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DEFINING THE COMPONENTS OF ACADEMIC SELF-EFFICACY IN NAVAJO
AMERICAN INDIAN HIGH SCHOOL STUDENTS

by

Thomas R. Golightly

A dissertation submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Counseling Psychology and

Special Education

Brigham Young University

August 2007

BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a dissertation submitted by

Thomas R. Golightly

This dissertation has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

Date

Steven A. Smith, Chair

Date

Aaron Jackson

Date

Tim Smith

Date

Lane Fischer

Date

Rachel Crook-Lyon

BRIGHAM YOUNG UNIVERSITY

As chair of the candidate's graduate committee, I have read the dissertation of Thomas R. Golightly in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

Date

Steven A. Smith
Chair, Graduate Committee

Accepted for the Department

Aaron Jackson
Training Director

Accepted for the College

Richard K. Young,
Dean, College of Education

ABSTRACT

DEFINING THE COMPONENTS OF ACADEMIC SELF-EFFICACY IN NAVAJO AMERICAN INDIAN HIGH SCHOOL STUDENTS

Thomas R. Golightly

Department of Counseling Psychology and Special Education

Doctor of Philosophy

The academic difficulties experienced by a majority of Navajo American Indian students are well documented. Past research has focused on a variety of internal and external factors which possibly explain some of these difficulties. Low levels of *academic self-efficacy* (ASE) has been identified as one of the factors possibly contributing to lower than expected rates of academic achievement and low post-secondary education retention rates in this population. This investigation sought to further define the component structures of ASE using theoretical structures postulated by Bandura (1977a, 1997), namely: past success, modeling, verbal persuasion, and emotional arousal. Information about grade point averages (GPA) and standardized achievement tests (*IOWA Tests of Educational Development*) were obtained for a sample of American Indian Students (N = 118) as a measure of past success. Three self-report measures were administered to the participants in the

sample: *The Career-Related Parental Support Scale-Verbal Encouragement* scale (*CRPSS-VE*); and two measures created specifically for this study, *The People I Know* (to assess levels of exposure to appropriate academic models) and *My feelings about School* (to assess levels of emotional arousal centered on school). An additional pair of self-report measures was administered to this sample, the *Self-in-School (SIS)* and *Academic Hardiness Scale (AHS)*, which sought to assess overall levels of ASE in each of the participants.

Reliability and factor analyses were conducted to psychometrically examine the measures created for this study. Both were found to be highly reliable measures which load primarily onto one factor. Regression analyses were created to determine if the measures of the four components would predict totals on the two measures of overall ASE (the *SIS* and *AHS*). Results indicated that GPA, *IOWA* percentile rank scores, the *CRPSS-VE* and *My Feelings about School* were significant predictors of *SIS* totals in the regression models. Only *The People I Know* and *My Feelings about School* were significant predictors of *AHS* totals in the regression analyses. There was some evidence suggesting that the four components of ASE predicted overall reported levels of ASE. Implications of this study as well as possible future studies are outlined.

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INTRODUCTION AND REVIEW OF LITERATURE

United States government statistics suggest that American Indians have more academic difficulties than European Americans and most other minority groups (U.S. Department of Education, 1998; U.S. Department of Commerce, 1993, 2003). For example, American Indian high school graduates that enter college complete postsecondary degrees at a lower rate than other ethnic minorities (Reddy, 1993; U.S. Department of Education 2003). Other researchers have found that American Indian students have a lower rate of academic achievement than students in other minority groups (Ah Nee-Benham & Stein, 2003; Bowker, 1993; Lin, 1990; Lin, LaCounte, & Eder, 1988; Ortiz & HeavyRunner, 2003). Lower educational attainment creates problems for this group. Individuals that complete post secondary education, regardless of race or ethnicity, are more capable of earning higher salaries and financially succeeding in society (U.S. Department of Commerce, 2000). Graduates obtaining a four-year degree can expect to earn nearly twice the amount of money over a lifetime ($M =$ US \$1,827,120) than those that do not graduate from college (U.S. Department of Commerce, 2000).

Several studies have been conducted to better understand problematic education patterns of American Indian students. Most of these studies have identified factors that contribute to the lower than expected persistence rate among college-age American Indian students. They sought to explain why this population has a lower rate of academic achievement than other ethnic/racial groups (Brown & Kurpius, 1997; Benjamin, 1993; Downs, 2005; Hill, 2004; Pipes, Westby, & Inglebret, 1993; Rindone, 1988). One positive predictor of college persistence identified by researchers is *academic self-*

efficacy. It has frequently been cited as an important component in the academic success of American Indian students (Brown & Kurpius, 1997; Hill, 2004; Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003; Lin, 1990; Wells 1989).

Self-efficacy could parsimoniously be defined as confidence in one's ability to succeed in accomplishing a task. Albert Bandura (1977) first proposed self-efficacy as a construct, which aids understanding of human behavior and motivation. Bandura's initial self-efficacy theory studied individuals with psychological disorders seeking therapeutic intervention and was used primarily to predict outcome of treatment. He further refined the definition of self-efficacy as, "an individual's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986b, p. 359). He underscored the importance of this construct explaining that, "efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experiences" (Bandura, 1977, p. 192).

Bandura (1977) explained that expectations of efficacy are "derived from four principal sources of information: performance accomplishments, vicarious experience, verbal persuasion, and physiological states" (p. 192). Bandura suggested that measuring the contribution of each of these four components would help explain global self-efficacy and subsequent therapeutic outcome. Performance accomplishments, or past success, can be described as the experiences a person has with a particular behavioral domain. If an individual has a number of successful experiences in an area, s/he is more likely to believe in subsequent successful executions of the same or similar behaviors. Vicarious experience, or modeling, may be described as an individual's experience with people

similar to him/her that have successfully executed behavior(s) in a given domain. This instills a sense of confidence that an individual can similarly accomplish the tasks in that domain. *Verbal persuasion* is the component of building self-efficacy in which persons with influence in an individual's life use persuasive measures to convince him/her of his/her capability to perform behaviors in a given domain. These persons may include parents, other close family members, and other individuals who have particular influence with an individual. Physiological states can be defined as the level of emotional arousal an individual exhibits when experiencing different levels of anxiety. Successful task performance is not likely when an individual exhibits high levels of anxiety. Likewise, if an individual has no interest in an activity, or a complete lack of anxiety about a given task, s/he is not likely to successfully perform this task.

While his initial self-efficacy theory sought to explain change in clients seen in therapy, Bandura (2003, 1986, 1984) postulated that this construct is relevant to other human activities. Bandura (1977, 1997) also suggested that the degree of self-efficacy expectation in a particular domain will affect whether an individual will engage and persist in behaviors. He further postulated that self-efficacy should be studied relevant to specific tasks as opposed to gathering global measures of self-efficacy (Bandura, 1997).

Many studies have demonstrated that individuals with stronger self-efficacy beliefs in specific content areas perform better in those specific areas. With particular relevance to counseling psychology, there are specific areas in which higher levels of self-efficacy have shown better performance. These areas include career self-efficacy (Betz, 1992; Betz, Borgen, & Harmon, 1996); academic self-efficacy and college student satisfaction (DeWitz & Walsh, 2002); academic self-efficacy and study skills acquisition

(Zytowski & Luzzo, 2002); math and science self-efficacy (Lapan, Boggs, & Morrill, 1989); vocational self efficacy and its relationship with major/career selection (Rooney & Osipow, 1992); and job-seeking self-efficacy (Barlow et al., 2002). These findings have led researchers to name the specific type of efficacy beliefs being studied (i.e., vocational self-efficacy and academic self-efficacy) (DeWitz & Walsh, 2002). Bandura et al. (1996) examined the effects of content specific self-efficacy on academic functioning (confidence in one's capabilities to successfully initiate and complete academic tasks). These authors referred to this construct as academic self-efficacy. Other researchers subsequently examined how academic self-efficacy applies to scholastic activities (DeWitz, & Walsh, 2002; Galliher, 1998; Lindley, & Borgen, 2002; Pajares, 1996).

Self-efficacy appears to have a relationship to persistence in completing postsecondary education. DeWitz and Walsh (2002) described a positive relationship between self-efficacy beliefs and both persistence and academic performance in college. Two recent unpublished studies have found a relationship between academic self-efficacy and high school grade point average (GPA) in an American Indian population (Bryan, 2003; Downs, 2005). Other studies have identified academic self-efficacy as a likely construct in American Indian students' academic achievement and persistence in postsecondary academic endeavors (Brown & Kurpius, 1997; Hill, 2004; Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003; Lin, 1990; Wells 1989).

While academic self-efficacy has been identified as a likely factor in academic functioning for American Indians, no research currently exists that examines the four components of self-efficacy, namely, performance accomplishments (past success), vicarious experience (modeling), verbal persuasion, and physiological states (emotional

arousal/anxiety) and their relevance to American Indian students. There is currently a dearth of information on the components of academic self-efficacy, the ability to measure and describe potential deficits in these areas could aid teachers, counselors, and administrators to more appropriately intervene to improve academic self-efficacy in American Indian students. Logic would suggest that improving a student's beliefs in her/his ability to succeed in school could potentially contribute to improvement in academic achievement and persistence in academic activities.

