIEVEMENT MOTIVATION

School achievement motivation in the present research is not concerned with how or what a student does rather it is concerned with why a student does or does not do something. Essentially it is about why a student engages, disengages, or does not engage in learning. By looking at school achievement motivation in these terms I seek to understand the reasons for school behavior. These reasons have explanatory power and by the judicious use of our understandings we may dispel myth and improve the delivery of education for Navajo students. Improved delivery of education benefits societies generally. In the context of the global economy, we face the prospect of rapid and continuing change in our lives. For those individuals who are members of minority groups and who, coincidentally, academically underachieve, this improvement in the delivery of education may benefit them as not only individuals but also their group generally.

MINORITY GROUPS AND EDUCATION

The purpose of the following is to introduce theory and research concerning minority groups and academic achievement. A central issue in this section is to examine the role and influences of socio-cultural factors for school achievement. Following this, I present theory and research concerning the relations of culture and structural inequalities and inequities with school achievement. I also present relevant research findings drawn from writings concerning social identity theory.

A DEFINITION OF CULTURE

It was important to find a definition of culture that I could operationalize. There are numerous definitions of culture and Lonner and Malpass (1993) have suggested that there may be as many as 175, perhaps more. Most social scientists, while differing on many aspects of the definition of culture, would agree that culture is both shared and learned.

Triandis, Bontempo, Kwok, and Hui (1990) have argued that it is important to avoid confounding cultural, social, and personality constructs. Triandis, et al (1990) refer to cultural constructs as subjective culture. By this they mean cultural level constructs that are shared by speakers of a particular dialect, living in a geographical proximal location, during the same historical period. They include shared norms, roles, values, associations, particular ways of categorizing experience, and so on (see also Triandis, 1972). It is not difficult to imagine the Navajo people generally fitting this description.

Triandis, et al, (1990) refer to social categories such as men or women and young or old, as demographic constructs. These, they argue, are the same contents as those dealt with by subjective culture (e.g. shared norms, values and so on). However, demographic constructs differ in that they are shared only within a social category. I have two variables classified as demographic categories. These are students' gender and students' living location (e.g., town, rural). In the present research, it is important to distinguish between the demographic category gender and the demographic category, living location. I make this distinction first because the Navajo society is a matriarchal one (Locke, 1992; Vadas, 1995). Second because theory and research concerning Navajo high school students academic achievement make these distinctions (e.g., James, Chavez, Beauvais, Edwards, & Oetting, 1995; Vadas, 1995). Hence, culture is operationalized as language spoken at home (Navajo or English), gender is operationalized as itself (male or female) and geographic is operationalized as living location (town or rural). Further, when speaking collectively of the three constructs I refer to them as socio-cultural variables or factors.

This conceptualization of culture facilitates the study of the relations of socio-cultural variables with other factors of school achievement motivation. It provides a method with which to study what is in the minds of individuals as shared by a group; any group. This conceptualization is generally consistent with social cognitive theories and the social cognitive approach to dimensions of motivation and their interrelations (Maehr and Midgley, 1996). It lends itself to psychometric studies that shed light on the sources of shared group achievement goals, social goals, achievement values, and ability beliefs.

There is a considerable body of research suggesting that through intercultural contact, cultures may increasingly become more homogeneous. There is also evidence regarding conflict and alienation related to intercultural contact (see for examples, Amir, 1969; 1976; 1994; Hewstone & Brown, 1986; Tajfel, 1978;). In addition, there is evidence that cultures, despite conquest, discrimination, and significant attempts at assimilation, continue to survive as an entity, albeit changed. Chrisjohn, Towson, & Peters (1988) illustrate this point when writing about American Indian students' adaptation to hostile environments.

Since the military conquest of the Navajo Nation in the 1860's (Locke, 1992), the Navajo have progressively adapted to the United States of America mainstream culture. Since the end of World War 2 the process of acculturation has gathered momentum (Locke, 1992; Vadas, 1995). If the language spoken at home is a measure of the extent of acculturation then clearly there is evidence for the sample of Navajo students in this study to suggest that there are non-traditional and, in contrast, near traditional students. Seventy percent of students reported that they speak English predominantly at home (non-traditional) while thirty percent reported that they spoke Navajo predominantly at home (near traditional).

For this study, culture is shared and learned and can be understood in terms of Triandis conceptualization. In addition, culture is also both resilient and adaptive. In the following section, I outline the relationship between education and culture.

EDUCATION AND CULTURE

Does one's culture impact upon school achievement? It seems that throughout the United States that school structures and processes, while far from perfect, meet many of the demands of a diverse range of expectations. For example, schools meet expectations concerning a) the training of future adult members to carry out social, economic, and other tasks that the "powers" consider important (Ogbu & Matute-Bianchi, 1986), b) the intrinsic value of learning (Urdan & Maehr, 1995), c) a counseling service (Maehr & Midgley, 1996), d) health care provider (Maehr & Midgley, 1996), e) assimilation (Deyhle, 1995), f) the maintenance of cultural beliefs, values, and identity (Deyhle & Swisher, 1997). Despite this, it is clear that there remains persistent school failure in terms of graduations, attendance, dropouts, and comparative school achievement for American Indian students (see, for examples, James, et al, 1995; Vadas, 1995; Pavel, 1997).

For many children in the United States the culture of home reflects the parents' culture of origin. In the early formative years children of these minorities are exposed to a socialization process that may reflect a culturally different environment that can be contrasted with that which they experience at school (see, for examples, Ledlow, 1992; Ogbu & Matute-Bianchi, 1986). Stemming

from this is the view that cultural factors may be of sufficient individual importance that, for practical purposes, they influence behavior in education. For example, Deyhle and Swisher, (1997) report that for American Indians the socialization process regarding learning to learn emphasizes private practice and public demonstration of accomplishment. The process of learning is one where the individual observes, privately practices and perfects. They then demonstrate competency. Culturally, there is value in being able to privately master culturally appropriate ways of behaving. In addition, an integral part of learning is that following privately mastering a particular behavior there is value in demonstrating one's competence. The process also reflects a concern for face saving insofar as the private mastery negates the possibility of public ridicule during the formative part of learning (Deyhle, 1989; Deyhle & Swisher, 1997). It is noteworthy that these cultural practices seem to reflect the idea of mastery and performance avoidance. These references to mastery and performance avoidance relative to learning I explore in Chapter 3. However, the American Indian method of learning is in contrast with the Western concept that learning is a process of trial, error, and practice. An integral part of the Western process of learning is that mistakes and the public constructive correction of them are valued. Mistakes are seen to have value.

Reported also is that for the American Indian student there is value in pursuing one's gifts and talents. One has an obligation to do this in one's own interest as well as that of the community. The decision of the individual to take up this or that pursuit is to be respected and supported. However, unlike the Western concepts of child, teenager, and adult stages of development toward maturity and independence of decision making there is, for the Navajo culture, only child and adult. The Western teenager in Navajo eyes is an adult (Deyhle & Swisher, 1997). Hence, it may follow that the decision of a Navajo teenage student to continue, or drop out, of school or college is to be respected and accepted by parents and the community. This is a different attitude concerning school to that of the wider American community.

Vadas (1995) and Platero, Brant, Witherspoon, & Wong (1988) report that among Navajo school underachievers and dropouts, male students are disproportionately represented compared to females. In addition, like Platero, et al (1988), Vadas (1995) reports student dropout profiles tended to be male "...more traditional, have less materialistic ambition, live in the more remote parts of the reservation, and have parents who speak only Navajo." Vadas (1995) posits cultural factors as the explanation for these results. This suggests that non-traditional Navajo students (speak English at home, live in towns,) and females are more likely than near traditional Navajo students (speak Navajo at home, live in rural areas) and males to adopt individualistic, interpersonal competition, and other Western norms and values emphasized by schools (Deyhle, 1995; Deyhle & Swisher, 1997; James, et al, 1995). Yet, there is evidence that American Indians, with strong cultural identity, whether traditional or otherwise, with

good English skills, can be, and are, successful at school (Oetting & Beauvais, 1990; James, et al, 1995; Willeto, 1999; see also Ethier and Deaux, 1994). In addition, McInerney, et al (1997) reported the motivational characteristics of a large sample of Navajo students are remarkably similar to other students (including Anglo students) differing only by degree rather than in kind. In my research I investigate the former position.

SHARING IS THE NAVAJO WAY

I would be remiss if I did not include a sub-section that describes to the co-operative nature of the Navajo culture. Navajo people believe that the gifts of nature are indeed simply that, gifts. Of course, one must be industrious to obtain these gifts for one's own use. However, the acquisition of nature's gifts for the sake of having them, or more than one, or ones relatives can use, is eschewed. Riches such as food are to be shared with one's family and by extension one's clan and related clan (Locke, 1992). A Navajo saying supportive of this view is reported in Locke (1992) "A Navajo leader once said: 'You can't get riches if you treat your relatives right. You can't get rich without cheating people. Cheating people is the wrong way. That way gets you into trouble. Men should be honest to get along'."

A further example of the Navajo Way (sometimes referred to as socialist system of the Navajo way) is the concept of property ownership. Certain things are communal property and no individual or family has a personal stake in them. For example, timber areas, water resources and patches of saltbush, which serve livestock as a substitute for mineral salt, belong to everyone. However, it seems that this communal sharing is not absurdly absolute. Certain restrictions are observed in the use of communal property. For example, no Navajo is supposed to use a water hole that has historically been used by another family or clan. Thus there are practical restraints on the notion of communal property (Locke, 1992).

It seems clear from the previous that these traditional practices of sharing are the source of the notion that the Navajo culture is socialist in nature. Strong communal ties extending from the immediate family through the extended family to the clan characterize Navajo communal life. This suggests strong social concern for one's fellows and this social concern is an important aspect of the present research.

SOCIAL IDENTITY THEORY AND EDUCATION

It seems that stereotype effects and strength of cultural identity may be influential in school achievement outcomes. Recent research suggests that the process of stereotyping individuals or groups contains within it a grain of truth (see for example Ben-Ari, Schwarzwald, & Horiner-Levi, 1994). For example, American Indians are not good at school. I am a American Indian. I must not be good at

school. Despite the flawed reasoning, or as put by Taylor and Porter (1994) mis-attribution, apparently members of negatively stereotyped groups are at risk of confirming the stereotype as self-characteristic (Steele and Aronson, 1995). According to Steele and Aronson (1995), such a situation may pressure a student to redefine their self-concept such that school achievement is a basis neither of self-evaluation nor of personal identity. Further, this self-protection may have the affect of diminishing motivation and ultimately achievement at school (see also Covington, 1992, for similar arguments regarding the implications of protecting one's self-worth in the face of academic failure).

Many authors concerned with the school underachievement among American Indians point to the detrimental effects of negative stereotyping (e.g. Deyhle, 1995; Deyhle & Swisher, 1997; James, et al, 1995). In this context, some interesting statistics are revealed in a supplement to the Schools and Staffing Survey conducted by the National Center for Education Statistics (NCES) in the periods 1990-91 and 1993-94 (Pavel, Curtin, & Whitener, 1997). Data reported concerned three categories of schools attended by American Indian students. These were BIA/Tribal schools, schools comprising more than twenty five percent American Indian students (high American Indian enrolment), and schools that comprised less than twenty five percent American Indian students (low American Indian enrolment). Regarding Principals and Teachers reporting serious problems associated with American Indian students, Principal's general rank order of serious problems were, (1) poverty, (2) parental alcoholism/drug abuse, (3) lack of parental involvement, (3) student absenteeism, (4) student tardiness, (5) students dropping out, (6) student use of alcohol, and (7) student apathy. Teachers differed by ranking poverty second after parental alcoholism abuse and for the last four categories reversed the order reported by Principals. Principals and teachers at schools with low enrolments were less likely to report these as serious problems compared to the other two groups of schools. BIA/Tribal schools were more likely to report these as serious problems than the other two groups. It seems clear from these generalizations that within the education system among principals and teachers there is a pervading negative view of American Indian students. Given that students attending Navajo schools are overwhelming Navajo and that many of the teachers are non-American Indian it seems to follow that the negative academic effects of stereotyping may be operative.

Complicating this situation are propositions concerning the strength with which the individual identifies with their particular cultural group. It seems that the stronger the cultural identity prior to experiencing a context in which that culture is in the minority (for example college) the more likely it is that the social identity will be strengthened. Conversely, the weaker the prior identity the more likely it is that the social identity will be further weakened. A corollary affect of this situation is that students with low cultural identity are more likely to perceive threat in the environment, have lower self esteem, and predictably, lower identification with that cultural group (Ethier and Deaux, 1994). It is important

to note that many authors argue that American Indian students whose cultural identity is strong do better at school than those whose cultural identity is weak (see, for examples, Deyhle 1995; James, et al, 1995; Oetting & Beauvais, 1990). Deyhle (1995) asserts that Navajos subjected to discrimination in the workplace and the vocationally centered and assimilationist school curriculum are less successful when they are not secure in their own culture. Yet, these findings seem to contradict those of Vadas (1995). Vadas (1995) found that those Navajo students who were more traditional were more likely than less traditional Navajo students to dropout of school. Obviously, there is a need to reconcile these findings.

The essential point to be drawn from the preceding is that our understanding of educational underachievement among some minority groups can be understood in terms of the links between culture, cultures in contact, and the school setting. The argument is that if there is a mismatch, incongruence, or discontinuance between the culture of home and the culture of education and school then this may negatively effect educational outcomes for American Indian students. This view on minority school achievement is sometimes referred to as the Cultural Discontinuance hypothesis (see, for example, Deyhle & Swisher, 1997; Ogbu & Matute-Bianchi, 1986).

Given these arguments and findings, are cultural variables such as those related to learning, or adulthood, or traditional gender roles, or remote or urban living of sufficient individual importance to influence school achievement motivation? Put another way, are Anglo Western style schools simply unsuited for American Indian students? These important indicative questions have significant policy implications. For example, many among the American Indian community advocate that American Indian education would be better served by bilingual schools that cater only for American Indian students.

From the perspective of the present research, it should be apparent from the preceding literature review that understanding culture is important in understanding school achievement motivation among Navajo high school students. Further, the preceding makes it is apparent that the relationship of American Indian educational achievement and culture is at best unclear. In the research presented here the question of the relationship of culture with school achievement motivation is examined by evaluating the the similarities between non-traditional and near traditional Navajo high school students' school achievement motivation. I also examine the implications for school achievement motivation of stereotype threat by examining the relations of non-traditional and near traditional students' ability beliefs on their achievement goals.

I now turn to a proposition which argues that culture alone is insufficient to explain minority school underachievement. This position is that the perceived relationship between societal success and education has a bearing on Navajo students' school achievement motivation.

STRUCTURAL INEQUALITIES IN EDUCATION FOR AMERICAN INDIANS

Underpinning this perspective is the critique that it is insufficient to describe school success or failure solely in terms of contrasting the culture of home and language background with the culture of school. Noteworthy is that Steele and Aronson (1995) argue that structural factors alone are insufficient an explanation (see also Covington, 1992).

Ogbu & Matute-Bianchi (1986) concede there is as yet no satisfactory explanation for the variance in achievement between minority group education outcomes but points out that one potential path to account for this variance would be to account for the "...connection between education and other societal institutions and events that may influence the school perceptions and behaviors of the minorities or their responses to schooling." In developing their position vis a vis cultural discontinuance and structural analysis of minority groups education outcomes Ogbu & Matute-Bianchi (1986) argue that explanations of minority educational outcomes have been too narrowly conceptualized. This they assert is in terms of "Discontinuance's between the culture and language background of the children on the one hand and the demands of the school milieu on the other." They concede the notion of cultural discontinuance as the "how" it may affect educational outcomes, but argue that such a perspective lacks explanatory power. That is, it fails to shed light on why culture affects educational outcomes. The most serious flaw they point to is "*why some minority groups, why some language minorities do quite well in school in spite of cultural and language barriers."* (Ogbu & Matute-Bianchi, 1986. p. 74. Italics in original.). A second point they emphasize is that the conceptual framework "... either does not recognize or cannot accommodate those broader historical and socio-cultural forces that may influence minority education experiences, perceptions, and practices."

Ogbu & Matute-Bianchi (1986) argue that although education is influenced by political and ideological needs and issues and by religious beliefs and tradition, it is the industrial economy and its perceived needs that are the most pervasive influence. Likewise, they argue that parents' and students' perceptions and responses are highly influenced by economic considerations. Thus they conclude that the "study of minority education or the education of any segment of American society has to consider this wider context and meaning of schooling." In developing a conceptual framework, Ogbu & Matute-Bianchi (1986) propose that to account for minority group education anomalies such a framework should:

a) Account for the nature of the linkage between schooling on the one hand and, on the other hand, socio-cultural and historical forces;

b) Distinguish between types of minority groups who are successful in school from other types of minorities who are not so successful;

c) Differentiate between types of cultural discontinuance (e.g. in the present research, cultural, social and demographic);

d) Examine each type of minority in relation to the societal and historical forces and schooling (e.g. in the present research, Navajo students).

Items a, c and d are relevant to the present research.

To facilitate the exploration of these issues Ogbu & Matute-Bianchi (1986) propose a typology or conceptual framework that distinguishes between classes of minorities in terms of historical and socio-cultural forces. For analytical purposes, they suggest three classes of minority groups. The first of these classes is identifiable mainly in a numerical sense. That is, in every other sense they are integrated into the political and economic domain, and, are not distinguished from fellow citizens by specialized economic, political, or ritual roles. Persistent and disproportionate school failure is not a characteristic of this class and often it has a cultural frame of reference that enhances and demonstrates success. Examples cited are the Amish, Jews, and Mormons. Ogbu & Matute-Bianchi (1986) refer to this class as Autonomous. A second class is one that is discernible as immigrant minorities who for economic, social, or political reasons have moved voluntarily to a host country or society. They generally lack political representation and are exploited politically, economically, and socially. In spite of such treatment, they often are successful at school. Generally their frame of reference for success is not that of the host but that of their homeland and self-advancement is uppermost in their minds. There is always the option of returning to their homeland. Thus, Ogbu & Matute-Bianchi (1986) conclude that immigrants are enabled to adopt and maintain attitudes toward schooling that value school credentials, while at the same time they maintain a cultural frame of reference as to their identity. Immigrants according to Ogbu & Matute-Bianchi, (1986) do not equate schooling with acculturation or assimilation. They adopt what Ogbu & Matute-Bianchi (1986) refer to as essentially an alternation model of behavior toward schooling. That is, they are not only successful at the schools of a host culture, but also retain their cultural identity. Ogbu & Matute-Bianchi (1986) cite Gibson's (1983) work with the Punjabis as an example.

The third and final class are those minority groups that have "become incorporated into a society more or less *involuntarily* and *permanently* through slavery, conquest, or colonization and then

relegated to menial status" (Ogbu & Matute-Bianchi, 1986; p. 90. Italics in original). This class is often not successful at school. Ogbu & Matute-Bianchi (1986) cite American Negroes and Hispanics as examples of this class. One can see the relevancy of this distinction for American Indian students as a group. The distinguishing characteristic of these minorities is how they respond to their treatment. Some minorities in this class adopt survival strategies to explain and cope with their social situation. For example, Chrisjohn, et al (1988) posits that for American Indian students the relative academic underachievement is an understandable adaptation to the historical effects of contact with the American education system. According to Chrisjohn, et al (1988) one of the most important effects of this contact has been negative parental attitudes and the degree to which American Indian students internalize this. Briefly, they argue that students learn that parents hated their educational experiences, believe that academic success is unrelated to societal success, and that education makes Indians less Indian. The adaptations which they identify for American Indian students are "passive resistance", "surrender", "adaptation on students' terms", and "return to formal education after dropping out" (see, for examples, Chrisjohn, et al, 1988, also Deyhle & Swisher, 1997). Furthermore, these strategies eventually become institutionalized cultural practices and beliefs, linked to norms, values, and attitudes that may or may not value persevering for school success.

Is there differentiation between groups as to the effects of the relations of one's social identity and educational outcomes which are explicable in terms of socio-cultural factors? Ogbu & Matute-Bianchi (1986) think so. They argue that it is insufficient to look merely at differences between groups in educational achievements and culture. One also has to look to the relations of socio-cultural factors and historical factors at work within the group and compare these workings between groups. To account for the nature of the linkage between schooling on the one hand and socio-cultural and historical forces on the other hand, Ogbu & Matute-Bianchi (1986) offer the concept of Status Mobility, or "folk theory of getting ahead". This they argue enables a better understanding of people's educational attitudes and efforts, "given their labor market experience, their history, and cultural values. Variables would include the overall status of the members of an identifiable group, their economic niche, their historical experiences, and their cultural values." This strategy can be operationalized through the concepts of subjective and demographic cultures (Triandis, et al, 1990). Educational outcomes viewed this way may provide us with additional explanations concerning the variance between minority groups in educational achievement.

Ogbu & Matute-Bianchi (1986) posit that perceived correlations between status mobility, economic and societal success, and school success, fuel folk theory concerning the value of schooling and factors (perseverance, working hard) which correlate with it. Thus on the positive side there

develops shared beliefs, values, attitudes, and behaviors that support wanting school credentials, persevering, and working hard. They write:

> "...children's positive responses are reinforced when shared cultural knowledge and "folklore" of their community about the relationship between school success and success in adult life, based on collective experience, are not too discrepant with verbal encouragement of parents and other adults." (Ogbu & Matute-Bianchi, 1986. p. 85).

On the other hand situations where discrepancies are apparent between schooling and adult opportunity may suggest there develops "folk theories" and coping strategies that may not be conducive to school achievement. For example, see Chrisjohn, et al (1988), cited earlier, regarding linkages between parental attitudes resulting from their past educational experiences and the degree to which this is transmitted to and internalized by American Indian children.

From the position of the present research, it is important to understand much of the forgoing is applicable not only to American Indian students generally but also to the Navajo. There is, within the Navajo Nation, substantial and chronic unemployment (see Appendix A., also, see chapter 4). The preceding goes to the question of the perception among Navajo high school students of the utility value of school. For further historical information regarding the Navajo experience, see Locke (1992).

AMERICAN INDIAN HISTORICAL EXPERIENCE WITH EDUCATION

Deyhle and Swisher (1997) placed American Indian education in a historical context when pointed to the evidence of more than four hundred treaties made between United States Governments and American Indian people in exchange for land on the one hand and promises on the other. In addition, more than one hundred of these treaties make direct reference to the "...provisions for educational services and facilities..." and "...subsequent executive orders, congressional acts, and court decisions" legitimate the basis for successive United States governments to make policy regarding American Indian Education (Deyhle & Swisher, 1997). Further evidence of legal "responsibility" is that for the preceding one hundred years the public education system has operated with local control and little assistance from the Federal government in contrast to the central control exercised by the Federal government regarding American Indian education (Deyhle & Swisher, 1997).

According to Deyhle and Swisher (1997) commencing with boarding schools introduced by Missionaries in the 1600's through the 1700's and culminating in the 1800's, with the Federal government's direct involvement by developing an education system for American Indians, there is reflected the assumption that the purpose of education is assimilation (for other perspectives of the

purpose of education see Ogbu & Matute-Bianchi, 1986; Maehr & Midgley, 1996). Deyhle and Swisher (1997) posit that the purpose of the boarding school was to teach Indians non-Indian ways. In consequence, American Indian children were removed from their families, religion, culture and value systems, and language and placed in boarding schools to learn, understand, and adapt to the ways of the dominant culture. In the 1900's there was a shift from boarding schools to day schools located closer to non-American Indian communities which according to Deyhle and Swisher (1997) reflected "the belief that assimilation would occur more rapidly if American Indian students were integrated with non-American Indian students".

Following World War 2 the then U.S. Government attempted to rescind treaty relations that gave American Indians their special sovereign status as semi independent nations within the United States. The goal here was to move American Indians off the reservations to the cities and hence more easily assimilate them into the mainstream culture. However, these policies were met by a series of legal challenges mounted by American Indians during the 1950's and 1960's (Nobles, 1997). In May of 1946 a delegation of Navajo, testifying before congressional committees, pointed out that of the twenty one thousand children of school age, less than six thousand were enrolled in all schools, federal, mission and public. It took two more decades before this appeal for universal education for Navajo children to be made available. Yet, the first treaty between the Navajo and the United States Government concerning schools and education was signed in 1868 (Locke, 1992).

From this brief history it is apparent that education for Navajo students has had many purposes and it seems that until recently education for education's sake took a very low priority.

AMERICAN INDIAN PARENTS, TEACHERS AND PEERS EDUCATIONAL EXPERIENCE

Among the many issues that have been the subject of investigation by social scientists are the relations of parents, peers and teachers with American Indian students' academic success. Many of these investigations reflect the belief that American Indian parents are disinterested in their child's academic achievement, that American Indian child rearing practices (such as learning to learn) are an inappropriate grounding for the child's adaptation to the school environment, and that parents fail to instill in their children the value of schooling, to cite but a few examples.

American Indian parents and community adult experience of the American education system is for many a living memory insofar as they have lived the experience and the consequences of assimilationist education policies. Many adult American Indians have experienced being removed from their families, community, and culture to attend boarding schools. This includes some American Indian teachers (Cleary & Peacock, 1998). They have experienced the racism and discrimination of the white student community, school administrations, parent and teacher associations, and teachers. For those

that completed school there has been the difficulty of finding employment and for those who do find employment the associated status and economic rewards may be well below the norm (see Appendix A.). It is difficult to imagine the situation where the adult memories of these experiences are not passed on to, and internalized by, the children of American Indians. Equally it is difficult to imagine a situation where the stories by one's parents about their experience with education does not influence American Indian students perceptions of education and its purpose (see for examples Chrisjohn et al, 1988; Cleary & Peacock, 1997; Deyhle & Swisher, 1997; Nobles, 1997; Pavel, et al, 1997). Yet it has been reported that many American Indian parents wish their children to do well at school (see, for examples, Deyhle, 1989; Deyhle & Swisher, 1997).

Child rearing practices such as private learning and public demonstration and the manner in which students are viewed by family and community - that is, as adults - have also been pointed to as influences for American Indian education outcomes. For many American Indian communities, it is expected that the individual students will display the appropriate cooperative behavior, but that individualistic behavior is also to be respected. Both behavioral attitudes are valued. This, arguably, may lead to misunderstandings between school administrations, teachers, and parents regarding such issues as truancy (Deyhle, 1989). On the one hand, truancy from the perspective of the school is irresponsibility on the part of the individual and the parents. An example quoted by Deyhle (1989) illustrates this point "That seventh grader was away from school for five days, and his parents didn't care!" (p. 43) From the community's point of view absenteeism by a student may be perceived as an "adult" response by individuals performing other functions in the community such as child minding (Deyhle, 1989). The reasons for frequent absences on the part of students or the apparent lack of parent and community involvement at school, may be economic, distance traveled to school, religious or cultural reasons (Deyhle, 1989). Added to this is the question of students' perceptions of the purpose of school as influenced by parents and the community.

Deyhle (1989) reports that successful Navajo and Ute students are exposed to the risk that one's peers will adopt a reportedly traditional method of teasing to pull the academic achiever back to the fold. Hence, as in many other groups and communities, we see the role of group conformity pressures to persuade the individual to abide by the values and standards of the group. Deyhle (1989) argues that this "teasing" is an effect of perceiving academic achievement as a non-Indian way. Academic achievement is the way of the white man. Empirical studies have shown that individuals in similar circumstances (such as teasing) are subjected to a discernible amount of stress and may adopt public behavior of depreciating one's academic efforts in order to belong. At the same time the individual's self esteem may be adversely affected (see for example, Fordham and Ogbu, 1986). Peer pressure, according to Deyhle (1989), may also be an influential reason for leaving school. Yet, here as

elsewhere, despite the pressure and stress resulting from "teasing", many students are able to fend for themselves:

> "They made fun of me over there (pointing with her lips to the reservation). So I stopped trying in school. Then I thought, 'I am doing this for me, not them.' So I started trying in school again. I want to do better than them, not just sit in a hooghan for the rest of my life". (Deyhle, 1989. p. 49).

Most would agree that the role of the teacher is of crucial importance in the education of children. Teachers are increasingly required to fulfil many roles such as nurse, counselor, and childcare worker to name but a few (e.g. Maehr & Midgley, 1996). These are in addition to the requisites of pedagogical and domain knowledge. As is generally the case, American Indian students report that teachers are influential in students being committed to schooling (see for example, Deyhle, 1989). Many researchers argue that a positive impact on American Indian and Native Alaskan students education is the use of culturally appropriate and relevant curricula and methodology together with teacher sensitivity to, and skill at dealing with, cultural differences. Much of the literature regarding the appropriate classroom teaching style to adopt for American Indian students argues that to be effective account must be taken of the American Indian students learning style. (see, for examples, Kleinfeld, 1994; Murdoch, 1988; More, 1989; Tafoya, 1989; Swisher, 1990; Deyhle & Swisher 1997). The following Deyhle (1989) observations of students and teachers illustrates this need for awareness and sensitivity:

> Student:
>
> "He is prejudiced. Talks about Navajos and welfare. 'You all listen, you aren't going to be on welfare like all the other Navajos. He shouldn't talk like that! And then the white students say things like that to us. Like all Navajo aren't on welfare. I'm not like that. We work for what we have. He shouldn't say things like that. It makes us feel bad." (Deyhle, 1989. p. 41)

Teacher classifying American Indian students according to the Indian community to which they belong.

> "I don't know what it is, but these students from Border are, well, it's their attitude. They are defiant. They walk around with their heads in the air. They just don't care. They have no respect. The other Navajo students were real nice and quiet in class. They did their work and what you told them to do in class". (Deyhle, 1989. p. 41)

The issue here is not that all teachers are characterized in this manner, nor is it that American Indian students see all teachers in this light. The issue here is that a substantial minority of American Indian students, irrespective of which American Indian community they come from, may characterize teachers in this manner and adapt their behavior to correspond with this perception. Sadly, it would seem that this stereotyping of teachers contains a grain of truth.

Clearly the experience of parents as told to their children, student interaction with peers, both American Indian and non-American Indian, and teachers, in the school context; and perceptions of their social experience in terms of prejudice, racism, social status and mobility will contribute to and influence students perceptions as to the purpose of schooling which, in turn, may influence school achievement motivation and school achievement. Yet, despite this, many American Indian students do succeed at school. What is discernible is that a substantial minority do not. It is the whole picture that Deyhle and Swisher (1997) urge researchers, policy makers, administrators, and teachers to heed. They encourage the exploration and understanding of not only the failures, but also the successes in what can only be described as a bleak landscape (see, also, James, et al, 1995).

In concluding a comparative study of school achievement and drop-outs between Anglos and American Indians, James, et al (1995) suggest that a clearer picture of why some American Indians achieve, and why some do not, may emerge from investigations into, among others, student attitudes and beliefs as to the utility of school, employment patterns, and community, family, and peer norms and values regarding education and school.

SUMMARY

In this section, I briefly summarize the main points of the preceding literature review. Subjective culture (Triandis, et al, 1990) is defined as constructs that are shared by speakers of a particular dialect, living in a geographical proximal location, during the same historical period. This construct is operationalized as language spoken at home. Social categories gender and living location are defined as demographic. These comprised the same contents as subjective culture except only members of a particular group shared them. In the case of the present research, these are operationalized as gender and living location. Collectively, I further defined these constructs as socio-cultural variables. I pointed out also that these definitions are broadly consistent with social cognitive theories and the social cognitive approach to motivation. In addition, they lend themselves to psychometric studies by shedding light on shared group values, their sources, and relations with school achievement (Maehr & Midgley, 1996). In this research, there is a concern to illuminate the relations of socio-cultural factors with shared values (achievement goals and intervening variables)

The sub-section Sharing is the Navajo Way, sets the scene for the social goal factors examined in the present research, at least to the extent of social concern, a property of which is co-operation. The sub-section Social Identity Theory and Education provides background information for Chapter 8 in which I examine the relationship of students' ability beliefs, with the socio-cultural factors and achievement goals. That is, I suggest that Navajo students, as members of an oppressed minority, may have their self-esteem affected such that it affects their ability beliefs concerning academic achievement.

In the section concerned with culture and education, I began with the idea that in their early formative years many children of minorities are often exposed to a socialization process that reflects a culturally different environment than the one they experience at school. I cited findings suggesting that for Navajo school underachievers and dropouts there are differences between genders, those who live in towns or the more remote parts of the reservation, and those who speak Navajo or English at home. In addition, I cited findings that suggested that there are non-traditional compared to those who are near traditional. I also cited theory and research that suggests that strong cultural identity, whether traditional or otherwise, is associated with school success (Oetting & Beauvais, 1990; James, et al, 1995; see also Ethier and Deaux, 1994). The essential point to be drawn from this section was that our understanding of educational underachievement among some minority groups can be understood in terms of the links between culture, cultures in contact, and the school setting. Further, it is apparent that the relationship of American Indian educational achievement and culture is at best unclear.

The section on Structural Inequalities in Education for American Indians presents the position that cultural factors alone are insufficient to account for the relative school underachievement among American Indian students. It was postulated that the process by which American Indian students assimilate these inequities and inequalities was the folk theory of success (Ogbu & Matute-Bianchi, 1986). Briefly, the concept of folk theory of success holds that consistencies between the shared cultural knowledge of the community about the relationship between school success and success in adult life is reinforced through the verbal encouragement of parents and other adults. I pointed out that there is among the Navajo substantial and chronic unemployment and earlier, that American Indian parents saw education as unrelated to success in adult life (Chrisjohn, et al, 1988). Hence, this raises questions concerning students perceived utility value of school and its relationship with their achievement goals.

Finally, there is the section on American Indian Parents, Teachers, and Peers Educational Experience. In this section I introduce the idea that the tragic education experience is the living memory of many parents, teachers and adults and that these memories of their school experience are transmitted to, and assimilated by, American Indian children (Chrisjohn, et al, 1988). Linked to this, is

the perception by some teachers that Navajo parents are not interested in their child's education and with the potential to confound, juxtaposed to Deyhle's (1989) report that many Navajo (and Ute) parents wish their children to do well at school. These issues logically go to the notion of Navajo high school students' personal value of school and their relationship with their achievement goals. The relations of personal value with the socio-cultural variables and the achievement goal factors are examined in Chapter 7.

The notion of teasing to bring dissidents back to the fold was also introduced in this subsection. The relevancy of this concept, and to some extent linked to the idea that Navajo parents and teachers wish their children to do well at school, is that of social approval. In Chapter 6, I examine the relations of social approval with the socio-cultural variables and the achievement goal factors.

In concluding, clearly a complex array of factors interacts to influence American Indian students' perceptions of school. This gives rise to many questions regarding the impact on individual students' willingness to engage in schooling. There are the comparatively poor socio-economic circumstances of many Navajo students and the influence this may have on the value of education. There is also the learned experience of adult American Indian with the American education system which combined with reports regarding many parents' wish that their children do well at school suggests questions regarding the effects of apparently conflicting messages as to the value and purpose of school for Navajo students. It seems apparent that there is peer pressure to not do well at school but to what extent is this peer pressure influential in the individual's decision to engage, or not, in schooling? There are also questions regarding the influence of teachers for Navajo students. It is entirely reasonable, though regrettable, to assume there will always be teachers who do not measure up. Equally there will be those who are conscientious, caring, and culturally aware and sensitive. These issues give rise to the role of social approval for Navajo high school students.

The primary purpose of this chapter was to provide a tapestry against which to consider Navajo students' school achievement motivation. I have endeavored to show the linkages between elements identified in this chapter with concepts used in the present research.

CHAPTER 3

A LITERATURE REVIEW CONCERNING ACHIEVEMENT MOTIVATION THEORY AND RESEARCH

INTRODUCTION

In this Chapter, I review the literature in terms of achievement motivation theory and research. Little research exists that specifically examines achievement motivation among Navajo high school students and even less that examines the relations of motivational dimensions from within (e.g. McInerney, Roche, McInerney, Marsh, 1997; McInerney & Swisher, 1995). A primary concern of the present research is to examine school achievement motivation among Navajo high school students using a mainstream model. Hence, the presentation in the following tends to emphasize research findings associated with mainstream schools. Reading Chapter 2 concerning American Indians and Educational experience and research further enhances understanding of the linkages between the concepts described in this chapter and American Indian educational experience.

I begin with an overview of achievement motivation theory particularly as it relates to the present research. I follow this with a review of the literature concerning achievement goal theory emphasizing mastery, performance approach, performance avoidance, school measures of achievement and social goals. There follows then a review of the literature concerning school achievement values and finally a review of the literature concerning school ability beliefs.

Pintrich (2000) distinguishes between three types of goals found in the literature. The first of these he refers to as task-specific goals or target goals. These goals relate directly to specific outcomes. Urdan & Maehr (1995) define these goals in terms of performance objectives. For example, I wish to improve my math results by ten percent. The work of Zimmerman, Bandura, & Martinez-Pons (1992) exemplify this type of goal. In the present research school measures of achievement (absence, Grade Point Average [GPA]) are viewed in this light. Another goal type referred to by Pintrich (2000) is that of a general goal. A general goal differs from a target goal in that they are more general in nature. These goals encompass notions such as personal striving, possible selves, happiness or safety. I will not refer to these goals in the present research. Finally, there are achievement goals. According to Pintrich (2000) these are intermediate goals situated between target goals and general goals. Achievement goals were specifically developed to explain achievement motivation and behavior (Pintrich, 2000). They refer to the reasons, or purposes, why individuals pursue an achievement task. In this context

> "… the term 'goal orientation' is often used to represent the idea that achievement goals are not just simple target goals or more general goals, but represent a general orientation to the task that includes a number of related beliefs about purposes, competence, success, ability, effort errors, and standards ." (Pintrich, 2000 p. 94)

In this research, the term achievement goals refer to mastery goals and performance goals (avoidance & approach).

There is debate concerning the stability or otherwise of achievement goals (e.g. Murphy & Alexander, 2000; Pintrich, 2000). For example, there is debate whether students bring to school achievement goals and related beliefs, or whether factors in the classroom influence the adoption of a particular goal orientation. In this respect there are competing models (e.g. Dweck & Leggett, 1988, Ames, 1992a). Pintrich (2000; Pintrich, Marx, & Boyle, 1993) seem to propose an interactionist perspective to address this issue. He suggests that there are characteristics, such as ability beliefs, that students bring to school. These, together with student perceptions of the goals emphasized by schools and teachers influence the goal orientations students adopt toward tasks. Hence, to understand better the nature of achievement motivation, Pintrich (2000) proposes the construction and examination of theoretical models that include moderators and mediators of the relations among achievement motivation dimensions.

I take Pintrich (2000) to mean the terms moderators and mediators in the same sense as Baron and Kenny (1986) use them. Baron and Kenny (1986) define moderators as variables that affect the direction and/or strength of the relation between an independent variable and a dependent variable. They suggest the interaction effects in ANOVA as an example of moderator effects. For example, in developmental psychology the interaction of gender and age. The role of moderators is not addressed in this research. Baron and Kenny (1986) define a mediator variable as one that accounts for the relation between independent and dependent variables. In this way, substantive issues such as why there are differential outcomes between males and females can be explained. Understanding that the relations of socio-cultural factors on students' school achievement goals are because the relations are indirect through an intervening factor is of theoretical and practical interest. For example, the knowledge that language (Navajo and English) is a predictor of mastery because of the indirect relations through ability beliefs and social goals may enable the development of programs that benefit Navajo high school students school achievement. I further define a mediator variable in Chapter 4.

Following the structural validation of an invariant model of school achievement motivation, I address the question of contrasting near traditional with non-traditional groups of Navajo high school students (see Chapter 5). Subsequent chapters focus on the indirect effects of the three socio-cultural

variables (language, location, & gender) on Navajo high school students' school achievement goals. I emphasize school measures of achievement, students' social goals, students' school achievement values and students' school ability beliefs as mediators of the socio-cultural variables. The intention of the following literature review is first, to inform the reader of theory and research concerning school achievement motivation. This will enable the comparison and contrast of findings in the present research concerning Navajo high school students with findings concerning students that more represent mainstream schools. Second, it defines the constructs used in the present research in terms of their relations with students' school achievement goals. In this context, the reader should be cognizant that while other research shows many of these dimensions to be related, they have not before been empirically examined as a single coherent model of school achievement motivation for a minority group.

ACHIEVEMENT GOAL THEORY

Achievement goals are cognitive representations of the purposes or reasons students perceive for academic engagement. It is presumed that they guide students' behavior, cognition, and affect, as they become involved in academic work (Ames, 1992a; Ames & Archer, 1987; Dweck & Elliott, 1983; Maehr, 1984; Maehr & Midgley, 1996; Urdan, 1997). Some theorists see achievement goals as a function of individual or personality characteristics and as such relatively stable across a variety of achievement situations (Dweck & Leggett, 1988). Others see achievement goals as more malleable and influenced by factors in the school environment (Anderman & Anderman, 1999; Pintrich, 2000; Urdan, 1997; Urdan & Maehr, 1995). Some researchers see these influences on motivation as extending to social goals. For example social responsibility goals may be related to adaptive patterns of learning such as the importance of learning, personal improvement and personal effort (e.g. Anderman & Anderman, 1999). Other social goals have been linked to ego or performance goals, (e.g. Anderman & Anderman, 1999). Some researchers see the influence on students' goal orientation as extending beyond the classroom to include factors such as the perceived purpose of school (e.g. Maehr & Midgley, 1996; Urdan, 1997; Urdan & Maehr, 1995). For example, the value of school in terms of its personal value and utility values (Pintrich, Marx & Boyle, 1993; Wigfield, 1994) or pleasing one's parents (Urdan & Maehr, 1995). Definitions of achievement goal theory include beliefs about the causes of success and failure (Dweck & Leggett, 1988; see also Urdan, 1997), cognitive and affective responses to success and failure (Ames, 1992a; Covington, 1992; Dweck & Leggett, 1988) and behavioral options based on the interaction of stable orientations and situational factors (Pintrich, 2000). In addition, it is believed that linked to students' achievement goals are the criteria or standards by which they judge their success or failure (Ames, 1992a; Blumenfeld, 1992; Pintrich, 2000; Urdan, 1997). Thus the implicit and explicit purposes of school espoused by parents, teachers and peers and the school curricula and its methods of evaluation are all thought to have consequences for students'

achievement goals (Ames, 1992a; Anderman & Maehr, 1994; Elliott & Dweck, 1988; Maehr & Midgley, 1996).