The balance of this chapter will review contemporary literature regarding many of the topics previously mentioned, including: common educational difficulties experienced by American Indian students; self-efficacy; academic self-efficacy; academic self-efficacy and its relationship to academic achievement; academic self-efficacy in American Indian students; and the four components of self efficacy, namely performance accomplishments (past success), vicarious experience (modeling), verbal persuasion, and physiological states (emotional arousal/anxiety).

Literature Review

Information provided by the federal government (U.S. Department of the Interior, 1999; U.S. Department of Commerce, 2003) suggests that American Indians have the highest poverty rates of all racial and ethnic groupings. One in four families (25.7%) of American Indian descent lives in poverty (U.S. Department of Commerce, 2003). Many societal factors prohibit economic growth among the American Indian population including geographical isolation, underdeveloped physical infrastructures and demographics (Bowker, 1993; U.S. Department of the Interior, 1999). A report by the Office of American Indian Trust in Washington D.C. suggests that, "the disparities in

basic services, social conditions and education are widening” (U.S. Department of the Interior, 1999).

American Indians and Education

Another disparity between American Indians and other US citizens is in education. Less than one percent of all students enrolled in college are of American Indian descent (U.S. Department of Commerce, 2003; Carter & Wilson, 1997). Only 21% of American Indian and Alaska Native young adults were enrolled in college in the year 2000 (U.S. Department of Commerce, 2003). This compares with 36% of White non-Hispanic, 28% of African Americans and 14% of Latino/as in the same age group. U.S. Census (2000) data supports the notion that American Indians are under-represented in high school and college settings. For example, the counties in which the Navajo reservation lies all have a higher high school dropout rate higher than the national average (U.S. Department of Commerce, 2003). American Indians have the second highest dropout rate of all ethnic and racial groups (16.1%) behind only Hispanic/Latinos (U.S. Department of Commerce, 2003). Furthermore, the percentage of young adult American Indians attending college (20.7%) was significantly below the national average of 37.8% (U.S. Department of Commerce, 2003).

A consequence of lower educational attainment is decreased opportunities for careers and earning potential (U.S. Department of Commerce, 2003). American Indian students do not appear to be obtaining the levels of education needed to increase career opportunities and lifetime career earnings. One of the implications of not obtaining adequate levels of education is an inability to reduce the poverty rate which is significantly higher among the American Indian population (26%) in the United States

than the national average (12.4%) (U.S. Department of Commerce, 2003). The closest poverty rate of another racial or ethnic group is that of the Black/African American population (25%).

Generally, American Indian students have performed poorly in school when compared to European Americans and other minority groups. American Indian students have performed below expected grade levels on standardized tests of achievement (Matthews & Smith, 1994). When compared to samples of White, non-Hispanic students at secondary and post-secondary settings, American Indian student samples have significantly lower GPA's and lower scores on standardized assessments (Humphries, 1988). Stone and Gridley (1991) examined the relationship between academic achievement and race. Their findings indicate that on average American Indian students perform at lower than expected levels from early grade levels and similar subsequent poor performances persist throughout all elementary and secondary levels of education (Stone & Gridley, 1991). Studies have indicated that American Indian students on average experience less academic success than students of other ethnicities (Humphries, 1988; Matthews & Smith, 1994; Stone & Gridley, 1991) and subsequent higher dropout rates (U.S. Department of Commerce, 2003). This higher than expected dropout rate may be explained by American Indians deciding not to continue in activities in which they are not succeeding, something postulated by Bandura (1977, 1997) and germane to the present discussion.

Factors Explaining Academic Underachievement in American Indians

In recent years an abundance of research has been conducted on understanding why many American Indians have difficulty completing requirements for high school and

postsecondary degrees (Benjamin, 1993; Brandt, 1993; Brown & Kurpius, 1997; Bryan, 2004; Downs, 2005; Gritts, 1997; Hill, 2004; Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003; Lin, 1990; Ortiz & HeavyRunner, 2003; Reddy, 1993; Simms, 1999; Wells, 1989; West, 1988). Some researchers have sought to identify external factors contributing to poor persistence rates among American Indian students (Benjamin et al., 1993; Bowker, 1993; Hoover & Jacobs, 1992), while others tried to identify individual student characteristics (Bryan, 2004; Downs, 2005; Jackson & Smith, 2001; Lin, LaCounte, & Eder, 1988; Rindone, 1988; West, 1988).

External factors. Several external factors have been identified as contributors to poor academic success. One of the most widely mentioned factors is geographic isolation, which leads to underdeveloped economies and limited job opportunities on reservations (Bowker, 1992; Simms, 1999). The high unemployment rate (nearing 90% on some tribal lands), the relative paucity of job opportunities and slow job growth rates on reservations are a few indicators of the underdeveloped economy in these areas (Ortiz & HeavyRunner, 2003). Another factor contributing to achievement was family support (Jackson & Smith, 2001; Jackson, Smith & Hill, 2003; Rindone, 1988). Several studies have added to the findings of the importance of family support as a contributing factor to achievement and have demonstrated a relationship between family support and academic self-efficacy (Fernandez, 1997; Lotta, 2001; Turner & Lapan, 2003). Other environmental barriers include: difficulty assimilating into the dominant culture after leaving the reservation (Jackson, Smith & Hill, 2003; Simms, 1999; Tashakkori & Thompson, 1991), spiritual values and belief systems which may give individuals a sense of duty to remain tied to traditional lands coupled with family pressure to stay home

(Jackson & Smith, 2001; Jackson, Smith & Hill, 2003), and limited access to career information services such as counseling (Simms, 1999). Other external factors include content of curricula used in public schools. Matthews and Smith (1994) gave mention to curricular materials having little relevance to American Indian students, and indicated that more culturally relevant topics and material could increase motivation and self-esteem of American Indian Students. Additionally, Suina (2000) created a philosophy of educating indigenous tribes of American Indians through their methods of obtaining wisdom in conjunction with their spiritual backgrounds. This spiritual educational model could potentially link students to their culture and their heritage (Suina, 2000). Manuelito (2005) conducted an ethnography of Navajo educational patterns and concluded that it was of vital importance to incorporate American Indian epistemologies in the education of students from this population.

Individual/internal factors. Other researchers have focused on personality characteristics of American Indians contributing to poor academic performance and low persistence rates. Lin, LaCounte, and Eder (1988) found that reported feelings of isolation and negative attitude toward college were significant predictors of poor college GPA (cumulative GPA < 2.0) for American Indians. Low career maturity has also been associated with low academic achievement in American Indian college students (West, 1988). Of the individual factors identified by researchers as contributing to academic success, or lack thereof, self-efficacy appears to have a great deal of promise in explaining and predicting the relationship between academic persistence and performance (Bandura, 1997; Eccles et al., 1998; Hackett, 1985; Linnenbrink & Pintrich, 2002; Lyman

et al., 1984; Pajares & Kranzler, 1995; Pintirch, 2000; Pintrich & Schunk, 2002; Schunk, 1989).

Self-efficacy

The construct of self-efficacy was initially proposed by Albert Bandura (1977, 1997) as a, “theoretical framework to explain and to predict psychological changes” (p. 192) in clients presenting for psychotherapy. Bandura (1977) postulated that psychological treatment in its various forms, “serves as a means of creating and strengthening expectations of personal efficacy” (p. 191). He further explained that these efficacy expectations are, “convictions that one can successfully execute the behavior required to produce successful outcomes” (p. 191). Bandura (1977, 1997) posited that positive self-efficacy expectations enhance motivation and performance attainments. There is a wide range of studies supporting the notion of self-efficacy’s regulatory effects on global human functioning (Bandura & Adams, 1977; Bandura & Cervone, 1983; Bandura, 1986; Bandura & Locke, 2003).

Bandura (1977) first proposed self-efficacy as a theoretical explanation of behavior change in therapy. Later, Bandura provided a pragmatic, refined definition of the construct. Bandura posited that individuals receive information about their ability to accomplish tasks through four principal sources: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. *Performance accomplishments* are best defined as the conglomeration of past successful or unsuccessful experiences with a given behavior. *Vicarious experience* can be understood as observing others successfully perform certain behaviors. *Verbal persuasion* is understood as an individual’s susceptibility to be persuaded of capability (or incapability)

to perform certain behaviors. *Physiological states* could be defined as the amount of emotional arousal or anxiety one feels about performing given behaviors. A more detailed discussion of the four component of self-efficacy is given in a subsequent section of the thesis.

The subsequent refining of this construct has suggested a role for self-efficacy in individuals' lives outside of psychological treatment. In a recent article, Bandura and Locke (2003) explained that efficacy beliefs "affect whether individuals think in self-enhancing or self-debilitating ways, how well they motivate themselves and persevere in the face of difficulties...and the choices they make at important decisional points" (p.87). These authors suggest that an individual's motivation is centered on, "the core belief that one has the power to produce the desired [behavior]," (Bandura & Locke, 2003, p.88). The authors discussed the importance of the notion of a "core belief" in new behavior acquisition. As an individual is presented with obstacles, which prevent successful execution of new behaviors one may persist in one's efforts to accomplish these tasks relying on the belief that one will eventually successfully execute the behavior (Bandura & Locke, 2003). Additionally, the authors explained that an individual without this core belief is not likely to continue in trying to acquire the unlearned behavior (Bandura & Locke, 2003).

Bandura and others have suggested self-efficacy applies to specific tasks (Bandura, 1977, 1999). Bandura and Locke (2003) reviewed meta-analyses conducted in various "spheres of functioning" (p. 87). These spheres of functioning can be defined as specific areas in which an individual's belief to successfully perform behaviors in a particular domain are independent of beliefs about the ability to succeed in other areas.

The areas discussed by Bandura and Locke (2003) includes academic achievement, psychosocial functioning, work performance, health functioning, group functioning, and athletic performance.

Academic Self-efficacy

Bandura (1977, 1997) posited that the degree of self-efficacy belief in a particular domain will affect whether an individual approaches or avoids a given behavior and his or her level of persistence and performance while engaging in that behavior. Following Bandura's original work, studies have sought to define and apply self-efficacy in various spheres (Bandura & Locke, 2003; Betz, 1992). Of particular interest to the current study is the empirical support for the construct of academic self-efficacy. Academic self-efficacy is a construct, which has its roots in Albert Bandura's (1977, 1997) theory of self-efficacy or social learning theory. Evidence from several studies consistently shows that higher self-efficacy expectation contributes significantly to motivation and desired performance in academic settings (Hackett, 1985; Lyman et al., 1984; Pajares & Kranzler, 1995; Schunk, 1989). The term *academic self-efficacy* is a term suggesting the possibility that self-efficacy with respect to academic behaviors may influence scholastic persistence and performance.

Hackett and Betz (1981) reported findings of a positive relationship between academic efficacy beliefs and academic performance. Since these initial findings in the early 1980's, researchers have conducted literally hundreds of studies testing Bandura's self-efficacy theory and Betz and Hackett's initial findings. An exhaustive listing of these studies is beyond the scope of the current literature review. However, it is important to mention that there is a large body of research which demonstrates the relationship

between academic efficacy beliefs and academic performance (Bandura, 1997; Brown, Lent & Larkin, 1989; Eccles et al., 1998; Hackett, 1985; Lent & Larkin, 1984; Linnenbrink & Pintrich, 2002; Lyman et al., 1984; Multon, Brown, & Lent, 1991; Pajares & Kranzler, 1995; Pintirch, 2000; Pintrich & Schunk, 2002; Schunk, 1989; Zimmerman, 2000).

Lent and Larkin (1984) found that students reporting high educational self-efficacy generally achieved higher grades and persisted for longer amounts of time in scientific or technical majors in a university setting. Brown, Lent, and Larkin (1989) demonstrated that global efficacy perceptions had effects on academic performance and persistence in students entering college. Findings from the numerous studies conducted on this topic are best summarized in a meta-analysis of all of the research conducted in this area over a nine-year period from 1981 to 1990 through which a positive, statistically significant relationship between self-efficacy beliefs and academic performance and persistence was demonstrated (Multon, Brown, & Lent, 1991). These findings, added to recent studies appear to have established the validity of academic self-efficacy as a predictor of students' learning, motivation, persistence and achievement (Zimmerman, 2000).

Recent empirical findings have continued to demonstrate the relationship between efficacy beliefs and educational performance and persistence. These studies have been more detailed in analyzing the relationship between efficacy beliefs in certain academic majors/subjects or with elementary and secondary level students. Bandalos, Yates, and Thorndike-Christ (1995) studied the effects of math efficacy beliefs and outcome in undergraduate college courses. Their findings showed that those with low reported levels

of math self-efficacy had higher test anxiety and lower grades than those with moderate and high reported levels of math self-efficacy. Linnenbrink and Pintrich (2002) correlated academic self-efficacy with not only academic outcomes, but also effort and persistence in elementary and secondary level students. This study supported previous findings, which yielded similar results (Bandura, 1997; Eccles et al., 1998; Pintirch, 2000; Pintrich & Schunk, 2002). Lopez et al. (1997) associated math self-efficacy with interest and performance in math courses in high school students. The aforementioned findings lend further support to the notion of the association academic efficacy beliefs has with academic performance for students of all ages and levels of education and in various subjects.

Academic self-efficacy and race/ethnicity. Before discussing how the construct of academic self-efficacy applies to minority populations it is imperative to note the caution one must take in applying any psychological construct cross-culturally. Many researchers make assumptions and practices consistent with Northern European cultural values (Sue & Sue, 1990). Sue and Sue (1999) underscored the importance of understanding individuals in ways that might be consistent with their diverse backgrounds. Researchers and clinicians alike should look to understand and share the world views of the culturally different (Sue & Sue, 1999). The researcher in this study may be making an assumption of imposing the values of the Euro-American educational system and its benefits to all individuals regardless of race or ethnicity.

American Indians may not, as a culture, share the values of the Euro-American educational system. American Indians may, in fact, have some disdain for the current structure. It is a well documented historical fact that the U.S. government made policies

which displaced American Indian from their native lands and may have contributed to American Indians, as a culture, to become skeptical of governmental intervention (Brown, 1991). Federal educational policies that required children at an early age to leave their respective families and attend boarding school in locations far away from their reservations were also a significant contributor to the cultural mistrust. Official policy at these schools was to acculturate American Indians. Thus, these students were forced to give up their native languages and traditions as a part of their schooling (American Academy of Child & Adolescent Psychiatry [AACAP], 1975). This led many American Indians to forsake their native culture in order to accommodate “White” culture. Historically, many American Indian individuals experienced prejudice and overt racism at the hands of the federal educational system (AACAP, 1975). The present author takes note of the caution of applying constructs to this culture and explicitly states making the assumption of the cross-cultural value of the current educational system in this study.

However, it is worthy to note that the Navajo chiefs have long advocated for their people to become more educated (McPherson, 1988). One example is Chief Manuelito, head of the Navajo Nation in the mid and late 1800s. Chief Manuelito was dedicated to creating and signing treaties with the federal government, which outlined educational practices that occurred simultaneously with similar movements in “White” culture (United States National Park Service [USNPS], 2006). He is reported to have said, "...my grandchild, education is the ladder. Tell our people to take it" (Snyder, 2003; USNPS, 2006). Currently, the Navajo tribal government has made education an important agenda. They encourage other Navajos to obtain as much schooling as possible to benefit their families and their Nation (Utah State Office of Education, 2006).

Relatively few studies exist which examine academic self-efficacy with different ethnic populations, and many studies conducted in the area of academic self-efficacy call for further research about formulation of efficacy beliefs in racially diverse populations (Bandura & Locke, 2003; Luzzo et al., 1999; Schunk, 2003). Early researchers underscored the importance of testing how well self-efficacy theory and its related constructs apply to diverse populations (Bandura, 1977; Betz, 1978), but compared with the total number of studies conducted on academic self-efficacy, there is a dearth of studies addressing the formation of academic efficacy beliefs in minority populations.

Initial studies of self-efficacy and race were conducted only a few years following Bandura's initial work regarding self-efficacy but these do not appear to have been immediately followed by other studies involving individuals from different ethnic groups. The earliest research conducted by Powers and Rossman (1984) looked at the attributional styles of low achieving college students which belonged to several diverse ethnic minority groups including Caucasians, African-Americans, Latino/as, and American Indian students. Their findings indicated that Caucasians and Latino/as were more likely to attribute failure to their lack of abilities (exhibited less confidence in their academic abilities) than students from the other groups included in the study (Powers & Rossman, 1984). Powers and Rossman (1984) further demonstrated that African-American and American Indian students attributed poor academic performance to a lack of individual effort as indicated by responses on self-report measures of attribution for school failure.

A re-examination of the academic self-efficacy among minority students began in the 1990s. Matsui, Matsui, and Ohnishi (1990) studied the relevance of academic self-

efficacy in major selection in a sample of Japanese college students. Their findings showed that students selected majors according to how well the individuals thought they could do in the required course work. If students believed they could achieve good grades and succeed in these courses, they were more likely to select a major in those areas of high reported self-efficacy. A similar study (Tashakori & Thompson, 1991) yielded results positively correlating academic efficacy beliefs and performance in a sample of African-American high school students. Pajares (1996) further underscored the notion of generalizability of academic self-efficacy to minority groups when he summarized a large number of studies, which also served to demonstrate the cross-cultural nature of academic self-efficacy. Pajares concluded from his review that this construct provides a way in which professionals can, “describe the interplay between the self system and external sources of influence in an individual’s education,” (p. 543). Pajares explained that the internal and external factors involved in self-efficacy could be affected by cultural background and these factors play a part in establishing academic efficacy beliefs.

Other recent studies conducted on academic self-efficacy are showing discrepancies in levels of academic self-efficacy among racial groups. Mayo and Christenfeld (1999) demonstrated low efficacy expectations (along with correlated poor comparative academic performance) in minority samples compared to Caucasian samples. Chim and Kameoka (2002) yielded similar results in samples of inner-city Latino/a students and suburban Caucasian students. Other studies have found significant relationships between self-efficacy and academic persistence/performance in samples of ethnic and racial minority groups (Linnenbrink & Pintrich, 2002; Mayo & Christenfeld,

1999; Nichols & Steffy, 1999; Tashakkori & Thompson, 1991). These findings suggest that self-efficacy is a construct, which can explain deficits in academic achievement in many ethnic minority groups including American Indian students.