MASTERY AND PERFORMANCE GOALS

Mastery and performance goals appear to have emerged as the central theoretical constructs in the development of a theory of school achievement motivation. Similar concepts are found in the literature as learning and performance goals (Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988), task involvement and ego involvement (Maehr, 1984; Nicholls, 1984), and mastery and performance goals (Ames & Archer, 1988; Ames, 1992a, 1992b; McInerney, Roche, McInerney, Marsh, 1997; Urdan & Maehr, 1995). Although each of these pairings may have subtle differences conceptually, learning, task involvement, and a mastery goal are different to ego involvement and a performance goal. I use the terms mastery goal and performance goal in the present research. Traditionally these two achievement goals have been seen as contrasting patterns of motivational processes (Ames, 1992a, 1992b). Recently the idea of contrasting goals has been questioned (e.g. McInerney, Yeung, & McInerney, 2000; Pintrich, 2000).

A MASTERY GOAL.

A mastery goal has as its focus the intrinsic value of learning (Meece & Holt, 1993). There are also associated attribution beliefs that effort and perseverance will lead to success (Ames, 1992a, 1992b; Ames & Archer, 1988). Based on self-referenced standards students are concerned to develop new skills, understand their work, and improve their competencies (Ames, 1992b; Meece, Blumenfeld, & Hoyle, 1988). Research suggests that a mastery goal is associated with work that involves challenge and risk taking (Ames & Archer, 1988; Elliott & Dweck, 1988) and positive attitudes toward learning (Ames & Archer, 1988; Meece, et al, 1988). A mastery goal has been associated with effective learning strategies which in turn have been linked with self-regulative learning behavior (Ames, 1992a; 1992b; 1992c).

A PERFORMANCE GOAL.

A performance goal is externally referenced by doing better than others or surpassing normative based standards (Ames, 1992a; see also Urdan, 1997). Public recognition that one has performed in a superior manner is considered especially important (Ames, 1992a). This attribution-ability outcome relationship has been linked with the idea of students' self-worth being determined by a public perception of their ability to perform (Ames, 1992a; Covington & Omelich, 1984). In this view, students' sense of self-worth may be threatened when effort has been expended yet the result has been failure (Covington & Omelich, 1979).

In this conception, a performance goal is a single unidimensional construct along which individual differences can be detected. Until recently it has been assumed that the single dimensional construct addressed the twin issues of a concern with good and bad outcomes (Urdan, 1997) and it was believed that the relations with a mastery goal were dichotomous. The evidence regarding the relationship of this conceptualization of a performance goal with valued school outcomes is mixed. More recently, Urdan (1997) has summarized these relationships as maladaptive, neutral, and positive (see also Pintrich, 2000; Urdan & Maehr, 1995). It now seems apparent that this view is no longer tenable and that the relations of a mastery and performance goal are not necessarily dichotomous (Elliot, 1999; McInerney, Yeung, & McInerney, 1998). The partitioning of the performance goal into two goals has made for conceptual clarity about the relations of performance and mastery goals.

A PERFORMANCE GOAL AS TWO GOALS.

Urdan (1997) suggests that the problem of conflicting evidence about a performance goal may be one of definition and the operationalization of the construct. Indeed, recent research regarding a performance goal has tended to refine its definition and operationalization by partitioning a performance goal into two (e.g. Elliot, 1999; Middleton & Midgley, 1997; Middleton, Kaplan, & Midgley, 1998; Midgley, Kaplan, Middleton, Maehr, Urdan, Anderman, Anderman, & Roeser, 1998). Generally, this partitioning has been along the lines of approach/avoidance dimensions. Consistent with the idea that a performance goal is externally referenced, researchers adopting this approach posit a performance approach goal and a performance avoidance goal. A performance approach goal can be seen as students wanting to appear more able than others and a performance avoidance goal as students wanting not to appear less able than others (Urdan, 1997). In the present research, I operationalize both of these conceptions of performance goals.

While the partitioning of a performance goal shows promise in refining our explanations about a performance goal and its relationship with valued school outcomes, some researchers have suggested an additional direction. These researchers have suggested the possibility of the presence of other variable(s) that may be related to a performance goal and a mastery goal (e.g. Bong, 1996). Indeed, in an earlier work Urdan & Maehr (1995) posited the presence of other variables to help account for the conflicting results regarding a performance goal. Specifically, they suggest that the inclusion of social goals in our research may improve our understanding of mastery and performance goals as well as their interrelations (see also Blumenfeld, 1992; McInerney, Roche, McInerney, & Marsh, 1997). However, it seems there has been little research to evaluate these relationships.

SOCIAL GOALS

Theorists suggest that social goals may also influence students' cognition, affect, and behavior (Anderman & Anderman, 1999; Blumenfeld, 1992; Triandis, 1995; Urdan & Maehr, 1995). Anderman & Anderman, (1999) point out that some social goals are related to adaptive patterns of learning such as a willingness to endorse the importance of learning, personal improvement and personal effort. In contrast, they suggest there are other social goals that are directed toward acceptance and status within a peer group. Whereas the first form of social goal is directed toward the adoption of a mastery type goal, the second is directed toward a performance type goal. Recently Anderman and Anderman (1999) reported that middle school students' social goals influenced their school achievement goals (see also, Anderman & Young, 1994). Indeed, they conclude their study by hypothesizing that social goals may have indirect effects, mediated by students' achievement goals, on students' learning strategies. I adopt the position of their hypothesized relations of social goals and achievement goals in the present research.

Beyond this, it has been suggested that the social purpose of academic achievement may vary with culture (Urdan, 1997; Urdan & Maehr, 1995). For some cultures it may be more important than others that one demonstrates one's sense of family or sense of wider social or cultural grouping by achieving at school (see for example, Bochner, 1994; Deyhle, 1995; Ogbu & Matute-Bianchi, 1986; Triandis, 1989). Conversely, one may demonstrate one's sense of family or sense of wider social or cultural grouping by intentionally doing poorly at school. This latter theme recurs repeatedly as an explanation for American Indian students doing poorly at school (e.g. Chrisjohn, Towson, & Peters, 1988; Deyhle & Swisher, 1997). For historical and experiential reasons school is seen by many American Indian students as the anathema to being Indian (e.g. Cleary & Peacock, 1998; Locke, 1992). In the present research, two qualitatively different social goals are examined in the light of their linkages with a mastery goal and the performance approach and performance avoidance goals. These goals are social approval and social concern. I will address the social approval goal first.

A SOCIAL APPROVAL GOAL.

A performance goal is externally referenced and related to normative measures of achievement (e.g. GPA) and social comparison (Ames, 1992a). Ames pointed out that public recognition for doing better than others or performing in a superior manner is important in adopting (and maintaining) a performance goal. In this context, the demonstration of one's ability (school measures of achievement) is seen as linked with social approval (Ames, 1992a; Urdan & Maehr, 1995). In the present research school measures of achievement (GPA, absence) are viewed as normative measures of achievement with which students may make achievement comparisons. Accordingly, they stand alongside social

approval as inducing or maintaining a performance goal. Indeed Rawsthorne and Elliot (1999) using a meta-analysis methodology reported no difference in the (undermining) effects on intrinsic motivation of performance goals that had been induced by manipulating ego-involvement (similar to social approval) and normative (e.g. GPA) evaluations.

Social approval, given or withheld, could have different consequences for students such as encouraging or discouraging academic ability related beliefs. Recent research suggests social approval may decrease as students succeed and increase with underachievement (Bempechat, Graham, & Jimenez, 1999). Bempechat, et al (1999) investigated the question of whether there are ethnic differences in children's perceptions of their parents' educational socialization processes? And, is the relationship between educational socialization and mathematics outcome different for different ethnic groups? The scales Education Socialization Scale (ESS) used by Bempechat et al (1999) reflect students' perceptions of parental approval for academic behaviors. The same study reports that there may be culturally different parental responses. For example, for the Indo-Chinese students lower math scores were associated with more frequent parental emphasis on the value of effort (a mastery goal) compared with the other groups (Caucasian, African/American, & Latino). However, social approval may have negative consequences for valued academic outcomes (Urdan & Maehr, 1995). Deyhle (1995) posits that the Navajo students see valued academic outcomes as an anathema to being Navajo. In such circumstances, social approval may have as its consequence the maintenance of group/social/cultural identity. Hence, Navajo high school students may not academically engage in deference to being socially acceptable.

Generally, it seems that a social approval goal is more likely to have a stronger relationship with a performance goal than with a mastery goal (Ames, 1992a; Urdan & Maehr, 1995). A recent study by McInerney, et al (1997) is informative in the context. In brief, McInerney, et al (1997) evaluated the responses of 2156 high school students drawn from Australian Aboriginal, Australian Immigrant, Australian Anglo, Navajo Indian, and Betsiamite Indian populations. They developed seven motivational constructs for the study. Among them are constructs similar to the constructs of mastery, performance (approach only), social approval, and social concern used in the present research. McInerney, et al (1997) reported moderate relationships between recognition (social approval) and the task goal (mastery goal) and between recognition and a performance goal ($\underline{r} = 0.57$ & $\underline{r} = 0.64$ respectively). Their findings also suggest that while the factor structures (factor loadings) are invariant across the different cultural groups factor correlations appear to differ. This result may suggest cultural differences regarding the relationships between social approval and mastery goals and between social approval and performance goals.

While the preceding provides guidance in hypothesizing the linkages of social approval with a performance approach goal and a mastery goal there are fewer guidelines for hypothesizing the linkages of social approval with a performance avoidance goal. Perhaps Bempechat's, et al (1999) finding provides some guidance at this juncture. It is believed that students' adoption of a performance avoidance goal is associated with the protection of one's self worth (Covington, 1992). Social approval would also be important in protecting one's self-worth. One might hypothesize that as achievement declines social recognition and/or approval become more important. Indeed, I suggest that the more students perceive themselves as less able with their schoolwork and seek to avoid engaging in schoolwork (performance avoidance goal) the more important social approval becomes. Based on these propositions it would seem that social approval and a performance avoidance goal may be positively related (e.g. Hinkley, McInerney, & Marsh, 2001).

A SOCIAL CONCERN GOAL.

The other social goal examined in this research is a social concern goal. While there are some research findings regarding this type of social goal they are sparse (e.g. Anderman & Anderman, 1999; Patrick, Hicks & Ryan, 1997; Urdan & Maehr, 1995; Urdan, 1997 for a review of social goals). The central characteristic of a social concern goal is that students act out of empathy for the interests of other students. Social concern is an inclusive construct the properties of which are cooperation and collectivism (Ames, 1992a; Triandis, 1989; Urdan & Maehr, 1995). The value of, and concerns, regarding cooperative learning structures have long been known (e.g. Triandis, 1995; Slavin, 1983; Urdan & Maehr, 1995). Co-operative learning processes have been shown to mitigate against the negative effects of failure more so than competitive learning processes (Harris & Covington, 1992).

McInerney, et al (1997) reported a moderate correlation of $\underline{r} = 0.52$ between their factor of social concern and a task (mastery) goal. However, they also reported no correlation ($\underline{r} = 0$ .05) between social concern and their equivalent of a performance approach goal. It should be born in mind that their research encompassed several cultural groupings, and consequently there may be subtle differences in the results in the present research to those of McInerney et al (1997).

SCHOOL ACHIEVEMENT VALUES

Before defining the school achievement value constructs used in the present research it is useful to distinguish between two concepts of goals used by achievement goal theorists and expectancy value theorists. For expectancy-value theorists, goals may be short or long term and these goals are believed to influence students' school achievement values (Wigfield & Eccles, 2000). Thus, the relation of these students' goals with choice, persistence, and performance is indirect through students' school achievement values. In contrast, goal theory's school achievement goals, similar to expectancy-value's

choice, persistence, and performance, are believed to be influenced by students' school achievement values (e.g. Pintrich, et al, 1993).

Urdan (1997) carefully, and usefully, distinguishes between these two types of goals found in motivation theory. He refers to this distinction as performance objectives (specific goals) and school achievement goals (see also Urdan & Maehr, 1995; Wigfield, 1994). The difference is in terms of answers to the questions *what* am I trying to achieve (a performance objective) and *why* am I trying to achieve (school achievement goal). Urdan (1997) suggests that these two concepts are understandable in terms of two contrasting concepts. That is, difference in terms of effort expended with the personal objective of improving my math mark by ten percent, and effort expended because I want to understand or learn. It may be that satisfying the target goal of better marks, in part, also meets the criteria of a mastery goal. Thus, at this fundamental level there seems to be some common ground between achievement goal theory and expectancy-value theory (Wigfield, 1994). Indeed, Wigfield (1994) urges a closer examination of the similarities and differences and relations of constructs and measures used by the different approaches to school achievement motivation. In the present research, I view achievement values as influenced by school measures of achievement (GPA & absence) and further that these achievement values influence students' achievement goals. That is, there are indirect effects of school measures of achievement mediated through students' school achievement values on students' school achievement goals.

ACHIEVEMENT VALUES

According to Feather (1982) the achievement value of a task can be understood as "criteria or frameworks against which present experience can be tested. They are tied to our feelings and can function as general motives" (p. 275). Thus, there is a nexus between values and behavior. Yet recently Wigfield and Eccles (2000) report that they did not find relations between achievement values and school achievement. This may suggest the presence of an intervening factor, such as school achievement goals, between school achievement values and school achievement. However, in their research Wigfield and Eccles (2000) report that the researchers did not operationalize the utility value.

It is believed that school achievement values differ from school achievement goals in that they to be more stable and less influenced by school situational variables than school achievement goals. Achievement values are considered more personal and attitudinal characteristics about school brought by students to the school situation (Pintrich, et al, 1993). Urdan (1997) describes achievement goal theory as organized schemas. It seems clear that students' personal value of school, and its utility value, can be viewed as important aspects of this organized schema. Hence, I posit a model of school achievement motivation that encompasses school achievement goals and school achievement values.

Indeed, Pintrich & Garcia (1991) have shown that college students who report that course material is more interesting, important, and useful to them are more likely to adopt deeper processing strategies such as elaboration and metacognitive control strategies. Pintrich & Garcia (1991) results were based on a composite factor. More recently Eccles and Wigfield (1995), using Confirmatory Factor Analysis (CFA) demonstrated that perceived personal value and perceived utility are separate factors. This latter position I initially adopt in the present research. The personal value of school construct I operationalized by items that reflect completing high school is of personal value. For example, in describing myself as the sort of person who would complete high school I am making a statement that implies the personal value of school for me. The utility achievement value I operationalize in the present research by items that reflect that doing well at school is related to perceived purpose.

To view achievement values in terms of personal value and utility value of school has particular relevance in the present research. In Chapter 2, I pointed out that school is seen by many researchers as an anathema to Navajo culture (Deyhle, 1995). In the following chapter, I show that there is chronic unemployment among the Navajo. Focusing on these two constructs in the hypothesized model of school achievement motivation enables an evaluation of these two hypotheses in terms of socio-cultural differences.

There has been little research regarding the relationships of school achievement values with mastery and performance goals. Surprisingly, Urdan (1997) does not include this type of goal when broadening achievement goal theory definitions to include additional goals suggesting instead only extrinsic (Urdan does not classify this as a goal) and social goals be included. Yet Pintrich, et al (1993) have posited constructs similar to personal value of school (important) and utility value of school (usefulness) as influencing mastery and performance goals. Wigfield (1994) proposes that an important future task for motivation theorists is to investigate the similarities and differences of constructs related to expectancy-value theory and achievement goal theory. This advice is consistent with Bong's (1996) view that it would be useful to determine if there is redundancy among achievement motivation constructs. Wigfield (1994) commenting on the similarities and differences concerning the structure of constructs associated with the two theories suggest that school achievement values and mastery and performance goals may be related. Further, Wigfield (1994), when comparing the mastery goal with the utility school achievement value, ponders the nature of the relationship of these constructs and wonders whether these are different constructs or similar constructs with the same underlying meaning (structure).

Analogous to the way in which school situational factors provide information for the individual to decide the goal most appropriate (Urdan, 1997), so too, situational factors in the wider community

provide information for the individual to decide the school achievement value. I now turn to formal definitions of the school achievement values used in the present chapter.

PERSONAL VALUE OF SCHOOL.

Personal value of school is concerned with the attainment value of school in terms of the importance of the activity relative to an individual's core personal values (Eccles & Wigfield, 1995; Wigfield, 1994. See also Feather, 1982; Eccles, Adler, Futterrman, Goff, Kaczala, Meece, & Midgley, 1983). Such a core personal value could be the importance to the student of completing high school. Eccles, et al (1983) add to the attainment value of school the intrinsic value of school. This component is not considered in the present research.

UTILITY VALUE OF SCHOOL.

The utility value of school refers to the school achievement value of the task because it is instrumental to the future and attaining short and long term goals (Eccles & Wigfield, 1995; see also Eccles, et al, 1983). For example, I may value school because being successful at school will enable me to go to college or get a job and I would see planning ahead as integral to this process.

STUDENTS' ABILITY BELIEFS

I remind readers that there remains persistent school underachievement among American Indian students (e.g. James, Chavez, Beauvais, Edwards, & Oetting, 1995; Pavel, Curtin, & Whitener, 1997) and that Navajo high school students are not an exception to this situation (e.g. Vadas, 1995). I have argued in Chapter 2 that the historical experience of the Navajo, indeed American Natives in general, with the American education system has been a disaster. Deyhle (1989, 1995) and Deyhle and Swisher (1997) point out that education for the Navajo is not a level playing field and among these imbalances is the implied self fulfilling prophesy effects of being seen as a failure. In Chapter 2, I also wrote concerning theories of stereotyping. Briefly, I repeat them here, as I believe they are relevant in terms of the postulated unsure ability belief construct defined later.

Research suggests that the process of stereotyping individuals or groups contains within it a grain of truth (see for example Ben-Ari, Schwarzwald, & Horiner-Levi, 1994). For example, American Indians are not good at school. I am a American Indian. I must not be able to learn at school. Despite the flawed reasoning, or as put by Taylor and Porter (1994) mis-attribution, apparently members of negatively stereotyped groups are at risk of confirming the stereotype as self-characteristic (Steele and Aronson, 1995). According to Steele and Aronson (1995), such a situation may pressure a student to redefine their self-concept such that school achievement is a basis neither of self-evaluation nor of

personal identity. Further, this self-protection may have the affect of diminishing motivation and ultimately achievement at school (see also Covington, 1992, for similar arguments regarding the implications of protecting one's self-worth in the face of academic failure). In the context of stereotype threat I believe that Navajo high school students would experience doubt about their academic capabilities.

Much of the work concerning school ability beliefs has assumed that a single continuous variable can inform us of the effects for learning of students' ability beliefs. Middleton, et al (1998) found that different levels of school ability beliefs were associated with different aspects of students' school achievement goals. However, the approach adopted by Middleton, et al (1998) does not satisfactorily identify negative school ability beliefs, which one would expect to be associated with individuals who experience stereotype threat (Steele & Aronson, 1995). I address this aspect of negative school ability beliefs in the present research.

I also examine the question of the relations of positive (sure) and negative (unsure) school ability beliefs with the social goals, and school measures of achievement. Generally, previous research has investigated relations between the school ability beliefs and specific measures (e.g. Murphy & Alexander, 2000) such as absence and GPA, between school ability beliefs and school achievement goals (Middleton, et al, 1998) and between school ability beliefs and school achievement values (personal, utility; Wigfield & Eccles, 2000). I was unable to identify any research concerning Navajo high school students' school ability beliefs as used in the present research. Thus, I rely on research conducted with mainstream students. In this way, I have the opportunity to contrast Navajo high school students' school ability beliefs with those of mainstream American students. However, there does not seem to be a precedent to guide me in hypothesizing relations between school ability beliefs and social goals.

School ability beliefs have been shown to be related to academic goals and achievement (e.g. Middleton, et al, 1998; Zimmerman, Bandura, Martinez-Pons, 1992) and posited to influence choice of activities, effort expended, and persistence (Bandura, 1986). Students' school ability beliefs are cognitively appraised (Bandura, 1986) based on information from sources such as social comparison and parents, teachers and peers (Dweck & Leggett, 1988; Schunk, 1994). Other important sources of information are students' experiences and achievement (e.g. Dweck & Leggett, 1988; Schunk, 1994).

School ability beliefs have been defined as individuals' judgements about their capability to accomplish a task or achieve a specific goal. This emphasis on links between school ability beliefs and specific goals seems to have led many researchers to explore the relations of ability beliefs and specific domain outcomes (e.g. math, English [e.g. Pintrich, Marx, & Boyle, 1993; Eccles & Wigfield, 1995; see

also Murphy & Alexander, 2000]). Murphy and Alexander (2000) suggest that researchers' focus on domain specific outcomes may reflect the view that American students' Mathematics and English achievements are seen as problematic and in need of "diagnosis and remediation (sic)"(pp. 30-31).

I wish to distinguish between the relations of Bandura's (1986) construct of self-efficacy with outcomes and expectancy-value theory of the relations of school ability beliefs with outcomes. Murphy and Alexander (2000) concluded, after a review of the literature regarding the research uses of self-efficacy, that unlike many of the other constructs used in motivation theory the self-efficacy construct was well defined and did not suffer the same dilemma caused by two definitions of goals (e.g. Urdan, 1997; see also Pintrich, 2000, for comment on this aspect). Further, Murphy and Alexander (2000) point out one of the striking characteristics of research using the self-efficacy construct was that the construct seemed invariably defined in terms of domain specific outcomes (e.g. Zimmerman, Bandura, & Martinez-Pons, 1992) with the assumption that school ability beliefs influence domain specific outcomes. In contrast, for expectancy-value theorists, students' short and long term goals are believed to influence students' school ability beliefs (i.e. expectancy of success; Wigfield and Eccles, 2000). Short and long term goals are specific goals also, such as gaining a pass in a subject and/or taking math because it will help the individual become a doctor. These different conceptions of the relations of school ability beliefs offer the potential for a chicken and egg situation. Although it is unclear as to which influences which, and the resolution of this question is beyond the scope of the present research, it is clear there are associations between students' school ability beliefs and their school achievement.

However, not all researchers have viewed school ability beliefs as related solely to specific domain outcomes (e.g. Roeser, Midgley, & Urdan, 1996; see also, Murphy & Alexander, 2000). In this latter view, the emphasis of the research has been focused on the relations of school ability beliefs and learning orientations (e.g. mastery and performance goals) rather than specific domain outcomes. The concern in the latter context is about students' beliefs about their school ability in the broader school context of learning. In the present research, the focus is on this broader context.

ABILITY BELIEFS AND MASTERY AND PERFORMANCE GOALS

In experimental studies Schunk (1991a; 1991b) showed that improving students' school ability beliefs lead to better use of cognitive strategies and higher levels of academic performance (see also, Pintrich & Garcia, 1991). In addition, it has been shown that mastery goals lead to an adaptive pattern of outcomes for learning at all levels of school ability beliefs (Elliott & Dweck, 1988). Consistently school ability beliefs are positively related to mastery goals (Anderman & Young, 1994; Midgley and Urdan, 1995; Schunk, 1996). Generally there seems to be agreement among achievement goal theorists

regarding the positive relations between school ability beliefs and mastery goals (e.g. Urdan, 1997). Studies that are more recent have sought to understand better the relations of school ability beliefs with performance approach and performance avoidance goals (e.g. Middleton, et al, 1998).

Dweck and Leggett (1988) posit that the relations of school ability beliefs with achievement goals covary. In this context, it is presumed that students' perceptions of their school ability are a stable entity. For example, Elliott and Dweck (1988) showed that students with high ability beliefs who were performance goal oriented had more positive cognition, affect, and behavior after failing than did students with low ability beliefs. Recent studies report positive relations between performance goals and school ability beliefs (Midgley & Urdan, 1996) while others have found negative relations (Anderman & Young, 1994). The recent innovation of partitioning performance goals into performance approach goals and performance avoidance goals has led to examination of these conflicting results and Middleton and Midgley (1997) report no relation between a performance avoidance goal and school ability beliefs. Further, Elliott and Church (1997) found that despite linkages with intrinsic motivation there was no difference in grades for high ability belief and low ability belief students who were performance goal oriented. Clearly, the relations between students' school ability beliefs and performance approach and performance avoidance goals are unclear. I address this issue in Chapter 8.

PARTITIONING ABILITY BELIEFS

The evidence regarding the relations of school ability beliefs with performance goals is inconsistent. Findings suggest that school ability beliefs have positive, negative and no relations with performance approach and performance avoidance goals. (e.g. Anderman & Young, 1994; Middleton & Midgley, 1997; Middleton, et, al, 1998; Midgley & Urdan, 1995; Skaalvik, 1997). In an attempt to account for this anomaly there has emerged a tendency to collapse ability belief type constructs into low, medium and high (e.g. Middleton, et, al, 1998). There is some doubt as to the efficacy of this method. It seems that better progress might be made if, analogous to the partitioning of the performance approach construct into approach and avoidance dimensions, a similar approach is adopted in the concerning ability beliefs. In the present research, unlike the partitioning of performance goals, the partitioning of ability beliefs results in positive and negative worded items. The positing of a dualistic conception of separate positive and negative school ability beliefs is not without precedent in self-concept literature (Marsh, 1996; Markus & Wurf, 1987).

In the present research, I assume that the concept of stereotype threat operates among Navajo high school students (Deyhle, 1995; Steele & Aronson, 1995). I further assume that if such a concept is operating then it might manifest itself in opposition to the positive concept of sure ability beliefs. That is I assume that Navajo students experience confidence and doubt about their school capabilities.

However, as pointed out by Marsh (1996), a critical concern in empirical research when using contrasting constructs such as positive and negative ability beliefs is whether the constructs are substantively meaningful or an artifact of response styles. I examine this issue in Chapter 5 where I describe a statistical method proposed by Marsh (1996) to evaluate whether the unsure ability belief construct is an artifact of response style.

Recently Urdan (1997) posited that whether students chose a performance approach goal (trying to appear able) or a performance avoidance goal (trying to avoid appearing unable) there should be linkages with students' school ability beliefs. This seems to suggest that the more sure students are then the stronger will be the linkages with a performance approach goal. On the other hand, the more unsure students are, then the stronger will be the linkages with a performance avoidance goal. I believe it informative and constructive to partition the school ability beliefs into constructs that logically link to the performance approach and performance avoidance goals.

It follows that sure ability beliefs would be related to a mastery goal and trying to appear able (performance approach). In contrast, unsure ability beliefs would be related to trying to avoid appearing unable (performance avoidance). There is then an interest in the present research in the relations of these two school ability belief constructs with other factors in the model, particularly performance approach and performance avoidance.

A BRIEF REVIEW OF SELF-SCHEMA THEORY AND RESEARCH

In the introduction, I mentioned that the self-schema conceptualization provides a framework that encompasses the three perspectives used in the present research. I refer to this model of as the self-schema model of school achievement motivation (e.g. Garcia & Pintrich, 1994; Markus & Nurius 1986; Markus & Wurf, 1987; Urdan, 1997).

Garcia and Pintrich (1994) offer a conceptual framework within which to situate the relations of achievement goals, achievement values and ability beliefs. Briefly, drawing on the self-concept work of Markus and Nurius (1986) and Markus & Wurf, (1987), Garcia and Pintrich (1994) posit a model of achievement motivation comprising knowledge of and beliefs about the task and self and include temporal (experiences are conceptualized in terms of past, present, and future [possible] selves), efficacy, and value dimensions. Self-schemas are understood as self-conceptions of self in different situations such as on the playing field or at school (Garcia & Pintrich, 1994). Self-schemas are the "cognitive manifestation of enduring goals, aspirations, motives, fears and threats" (Markus & Nurius, 1986). They include cognitions and affective evaluations of agency, volition, and ability (Garcia & Pintrich, 1994; Markus & Nurius, 1986; Markus & Wurf, 1987).

RESEARCH QUESTIONS ADDRESSED IN THE PRESENT RESEARCH

The primary concern of my research is to contribute to an understanding of Navajo high school students' school achievement motivation. In Table 3.1 I present a summary of the constructs described in this chapter followed by an outline of the relationships of these constructs. This chapter, and the preceding chapter, brings me to the research questions addressed in the present research.

The substantive questions in this research are:

1. Whether a model of school achievement motivation, drawn from Western concepts of achievement motivation, describe the achievement motivation characteristics of Navajo high school students.

2. Whether a model of school achievement motivation, drawn from Western concepts of achievement motivation, describes non-traditional and female and near traditional and male Navajo high school students equally well.

3. To understand better the relations of the socio-cultural variables on students' school achievement goals (mastery, approach, and avoidance) I examine, as intervening factors, the mediation effects of the school measures of achievement, achievement values, ability beliefs, and social goals.

4. To understand better the relations of school measures of achievement (i.e. students' prior experiences and achievement; e.g. Dweck & Leggett, 1988; Schunk, 1994) on their school achievement goals, I examine, as intervening factors, the mediation effects of achievement values, ability beliefs, and social goals.

5. To understand better the relations of students' achievement values and ability beliefs on their school achievement goals, I examine, as intervening factors, the mediation effects of their social goals.

TABLE 3.1. DIMENSIONS DESCRIBED IN THIS CHAPTER FOLLOWED BY A BRIEF DESCRIPTION OF THE HYPOTHESIZED RELATIONSHIPS.

Socio-cultural variables	School Measures of Achievement	Characteristics Brought to School	Characteristics Influenced by School	
			Social Goals	School Achievement Goals
Language spoken at home (Navajo & English) Living location (Town and Rural) Gender	Attendance GPA	Personal value of school Utility value of school Sure ability beliefs Unsure ability beliefs	Social approval Social concern	Mastery goal Performance approach goal Performance avoidance goal
Associated with these variables are social and cultural factors believed to influence Navajo high school students' achievement and hence school achievement goals (James, Chavez, Beauvais, Edwards, & Oetting, 1995; Vadas, 1995).	Experience and prior achievement are hypothesized to be related to ability beliefs (Dweck & Leggett, 1988; Schunk, 1994) School measures of achievement (target goals) are hypothesized to be related to achievement values (Wigfield & Eccles, 2000) and are hypothesized to influence ability beliefs as such as expectancy of success (Wigfield & Eccles, 2000).	Achievement values are hypothesized to be related to school achievement goals (Wigfield, 1994). Ability beliefs are believed to be more stable than achievement goals & are attitudes brought to school (Pintrich, Marx, & Boyle, 1993). Hypothesized to be related to school achievement goals (Urdan, 1997).	Hypothesized to be related to school achievement goals and to indirectly effect school achievement (Anderman & Anderman, 1999).	Hypothesized to influence school achievement (Anderman & Anderman, 1999; Ames & Archer, 1988).

SUMMARY

I began with an overview of achievement motivation theory particularly as it relates to the present research. In that overview I pointed out that following the establishment an invariant model of school achievement motivation, I would examine the relationships of achievement motivation constructs. In this respect, I followed the recommendations of Pintrich (2000). I understood Pintrich (2000) to view achievement motivation as interrelations between the individuals stable characteristics and perceptions of the school environment. I point out that the method I adopt to examine the relations of motivation constructs is influenced by Pintrich (2000) advocacy to examine the moderating and mediating effects of the relations of constructs. In the present research, I examine the mediating effects.

I followed this overview of achievement motivation theory with a review of the literature concerning achievement goal theory emphasizing mastery, performance approach, performance avoidance, school measures of achievement and social goals. This was followed by a review of the literature concerning students' school achievement values and school ability beliefs. I also pointed out that, all these constructs had not before been brought together in a single coherent model to describe achievement motivation. Further, this was particularly to for Navajo high school students. Throughout the literature review, I linked key constructs with important aspects concerning the Navajo education.

I presented important outstanding questions identified in the literature concerning achievement goal theory. Perhaps the most important of these were: 1) Questions concerning the three achievement goals that have been shown to be both positively and negatively correlated as well as un-correlated (Pintrich, 2000). 2) The concept that students' social goals may have indirect effects on student school achievement mediated by students' achievement goals (Anderman & Anderman, 1999). I examine this aspect in the present research in terms of social goals direct effects on students' achievement goals. 3) The relations of students ability beliefs with students achievement goals. In the present research, I link the concept of stereotype threat (Steele & Aronson, 1995) with the concept of students being unsure about their school abilities. That is I introduce the concept of unsure ability beliefs.

CHAPTER 4

METHODOLOGY

INTRODUCTION

In this chapter I describe the methods and statistical strategy used in the present research. I begin by describing the participants and relevant demographics. I follow this with a brief description of the research model I use and finally I present the statistical strategy I employ.

METHOD

PARTICIPANTS

Students from Kayenta High School (n=300) and Window Rock High School (n=529) participated in the survey. All students in years 9, 10, 11, and 12 participated in the data collection (year 9, n=303; year 10, n= 187; year 11, n = 164 year 12, n=160; and, missing n = 16). Four hundred and sixty nine students reported that they were domiciled in a town (urban) and 329 that they were domiciled in rural areas (remote) in the Navajo Nation. The distribution of town-domiciled and rural-domiciled students for Window Rock was 348 and 171 respectively while for Kayenta the distribution was 121 and 158 respectively. Five hundred and fifty seven students described themselves as speaking English at home and 243 described themselves as speaking Navajo at home. The following tables describe the distribution of females and males by school year (Table 4.1), the distribution of females and males by where domiciled (town or rural) and by language spoken at home within town or rural domiciled (Table 4.2). The data in Table 4.2 suggest, first that English is the predominant language spoken at home for both locations and second that English is more predominant in towns (74%) compared to rural areas (60%). While females and males living in towns are approximately the same in terms of English being predominant (71% and 76% respectively) they appear to differ for the rural areas with more females speaking Navajo at home than males (65% and 56% respectively).

BACKGROUND INFORMATION

Students from two high schools located at Kayenta and Window Rock, Navajo Nation, Arizona participated in the study. Both schools generally follow mainstream state prescribed curriculum. In a bid to strengthen cultural identity among Navajo children, both schools have recently introduced Navajo language classes.

Kayenta is in the relatively remote north of the State where there is little industry. The major industries in the area are coal mining at Black Mesa, tourism, and farming. There is high unemployment in the area, few job prospects, and it is remote from major centers of population and industry. Such circumstances mean that graduate students seeking work need to consider relocation in order to be closer to employment centers. Kayenta is considered the more traditional of the two locations (conversations with the Kayenta High School site council in April 1998 and, the Window Rock senior student counselor, (James Arviso) January 1999). It is common to hear Navajo spoken in school meeting areas (cafeteria) and school corridors at Kayenta (see heading Language below).

TABLE 4.1 SEX BY SCHOOL YEAR

Sex	Year 9	Year 10	Year 11	Year 12	Total
Male	132	92	80	87	391
Female	170	95	84	73	422
Totals (Missing=16)	**302**	**187**	**164**	**160**	**813**

TABLE 4.2 SEX BY WHERE DOMICILED BY LANGUAGE SPOKEN AT HOME

	Town (n = 469)		Rural (n=329)		Missing = 31
Sex	**Navajo**	**English**	**Navajo**	**English**	**Totals**
Male	49	162	67	87	365
Female	69	172	58	107	406
Totals (Missing=58)	**118**	**334**	**125**	**194**	**771**

Window Rock is about an hour's drive across the State border (Arizona/New Mexico) from Gallup (New Mexico). Gallup is a major center for American Indian artifacts; it has significant mining and tourist industries and it is well serviced by rail. Window Rock is the center of Government for the Navajo Nation. Thus, for graduate students there are more job opportunities at Window Rock and Gallup than at Kayenta. Although there is high unemployment at both locations it appears from the student reports that more parents are employed in professional and skilled occupations at Window Rock than at Kayenta (see Table 4.3). This seems consistent with the employment opportunities in the area. Further relevant background information is provided in Appendix A. The information contained in Appendix A was obtained from the Navajo Nation web site, www.navajo land.com

LANGUAGE.

The Navajo Nation has its own radio station. The station provides news broadcasts, weather information and entertainment. Consistent with many popular radio stations much of its broadcast time is devoted to music. However, a very important feature of the radio station is that announcers generally broadcast in Navajo and interviews with prominent locals are often conducted in the Navajo language.

In addition, at Kayenta High School it is common to hear Navajo spoken in the corridors and common meeting places (e.g. administration area, cafeteria, and corridors). Navajo speaking seems to be far more prominent at Kayenta High School than at Window Rock High School. In addition, at Kayenta some school functions, such as plays, one of which I was fortunate enough to attend, are conducted in Navajo.

EDUCATION AND OCCUPATIONS OF PARENTS.

Students were asked to indicate the type of employment and education qualifications of their mothers and fathers. The employment classifications are according to a schedule developed by McInerney (1988) subsequently supplemented and updated on advice given by the Director of the Center for Indian Education at Arizona State University. Table 4.3 presents a cross tabulation of occupation by education for mothers and fathers in each location (town and rural). These cross tabulations suggest that there are more college educated mothers living in town than in rural areas (44% versus 34% respectively) and that there are more employed mothers living in town areas than in rural areas (54% versus 37% respectively). The cross tabulations also suggest that there are more college educated fathers living in town than in rural areas (43% versus 30%), more fathers living in town completed high school than fathers living in rural areas (21% versus 11%). Although there are fewer employed fathers living in town than in rural areas (65% versus 70%) this difference does not seem to be of practical significance. Table 4.4 presents cross tabulations of parental occupation and education by school location. These cross tabulations suggest similar numbers of college-educated mothers and fathers from both locations. The cross tabulations concerning employment suggest that employment for mothers in both locations is similar (48% in Kayenta and 54% in Window Rock). However, there appears a greater difference in employment for fathers with 64% employed in Kayenta and 46% employed in Window Rock.

WITH WHOM DOMICILED.

For Kayenta, students reported that 67% lived with their mother and father, 20% with their mother only, 6% with their father only, and 7% with relatives. For Window Rock students reported that 56% lived with their mother and father, 29% with their mother only, 7% with their father only, and 7% with relatives.

ADMINISTRATION

Parental authorizations were gained before administering the survey and students were informed that the survey was voluntary. In general, the response rate was excellent and the students' approach was enthusiastic.

The data used in this research were selected from data collected by Professor Dennis McInerney as part of a funded large-scale research project. Professor McInerney trained teachers in the administration of the surveys. The teachers then administered the surveys during scheduled English classes. Each survey session began with a standard explanation of the purpose of the survey and a request for the support from the students in completing the survey accurately. Students then responded to the items. The survey took approximately 50 minutes to complete.

On completion of the survey, the forms were checked for accuracy and completion immediately following administration. Details of absences and GPA were compiled and entered onto the survey form at the end of the survey session.

INSTRUMENTATION

The following presents information about the source of the items and scales selected for the model of school achievement motivation used in the present research.

INVENTORY OF SCHOOL MOTIVATION (ISM).

The ISM was developed by McInerney (1988) and McInerney and Sinclair (1992) and subsequently validated by McInerney and Swisher (1995) and again by McInerney, Roche, McInerney, and Marsh (1997). The instrument was developed to reflect the dimensions hypothesized by Maehr's personal investment (or motivation) theory (Maehr, 1984; Maehr & Braskamp, 1986) in a school context. All the items use a 5-point Likert-type rating scale (1=strongly agree to 5=strongly disagree). For the purpose of statistical analyses these scales were reverse coded. For the present research, relevant items only are selected.

I drew thirty seven items from the ISM. These items operationalize the constructs relevant to the present research and defined in Chapter 3. In the statistical analysis section that follows, I describe the procedures adopted to test for the internal consistency and unidimensionality of the scales. I present examples of the items used in the constructs in Table 4.5. Appendix B presents the full list of items used in the present research.

TABLE 4.3 PARENTS EDUCATION BY OCCUPATION WITHIN LIVING IN TOWN OR RURAL LOCATIONS

				Education Level			
Location	**Parent**	**Occupation**	**None or N/A**	**Did not Complete HS**	**Completed HS**	**Attended College**	**Row Total**
Town	**Mothers**	Professional	1	3	12	62	78 (17.4%)
		Clerical/Sales	2	6	33	53	94 (20.9%)
		Skilled	3	4	18	19	44 (9.8%)
		Semi-skilled	1	3	10	4	18 (4.0%)
		Unskilled	-	5	8	6	19 (4.2%)
		Unemployed-N/A	26	47	70	53	196(43.7%)
Column	**Total**		33 (7.3%)	68 (15.1%)	151 (33.6%)	197 (43.9%)	449(100%) **Missing =20**
	Fathers	Professional	-	2	12	50	64 (14.5%)
		Clerical/Sales	1	-	9	19	29 (6.6%)
		Skilled	6	16	44	46	112(25.3%)
		Semi-skilled	2	5	22	12	41 (9.3%)
		Unskilled	4	7	17	12	40 (9.0%)
		Unemployed-N/A	35	18	54	49	156(35.3%)
Column	**Total**		48 (10.9%)	48 (10.9%)	158 (35.7%)	188 (42.5%)	442(100%) **Missing = 27**

Location	Parent	Occupation	None or N/A	Education Level: Did not Complete HS	Completed HS	Attended College	Row Total
Rural	**Mothers**	Professional	-	1	11	22	34 (11.1%)
		Clerical/Sales	2	4	14	20	40 (13%)
		Skilled	2	4	10	6	22 (7.2%)
		Semi-skilled	-	4	9	13	26 (8.5%)
		Unskilled	-	6	11	5	22 (7.2%)
		Unemployed-N/A	17	44	63	39	163(63.1%)
		Column Total	21 (6.8%)	63 (20.5%)	118 (38.4%)	105 (34.2%)	307(100%) **Missing = 22**
	Fathers	Professional	1	3	7	31	42 (13.8%)
		Clerical/Sales	1	3	7	7	18 (5.9%)
		Skilled	3	17	25	17	62 (20.3%)
		Semi-skilled	2	12	37	17	68 (22.3%)
		Unskilled	2	13	14	1	30 (9.8%)
		Unemployed-N/A	13	16	37	19	85 (27.9%)
Column	**Total**		22 (7.2%)	64 (21%)	127 (41.6%)	92 (30.2%)	305(100%) **Missing = 24**

TABLE 4.4 PARENTAL OCCUPATION AND EDUCATION BY SCHOOL LOCATION

				Education Level			
Location	**Parent**	**Occupation**	**None or N/A**	**Did not complete HS**	**Completed HS**	**Attended College**	**Row Total**
Kayenta	**Mothers**	Professional			8	24	32 (13%)
		Clerical/Sales		1	2	6	9 (4%)
		Skilled		2	5	10	17 (7%)
		Semi-skilled		4	15	18	37 (15%)
		Unskilled		7	12	8	27 (11%)
		Unemployed-N/A	10	41	54	25	130(52%)
Column	**Total**		10 (4%)	55 (22%)	96 (38%)	91 (36%)	252(100%) **Missing =48**
	Fathers	Professional		3	7	19	29 (12%)
		Clerical/Sales			3	4	7 (3%)
		Skilled	1	9	14	16	40 (16%)
		Semi-skilled	4	15	59	29	107(44%)
		Unskilled	1		4	1	6 (2%)
		Unemployed-N/A	2	12	27	15	56 (23%)
Column	**Total**		8 (3%)	39 (16%)	114 (47%)	84 (34%)	245(100%) **Missing =55**

Location	Parent	Occupation	None or N/A	Education Level: Did not complete HS	Completed HS	Attended College	Row Total
Window	**Mothers**	Professional	1	4	15	61	81 (15%)
		Clerical/Sales	3	5	34	48	90 (17%)
		Special in Posn.	1	4	12	19	36 (7%)
		Skilled	6	6	24	17	53 (10%)
		Semi-skilled	1	3	7		11 (2%)
		Unskilled		4	8	3	15 (3%)
		Unemployed-N/A	35	57	83	67	243(46%)
Column	**Total**		47 (9%)	84 (16%)	183 (35%)	215 (40%)	529(100%)
Window	**Fathers**	Professional	1	2	12	63	78 (15%)
		Clerical/Sales	1	1	4	6	12 (2%)
		Special in Posn.	1	2	9	16	28 (5%)
		Skilled	9	26	58	50	143(27%)
		Semi-skilled		4	4	1	9 (2%)
		Unskilled	5	21	27	12	65 (12%)
		Unemployed-N/A	47	26	67	53	192(36%)
Column	**Total**		64 (12%)	82 (16%)	181 (34%)	201 (38%)	528(100%) **Missing = 1**

TABLE 4.5. EXAMPLES OF THE 37 ITEMS USED IN THE PRESENT RESEARCH.

MASTERY (MASTERY) SCALE (4 ITEMS).

B33 I like to see that I am improving in my schoolwork.
B40 I work hard to try to understand something new at school.

PERFORMANCE APPROACH (APPROACH) SCALE (4 ITEMS).

B1 I want to be better at class work than my classmates.
B2 Winning is important to me.

PERFORMANCE AVOIDANCE (AVOIDANCE) SCALE (3 ITEMS).

B80 Trying hard at school is not much fun if the competition is too strong.
B95 I only like to do things at school that I am confident at.

SOCIAL APPROVAL (APPROVAL) SCALE (5 ITEMS).

B17 Praise from my teachers for my schoolwork is important to me.
B23 Praise from my friends for my schoolwork is important to me.

SOCIAL CONCERN (CONCERN) SCALE (5 ITEMS).

B10 It is very important for students to help each other at school.
B21 I like to help other students do well at school.

PERSONAL VALUE OF SCHOOL (PERSVAL; 4 ITEMS).

A33 I am the kind of person who would complete high school.
A34 I personally feel that I should complete high school.

UTILITY VALUE OF SCHOOL (UTILITY; 4 ITEMS).

B22 I want to do well at school so that I can have a good future.
B38 I aim my schooling towards getting a good job.

ABILITY BELIEF SCALES.

SURE ABILITY BELIEFS (SURE) SCALE (4 ITEMS).

B75 I am very confident at school
B69 Generally I am pleased with myself at school.

UNSURE ABILITY BELIEFS (UNSURE) SCALE (5 ITEMS).

B45 At times I feel that I am not good at anything at school.
B81 I often worry that I am not very good at school.

SCHOOL MEASURES OF ACHIEVEMENT.

GPA: The schools supplied these data.
Absence: The schools supplied these data.

Note: The data concerning absences and GPA are treated as interval data.

DUMMY CODING

The socio-cultural variables were dummy coded zero and one (Pedhazur, 1997). Language was coded, Navajo speakers = 0, and English speakers = 1. Location was coded, town = 0, rural = 1. Gender was coded male = 0, female = 1.

A RESEARCH MODEL

The research model adopted in the present research is an integrative model (Bong, 1996, Pintrich, 2000). That is, it draws together from different theoretical perspectives of achievement motivation key constructs found in the literature. For example, the self-efficacy construct has been shown as related to the expectancy-value theory's constructs of importance (personal value) and utility (Eccles & Wigfield, 1995) and self-efficacy has been shown to be related to achievement goals (Middleton, Kaplan, & Midgley, 1998). Yet as Bong (1996) has advocated, there have been few attempts to bring together in a single coherent model the key constructs identified in the present research. In this research, I also systematically examine the relations of these constructs (e.g. Pintrich, 2000).

From a review of the literature, it seems that the present research is unique in that:

1. It draws together into single coherent model these particular achievement motivation constructs (e.g. Bong, 1996)

2. It examines the role of culture on Navajo high school students' achievement motivation by contrasting an invariant and a socio-cultural model of achievement motivation (e.g. Deyhle, 1995).

3. It systematically examines the socio-cultural variables effects on Navajo high school student' achievement motivation mediated by intervening factors (e.g. school achievement values).

This attempt to weld the identified constructs into a coherent model of school achievement motivation is theoretically important. A review of the literature will often reveal, as was the case in the present research, findings regarding the relations of constructs that are limited in their scope; first, by the requirement of science to incrementally and painstakingly examine issues and replicate findings; second, by limitations imposed on the length of articles by journal editors. It is not the purpose of the present research to explore these issues in detail, rather, simply to draw attention to them. The literature contains many articles regarding these issues should the reader be interested in exploring them further. However, these constraints may mean that the full implications of the published research are

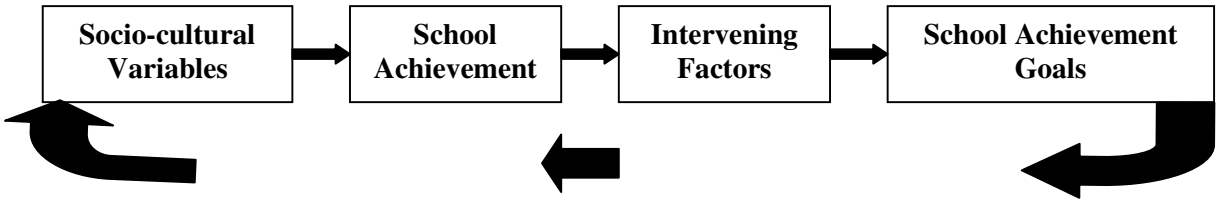
not made apparent. I personally experienced these limitations in developing the model used in the present research. During the model construction stage, I naively constructed three separate and independent models each representing the main aspects of the present research (e.g. achievement values and achievement goals). I proceeded to present the results and draw conclusions based on these results. However, when I compared these solutions with the solution of the integrated model I detected important differences between the solutions. The interesting and important point of this approach was that some of the relations of factors in the independent models contradicted the relations of factors in the integrated model. Put another way, by simultaneously accounting for all the factors in the model, I obtained different results than those obtained in the independent models. However, there are practical limitations to the implied method proposed in the preceding. Clearly, it is impossible to include all the variables believed related to a particular phenomenon. However, the preceding does support the contention advocated by Bong (1996) that, driven by theory, key variables should be included in a model to describe or explain a particular phenomenon.

Achievement motivation theory and research tends to emphasize students' achievement goals (mastery and performance approach and performance avoidance) as related to learning (Ames, 1992a; 1992b; Urdan, 1997). To this has been added the question of the role of social goals and their relations with mastery and performance goals (Anderman & Anderman, 1999). That is, Anderman and Anderman (1999) posit achievement goals as mediators of the effects of social goals on students' school achievement. There seems to be little research conducted with this aspect of theory. Second, other theorists, drawing on expectancy-value theory and research have posited that the values brought to school by students may moderate or mediate the goals students adopt and subsequently their school achievement (Garcia and Pintrich, 1994; Pintrich, Marx, and Boyle, 1993). In the present research the question of the effects of mediating variables is addressed. Third, some theorists and researchers have looked at the relations of students' ability beliefs and their achievement goals (Middleton, et al, 1998). This aspect of the relations of students' ability beliefs for their achievement goals is also examined in the present research. For the present research this hypothesized multidimensional model of school achievement motivation seems best encapsulated by self-schema theory (Garcia and Pintrich, 1994; Markus & Wurf, 1987).

To examine the interrelations of dimensions it is necessary to hypothesize the causal relations of dimensions. I have done this in Chapter 3 suggesting a cyclical process for school achievement motivation. That is, I hypothesize that for Navajo high school students the relationship of socio-cultural background variables with their school achievement motivation can be understood in terms of their prior achievement and the relations of this with their achievement values, ability beliefs and social goals. In turn, the affects of this process are

subsequently realized on school achievement. Figure 4.1 diagrammatically presents this concept.

FIGURE 4.1 HYPOTHESIZED PATH MODEL USED IN THIS RESEARCH



At another level, underlying the hypothesized model is the influence of Maehr's (1984) and Maehr & Braskamp (1986) personal investment model which posits three global variables: perceived goals of behavior, beliefs about self, and action possibilities. According to Maehr (1984) perceived goals of behavior are held to be universal. These, it is believed, influence the attitudes toward success or failure students adopt when faced with academic tasks. In the present research, perceived goals of behavior are operationalized as mastery, performance and social goals. These goals are specifically defined in Chapter 3. Beliefs about self in the present research I partitioned into beliefs about one's capabilities in terms of negative and positive ability beliefs. Beliefs about self I operationalized as separate factors of sure ability beliefs and unsure ability beliefs and these I also defined in Chapter 3. Finally, action possibilities refer to the behavioral alternatives the individual perceives to be available and which are perceived to be appropriate to the situation (see McInerney, Roche, McInerney, & Marsh, 1997). Action possibilities are operationalized as achievement values in terms of the personal value (importance) of school to one's self and the utility value of school to one's purpose. These I also define in Chapter 3.

STATISTICAL ANALYSIS

Below I describe the statistical strategy used in the analyses of the data. The statistical packages I use are SPSS V6.3 (Norusis/SPSS Inc., 1993) to compile the descriptive statistics and standardize the data. I base the statistical inferences on Structural Equation Modeling (SEM) methodology throughout the present research. LISREL 8.3 (Jöreskog, K. & Sörbom, D. 1996a) and Prelis 2.3 (Jöreskog, K. & Sörbom, D. 1996b) statistical package is used for this purpose.

A BRIEF INTRODUCTION TO STRUCTURAL EQUATION MODELING (SEM)

SEM is a comprehensive statistical approach for testing hypotheses about the relations among observed and latent variables (Hoyle, 1995). Like correlation, multiple regression, and ANOVA,

SEM is based on linear statistical models with the former being special instances of the general structural equation model. However, Hoyle (1995) proposed that SEM enjoys at least two advantages over the other linear statistical models. First, unlike ANOVA and multiple regression analyses, SEM offers no default model specification requiring instead that the researcher specify relations in the model. This characteristic is believed to be an advantage because it requires the researcher to think carefully about their data and venture hypotheses about each variable. Second, Hoyle (1995) proposes that the most compelling advantage of SEM is its characteristic to estimate and test relations between latent variables. To paraphrase Hoyle (1995), this is because of the increased probability of detecting associations between constructs and obtaining parameter estimates close to their population values through isolating constructs from the uniqueness and unreliability of their indicators. These SEM characteristics meet the need of the present research to address empirical questions about the nature of the relationship of variables and factors that best describe school achievement motivation among Navajo high school students. Another reason for using SEM is that I wish to contrast the achievement motivation characteristics of near traditional Navajo students with those of non-traditional Navajo students. SEM offers a powerful capability for contrasting two or more groups of data where parallel data exists (Marsh 1993, 1994). A further reason for choosing SEM methodology is to examine the indirect effects of the socio-cultural variables on students' school achievement motivation. Mediators have the effect of transforming the socio-cultural variables used the present research in some way (Baron & Kenny, 1986). It is believed that understanding these mediating effects will enhance our understanding of school achievement motivation among Navajo high school students. Another influence in the choice of SEM is to demonstrate its usefulness for analyses where cultural factors are an issue (e.g. Pavel & Padilla, 1993; van de Vijver & Leung, 2000).

THE STATISTICAL STRATEGY USED IN THE PRESENT RESEARCH

The strategy employed in the present research consists of three major parts. The first part is concerned with the measurement model and this has two aspects. The first aspect focuses on the psychometric properties of the scales used in the present research. In this aspect I make use of estimates of internal consistency (Cronbach's Alpha) and one-factor Confirmatory Factor Analysis (CFA). The focus of the second aspect is the extent to which the socio-cultural variables, intervening factors and achievement goal factors comprise a single model. The method employed for this aspect is again a CFA.

The second major part concerns the primary issue of whether there are substantive differences in school achievement motivation between non-traditional and near traditional Navajo high school students. That is, I test for the structural invariance of the model of

school achievement independently for each of the socio-cultural variables. Coincidentally this aspect also adds weight to structural validity of the model.

The third part of the analysis concerns the mediating effects of the intervening factors for the relations of the socio-cultural variables on students' achievement goals. For this part of the present research I extend the use of the SEM capabilities and construct a path model to examine the structural relations of the variables and factors according to theory as outlined earlier. Unlike the results of the first two parts which I present in Chapter 5, the results for this part of the research I present in Chapters 6, 7 and 8. In the following, I summarize the strategy used.

ANALYSES CONDUCTED IN THE PRESENT RESEARCH

CFA one-factor models of each scale with particular emphasis on face validity, goodness of fit and unidimensionality are conducted. In all, nine scales, using 37 items that comprise the latent factors, are subjected to this process.

A CFA with an emphasis on goodness of fit is used to examine the goodness of fit of an 11-factor and a 14-factor model of school achievement motivation to the data. In addition to the nine scales associated with the latent factors, five additional variables are included in the model. These variables are the two school measures of achievement (attendance records, GPA) and the three socio-cultural variables (gender, language spoken at home and living location). The socio-cultural variables are dichotomous variables. The results of these tests then provide an acceptable model with which to advance the analyses through tests of invariance for each of the socio-cultural variables.

To address the primary research question an invariant model of school achievement motivation assumes that the measurement model is equally structurally valid for the three socio-cultural variables at least in terms of factor loadings and factors correlations. Multi-group CFA's are conducted for the cohorts of gender, language spoken at home, and location with an emphasis on factor loadings and factor correlations across the groups of each socio-cultural variable. The solutions to these CFA's enable me to proceed with the path analysis comprising all participants as a single cohort. Non-invariance of either factor loadings or factor correlations would mean that I would need to proceed with the path analysis using separate models for the groups contained in the non-invariant socio-cultural variable (e.g. male & female).

Finally, using SEM, a path model is used to address the substantive research questions concerning the indirect effects of factors. The emphasis in this part of the research is the

mediating effects of intervening factors. The results of this analysis are presented in each of the relevant chapters (i.e. 6, 7 & 8).

A BRIEF CFA ORIENTATION USING SEM.

According to Byrne (1998), in conducting CFA's the researcher draws on knowledge of the theoretical structure of the variables, proposes a priori a factor structure, and then statistically tests this hypothesized factor structure. In the present study it was hypothesized that (a) each measured variable would have a non-zero loading on the factor it was designed to measure and a zero loading on all other factors and (b) that the error terms (referred to as uniqueness) for each measured variable would be uncorrelated (unless stated otherwise). In addition, Byrne (1998) points out that an acceptable fit of the model to the data does not contain any negative variances, or completely standardized factors loadings, or factor correlations greater than one.

The latest release of LISREL 8.3 offers researchers a plethora of different fit indices to determine the best model fit. There is no consensus among researchers as to which of the fit indices is best for this purpose (Marsh, Balla, and Hau, 1996). However, it seems that the family of incremental fit indices is one of the most popular (Marsh, et al, 1996; Hu & Bentler, 1995). Incremental fit indices suggest the degree of improvement in model fit by comparing the researchers' model to a nested baseline model (Hu & Bentler, 1995). Typically, the baseline model is a null model in which all the observed variables are uncorrelated (Bentler & Bonett, 1980). Following Marsh, et al (1996) in this research two qualitatively different but complementary incremental fit indices, the non-normed fit index (NNFI: also known as the Tucker Lewis Index) and the normed relative comparative fit index (CFI: the normed version of the RNI), are used to assist in determining model fit. In general, the arbitrary and commonly accepted application of the .9 rule is applied with these indices to determine an acceptable fit for a model. The primary distinction between these two fit indices is that the NNFI penalizes model complexity, as in the case of estimating additional parameters, and rewards model parsimony, as in the case of invariance testing across multiple groups (Marsh et al, 1996). Each of these fit indices also has the advantage that they are not biased by sample size (Marsh et al, 1996). The Residual Mean Error of Approximation (RMSEA) is also used in assessing model fit in the present research. The RMSEA is a parsimonious measure of the discrepancy of model fit. That is, a measure of the extent to which the model can be generalized to the population. As a measure of close fit, Steiger (1989) and Browne and Mels (1990) recommend that an RMSEA value of less than 0.05 indicate a close fit. Values in the range of 0.05 and 0.08 indicate medium fit and McCullum, Browne, and Sugawara (1996) suggest that values in the range of 0.08 and 0.1 indicate mediocre fit. For a more detailed discussion regarding the RMSEA the reader is referred to

McCullum, et al, (1996). I also present the $\chi 2$ test statistic. I refer the reader to McCullum, et al (1996), Marsh, et al (1996), Hu & Bentler (1995), and Jöreskog and Sörbom (1996a) for detailed discussion regarding the fit indices used in my research. In the present research, I emphasize the NNFI fit index. I must point out that while statistical results such as described above aid in the acceptance of a model, ultimately there is a degree of subjectivity and professional judgement in balancing the statistical and practical significance involved in selecting the "best" model (Marsh, Hau, Balla, & Grayson, 1998).

The scales used in the present research are five point Likert-type scales. Jöreskog and Sörbom (1996a) recommend that given a large enough sample size that for the purposes of estimation one should use the asymptotic covariance matrix. However, they also go on to point out that it is inadvisable to use this covariance matrix with sample sizes that are too small. They add the cautionary note that to do so may cause more harm than good (see also, Yaun & Bentler, 1999) in which case the safest method is to use Maximum Likelihood (ML) estimation methods. In the present research, because multi-group analyses are conducted the consequent small sample sizes suggested the risk of more harm than good. Thus, I use the ML method of estimation throughout the present research. I also standardize the data using SPSS 6.1.

PSYCHOMETRIC PROPERTIES: CONSTRUCT VALIDITY OF THE MOTIVATIONAL SCALES

SCALE VALIDATION AND RELIABILITY.

Unidimensionality of items for latent factors is established through a combination of measures comprising CFA's, goodness of fit indices, the structural relations (factor loadings, inter-item correlations and uniquenesses) of items for the latent variable, face validity of the item for the factor, the researcher's alertness to the many possible underlying meanings and interpretations that may be attributed to the items, and plain common sense. To evaluate the structural relations of items, I adopted a one-factor congeneric strategy. For the present research, in SEM terms this methodology is a model generating strategy (Jöreskog & Sörbom, 1993) insofar as the fit indices resulting from different models containing modifications are compared. Modifications to the model are made on substantive grounds (i.e. correlated uniquenesses).

The procedure adopted is to examine Cronbach's Alpha to determine the internal consistency of the items for the factor of interest. I follow this with the conduct of one-factor congeneric CFA's.

Correlated uniqueness, the term used in the present research for freeing the residual variance (error) of two or more items to correlate, are permitted only on a priori grounds (e.g.

Marsh, 1989b; Marsh & Grayson, 1995). The a priori grounds for these correlated uniqueness in each case is method effect inasmuch as the stem of the items are the same. Three correlated uniquenesses are permitted on these grounds in the present research. These are presented in Chapter 5.

FACTORIAL VALIDITY OF SCORES FOR THE MEASUREMENT MODEL.

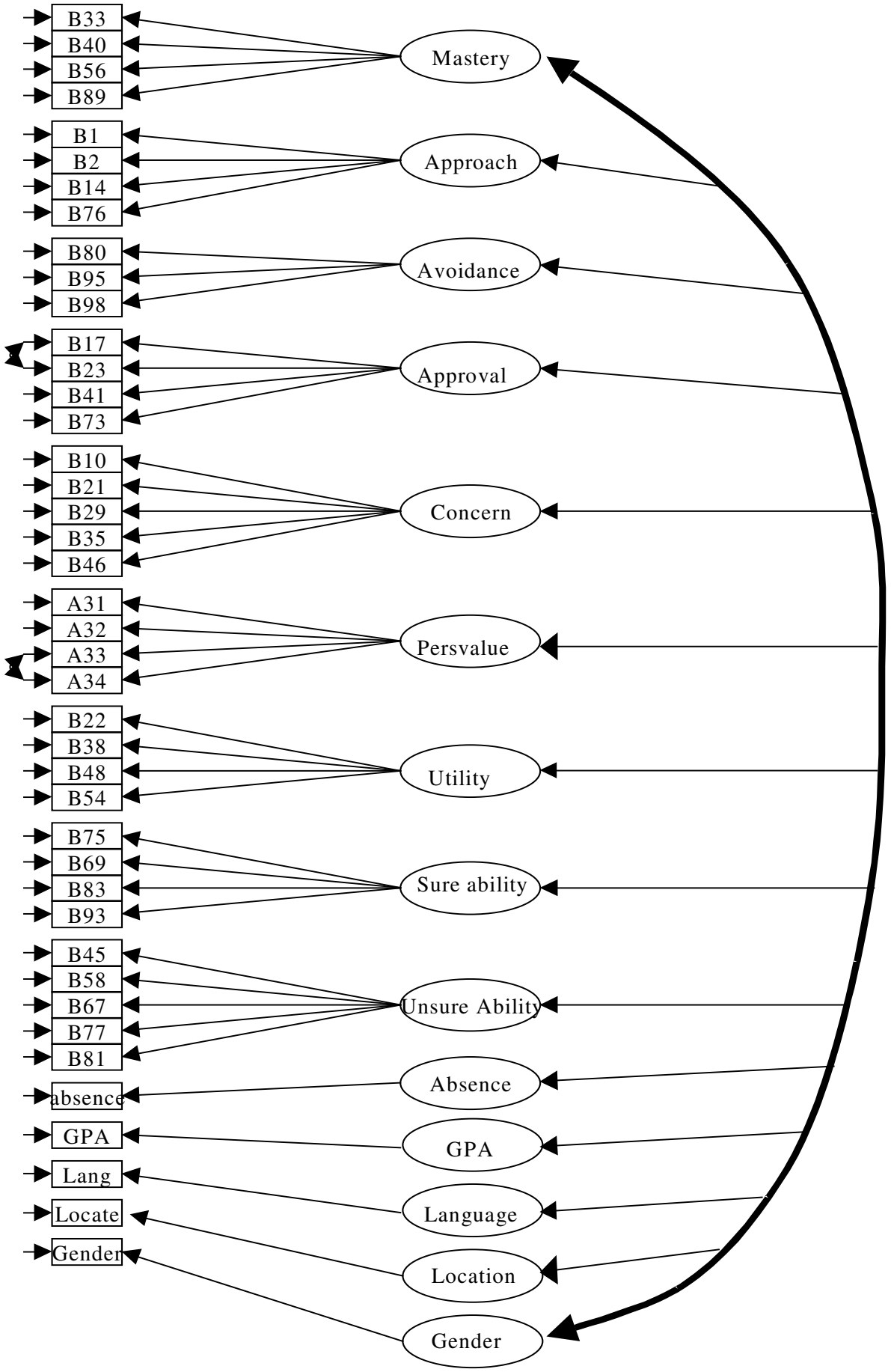
The fact of establishing the internal consistency and validity of the scales enables me to move to the next step and test for the factorial validity of the model as a whole. In this part of the present research the concern is how well the scales fit together in a model of school achievement motivation. As I wish to consider, at a later stage, the relations of all the variables and factors in a single model I examined two measurement models. The first of these comprised the nine motivational scales and the two school achievement measures (an 11-factor model). The second model constructed added the three socio-cultural variables to the 11-factor model. The results of these evaluations generally establish the structural validity and relevance of the model for the participating Navajo high school students. The criteria for the acceptance of the model as proper and its fit to the data I have outlined already.

THE HYPOTHESIZED 14-FACTOR MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

Figure 4.2 presents a diagram of the 14-factor model of school achievement motivation. In the present research, I hypothesize that school achievement motivation is a 14-factor structure. In the diagram presented in Figure 4.2 a circle represents each of the 14 factors in the model of school achievement motivation. Each factor in the model is correlated with all other factors in the model. This correlation is depicted by the embolden semi-circle with finer lines to each of the circles representing factors. This is not the traditional way of representing the correlations among factors. However, to represent the correlations in the traditional manner left the diagram too cluttered. Instead, I opted to represent the correlations among the factors in the manner described (see Marsh, 1996 for a similar presentation of correlations). There are 37 observed variables. Each of these is represented by a small rectangle and is individually labeled. I have also grouped the items according to the factor they are meant to load onto. Arrows pointing from the factor to the observed variables represent the factor loadings belonging to that factor. Finally, there are the measurement errors, or residuals, associated with each observed variable. These are represented with small arrows pointing to the observed variables. Note though that unlike the factor loading arrows, they are not related to a particular factor. Correlated uniquenesses are represented by line with a double arrow joining two (or more) residuals. In the present hypothesized model of school achievement motivation I have three correlated uniquenesses. These are between the observed variables B17 and B23, between A33 and A34, and between B38 and B48. Only

the first two of these correlated uniquenesses are depicted in Figure 4.2 as the correlated uniqueness between B38 and B48 is not apparent until later in the analyses.

FIGURE 4.2. HYPOTHESIZED 14-FACTOR MODEL



MASTERY AND UTILITY; SURE AND UNSURE: ONE OR TWO FACTORS

In Chapter 3, I raised the issue concerning the relationship of the achievement goal, mastery and the school achievement value, utility. In the present research it is clear from the wording of the items of these two factors that they share the notion of purpose. It is equally clear that the purpose of each differs with mastery being concerned with improvement while the purpose for utility is material. That is, both factors are conceptually distinct. However, Wigfield (1994) was concerned that the underlying meaning of both constructs may be similar. I take it that he means something along the lines that improvement in school and purpose are, if not conceptually, then empirically synonymous. In any event, the question arises whether the constructs are empirically distinct. That is if one factor can substitute for another then there is little point of two factors.

MASTERY AND UTILITY.

To evaluate the question I adopted a variation on the method proposed by Marsh, (1996). In the first instance, the size of the correlation between the two factors is an indication of whether one ought to be concerned. Logically, Marsh (1996) argued that the nearer the correlation approached zero the less likely the need for concern. Conversely, the more the correlation approached one, the more likely that the factors are not empirically distinct. In essence, Marsh (1996) proposed a method using CFA's to evaluate whether two constructs are distinct. While Marsh (1996) was concerned with constructs that could be contrasted by positive versus negatively worded items, the general principle he laid down is used in the present research to evaluate whether these two constructs are empirically distinct. The following is the strategy adopted to accomplish that end concerning these two constructs.

1. I inspected the correlations of mastery and utility with other factors in the 14-factor model to determine if there was an apparent difference between the relations of the two constructs with other constructs in the model.

2. I conducted tests to determine if the correlations between the two factors with other factors in the model were significantly different. I accomplished this by separately constraining mastery and utility correlations with each other factor to be equivalent and comparing the fit indices and the chi square statistic.

3. I then conducted a CFA that comprised the two constructs only and compared the fit indices and the chi square statistic of this CFA with a CFA in which I collapsed the two factors into a single factor. In this procedure I used correlated uniquenesses to control for method effect where the modification indices suggested that freeing the residual

variances of items to correlate would make a significant difference to the fit and where it made substantive sense to do so. For more detail regarding this procedure see Marsh (1996).

4. Next, I compared the fit indices of two models of school achievement motivation one of which had the utility factor removed. That is, I compared a 14-factor model with a 13-factor model. I also reversed this procedure and removed mastery from the model leaving in its place the utility factor. The basis of comparison was the NNFI and the Chi-square statistic.

5. Finally, I collapsed the mastery and utility factors into a single factor and conducted a 13-factor CFA. I included the correlated uniqueness between items B48 and B38 in this CFA. This procedure has an advantage over the previous procedure in that I retain the 4 items that comprise the utility factor. I then compared the correlation matrix of the 14-factor model with that of this 13-factor model as well as the NNFI and the Chi-square statistic.

SURE AND UNSURE.

Concerning the test of whether the sure and unsure ability beliefs are empirically distinct, I adopted a procedure similar to that adopted for the examination of mastery and utility. However, the nature of sure and unsure ability beliefs is different from that of mastery and utility. That is, the difference between sure and unsure ability beliefs is that unsure ability beliefs comprises negatively worded items relative to sure ability beliefs. This raises the question of whether unsure ability beliefs although conceptually distinct may be, empirically, an artifact of method effect or response bias. The thrust of Marshs' (1996) argument concerning this issue appears to be that the older or more mature a student is the more likely they are to make valid distinctions between items based on the wording of those items. It follows that the more the correlation between the positive and negatively worded factors approaches zero the more likely the validity of the factors. Marsh (1996) proposed that to test further this aspect one could make use of correlated uniquenesses to evaluate method effect or response bias. I adopt this procedure to evaluate the distinctiveness of the sure and unsure ability beliefs in the present research. Specifically:

1. I inspect the correlations of sure and unsure ability beliefs with other factors in the 13-factor model to determine if there was an apparent difference between the relations of the two constructs with other constructs in the model. Before the conduct of this CFA, mastery and utility are collapsed into a single factor.

2. I conducted tests to determine if the correlations between the two factors with other factors in the model are significantly different. I accomplish this by separately constraining sure and unsure correlations with each other factor to be equivalent and comparing the resultant fit indices and the chi square statistic.

3. I then conduct a CFA that comprises the two constructs only. I compare the fit indices and the chi square statistic of this CFA with a CFA in which I collapse the two factors into a single factor. In this procedure, I use correlated uniquenesses to control for method effect. This is done guided by the modification indices where correlated residuals make a significant difference to the fit of the model to the data and where it makes substantive sense to do so. For more detail regarding this procedure, see Marsh (1996). Unfortunately, in this instance the correlated uniquenesses are difficult to support substantively (see Chapter 5.).

4. Finally, I collapse the sure and unsure ability belief factors into a single factor and conduct a 12-factor CFA. I include the correlated uniquenesses previously established in this CFA. This procedure has an advantage in that I retain the 5 items that comprise unsure ability belief factors. Each of the correlated uniquenesses established earlier were progressively implemented. I then compare the correlation matrix of the 13-factor model sure ability belief with those in this 12-factor model.

TESTS OF EQUIVALENCY ACROSS GROUPS: INVARIANT FACTOR LOADINGS, FACTOR VARIANCES, FACTOR COVARIANCES AND UNIQUENESSES

This test addresses the primary research question of the present research. That is, I wish to determine whether the measurement model of school achievement motivation is invariant for each of the socio-cultural groups. I want to know if estimates of designated parameters for one group are equivalent to the estimates of the same parameters for another group. The latter solution would mean, first, that the groups are not different in kind. Second, it also means that I can proceed with further analysis without having to resort to separate models for each cohort (e.g. male, female). Where parallel data exists for more than one group a CFA offers a powerful test of equivalency of solutions across multiple groups (Marsh, 1993). This is because the researcher is able to constrain any single, set, or all parameters equal across groups and thus contrast the structural relations of parameters between groups. There are several tests and Jöreskog and Sörbom (1996a) recommend a strategy whereby parameters are increasingly constrained to be equivalent across groups. I adopt this recommendation in the present research. The progressive constraint of parameters is a nested model approach that facilitates model comparison (Byrne, 1998; Marsh, 1994; Marsh & Hocevar, 1985; Jöreskog and Sörbom, 1996a). Each constrained model is compared

to a baseline model (Byrne, 1998). The baseline model is a non-invariant model in which parameter estimates are freely estimated for two or more groups of data. It serves as a basis of comparison for all subsequent models. If this baseline model does not fit the data, then it is unlikely that subsequent more restrictive models will fit the data (Marsh, 1994). In the present research, the focus is on invariant factor loadings and invariant factor correlations. Of less concern are invariant factor variances and invariant factor uniqueness (Marsh, 1993). Of considerable importance is that factor loadings are the equivalent for each group. Invariance of factor loadings suggests that students are responding to the items in similar ways across the groups. This offers confidence that across the groups the participating Navajo high school students perceive the items to have similar meaning. Invariant factor correlations suggest agreement across groups that there are similar associations between the factors.

Following a test for equivalent factor loadings, I conduct tests that constrain the factor variances and factor covariances as equivalent. A result in which factor variances and factor covariances are equivalent also means that factor correlations are equivalent (Marsh, 1985). I adopt this procedure in the present research for each of the socio-cultural variables. Finally, I test for invariant residual errors. I return to this aspect in Chapter 5.

EXAMINING THE INDIRECT EFFECTS

The focus in this sub-section is the statistical method used to evaluate substantive issues concerning the indirect relations of the socio-cultural variables on Navajo high school students' school achievement goals mediated by intervening factors. Briefly, the issues address the question: Why there are differences in school achievement between the socio-cultural groups as reported by James, Chavez, Beauvais, Edwards, & Oetting, (1995) and Vadas (1995)? It is postulated that understanding Navajo students' school achievement motivation will shed light on this issue. This understanding is achieved by examining the relations of factors believed to mediate the effects of the socio-cultural variables on students' achievement goals. In this way, for example, I am able to address the question of why should being male or female, or speaking Navajo or English at home, or living in a town or rural location have a bearing on achievement motivation. Why is it that Navajo female students fare better at school than Navajo male students? We might like to postulate a mediator that transcends gender. For example, we could hypothesize that being female is a better predictor of school achievement because females personally value school more than males.

The research conducted in this dissertation is a correlation study. It is established practice to exercise caution when interpreting the results of correlation research. One good reason for this caution is that the correlation between two factors may be a consequence of, or accounted for by, the presence of other factors. Urdan and Maehr (1995) make this point

when discussing the implications for achievement motivation of the relationship of social goals and achievement goals. For example, in my results there is a correlation of $\underline{r} = 0.18$, $\underline{p} < 0.01$ between language and mastery. Yet, after controlling for the effects of GPA and sure ability beliefs, as mediators of language on mastery, there are no direct relations between language and mastery. One further example serves to make my point. In this research the correlation between location and approach is non-significant. Yet, there are significant indirect effects of location on approach mediated by GPA and social approval. Hence, in this part of my research I decompose (Pedhazur, 1997) relevant correlations of a model of school achievement motivation to identify significant mediators. I remind the reader of the research questions designed to address this issue:

1. To understand better the relations of the socio-cultural variables on students' school achievement goals (mastery, approach, and avoidance) I examine, as intervening factors, the mediation effects of the school measures of achievement, achievement values, ability beliefs, and social goals.

2. To understand better the relations school measures of achievement (i.e. students' prior experiences and achievement; e.g. Dweck & Leggett, 1988; Schunk, 1994) on their school achievement goals, I examine, as intervening factors, the mediation effects of achievement values, ability beliefs, and social goals.

3. To understand better the relations of students' achievement values and ability beliefs on their school achievement goals, I examine, as intervening factors, the mediation effects of their social goals.

To examine these additional substantive issues a path model reflecting the posited relations is constructed. From the theoretical standpoint, the development of path models has been credited to Sewell Wright around the 1930's (Jöreskog & Sörbom, 1996a; Schumacker & Lomax, 1996). For Structural Equation Modeling (SEM) the procedure can be formulated as one of estimating the coefficients of linear structural equations representing the cause and effect relationships hypothesized by the researcher (Jöreskog & Sörbom, 1996a). However, Schumacker and Lomax (1996) represent path models as not only associated with causal relations, but also a procedure by which relationships among variables can be examined. It follows, in light of this counsel, that an infinite number of models about the relationships of factors might be posited depending on previous research, theory, serendipity or researcher interests or insights. In the present research, a combination of temporal ordering and theory already presented about the relations of factors guides the construction of the paths.

I have in the previous section concerning my research model and in Chapter 3 described the relations of factors to be examined in this research. What I propose now is to describe the statistical methods used to examine these relations.

THE MEDIATION MODEL.

According to Baron and Kenny (1986), to evaluate the mediation effects of intervening variables, the usefulness of ANOVA is limited because not all paths are tested and multiple regression is limited because measurement error is not controlled for and this may produce results that mislead. Instead, they recommend the use of SEM methodology. The present research heeds this advice.

Briefly, for Baron and Kenny (1986) mediation is said to hold when there are:

1. Significant total effects of the independent variable on the dependent variable;
2. Significant indirect effects of the independent variable on the dependent variable;
3. Significant direct effects of the independent variable on the mediating variable; and
4. Significant direct effects of the mediating variable on the dependent variable.

Fortunately, LISREL 8.3 reports standardized total, indirect and direct effects (Jöreskog, & Sörbom, 1996a). Hence, as suggested by Baron and Kenny (1986) I use LISREL 8.3 to examine the mediation effects of the intervening factors. Using SEM methodology I present in Figure 4.3 two path diagrams. Figure 4.3a depicts the mediation model. There are three possible outcomes. First, there are no mediation effects, with at least path "b" or "c" non-significant. Second, there is a complete mediation effect. In a model where there is complete mediation path "a" is non-significant and paths "b" and "c" are significant. Third, there is a partial mediation effect with paths "a", "b" and "c" all significant.

In the present research, I am unable to present some correlations as hypothesized paths. Examination of the relations of some factors is beyond the scope of the present research. Clearly the relations of, for example, social approval on social concern, or vice versa, is of theoretical and empirical interest. However, the immediate task is to examine the relations in terms of the hypothesized category of factors assumed in the causal ordering of factors. The interrelations of factors in these categories are the subject of future research. Figure 4.3b represents such a situation in the present research. In this figure both approval and concern are assumed to directly effect the achievement goals (e.g. Anderman & Anderman, 1999) and the effects are depicted by paths "b" and "c". However, I do not hypothesize a causal path between approval and concern. The relations of these two factors I leave as a correlation

depicted by "a" in Figure 4.3b. I am able to control for this correlation by partialling out its effects on the relations of approval and concern on the achievement goals. I sometimes refer to this process of partialling out of the effects of correlations on the direct relations of factors as decomposing factor correlations (Pedhazur, 1997).

FIGURE 4.3 THE MEDIATION MODEL: CONCEPTUAL DIAGRAMS

Figure 4.3a

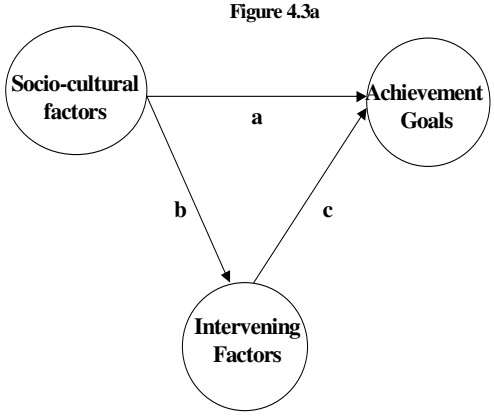
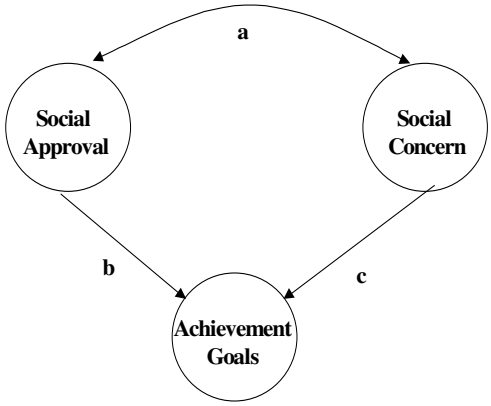


Figure 4.3b



SUMMARY

In this chapter, I describe some of the more important social, economic, and demographic factors for the participating Navajo high school students. I then describe the instrument used in the present research. I follow this with an outline of the research model used. I also present the statistical strategy used to address the main issues examined. The issues addressed are the psychometric properties of the proposed 11-factor and 14-factor models of school achievement motivation for Navajo high school students. The primary concern is the contrasting of an invariant model of school achievement motivation with a socio-cultural model of school achievement motivation. To accomplish this, following the construction of a CFA's to evaluate the scale validity and the structural validity of the 11-factor and 14-factor models of school achievement motivation, I make use a multi-group CFA. Coincidentally this multi-group CFA adds to the factorial validity of the model of school achievement motivation. For example, I test for invariance of gender while controlling for language and location. I also outline the method I adopt in the present research to establish whether the mastery and utility factors as well as whether the sure ability and unsure ability beliefs are empirically distinct factors.