Academic self-efficacy and American Indian students. There has been a recent increase in research on academic self-efficacy and American Indian students. Most studies examine factors contributing to low rates of academic persistence and achievement (Brown & Kurpius, 1997; Bryan, 2004; Downs, 2005; Hill, 2004; Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003; Lin, 1990; Wells 1989). Bryan (2003) and Downs (2005) conducted separate studies in which self-efficacy was significantly positively correlated to academic achievement, suggesting that this construct may have some utility with this population. Bryan (2003) as part of his study on cultural identity and school performance identified the strong relationship between GPA and scores on a self-report measure of academic self-efficacy, the Self-in-School (Smith, 1988). He concluded that higher academic performance will result from higher academic self-efficacy (Bryan, 2003). Bryan (2003) further suggested that efforts to improve academic self-efficacy could positively impact academic performance in Navajo American Indian students. Adding to these initial findings Downs (2005) conducted a study to determine parental influence on students' academic efficacy beliefs. The subsequent findings lent further support to the notion of a significant correlation between academic expectancy beliefs and educational performance as measured by GPA (Downs, 2005). Further, Downs (2005) found that scores on self-report measures of academic self-efficacy are significantly positively correlated to scores on Standardized Academic Tests (SAT).

The author of the current study links the findings from Bryan (2004) and Downs (2005) with themes from qualitative research on lower than expected levels of academic achievement and post-secondary persistence (Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003) which suggest that Navajo American Indian students lack exposure and feedback in the four sources of efficacy information. While academic self-efficacy has been shown to correlate with academic achievement (Bryan 2003; Downs, 2005) there are issues with the instrumentation and measurement involved with the construct of academic self-efficacy. Researchers need to better define and analyze the components of academic self-efficacy in order to better help professionals intervene to improve academic efficacy in this population.

Components of Self-Efficacy

In his later work on self-efficacy, Bandura (1997) acknowledged the powerful findings relating self-efficacy beliefs and educational performance. However, most of the studies assessed levels of general academic self-efficacy (Bryan, 2003; DeWtiz & Walsh, 2002; Downs, 2005; Galliher, 1998; Lindley & Borgen, 2002; Pajares, 1996), and few have focused on identifying the relevancy of the four components of self-efficacy in academic settings (Bandura et al., 1996; Lopez et al., 1997; Schunk, 2003; Zimmerman, 2000). Some empirical studies have examined the effects of the four sources of information on the development of academic efficacy beliefs, and these will be reviewed below.

Performance accomplishments. Performance accomplishments are based on an individual's history of performances/experiences with a given task (Bandura, 1977, 1997). Several terms have been used to describe *performance accomplishments*. Three

examples of these terms are *enactive attainments* (Lane, Lane, & Kyprianou, 2004; Lindley & Borgen, 2002), *personal accomplishments* (Betz, 1992; Luzzo et al., 1999), and *past success* (Bandura, 1997; Betz, 1992; Lane, Lane, & Kyprianou, 2004). These four terms are considered to be synonymous; however, the term past success is used for the balance of this study. Bandura (1997) explained the importance successful experiences play in forming efficacy beliefs:

Successes raise mastery expectations; repeated failures lower them, especially if the failures occur early in the course of events. After strong efficacy expectations are developed through repeated successes, the negative impact of failures is likely to be reduced. Occasional failures that are later overcome by determined effort can then strengthen persistence and efficacy expectations because of the perceived ability to better overcome obstacles to achieve a mastery level. The effects of failure (and success) on personal efficacy is therefore dependent not only on the pattern of experiences, but the timing of experiences in which failures occur. (p. 195)

Bandura (1977) further explained that giving opportunities to individuals with low self-efficacy to successfully accomplish a particular task or behavior reduces anxiety around the task or behavior and creates positive experience that an individual can use to increase efficacy expectations. Furthermore, if an individual is systematically exposed to a task for which he/she has low self-efficacy, he/she can generate successful experiences (Betz, 1992; Lane, Lane, & Kyprianou, 2004; Luzzo et al., 1999).

A large body of research has demonstrated the importance of past success and its effects on efficacy beliefs. An extensive discussion of studies conducted on past success

is beyond the scope of this study. Relevant to the current study is literature, which supports past success as a relevant component in increasing academic self-efficacy. Many studies suggest that past successful experiences are the most powerful component of academic self-efficacy (Bandura, 1982, 1997; Betz, 1992; Luzzo et al., 1999). Luzzo et al. (1999) conducted a study demonstrating that interventions geared toward helping math and science self-efficacy were more successful when focusing on creating positive personal mastery experiences. Barling and Snipelsky (1983) demonstrated effects of past success on academic self-efficacy beliefs. Betz (1992) discussed the necessity of creating successful experiences in order to improve career and academic self-efficacy as part of effective counseling of college students. Campbell and Hackett (1986) found that individuals reporting success solving math problems had high levels of perceived efficacy in math. Other studies have similarly shown the positive relationship between past accomplishments and reported levels of academic self-efficacy (Keyser & Barling, 1981; Lane, Lane, & Kyprianou, 2004), and career self-efficacy (Dawes, Horan, & Hackett, 2000).

Many researchers have examined the relationship between self-efficacy beliefs and academic performance (Kluger & Koslowsky, 1988; Lufi, Parish-Plass & Cohen, 2003; Malouff et al., 1990; Stader & Licht, 1992), and a majority of the studies measuring academic performance operationalized this construct as students' grade-point averages (GPA). In the educational system in the United States, grades are the primary method of a students' performance feedback (Stader & Licht, 1992). Grades are the most widely used indicator of successful or unsuccessful academic performance (Lufi, Parish-Plass & Cohen, 2003). Researchers looking to examine efficacy beliefs about certain

subjects such as math or science seem to prefer more objective measures of ability such as number of correct answers on a test (Lopez et al., 1997; Schunk, 2003). Other researchers have attempted to utilize standardized achievement test as measures of successful performance across subjects with less powerful results (Lent, Lopez & Bieschke, 1991). However, researchers continue to utilize GPA as a pragmatic measure of academic performance (Malouff et al., 1990). GPA is a time-saving heuristic to account for performance in many subjects with as little administration time as possible (Kluger & Koslowsky, 1988). GPA is not only the most efficient measure of academic performance it is also the most widely utilized.

Vicarious experience (modeling). While past successes are powerful sources of information they are not the only source by which people form efficacy beliefs. Vicarious experiences are also a widely studied source of efficacy information and shown to influence levels of self-efficacy. Vicarious experience is the second most studied source of efficacy information behind performance accomplishments (Bandura, 1997). Bandura gave the following explanation of vicarious experience:

Seeing others perform threatening activities without adverse consequences can generate expectations in observers that they too will improve if they intensify and persist in their efforts. Individuals persuade themselves that if others can do it, they should be able to achieve at least some improvement in performance. (p. 197)

Thus, vicarious experiences are those in which an individual observes another successfully perform a given task. Bandura defines these observations as *modeled behavior* (1977, 1997). Modeling takes place when observers display new behaviors that

prior to modeling had no probability of occurrence, even if the observers were motivated to accomplish such behaviors (Bandura, 1986b). There are three main factors that create good models: (1) age and expertness, (2) similarity between models and observers, and (3) the difficulty of tasks to be performed (Bandura, 1977, 1997). Bandura (1986a, 1997) suggested that efficacy beliefs are not as powerfully influenced by models as they are past successes, but modeled behavior also leads to significant changes in behavior.

Modeling has not been studied as widely as past success but is still likely to contribute to increases in self-efficacy (Bandura, 1997; Dawes, Horan, & Hackett, 1997). For example, Hackett et al. (1992) found that individuals who had good models in conjunction with successful performance accomplishments exhibited greater increases in self-efficacy than individuals who experienced only performance accomplishments. Exposure to both senior and peer models have been shown to increase positive work attitudes and behaviors such as work attendance and participation in volunteer projects in places of work (Eden & Kinnar, 1991). These findings give weight to the notion that models are an important source of information in the formation of efficacy beliefs in several areas including academic skill acquisition (Pajares, 1996), occupational self-efficacy (Schyns, 2004), social self-efficacy (Anderson & Betz, 2001), math/science self-efficacy (Luzzo et al., 1999), and athletic performance self-efficacy (Jackson & Csikszentmihalyi, 1999).

Over the past several decades, studies have shown modeling to be an important means of promoting learning (successful academic experiences) and increasing academic self-efficacy (Luzzo et al., 1999; Schunk, 2003). Luzzo et al. (1999) demonstrated that college students' belief in their ability to successfully accomplish difficult math and

science tasks was the key component to major selection in these areas. Findings demonstrate that appropriate models inform and motivate students that have previously been unsuccessful in their attempts to succeed in school and provide information about actions that lead to success (Chin & Kameoka, 2002). Student improvement has been shown to correlate with exposure to successful models (Schunk, 2003). Furthermore, successful peer models have been incorporated to improve academic achievement and career planning of individuals with learning disabilities (Reekie, 1995). The concept of modeling and its role in the formation of self-efficacy is less well established than the role of performance accomplishments. However, modeling appears to augment information received through past successes (Schunk, 2003).