The other main issue addressed is concerned the relations of the socio-cultural variables on students' achievement goals mediated by other factors in the model. I outlined the process that I adopt to address this issue.

CHAPTER 5

RESULTS

INTRODUCTION

I begin by presenting the descriptive statistics and the results of Cronbach's Alpha measure of internal consistency. I then present the results of the one-factor congeneric CFA's conducted for each of the nine motivational scales described in Chapter 4 followed by the results of CFA's that test for the factorial validity of hypothesized 11-factor and 14-factor models of school achievement motivation. I then test for the independence of the mastery and utility factors, and for the independence of the sure and unsure ability factors. As a consequence of these tests mastery and utility are collapsed into a single factor resulting in an hypothesized 13-factor model of school achievement motivation. Finally, I report the results of independently conducted tests of factorial invariance for each of the socio-cultural variables in the hypothesized 13-factor model. In this case, for example, while testing for gender invariance I control for language and location socio-cultural variables by including them in the model. Hence, the 13-factor model becomes a 12-factor model.

DESCRIPTIVE STATISTICS

The means, standard deviation and Cronbach's Alpha coefficients for the scales used in present research are presented in Appendix C. Cronbach's alpha results are considered moderate and acceptable (e.g. Nunnally, Lemond, & Wilson, 1977). They range from 0.55 to 0.81 with a mean of 0.71. Four Cronbach's Alphas are less than 0.70. The factor avoidance has the lowest Cronbach's Alpha (0.55). However, this factor comprises 3 items only and perhaps this contributes to the low result. Many researchers consider that Cronbach's Alpha has a general tendency to underestimate reliability (e.g. Raykov, 1997a). Nonetheless, given these results the over riding consideration is the usefulness of the factor in the model under consideration. In the present research I considered the factors to be useful in describing school achievement motivation among Navajo high school students.

The covariance matrix evaluated in the present research is included in the appendices as Appendix D.

CONSTRUCT VALIDITY OF THE MOTIVATIONAL SCALES

One-factor congeneric models are fitted separately to the responses for each scale. I expect there to be correlated uniquenesses within the factors approval and personal value of school. These were expected as a consequence of method effect due to the stem of items being similar. In the case of

approval it was expected that the uniquenesses of items B17 and B23 (Praise from …) would correlate. An inspection of the modification indices revealed that freeing the uniquenesses of these two items would significantly improve the fit of the factor (see Table 5.1). After freeing these uniquenesses to correlate a further inspection of the modification indices reveal that there were no more significant modification indices.

In the case of the personal value factor it was expected that the uniquenesses of items A31 and A32 would correlate due to the stem of items being the same (… should complete high school.). A31 and A32 reflect the notion of thinking of others or others thinking of the individual. It was expected that items A33 and A34 would correlate also due to the stem of these items being the same (.. complete high school). Items A33 and A34 differ from A31 and A32 in that they are more focussed on self. An inspection of the modification indices revealed that either the uniquenesses of A31 and A32 or A33 and A34 being freed would make a significant difference to the fit of the factor. I chose to free A33 and A34 in the belief that these two items are the most similar in terms of their uniquenesses. On freeing these uniquenesses a further inspection of the modification indices revealed that there were no more significant modification indices. Of the remaining factors there were no significant modification indices although the factor approach did contain a modification index (MI = 3.76) that improved the fit of that factor. I do not modify this scale.

Finally, the scale for avoidance comprises 3 items only and as a consequence it is a saturated model with zero degrees of freedom. Tests were conducted to ensure that the items were unidimensional (e.g. Byrne, 1998). The tests constituted independently constraining the first item to be equivalent to the second and subsequently the first item equivalent to the third item. Finally the second item is constrained equivalent to the third item. The results revealed an NNFI of 1.00 in the first two instances and an NNFI of .94 in the second instance. All solutions had 1 degree of freedom. I concluded that these results were acceptable.

The NNFI for the motivational scales ranged from 0.97 to 1.01 (not including the avoidance scale) with a mean of 0.998. The results obtained in this part of the statistical analyses provided a good basis on which to proceed with further analyses. Table 5.1 presents the goodness of fit indices for each of the solutions as models M1 to M11 inclusive.

TABLE 5.1. FIT INDICES FOR THE SOLUTIONS OF THE SCALES EVALUATED IN THE PRESENT RESEARCH

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M1 Mastery	2.07	2	1.00	1.00	0.004 (RMSEA[a] <.05=0.74)	
M2 Approach	4.54	2	0.97	0.99	0.046(RMSEA[a] <.057=0.44)	
M3 Avoidance: This is a 3 item saturated model						
M4 Approval no CU	33.07	2	0.85	0.95	0.17(RMSEA[a] <.05=0.00)	
M5 Approval CU	1.03	1	1.00	1.00	0.008(RMSEA[a] <.05=0.59)	Items B23 and B17 correlated uniqueness were freed to correlate.
M6 Concern	7.35	5	0.99	1.00	0.029(RMSEA[a] <.05=0.76)	
M7 Persvalue no CU	36.84	2	0.85	0.95	0.18 (RMSEA[a] <.05=0.00)	
M8 Persvalue CU	1.42	1	1.00	1.00	0.027 (RMSEA[a] <.05=0.51)	Uniqueness of item A34 and A33 freed to correlate
M9 Utility	1.35	2	1.00	1.00	0.000 (RMSEA[a] <.05=0.83)	
M10 Sure ability belief	1.01	2	1.01	1.00	0.000(RMSEA[a] <.05=0.93)	
M11 Unsure ability belief	3.37	5	1.01	1.00	0.000(RMSEA[a] <.05=0.96)	

Note [a] = P-Value for Test of Close Fit
CU = Correlated Uniqueness

THE 11-FACTOR AND 14-FACTOR MODELS OF SCHOOL ACHIEVEMENT MOTIVATION

In this sub-section I report the solutions of fitting to the data the 11-factor and 14-factor models of school achievement motivation. The purpose of conducting these CFA's is to establish the factorial validity of school achievement motivation. To begin, I test the hypothesis that school achievement motivation for Navajo high school students is a multidimensional construct composed of 11 factors (mastery, performance approach, performance avoidance, social approval, social concern, personal value of school, utility value of school, sure ability beliefs, unsure ability beliefs, absence and GPA). On establishing the factorial validity of school achievement motivation as a multidimensional construct, I further validate the construct by including the variables of language spoken at home, living location and gender. The additional 3 factors are the 3 socio-cultural variables designed to operationalize the concept of near-traditional and non-traditional Navajo high school students and gender. Hence, I test the hypothesis that school achievement motivation is a multidimensional construct composed of the 11 motivational factors plus the 3 socio-cultural factors. The models tested include the 2 correlated uniquenesses associated with the social approval and the personal value scales.

FITTING THE 11-FACTOR AND THE 14-FACTOR MODELS TO THE DATA

There was no evidence to reject the hypotheses that: (a) Each measured variable have a non-zero loading on the factor it was designed to measure and a zero loading on all other factors. b) That the error terms (referred to as uniqueness) for each measured variable are uncorrelated (unless stated otherwise). In addition, Byrne (1998) points out that an acceptable fit of the model to the data does not contain any negative variances or completely standardized factor loadings or factor correlations greater than one. This condition was also met in both models. The 2 CFA's yielded acceptable fits for both solutions with an NNFI of 0.92 for the 11-factor model and an NNFI of 0.90 for the 14-factor model. Table 5.2 presents the goodness of fit indices for these solutions. A comparison between the 11-factor model and the 14-factor model of factor loadings, factor correlations and factor residual variances revealed that there were no significant differences. Hence I report the following results in terms of the 14-factor model.

FACTOR LOADINGS AND RESIDUAL VARIANCES

An inspection of the factor loadings reveals that generally the factor loadings are moderate, as were the factor residual variances. Residual variances, although acceptable, are higher than I prefer for items B83 and B93 (sure ability), for items B81, B58 and B67 (unsure ability), for items B10, B35 and B46 (concern), for items B1 and B2 (approach) and for item B95 (avoidance). Table 5.3 presents the factor loadings and residual variances.

TABLE 5.2. FIT INDICES FOR THE SOLUTIONS OF THE 11-FACTOR AND 14-FACTOR MODELS

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M12 11-factor model	1011.85	647	0.92	0.93	0.031(RMSEA[a] <.05=1.00)	
M13 14-factor model	1226.15	731	0.90	0.91	0.033(RMSEA[a] <.05=1.00)	

Note: [a] = P-Value for Test of Close Fit

TABLE 5.3. FACTOR LOADINGS AND UNIQUENESSES FOR THE 14-FACTOR SOLUTION.

	Language	Location	Gender	Absence	GPA	Persval	Uniqueness
language	1.00	- -	- -	- -	- -	- -	- -
location	- -	1.00	- -	- -	- -	- -	- -
gender	- -	- -	1.00	- -	- -	- -	- -
absence	- -	- -	- -	1.00	- -	- -	- -
gpa	- -	- -	- -	- -	1.00	- -	- -
a31	- -	- -	- -	- -	- -	0.70	0.51
a32	- -	- -	- -	- -	- -	0.76	0.42
a33	- -	- -	- -	- -	- -	0.60	0.64
a34	- -	- -	- -	- -	- -	0.65	0.58

	Utility	Sure	Unsure	Approval	Concern	Mastery	Uniqueness
b22	0.62	- -	- -	- -	- -	- -	0.61
b38	0.70	- -	- -	- -	- -	- -	0.52
b48	0.74	- -	- -	- -	- -	- -	0.45
b54	0.54	- -	- -	- -	- -	- -	0.71
b75	- -	0.71	- -	- -	- -	- -	0.50
b69	- -	0.61	- -	- -	- -	- -	0.63
b83	- -	0.48	- -	- -	- -	- -	0.77
b93	- -	0.42	- -	- -	- -	- -	0.82
b45	- -	- -	0.66	- -	- -	- -	0.57
b81	- -	- -	0.41	- -	- -	- -	0.83
b58	- -	- -	0.47	- -	- -	- -	0.78
b67	- -	- -	0.46	- -	- -	- -	0.79
b77	- -	- -	0.72	- -	- -	- -	0.48
b17	- -	- -	- -	0.70	- -	- -	0.51
b23	- -	- -	- -	0.57	- -	- -	0.67
b41	- -	- -	- -	0.69	- -	- -	0.52
b73	- -	- -	- -	0.71	- -	- -	0.50
b10	- -	- -	- -	- -	0.46	- -	0.79
b21	- -	- -	- -	- -	0.70	- -	0.51
b29	- -	- -	- -	- -	0.68	- -	0.54
b35	- -	- -	- -	- -	0.55	- -	0.70
b46	- -	- -	- -	- -	0.52	- -	0.73
b33	- -	- -	- -	- -	- -	0.62	0.62
b40	- -	- -	- -	- -	- -	0.61	0.63
b56	- -	- -	- -	- -	- -	0.66	0.57
b89	- -	- -	- -	- -	- -	0.61	0.63

	Approach	Avoidance	Uniqueness
b1	0.53	- -	0.71
b2	0.55	- -	0.72
b14	0.60	- -	0.64
b76	0.60	- -	0.64
b80	- -	0.52	0.73
b95	- -	0.44	0.81
b98	- -	0.69	0.53

FACTOR CORRELATIONS OF INTEREST IN THE PRESENT CHAPTER

Clearly the correlations between the factors are important in the present research and I present these in Tables 5.4 and 5.5. In chapters 6, 7 & 8, using the mediation model, I systematically decompose the factor correlations to understand better the relations among factors. Because of this I will not examine the factor correlations in detail in this chapter. However, in this chapter, I am interested in the correlation between mastery and utility and the correlations of each of these factors with other factors in the model. Wigfield (1994) posited that these two factors might have similar underlying meanings. I have already stated that I believe the factors are conceptually distinct however, the question remains whether they are empirically distinct. I am also interested in the correlation between sure ability beliefs and unsure ability beliefs and their correlations with other factors in the model. These correlations go to the question of whether the unsure ability belief factor is an artifact of method effect or response bias. I will examine the relations of mastery and utility first and in this respect it is hypothesized that the factors mastery and utility are empirically distinct (Wigfield, 1994).

MASTERY AND UTILITY: ONE OR TWO FACTORS

The correlation between mastery and utility is very high and highly significant ($r = 0.86$; $p < 0.01$; see Table 5.4). In Chapter 4, following Marsh (1996) I outlined the strategy I adopt to examine the relations of these factors. Below I present the results of these procedures. To guide the examination I hypothesize that mastery and utility are empirically distinct factors in the 14-factor model of school achievement motivation.

1. I inspected the correlations of mastery and utility with other factors in the 14-factor model to determine if there was an apparent difference between the relations of the two constructs with other constructs in the model.

   This inspection of the correlation matrix (see Table 5.4) reveals that the correlation of mastery with absence is significant while the correlation of utility with absence is not. In addition, it appears that the correlation of mastery with social approval ($r = 0.43$, $p < 0.01$) and with social concern ($r = 0.56$, $p < 0.01$) is stronger than those of utility with social approval and social concern ($r = 0.32$, $p < 0.01$ & $r = 0.44$, $p < 0.01$, respectively).

2. I conducted tests to determine if the correlations between the two factors with other factors in the model were significantly different. I accomplished this by separately constraining mastery and utility correlations with each other factor to be equivalent and comparing the fit indices and the chi square statistic.

This procedure detected three factors whose correlations with mastery and utility differed significantly. Surprisingly absence was not among them. The factors that correlated differently with mastery and utility were sure ability ($\Delta\chi^2 = 13.11$, $\Delta df = 1$), approval ($\Delta\chi^2 = 5.38$, $\Delta df = 1$) and concern ($\Delta\chi^2 = 7.58$, $\Delta df = 1$).

3. I then conducted a CFA that comprised the two constructs only and compared the fit indices and the chi square statistic of this CFA with a CFA in which I collapsed the two factors into a single factor. In this procedure I used correlated uniquenesses to control for method effect where the modification indices suggested that freeing the residual variances of items to correlate would make a significant difference to the fit and where it made substantive sense to do so. The items freed were B48 with B38 and items B56 with B89. For more detail regarding this procedure see Marsh (1996).

   The final result of this procedure was that the two-factor model had marginally better results (one-factor NNFI = 0.99; 2-factor NNFI = 1.00. See Table 5.6). However, more importantly, it is not possible to choose between the two solutions. To err on the side of conservatism would leave one to conclude that there is no difference. However, Marsh (1996) points out this test alone offers insufficient evidence on which to base a decision.

4. Next, I compared the solutions of a 14-factor model with mastery and utility as separate factors with a 13-factor model with utility removed. I reversed this procedure and removed mastery from the model leaving in its place the utility factor.

   The solutions of this procedure (see Table 5.6) again suggested that there is not a substantial difference between a model that includes both mastery and utility and one that excludes utility or mastery. The solution for the model comprising both factors is NNFI = 0.90 while for the model that removed the utility factor (13-factor model) is NNFI = 0.89. Concerning the results where the mastery factor was removed from the model the solution is the same as that where the utility factor is removed from the model. This model included the correlated uniqueness of items B48 and B38.

5. Finally, I collapse the mastery and utility factors into a single factor and conducted a 13-factor CFA. I included the correlated uniqueness between items B48 and B38 in this CFA. This procedure has an advantage over the previous procedure in that I retain the 4 items that comprise the utility factor. I then compared the correlation matrix of the 14-factor model with that of this 13-factor model.

   I paid particular attention to a comparison of factor correlations between the 14-factor and 13-factor model with an emphasis on the correlations of mastery with sure, approval and concern. Generally,

I did not detect any difference between the 14-factor and 13-factor correlations (see Tables 5.4 and 5.5). Nor did I detect differences between the factor correlations of the collapsed mastery/utility factor with sure, approval and concern. In addition, the factor loadings for the new factor are similar to the two factor loadings in the 14-factor model although the factor loading for item B48 is noticeably less in the single factor solution (see Tables 5.3 and 5.7). Had there been a marked difference then it would suggest that the utility factor items had different effects in the model. The NNFI for the 13-factor model of 0.90 is the same as that of the 14-factor model. Hence it appears that there are no substantial differences between a model that has the utility factor as a separate factor and a model that has the utility factor and the mastery factor collapsed into a single factor.

While there is some evidence to suggest that these factors are distinct, that evidence relies on the significant different correlations of mastery and utility with the factors sure, approval and concern. Had there been other evidence of difference then I would have been inclined to accept this as evidence of difference between the two factors. However, it seems that the overwhelming evidence suggests the two factors are not significantly different. Consequently, and in the interests of parsimony, I find there is insufficient evidence to support the hypothesis that these two factors are empirically distinct. Hence for the remainder of the present research mastery and utility will be combined into a single factor. I will refer to it as mastery or mastery/utility.

TABLE 5.4. FACTOR CORRELATIONS FOR THE 14-FACTOR MODEL

	Language	Location	Gender	Absence	GPA	Persval
Language	1.00					
Location	-0.26**	1.00				
Gender	-0.09*	0.01	1.00			
Absence	-0.14**	0.02	0.07	1.00		
GPA	0.08	-0.11**	0.14**	-0.41**	1.00	
Persval	0.07	-0.03	0.12**	0.01	0.07	1.00
Utility	0.15**	-0.08	0.10*	-0.07	0.23**	0.45**
Sure	0.08	-0.05	-0.04	-0.27**	0.32**	0.25**
Unsure	0.06	0.01	0.21**	0.18**	-0.25**	0.06
Approval	0.05	0.12**	0.07	-0.04	-0.02	0.14**
Concern	0.15**	0.00	0.32**	-0.07	0.18**	0.42**
Mastery	0.18**	-0.03	0.13**	-0.12**	0.21**	0.45**
Approach	0.05	0.04	-0.31**	-0.06	0.01	0.17**
Avoidance	-0.04	0.11*	-0.18**	0.15**	-0.36**	-0.05

	Utility	Sure	Unsure	Approval	Concern	Mastery
Utility	1.00					
Sure	0.52**	1.00				
Unsure	0.03	-0.47**	1.00			
Approval	0.32**	0.30**	0.19**	1.00		
Concern	0.44**	0.39**	-0.01	0.33**	1.00	
Mastery	0.86**	0.68**	0.07	0.43**	0.56**	1.00
Approach	0.34**	0.30**	0.07	0.65**	0.14**	0.37**
Avoidance	-0.20**	-0.33**	0.55**	0.20**	-0.12*	-0.18**

	Approach	Avoidance
Approach	1.00	
Avoidance	0.13*	1.00

Note ** = P < 0.01
* = P < 0.05

TABLE 5.5. FACTOR CORRELATIONS FOR THE 13-FACTOR MODEL – MASTERY AND UTILITY COLLAPSED INTO A SINGLE FACTOR

	Language	Location	Gender	Absence	GPA	Persval
Language	1.00					
Location	-0.26**	1.00				
Gender	-0.09*	0.01	1.00			
Absence	-0.14**	0.02	0.07	1.00		
GPA	0.08	-0.11**	0.14**	-0.41**	1.00	
Persval	0.07	-0.03	0.12**	0.00	0.07	1.00
Sure	0.08	-0.04	-0.04	-0.27**	0.32**	0.26**
Unsure	0.06	0.01	0.21**	0.18**	-0.25**	0.06
Approval	0.05	0.12**	0.07	-0.04	-0.02	0.14**
Concern	0.15**	0.00	0.32**	-0.07	0.18**	0.42**
Mastery	0.18**	-0.06	0.13**	-0.11**	0.24**	0.48**
Approach	0.05	0.04	-0.31**	-0.06	0.01	0.17**
Avoidance	-0.04	0.11*	-0.18**	0.15**	-0.36**	-0.05

	Sure	Unsure	Approval	Concern	Mastery	Approach
Sure	1.00					
Unsure	-0.47**	1.00				
Approval	0.30**	0.19**	1.00			
Concern	0.39**	-0.01	0.33**	1.00		
Mastery	0.64**	0.06	0.41**	0.54**	1.00	
Approach	0.30**	0.07	0.65**	0.14**	0.38**	1.00
Avoidance	-0.33**	0.55**	0.20**	-0.12*	-0.21**	0.13*

	Avoidance
Avoidance	1.00

Note ** = P < 0.01
* = P < 0.05

TABLE 5.6. FIT INDICES FOR THE SOLUTIONS CONCERNING MASTERY AND UTILITY: ONE OR TWO FACTORS

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M14 One-factor model. Mastery & utility collapsed – NO CU	61.09	20	0.95	0.97	0.064(RMSEA[a] <.05=0.077)	
M14a B48 and B38 CU	36.35	19	0.98	0.99	0.047(RMSEA[a] <.05=0.74)	First CU
M14b B59 and B89 CU	26.44	18	0.99	0.99	0.030(RMSEA[a] <.05=0.94)	Second CU
M15 Two-factor model NO CU	30.00	19	0.99	0.99	0.032(RMSEA[a] <.05=0.92)	First CU
M15a B48 and B38 CU	22.49	18	0.99	1.00	0.021(RMSEA[a] <.05=0.98)	Second CU
M15b B59 and B89 CU	17.87	17	1.00	1.00	0.011(RMSEA[a] <.05=0.99)	Third CU
M13 14-factor model	1226.15	731	0.90	0.91	0.033(RMSEA[a] <.05=1.00)	This is the original 14-factor model fit indices
M16 13-factor model with utility removed	1026.89	590	0.89	0.91	0.034(RMSEA[a] <.05=1.00)	
M17 13-factor model with mastery removed	1026.89	590	0.89	0.91	0.034(RMSEA[a] <.05=1.00)	
M18 13-factor model with mastery and utility as a single factor NO CU	1286.78	744	0.89	0.91	0.035(RMSEA[a] <.05=1.00)	.
M19 13-factor model with mastery and utility as a single factor CU	1245.30	743	0.90	0.91	0.033(RMSEA[a] <.05=1.00)	Uniquenesses of items B48 and B38 free to correlate

Note: [a] = P-Value for Test of Close Fit
CU = Correlated Uniqueness

TABLE 5.7. FACTOR LOADINGS AND UNIQUENESSES FOR THE 13-FACTOR SOLUTION

	Language	Location	Gender	Absence	GPA	Persval	Uniqueness
language	1.00	- -	- -	- -	- -	- -	- -
location	- -	1.00	- -	- -	- -	- -	- -
gender	- -	- -	1.00	- -	- -	- -	- -
absence	- -	- -	- -	1.00	- -	- -	- -
gpa	- -	- -	- -	- -	1.00	- -	- -
a31	- -	- -	- -	- -	- -	0.70	0.51
a32	- -	- -	- -	- -	- -	0.76	0.42
a33	- -	- -	- -	- -	- -	0.60	0.64
a34	- -	- -	- -	- -	- -	0.65	0.57

	Sure	Unsure	Approval	Concern	Mastery	Approach	Uniqueness
b75	0.70	- -	- -	- -	- -	- -	0.51
b69	0.61	- -	- -	- -	- -	- -	0.62
b83	0.48	- -	- -	- -	- -	- -	0.77
b93	0.42	- -	- -	- -	- -	- -	0.82
b45	- -	0.65	- -	- -	- -	- -	0.57
b81	- -	0.41	- -	- -	- -	- -	0.83
b58	- -	0.47	- -	- -	- -	- -	0.78
b67	- -	0.46	- -	- -	- -	- -	0.79
b77	- -	0.72	- -	- -	- -	- -	0.48
b17	- -	- -	0.70	- -	- -	- -	0.51
b23	- -	- -	0.57	- -	- -	- -	0.67
b41	- -	- -	0.69	- -	- -	- -	0.52
b73	- -	- -	0.71	- -	- -	- -	0.50
b10	- -	- -	- -	0.46	- -	- -	0.79
b21	- -	- -	- -	0.70	- -	- -	0.51
b29	- -	- -	- -	0.68	- -	- -	0.54
b35	- -	- -	- -	0.55	- -	- -	0.70
b46	- -	- -	- -	0.52	- -	- -	0.73
b33	- -	- -	- -	- -	0.62	- -	0.62
b40	- -	- -	- -	- -	0.60	- -	0.64
b56	- -	- -	- -	- -	0.65	- -	0.58
b89	- -	- -	- -	- -	0.59	- -	0.65
b22	- -	- -	- -	- -	0.58	- -	0.67
b38	- -	- -	- -	- -	0.59	- -	0.65
b48	- -	- -	- -	- -	0.64	- -	0.59
b54	- -	- -	- -	- -	0.55	- -	0.70
b1	- -	- -	- -	- -	- -	0.54	0.71
b2	- -	- -	- -	- -	- -	0.55	0.70
b14	- -	- -	- -	- -	- -	0.60	0.64
b76	- -	- -	- -	- -	- -	0.60	0.64

	Avoidance	Uniqueness
b80	0.52	0.73
b95	0.44	0.81
b98	0.69	0.53

SURE ABILITY AND UNSURE ABILITY: ONE OR TWO FACTORS

The nature of the question of the relationship between sure and unsure ability beliefs is different to the nature of the question between mastery and utility. That difference is that unsure ability beliefs is composed of negatively worded items relative to sure ability beliefs. This raises the question of whether, although conceptually distinct, unsure ability beliefs may be an artifact of method effect or response bias. The thrust of Marsh (1996) argument concerning this issue appears to be that the older or more mature a student is the more likely they are to make valid distinctions between items based on the wording of those items. The participants in this survey were all high school students. It follows that the more the correlation between the positive and negatively worded factors approaches zero then the more likely the validity of the factors. In the present research I test the hypothesis that unsure ability beliefs is an artifact of method effect or response bias.

Marsh (1996) proposed that to further test this aspect one could make use of correlated uniquenesses to evaluate method effect or response bias. I adopt this procedure to evaluate the distinctiveness of the sure and unsure ability beliefs in the present research. Further, Marsh (1996) also suggests that an evaluation of the correlations between factors is useful in throwing light on this issue. Generally, I follow the same procedures as I did for the test of mastery and utility as separate factors. However, I will be using the new 13-factor model with mastery and utility collapsed into a singe factor.

1. I inspected the correlations of sure and unsure ability beliefs with other factors in the 13-factor model to determine if there was an apparent difference between the relations of the two constructs with other constructs in the model.

   An inspection of the factor correlations in Table 5.5 reveals that the correlation between sure and unsure ability beliefs are ($\underline{r} = -0.47$, $\underline{p} < 0.01$). This constitutes a moderate correlation rather than a strong or weak correlation. In addition, although sure ability beliefs are correlated with personal value, concern, mastery and approach, unsure ability beliefs is not correlated with any of these factors. Thus there seems to be a prima facie case that the two ability belief constructs are distinct

2. To test this hypothesis I conducted tests to determine if the correlations between the two ability factors with other factors in the model are significantly different. I accomplish this by separately constraining sure and unsure correlations with each other factor to be equivalent and comparing the resultant fit indices and the chi square statistic.

   The summarized results presented in Table 5.8 suggest that there are a number of factors that have significant different correlations with sure ability beliefs than with unsure ability beliefs. Table 5.8

shows in tabular form those factors with which sure and unsure ability beliefs correlate differently. The results suggest that the sure and unsure ability beliefs factors are empirically distinct.

3. I then conducted a CFA that comprised the two constructs only and compared the fit indices and the chi square statistic of this CFA with a CFA in which I collapsed the two factors into a single factor. In this procedure I used correlated uniquenesses to control for method effect where the modification indices suggested that freeing the residual variances of items to correlate would make a significant difference to the fit. For more detail regarding this procedure see Marsh (1996). The items freed were B69 with B75, B83 with B75, B83 with B69, B93 with B75, B93 with B69 and B93 with B83. These items comprise the sure factor. As can be seen from Table 5.9, five or six correlated uniquenesses are required to obtain a comparable fit.

4. Finally, I collapsed the sure and unsure ability belief factors into a single factor and conducted a 12-factor CFA. I included the correlated uniquenesses previously established in this CFA. This procedure has an advantage in that I retain the 5 items that comprise unsure ability belief factors. Each of the correlated uniquenesses established earlier was progressively implemented. I then compared the correlation matrix of the 13-factor model sure ability belief with those in this 12-factor model.

   A comparison of the fit indices (see Table 5.9. M22) reveals that the 12-factor solution does not fit the data as well as the 13-factor solution (see Table 5.6). Further, a comparison of the factor loadings of the 12-factor solutions with the 13-factor solution reveals that the 12-factor loadings for the ability belief factors are extremely poor. The item factor loadings for the 12-factor the collapsed sure and unsure ability beliefs are: B75=0.34, B69=0.33, B83=0.14, B93=0.21, B45=0.65, B81=0.42, B58=0.47, B67=0.44 and B77=-0.73. A comparison of these loadings with the item loadings presented in Table 5.7 make it abundantly clear that these two factors do not fit together comfortably.

It seems clear from the preceding that in the 13-factor model of school achievement motivation sure and unsure ability beliefs function differently in the model. The magnitude of the correlations between these factors and other factors in the model are significantly different (see Table 5.8). In addition, in the collapsed versions the factor loadings are significantly poorer than in the 13-factor model. The correlated uniquenesses used in this part of the present research would be extremely difficult to sustain on substantive grounds. Hence it seems that I can reject the hypothesis that the unsure ability belief factor is an artifact of method effect or response bias. For the remainder of the present research I use the 13-factor model of school achievement motivation.

Given that the primary concern of the present research is whether near-traditional and non-traditional Navajo high school students are contrasting models of school achievement motivation, using the 13-factor solution I now turn my attention to models that test this hypothesis.

TABLE 5.8 FACTORS THAT THE CORRELATIONS OF SURE AND UNSURE ABILITY BELIEFS DIFFERED WITH

Factors differed with	Chi-square difference	Factors differed with	Chi-square difference
Mastery	145.68 ($p < 0.01$)	Concern	34.62 ($p < 0.01$)
Approach	26.48 ($p < 0.01$)	Personal value	22.93 ($p < 0.01$)
Approval	56.91($p < 0.01$)	Absence	13.53 ($p < 0.01$)

TABLE 5.9. SOLUTIONS CONCERNING THE CORRELATED UNIQUENESSES FOR THE COLLAPSED SURE AND UNSURE ABILITY BELIEF FACTORS

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M20 2-factor sure and unsure ability beliefs. NO CU	50.65	26	0.96	0.97	0.040(RMSEA[a] <.05=0.84)	
M21 Sure & unsure ability beliefs collapsed into a single factor NO CU	214.83	27	0.67	0.75	0.13(RMSEA[a] <.05=0.00)	
M21a CU B69 & B75	154.59	26	0.77	0.83	0.097(RMSEA[a] <.05=0.00)	
M21b CU B83 & B75	132.10	25	0.80	0.86	0.091(RMSEA[a] <.05=0.00)	.
M21c CU B83 & B69	95.02	24	0.86	0.91	0.073(RMSEA[a] <.05=0.01)	
M21d CU B93 & B75	75.78	23	0.89	0.93	0.065(RMSEA[a] <.05=0.05)	
M21e CU B93 & B69	57.02	22	0.92	0.95	0.053(RMSEA[a] <.05=0.37)	
M21f CU B93 & B69	45.94	21	0.94	0.97	0.045(RMSEA[a] <.05=0.66)	
M22 12-Factor model CU	1451.02	749	0.86	0.88	0.039(RMSEA[a] <.05=1.00)	

Note: [a] = P-Value for Test of Close Fit
CU = Correlated Uniqueness

MULTI-GROUP TESTS OF EQUIVALENCY

In the previous sections I established that there is evidence to reject the hypothesis that school achievement motivation for Navajo high school students is a 14-factor multidimensional model in favor of a 13-factor solution. However, the question remains regarding the extent to which, if at all, this 13-factor model of school achievement motivation differs for near-traditional and non-traditional and male and female Navajo high school students. That is, I now wish to test the hypothesis that there is no difference between near-traditional and non-traditional and male and female Navajo high school students in the 13-factor model of school achievement motivation. I can test this hypothesis by contrasting an invariant model of school achievement motivation with a socio-cultural model of school achievement motivation. That is, if the groups are invariant then this is evidence in support of no socio-cultural difference. On the other hand if the groups are non-invariant, this then is evidence in support of socio-cultural differences. Marsh (1993,1994) showed that where parallel data exists, CFA's offer a powerful capability for contrasting two or more groups of data. In this sub-section I take advantage of this capability to test the preceding hypothesis. In testing this hypothesis my primary concern is for invariant factor loadings and factor correlations. Of less concern, although also tested, are invariant factor variances and item residual variances. However, as pointed out by Byrne (1998) when discussing item residual variances:

> "In contrast to the conceptual definition of item bias (i.e. individuals of equal ability have unequal probability of success), item bias related to affective instruments reflects on their validity and, hence, on the question of whether items generate the same meaning across groups."

It should be noted that the samples used in the multi-group tests I conduct are drawn from a common metric that was standardized using SPSS (see Chapter 4.).

I begin by reporting the results of tests for invariant factor loadings and follow this with the results for the tests of invariant factor covariances and variances. I then report the results concerning the item residual variances. The reader will recall that near-traditional and non-traditional groupings of Navajo high school students I operationalized with the socio-cultural variables of language, living location and gender as these factors have been used in the past by other researchers to operationalize the same concepts (e.g. Vadas, 1995).

FACTOR LOADINGS FOR THE SOCIO-CULTURAL VARIABLES OF LANGUAGE, LOCATION, AND GENDER

I first constructed a baseline model of the 13-factor model of school achievement motivation with which to compare subsequent constrained models of school achievement motivation. In this sub-section I am interested in the equivalency of factor loadings that I constrain as equivalent across each of the socio-cultural variables. The three correlated uniquenesses already established for the factors personal value of school, mastery/utility and performance approach are included in the present tests. Below I emphasize the NNFI in reporting the results. I begin by reporting the results for language.

LANGUAGE.

The baseline model for the 13-factor model of school achievement motivation yielded an acceptable result with an NNFI of 0.93 (see Table 5.10; M23). Next I test the hypothesis that the factor loadings are invariant for language spoken at home. The test for invariant factor loadings yielded an NNFI of 0.94 (see Table 5.10; M24). Hence, as there are no significant differences I cannot reject the hypothesis that factor loadings for language are invariant.

LOCATION.

The baseline model for the 13-factor model of school achievement motivation yielded an acceptable result with an NNFI of 0.96 (see Table 5.10; M25). Next I test the hypothesis that the factor loadings are invariant for living location. The test for invariant factor loadings yielded an NNFI of 0.96 (see Table 5.10; M26). Hence, as there are no significant differences I cannot reject the hypothesis that factor loadings for location are invariant.

GENDER.

The baseline model for the 13-factor model of school achievement motivation yielded an acceptable result with an NNFI of 0.96 (see Table 5.10; M27). Next I test the hypothesis that the factor loadings are invariant for gender. The test for invariant factor loadings yielded an NNFI of 0.95 (see Table 5.10; M28). Hence, as there are no significant differences I cannot reject the hypothesis that factor loadings for gender are invariant.

It is clear from the preceding and an inspection of the fit indices for these solutions presented in Table 5.10, that for the three socio-cultural cohorts there is no difference in factor loadings. This provides confidence that the students are responding to the items in a similar fashion across the respective groups. It becomes apparent when I look at the invariance of residual variance that this confidence is justified.

TABLE 5.10. FIT INDICES FOR THE SOLUTIONS OF THE 13-FACTOR MODEL INVARIANT FACTOR LOADINGS

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M23 13-factor model baseline – Language	1764.84	1428	0.93	0.94	0.026(RMSEA[a] <.05=1.00)	
M24 13-factor model factor loadings – Language	1779.32	1457	0.94	0.94	0.024(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 14.58 Δdf = 29 NS
M25 13-factor model baseline – Location	1635.73	1428	0.96	0.96	0.020(RMSEA[a] <.05=1.00)	
M26 13-factor model factor loadings – Location	1643.24	1457	0.96	0.97	0.019(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 7.51 Δdf = 29 NS
M27 13-factor model baseline – Gender	1693.52	1428	0.94	0.95	0.021(RMSEA[a] <.05=1.00)	
M28 13-factor model factor loadings – Gender	1706.55	1457	0.95	0.95	0.020(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 13.03 Δdf = 29 NS

Note: [a] = P-Value for Test of Close Fit
CU = Correlated Uniqueness

FACTOR COVARIANCES AND FACTOR VARIANCES FOR THE SOCIO-CULTURAL VARIABLES OF LANGUAGE, LOCATION AND GENDER

In this sub-section the focus is on invariant factor correlations. In this model I constrain factor loadings and factor covariances and factor variances as equivalent. As I described in Chapter 4, invariant factor loadings, factor covariances and factor variances mean that the factor correlations are also invariant. In this sub-section I again emphasize the NNFI. In Table 5.11, where I present the goodness of fit indices for the respective solutions that follow, I also repeat the baseline fit indices to facilitate the reader's comparison between fit indices.

LANGUAGE.

In this sub-section I report the results of the test of the hypothesis that the factor loadings, factor covariances and factor variances are invariant for language spoken at home. The test for invariant factor loadings, factor covariances and factor variances yielded an NNFI of 0.94 (see Table 5.11; M31 & M32). Hence, as there are no significant differences I cannot reject the hypothesis that factor correlations for language spoken at home are invariant.

LOCATION.

In this sub-section I report the results of the test of the hypothesis that the factor loadings, factor covariances and factor variances are invariant for living location. The test for invariant factor loadings, factor covariances and factor variances yielded an NNFI of 0.97 (see Table 5.11; M33 & M34). Hence, as there are no significant differences I cannot reject the hypothesis that factor correlations for living location are invariant.

GENDER.

In this sub-section I report the results of the test of the hypothesis that the factor loadings, factor covariances and factor variances are invariant for gender. The test for invariant factor loadings, factor covariances and factor variances yielded an NNFI of 0.96 (see Table 5.11; M33 & M34). Hence, as there are no significant differences I cannot reject the hypothesis that factor correlations for gender are invariant.

It is clear from the preceding, and an inspection of the fit indices for these solutions presented in Table 5.11, that for the three socio-cultural cohorts there is no difference in factor loadings, factor covariances and factor variances. The fact of factor correlations being invariant for the respective socio-cultural variables strongly suggests that although there may still be different correlations between

groups these differences are ones of degree rather than kind. In other words, I can be reasonably sure that there is not a dichotomy of perceptions between the groups and that the groups contained in each of the socio-cultural variables broadly respond in like manner concerning the significant relations among the factors.

TABLE 5.11. FIT INDICES FOR THE SOLUTIONS OF THE 13-FACTOR MODEL INVARIANT FACTOR LOADINGS, FACTOR COVARIANCES AND VARIANCES.

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M29 13-factor model baseline – Language	1764.84	1428	0.93	0.94	0.026(RMSEA[a] <.05=1.00)	
M30 13-factor model factor correlations – Languag	1826.97	1535	0.94	0.95	0.023(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 62.13 Δdf = 107 NS
M31 13-factor model baseline – Location	1635.73	1428	0.96	0.96	0.020(RMSEA[a] <.05=1.00)	
M32 13-factor model factor correlations – Location	1665.11	1535	0.97	0.98	0.014(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 29.38 Δdf = 107 NS
M33 13-factor model baseline – Gender	1693.52	1428	0.94	0.95	0.021(RMSEA[a] <.05=1.00)	
M34 13-factor model factor correlations - Gender	1738.53	1535	0.96	0.96	0.017(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 45.01 Δdf = 107 NS

Note: [a] = P-Value for Test of Close Fit
CU = Correlated Uniqueness

FACTOR RESIDUAL VARIANCES FOR THE SOCIO-CULTURAL VARIABLES OF LANGUAGE, LOCATION AND GENDER

In this sub-section the focus is on invariant factor residual variances. As described earlier, invariant residual factor variances strengthens the argument that students are responding to the items in a like manner. In this model I constrain factor loadings, factor covariances and factor variances, and factor residual variances as equivalent. In this sub-section I again emphasize the NNFI. In Table 5.12, where I present the goodness of fit indices for the respective solutions that follow I also repeat the baseline fit indices to facilitate the reader's comparison between fit indices.

LANGUAGE.

In this sub-section I report the results of the test of the hypothesis that the factor loadings, factor covariances and factor variances and factor residual variances are invariant for language spoken at home. The test for invariant factor loadings, factor covariances and factor variances and factor residual variances yielded an NNFI of 0.95 (see Table 5.12; M35 & M36). Hence, as there are no significant differences I cannot reject the hypothesis that factor residual variances for language spoken at home are invariant.

LOCATION.

In this sub-section I report the results of the test of the hypothesis that the factor loadings, factor covariances and factor variances and factor residual variances are invariant for living location. The test for invariant factor loadings, factor covariances and factor variances and factor residual variances yielded an NNFI of 0.98 (see Table 5.12; M37 & M38). Hence, as there are no significant differences I cannot reject the hypothesis that factor residual variances for living location are invariant.

GENDER.

In this sub-section I report the results of the test of the hypothesis that the factor loadings, factor covariances and factor variances and factor residual variances are invariant for gender. The test for invariant factor loadings, factor covariances and factor variances and factor residual variances yielded an NNFI of 0.96 (see Table 5.12; M39 & M40). Hence, as there are no significant differences I cannot reject the hypothesis that factor residual variances for gender are invariant.

It is clear from the preceding, and an inspection of the fit indices for these solutions presented in Table 5.12, that for the three socio-cultural cohorts there is no difference in factor loadings, factor covariances and factor variances and factor residual variances. The fact of factor residual variances

being broadly similar for the respective socio-cultural variables strongly suggests that that students are responding to the items in a broadly similar fashion. In other words, as posited by Byrne (1998) this strengthens the argument that across groups contained in the socio-cultural variables, students may well ascribe similar meanings to the items.

TABLE 5.12. FIT INDICES FOR THE SOLUTIONS OF THE 13-FACTOR MODEL INVARIANT FACTOR LOADINGS, FACTOR COVARIANCES AND VARIANCES AND FACTOR RESIDUAL VARIANCES

Model	Chi	df	NNFI	CFI	RMSEA	Comments
M35 13-factor model baseline – Language	1764.84	1428	0.93	0.94	0.026(RMSEA[a] <.05=1.00)	
M36 13-factor model factor residual variance – Language	1859.61	1575	0.95	0.95	0.022(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 94.77 Δdf = 147 NS
M37 13-factor model baseline – Location	1635.73	1428	0.96	0.96	0.020(RMSEA[a] <.05=1.00)	
M38 13-factor model factor residual variance – Location	1680.21	1575	0.98	0.98	0.012(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 44.48 Δdf = 147 NS
M39 13-factor model baseline – Gender	1693.52	1428	0.94	0.95	0.021(RMSEA[a] <.05=1.00)	
M40 13-factor model factor residual variance - Gender	1757.05	1575	0.96	0.97	0.015(RMSEA[a] <.05=1.00)	$\Delta\chi^2$ = 63.53 Δdf = 147 NS

Note: [a] = P-Value for Test of Close Fit
CU = Correlated Uniqueness

SUMMARY AND CONCLUSIONS

The results clearly demonstrate that the hypothesized model of school achievement motivation has a well-defined factor structure that appears to operate consistently across three socio-cultural variables (language, location & gender). In addition, on three qualitatively different measures of culture the results demonstrate that in terms of school measures of achievement, achievement values, ability beliefs, social goals and school achievement goals, near-traditional and non-traditional and male and female Navajo high school students are more similar than different. This demonstrates that constructs representing different theoretical traditions can be merged into a single coherent model of school achievement motivation. The implication is that Navajo high school students, whether non-traditional or near traditional, male or female generally appear to have similar motivational characteristics. Hence it seems, that a model of school achievement motivation, drawn from Western theorizing about the nature of school achievement motivation, appears relevant to Navajo high school students.

The finding that the mastery and utility concepts were not empirically distinct is, on the one hand, a disappointment. It was anticipated that there would be different factors associated with the concept of mastery and utility. The wording of the items seems to clearly reflect this distinction with mastery focusing on improvement and utility focusing on the relationship of doing well at school and its future usefulness. It seems, though, that the implied linkage between improving (mastery) and doing well at school (utility) is my undoing. That is, the difference these students perceived between the two concepts is minimal. On the other hand this is an important finding. First it supports Wigfield's (1994) hypothesis that these two constructs may have the same underlying meaning for students. That is students do not distinguish between effort and usefulness. Seen from this perspective, the finding is consistent with Ogbu and Matute-Bianchi's (1986) structural hypothesis that the purpose of school is the training of future adult members to carry out social, economic, and other tasks that the "powers" consider important (see also Maehr & Midgley, 1996; also Chapter 2.). Having said that, it is important to note that according to the structural hypothesis I would have expected there to be significant differences between the near traditional and non-traditional Navajo high school students. However, concerning future investigations of the utility construct, wording of items that do not reflect a linkage between doing well at school and societal success may be useful in distinguishing between students' perceptions of mastery and their perceptions of the utility value of school. It may be that despite the face validity of items reflecting the utility construct, to get at the underlying value of utility, if in fact it can be distinguished from mastery, another approach needs to be taken.

The finding concerning the relationship of sure ability beliefs and unsure ability beliefs is encouraging. First there appears reasonable support for the hypothesis that Navajo high school students

may hold negative attitudes regarding school achievement motivation. Such a conclusion is entirely consistent with the literature concerning Navajo high school students (e.g. Deyhle, 1995; Chrisjohn, Towson, & Peters, 1988). Second, the finding that there is no dichotomy between near traditional and non-traditional Navajo high school students suggests that what stereotype negative effects there may be, it is generally applicable to all Navajo high school students. However, despite this homogeneity, I believe I show in Chapter 8 that generally there are subtle stereotype effects operating. .

What needs to be understood is that these findings suggest that non-traditional and near traditional and male and female Navajo high school students are more similar than different in terms of school achievement motivation. Clearly, acknowledging this fact has implications not only for school policy but also for teachers and parents. Assuming radical differences in students' school achievement motivation may mean misplaced effort and emphasis on programs and curriculum to no avail. However, as I show in the following chapters, there are relative differences between near traditional and non-traditional and male and female Navajo high school students (Vadas, 1995). It is to this issue, and to the issue of the relations of the socio-cultural variables on Navajo high school students achievement goals mediated by school measures of achievement, personal value of school, ability beliefs, and social goals that I direct the examination to in the next three chapters.

CHAPTER 6

A MODEL OF SCHOOL ACHIEVEMENT MOTIVATION: THE CASE FOR SOCIAL GOALS

INTRODUCTION

The focus in this chapter, as well as Chapters 7 and 8, shifts from contrasting non-traditional with near traditional, and male and female Navajo high school students, to one of examining the interrelations of dimensions. Making use of a path model enables me to examine hypothesized relationships among the factors that comprise my model of school achievement motivation. In this chapter the focus is on the relations of the socio-cultural variables on the three achievement goals mediated by the school measures of achievement and the two social goals. The relations of the school measures of achievement on the three achievement goals mediated by the two social goals are also examined.

In the introduction to this dissertation I pointed out that in the United States of America there remains persistent school underachievement among American Indian students (e.g. James, Chavez, Beauvais, Edwards, & Oetting, 1995; Pavel, Curtin, & Whitener, 1997). I also pointed out that Navajo high school students were not an exception to this situation (e.g. Vadas, 1995). Among the many potential causes cited for this underachievement is a cultural environment that can be contrasted with the one American Indians and Navajo students experience at school (e.g. Ledlow, 1992; Vadas, 1995). For example, it is believed that the Navajo value co-operation, a property of a social concern goal, yet schools emphasize competition (Deyhle, 1995; Locke, 1992; McInerney & Swisher, 1995). In addition, it is believed that the Navajo generally adhere to socially approved behaviors, that is, a social approval goal (Deyhle, 1989; Locke, 1992). Concerning this latter point the question arises as to whether Navajo students see school as a socially approved behavior. According to the literature there appears some doubt about this. For example, there are arguments that many American Indians see school as an anathema to being a American Indian (Chrisjohn, Towson, & Peters, 1988; Deyhle, 1995). Hence, I examine the issue of whether social goals mediate the effects of culture on Navajo students' achievement goals.

Before proceeding I wish to briefly refocus the readers attention an achievement goal theory. Achievement goal theory assumes students' perceptions of the goal structures emphasized by schools, teachers and parents are reflected in the achievement goals students adopt in the classroom (e.g. Anderman & Anderman, 1999; Anderman & Maehr, 1994). The two most common goals emphasized

in achievement goal theory research are those of mastery and performance goals. It is believed that when students emphasize a mastery goal they are focused on learning, self-improvement, and effort. Note that in Chapter 5 I include utility as a quality of mastery. It is believed that when students emphasize a performance goal they are concerned to demonstrate their ability relative to others (e.g. Ames and Archer, 1988). Recently, in order to explain better disparate findings concerning performance goals, researchers have partitioned the performance goal into a performance approach goal and a performance avoidance goal (e.g. Elliott & Church, 1997; Midgley, Kaplan, Middleton, Maehr, Urdan, Anderman, Anderman, & Roeser 1998). However, often these researchers find that the correlation between the performance approach goal and the performance avoidance goal is positive and moderate. Midgley, et al (1998), suggest that there is more work needed to construct and validate the scales used to measure these approach and avoidance concepts. For example they point out that Elliot and Church (1997) obtained better results than Midgley, et al (1998) regarding the correlation of these two factors. The difference between the scales used by Midgley, et al, (1998) and those used by Elliot and Church (1997) was that the latter researchers included items in the avoidance scale that tapped into general anxiety. In contrast Midgley, et al (1998) emphasized positive and negative ability (see Marsh, 1996, re positive and negative constructs, see also Chapter 4). I will return to this notion of anxiety in Chapter 8.

Ames (1992a) points out that especially important to the adoption of a performance goal is public recognition that one has done better than others. Ames (1992a) also pointed out that recognition could be a double-edged sword depending on whether the recognition was directed at success or failure. That is, in consequence of recognition students may adopt either a performance approach or a performance avoidance goal. Urdan (1997) has described this as the notion that performance approach goals relate to students trying to appear able whereas performance avoidance goals relate to students trying not to appear unable. Recently, Anderman and Anderman (1999) described linkages between students' social goals and their achievement goals. In their research they hypothesized that there are social goals that are related to mastery goals and different social goals that are related to performance goals. Indeed, they found that social responsibility goals were related to a mastery goal. In addition, they found social goals that emphasized peer relationships and status (social approval) were related to performance goals. Hence it seems that social approval goals could relate to both performance approach and performance avoidance goals (e.g. Bempechat, Graham, & Jimenez, 1999). Social concern goals however, would seem to more strongly relate to a mastery goal. Indeed, in the present research (see table 6.1) social approval is moderately correlated with mastery ($\underline{r} = 0.41$, $\underline{p} < 0.01$), strongly correlated with approach ($\underline{r} = 0.65$, $\underline{p} < 0.01$), and weakly correlated with avoidance ($\underline{r} = 0.20$, $\underline{p} < 0.01$). In comparison, social concern is strongly correlated with mastery ($\underline{r} = 0.54$, $\underline{p} < 0.01$), and weakly correlated with approach ($\underline{r} = 0.14$, $\underline{p} < 0.01$) and avoidance ($\underline{r} = -0.12$, $\underline{p} < 0.05$).

NAVAJO STUDENTS AND SOCIAL GOALS

Further to their findings, Anderman and Anderman (1999) point out that research shows that social goals are related to students' achievement (see also Triandis, 1995). Hence, they hypothesize that the relations of students' social goals with achievement may be meditated by achievement goals (see also, Urdan & Maehr, 1995). Thus they assume causal relations between students' social goals and their achievement goals. The question of the relations of Navajo high school students social goals with their achievement goals has not before been examined in detail (e.g. McInerney and Swisher, 1995). Clearly the role of Navajo students social goals in a school context is an important consideration. The question also arises whether Navajo high school students perceive social goals and their relations with school achievement goals in a similar way as did Anderman and Anderman (1999).

SCHOOL MEASURES OF ACHIEVEMENT AND SOCIAL GOALS

Examined in the present chapter are the relationships of school measures of achievement with Navajo students' social goals and their school achievement goals. School success or failure has been linked to students' social goals and their achievement goals (Ames, 1992a, Blumenfeld, 1992). Anderman and Anderman (1999) hypothesized that the relations of students' social goals on their achievement are mediated by their achievement goals. It is believed that students' prior experiences and achievement are related to their achievement goals (see Chapter 4; also Dweck & Leggett, 1988; Schunk, 1994). In the present research it is hypothesized that the relations of the socio-cultural variables on the school achievement goals are mediated by the school measures of achievement and the social goals. Further, it is also hypothesized that the relations of students' school measures of achievement on the school achievement goals are mediated by the social goals. See Figure 6.1 for a diagrammatic representation of the hypothesized relationships of the socio-cultural variables and these constructs as applicable to this chapter.

GENDER AND SOCIAL GOALS

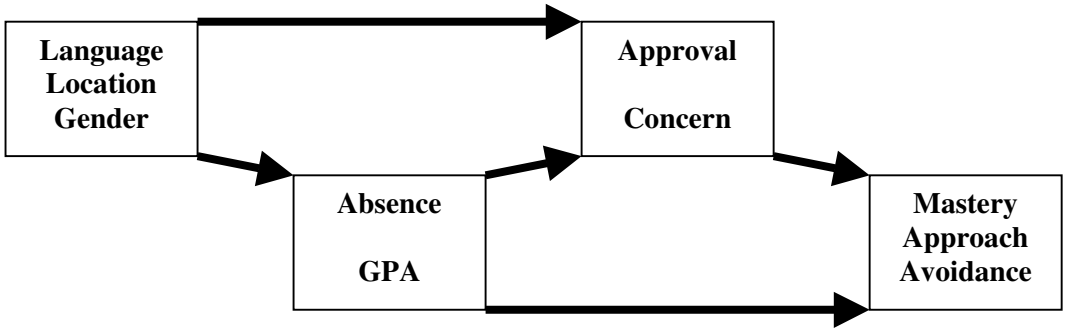
Research concerning gender differences related to school achievement goals reveal that males are more likely than females to endorse performance goals (e.g. Anderman & Midgley, 1997). Findings concerning social goals suggest that females endorse relationship and responsibility goals more than males do (e.g. Patrick, Hicks, & Ryan, 1997) and males endorse status goals more than females do (e.g. Ryan, Hicks, & Midgley, 1997). Anderman and Anderman (1999) report their findings as consistent with these. However, they go on to add that they found no difference in the indirect effects of gender on student achievement goals. While there is reported research concerning gender differences related to students' achievement goals and social goals there appears little research that explores similar issues for Navajo high school students. The present research addresses this gap in our knowledge.

RESEARCH QUESTIONS ADDRESSED IN THIS CHAPTER

The specific research questions addressed in this chapter are:

1. Are there socio-cultural differences in terms of school measures of achievement?
2. Are there socio-cultural differences in terms of students' social goals?
3. Are there socio-cultural differences in terms of students' achievement goals?
4. Are the relations of the socio-cultural variables on students' school achievement goals mediated by school measures of achievement?
5. Are the relations of the socio-cultural variables on students' achievement goals mediated by the social goals?
6. Are the relations of the school measures of achievement on students' achievement goals mediated by the social goals?

FIGURE 6.1. HYPOTHESIZED RELATIONSHIPS OF FACTORS EXAMINED IN THIS CHAPTER



For details associated with the METHOD section concerning participants, administration, instrumentation and scales see chapter 4. For convenience sake the 13-factor correlation matrix from Chapter 5 is reproduced here. I now turn to the statistical analyses and hypotheses used in the present research.

TABLE 6.1. FACTOR CORRELATIONS FOR THE 13-FACTOR MODEL – MASTERY AND UTILITY COLLAPSED INTO A SINGLE FACTOR

	Language	Location	Gender	Absence	GPA	Persval
Language	1.00					
Location	-0.26**	1.00				
Gender	-0.09*	0.01	1.00			
Absence	-0.14**	0.02	0.07	1.00		
GPA	0.08	-0.11**	0.14**	-0.41**	1.00	
Persval	0.07	-0.03	0.12**	0.00	0.07	1.00
Sure	0.08	-0.04	-0.04	-0.27**	0.32**	0.26**
Unsure	0.06	0.01	0.21**	0.18**	-0.25**	0.06
Approval	0.05	0.12**	0.07	-0.04	-0.02	0.14**
Concern	0.15**	0.00	0.32**	-0.07	0.18**	0.42**
Mastery	0.18**	-0.06	0.13**	-0.11**	0.24**	0.48**
Approach	0.05	0.04	-0.31**	-0.06	0.01	0.17**
Avoidance	-0.04	0.11*	-0.18**	0.15**	-0.36**	-0.05

	Sure	Unsure	Approval	Concern	Mastery	Approach
Sure	1.00					
Unsure	-0.47**	1.00				
Approval	0.30**	0.19**	1.00			
Concern	0.39**	-0.01	0.33**	1.00		
Mastery	0.64**	0.06	0.41**	0.54**	1.00	
Approach	0.30**	0.07	0.65**	0.14**	0.38**	1.00
Avoidance	-0.33**	0.55**	0.20**	-0.12*	-0.21**	0.13*

	Avoidance
Avoidance	1.00

Note ** = P < 0.01
* = P < 0.05

STATISTICAL ANALYSES

THE STATISTICAL STRATEGY AND HYPOTHESES USED IN THIS CHAPTER

The model used in the present chapter for the examination of the research questions is the 13-factor model of school achievement motivation. In Chapter 5, I presented the results of a series of CFA's that culminated in the conclusion that there was no evidence to warrant rejection that the hypothesized model of school achievement motivation is invariant for near traditional and non-traditional and male and female Navajo high school students. Because the model is invariant I am able to use a single model comprising all the participants to examine the relations of the factors of interest to the present chapter (e.g. Marsh, 1993). Hence, I use the 13-factor model that was validated in Chapter 5 to examine the research questions in the present chapter.

In this chapter I emphasize the relations of the socio-cultural variables, the school measures of achievement, the social goals and the achievement goals. In Chapter 4 I described the statistical

strategy of decomposing factor correlations to examine the relations of the factors of interest in the present chapter. The path model described in Chapter 4 was constructed for this purpose. To facilitate the presentation of the results, earlier I presented in diagrammatic form the hypothesized relations of factors relevant to the present chapter (see Figure 6.1).

RESEARCH HYPOTHESES FOR THIS CHAPTER

The following hypotheses are used to guide the examination of the research questions:

1. **School measures of achievement.** Deyhle (1995) suggest that Navajo and Ute students' cultural values are in conflict with the values emphasized by schools. Hence, it is hypothesized that near traditional (language and location) Navajo students will score higher on absence than will non-traditional while non-traditional Navajo students will score higher on GPA than will near traditional Navajo students. Vadas (1995) reported that Navajo female students achieved higher grades than did male Navajo students. Hence it is hypothesized that female students will score higher on the GPA school measure of achievement than male students while male students will score higher on the absence measure than will female students.

2. **Students' social goals.** According to Deyhle (1995) Navajo and Ute social goals are in conflict with those emphasized by schools (see also Locke, 1992). Hence it is hypothesized that non-traditional Navajo students will score higher on the social goals than will near-traditional Navajo students. Anderman & Anderman (1999) reported that female students scored higher than males on responsibility goals (similar to social concern goals) while male students scored higher than females on social goals similar to social approval goals used in the present research. Hence, it is hypothesized that female students will score higher on social concern than male students while male students will score higher on social approval goals than will females students.

3. **Students' achievement goals.** According to Deyhle (1995; see also Deyhle & Swisher, 1997) Navajo and Ute students' learning values are in conflict with the values emphasized by schools. Hence it is hypothesized that non-traditional Navajo students will score higher on mastery and performance approach goals than will near traditional Navajo students while near-traditional Navajo students will score higher on performance avoidance than will non-traditional Navajo students. Anderman and Anderman (1999) reported that female students were more likely than male students to score higher on a mastery goal while male students were more likely than female students to score higher on an approach goal. Hence, it is hypothesized that female students will score higher than male students on a mastery goals while male students will score higher than female students on performance approach and performance avoidance goals.

4. **Relations of school measures of achievement on the school achievement goals mediated by the social goals.** It is hypothesized that the relations of the school measures of achievement on the school achievement goals will be mediated by the social goals (e.g. Anderman & Anderman, 1999).

5. **Relations of socio-cultural variables on the school achievement goals mediated by the school measures of achievement and the social goals.**

   It is hypothesized that:

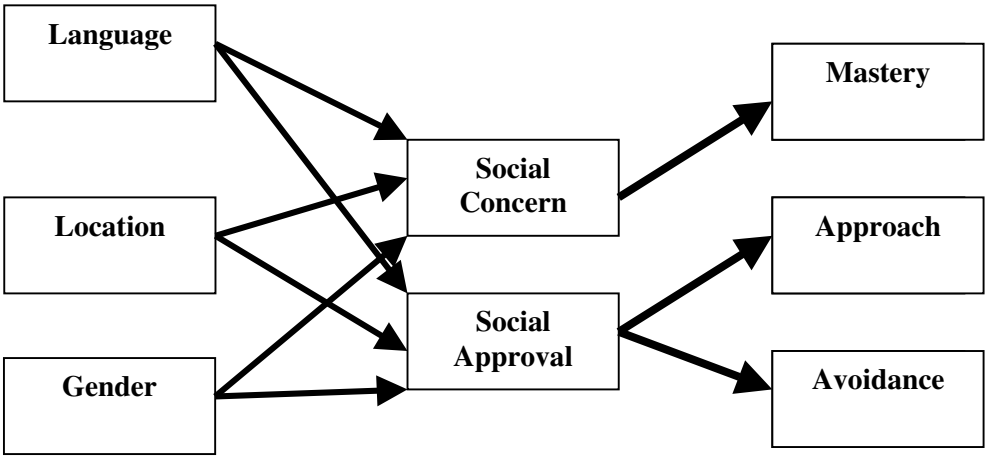
   5.1. The relations of language, location, and gender on the three achievement goals will be mediated by the school measures of achievement. Further, these effects will be greater for English speakers and students living in towns (non-traditional), and females than for Navajo speakers and students living in rural areas (near traditional), and males. (e.g. Anderman & Anderman, 1999; Deyhle & Swisher, 1997).

   In the following hypotheses, I follow Anderman and Anderman (1999) concerning the relations of the two social goal factors on the three achievement goal factors. However, I adhere to the concepts of non-traditional and near traditional concerning the language, location, and gender relations on the three achievement goal factors mediated the two social goal factors. See Figure 6.2 for a diagrammatic presentation of these relations.

   5.2. It is hypothesized that the social approval factor will mediate the effects of language, location, and gender on the performance approach and performance avoidance factors only (see Anderman & Anderman, 1999). Further, these effects will be greater for English speakers and students living in towns (non-traditional), and females than for Navajo speakers and students living in rural areas (near traditional), and males.

   5.3. It is hypothesized that the social concern factor will mediate the effects of language, location, and gender on mastery only (see Anderman & Anderman, 1999). Further, these effects will be greater for English speakers and students living in towns (non-traditional), and females than for Navajo speakers and students living in rural areas (near traditional), and males.

FIGURE 6.2. HYPOTHESIZED RELATIONS BETWEEN THE SOCIO-CULTURAL VARIABLES, THE SOCIAL GOALS, AND THE ACHIEVEMENT GOALS.



RESULTS

In this section, I present the results of the analysis of the data in two sub-sections. The first of these sub-sections presents the results for hypotheses 1 to 3. I present these in terms of the direct effects (see Table 6.2). In so doing the effects of other factors on the relations of factors is controlled for. The reader should note that for language, Navajo speakers are coded 0 and English speakers are coded 1; for location, town is coded 0 and rural is coded 1; and for gender, males are coded 0 and females are coded 1. The second sub-section presents the results for hypotheses 4 and 5. To address this hypothesis the mediation model is analyzed emphasizing the total, indirect and direct effects in the hypothesized model of school achievement motivation. I begin by presenting the significant differences in the hypothesized model of school achievement motivation in terms of socio-cultural variables, school measures of achievement, social goals and school achievement goals (see Table 6.2).

THE RESULTS FOR HYPOTHESIS 1: DIFFERENCES BETWEEN NEAR TRADITIONAL AND NON-TRADITIONAL NAVAJO HIGH SCHOOL STUDENTS ON THE SCHOOL MEASURES OF ACHIEVEMENT

LANGUAGE.

English speakers scored higher on absence than Navajo speakers with a path coefficient of –0.14, $p < 0.01$ (see Table 6.2). This finding is contrary to the hypothesis. Thus the hypothesis that near

traditional (Navajo speakers) Navajo students would score higher on absence than would non-traditional (English speakers) Navajo students is not supported.

The relation of language on GPA is non-significant (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher on GPA than near traditional Navajo students is not supported.

LOCATION.

The relation of location on absence is non-significant (see Table 6.2). Thus the hypothesis that near traditional (rural students) Navajo students would score higher on absence than non-traditional (rural students) Navajo students is not supported.

Town students scored higher on GPA than rural students with a path coefficient of –0.10, $\underline{p} < 0.01$ (see Table 6.2). Thus these results support the hypothesis that non-traditional Navajo students would score higher on GPA than would near traditional Navajo students.

GENDER.

The relation of gender on absence is non-significant (see Table 6.2). Thus the hypothesis that male students would score higher on absence than female students is not supported.

Female students scored higher on GPA than male students with a path coefficient of 0.17, $\underline{p} < 0.01$ (see Table 6.2). Thus the hypothesis that female students would score higher on GPA than male students is supported.

THE RESULTS FOR HYPOTHESIS 2: DIFFERENCES BETWEEN NEAR TRADITIONAL AND NON-TRADITIONAL NAVAJO HIGH SCHOOL STUDENTS ON THE SOCIAL GOAL FACTORS

LANGUAGE.

The relation of language on approval is non-significant (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher on social goals than would near traditional Navajo students is not supported.

English speakers scored higher on social concern than Navajo speakers with a path coefficient of 0.29, $\underline{p} < 0.01$ (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher on social goals than would near traditional Navajo students is supported.

LOCATION.

Rural students scored higher on social approval than town students with a path coefficient of 0.14, $p < 0.01$ (see Table 6.2). This finding is contrary to the hypothesis. Thus the hypothesis that non-traditional Navajo students would score higher on the social goals than would near traditional Navajo students is not supported.

The relation of location on social concern is non-significant (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher than near traditional Navajo students is not supported.

GENDER.

The relation of gender on social approval is non-significant (see Table 6.2). Thus the hypothesis that female students would score higher than male students on social approval is not supported.

Female students scored higher on social concern than male students with a path coefficient of 0.29, $p < 0.01$ (see Table 6.2). Thus the hypothesis that female students would score higher on social concern than male students is supported.

THE RESULTS FOR HYPOTHESIS 3: DIFFERENCES BETWEEN NEAR TRADITIONAL AND NON-TRADITIONAL NAVAJO HIGH SCHOOL STUDENTS ON THE ACHIEVEMENT GOAL FACTORS

LANGUAGE.

The relation of language on mastery is non-significant (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher on mastery than would near traditional Navajo students is not supported.

The relations of language on approach and of language on avoidance are non-significant (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher on approach than would near traditional Navajo students is not supported. In addition, the hypothesis that near traditional Navajo students would score higher than non-traditional Navajo students on avoidance is not supported.

LOCATION.

The relations of location on mastery, approach, and avoidance are non-significant (see Table 6.2). Thus the hypothesis that non-traditional Navajo students would score higher on mastery and

approach is not supported. In addition, the hypothesis that near traditional Navajo students would score higher than non-traditional Navajo students on avoidance is not supported.

GENDER.

The relation of gender on mastery is non-significant (see Table 6.2). Thus the hypothesis that female students would score higher than male students on mastery is not supported.

Male students scored higher on approach and avoidance than female students with a path coefficient of –0.38, $p < 0.01$, and –0.27, $p < 0.01$ respectively (see Table 6.2). Thus the hypothesis that male students would score higher than female students on approach and avoidance is supported.

TABLE 6.2. STANDARDIZED DIRECT EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	-0.14**	-0.02	0.06	- -	- -	- -
GPA	0.01	-0.10**	0.17**	-0.42**	- -	- -
Persval	0.08	-0.01	0.11*	0.03	0.06	- -
Sure	0.03	0.00	-0.06	-0.16**	0.26**	- -
Unsure	0.11*	0.01	0.25**	0.07	-0.26**	- -
Approval	0.02	0.14**	0.01	0.01	-0.07	-0.01
Concern	0.14**	0.06	0.29**	0.03	0.04	0.28**
Mastery	0.07	0.00	-0.01	0.07	0.10*	0.20**
Approach	-0.03	-0.03	-0.38**	0.02	0.08	0.11
Avoidance	-0.07	0.04	-0.27**	-0.02	-0.17**	-0.04

	Sure	Unsure	Approval	Concern	Mastery	Approach
Approval	0.53**	0.42**	- -	- -	- -	- -
Concern	0.36**	0.08	- -	- -	- -	- -
Mastery	0.66**	0.35**	0.06	0.16*	- -	- -
Approach	0.10	0.08	0.64**	-0.04	- -	- -
Avoidance	-0.08	0.51**	0.14*	0.00	- -	- -

Note ** = P < 0.01
* = P < 0.05

FOR MEDIATION EFFECTS TO HOLD

In reporting the results for the following hypotheses I emphasize the total effects (Table 6.3), the indirect effects (Table 6.4) and the direct effects (Table 6.2). For mediation effects to hold there must be:

1. Significant total effects of the independent variable on the dependent variable;

2. Significant indirect effects of the independent variable on the dependent variable;

3. Significant direct effects of the independent variable on the mediating variable; and

4. Significant direct effects of the mediating variable on the dependent variable (Baron & Kenny, 1988).

THE RESULTS FOR HYPOTHESIS 4: THE INDIRECT EFFECTS OF THE SCHOOL MEASURES OF ACHIEVEMENT ON THE ACHIEVEMENT GOALS MEDIATED BY THE SOCIAL GOAL FACTORS

ABSENCE.

1. There were significant total effects of absence on mastery and avoidance with path coefficients of –0.09, $p < 0.05$, and 0.016, $p < 0.01$ respectively (see Table 6.3).

2. There were significant indirect effects of absence on mastery and avoidance with path coefficients of –0.16, $p < 0.01$ and 0.18, $p < 0.01$ respectively (see Table 6.4).

3. However, there were no direct effects of absence on either approval or concern (see Table 6.2). Thus, the hypothesis that the social goals mediate the effects of the school measures of achievement is not supported.

GPA.

1. There were significant total effects of GPA on mastery and avoidance with path coefficients of 0.21 $p < 0.01$ and -0.33 $p < 0.01$ respectively (see Table 6.3). There were significant indirect effects of GPA on mastery and avoidance with path coefficients of 0.11 $p < 0.05$ and –0.16, $p < 0.01$ respectively (see Table 6.3).

2. However, there were no direct effects of GPA on either approval or concern. Thus, the hypothesis that the social goals mediate the effects of the school measures of achievement is not supported.

TABLE 6.3. STANDARDIZED TOTAL EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	-0.14**	-0.02	0.06	- -	- -	- -
GPA	0.07	-0.09*	0.15**	-0.42**	- -	- -

Persval	0.08	-0.02	0.12*	0.01	0.06	- -
Sure	0.07	-0.03	-0.04	-0.27**	0.26**	- -
Unsure	0.09	0.03	0.21**	0.18**	-0.26**	- -
Approval	0.09	0.15**	0.07	-0.03	-0.04	-0.01
Concern	0.19**	0.05	0.33**	-0.07	0.12*	0.28**
Mastery	0.20**	-0.01	0.15**	-0.09*	0.21**	0.25**
Approach	0.04	0.06	-0.31**	-0.03	0.06	0.09
Avoidance	-0.03	0.10	-0.18**	0.16**	-0.33**	-0.04

	Sure	**Unsure**	**Approval**	**Concern**	**Mastery**	**Approach**
Approval	0.53**	0.42**	- -	- -	- -	- -
Concern	0.36**	0.08	- -	- -	- -	- -
Mastery	0.75**	0.39**	0.06	0.16**	- -	- -
Approach	0.42**	0.34**	0.64**	-0.04	- -	- -
Avoidance	0.00	0.57**	0.14**	0.00	- -	- -

Note ** = P < 0.01
* = P < 0.05

TABLE 6.4. STANDARDIZED INDIRECT EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	**Location**	**Gender**	**Absence**	**GPA**	**Persval**
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	- -	- -	- -	- -	- -	- -
GPA	0.06**	0.01	-0.02	- -	- -	- -
Persval	0.00	-0.01	0.01	-0.02	- -	- -
Sure	0.04*	-0.02	0.03	-0.11**	- -	- -
Unsure	-0.03	0.02	-0.03*	0.11**	- -	- -
Approval	0.07*	0.01	0.06	-0.04	0.03	- -
Concern	0.05	-0.01	0.05	-0.09**	0.09**	- -
Mastery	0.13**	0.00	0.15**	-0.16**	0.11*	0.04*
Approach	0.08*	0.08*	0.07	-0.06	-0.02	-0.02
Avoidance	0.04	0.06	0.09*	0.18**	-0.16**	0.00

	Sure	**Unsure**	**Approval**	**Concern**	**Mastery**	**Approach**
Mastery	0.09*	0.04	- -	- -	- -	- -
Approach	0.32**	0.26**	- -	- -	- -	- -
Avoidance	0.08	0.06	- -	- -	- -	- -

Note ** = P < 0.01
* = P < 0.05

THE RESULTS FOR HYPOTHESIS 5: THE INDIRECT EFFECTS OF THE SOCIO-CULTURAL VARIABLES ON THE ACHIEVEMENT GOAL FACTORS MEDIATED BY 1) THE SCHOOL MEASURES OF ACHIEVEMENT AND 2) THE SOCIAL GOAL FACTORS

1. The relations of the socio-cultural variables on the achievement goal factors meditated by the school measures of achievement. There is some support for hypothesis 5.1 (see Tables 6.2, 6.3, & 6.4).

   1.1. There were significant total effects of gender on mastery with a path coefficient of 0.20 $p < 0.01$ (see Table 6.3). The effects of gender on mastery are completely mediated by GPA with a path coefficient from gender to GPA of 0.17, $p < 0.01$ and from GPA to mastery of 0.10, $p < 0.05$. The effects are greater for females than males. This result offers support for hypothesis 5.1 insofar as the relation of gender on mastery is mediated by the GPA school measure of achievement (see Figure 6.3).

   1.2. There were significant total effects of gender on avoidance with a path coefficient of -0.18 $p < 0.01$ (see Table 6.3). The effects of gender on avoidance are partially mediated by GPA with a path coefficient from gender to GPA of 0.17, $p < 0.01$ and from GPA to avoidance of -0.17, $p < 0.0$. The effects are greater for males than for females with a path coefficient of –0.27 $p < 0.01$. This result offers support for hypothesis 5.1 insofar as the relation of gender on avoidance is mediated by the GPA school measure of achievement (see Figure 6.3)

   1.3. There was no other support for hypothesis 5.1.

2. The relations of the socio-cultural variables on the achievement goal factors are meditated by the social goals. There was no support for hypothesis 5.2 and some support for hypothesis 5.3 (see Tables 6.2, 6.3, & 6.4).

   2.1. The relations of language, location, and gender on the performance approach and performance avoidance factors mediated by the social approval factor. As there were not total effects of location on any of the achievement goal factors there is no support for this hypothesis (see Table 6.3).

   2.2. The relations of language, location, and gender on the achievement goal factors mediated by the social concern factor. There were significant total effects of language on mastery with a path coefficient of 0.20, $p < 0.01$ (see Table 6.3). The effects of language on mastery were completely mediated by social concern factor with a path coefficient from language to concern of 0.14, $p < 0.01$ and from concern to mastery with a path coefficient of 0.16, $p < 0.05$ (see

figure 6.3). In addition, the effects were greater for English speakers (non-traditional) than for Navajo speakers (near traditional). This result offers support for hypothesis 5.3 insofar as the relation of language on mastery is mediated by the social concern factor.

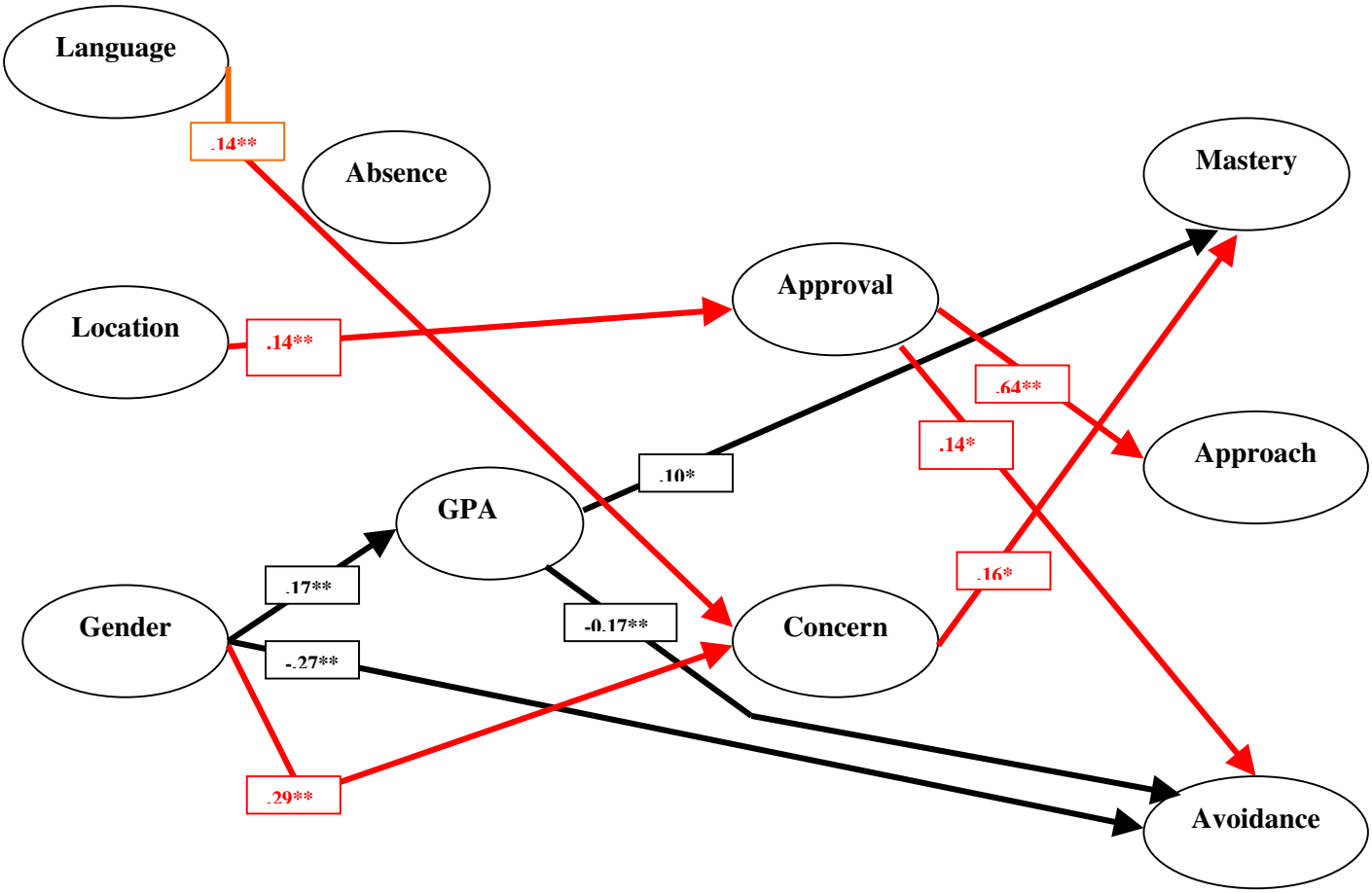
There were significant total effects of gender on mastery with a path coefficient of 0.15, $\underline{p} < 0.01$ (see Table 6.3). The effects of gender on mastery were completely mediated by social concern with a path coefficient from gender to concern of 0.29, $\underline{p} < 0.01$ and from concern to mastery with a path coefficient of 0.16, $\underline{p} < 0.05$ (see Figure 6.3). In addition, the effects were greater for females than for males. This result offers support for hypothesis 5.3 insofar as the relation of gender on mastery is mediated by the social concern factor.

Finally, there is no support for the hypothesis that the effects of location on the mastery factor will be mediated by the social concern factor. There was no other support for hypothesis 5.3.

FIGURE 6.3. SIGNIFICANT PATHS FOR THE SOCIO-CULTURAL VARIABLES ON THE ACHIEVEMENT GOALS MEDIATED BY THE SCHOOL MEASURES OF ACHIEVEMENT AND SOCIAL GOALS

Legend: Mediation effects of school measures of achievement

Mediation effects of the social goals



SUMMARY AND CONCLUSION

The results presented in this chapter add to the literature concerning Navajo high school students' school achievement motivation from the perspective of comparing non-traditional with near traditional and male and female Navajo high school students. To a lesser extent, they also add to the literature comparing Navajo high school students' achievement motivation characteristics with those found in mainstream schools.

The findings concerning non-traditional and near traditional differences are interesting in that on the language and location measures non-traditional and near traditional students are more similar than dissimilar. To begin with, the only differences detected concerning school measures of achievement were that English speakers were more likely than Navajo speakers to be absent from school. In addition to this, female students were more likely than male students to score higher on GPA. The finding concerning gender differences is consistent with that reported by Anderman and Anderman (1999).

Concerning the social goals and the achievement goals, no gender differences were detected for the social approval goal. Yet, Anderman and Alderman (1999) reported gender differences with males more likely than females to emphasize this goal. However, the findings concerning the social concern goal were consistent with those of Anderman and Anderman (1999) with females more likely than males to emphasize social concern. Further, like Anderman and Anderman (1999), males were more likely than females to emphasize an approach goal and there were no gender differences concerning the mastery goal. Notwithstanding that Anderman and Anderman (1999) evaluated 5th and 6th grade students whereas my study was concerned with Navajo high school students, there is remarkable similarity of achievement characteristics between the two studies. Further weight is added to this position when consideration is given to the finding that there were no language or location differences for the mastery and performance approach and avoidance factors. Indeed, despite the finding of significant differences for language on concern and for location on approval, the mean differences are comparatively small (see Appendix C.) suggesting that the differences may not be of practical significance

The findings also add to the literature generally in terms of the relations of social goals with students' school achievement goals. Anderman and Anderman (1999) found that students perceive different social goals as related to qualitatively different goal orientations (achievement goals). In my study, after controlling for the other factors in the model, the results suggest direct relations between social concern and a mastery goal and between social approval and an approach goal. These findings are consistent with previous research (e.g. Anderman & Anderman, 1999). I interpret this finding as

suggesting that the relations of students' social goals with their school achievement goals may be similar across cultural divides.

An interesting finding concerned the relationship of the social approval factor and the performance avoidance factor. I had expected a negative relationship and instead I found a positive relationship. One interpretation of this finding could be that students who are low on avoidance have little concern for social approval. Another interpretation could be, that in the face of praise for good work, students who are avoidance oriented become more avoidance oriented. That is, they adopt a "rest on one's laurels attitude" to avoid future embarrassment from appearing unable. In either event, the finding is interesting and warrants further exploration that is beyond the scope of the present research.