Some studies have shown modeling to have a positive influence on academic achievement. Modeling has been shown to be an important means of promoting learning (successful academic experiences) and increasing academic self-efficacy (Schunk, 2003). Findings demonstrate that appropriate models inform and motivate students that have previously been unsuccessful in their attempts to succeed in school and provide information about sequences of action that lead to success (Chin & Kameoka, 2002). Teachers have appropriately used peer models to effectively increase performance and efficacy beliefs in several subjects such as English, writing, math and science in secondary level students (Schunk, 2003; Lopez et al., 1997). Assessing exposure to successful academic models is potentially a beneficial exercise. The next step is to assess the amount of exposure students have to individuals most likely to be powerful social models, individuals that have similar characteristics to the observing students.

Bandura (1977, 1997) posited that in order for models to be most effective as a source of information they must be similar to the observer in characteristics, such as age, gender, ethnicity, and perceived competence. Bandura (1997) further posited that models of similar race and gender are viewed as more credible and instill stronger efficacy beliefs than do models of different races and gender. Subsequent empirical findings support the notion that racially similar models being more effective than those that are racially different from the observer (Mayo & Christenfeld, 1999; Schunk, 2003). Several studies indicate the lack of appropriate racially similar models as being a roadblock in the completion of college degrees in multicultural college student populations (Mayo & Christenfeld, 1999; Jackson & Smith, 2003; Powers & Rossman, 1984; Tashakori & Thompson, 1991). It may be necessary to expose students to individuals that are successful academically and who are similar in race, gender and age.

Verbal persuasion. *Verbal persuasion* can be defined as the source of efficacy information by which an individual is led to believe she/he can successfully complete tasks in a specific domain through verbal suggestion. Bandura (1977, 1997) postulated that verbal persuasion as a source of efficacy information is less influential than the two previously discussed. Bandura (1977, 1986a, 1986b, 1997) believed this to be true since verbal persuasion provides no experiential basis. However it is imperative to acknowledge the role verbal persuasion plays in influencing human behavior and motivation. It is the most widely used and readily available source of efficacy information (Bandura, 1977, 1997). People report being affected by motivational speeches which increase their beliefs that they are capable of successfully performing behaviors in a variety of settings and performance areas including: athletic competition

(Orlick, 2000); supervision and training of graduate student counselors (Bernard & Goodyear, 2004); occupational self-efficacy (Schyns, 2004); and math and science self-efficacy (Betz, 1992; Spight & Rosenthal, 1995).

While it is known that verbal persuasion plays a role in the formulation of self-efficacy beliefs, the attempts to demonstrate the effects of verbal suggestion are somewhat limited. Many studies look at the two main sources of efficacy information (performance accomplishments and vicarious experiences) in conjunction with verbal persuasion (Betz, 1992; Guthrie & Shwoerer, 1996; Schyns, 2004; Spight & Rosenthal, 1995). Results from these studies are similar: verbal persuasion is a significant factor, but less influential than performance accomplishments or modeling (Betz, 1992; Guthrie & Shwoerer, 1996; Schyns, 2004; Spight & Rosenthal, 1995).

Verbal persuasion is a means of strengthening students' beliefs in their ability to succeed academically. Students that are persuaded by others of their ability to accomplish educational tasks are more likely to exert greater effort and maintain that effort over a period of time than individuals not receiving persuasion (Bandura, 1997). Likewise, individuals that have been persuaded by others that they lack the capabilities to succeed avoid engaging in challenging academic activities and thus eliminate the possibility of creating positive efficacy beliefs (Bandura, 1977, 1997; Bandura & Cervone, 1983; Baron, 1988; Betz, 1992). Bandura et al. (1996) studied the role parents play in verbally encouraging their children in academic pursuits. Secondary level students that reported having parents that verbally support and reinforce academic successes were generally performing better in school (Bandura et al., 1996).

Research conducted involving career and academic self-efficacy establish parental involvement as the primary source of verbal persuasion (Turner & Lapan, 2002; Turner et al., 2003). Turner et al. (2003) constructed the Career-Related Parent Support Scale (CRPSS) to assess the level of exposure to the four sources of efficacy information as it pertained to career efficacy development. Included in their definition of *career development* was *educational development*, which prepares a student to enter the working world and establish career efficacy beliefs. In assessing the amount of exposure to verbal persuasion the researchers determined the level of parental verbal praise and encouragement to be the best indicator of the amount of verbal persuasion perceived by a secondary level student (Turner et al., 2003). What is more, Turner et al. (2003) and Turner and Lapan, (2002) created the CRPSS specifically for American Indian students in order to better understand career self-efficacy in this population. The aforementioned studies were conducted with samples from minority groups in mind and the CRPSS was designed specifically for American Indian students. It could be concluded that at the secondary level American Indian students perceive their parents as the most relevant source of verbal persuasion information in augmenting their formation of academic efficacy beliefs.

Emotional arousal. The last source of efficacy information, emotional arousal, is widely believed to play a role in the development of self-efficacy, but empirical support for it is somewhat weak (Bandura, 1986a). *Emotional arousal* can be defined as the level of anxiety one experiences when performing behaviors in a given domain. Other terms used to describe emotional arousal include physiological states and anxiety levels. Bandura (1977, 1997) posited that stress provoking experiences and demanding situations

elicit emotional arousal that might inform an individual concerning her/his competency to complete a given task. Moderate levels of emotional arousal are posited to lead to greater self-efficacy. People rely on their state of emotional arousal to judge their ability to complete a task (Bandura, 1986a).

Many studies have been conducted which examine how low levels of fear and moderate levels of emotional arousal positively affect the treatment of individuals with various mental disorders. Newman and Brand (1980) were capable of eliminating fear responses in individuals handling animals that were considered threatening (e.g., snakes, rats, and kimono dragons). Bruck and Melnyk (2004) reviewed 15 studies, which associated stress and emotional arousal with self-efficacy beliefs. Many of these studies demonstrated that individuals (especially children) are more susceptible to verbal suggestion when reporting a high level of emotional arousal (Bruck & Melnyk, 2004). Kominars (1997) found that decreasing levels emotional arousal in individuals being treated for substance abuse through relaxation and visualization techniques increased perceived ability in these individuals to quit these destructive habits. Other findings correlate a positive relationship between moderate levels of anxiety and high social and career self-efficacy (Anderson & Betz, 2001) and coming out self-efficacy in lesbians (Anderson & Mavis, 1996). These findings lend credence to the notion that emotional arousal is a source of efficacy information. However it should be noted that emotional arousal is less powerful as a source of efficacy information than past successes and vicarious experiences.

Bandura (1986b) cautioned against giving too much weight to emotional arousal as it pertains to the formulation of efficacy beliefs. Bandura explained the following:

Perceived self-inefficacy leads people to approach intimidating situations anxiously, and experience of disruptive levels of arousal may further lower their sense that they will be able to perform well. However, people are much more likely to act on self-percepts of efficacy inferred from mastery experiences (past successes) and social comparison of capabilities (modeling) than to rely heavily on the stirrings of the viscera. (p. 365)

In order to understand the role emotional arousal plays in the development of efficacy beliefs it is imperative to outline the nature of the relationship between physiological arousal and performance.

The inverted U-hypothesis is the most viable description of the relationship between emotional arousal and performance (Landers & Arent, 2001). This hypothesis predicts that as emotional arousal increases there is a progressive increase in performance efficiency. However, once emotional arousal continues to increase and reaches a state of high excitement there is a decrease in task performance (Figure 1). The key point to inverted-U theory is that the relationship between performance and arousal is curvilinear with the best performance occurring at a moderate point within the range of arousal. Inverted-U theory has a long history of research and a breadth of findings that surround it. The first series of experiments was conducted by Yerkes and Dodson (1908). Their findings demonstrated not only that the inverted-U shape was the best way to describe the relationship between emotional arousal and performance, but that the difficulty of the tasks required of participants also played a factor in this relationship (Yerkes & Dodson, 1908). Subsequent studies have also demonstrated this relationship between difficulty of tasks and performance (Babin, 1966; Landers & Arent, 2001; Martens & Landers, 1970).

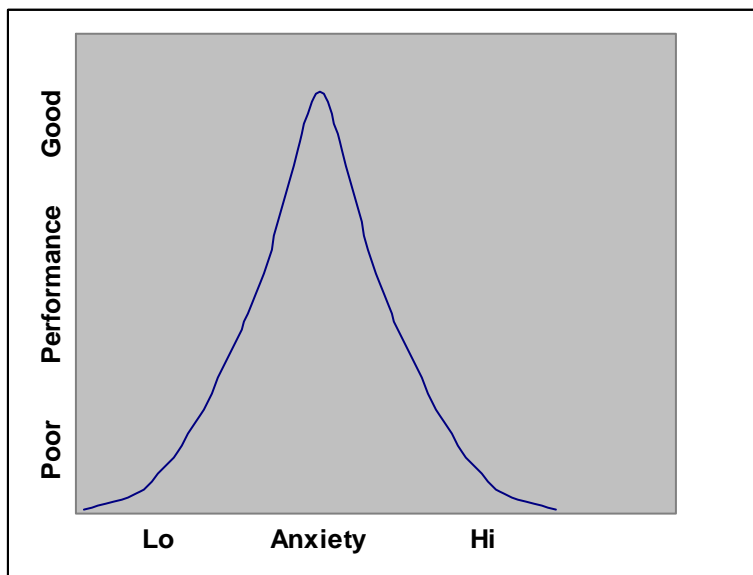


Figure 1. Graphical explanation of the inverted-U theory: Researchers appear to operationalize the emotional arousal source of academic efficacy information as anxiety about academics and related activities.