It is believed that Navajo students' social values are inconsistent with those espoused by schools (e.g. Deyhle, 1995). The findings concerning the relations of the school measures of achievement and the social goals tend to be consistent with this belief. For example, neither absence nor GPA was related to either of the social goals. This finding is generally inconsistent with the findings reported by Anderman and Anderman (1999). There are important implications of this finding insofar as it suggests that schools and teachers, in terms of school measures of achievement, may not map school processes onto Navajo high school students' social values.

It seems that in terms of language and location, school measures of achievement are irrelevant. The only relevance seems to be associated with gender. For example, I found that concerning the relations of the socio-cultural variables on the achievement goals GPA mediated gender only on mastery and avoidance. There were no other mediating effects of the school measures of achievement on the achievement goals.

It also appears that social approval is irrelevant in terms of language and living location. There were no mediating effects of social approval on the achievement goals for any of the socio-cultural variables. However, I found that the relations of language and gender on mastery were completely mediated by the social concern factor. In the absence of direct relations of language or gender groups on the achievement goals, these mediation effects highlight the importance of Navajo high school students' social goals. This suggests that Navajo high school students' social goals are an important influence on the school achievement goals they emphasize.

This chapter also demonstrates, first, the utility of Pavel and Padilla (1993) position that there is much to be gained by using mainstream models to understand better education and school achievement motivation among American Indian students. Second, although the mediation effects are weak, it supports Pintrich (2000) advocacy for the use of a mediation model to understand better achievement motivation.

CONCLUSION

It is clear from the findings that a simple contrasting of Navajo high school students' achievement motivation on cultural lines is insufficient to explain Navajo student's academic achievement and school achievement motivation. Clearly there are subtleties at work that require further research to better understand why Navajo students relatively underachieve at school compared to the general population, and why some students, irrespective of how close they are to, or distant from, their Navajo traditions, do well at school while others do relatively poorly.

CHAPTER 7

A MODEL OF SCHOOL ACHIEVEMENT MOTIVATION: THE CASE FOR ACHIEVEMENT VALUES

INTRODUCTION

The emphasis in this chapter shifts from Navajo high school students' school measures of achievement and their social goals to their school achievement values. Expectancy-value theorists hold that students' school achievement values influence choice, persistence and performance (Wigfield, 1994; Wigfield & Eccles, 2000) and Pintrich, Marx, and Boyle (1993) posit that these school achievement values influence students' school achievement goals. The school achievement value examined in this chapter is the personal value of school. This construct is similar to Wigfield and Eccles (2000) construct of importance. The reader will recall that in Chapter 5 I collapsed the utility value of school into the mastery factor. Thus, I do not directly examine the utility value of school construct in this chapter. Further, the collapsing of these two factors suggests that more work is required to construct a scale that distinguishes between the mastery and utility value constructs.

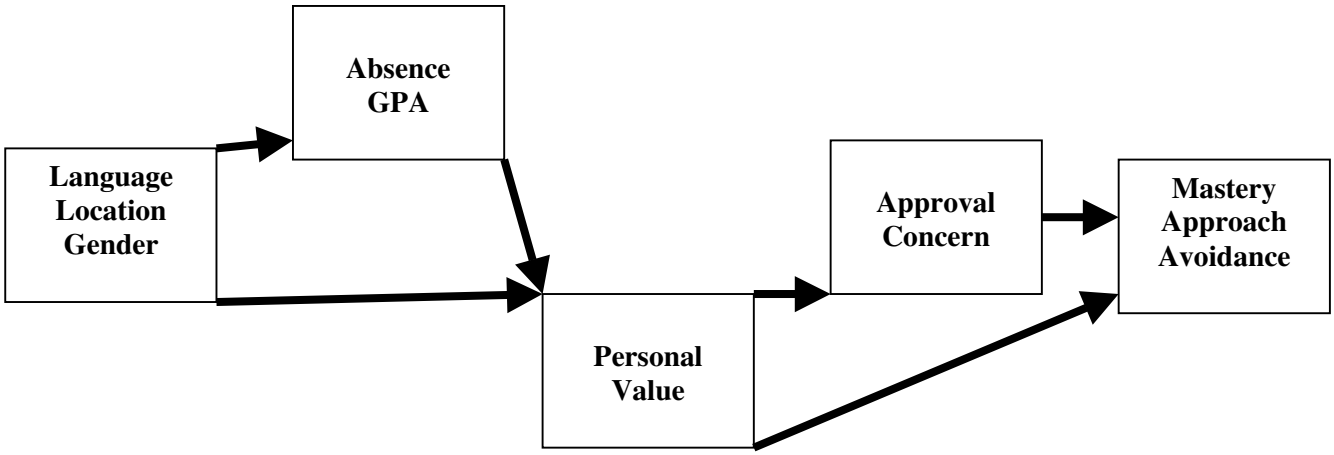
In this chapter I progress the description of Navajo high school students' school achievement motivation by examining the indirect relations of the three socio-cultural variables on students' achievement goals mediated by students' personal value of school. In addition, I examine the indirect relations of the socio-cultural variables on the personal value of school mediated by the two school measures of achievement. I also examine the indirect relations of students' personal value of school on the three achievement goals mediated by the social goal factors. Figure 7.1 diagrammatically depicts these relations. Finally, I report the difference in scores of the personal value of school factor for the three socio-cultural variables.

AMERICAN INDIAN STUDENTS AND ACHIEVEMENT VALUES

Literature regarding American Indian students consistently reflects the idea that underachievement among many American Indian students is related to factors such as personal value of school. This underachievement is often understood in terms of stereotypical

cultural, gender, and location differences (Deyhle & Swisher, 1997; Vadas, 1995). The literature also offers differential socialization processes as the explanation for different achievement outcomes between Navajos who speak English at home and those who speak Navajo, between Navajo male and female students, and between Navajo students living in town locations and those living in rural locations (e.g. Deyhle, 1995, Deyhle & Swisher, 1997; Vadas, 1995).

FIGURE 7.1. DIAGRAMMATIC REPRESENTATION OF THE RELATIONS OF FACTORS EXAMINED IN THIS CHAPTER



Many believe that American Indian students may not personally value school because of being made aware of their parents bad school experience and internalizing these negative attitudes (Chrisjohn, Towson, & Peters, 1988). In addition, Deyhle & Swisher (1997) point out that many American Indian students are socialized to believe that school activities are not the Indian way (Deyhle, 1995; Deyhle & Swisher, 1997). Cleary & Peacock (1998) add that within the school itself there are many American Indian teachers who have experienced the "bad times" of education. It seems most unlikely that American Indian students do not also internalize teacher negative attitudes to school.

On the other hand, it is apparent, from activities such as the Navajo radio station, that there is a conscious effort to extend the use of Navajo language among the Navajo and with this strengthen cultural identity. The current (2000) President of the Diné College at Tsaile Arizona reflects this attitude to maintaining or strengthening the Navajo cultural identity in the following statements:

> "As the first tribal college in the nation, Diné College is a unique institution of higher learning because it has a bicultural education mission. We combine Navajo language, history, culture, and philosophy with traditional Western disciplines."

And

> " One of our great leaders, Chief Manuelito, is well known for his belief in and dedication to encouraging his children and grandchildren to climb the 'ladder of education'. From that vantage point, our Diné people would help themselves and the Navajo Nation."

Tsaile College Home Page (2000). (http://crystal.ncc.cc.nm.us/Admin/nccpres.html)

The Tsaile College President's statements reflect the belief that there are linkages between social identity and the value of education for the individual. This position tends to support the social identity hypothesis (see Chapter 3). The reader will recall that for expectancy-value theorists, goals may be short or long term. Further these goals (e.g. GPA) are believed to influence students' school achievement values (Wigfield & Eccles, 2000). Thus, the relation of these students' goals with choice, persistence, and achievement is indirect through students' school achievement values. Pintrich, et al (1993) posits that students' school achievement values influenced their school achievement goals. Hence, I would expect students' personal value beliefs to influence their school achievement goals.

Concerning gender, the evidence suggests that it is females more so than males who see achievement value in school. This is particularly so for the personal value of school and such a finding would be consistent with Eccles (1987) and Vadas (1995) results. Yet, an inspection of the numbers provided in Table 4.3 in Chapter 4 reveals that the education experience for mothers and fathers are broadly similar.

Both Vadas (1995) and Deyhle and Swisher (1997) posit a number of factors as explanations for achievement differences related to living location. The most prominent of these is that the combination of a herdsman's lifestyle and poverty means that many Navajo students leave school as soon as possible in order to help at home. This suggests where one lives influences school achievement values. An inspection of Table 4.3 in Chapter 4 is again useful in this context. There are more student responses for the unemployment/NA category among mothers in rural areas than among mothers in town areas. Added to this, there are fewer responses in the unemployment/NA category among fathers in rural locations than among fathers living in town. Yet, this is despite similar education attainment for mothers and fathers living in town and rural locations. This suggests that rural fathers are active with

farming responsibilities while mothers are concerned with traditional domestic responsibilities. This leads me to conclude that the influence of the school achievement values will differ for students living in town locations compared to rural locations. Such a finding would lend support for the location hypothesis.

PERSONAL VALUE OF SCHOOL

In Chapter 3, I defined students' personal value of school as being concerned with the attainment value of school in terms of the importance of the activity relative to an individual's core personal values (Eccles & Wigfield, 1995; Wigfield, 1994. See also Feather, 1982; Eccles, Adler, Futterrman, Goff, Kaczala, Meece, & Midgley, 1983). Such a core personal value could be the importance to the student of completing high school. I operationalized the personal value of school construct with items that reflect completing high school is of personal value (see Appendix B.). For example, in describing myself as the sort of person who would complete high school I am making a statement that implies the personal value of school for me.

PERSONAL VALUE OF SCHOOL AND SCHOOL MEASURES OF ACHIEVEMENT

Wigfield and Eccles (2000) model of achievement motivation suggests that short & long term target goals, such as school measures of achievement, influence students' achievement values. Earlier I pointed out that it is believed Navajo students hold negative attitudes about school such that they do not personally value school (Chrisjohn, et al, 1988). Seen from this perspective it would seem that for Navajo high school students there would be no relations, or at best, negative relations between school measures of achievement and Navajo high school students' achievement values. In the present research, an inspection of the correlation matrix for the hypothesized model of school achievement motivation is consistent with this position (see Table 7.1). The position I adopt in this part of the present research is that it is one thing to personally value school. It is quite another thing to value school achievement as represented by school measures of achievement. Hence, it seems unlikely that for Navajo high school students school measures of achievement relate to their personal value of school, or at best, there is a negative relationship.

PERSONAL VALUE OF SCHOOL AND SOCIAL GOALS

There is little to guide me concerning the relations of Navajo high school students' personal value of school and their social goals. However, generally, I would expect there to be relations between students' personal value of school and their social goals. In this respect I

rely on the work of Bempechat, Graham, and Jimenez (1999; See Chapters 3 & 6) to infer a relationship between personal value of school and social approval. Further, Deyhle (1989) points out in her research that American Indian parents want their children to do well at school. Following from this, I believe the relations of Navajo high school students' personal value of school and social approval may be affected by this parental attitude The correlations obtained between these two factors for the 13-factor model of school achievement motivation also tends to support this position (see Table 7.1). Note that for the sake of convenience I have reproduced the correlation matrix from Chapter 5 as Table 7.1.

I also expect there to be relations between personal value of school and social concern. I arrive at this position through reports that the Navajo value co-operative behavior and that this valuing extends to school environment (Deyhle, 1995; Deyhle & Swisher, 1997). In addition, as with the relations of personal value of school and social approval, I am again guided by the correlations between personal value of school and social concern.

The reader should be aware that in inferring these relations I am conscious of the fact that one could equally argue for no relations between these dimensions (see Chapter 2). What I have presented here reflects a position that is influenced by the results obtained in Chapter 5 (see Table 7.1).

PERSONAL VALUE OF SCHOOL AND ACHIEVEMENT GOALS

There has been little research regarding the relationship of achievement values with mastery and performance goals. In Chapter 5, I drew attention to the relationship of mastery and utility. I concluded that in the present research the evidence suggested that these two factors could not be distinguished. However, concerning the relations of personal value of school and the achievement goals, Pintrich, et al, (1993) have posited constructs similar to personal value of school (importance) as influencing mastery and performance goals (see Chapter 3). In Chapter 2 I wrote that American Indians value privately mastering a behavior and publicly demonstrating their competence. I contrasted this with the values associated with school learning. That is, mistakes and the public critique of them is valued. If Navajo high school students have adapted to the school environment, then one would expect to find relations between their personal value of school and their achievement goals. The converse would be the case if Navajo high school students have not adapted to the school environment. The evidence of the present research suggests that the former is the case as the correlations between personal value of school, mastery, and approach are significant (See Table 7.1).

The specific research questions addressed in the present chapter are:

1. Are there socio-cultural differences in terms of students' personal value of school?

2. Do the school measures of achievement mediate the effects of the socio-cultural variables on the personal value of school (see Figure 7.1)?

3. Do the social goals mediate the effects of students' personal value of school on their achievement goals (see Figure 7.1)?

4. Does the personal value of school mediate the effects of the socio-cultural variables on the school achievement goals (see Figure 7.1)?

For details associated with the METHOD section concerning participants, administration, instrumentation and scales see Chapter 4. I now turn to the statistical analyses and hypotheses used in the present research.

TABLE 7.1. FACTOR CORRELATIONS FOR THE 13-FACTOR MODEL – MASTERY AND UTILITY COLLAPSED INTO A SINGLE FACTOR.

	Language	Location	Gender	Absence	GPA	Persval
Language	1.00					
Location	-0.26**	1.00				
Gender	-0.09*	0.01	1.00			
Absence	-0.14**	0.02	0.07	1.00		
GPA	0.08	-0.11**	0.14**	-0.41**	1.00	
Persval	0.07	-0.03	0.12**	0.00	0.07	1.00
Sure	0.08	-0.04	-0.04	-0.27**	0.32**	0.26**
Unsure	0.06	0.01	0.21**	0.18**	-0.25**	0.06
Approval	0.05	0.12**	0.07	-0.04	-0.02	0.14**
Concern	0.15**	0.00	0.32**	-0.07	0.18**	0.42**
Mastery	0.18**	-0.06	0.13**	-0.11**	0.24**	0.48**
Approach	0.05	0.04	-0.31**	-0.06	0.01	0.17**
Avoidance	-0.04	0.11*	-0.18**	0.15**	-0.36**	-0.05

	Sure	Unsure	Approval	Concern	Mastery	Approach
Sure	1.00					
Unsure	-0.47**	1.00				
Approval	0.30**	0.19**	1.00			
Concern	0.39**	-0.01	0.33**	1.00		
Mastery	0.64**	0.06	0.41**	0.54**	1.00	
Approach	0.30**	0.07	0.65**	0.14**	0.38**	1.00
Avoidance	-0.33**	0.55**	0.20**	-0.12*	-0.21**	0.13*

	Avoidance
Avoidance	1.00

Note ** = P < 0.01
* = P < 0.05

STATISTICAL ANALYSES

THE STATISTICAL STRATEGY AND HYPOTHESES USED IN THE PRESENT CHAPTER

The model used in the present chapter for the examination of the research questions is the 13-factor model of school achievement motivation validated in Chapter 5. In Chapter 5 I established the structural validity of this model and that the model was invariant for the socio-cultural variables used in the present chapter. Because the model is invariant I am able to use a single model comprising all the participants to examine the relations of the factors of interest to the present chapter (e.g. Marsh, 1993).

In Chapter 6 particular emphasis is given to the relations of the socio-cultural variables, the school measures of achievement, the social goals and the achievement goals. In this chapter, I include the personal value of school in the examination of relations. In Chapter 4 I described the statistical strategy of decomposing factor correlations to examine the relations of the factors. The path model described in Chapter 4 was again used for this purpose. To facilitate the presentation of the results I present in diagrammatic form the hypothesized relations of factors relevant to the present chapter (see Figure 7.1). I use the following hypotheses to guide the examination of the research questions:

1. **Personal value of school.** Chrisjohn, et al (1988; see also Deyhle, 1995; Deyhle & Swisher, 1997) suggest that American Indian students have a negative attitude toward school. Hence, it is hypothesized that non-traditional (language and location) Navajo students will score higher on personal value of school than will near traditional. Concerning gender, findings seem to suggest that it is females more so than males who see achievement value in school (Eccles 1987; Vadas 1995). Hence it is hypothesized that female students will score higher on the personal value of school than male students.

2. **Indirect effects of the socio-cultural variables on the personal value of school mediated by school measures of achievement**. In the introduction to this chapter I pointed out that Navajo students may hold negative attitudes about school such that they do not personally value school (Chrisjohn, et al, 1988). I argued that in such circumstances it is unlikely that there will be a positive relationship between Navajo students school measures of achievement and personal value of school. Hence, it is hypothesized that the relations of the socio-cultural variables on the personal value of school will not be mediated by the school measures of achievement.

3. **Indirect effects of the personal value of school on the achievement goals mediated by the social goal factors**. In the introduction to this chapter, I argued that there are grounds to infer relations between Navajo students' personal value of school and social approval and concern. In the following hypotheses, I follow Anderman and Anderman (1999) and the results obtained in Chapter 6 concerning the relations of the two social goal factors on the three achievement goal factors. That is social approval will be related to approach only and concern will be related to mastery only. Hence, it is hypothesized that the relations of personal value of school on the achievement goals will be mediated by approval on approach and on mastery by concern.

4. **Indirect effects of the socio-cultural variables on students' achievement goal factors mediated by the personal value of school factor.** In the introduction to this chapter, I argued that the relationship of Navajo students' personal value of school with school achievement goals could be seen as positive or negative. Guided by the correlation results between these factors I concluded that the former relationship was most likely the case. Hence, it is hypothesized that there will be indirect effects of the socio-cultural variables on the three achievement goals mediated by personal value of school.

RESULTS

I present the results in four sub-sections. The focus of the first sub-section relates to hypothesis 1. I present these in terms of the direct effects table reported in Chapter 6. For convenience, I reproduce that table as Table 7.2. The reader should note that for language Navajo speakers are coded 0 while English speakers are coded 1; for location town is coded 0 while rural is coded 1; and for gender males are coded 0 while females are coded 1. The second, third, and fourth sub-sections present the results in terms of hypothesis 2, 3, and 4. To address these hypotheses the mediation model is examined emphasizing the relevant total, indirect, and direct effects in the hypothesized model of school achievement motivation. I begin by presenting the significant differences in the hypothesized model of school achievement motivation in terms of socio-cultural variables and the personal value of school factor.

THE RESULTS FOR HYPOTHESIS 1: DIFFERENCES BETWEEN NAVAJO HIGH SCHOOL STUDENTS PERSONAL VALUE OF SCHOOL FOR THE THREE SOCIO-CULTURAL VARIABLES

LANGUAGE.

The relations between language and personal value of school is non-significant (see Table 7.2). Thus the hypothesis that non-traditional Navajo students would score higher than near traditional Navajo students on personal value of school is not supported.

LOCATION.

The relations between location and personal value of school is non-significant (see Table 7.2). Thus the hypothesis that non-traditional Navajo students would score higher than near traditional Navajo students on personal value of school is not supported.

GENDER.

Female students scored higher on personal value of school than did male students with a path coefficient of 0.11, $p < 0.05$ (see Table 7.2). Thus, the hypothesis that female students score higher than male students on GPA is supported.

TABLE 7.2. STANDARDIZED DIRECT EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	-0.14**	-0.02	0.06	- -	- -	- -
GPA	0.01	-0.10**	0.17**	-0.42**	- -	- -
Persval	0.08	-0.01	0.11*	0.03	0.06	- -
Sure	0.03	0.00	-0.06	-0.16**	0.26**	- -
Unsure	0.11*	0.01	0.25**	0.07	-0.26**	- -
Approval	0.02	0.14**	0.01	0.01	-0.07	-0.01
Concern	0.14**	0.06	0.29**	0.03	0.04	0.28**
Mastery	0.07	0.00	-0.01	0.07	0.10*	0.20**

Approach	-0.03	-0.03	-0.38**	0.02	0.08
0.11					
Avoidance	-0.07	0.04	-0.27**	-0.02	-0.17**
-0.04					

Approach	Sure	Unsure	Approval	Concern	Mastery
Approval	0.53**	0.42**	- -	- -	- -
- -					
Concern	0.36**	0.08	- -	- -	- -
- -					
Mastery	0.66**	0.35**	0.06	0.16*	- -
- -					
Approach	0.10	0.08	0.64**	-0.04	- -
- -					
Avoidance	-0.08	0.51**	0.14*	0.00	- -
- -					

Note ** = P < 0.01
* = P < 0.05

FOR MEDIATION EFFECTS TO HOLD

The results reported in the following sub-sections are for the hypothesized path model of school achievement motivation (see Figure 7.1). In presenting these results, I emphasize the total effects (see Table 7.3) the indirect effects (see Table 7.4) and the direct effects (see Table 7.2). For mediation effects to hold there must be:

1. Significant total effects of the independent variable on the dependent variable;
2. Significant indirect effects of the independent variable on the dependent variable;
3. Significant direct effects of the independent variable on the mediating variable; and
4. Significant direct effects of the mediating variable on the dependent variable (Baron & Kenny, 1988).

RESULTS FOR HYPOTHESIS 2: THE INDIRECT EFFECTS OF THE SOCIO-CULTURAL VARIABLES ON THE PERSONAL VALUE OF SCHOOL FACTOR MEDIATED BY THE SCHOOL MEASURES OF ACHIEVEMENT FACTORS

It was hypothesized that the relations of the socio-cultural variables on the personal value of school would not be mediated by the school measures of achievement. There were significant total effects of gender on personal value of school with a path coefficient of 0.12, $p < 0.05$ (see Table 7.3). However, the indirect effects of the socio-cultural variables on personal

value of school are non-significant (see Table 7.3). Hence, this offers support for hypothesis 2 that the relations of the socio-cultural variables on the personal value of school are not mediated by the school measures of achievement.

THE RESULTS FOR HYPOTHESIS 3: THE INDIRECT EFFECTS OF THE PERSONAL VALUE OF SCHOOL FACTOR ON STUDENTS' SCHOOL ACHIEVEMENT GOAL FACTORS MEDIATED BY THE SOCIAL GOAL FACTORS

It was hypothesized that the relations of personal value of school on the achievement goals would be mediated by approval on approach and on mastery by concern. The significant total effects of language on mastery and gender on mastery, approach, and avoidance were reported in Chapter 6 (see Table 7.3). The effects of personal value of school on mastery are partially mediated by the social concern factor with a path coefficient of 0.28, $\underline{p} < 0.01$ from personal value of school to concern and from concern to mastery with a path coefficient of 0.20, $\underline{p} < 0.01$ (see Table 7.4). The direct effects of personal value of school on mastery were significant with a path coefficient of 0.20, $\underline{p} < 0.01$ (see Tables 7.2 & 7.3). This result offers support for hypothesis 3 to the extent of the social concern factor only. There were no mediating effects of the social approval factor or of either of the social goal factors on the approach and avoidance achievement goal factors. Figure 7.2 diagrammatically presents the significant results.

THE RESULTS FOR HYPOTHESIS 4: THE INDIRECT EFFECTS OF THE SOCIO-CULTURAL VARIABLES ON THE ACHIEVEMENT GOAL FACTORS MEDIATED BY THE PERSONAL VALUE OF SCHOOL FACTOR

It was hypothesized that there would be indirect effects of the socio-cultural variables on the three achievement goals mediated by personal value of school. The effects of gender on mastery are completely mediated by the personal value of school factor with a path coefficient of 0.11, $\underline{p} < 0.05$ from gender to personal value of school and a path coefficient of 0.20, $\underline{p} < 0.01$ from personal value of school to mastery (see Table 7.4). The effects are greater for females than for males. This offers support for hypothesis 4 insofar as the relation of gender on mastery was mediated by the personal value of school factor. There were no relations of language and location on either approach of avoidance mediated by the personal value of school factor (see Figure 7.2).

TABLE 7.3. STANDARDIZED TOTAL EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	-0.14**	-0.02	0.06	- -	- -	- -
GPA	0.07	-0.09*	0.15**	-0.42**	- -	- -
Persval	0.08	-0.02	0.12*	0.01	0.06	- -
Sure	0.07	-0.03	-0.04	-0.27**	0.26**	- -
Unsure	0.09	0.03	0.21**	0.18**	-0.26**	- -
Approval	0.09	0.15**	0.07	-0.03	-0.04	-0.01
Concern	0.19**	0.05	0.33**	-0.07	0.12*	0.28**
Mastery	0.20**	-0.01	0.15**	-0.09*	0.21**	0.25**
Approach	0.04	0.06	-0.31**	-0.03	0.06	0.09
Avoidance	-0.03	0.10	-0.18**	0.16**	-0.33**	-0.04

	Sure	Unsure	Approval	Concern	Mastery	Approach
Approval	0.53**	0.42**	- -	- -	- -	- -
Concern	0.36**	0.08	- -	- -	- -	- -
Mastery	0.75**	0.39**	0.06	0.16**	- -	- -
Approach	0.42**	0.34**	0.64**	-0.04	- -	- -
Avoidance	0.00	0.57**	0.14**	0.00	- -	- -

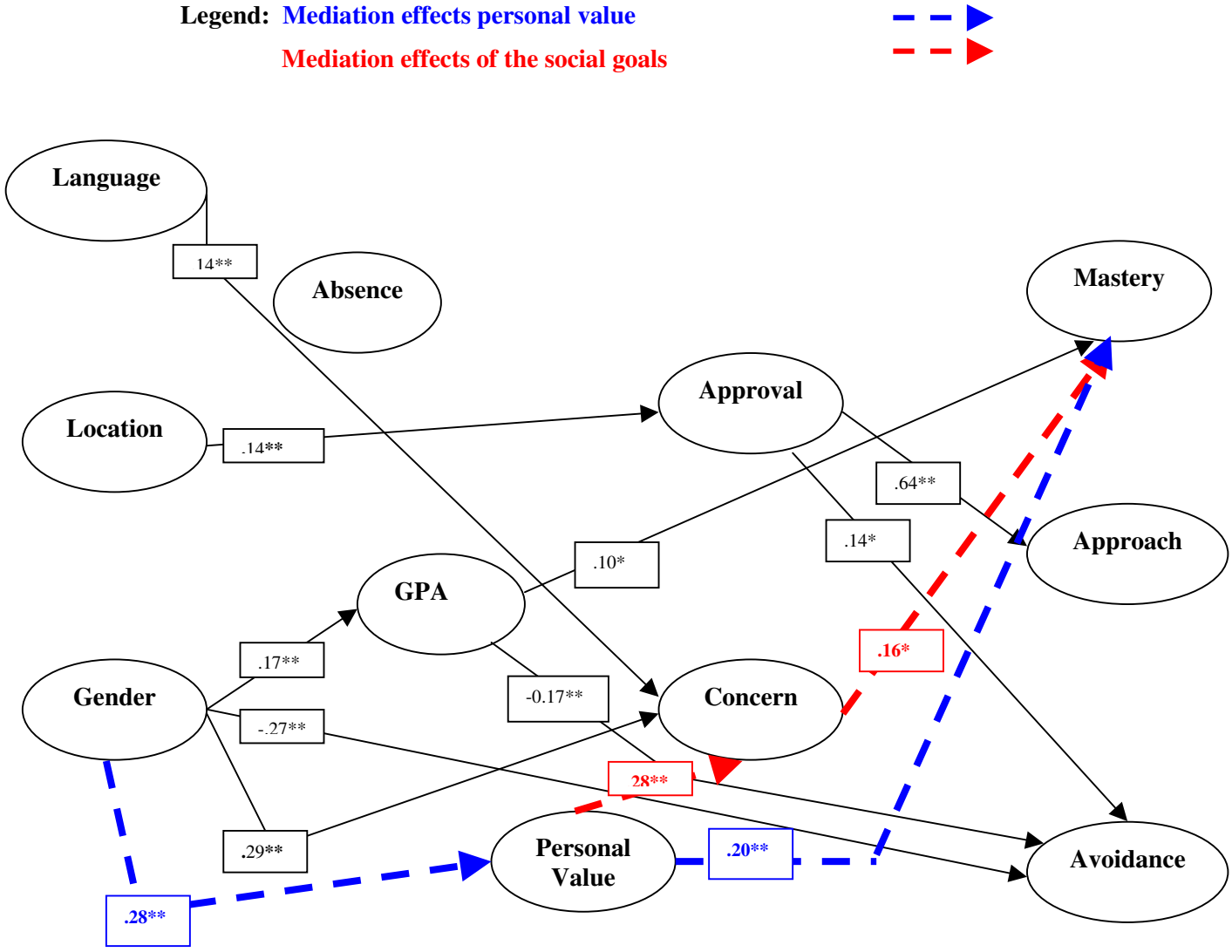
Note ** = P < 0.01
* = P < 0.05

TABLE 7.4. STANDARDIZED INDIRECT EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION.

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	- -	- -	- -	- -	- -	- -
GPA	0.06**	0.01	-0.02	- -	- -	- -
Persval	0.00	-0.01	0.01	-0.02	- -	- -
Sure	0.04*	-0.02	0.03	-0.11**	- -	- -
Unsure	-0.03	0.02	-0.03*	0.11**	- -	- -
Approval	0.07*	0.01	0.06	-0.04	0.03	- -
Concern	0.05	-0.01	0.05	-0.09**	0.09**	- -
Mastery	0.13**	0.00	0.15**	-0.16**	0.11*	0.04*
Approach	0.08*	0.08*	0.07	-0.06	-0.02	-0.02
Avoidance	0.04	0.06	0.09*	0.18**	-0.16**	0.00

	Sure	Unsure	Approval	Concern	Mastery	Approach
Mastery	0.09*	0.04	- -	- -	- -	- -
Approach	0.32**	0.26**	- -	- -	- -	- -
Avoidance	0.08	0.06	- -	- -	- -	- -

FIGURE 7.2. SIGNIFICANT PATHS FOR THE SOCIO-CULTURAL VARIABLES ON THE ACHIEVEMENT GOALS MEDIATED BY THE PERSONAL VALUE AND THE PERSONAL VALUE ON THE ACHIEVEMENT GOALS MEDIATED BY THE SOCIAL GOALS



SUMMARY AND CONCLUSION

The results presented in this chapter add further to a description of school achievement motivation among Navajo high school students. Particularly interesting in this respect was that there were no differences on the language and location variables for the personal value of school factor and with this that neither language nor location were mediated by the personal value of school. This seems to suggest that there are no differences between non-traditional and near traditional Navajo high school students concerning their personal value of school.

There were differences concerning the gender variable with females more likely than males to score higher on the personal value of school factor. In addition, personal value of school mediated the effects of gender on the mastery factor only. However, perhaps a more interesting finding was that the school measures of achievement were not related to personal value of school and personal value of school was not related to either approach or avoidance. These findings seem to be consistent with the assertions of Deyhle (1995) and with Chrisjohn et al, (1988) that American Indian students entertain negative attitudes towards school. However, contrary findings were the positive relations between personal value of school and mastery. This finding, combined with the finding that the effect of personal value of school on mastery was mediated by social concern might present teaching opportunities for school and teachers. However, it should be noted that the relations of social concern with mastery are weak.

From the theoretical standpoint of Wigfield and Eccles (2000) model of achievement motivation and the relations of target goals and achievement values the findings in the present chapter do not support their model that target goals such as school measures of achievement are related to achievement values. At least in terms of students' personal value of school. However, this finding may reflect cultural differences and to this end is worth investigating with non-American Native students for comparative purposes. Further, it should be borne in mind that the other achievement value used in the present research was collapsed into the mastery factor.

CONCLUSION

It seems clear from the findings in this chapter that personal value of school is important to Navajo high school students in terms of it relations with a mastery goal and that it is more important to females than to males. In addition, there are implications for teachers in encouraging students to personally value school in a socially concerned context (co-operative learning structures).

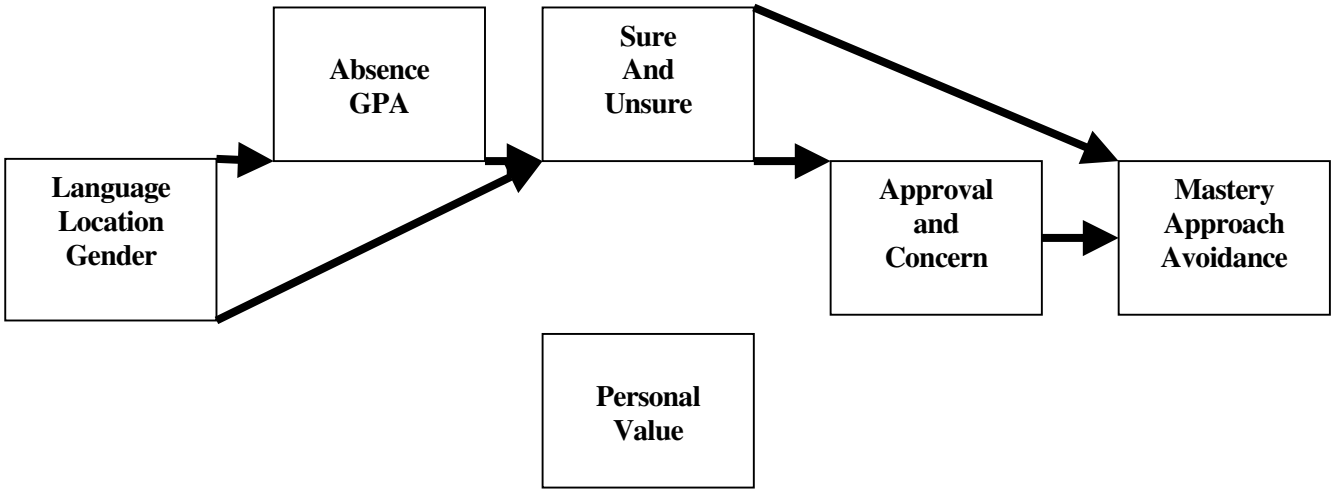
CHAPTER 8

A MODEL OF SCHOOL ACHIEVEMENT MOTIVATION: THE CASE FOR ABILITY BELIEFS

INTRODUCTION

In this chapter I emphasize Navajo high school students' ability beliefs. I progress the description of Navajo high school students' school achievement motivation by examining the indirect effects of the three socio-cultural variables on students' school achievement goals mediated by their ability beliefs and the indirect effects of the socio-cultural variables on students' ability beliefs mediated by school measures of achievement. I also examine the indirect effects of the school measures of achievement on the students' achievement goals mediated by students' ability beliefs and the indirect effects of students' ability beliefs on the three achievement goals mediated by their social goals. Figure 8.1 presents these hypothesized relations in diagrammatic form.

FIGURE 8.1. DIAGRAMMATIC REPRESENTATION OF THE RELATIONS OF FACTORS EXAMINED IN THIS CHAPTER



NAVAJO HIGH SCHOOL STUDENTS AND STEREOTYPE THREAT

The anxiety associated with knowing that one is a potential target of prejudice and stereotypes is much discussed in the social sciences (e.g. Allport, 1954; Goffman 1963; Steele & Aronson, 1995; Steele, 1997). Steele (1990) in an essay presented a concept he referred to as racial

vulnerability. Steele (1990) argued that after a lifetime of exposure to society's negative images about their ability these students are likely to internalize an inferiority anxiety. In turn this anxiety may lead to adaptations symptomatic of avoidance. Steele and Aronson (1995) in an experimental study focussed on the immediate situational threat that derives from widely held beliefs about one's group. Their concern was for the threat to individuals who are judged and treated according to the stereotype or self-fulfilling the stereotype. According to Steele and Aronson (1995) the individual need not even believe the stereotype. The individual need only know that the stereotype is relevant to the context. For example, it is widely believed that American Indians underachieve at school (e.g. Deyhle, 1995; James, Chavez, Beauvais, Edwards, & Oetting, 1995; Pavel, Curtin, & Whittener, 1997). Hence it follows that for American Indians students, including Navajo high school students, stereotype threat is relevant in the school context.

The conclusion Steele and Aronson (1995) reached was that students, such as Navajo high school students, who were at risk of stereotype threat were inefficient at academic tasks much like students who experience test anxiety and competition anxiety (e.g. Sarason, 1972; Wine, 1971). That is they concluded that stereotype threat led students to try hard (effort) but with impaired efficiency. They argued that the anxiety associated with stereotype threat was additional to that generally associated with test anxiety or competition anxiety. Steele & Aronson (1995) speculated that in real-life situations that as achievement falters and this underachievement is defined in terms of stereotypes, individuals' expectations about their ability might decrease. That is they may become less confident in their abilities. Further, they argued, lower expectations can further undermine achievement by undermining motivation and effort (e.g. Bandura, 1977; Bandura, 1986). In addition, they suggest that this process of stereotype threat may eventually lead students to no longer identify with schoolwork and adopt behaviors that have the effect of avoiding academic engagement. Importantly for the present research Steele (1997) posits that this situation may result in what he terms is a disidentification with school.

In the present chapter, following the findings of Vadas (1995), it is believed that stereotype threat is more associated with Navajo high school students who speak Navajo at home than those who speak English at home and more associated with those who live in rural locations than those who live in town (see Chapter 2). Concerning females, Steele (1997) posits stereotype threat is linked to female mathematics achievement. Vadas, (1995) suggests that the traditional Navajo female role is less impacted by identification with school than is the traditional Navajo male role. Hence it would seem that with regard to the present research it is more likely to be males than females who experience stereotype threat.

SCHOOL ABILITY BELIEFS AND ACHIEVEMENT GOALS

Research concerning school ability beliefs generally assumes that a single continuous variable is sufficient to inform us of its effect on learning. There seems to be agreement among researchers that ability beliefs positively covary with mastery goals (e.g. Anderman & Young, 1994; Midgley & Urdan, 1995; Schunk, 1996). Urdan (1997) posits linkages between students' ability beliefs and their choice of performance approach goal (trying to appear able) or a performance avoidance goal (trying to avoid appearing unable). Recently the focus of research has emphasized the relations of ability beliefs and performance approach and avoidance goals (e.g. Middleton, Kaplan, & Midgley, 1998). In this respect there are contrary findings suggesting that there are positive, negative and no relations between students ability beliefs and performance approach and performance avoidance goals (e.g. Anderman & Young, 1994; Middleton & Midgley, 1997; Middleton, et, al, 1998; Midgley & Urdan, 1995; Skaalvik, 1997). Hence, in the present research it is believed, analogous to the partitioning of performance goals into performance approach and performance avoidance goals, partitioning school ability beliefs into sure and unsure ability beliefs is of heuristic value. Following Steele and Aronson (1995) sure and unsure ability beliefs should be related to the three achievement goals. An inspection of the 13-factor correlation matrix (see Table 8.1) suggests these relations remain true for sure ability beliefs. However, at best the relations between unsure and mastery and approach is indirect. This issue is examined in more detail in this chapter. Note that for the sake of convenience I reproduce the correlation matrix from Chapter 5 as Table 8.1.

SCHOOL ABILITY BELIEFS AND SOCIAL GOALS

There is a dearth of literature concerning students' ability beliefs and social goals. However, social approval could have different consequences for students such as encouraging or discouraging academic ability related beliefs (Urdan & Maehr, 1995). Recent research suggests social approval may decrease as students succeed and increase with underachievement (Bempechat, Graham, & Jimenez, 1999; see also Meece, Blumenfeld, & Hoyle, 1988). Bempechat, et al (1999) investigated the questions: "a) Are there ethnic differences in children's perceptions of their parents' educational socialization processes? And, is the relationship between educational socialization and mathematics outcome different for different ethnic groups?" The scales (Education Socialization Scale [ESS]) used by Bempechat, et al (1999) reflect students' perceptions of parental approval for academic behaviors. The same study reports that there may be culturally different parental responses in that Indo-Chinese students' lower math scores were associated with more frequent parental emphasis on the value of effort (a mastery goal) than for the other groups (Caucasian, African/American, & Latino). This leads me to speculate that social approval could be related to both sure and unsure

ability beliefs. An inspection of the 13-factor correlation matrix (see Table 8.1) reveals that there are positive correlations between the two ability belief factors and approval. Hence it appears that generally there is support for this position. Nonetheless, in the present chapter the correlations are decomposed (Pedhazur, 1997) to gain a better understanding of these relations.

There is less information in the literature concerning the relations between students' social concern and their ability beliefs. Most theorists and researchers consider that the Navajo value behaviors that are cooperative more so than behaviors that are competitive and it is believed that this priority extends to the school situation (Deyhle & Swisher, 1997; Locke, 1992; McInerney, Roche, McInerney, & Marsh, 1997). In the present research cooperation is a property of social concern. It would seem then that the more confident a student is the more likely they would be socially concerned. However, the converse might be the case in situations where students lack confidence in their abilities. Indeed, Steele and Aronson (1995) argue that one of the behaviors likely to be associated with stereotype threat is that of interfering self-consciousness or over-cautiousness. Both of these behaviors are likely to mitigate feelings of social concern. An inspection of the 13-factor school achievement correlation matrix (see Table 8.1), in which sure ability belief is correlated with social concern while unsure ability beliefs is not, tends to support this theorizing.

SCHOOL MEASURES OF ACHIEVEMENT AND STUDENTS' ABILITY BELIEFS

There is a considerable body of theory and research that demonstrates relations between students' achievement and their academic self-concept such as ability beliefs (e.g. Roeser, Midgley, & Urdan 1996; Wigfield & Eccles, 2000, Zimmerman, Bandura, & Martinez-Pons, 1992). Earlier I cited Steele and Aronson (1995) as arguing that the deleterious affect of the spiraling relationship between ability beliefs and achievement was such that students may seek to disengage (see also, Aronson, Quinn, & Spencer, 1998). An inspection of the 13-factor correlation matrix suggests that the results in the present research are generally consistent with this position. This issue is also examined in the present chapter.