Note. This graph was created by the author of the current investigation however this graphical representation is supported by research findings (Anderson & Betz, 2001; Matsui, Matsui & Ohnishi, 1990; Seifert, 2004; Yerkes & Dodson, 1908).

Even before Bandura began theorizing about self-efficacy, researchers were examining the role of affective responses in students (Betz, 1978). Emotional arousal has often been operationalized by researchers as *anxiety* (Betz, 1978; Stent, 1977; Tobias, 1976). Stent (1977) and Tobias (1976) coined the term *math anxiety* to explain poor performance and avoidance of math courses. Math anxiety was described as, “the tension and anxiety that interfere with the manipulation of numbers... In academic situations” (Stent, 1977). Results from research conducted at that time demonstrated that students with higher reported levels of math anxiety had lower levels of math achievement (Betz,

1978). As the concept of academic self-efficacy emerged as a more comprehensive explanation for poor academic achievement researchers looking at the effects of anxiety, or *emotional arousal*, sought to lend support to Bandura's notion of emotional arousal as a source of efficacy information. Matsui, Matsui, and Ohnishi (1990) found *emotional arousal* defined as anxiety to play a role in the formation of math self-efficacy. Other researchers showed that levels of emotional arousal play a key role in the formation of academic efficacy beliefs across subjects

Through empirical findings researchers have suggested two patterns in the relationship with anxiety and academic achievement in students that consistently under-perform. The first pattern suggests that students that report feeling a high amount of nervousness and anxiety (emotionally over-aroused) about school and schoolwork will under-perform (Anderson & Betz, 2001; Matsui, Matsui, & Ohnishi, 1990). Secondly, many students that are typically emotionally under-aroused (bored) perform below expectations. There are two groups of individuals that fit into this pattern. The first group is comprised of individuals that have failed so frequently that they experience extreme anxiety, or over-arousal, about schoolwork and perform well below age/grade norms (Seifert, 2004). The second group of students consists of individuals that are capable of performing well but seem to be under-challenged and thus perform well below their levels of capability due to boredom (Dweck, 1986; Jarvis & Seifert, 2002). These findings outline how students that are more often than not emotionally over or under-aroused typically have poor academic outcomes.

Assessment of Academic Self-Efficacy

The previous sections of this review have included how researchers have defined and utilized self-efficacy and its component parts. A basic knowledge of this construct and how it is understood by researchers and helping professionals provides the basis of understanding the conceptual framework of the current study. What has not been outlined is how researchers have assessed for levels of academic self-efficacy. The balance of this literature review summarizes the development of this line of research.

Researchers have sought for reliable and valid measures of self-efficacy in order to appropriately assess students for potential deficits in levels of this construct. Some research has been conducted establishing reliable and valid measures of global academic self-efficacy. Self-efficacy is typically assessed using self-report measures (Linnenbrink & Pintrich, 2002). While several instruments have been created to measure academic efficacy beliefs in students of all educational levels, many of these measures were created to assess levels of self-efficacy in specific subjects such as math (Hackett & Betz, 1989; Matsui, Matsui, & Ohnishi, 1990) and reading/writing in English courses (Shell, Colvin, & Brunning, 1995) or to indicate levels of student efficacy beliefs to accomplish specific academic activities such as listening to lectures, note taking, and understanding oral presentations (Zimmerman, Bandura, & Martinez-Pons, 1992). Heretofore, assessment of academic self-efficacy has been primarily used by researchers to determine the role this construct plays in academic achievement (Linnenbrink & Pintrich, 2002). Only a small number of instruments exist that were created with the intent to assess global levels of academic self-efficacy.

Few measures of academic self-efficacy provide relevant information for helping professionals (Hampton, 1998). However, those that have been created have shown good levels of reliability and validity. Pintrich et al. (1993) created the Motivated Learning Strategies Questionnaire (MLSQ) and were able to demonstrate good levels of reliability and validity in samples of students at all levels from fourth grade to postsecondary students. This instrument consists of a series of 60-item in 5-point Likert-response format. While reliable and valid the practical use of this instrument with students has been called in to question due to relatively long completion times (Cassidy & Eachus, 2000; Bong & Clark, 1999). A shorter, more pragmatic, yet reliable and valid measure of a similar construct, academic hardiness, was created by Benishek & Lopez (2001) to provide information about students' academic successes. The Academic Hardiness Scale is an 18-item self-report instrument in four-point Likert-response format. In a similar attempt to reduce administration time Smith (1988) created the Self-in-School measure of academic self-efficacy. In its original 18-item version the Self-in-School demonstrated good reliability levels ($\alpha = .89$) (Smith, 1988). Bryan (2003) administered this instrument to American Indian samples and found similar levels of reliability (Chronbach's $\alpha = .90$). Bryan's (2003) findings suggest that this instrument may be a useful tool in assessing levels of academic self-efficacy for this population.

Regardless of past levels of reliability and validity the aforementioned instruments have proven to be in the past it has been noted that student responses on self-report measures differ depending on the context (Linnenbrink & Pintrich, 2002). In this spirit, the Self-in-School measure of academic self-efficacy was recently revised (Downs, 2005). Downs made a number of changes to the instrument including: reducing the total

number of items to 15, rewording and eliminating reversed scored items, and changing the number of response options to a seven-point Likert-response format. After its restructuring, the Self-in-School was administered to a sample of Navajo American Indian students. It was shown to be a reliable instrument ($\alpha = .91$) with this population (Downs, 2005). Additionally, Downs provided evidence of construct validity for this instrument in that totals on the Self-in-School were significantly correlated with GPA and standardized achievement test scores.

There are relatively few instruments designed to assess academic self-efficacy across subjects. Fewer still have proved to be useful for researchers assessing this construct with American Indian students. The present researcher found no instruments designed to assess the level of exposure to the four sources of efficacy information in academic self-efficacy. One instrument was created to assess the influence of the four sources of information on career self-efficacy in middle school students (Turner et al., 2003). Turner et al. developed the Career-Related Parent Support Scale (CRPSS) to assess students' perceptions of how their parents provided opportunities and exposure to the four sources of efficacy information. While the creators of the CRPSS were aiming to assess levels of career self-efficacy in adolescents, a major part of career self-efficacy at that stage of development is determined by school performance (Turner, 2002; Turner et al., 2003). Thus, the CRPSS has proved itself to be a useful instrument in assessing levels of parental involvement in the amount of exposure to the sources of academic efficacy, including American Indian samples (Alliman-Brissett, Turner, & Skovholt, 2004; Turner & Lapan, 2003; Turner et al., 2003).

Summary

Several conclusions are based on this literature review:

1. American Indian students demonstrate lower levels of academic achievement and persistence for a variety of personal, environmental and cultural factors (Jackson, Smith & Hill, 2003; U.S. Department of Commerce, 2003).
2. The difficulties American Indian students face in school may contribute to the high poverty levels in this group (U.S. Department of Commerce, 2003).
3. Academic self-efficacy has been shown to correlate with academic achievement and postsecondary persistence in American Indian students (Bryan, 2003; Jackson, Smith & Hill, 2003; Downs, 2005).
4. While researchers understand that reported levels of academic self-efficacy is related to low achievement and academic persistence, what is lacking from the current literature is tying in the four sources of efficacy information as posited by Bandura (1977, 1997) and its relationship to global levels of academic efficacy.
5. Two of the components of academic self-efficacy (past success-GPA, and verbal persuasion-CRPSS-VE) have previously established measures, which seek to assess the type and amount of efficacy information individuals receive in these areas. To date, there are no established measures for the other two sources of efficacy information (modeling and emotional arousal).

Providing information about the components of academic self-efficacy could help professionals better intervene and improve levels of academic self-efficacy. This may in turn help improve academic performance and persistence in Navajo American Indian students.

Statement of Problem

Academic self-efficacy has been identified as a relevant construct contributing to academic performance by American Indian students. There is a positive relationship between academic self-efficacy and both academic achievement and persistence in postsecondary education activities. Thus, improving a student's academic efficacy beliefs could potentially improve academic persistence and performance.

In order to improve an individual's self-efficacy, one must be able to understand where to intervene. While many studies describe academic self-efficacy as a salient construct, no current studies examine the relevance of the four components of self-efficacy. Furthermore, there are existing measures, which assess global levels of academic self-efficacy, however no measures currently exist that assess where potential individual deficits in the four areas lie.

Statement of Purpose

The current study focuses on refining the definition of the construct of academic self-efficacy and has two main purposes. The first is to create two instruments to aid in the assessment of the four component areas of self-efficacy as theorized by Bandura (1977, 1997). The second goal is to utilize the measures of the four components of academic self-efficacy to provide specific areas of focus in order for counselors and other

helping professionals to intervene and improve levels of confidence in Navajo American Indian students.

Importance of Study

As previously outlined in this study, the high percentage rate of American Indians living under the poverty level is well documented and may be made worse by the poor educational attainment of this group (Ortiz & HeavyRunner, 2003; Simms, 1999; U.S. Department of Commerce, 2000). The academic difficulties experienced by American Indian students are also well documented (Brown & Kurpius, 1997; Bryan, 2004; Downs, 2005; Hill, 2004; Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003; Lin, 1990; Wells 1989). There is a growing body of literature, which speaks to the importance of the relationship between academic efficacy beliefs and two of the challenges faced by Navajo American Indian students—persistence in school and academic achievement. Improving students' academic self-efficacy could be an effective intervention to improving academic performance as well as retention and completion rates.

While the construct of academic self-efficacy has been identified and defined in a general sense, little is known about the four components of self-efficacy as defined by Bandura (1977; 1986). This study attempts to provide a more complete view of the relationship between academic self-efficacy and the factors that influence academic self-efficacy.

The ability to assess and identify the components of self-efficacy, which need improvement could be of great importance to counselors, teachers, administrators and other professionals. If effective interventions to improve academic efficacy beliefs in Navajo students are to be made, areas for improvement must be identified. The ability to

break down areas of self-efficacy for purposes of intervening with individual students could help caring professionals help individuals with low self-efficacy.

While many of the findings cited in this literature review are not with Navajo samples, there are many similarities in academic patterns between tribes (U. S. Department of Education, 2005). Therefore, the author is extrapolating findings with samples from other tribes to the Navajo tribe. The current study looks to fill in the gap of information with this population by determining if measures of the four components of academic self-efficacy will predict self-reported levels this construct in Navajo American Indian high school students.

Hypotheses

One of the purposes of the current study was to identify and assess the components of academic self-efficacy with the scope of helping professionals intervene and improve efficacy beliefs about education in Navajo students. Another main purpose was to better assess academic self-efficacy in Navajo students, which includes construction of two self-report measures, one to measure exposure to like models and the other to evaluate levels of anxiety about school. The following hypotheses were tested to address these purposes:

Preliminary Hypothesis

The instruments created for this study (*The People I Know* and *My Feelings about School*) will be reliable (internally consistent) measures that demonstrate evidence of construct validity in factor analyses.

Hypothesis #1

The reported totals on the Self-in School measure of academic self-efficacy will be strongly correlated with the reported totals on the Academic Hardiness measure at a statistically significant level.

Hypothesis #2

Three measures of the components of academic self-efficacy (*The People I Know*, the CRPSS-VE and *My Feelings about School*) will not predict past success as measured by IOWA Tests of Educational Development (IOWA) percentile rank scores.

Hypothesis #3

Three measures of the components of academic self-efficacy (*The People I Know*, the CRPSS-VE and *My Feelings about School*) will not predict past success as measured by GPA scores.

Hypothesis #4

The four components of academic self-efficacy as measured by GPA, IOWA percentile rank, *The People I Know*, the CRPSS-VE, and *My Feelings about School* will explain a statistically significant amount of variance in a linear regression model predicting self-reported levels of academic self-efficacy as measured by the Self-in-School.

Hypothesis #5

The four components of academic self-efficacy as measured by GPA, IOWA percentile rank, *The People I Know*, the CRPSS-VE, and *My Feelings about School* will explain a statistically significant amount of variance in a linear regression model

predicting self-reported levels of academic hardiness as measured by the Academic Hardiness Scale (AHS).

METHOD

This study involved two separate data collections in April 2005 and October 2005. The two data collections were necessary to obtain a suitably large sample of Navajo American Indian students. Students in the sample were enrolled in three rural high schools on the Navajo reservation. These high schools include students in grades 9 to 12.

Data used in this study were collected as part of a GEAR UP federal grant. In order to comply with local school district policy, consent of the local school board and the presiding administrators of the separate schools were obtained. After consent was obtained from the school board, the measures were administered to the students by the GEAR UP counselors. Parental consent to participate in this study was obtained in a letter sent to the parents of the students from GEAR UP counselors. Incentives were used and distributed to students returning the parental consent form in order to achieve a better response rate. Administration of the measures utilized in this study was done as part of an academic and career advisement hour in which all high school students in the school district are enrolled.

During the initial data collection, only 21 American Indian students completed the five measures. Because of the small number of students completing the measures during initial data collection, the present researcher sought to augment the number of students participating in the study by administering the five self-report measures at a subsequent date. According to school policy, the researcher sought consent through the separate school administrators and distributed the measures through the career advisory teachers and obtained parent/guardian consent. This second administration was also conducted

during the advisory hour and added significantly to the total number of participants. All of the participants lived on the Navajo Reservation in Utah.

Participants and Procedures

The total number of participants was 118. The numbers of participants of each gender participating in this study were nearly equal (61 females and 57 males), with 10 freshmen, 40 sophomores, 36 juniors, and 32 seniors. There were 8 students from the smallest school (total student population 45), 33 from a second school of 150 students, and 77 from a third school of 150 students. GPA and IOWA test scores were sought for all students, but information was not available for the entire sample. During the course of data collection, two students dropped out of school. Subsequently their GPA information was not available. The analyses including GPA information had a total of 116 participants. Furthermore, the district had information on IOWA percentile ranks for only 92 of the 118 students completing the self-report measures. Only these 92 participants were included in the analyses involving IOWA percentile rank scores.

Data demonstrating students' exposure in the four areas of efficacy information (past success/enactive attainments, vicarious experience, verbal persuasion, and emotional arousal) were obtained in two steps. The first was the administration of five self-report measures to each student participant. As discussed in the previous chapter the Self-in-School (SIS) (Smith, 1988; Downs, 2005) and Academic Hardiness (AHS) (Benishek & Lopez, 2001) measures were utilized to obtain global self-reported levels of academic self-efficacy; the Career-Related Parent Support Scale-Verbal Encouragement scale (CRPSS-VE) (Turner et al., 2001) sought to assess exposure to verbal persuasion; *The People I Know* sought to measure exposure to information viewed in appropriate

academic models; and *My Feelings about School* assessed levels of emotional arousal around academic self-efficacy. A more complete description of each of these measures is given in a subsequent section. The approximate completion time for the five measures was 15-20 minutes.

The second step of data collection in both samples was to gather the participants' grade-point averages (GPA) and composite achievement percentile rank scores (IOWA Tests of Educational Development). This test of global academic achievement is administered by the State of Utah for students in grades 9-12. Information regarding grade point average and achievement test scores was determined by the present researcher to be the most effective way of measuring academic success (Anastasi, 1986; Kluger & Koslowski, 1988; Lufi et al., 2003; Malouff et al., 1990; Stader & Licht, 1992). Thus, collecting cumulative GPAs and IOWA scores for the students completing the measures gives the present researcher information regarding the performance accomplishment component of academic efficacy. Information about participants' GPAs and IOWA scores was obtained from the school district's database. District officials familiar with the information in the database collected this information for the present researcher. The data collected from the participants and district officials was included in the statistical analysis.

It is important to note that multiple linear regression analysis is a statistical method used to assess the predictive relationships between variables. For multiple regression models to be effective the data used in regression models must meet specific requirements or assumptions. This first assumption that should be met is that each variable included in a particular regression model must be interval or ratio scaled.

Another assumption of regression models is that the criterion variables are normally distributed around the prediction line. GPA, as utilized in this study, potentially presents concerns in that it is not an interval or ratio scale. However, it has been suggested by statisticians that dichotomous variables and/or ordinal data such as GPA can also be acceptable as predictor variables in multiple linear regression models (Kernlinger & Pedhazur, 1982). Linear regression appears to exhibit qualities of a robust statistical test, which adequately provides reliable results with ordinal data (Kernlinger & Pedhazur, 1982).

Measures

Three measures that had previously been created were utilized for the purposes of this study: the SIS (Smith, 1988; Downs, 2005); the AHS (Benishek & Lopez, 2001); and the CRPSS-VE (Turner et al., 2003). The former two measures were utilized for three purposes. The first reason was to collect information from the participants regarding global levels of academic self-efficacy. The second reason was to cross-validate the two measures in order to provide concurrent validity for the Self-in School measure. While these measures seek to assess separate constructs, it was believed that they would be related enough with one another to provide information about levels of concurrent validity. The third reason was to establish the utility of Academic Hardiness Scale with a different ethnic population.

The CRPSS-VE was created by Turner (2003) to assess vocational self-efficacy in adolescents. A major portion of vocational efficacy development is educational development. Accordingly, Turner assessed adolescents for perceived levels of parent praise and encouragement and interpreted this as the verbal persuasion component of

vocational self-efficacy. Additionally, the CRPSS-VE was created specifically for and administered to American Indian students from another tribe in the Midwest. Because of the scope of the CRPSS-VE the present researcher deemed this subscale to be a sufficient measure of verbal persuasion for the Navajo student sample in the current investigation.

Two other measures were also administered in this study, *The People I Know* and *My Feelings about School*, were created by the researchers for the purposes of this study. These instruments were created in order to measure the two components of academic self-efficacy, vicarious experience and emotional arousal/anxiety. After extensive searches in the existing literature, no instruments were found that measure these components. Accordingly, it was deemed necessary by the present researcher to create instruments that measure vicarious experience and emotional arousal/anxiety. A more comprehensive discussion regarding test construction and the resulting measures is given in the Results chapter.

Self-in-School

The Self-in-School (SIS; Appendix B) measure was originally a 19-item, self-report Likert scale created by Smith (1988) to assess levels of academic self-efficacy in young adults. Sample items include, “I have the ability to do well in my school work” and “I am a good student.” Internal consistency of the original instrument was .89 and test/retest reliability (10 day interval) was .85 (Smith, 1988). Bryan (2003) established the internal consistency for a sample of Navajo American Indians with the original instrument. He sampled of 687 high school students. This sample had an $\alpha = .89$ internal consistency.