The specific research questions addressed in this chapter are:

1. Are there socio-cultural differences in terms of students' school ability beliefs?

2. Do students' school ability beliefs mediate the effects of the school measures of achievement on students' school achievement goals?

3. Do students' social goals mediate the effects of the students' ability beliefs on their school achievement goals?

4. Do students' ability beliefs mediate the effects of the socio-cultural variables on their school achievement goals?

5. Do students' sure ability belief relate to the three achievement goals yet only the unsure ability belief relates to the performance avoidance goal?

For details associated with the METHOD section concerning participants, administration, instrumentation and scales see Chapter 4. I now turn to the statistical analyses and hypotheses used in the present research.

TABLE 8.1. FACTOR CORRELATIONS FOR THE 13-FACTOR MODEL – MASTERY AND UTILITY COLLAPSED INTO A SINGLE FACTOR

	Language	Location	Gender	Absence	GPA	Persval
Language	1.00					
Location	-0.26**	1.00				
Gender	-0.09*	0.01	1.00			
Absence	-0.14**	0.02	0.07	1.00		
GPA	0.08	-0.11**	0.14**	-0.41**	1.00	
Persval	0.07	-0.03	0.12**	0.00	0.07	1.00
Sure	0.08	-0.04	-0.04	-0.27**	0.32**	0.26**
Unsure	0.06	0.01	0.21**	0.18**	-0.25**	0.06
Approval	0.05	0.12**	0.07	-0.04	-0.02	0.14**
Concern	0.15**	0.00	0.32**	-0.07	0.18**	0.42**
Mastery	0.18**	-0.06	0.13**	-0.11**	0.24**	0.48**
Approach	0.05	0.04	-0.31**	-0.06	0.01	0.17**
Avoidance	-0.04	0.11*	-0.18**	0.15**	-0.36**	-0.05

	Sure	Unsure	Approval	Concern	Mastery	Approach
Sure	1.00					
Unsure	-0.47**	1.00				
Approval	0.30**	0.19**	1.00			
Concern	0.39**	-0.01	0.33**	1.00		
Mastery	0.64**	0.06	0.41**	0.54**	1.00	
Approach	0.30**	0.07	0.65**	0.14**	0.38**	1.00
Avoidance	-0.33**	0.55**	0.20**	-0.12*	-0.21**	0.13*

	Avoidance
Avoidance	1.00

Note ** = P < 0.01
* = P < 0.05

STATISTICAL ANALYSES

THE STATISTICAL STRATEGY AND HYPOTHESES USED IN THE PRESENT RESEARCH

As with the previous two chapters in the present chapter the model used to examine the research questions is the 13-factor model of school achievement motivation. In Chapter 5 I established the structural validity of this model and that the model is invariant for the socio-cultural variables used in the present chapter. Because the model is invariant I am able to use a single model comprising all the participants to examine the relations of the factors of interest to the present chapter (e.g. Marsh, 1993).

In chapter 6 particular emphasis is given to the relations of the socio-cultural variables, the school measures of achievement, the social goals and the achievement goals. In chapter 7 I included students' achievement values in the analysis. In this chapter I add students' ability beliefs to the examination. In Chapter 4 I described the statistical strategy used to examine the relations of the factors. The path model described in Chapter 4 and used in Chapters 6 and 7 is again used for this purpose. The hypothesized relations of factors relevant to the present chapter are presented in Figure 8.1. The following hypotheses are used to guide the examination of the research questions:

1. **Sure and unsure ability beliefs scores.** Steele and Aronson (1995) argue that the anxiety associated with stereotype threat is additional to that associated with anxiety provoked by other aspects of schooling (e.g. test anxiety). They link this stereotype threat anxiety to students' expectations (ability beliefs). Hence in terms of the present research I do not expect the socio-cultural groups scores to differ for the sure ability factor. However, I do expect the socio-cultural group's scores to differ for the unsure ability factor and near traditional students scoring higher than non-traditional students. Hence, it is hypothesized that scores of the sure ability factor on the socio-cultural variables will not differ while it is hypothesized that scores of the unsure ability belief factor will be higher for near traditional students (Navajo speakers & rural living) and males than non-traditional traditional students (English & town living), and females.

2. **Indirect effects of the school measures of achievement on the achievement goals mediated by the ability beliefs.** Steele and Aronson (1995) speculate that there are spiraling deleterious

effects of the relations of stereotype threat, achievement, and effort (mastery). Further, in the face of these deleterious effects students may adopt behaviors the consequence of which is the avoidance of engagement. Hence, it is hypothesized that the school measures of achievement will have indirect effects on the mastery and avoidance achievement factors mediated by the sure and unsure ability belief factors.

3. **Indirect effects of the ability belief factors on the achievement goals mediated by the social goals.** Bempechat, et al (1999) and Anderman & Anderman (1999; see also Chapter 6) results concerning the relations between social approval and effort (mastery) in the first instance and research concerning the relations of ability beliefs and achievement goals (e.g. Middleton, et al, 1998; Midgley & Urdan, 1996) in the second instance raises questions concerning the relations between all these dimensions. In the following hypotheses, I follow Anderman and Anderman (1999) and the results obtained in Chapter 6 concerning the relations of the two social goal factors on the three achievement goal factors. That is social approval will be related to approach only and concern will be related to mastery only. Hence, it is hypothesized that there are indirect effects of the ability belief factors on the approach factor mediated by the approval factor and indirect effects of students' ability belief factors on mastery factor mediated by the concern factor.

4. **Indirect effects of the socio-cultural variables on the achievement goals mediated by the ability beliefs.** It is hypothesized that 1) There will be no indirect effects of the socio-cultural variables on the three achievement goal factors mediated by the sure ability belief factor. 2) There will be indirect effects of the socio-cultural variables on the three achievement goal factors mediated by the unsure ability belief factor and the effects will be greater for Navajo speakers and students living in rural areas (near traditional) and males than for English speakers and students living in town (non-traditional) and females.

5. **Direct relations of ability beliefs and mastery.** Steele and Aronson (1995) proposed that effort (mastery) and lower expectations concerning abilities Unsure ability belief) were associated with stereotype threat. Further, that stereotype threat led to adaptations symptomatic of performance avoidance. Hence it is hypothesized that there will be direct relations of sure and the unsure ability factors on the mastery factor, however, only the unsure factor will have direct relations on the performance avoidance factor.

RESULTS

I present the results in three sub-sections. The focus of the first sub-section relates to hypothesis 1. I present these in terms of the direct effects reported in Chapters 6 and 7 (see Table 8.2). The

reader should be mindful that for language Navajo speakers are coded 0 while English speakers are coded 1; for location town is coded 0 while rural is coded 1; and for gender males are coded 0 while females are coded 1. The second section presents the results in terms of hypotheses 2, 3, and 4. To address these hypotheses the hypothesized model of school achievement motivation is analyzed emphasizing the relevant indirect and direct effects (see Figure 8.1).

I begin by presenting the significant differences in the hypothesized model of school achievement motivation in terms of socio-cultural variables and the personal value of school factor.

THE RESULTS FOR HYPOTHESIS 1: DIFFERENCES BETWEEN THE THREE SOCIO-CULTURAL VARIABLES FOR THE ABILITY BELIEF FACTORS

It was hypothesized that scores of the sure ability factor for the socio-cultural variables would not differ while it was hypothesized that scores for the unsure ability belief factor would be higher for near traditional students (Navajo speakers & rural living) and males than non-traditional traditional students (English & town living), and females. The relations of language, location, and gender on sure ability beliefs was non-significant (see Table 8.2). Thus, the hypothesis that there would be no difference in the scores of the sure ability factor for language, location and gender is supported.

English speakers and females scored higher on the unsure ability belief factor than did Navajo speakers and males with path coefficients of 0.11, $p < 0.05$ and 0.25, $p < 0.01$ respectively (see Table 8.2). These findings are contrary to the hypothesis 1. The relation between location and the unsure ability belief factor was non-significant. Thus, these results do not offer support for the hypothesis that near traditional and male Navajo students would score higher on the unsure ability belief factor.

TABLE 8.2. STANDARDIZED DIRECT EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	-0.14**	-0.02	0.06	- -	- -	- -
GPA	0.01	-0.10**	0.17**	-0.42**	- -	- -

Persval	0.08	-0.01	0.11*	0.03	0.06	- -
Sure	0.03	0.00	-0.06	-0.16**	0.26**	- -
Unsure	0.11*	0.01	0.25**	0.07	-0.26**	- -
Approval	0.02	0.14**	0.01	0.01	-0.07	-0.01
Concern	0.14**	0.06	0.29**	0.03	0.04	0.28**
Mastery	0.07	0.00	-0.01	0.07	0.10*	0.20**
Approach	-0.03	-0.03	-0.38**	0.02	0.08	0.11
Avoidance	-0.07	0.04	-0.27**	-0.02	-0.17**	-0.04

	Sure	**Unsure**	**Approval**	**Concern**	**Mastery**	**Approach**
Approval	0.53**	0.42**	- -	- -	- -	- -
Concern	0.36**	0.08	- -	- -	- -	- -
Mastery	0.66**	0.35**	0.06	0.16*	- -	- -
Approach	0.10	0.08	0.64**	-0.04	- -	- -
Avoidance	-0.08	0.51**	0.14*	0.00	- -	- -

Note ** = P < 0.01
* = P < 0.05

FOR MEDIATION EFFECTS TO HOLD

The results reported in the following sub-sections are for the hypothesized path model of school achievement motivation (see Figure 8.1). In presenting these results, I emphasize the total effect (see Table 8.3) direct effects (see Table 8.2) and the indirect effects (see Table 8.4). For mediation effects to hold there must be:

1. Significant total effects of the independent variable on the dependent variable;
2. Significant indirect effects of the independent variable on the dependent variable;
3. Significant direct effects of the independent variable on the mediating variable; and
4. Significant direct effects of the mediating variable on the dependent variable (Baron & Kenny, 1988).

THE RESULTS FOR HYPOTHESIS 2: THE INDIRECT EFFECTS OF SCHOOL MEASURES OF ACHIEVEMENT ON THE MASTERY AND AVOIDANCE ACHIEVEMENT GOAL FACTORS MEDIATED BY THE SURE AND UNSURE ABILITY BELIEF FACTORS

It was hypothesized that the school measures of achievement would have indirect effects on the mastery and avoidance achievement factors mediated by sure and unsure ability belief factors. There were significant total effects of absence on mastery and avoidance with path coefficients of 0.09, $p < 0.05$, and 0.16, $p < 0.05$. There were also significant total effects o GPA on mastery and avoidance with path coefficients of 0.21, $p < 0.01$ and 0.33, $p < 0.01$ (see Table 8.3).

The effects of absence on mastery were completely mediated by the sure ability belief factor with a path coefficient of –0.16, $p < 0.01$ from absence to sure and a path coefficient of 0.66, $p < 0.01$ from sure to mastery (see Figure 8.2). There were direct effects of GPA on mastery with a path coefficient of 0.10, $p < 0.05$ (see Table 8.2). This offers partial support for hypothesis 2 insofar as the relation of absence on mastery is mediated by the sure ability belief. There was no significant path from the sure ability belief factor on the avoidance factor. This result does not offer support for hypothesis 2.

The effects of GPA on mastery was partially mediated by the sure ability factor with a path coefficient of 0.26, $p < 0.01$ from GPA to the sure ability belief factor and a path coefficient of 0.66, $p < 0.01$ from the sure ability belief factor to the mastery factor. This offers support for hypothesis 2. In addition, there was a direct effect of GPA on the mastery factor with a path coefficient of 0.10, $p < 0.05$. Figure 8.2 presents these results in diagrammatic form.

The effects of GPA on mastery were partially mediated by the unsure ability belief factor with path coefficients of –0.26, $p < 0.01$ from GPA to unsure and a path coefficient of 0.35, p 0.01 from unsure to mastery. The effects of GPA on avoidance were partially mediated by the unsure ability belief factor with a path coefficient of –0.26, $p < 0.01$ on the unsure ability belief factor and a path coefficient of 0.51, $p < 0.01$ on the avoidance factor. These results offer support for hypothesis 2. In addition, there was a direct effect of GPA on avoidance with a path coefficient of –0.17, $p < 0.01$. The signs concerning the direct and indirect relations of GPA on avoidance should be noted (see Table 8.2 & 8.3). The sure ability belief factor did not mediate the effects of GPA on avoidance. Figure 8.2 presents these results in diagrammatic form.

It is noteworthy that there appears to be suppressor effects (Pedhazur, 1997) operating concerning the relations of unsure and mastery. For example the correlation between unsure and mastery is non-significant (see Table 8.1), yet the path coefficient from unsure to mastery is 0.35, $p < 0.01$. The determination of the factor(s) that act as a suppressor(s) in this instance is beyond the

scope of this research. However, as a starting point for further investigations I would speculate that an examination of the interrelations of the sure and unsure factors might prove fruitful.

THE RESULTS FOR HYPOTHESIS 3: THE INDIRECT EFFECTS OF THE ABILITY BELIEF FACTORS ON THE ACHIEVEMENT GOAL FACTORS MEDIATED BY THE SOCIAL GOAL FACTORS

The relations of students' ability beliefs on the achievement goals mediated by the social goals. It is hypothesized that there are indirect effects of the ability belief factors on the approach factor mediated by the approval factor and indirect effects of the ability belief factors on mastery factor mediated by the concern factor.

The effects of the sure and the unsure factors on the approach factor are completely mediated by the approval factor with path coefficients from sure to approval of 0.53, $p < 0.01$ and from unsure to approval of 0.42, $p < 0.01$ and from approval to approach of 0.64, $p < 0.01$ (see Figure 8.2). This result offers support for hypothesis 3.

The effects of sure on the mastery factor are partially mediated by the concern factor with a path coefficient of 0.36 $p < 0.01$ from sure to concern and from concern to mastery of 0.16, $p < 0.05$ (see Table 8.2). This offers support for hypothesis 3 insofar as the effects of sure on mastery are mediated by the social concern factor. In addition, there were direct effects of the sure factor on the mastery factor with a path coefficient of 0.66, $p < 0.01$ (see Table 8.2). There were no indirect effects of unsure on mastery mediated by concern. This result does not offer support for hypothesis 3.

It is noteworthy that, again, there appears to be suppressor effects (Pedhazur, 1997) operating. However, in this instance it concerns the relations of unsure and approval and sure and approval. For example the correlation between unsure and approval is 0.19, $p < 0.01$ (see Table 8.1), yet the path coefficient from unsure to approval is 0.42, $p < 0.01$. In addition, the correlation between sure and approval is 0.30, $p < 0.01$, yet the path coefficient from sure to approval is 0.53, $p < 0.01$. As before, the determination of the factor(s) that acts as the suppressor is beyond the scope of this research. However, as a starting point for further investigations I again speculate that an examination of the interrelations of the sure and unsure factors might prove fruitful.

THE RESULTS FOR HYPOTHESIS 4: THE INDIRECT EFFECTS OF THE SOCIO-CULTURAL VARIABLES ON THE THREE ACHIEVEMENT GOAL FACTORS MEDIATED BY THE ABILITY BELIEF FACTORS

The relations of the socio-cultural variables on the achievement goal factors mediated by the ability belief factors. It is hypothesized that:

1. There will be no indirect effects of the socio-cultural variables on the three achievement goal factors mediated by the sure ability belief factor. The results show that there were no indirect effects of the socio-cultural variables on the achievement goal factors mediated by the sure ability belief factor. This result offers support for hypothesis 4.

2. There will be indirect effects of the socio-cultural variables on the three achievement goal factors mediated by the unsure ability belief factor.

    2.1. There were complete mediation effects of language and gender on mastery and avoidance with path coefficients from:

        2.1.1. Language to unsure of 0.11, $\underline{p} < 0.05$ and from unsure to mastery of 0.35, $\underline{p} < 0.01$. The effects are greater for English speakers than for Navajo speakers. This finding is contrary to hypothesis 4 (see Figure 8.2).

        2.1.2. Gender to unsure of 0.25, $\underline{p} < 0.01$ and from unsure to avoidance of 0.51, $\underline{p} < 0.01$. The effects were greater for females than for males. This finding is contrary to hypothesis 4 (see Figure 8.2).

    2.2 There were no relations of the socio-cultural variables on the approach factor mediated by the unsure factor. This result does not offer support for hypothesis 4 (see Figure 8.2).

    2.3 There were no relations of the location variable on the achievement goal factors mediated by the unsure factor. This result does not offer support for hypothesis 4 (see Figure 8.2).

THE RESULTS FOR HYPOTHESIS 5: THE DIRECT RELATIONS OF THE ABILITY BELIEF FACTORS AND THE MASTERY FACTOR

It is hypothesized that there will be direct relations of sure and the unsure ability factors on the mastery factor, however, only the unsure factor will have direct relations on the performance avoidance factor.

There were direct effects of the sure and unsure ability factors on the mastery factor with a path coefficient for the sure factor on the mastery factor of 0.66, $\underline{p} < 0.01$ and a path coefficient for the unsure on the mastery factor of 0.35, $\underline{p} < 0.01$. There were no direct effects of the sure factor on the avoidance factor. This offers support for hypothesis 5. There were direct effects of the unsure factor on the avoidance factor with a path coefficient of 0.51, $\underline{p} < 0.1$. This offers support for hypothesis 5.

TABLE 8.3. STANDARDIZED TOTAL EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	-0.14**	-0.02	0.06	- -	- -	- -
GPA	0.07	-0.09*	0.15**	-0.42**	- -	- -
Persval	0.08	-0.02	0.12*	0.01	0.06	- -
Sure	0.07	-0.03	-0.04	-0.27**	0.26**	- -
Unsure	0.09	0.03	0.21**	0.18**	-0.26**	- -
Approval	0.09	0.15**	0.07	-0.03	-0.04	-0.01
Concern	0.19**	0.05	0.33**	-0.07	0.12*	0.28**
Mastery	0.20**	-0.01	0.15**	-0.09*	0.21**	0.25**
Approach	0.04	0.06	-0.31**	-0.03	0.06	0.09
Avoidance	-0.03	0.10	-0.18**	0.16**	-0.33**	-0.04

	Sure	Unsure	Approval	Concern	Mastery	Approach
Approval	0.53**	0.42**	- -	- -	- -	- -
Concern	0.36**	0.08	- -	- -	- -	- -
Mastery	0.75**	0.39**	0.06	0.16**	- -	- -
Approach	0.42**	0.34**	0.64**	-0.04	- -	- -
Avoidance	0.00	0.57**	0.14**	0.00	- -	- -

Note ** = P < 0.01
* = P < 0.05

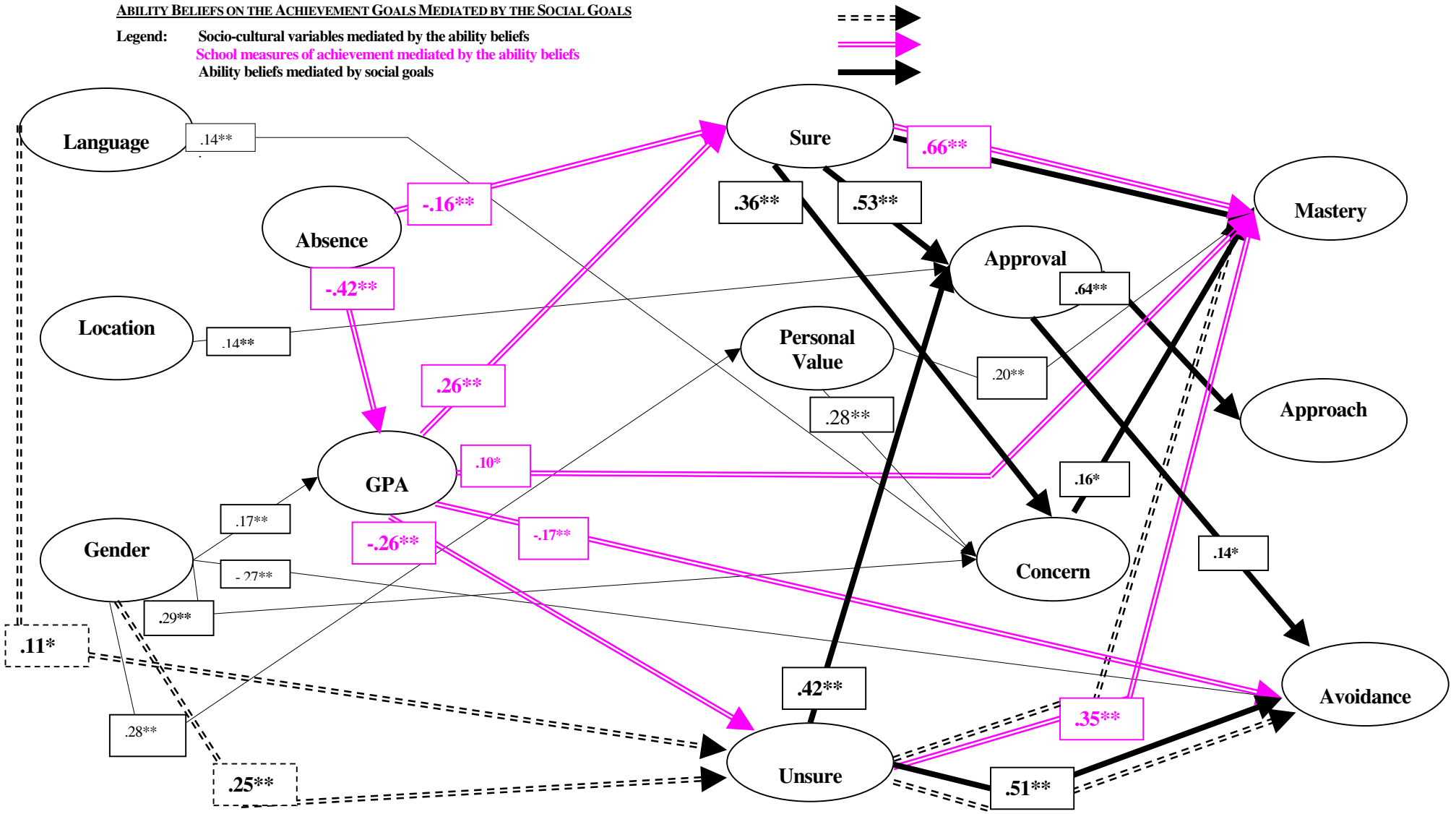
TABLE 8.4. STANDARDIZED INDIRECT EFFECTS IN THE PATH MODEL OF SCHOOL ACHIEVEMENT MOTIVATION

	Language	Location	Gender	Absence	GPA	Persval
Language	- -	- -	- -	- -	- -	- -
Location	- -	- -	- -	- -	- -	- -
Gender	- -	- -	- -	- -	- -	- -
Absence	- -	- -	- -	- -	- -	- -
GPA	0.06**	0.01	-0.02	- -	- -	- -
Persval	0.00	-0.01	0.01	-0.02	- -	- -
Sure	0.04*	-0.02	0.03	-0.11**	- -	- -
Unsure	-0.03	0.02	-0.03*	0.11**	- -	- -

Approval	0.07*	0.01	0.06	-0.04	0.03	- -
Concern	0.05	-0.01	0.05	-0.09**	0.09**	- -
Mastery	0.13**	0.00	0.15**	-0.16**	0.11*	0.04*
Approach	0.08*	0.08*	0.07	-0.06	-0.02	- 0.02
Avoidance	0.04	0.06	0.09*	0.18**	-0.16**	0.00

	Sure	**Unsure**	**Approval**	**Concern**	**Mastery**	**Approach**
Mastery	0.09*	0.04	- -	- -	- -	- -
Approach	0.32**	0.26**	- -	- -	- -	- -
Avoidance	0.08	0.06	- -	- -	- -	- -

FIGURE 8.2. SIGNIFICANT PATHS OF THE SOCIO-CULTURAL VARIABLES AND THE SCHOOL MEASURES OF ACHIEVEMENT ON THE ACHIEVEMENT GOALS MEDIATED BY THE ABILITY BELIEFS AND THE ABILITY BELIEFS ON THE ACHIEVEMENT GOALS MEDIATED BY THE SOCIAL GOALS



SUMMARY AND CONCLUSION

The results reported in this chapter add to the literature concerning the characteristics of Navajo high school students' school achievement motivation. As far as I am aware, this is the first time that the concept of stereotype threat has been investigated using a large sample in the context of American Indian students and certainly in the context of Navajo high school students. More generally, the findings demonstrate the utility for future research of partitioning ability beliefs into positive and negative constructs. For example, Steele and Aronson (1995) posit that effort and lower ability expectations are associated with stereotype threat and that stereotype threat led to adaptations symptomatic of performance avoidance. The finding that both the sure and unsure factors were both related to mastery yet unsure only was related to avoidance seems consistent with the theory advanced by Steele and Aronson (1995). While there is some evidence that non-traditional and near traditional and male and female students differ in terms of stereotype threat, importantly the evidence suggests that stereotype threat in terms of unsure ability beliefs is generally operating for Navajo high school students. Such interpretations of the results is consistent with the position adopted by Deyhle (1995) concerning the detrimental effects of a lifetime of stigmatization for Navajo and Ute students.

It was unexpected that English speakers were more likely than Navajo speakers to be unsure of their abilities. However, the path coefficient was weak and this difference might be of no practical significance. Also unexpected was the finding that females were more unsure of themselves than were males. These findings are also interesting in the context that neither the language nor the gender cohorts differed on the sure ability belief. They become complex when consideration is given to an earlier finding that it is females who are more likely than males to have higher GPA scores.

The findings concerning the relationship between GPA, students' ability beliefs, and mastery and avoidance achievement goals warrant highlighting. For example, GPA was indirectly related to both mastery and avoidance and partially mediated on mastery by both sure and unsure ability beliefs. However, GPA on avoidance was partially mediated by unsure only. The sign for the indirect effects of GPA on avoidance (-0.26 X 0.51) and on mastery (-0.26 X 0.35) are negative. Together, these results seem to suggest the relevance of students' prior achievement and linkages with their ability beliefs and the achievement goals they emphasize. Accepting this interpretation suggests that there are implications for schools and teachers concerning the management of these linkages.

Recall that in Chapter 6, it was found that there were no relations between school measures of achievement and the social goal factors. This was supprising given that in other research social

goals have been shown to be related to school measures of achievement. The finding in this chapter suggests that the relations of the school measures of achievement on the social goals might be indirect through the ability beliefs, and subsequently, with the achievement goals. The implication of the sure ability factor on mastery mediated by concern also deserves consideration by the schools and teachers. Sure ability seems an important factor for the achievement goals emphasized by Navajo high school students. Yet the relation of sure on concern was moderate with a path coefficient of 0.36, $p < 0.01$ while the relations of concern on mastery was weak with a path coefficient of 0.16, $p < 0.05$. The reasons for concern not being more strongly related to mastery are not immediately clear. The finding warrants further investigation by the schools.

Noteworthy also is that approval mediated the effects of sure and unsure ability belief factors on approach and avoidance. These findings suggest a level of complexity in the relationships of ability beliefs, social goals, and achievement goals that warrants further research. Perhaps a starting point for further research are the findings of Bempechat, et al (1999). However, in the interim, the findings also suggest that the schools and teachers should note that social approval in the context of students sure and unsure ability beliefs may have different consequences for the achievement goals that students emphasize.

This chapter also contributes to the literature concerning stereotype threat among Navajo high school students. Previous research concerning stereotype threat has generally focussed on contrasting white Anglo-Americans with African-Americans. Stereotype threat research has also been dominated by experimental research. The present study adds survey and correlational methodology to the study of this hypothesis.

CONCLUSION

It seems clear that schools and teachers need to heed the findings in this chapter concerning the potential deleterious effects for students of stereotype threat. In addition, I believe it important that schools address this issue by investigating ways in which the associated negative consequences can be prevented. I speculate that as a counterpoint to Navajo high school students' unsure ability beliefs placing emphasis on students' sure ability beliefs would benefit their school achievement generally. In this regard, Anderman and Anderman (1999), and other motivation researchers have recently focussed on the transition period of middle school as fertile ground for understanding the development of students' attitudes about school. Hence, it may be useful if further research concerning the relations of Navajo students' positive and negative ability beliefs and achievement goals took into account the development of these relations during the middle school years.

CHAPTER 9

SUMMARY AND CONCLUSION

From the perspective of the wider cultural and social context in which the Navajo find themselves many reasons have been postulated as causes for the school underachievement among Navajo students. Among the reasons offered are the tragic historical and adult experiences of the Navajo with the American education system, structural inequalities and inequities in the delivery of education services and a cultural environment that many researchers contrast with the environment that Navajo students experience at school. In chapters 2 and 3, I show the linkages between these cultural and social factors with key psychological constructs found in the literature concerning achievement motivation.

My focus in this research was on students' cultural and social backgrounds as contributing factors to Navajo high school students' school achievement motivation. School culture, it is argued, reflects the dominant surrounding Anglo culture (e.g. Deyhle & Swisher, 1997; James, Chavez, Beauvais, Edwards, & Oetting, 1995). That is, the culture of school is based largely on individualism, interpersonal competition and other Western norms and values (Deyhle, 1995; James. et al, 1995). These approaches, it is argued, may be the anathema of American Indians and particularly American Indian women (James, et al, 1995). Thus for example, it has been suggested that group-based and cooperative forms of education may be more effective for American Indians than the individualistic competitive approaches found in American schools (e.g. Ledlow, 1992; Vadas, 1995).

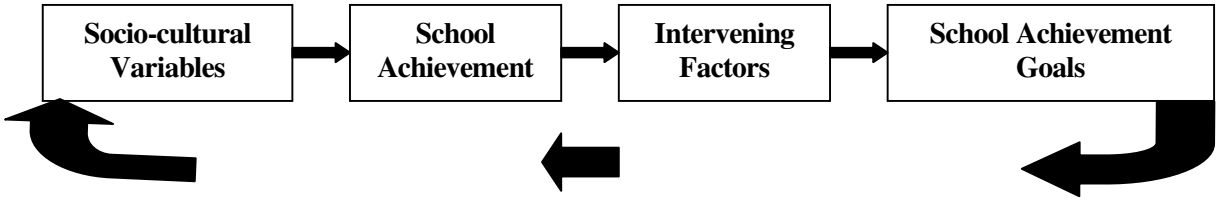
To facilitate the description of school achievement motivation among Navajo high school students, I chose from the literature key constructs concerning achievement motivation. I posit a model of school achievement motivation that integrates these key achievement motivational constructs into a single coherent model of school achievement motivation. I refer to this model as a self-schema model of school achievement motivation. The constructs and their relationships are summarized in Table 9.1. The choice of mainstream constructs has the added advantage of providing findings that may be compared to other cultural groupings (Pavel & Padilla, 1993).

TABLE 9.1. DIMENSIONS DESCRIBED IN CHAPTER 3 FOLLOWED BY A BRIEF DESCRIPTION OF THE HYPOTHESIZED RELATIONSHIPS.

Socio-cultural variables	School Measures of Achievement	Characteristics Brought to School	Characteristics Influenced by School	
			Social Goals	School Achievement Goals
Language spoken at home (Navajo & English) Living location (Town and Rural) Gender	Attendance GPA	Personal value of school Utility value of school Sure ability beliefs Unsure ability beliefs	Social approval Social concern	Mastery goal Performance approach goal Performance avoidance goal
Associated with these variables are social and cultural factors believed to influence Navajo high school students' achievement and hence school achievement goals (James, Chavez, Beauvais, Edwards, & Oetting, 1995; Vadas, 1995).	Experience and prior achievement are hypothesized to be related to ability beliefs (Dweck & Leggett, 1988; Schunk, 1994) School measures of achievement (target goals) are hypothesized to be related to achievement values (Wigfield & Eccles, 2000) and are hypothesized to influence ability beliefs as such as expectancy of success (Wigfield & Eccles, 2000).	Achievement values are hypothesized to be related to school achievement goals (Wigfield, 1994). Ability beliefs are believed to be more stable than achievement goals & are attitudes brought to school (Pintrich, Marx, & Boyle, 1993). Hypothesized to be related to school achievement goals (Urdan, 1997).	Hypothesized to be related to school achievement goals and to indirectly effect school achievement (Anderman & Anderman, 1999).	Hypothesized to influence school achievement (Anderman & Anderman, 1999; Ames & Archer, 1988).

Next, to examine the interrelations among dimensions I hypothesize their causal relations (see Chapters 3 & 4). That is, I hypothesize that for Navajo high school students the relationship of socio-cultural background variables with their school achievement motivation can be understood in terms of their prior achievement and the relations of this with their achievement values, ability beliefs and social goals. In turn, the effects of these relations are realized on school achievement. Figure 9.1 diagrammatically presents this concept.

FIGURE 9.1. HYPOTHESIZED PATH MODEL USED IN THIS RESEARCH AND PRESENTED IN CHAPTER 4



While there is considerable body of literature that examines the causes of Navajo high school students' underachievement there is little that makes use of large data bases and even less that examines achievement motivation.

This research addresses these limitations by examining the following research questions:

1. Whether a model of school achievement motivation, drawn from Western concepts of achievement motivation, describe the achievement motivation characteristics of Navajo high school students.

2. Whether a model of school achievement motivation, drawn from Western concepts of achievement motivation, describes non-traditional and near traditional and male and female Navajo high school students' achievement motivation equally well.

3. To understand better the relations of the socio-cultural variables (language, location, & gender) on students' school achievement goals (mastery, approach, and avoidance) I examine, as intervening factors, the mediation effects of the school measures of achievement, achievement values, ability beliefs, and social goals.

4. To understand better the relations of school measures of achievement (i.e. students' prior experiences and achievement; e.g. Dweck & Leggett, 1988; Schunk, 1994) on their school achievement goals, I examine, as intervening factors, the mediation effects of achievement values, ability beliefs, and social goals.

5. To understand better the relations of students' achievement values and ability beliefs on their school achievement goals, I examine, as intervening factors, the mediation effects of their social goals.

The methodology used to address these questions began first, by drawing from the literature constructs that reflect Western concepts of achievement motivation. It is possible that a model of school achievement motivation that reflects Navajo beliefs, values, and goals will describe Navajo high school students' achievement motivation equally well or better than one drawn from Western concepts. However, the concern in my research was whether a Western model of school achievement motivation described Navajo students' school achievement motivation. I believe that if Navajo high school students' culture is an anathema to the beliefs, values, and goals reflected in school structures and methods of evaluation then a model of achievement motivation that reflects these factors will not describe Navajo students' achievement motivation characteristics. Clearly, this was not the case. As I demonstrate in Chapter 5, the model of school achievement motivation fitted the data well. Such a result would be most unlikely in circumstances where the culture of the Navajo concerning learning was the anathema of the beliefs, values and goals practiced by schools.

Second, from a review of the literature regarding Navajo school achievement, I derive the concepts of non-traditional and near traditional. I operationalize non-traditional as students who spoke English at home or lived in towns. I operationalized near traditional as students who spoke Navajo at home or lived in rural areas. According to the literature non-traditional Navajo students are more likely than near traditional students to have higher achievement results on normative based tests (e.g. Vadas, 1995). I also include gender in the research. Research suggests that Navajo females have better achievement results than males (Vadas, 1995). Hence, one would expect a model of achievement motivation that reflects Western concepts to fit the non-traditional Navajo students better than near traditional Navajo students. I also expected the model to fit females better than males. As I demonstrate in Chapter 5, the model of school achievement motivation fitted the non-traditional and near traditional data equally well. Finally, if there are differences between non-traditional and near traditional students, I would expect these differences to be reflected in the path model used to examine the mediation effects. In fact, the only differences were for language on the social concern and unsure factors, and for location on the social approval factor. All of these relations were weak. There were no differences concerning the important factors of mastery and performance approach and avoidance. In contrast, for gender, there were significant differences on GPA, personal value of school, the unsure ability belief, social concern, mastery and performance avoidance. Further to this generally and for gender, I find that the relations of the social goals on the achievement goals are similar to the findings of Anderman and Anderman (1999). These findings seem to suggest that rather than contrast non-traditional with near traditional Navajo students, it is perhaps more accurate to say that the groups are more similar than dissimilar

One possible explanation for these results may be the universal availability of education for the Navajo since the 1970's. I suggest that this has resulted in school educated generations who see education as less alien to the Navajo way. In turn these adults are passing on to their children, in contrast to the attitudes that prevailed two or three decades ago, attitudes that are positive regarding school learning. This account would be consistent with Deyhle's (1995) assertion that most Navajo and Ute parents wish their children to do well at school (see also McInerney, McInerney, Ardington, & Rachewiltz, 1997). These results seem to suggest that the modern Navajo student has adapted to school learning. However, it remains for the Navajo to turn these more positive attitudes to their advantage concerning school achievement.

Establishing that the characteristics of school achievement motivation for the non-traditional, near traditional, and gender cohorts are more similar than dissimilar is important. Clearly this raises concerns regarding the making of policy based on assumptions regarding presumed differences between non-traditional and near traditional Navajo high school students. Similarly, there are implications for teachers who too readily assume differences in achievement motivation characteristics between these groups and indeed, between Navajo and Anglo groups attending mainstream schools.

However, of equal importance are the interrelations of these achievement motivation characteristics within the sample as a whole. In Chapters 3 and 4, drawing on the literature, I propose that prior academic experience and achievement affected future achievement motivation characteristics (see Figure 9.1). If the Navajo culture is the anathema of school culture I would not expect significant relations between the school measures of achievement and the achievement motivation characteristics in my model. Clearly, this is not the case. For example, I found that there were total effects of both school measures of achievement on the mastery and performance avoidance factors. In addition, there were significant indirect effects of the school measures of achievement on the mastery and performance avoidance factors, mediated by the sure and unsure ability beliefs and the social goal factors. Only personal value of school was unrelated to the school measures of achievement although it was related to mastery. These results seem to add weight to the notion that from the cultural perspective and in terms of school achievement motivation the Navajo have largely adapted to school learning.

I have two primary concerns regarding these findings. The first is the weak path coefficients from the school measures of achievement to the achievement motivation characteristics. In discussing the question of why one should study students' achievement motivation, Covington (1992) and Maehr and Midgley (1996) point out that many factors affect students' school achievement. They suggest that some of these factors, such as socio-economic factors, are beyond the control of schools and teachers. They add that these factors may even account for the substantial component of the variance that affects students' achievement motivation. They go on to say this is no justification for not studying other important factors that account for less of the variance effecting students' achievement motivation. Viewed in this light perhaps it is more important to

interpret my results in terms of success or failure rather than the strength of the relations. For example, failure has been shown to have deleterious effects on future achievement (e.g. Harris & Covington, 1992). The signs for the relations of the school measures of achievement with the other achievement motivation factors were in the expected direction. For example, the sign for GPA on mastery was positive and the sign for GPA on performance avoidance was negative. The schools and teachers can use this knowledge to influence the achievement goals students emphasize at school. Hence, in this light, I view the relations of school measures of achievement on the achievement characteristics favorably.

A second concern is the finding that the school measures of achievement are unrelated to the personal value of school factor. This finding is surprising in the context that the items used in the personal value of school construct reflected the notion that completing high school is important. It follows that school progress and completion is dependent on satisfactory achievement. Hence, it seems reasonable to expect significant and positive relations between school measures of achievement and personal value of school. However, on reflection, personally valuing school may more reflect an intrinsic quality and hence might not necessarily be related to achievement outcomes that may be subject to a variety of other influences such as quality of assessment and quality of teaching. However, this result suggests that more work is needed to understand better the nature of Navajo high school students' concept of their personal value of school and its relations with school achievement.

Despite the preceding generally positive findings, there still remain questions concerning possible linkages of Navajo high school students' achievement motivation with their reported underachievement on normative based tests. Deyhle (1995) alludes to the detrimental effects on Navajo and Ute students' schooling from a lifetime of stigmatization as a possible explanation. In Chapter 8, I introduce the concept of partitioning students' ability beliefs into positive and negative beliefs. I also link the concept of negative ability beliefs with the concept of stereotype threat. That is, following Steele and Aronson (1995) I suggest that one consequence of stereotype threat for Navajo high school students would be a lowering of their ability expectations. Further, these lower ability expectations are hypothesized to be related to avoidance and effort. Hence, I hypothesize that the negative ability belief factor used in my research would be related to the mastery and avoidance factors. Indeed, they were, with moderate path coefficients. In the context of stereotype threat and its implications for Navajo high school students' achievement motivation, this finding is useful. I say useful because recognizing the problem offers the opportunity of finding a solution. In addition to this finding, I also found that the negative ability belief factor relations on the approach factor is completely mediated by the approval factor. This latter finding seems to suggest that students with low or poor ability expectations may seek to bolster their self-worth (Covington, 1992) through recognition for good work and doing better than classmates at schoolwork. In the attempt to understand better Navajo high school students' underachievement these are useful results and suggest a valuable future line of enquiry.

Other research suggests that social goals are related to school measures of achievement (e.g. Anderman and Anderman, 1999; Triandis, 1995). Yet, in this study there were no direct relations between the school measures of achievement and the social goal factors. Rather, the relations were indirect with GPA indirectly related to approval mediated by the sure and the unsure ability belief factor. In contrast, GPA's relations on concern were mediated by the sure ability belief factor only. This suggests important considerations for schools and teachers regarding the relationship between students' success or failure, their ability beliefs, their social goals and the achievement goals they emphasize. For example, recognition in the form of praise for good schoolwork seems to have the effect of students emphasizing a competitive orientation to their schoolwork. This is irrespective of whether they hold sure or unsure ability beliefs. There are two points of concern here. The first is that inherent in the performance approach orientation is the risk of failure. Should students not achieve according to their ability expectations relative to their peers they are exposed to threats to their self-worth and to protect this they may subsequently choose to not engage in schoolwork (Covington, 1992). The second concerns students with low ability expectations. In Chapter 6 I suggest that following praise for good work, students who are avoidance oriented may become more avoidance oriented. That is, students may adopt a "rest on one's laurels attitude" to avoid future embarrassment from appearing unable.

GPA, like social approval, is also a form of recognition for good schoolwork. Yet the significant paths for GPA on the achievement goals differ to those of social approval. That is, there are significant direct and indirect effects of GPA on mastery. It seems to follow from these contrasting relations of two different methods of recognition that schools and teachers should be wise in their use and be circumspect in the administration of social approval forms of recognition.

The weak relations between concern and mastery in the context that concern partially mediated the effects of sure ability beliefs on mastery is a further area for consideration by the schools and teachers. Social goals, like the achievement goals that students emphasize, are believed to be influenced by students' perception of the goals emphasized by school and teachers. The results suggest that these students do not see the Navajo attribute of cooperation being emphasized compared to the competitive value of competition. The results in my research suggest that the schools and teachers may be paying less attention to the qualities of social concern than they are to those of social approval. When consideration is given to the known positive effects for learning of cooperative learning strategies (Slavin, 1983) and that cooperation is believed to be important to the Navajo, it seems an important learning strategy is being overlooked. An investigation by the schools regarding this aspect of their structure may lead to better utilization of cooperative learning structures in the classroom.

A further area of interest for the schools and teachers is the juxtaposition of the relations of the sure and unsure ability beliefs. While there is insufficient information in this study to find a definitive conclusion, there is sufficient to speculate about these relations. The correlation between the sure ability

belief and performance avoidance is significant and negative. This suggests that the sure ability belief factor is a counterpoint to the unsure ability belief factor and its relationship with the performance avoidance factor. While this has intuitive appeal it is not immediately clear why this is so. For me it seems perfectly reasonable to say that while I am generally confident about my abilities, there may well be some particular aspects about which I am not confident. For example, I may be confident in my ability to pass the math exam but not confident in may ability to do simultaneous equations. Hence I would do the simultaneous equations last or not at all (avoidance). The evidence I can cite in support of this argument is that after controlling for the correlation between the sure and unsure ability belief factors, the sure ability belief factor is not related to avoidance. Further research is necessary to confirm or rebut this speculation. However, in the meantime, schools and teachers emphasizing social concern characteristics, may further strengthen the relations between students' positive ability beliefs and their mastery goal. .

The present study also adds to the literature in five other respects. First, it demonstrates the usefulness of using mainstream models to better understand American Indian school achievement (e.g. Pavel & Padilla, 1993). Second, it demonstrates the usefulness of understanding better achievement motivation by examining the mediation effects of factors in a model of achievement motivation (Pintrich, 2000). Third, and linked to the previous points, it demonstrates the usefulness of SEM methodology in understanding better achievement motivation among American Indian students. Fourth, it introduces and demonstrates the usefulness of a negative ability belief and the possible consequences for the achievement goals students emphasize. However, further work is needed to see if this concept is applicable to mainstream and other minority students. Finally, the study offers a coherent model of school achievement motivation built from key constructs found in the literature concerning school achievement motivation. However, while I believe that the findings presented in this thesis can be generalized to other Navajo high school populations, the question remains regarding the extent to which the model can be generalized to school populations beyond this.

LIMITATIONS OF THE PRESENT RESEARCH

I recognize that there are many shortcomings to this study. I am sure there are limitations that I have not recognized. However, in the meantime I wish to draw the reader's attention to the more salient limitations. These are as follows:

1. The notable limitation is the assumptions regarding the relations of the factors in the path model. However, I wish to make the point that in the present research the position was adopted that school events such as GPA and events in the wider community, such as achievement values, which students bring to school, also affect students' school achievement goals. This position is a common view held by many achievement goals theorists (e.g. Pintrich, 2000; Pintrich, Marx, & Boyle, 1993). The determination of the merits or otherwise of a competing causal ordering that reflect different theoretical perspectives to the one I adopted was not the concern of the present research.

2. Another limitation of the present research is that single-phase data have been used hence, aspects of a developmental nature are not controlled for. For example, students' belief that school is of personal value may be stronger for high school students than for middle school students. This in turn could suggest that personal value of school is not a stable entity and hence may be influenced by school structures and teachers.

3. I base the conclusions of this study on correlational methods hence the most profound statement I can make about the results is that 'We can say that Navajo high school students behave as if …' However, to facilitate the systematic examination of the interrelations of the constructs I posited a causal order among the factors examined in this study. These hypothesized interrelations were drawn from theory. I recognize that other causal orders may serve equally well in describing Navajo high school students' school achievement motivation. However, the contrasting of competing models of school achievement motivation was not the intent of this thesis. The method employed enabled the systematic decomposition of correlations among the hypothesized factors to better explain their relations. Hence, the most that I can say is that when the correlation's of other factors in the model with the factors 'a' and 'b' are controlled for, then the partial correlation between a and b is xxx. This is useful information for schools and teachers. For an informative discussion concerning correlational studies of this nature see Johnson (2001).

4. Despite this study being informative about the relations of motivational factors it is also limited in this respect. I say this because the direction of relations between a number of factors remains undetermined. I refer to the correlations of factors that were not decomposed due to a lack of theory concerning their relations (e.g. sure and unsure ability beliefs). This introduces a limitation concerning the indirect relations of one of the factors mediated by the other. For example, it may well be that these factors affect each other and hence each is a mediator of the other on the achievement goals. This is a consideration for further research.

5. In my research I speculate that the negative ability beliefs experienced by Navajo high school students is due to a relationship with stereotype threat. In fact the negative ability beliefs may be due to other factors in the environment or for that matter the individual. The position adopted in the present research would have been much strengthened by factors that measured perceived stereotype threat and anxiety. Unfortunately these measures were not available but should be considered in future research.

APPENDICES

APPENDIX A. PROFILE OF THE NAVAJO NATION

NAVAJO NATION PROFILE

NAVAJO NATION RESIDENT POPULATION
1980 and 1990 Censuses, and 1993 Estimate
(Navajo territorial jurisdiction lands)

	Total Population	Amer Ind Population
1993 Estimate:	161,405	154,962
1990 Census:	155,276	148,983
1980 Census:	140,984	132,052
Growth-'80 to '90:	14,292	16,931
Median age (1990):	22.3	21.8
Median age (1980):	nra	18.7

1993 Estimated Population by Agency

Western Navajo:	34,947	33,314
Chinle:	24,659	23,910
Fort Defiance:	43,439	42,097
Shiprock:	27,846	27,173
Eastern Navajo:	30,514	28,468

1993 Estimated Population by Gender

	Number	Percent
Male:	78,604	48.7
Female:	82,801	51.3

1993 Estimated Race Distribution

White:	5,563	3.5
Black:	200	0.1
American Indian:	154,962	96.0
Asian/Pac Islander:	174	0.1
Other race:	506	0.3

1990 Rural versus Census Designated Places(CDPs)

Rural areas:	104,328	67.2
CDPs:	50,948	32.8

1990 Navajo Nation Total Population by State		
Arizona:	91,004	58.6
New Mexico:	58,772	37.9
Utah:	5,500	3.5

SCHOOL ENROLLMENT (1990)

Number persons 3 years of age and older enrolled	Number	Percent
Preprimary	3,286	6.2
Elementary and high school	43,795	82.2
College	6,183	11.6

NAVAJO LAND BASE

-NN is larger than 10 states
-NN is near equal in size of RI, CT, NJ, & NH combined
-NN is closest in size to West Virginia; NN is bigger by another 1,120 acres.

EDUCATIONAL ATTAINMENT (1990)

Number of American Indian persons 25 years of age and older with	Number	Percent
Less than 9th grade	23,274	36.4
9th grade to 12th grade, no diploma	14,306	22.4
High school graduate	15,477	24.2
Some college, no degree	6,647	10.4
Associate degree	2,380	3.7
Bachelor's degree	1,254	1.9
Graduate/Professional degree	638	1.0

INCOME AND POVERTY STATUS: 1970 to 1990

Per Capita Income		
1970 Census	1980 Census	1990 Census
$776	$2,414	$4,106
Median Family Income		
1970 Census	1980 Census	1990 Census
$3,084	$9,079	$11,885
Percent of Persons below the Poverty Level		
1970 Census	1980 Census	1990 Census
64.5%	49.7%	56.1%
Percent of Families below the Poverty Level		

1970 Census	1980 Census	1990 Census
62.1%	47.3%	57.4%

LANGUAGE SPOKEN AT HOME (1990)

Persons 5 years of age and older	
English only	22,855
American Indian language	107,665
Spanish	494
Asian/Pacific Island language	79
Other language	136

NATIVITY AND PLACE OF BIRTH (1990)

Native population	151,015
Born in state of residence	126,369
Born in another state	24,537
Born outside the U.S.	109
Foreign-born	270
Entered U.S. between 1980 and 1990	171

POVERTY STATUS IN 1989

Persons for whom status is determined	150,577
Below poverty	84,508
Percent	56.1%
Persons 18 years and over	85,824
Below poverty	46,619
Percent	54.3%
Persons 65 years and over	8,864
Below poverty	5,878
Percent	66.3%

Poverty Status by Age Group

VETERAN STATUS (1990)

Total civilian veterans	5,826
Civilian veterans 16 to 64 years of age	
Male	4,468
Female	170
Civilian veterans 65 years and over	

Male	1,121
Female	67
Period of military service:	
May 1975 or later*	1,135
Vietnam era	2,140
Feb 1955 to July 1964	433
Korean conflict	745
World War II	1,335
World War I, other service	38

*Does not include the Persian Gulf conflict

HOUSING CHARACTERISTICS(1990)

Total housing units	56,372
Lacking complete plumbing	29,099
Lacking complete kitchen facilities	26,869
Source of water	
Public system or private company	34,306
Individual drilled well	11,360
Individual dug well	2,071
Some other source	8,635
Sewer disposal	
Public sewer	18,569
Septic tank or cesspool	10,449
Other means	27,354

Total housing units occupied	37,000
Heating fuel	
Utility gas	4,998
Bottled tank or LP gas	5,174
Electricity	3,349
Fuel oil, kerosene, etc.	594
Coal	2,427
Wood	20,094
Solar energy	22
Other fuel	167
No fuel used	175

Occupied housing units without telephone	28,688
Percent of units without telephone	77.5%

Period structure built			
1980's	20,252	1950's	5,093
1970's	15,758	1940's	1,664
1960's	11,676	1939/earlier	1,929

LABOR FORCE STATUS IN1990

Persons 16 years of age and older	92,671
In labor force	41,545

Percent in labor force (%)		44.8
Civilian labor force		41,451
Employed		29,867
Unemployed		11,584
Percent Unemployed (%)	**27.9**	
Not in labor force		51,126
__Females 16 years and over		48,258
In labor force		18,861
With own children under 6 yrs		4,746
Percent in labor force		47.7%
With own children 6 to 17 yrs		9,605
Percent in labor force		51.8%

COMMUTING TO WORK

Workers 16 years of age and older	29,285
Percent drove alone(%)	63.0
Percent in carpools(%)	20.9
Percent using public transportation(%)	1.4
Percent using other means(%)	2.5
Percent walked or worked a home(%)	12.2
Average travel time to work(minutes)	23.8

How Commuted to Work

VEHICLES AVAILABLE (1990)

Occupied housing units	37,000
No vehicle	9,567
One vehicle	16,067
Two vehicles	8,201
Three or more vehicles	3,165
Average number of vehicles available	1.15

EMPLOYMENT BY INDUSTRY IN 1990

Employed persons 16 years & over

	Number	Percent
Agriculture, forestry, & fisheries	790	2.65
Mining	1,045	4.88
Construction	2,647	8.86
Manufacturing(nondurable goods)	363	1.22
Manufacturing(durable goods)	1,183	3.96

Transportation	859	2.88
Communication & public utilities	1,329	4.45
Wholesale trade	597	2.00
Retail trade	4,092	13.70
Finance, insurance, & real estate	422	1.41
Business & repair services	775	2.59
Personal services	1,191	3.99
Entertainment & recreation	159	.53
Health services	2,194	7.35
Educational services	5,631	18.85
Other perfessional & related srcs	3,117	10.44
Public administration	3,060	10.24

CLASS OF WORKERS IN 1990

Employed persons 16 years and over		
Private wage & salary	14,476	48.47
Private not-for-profit wage/salary	1,574	5.27
Government workers	13,069	43.76
Self-employed workers	722	2.42
Unpaid family workers	26	.08

TYPE OF INCOME IN 1989

Income type by number of households and average income

	Number	($)Avg. Income
Wage and Salary	25,014	19,720
Non-farm self-employment	1,184	10,980
Interest, dividend, or rental	1,162	4,305
Farm self-employment	350	2,916
Social Security	7,278	4,831
Public/General assistance	12,093	3,543
Retirement	2,645	5,147
Other type	3,156	4,007

APPENDIX B. LIST OF ITEMS USED IN THE PRESENT RESEARCH.

MASTERY (MASTERY) SCALE (4 ITEMS).

B33 I like to see that I am improving in my schoolwork.
B40 I work hard to try to understand something new at school.
B56 When I am improving in my schoolwork I try even harder.
B89 I am always trying to do better in my schoolwork.

PERFORMANCE APPROACH (APPROACH) SCALE (4 ITEMS).

B1 I want to be better at class work than my classmates.
B2 Winning is important to me.
B14 I am happy only when I am one of the best in class.
B76 I work harder if I am trying to be better than others.

PERFORMANCE AVOIDANCE (AVOIDANCE) SCALE (3 ITEMS).

B80 Trying hard at school is not much fun if the competition is too strong.
B95 I only like to do things at school that I am confident at.
B98 I always chose easy work at school so that I don't have too much trouble.

SOCIAL APPROVAL (APPROVAL) SCALE (5 ITEMS).

B17 Praise from my teachers for my schoolwork is important to me.
B23 Praise from my friends for my schoolwork is important to me.
B41 At school I work best when I am praised for my school work.
B73 I want to be praised for my schoolwork.
B91 Praise from my parents for schoolwork is important to me.

SOCIAL CONCERN (CONCERN) SCALE (5 ITEMS).

B10 It is very important for students to help each other at school.
B21 I like to help other students do well at school.
B29 I care about other people at school.
B35 I like working with other people at school.
B46 I enjoy helping others with their schoolwork even if I don't do so well myself.

PERSONAL VALUE OF SCHOOL (PERSVAL; 3 ITEMS).

A31 School students should complete high school
A32 Most people who are important to me think that I should complete high school.
A33 I am the kind of person who would complete high school.
A34 I personally feel that I should complete high school.

UTILITY VALUE OF SCHOOL (UTILITY; 4 ITEMS).

B22 I want to do well at school so that I can have a good future.
B38 I aim my schooling towards getting a good job.
B48 I try hard to do well at school so that I can get a good job when I leave.
B54 It is good to plan ahead to complete my schooling.

ABILITY BELIEF SCALES.

Sure ability beliefs (Sure) scale (4 items).

B75 I am very confident at school
B69 Generally I am pleased with myself at school.
B83 I think that I can do quite well at school.
B93 I succeed at whatever I do at school.

Unsure ability beliefs (Unsure) scale (5 items).

B45 At times I feel that I am not good at anything at school.
B58 No one pays much attention to me at school.
B67 I often think there are things that I can't do at school.
B77 I wish I had a little more confidence in my schoolwork.
B81 I often worry that I am not very good at school.

SCHOOL MEASURES OF ACHIEVEMENT.

GPA The schools supplied these data.
Absence The schools supplied these data.

APPENDIX C. MEAN VALUES AND STANDARD DEVIATIONS OF MOTIVATIONAL SCALES BY SOCIO-CULTURAL VARIABLES

Factor	Sex		Language		Location			Chronbach's	Coefficient of
	M	F	Navajo	English	Town	Rural	Single Group	Alpha	Determination
Mastery	4.15(.61)	4.28(.54)	4.15(.66)	4.25(.54)	4.24(.56)	4.19(.59)	4.22(.58)	0.73	0.72
Approach	3.56(.79)	3.29(.74)	3.39(.77)	3.43(.79)	3.42(.78)	3.42(.78)	3.42(.78)	0.66	0.66
Avoidance	3.06(.80)	2.93(.85)	3.00(.78)	2.99(.85)	2.92(.85)	3.07(.80)	2.99(.83)	0.55	0.58
Approval	3.26(.78)	3.33(.82)	3.25(.78)	3.30(.82)	3.25(.84)	3.33(.77)	3.29(.81)	0.81	0.76
Concern	3.77(.64)	4.06(.53)	3.85(.62)	3.96(.58)	3.93(.62)	3.90(.43)	3.93(.60)	0.77	0.76
Persvalue	4.75(.44)	4.82(.40)	4.77(.45)	4.80(.39)	4.79(.43)	4.78(.21)	4.78(.40)	0.80	0.77
Utilvalue	4.40(.53)	4.48(.54)	4.38(.59)	4.47(.51)	4.45(.53)	4.41(.56)	4.43(.54)	0.74	0.79
Sure ability	3.74(.61)	3.69(.66)	3.69(.64)	3.72(.63)	3.73(.67)	3.70(.60)	3.72(.64)	0.63	0.68
Unsure ability	3.15(.75)	3.31(.70)	3.25(.65)	3.24(.76)	3.21(.78)	3.26(.66)	3.23(.73)	0.66	0.64

Note: Standard Deviations are enclosed in brackets ()

APPENDIX D. COVARIANCE MATRIX ANALYSED IN THE PRESENT RESEARCH

Covariance Matrix to be Analyzed

	language	location	gender	absence	gpa	a31
language	1.00					
location	-0.26	1.00				
gender	-0.09	0.01	1.00			
absence	-0.14	0.02	0.07	1.00		
gpa	0.08	-0.11	0.14	-0.41	1.00	
a31	0.04	-0.06	0.07	0.02	0.01	1.00
a32	0.06	-0.03	0.13	0.03	0.01	0.54
a33	0.08	0.06	0.03	-0.07	0.14	0.40
a34	0.02	-0.01	0.04	-0.03	0.10	0.46
b75	0.05	-0.07	-0.06	-0.19	0.21	0.08
b69	0.06	0.04	0.07	-0.18	0.23	0.06
b83	0.15	-0.04	-0.06	-0.14	0.18	0.19
b93	-0.09	-0.03	-0.07	-0.07	0.06	-0.01
b45	-0.01	-0.05	0.19	0.10	-0.13	0.07
b81	0.03	0.06	-0.06	0.04	-0.08	-0.03
b58	-0.02	0.13	0.10	0.08	-0.14	0.09
b67	0.09	-0.02	0.00	0.06	-0.11	0.04
b77	0.08	0.00	0.19	0.17	-0.19	0.10
b17	0.04	0.08	0.10	-0.01	0.00	0.07
b23	0.13	-0.01	0.07	-0.04	0.00	0.09
b41	-0.01	0.15	0.01	0.00	-0.06	0.05
b73	0.03	0.07	0.03	-0.05	0.01	0.07
b10	0.15	-0.01	0.08	-0.02	-0.01	0.17
b21	0.05	0.03	0.22	-0.10	0.19	0.16
b29	0.13	-0.01	0.24	-0.04	0.12	0.14
b35	0.07	0.03	0.20	-0.01	0.07	0.15
b46	0.09	-0.07	0.15	0.00	0.08	0.15
b33	0.19	-0.02	0.08	-0.05	0.14	0.22
b40	0.08	-0.02	0.10	-0.05	0.09	0.15
b56	0.08	0.02	0.09	-0.06	0.13	0.21
b89	0.11	-0.06	0.06	-0.16	0.15	0.17
b22	0.13	-0.07	0.10	-0.05	0.22	0.19
b38	0.10	-0.06	0.00	-0.02	0.12	0.21
b48	0.08	-0.04	0.11	-0.06	0.12	0.29
b54	0.11	-0.04	0.06	-0.08	0.19	0.24
b1	0.04	-0.02	-0.09	0.03	-0.02	0.09
b2	0.06	0.00	-0.22	-0.08	0.00	0.10
b14	-0.01	0.09	-0.15	0.00	0.02	0.10
b76	0.05	0.03	-0.25	-0.08	0.03	0.05
b80	0.09	0.03	-0.05	0.10	-0.19	-0.04
b95	-0.01	0.04	-0.06	0.01	-0.10	0.04
b98	-0.08	0.09	-0.15	0.12	-0.27	-0.04

Covariance Matrix to be Analyzed

	a32	a33	a34	b75	b69	b83
a32	1.00					
a33	0.46	1.00				
a34	0.49	0.59	1.00			
b75	0.11	0.16	0.12	1.00		

b69	0.11	0.19	0.10	0.44	1.00	
b83	0.19	0.27	0.19	0.31	0.29	1.00
b93	-0.02	0.06	-0.05	0.32	0.27	0.16
b45	0.02	-0.10	0.00	-0.16	-0.16	-0.08
b81	-0.04	-0.09	-0.07	-0.21	-0.24	-0.15
b58	0.05	-0.02	-0.03	-0.17	-0.07	-0.03
b67	0.03	0.00	0.05	-0.16	-0.18	0.04
b77	0.08	-0.07	0.01	-0.26	-0.26	-0.12
b17	0.13	0.10	0.10	0.19	0.16	0.09
b23	0.11	0.13	0.12	0.18	0.14	0.16
b41	0.01	0.02	0.00	0.10	0.06	0.00
b73	0.05	0.07	0.10	0.16	0.13	-0.01
b10	0.18	0.10	0.09	0.13	0.09	0.05
b21	0.24	0.23	0.18	0.21	0.15	0.18
b29	0.21	0.23	0.18	0.21	0.13	0.17
b35	0.17	0.17	0.19	0.20	0.12	0.07
b46	0.18	0.19	0.12	0.18	0.13	0.12
b33	0.23	0.19	0.17	0.23	0.17	0.25
b40	0.18	0.24	0.22	0.28	0.28	0.26
b56	0.18	0.22	0.22	0.32	0.26	0.29
b89	0.17	0.19	0.20	0.31	0.27	0.30
b22	0.16	0.22	0.23	0.16	0.18	0.23
b38	0.14	0.16	0.17	0.24	0.20	0.27
b48	0.25	0.23	0.25	0.23	0.23	0.29
b54	0.24	0.18	0.16	0.23	0.18	0.28
b1	0.13	0.15	0.13	0.06	0.02	0.15
b2	0.05	0.09	0.03	0.16	0.01	0.06
b14	0.06	0.12	0.08	0.12	0.08	0.11
b76	-0.01	0.01	0.01	0.16	0.07	0.09
b80	0.00	-0.06	-0.06	-0.11	-0.10	-0.04
b95	-0.01	-0.02	0.00	-0.04	0.02	0.00
b98	0.00	-0.08	-0.03	-0.21	-0.18	-0.13

Covariance Matrix to be Analyzed

	b93	b45	b81	b58	b67	b77
b93	1.00					
b45	-0.10	1.00				
b81	-0.17	0.27	1.00			
b58	-0.06	0.34	0.19	1.00		
b67	-0.12	0.31	0.17	0.16	1.00	
b77	-0.16	0.47	0.29	0.35	0.32	1.00
b17	0.16	0.15	-0.05	0.05	0.12	0.02
b23	0.10	0.11	-0.04	0.09	0.10	0.02
b41	0.16	0.10	0.00	0.08	0.11	0.10
b73	0.17	0.13	0.03	0.06	0.15	0.06
b10	0.01	0.06	-0.08	0.10	0.09	0.06
b21	0.08	-0.06	-0.11	-0.02	0.05	-0.07
b29	0.03	0.09	-0.09	0.06	0.11	-0.05
b35	0.02	-0.04	-0.15	0.00	0.01	-0.06
b46	0.05	0.09	-0.04	0.04	0.06	0.06
b33	0.07	0.10	-0.08	0.11	0.10	0.07
b40	0.18	0.06	-0.08	0.02	0.07	-0.04
b56	0.20	0.06	-0.12	0.07	0.03	0.01
b89	0.18	0.07	-0.12	0.02	0.05	0.00
b22	0.08	0.05	-0.06	0.04	0.10	0.01
b38	0.12	0.02	-0.07	0.03	0.05	-0.01
b48	0.10	0.04	-0.04	0.04	0.05	-0.01

b54	0.23	-0.02	-0.09	0.00	-0.02	0.02
b1	0.08	0.09	0.04	0.07	0.16	0.08
b2	0.11	-0.01	-0.07	-0.05	0.07	-0.05
b14	0.16	0.04	0.05	0.02	0.06	0.02
b76	0.19	0.01	-0.02	-0.07	0.10	-0.01
b80	-0.05	0.19	0.20	0.19	0.18	0.17
b95	-0.04	0.17	0.20	0.13	0.17	0.19
b98	-0.08	0.19	0.25	0.15	0.23	0.22

Covariance Matrix to be Analyzed

	b17	b23	b41	b73	b10	b21
b17	1.00					
b23	0.55	1.00				
b41	0.47	0.36	1.00			
b73	0.48	0.41	0.53	1.00		
b10	0.21	0.24	0.08	0.11	1.00	
b21	0.28	0.24	0.10	0.10	0.30	1.00
b29	0.18	0.18	0.08	0.12	0.31	0.50
b35	0.14	0.16	0.05	0.09	0.31	0.36
b46	0.16	0.23	0.12	0.12	0.22	0.37
b33	0.22	0.21	0.14	0.22	0.18	0.31
b40	0.24	0.19	0.15	0.18	0.20	0.25
b56	0.20	0.18	0.12	0.14	0.15	0.22
b89	0.26	0.22	0.14	0.18	0.14	0.18
b22	0.20	0.22	0.12	0.15	0.15	0.21
b38	0.16	0.17	0.09	0.13	0.20	0.19
b48	0.24	0.20	0.08	0.11	0.21	0.27
b54	0.18	0.16	0.14	0.16	0.13	0.23
b1	0.27	0.18	0.19	0.22	0.10	0.15
b2	0.24	0.15	0.25	0.19	0.18	0.12
b14	0.30	0.27	0.30	0.24	0.02	0.04
b76	0.26	0.22	0.33	0.32	-0.01	0.05
b80	0.04	0.06	0.03	0.12	0.06	-0.07
b95	0.11	0.09	0.15	0.15	0.01	0.05
b98	0.04	-0.02	0.10	0.10	-0.03	-0.12

Covariance Matrix to be Analyzed

	b29	b35	b46	b33	b40	b56
b29	1.00					
b35	0.36	1.00				
b46	0.35	0.29	1.00			
b33	0.27	0.23	0.20	1.00		
b40	0.22	0.23	0.21	0.35	1.00	
b56	0.23	0.16	0.22	0.41	0.40	1.00
b89	0.17	0.14	0.23	0.32	0.38	0.44
b22	0.20	0.16	0.10	0.38	0.31	0.35
b38	0.15	0.15	0.09	0.40	0.34	0.37
b48	0.21	0.16	0.12	0.39	0.37	0.40
b54	0.13	0.14	0.21	0.35	0.33	0.32
b1	0.08	0.04	0.06	0.16	0.19	0.18
b2	0.11	0.03	0.02	0.11	0.11	0.10
b14	-0.03	-0.01	0.01	0.10	0.17	0.16
b76	0.01	-0.01	0.03	0.10	0.07	0.12
b80	-0.05	-0.04	-0.03	-0.02	-0.06	-0.09
b95	0.01	-0.02	0.01	0.08	-0.01	0.07

b98	-0.11	-0.06	0.03	-0.10	-0.12	-0.13

Covariance Matrix to be Analyzed

	b89	b22	b38	b48	b54	b1
b89	1.00					
b22	0.27	1.00				
b38	0.36	0.42	1.00			
b48	0.37	0.47	0.57	1.00		
b54	0.30	0.31	0.35	0.36	1.00	
b1	0.16	0.22	0.10	0.14	0.11	1.00
b2	0.10	0.12	0.12	0.14	0.11	0.37
b14	0.17	0.15	0.11	0.19	0.18	0.32
b76	0.11	0.14	0.10	0.09	0.15	0.32
b80	-0.09	-0.08	-0.07	-0.08	-0.08	0.07
b95	0.00	0.02	0.04	0.04	0.02	0.07
b98	-0.09	-0.13	-0.12	-0.12	-0.14	0.06

Covariance Matrix to be Analyzed

	b2	b14	b76	b80	b95	b98
b2	1.00					
b14	0.34	1.00				
b76	0.28	0.35	1.00			
b80	-0.02	0.04	0.04	1.00		
b95	-0.01	0.14	0.09	0.25	1.00	
b98	-0.06	0.03	0.11	0.35	0.29	1.00

APPENDIX E. LISREL SYNTAX USED IN THE PRESENT RESEARCH

APPENDIX E.1. EXAMPLE OF SYNTAX USED FOR CONGENERIC CFA'S.

```
M1 Syntax for Mastery congenric
DA ni=42 no=579 ma=km
LA
b33 b40 b56 b89             !mastery
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73             !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34             !persval
b22 b38 b48 b54             !utility
b75 b69 b83 b93             !sure ability belief
b45 b81 b58 b67 b77         !unsure ability belief
gpa
absence
gender language location
cm = cfa4.cov re
MO nx=9 nk=1 lx=fu,fr ph=st td=sy,fi
```

```
SE
b33 b40 b56 b89/            !mastery
fr td 1 1 td 2 2 td 3 3 td 4 4 td 5 5
Lk
Mastery
ou  mi sc ad=off it=20
```

APPENDIX E.2. SYNTAX USED FOR DIFFERENTIATING THE TWO ABILITY SCALES.

```
DA ni=43 no=579 ma=km
LA
LA
b33 b40 b56 b89             !mastery
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73             !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34             !persval
b22 b38 b48 b54             !utility
b75 b69 b83 b93             !sure ability belief
b45 b81 b58 b67 b77         !unsure ability belief
gpa
absence
gender language location
cm = cfa4.cov re
MO nx=9 nk=1 lx=fu,fr ph=st td=sy,fi
SE
b75 b69 b83 b93            !sure ability belief
b45 b81 b58 b67 b77 /      !unsure ability belief
!PA lx
!4(1 0)
!5(0 1)
fr td 1 1 td 2 2 td 3 3 td 4 4 td 5 5 td 6 6 td 7 7 td 8 8 td 9 9
Lk
Collapsed
ou  mi sc ad=off it=20
```

APPENDIX E.3. SYNTAX USED FOR THE 13-FACTOR MEASUREMENT MODEL.

```
13-factor model utility and mastery collapsed - single factor including
CU's
!FACTORS REARRANGED
DA ni=42 no=579 ma=km
LA
b33 b40 b56 b89             !mastery
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73             !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34             !persval
b22 b38 b48 b54             !utility
b75 b69 b83 b93             !sure ability belief
b45 b81 b58 b67 b77         !unsure ability belief
gpa
absence
gender language location
```

```
cm = cfa4.cov re
MO nx=42 nk=13 lx=fu,fi ph=st td=sy,fi
SE
language location gender
absence
gpa
a31 a32 a33 a34               !persval
b75 b69 b83 b93               !sure ability belief
b45 b81 b58 b67 b77           !unsure ability belief
b17 b23 b41 b73               !approval
b10 b21 b29 b35 b46           !concern
b33 b40 b56 b89 b22 b38 b48 b54  !mastery !utility
b1 b2 b14 b76                 !performance approach
b80 b95 b98 /                 !performance avoidance
pa lX
1(1 0 0 0 0 0 0 0 0 0 0 0)
1(0 1 0 0 0 0 0 0 0 0 0 0)
1(0 0 1 0 0 0 0 0 0 0 0 0)
1(0 0 0 1 0 0 0 0 0 0 0 0)
1(0 0 0 0 1 0 0 0 0 0 0 0)
4(0 0 0 0 0 1 0 0 0 0 0 0)
4(0 0 0 0 0 0 1 0 0 0 0 0)
5(0 0 0 0 0 0 0 1 0 0 0 0)
4(0 0 0 0 0 0 0 0 1 0 0 0)
5(0 0 0 0 0 0 0 0 0 1 0 0)
8(0 0 0 0 0 0 0 0 0 0 1 0)
4(0 0 0 0 0 0 0 0 0 0 0 1)
3(0 0 0 0 0 0 0 0 0 0 0 0)
fr td 1 1 td 2 2 td 3 3 td 4 4 td 5 5 td 6 6 td 7 7 td 8 8 td 9 9 td 10 10
fr td 11 11 td 12 12 td 13 13 td 14 14 td 15 15 td 16 16 td 17 17 td 18 18
td 19 19 td 20 20
fr td 21 21 td 22 22 td 23 23 td 24 24 td 25 25 td 26 26 td 27 27 td 28 28
td 29 29 td 30 30
fr td 31 31 td 32 32  td 33 33 td 34 34 td 35 35 td 36 36 td 37 37 td 38 38
td 39 39 td 40 40
fr td 41 41 td 42 42
st 0 td 1 1 td 2 2 td 3 3 td 4 4 td 5 5
fi td 1 1 td 2 2 td 3 3 td 4 4 td 5 5
fr td 9 8
fr td 20 19 td 34 33
Lk
Language Location Gender Absence GPA Persval Sure Unsure Approval Concern
Mastery Approach Avoidance
ou  mi sc ad=off it=20
```

APPENDIX E.4. EXAMPLE OF THE SYNTAX USED FOR THE MULTI-GROUP ANALYSES.

```
13 factor model with untility collapsed  invariant for gender
DA ni=42 no=318 ma=cm ng=2
LA
b33 b40 b56 b89             !mastery
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73             !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34             !persval
b22 b38 b48 b54             !utility
```

```
b75 b69 b83 b93             !sure ability belief
b45 b81 b58 b67 b77         !unsure ability belief
gpa
absence
language location
cm =female.cov re
MO nx=41 nk=12 lx=fu,fi ph=sy,fr td=sy,fi
SE
b33 b40 b56 b89               !mastery
b22 b38 b48 b54               !utility
b1 b2 b14 b76                 !performance approach
b80 b95 b98                   !performance avoidance
b17 b23 b41 b73 !b91          !approval
b10 b21 b29 b35 b46           !concern
a31 a32 a33 a34               !persval
b75 b69 b83 b93               !high ability belief
b45 b81 b58 b67 b77           !low abillity belief
absence
gpa
language location/
PA lx
8(1 0 0 0 0 0 0 0 0 0 0)
4(0 1 0 0 0 0 0 0 0 0 0)
3(0 0 1 0 0 0 0 0 0 0 0)
4(0 0 0 1 0 0 0 0 0 0 0)
5(0 0 0 0 1 0 0 0 0 0 0)
4(0 0 0 0 0 1 0 0 0 0 0)
4(0 0 0 0 0 0 1 0 0 0 0)
5(0 0 0 0 0 0 0 1 0 0 0)
1(0 0 0 0 0 0 0 0 1 0 0)
1(0 0 0 0 0 0 0 0 0 1 0)
1(0 0 0 0 0 0 0 0 0 0 1)
fi   lx 1 1 lx 9 2 lx 13 3 lx 16 4 lx 20 5 lx 25 6 lx 29 7 lx 33 8 lx 38 9
lx 39 10 lx 40 11
fi lx 41 12
st 1 lx 1 1 lx 9 2 lx 13 3 lx 16 4 lx 20 5 lx 25 6 lx 29 7 lx 33 8 lx 38 9
lx 39 10 lx 40 11
st 1 lx 41 12
fr td 1 1 td 2 2 td 3 3 td 4 4 td 5 5 td 6 6 td 7 7 td 8 8 td 9 9 td 10 10
fr td 11 11 td 12 12 td 13 13 td 14 14 td 15 15 td 16 16 td 17 17 td 18 18
td 19 19 td 20 20
fr td 21 21 td 22 22 td 23 23 td 24 24 td 25 25 td 26 26 td 27 27 td 28 28
td 29 29 td 30 30
fr td 31 31 td 32 32  td 33 33 td 34 34 td 35 35 td 36 36 td 37 37 td 38 38
td 39 39 td 40 40
fr td 41 41
st 0 td 38 38 td 39 39 td 40 40 td 41 41
fi td 38 38 td 39 39 td 40 40 td 41 41
fr td 17 16
fr td 28 27
fr td 8 7
Lk
Mastery Approach Avoidance Approval Concern Persval Sure Unsure Absence GPA
Location Gender
ou  mi sc ad=off it=20

group 2 male
DA  no=261
```

```
LA
b33 b40 b56 b89             !mastery
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73             !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34             !persval
b22 b38 b48 b54             !utility
b75 b69 b83 b93             !sure ability belief
b45 b81 b58 b67 b77         !unsure ability belief
gpa
absence
language location
cm = male.cov re
MO nx=41 nk=12 lx=in ph=in td=in
SE
b33 b40 b56 b89           !mastery
b22 b38 b48 b54             !utility
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73 !b91         !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34          !persval
b75 b69 b83 b93           !high ability belief
b45 b81 b58 b67 b77         !low abillity belief
absence
gpa
language location/
Lk
Mastery Approach Avoidance Approval Concern Persval Sure Unsure Absence GPA
Language Location
ou  sc ad=off it=20
```

APPENDIX E.5. SYNTAX USED FOR PATH MODEL.

```
!THIS IS THE 13-FACTOR MODEL WITH UTILITY AND MASTERY COLLAPSED
DA ni=42 no=579 ma=cm
LA
b33 b40 b56 b89             !mastery
b1 b2 b14 b76               !performance approach
b80 b95 b98                 !performance avoidance
b17 b23 b41 b73             !approval
b10 b21 b29 b35 b46         !concern
a31 a32 a33 a34             !persval
b22 b38 b48 b54             !utility
b75 b69 b83 b93             !sure ability belief
b45 b81 b58 b67 b77         !unsure ability belief
gpa
absence
gender language location
cm= path1.cov re
MO ny=42 ne=13 ly=fu,fi ps=sy,fi be=fu,fi te=sy,fi
SE
language location gender
absence
gpa
a31 a32 a33 a34               !persval
```

```
b75 b69 b83 b93                !sure ability belief
b45 b81 b58 b67 b77            !unsure ability belief
b17 b23 b41 b73                !approval
b10 b21 b29 b35 b46            !concern
b33 b40 b56 b89 b22 b38 b48 b54  !mastery !utility
b1 b2 b14 b76                  !performance approach
b80 b95 b98 /                  !performance avoidance
pa ly
1(1 0 0 0 0 0 0 0 0 0 0 0 0)
1(0 1 0 0 0 0 0 0 0 0 0 0 0)
1(0 0 1 0 0 0 0 0 0 0 0 0 0)
1(0 0 0 1 0 0 0 0 0 0 0 0 0)
1(0 0 0 0 1 0 0 0 0 0 0 0 0)
4(0 0 0 0 0 1 0 0 0 0 0 0 0)
4(0 0 0 0 0 0 1 0 0 0 0 0 0)
5(0 0 0 0 0 0 0 1 0 0 0 0 0)
4(0 0 0 0 0 0 0 0 1 0 0 0 0)
5(0 0 0 0 0 0 0 0 0 1 0 0 0)
8(0 0 0 0 0 0 0 0 0 0 1 0 0)
4(0 0 0 0 0 0 0 0 0 0 0 1 0)
3(0 0 0 0 0 0 0 0 0 0 0 0 1)
fi ly 1 1 ly 2 2 ly 3 3 ly 4 4 ly 5 5 ly 6 6 ly 10 7 ly 14 8 ly 19 9
ly 23 10 ly 28 11 ly 36 12
fi ly 40 13
st 1 ly 1 1 ly 2 2 ly 3 3 ly 4 4 ly 5 5 ly 6 6 ly 10 7 ly 14 8 ly 19
9 ly 23 10 ly 28 11 ly 36 12
st 1 ly 40 13
pa ps
1
1 1
1 1 1
0 0 0 1
0 0 0 0 1
0 0 0 0 0 1
0 0 0 0 0 1 1
0 0 0 0 0 1 1 1
0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0 1 1
0 0 0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0 0 0 1 1
0 0 0 0 0 0 0 0 0 0 1 1 1
PA BE
0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0
1 1 1 0 0 0 0 0 0 0 0 0 0
1 1 1 1 0 0 0 0 0 0 0 0 0
1 1 1 1 1 0 0 0 0 0 0 0 0
1 1 1 1 1 0 0 0 0 0 0 0 0
1 1 1 1 1 0 0 0 0 0 0 0 0
1 1 1 1 1 1 1 1 0 0 0 0 0
1 1 1 1 1 1 1 1 0 0 0 0 0
1 1 1 1 1 1 1 1 1 1 0 0 0
1 1 1 1 1 1 1 1 1 1 0 0 0
1 1 1 1 1 1 1 1 1 1 0 0 0
fr TE 1 1 TE 2 2 TE 3 3 TE 4 4 TE 5 5 TE 6 6 TE 7 7 TE 8 8 TE 9 9 TE
10 10
fr TE 11 11 TE 12 12 TE 13 13 TE 14 14 TE 15 15 TE 16 16 TE 17 17 TE
18 18 TE 19 19 TE 20 20
```

```
fr TE 21 21 te 22 22 te 23 23 te 24 24 te 25 25 te 26 26 te 27 27 te
28 28 te 29 29 te 30 30
fr te 31 31 te 32 32 te 33 33 te 34 34 te 35 35 te 36 36 te 37 37 te
38 38 te 39 39 te 40 40
fr te 41 41 te 42 42
st 0 te 1 1 te 2 2 te 3 3 te 4 4 te 5 5
fi te 1 1 te 2 2 te 3 3 te 4 4 te 5 5
fr te 9 8 te 20 19 te 34 33
Le
Language Location Gender Absence GPA Persval Sure Unsure Approval
Concern Mastery Approach Avoidance
ou  ef sc ad=off it=20
```

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