Recently this measure was refined by Downs (2005) in order to correct some perceived problems. While the newer version of the Self-in-School maintained its self-report Likert format several changes were made. The original 19 items were cut to 15. Other adjustments included a one to seven range of response options (1 = completely false, 7 = completely true) rather than the initial 9 response options, and eliminated three reverse scored items (originally completely false = 9, and completely true = 1). The measure of internal consistency for the original version of the SIS based on Bryan's (2003) (Chronbach's $\alpha = .89$) was more than adequate. However, the recent improvements made to the Self-in School by Downs (2005) have improved on the internal consistency of this measure (Chronbach's $\alpha = .91$). Downs further (2005) demonstrated that the Self-in-School is a relevant instrument in assessing levels of global academic self-efficacy in Navajo American Indian populations. He found .37 ($p < .01$) correlation between GPA and the SIS and .29 ($p < .01$) correlation between SAT scores and the SIS. The 15-item version of the Self-in-School was utilized in the current study (see Appendix 1).

Academic Hardiness Scale (AHS)

The Academic Hardiness Scale (AHS; Appendix C) created by Benishek and Lopez (2001) is an 18-item self-report instrument in a four-response Likert format. This instrument was designed to gather information about student attitudes regarding academic success (see Appendix C). The four response options range from 1 = completely false to 4 = completely true. Sample items include, "I take my work as student very seriously" and "If I begin to do poorly in a class, I start to doubt my ability as a student." This instrument was designed to measure psychological hardiness based on psychological

hardiness theory (Kobasa, 1979). Kobasa theorized that three cognitive appraisal processes help individuals moderate the effects of stressful life situations. These processes are as follows: commitment (one's perceived positive value of one's life activities), challenge (viewing change as a normal and beneficial part of life), and control (amount of perceived control over important events in life). Benishek and Lopez (2001) postulated that, "differences in hardiness among students should be related to important motivational differences in students' attitudes toward higher learning and achievement" (p. 334).

In an attempt to measure these three cognitive appraisal processes—commitment, control, and challenge—Benishek and Lopez (2001) created the AHS. The AHS consists of three subscales: F1 = commitment; F2 = challenge; F3 = control. Various statistical procedures were conducted to determine levels of reliability and validity of the AHS (Benishek & Lopez, 2001). The AHS showed good levels of internal consistency (Chronbach's $\alpha = .84$). In the preliminary validation analyses, correlations between the subscale scores and scores from other self-report measures were conducted. Attempts to validate the AHS in comparison with totals from other self-report measures showed significant correlations between AHS subscale scores and measures of global academic self-concept (Benishek & Lopez, 2001). Benishek and Lopez called for more exploration of how this measure of academic hardiness fits with ethnically/racially diverse populations. Correlating totals of the SIS measure (Smith, 1989; Downs, 2005) and the AHS should provide information regarding the relevance of the AHS with a Navajo American Indian population. Running a bivariate correlation between the totals of the

AHS and the 15-item Self-in-School could potentially provide concurrent validity for both measures.

Career-Related Parent Support Scale-Verbal Encouragement Scale (CRPSS-VE)

The CRPSS-VE (Turner et al., 2003; Appendix D) is a six-item, self-report subtest of the CRPSS. The six questions are in a five-point Likert-response format assessing adolescents' perceived levels of parental support and encouragement regarding their educational and career development. The CRPSS-VE was constructed to measure verbal persuasion (Bandura 1977, 1997). As previously mentioned, the CRPSS-VE is one of four scales from a larger instrument which assesses the role parents play in providing support for adolescents' vocational self-efficacy. It is designed to measure the four components of self-efficacy. Results from the initial validation of the CRPSS demonstrated that the CRPSS-VE offered good levels of internal consistency (Chronbach's $\alpha = .83$) and measured verbal persuasion as well as parental involvement in academic domains (Turner et al., 2003). Additionally, the validation of the CRPSS was conducted on an American Indian sample, making this instrument more applicable to the sample of participants involved in the current study (Turner et al., 2003). Based on how this measure was normed and the findings from follow up studies (Turner & Lapan, 2002; Turner et al., 2003), the present researcher decided to measure parental involvement with the CRPSS-VE. Sample items include, "My parents encourage me to get good grades" and "My parents encourage me to go to a technical school or college after I graduate.

The People I Know

The People I Know is a 10-item, self-report measure in a five-point, Likert-response format. It is designed to assess the extent students have been exposed to persons similar to themselves that have successfully completed postsecondary education. This measure was created by the present researcher in response to the need for an instrument to measure the modeling component of academic self-efficacy. Response options ranged from 1 = does not describe me at all, to 5 = describes me very well. Originally 15-items were generated and included on a pilot version of this measure. This rough draft was administered to a small sample ($N = 46$) of Navajo American Indian students in order to establish normative information and rates of internal consistency. All items were positively worded. The highest possible raw score total was 75. The summary statistics for the pilot sample are given in Table 1. Based on the responses of this pilot sample, the instrument was shown to be internally consistent (Chronbach's $\alpha = .85$).

Due to the fact that the present researcher was administering all five measures at one sitting, it was important to account for fatigue and time of administration. Hence in creating *The People I Know* the present researcher sought to minimize participant completion time and maintain adequate levels of internal consistency and validity. Spearman-Brown Prophecy prediction and estimation formulas were conducted to obtain probable Chronbach's α for the instrument with 15 total items. Results from these Spearman-Brown analyses demonstrated that an adequate level of internal consistency would be maintained by omitting five of the items. These five items were omitted creating a 10-item version of the instrument and an adequate level of internal consistency was maintained (Chronbach's $\alpha = .82$; Appendix E). Sample items from this measure

include statements such as, “I know many people that went to college” and “I have opportunities to talk with people that graduated from college.” One of the purposes of this study was to conduct further psychometric analysis on *The People I Know*. Thus, the summary statistics, measure of internal consistency and a factor analysis conducted on *The People I Know* will be given in the Results chapter.

Table 1
Summary Statistics of Measures Administered

Measures	<i>N</i>	<i>M</i>	<i>SD</i>	Skewness	SE Skewness	Kurtosis
GPA	116	2.31	.88	-.193	.23	-.688
IOWA	92	24.60	19.07	.931	.25	.14
People-pilot	46	47.40	10.79	Not Known	Not Known	Not Known
People-study	118	27.31	8.12	.15	.22	-.69
Feel-pilot	46	52.18	8.29	Not Known	Not Known	Not Known
Feel-study	118	40.67	8.17	-.09	.22	-.54
SIS	118	81.51	17.79	-.62	.22	-.29
AHS	118	52.70	6.05	.07	.22	.05
CRPSS-VE	118	26.26	4.46	-1.70	.22	2.83

My Feelings about School

Emotional arousal (anxiety) has a long history of being assessed through self-report measures (Kotsopoulos & Walker, 1994). Several self-report measures have been created in order to appropriately assess pathological levels of emotional arousal, or anxiety, including specific instruments designed to aid in diagnosing specific disorders such as obsessive-compulsive disorder (Kiselica et al., 1994), social anxiety disorder

(Beidel et al., 1995), and generalized anxiety disorder (Rabian & Embry, 1999). Other instruments have been created to assess sub-pathological levels of emotional distress/arousal under specific circumstances (King et al., 1995). Professionals that seek information about levels of anxiety or emotional arousal routinely include self-report measures in their procedures (Kotsopoulos & Walker, 1994). Self-report measures of emotional arousal have also shown good levels of reliability and validity among child and adolescent samples (King et al., 1995; Kiselica et al., 1994; Kotsopoulos & Walker, 1994; Rabian & Embry, 1999).

While self-report measures have demonstrated good statistical reliability and validity in adolescent populations, little is known about how these instruments assess emotional arousal in multicultural populations. The present author found no instruments that assess levels of emotional arousal associated with schoolwork and assignments with the exception of test anxiety. Based on the absence of an instrument designed to assess levels of emotional arousal in school for an American Indian population, the present author designed the *My Feelings about School* instrument.

My Feelings about School is a 12-item, self-report measure in a five-point, Likert-response format designed to assess students' levels of emotional arousal in school/academic settings. Response options ranged from 1 = does not describe me at all, to 5 = describes me very well. Initially 15-items were generated by the present author to assess levels of stress, anxiety and worry about academic performance. As with the other measure created for this study, *My Feelings about School* was administered to a small sample ($N = 46$) of Navajo American Indian students in order to establish normative information and rates of internal consistency. All items were positively worded, thus low

reported scores would be indicative of high levels of anxiety. The highest possible raw score total was 75; the lowest possible score (which would indicate an extreme amount of anxiety) was 15. The summary statistics for the pilot sample are summarized in Table 1. Internal consistency for this small sample was good (Chronbach's $\alpha = .83$).

In the interest of keeping participant completion time to a minimum while maintaining levels of internal consistency and validity, Spearman-Brown Prophecy prediction and estimation formulas were again conducted to obtain probable Chronbach's α for *My Feelings about School* with different number of total items. Results from these Spearman-Brown analyses demonstrated that the coefficient measuring internal consistency would increase by omitting three of the items (Chronbach's $\alpha = .87$). These items were subsequently omitted, creating the 12-item version administered to the sample of Navajo student in the current study (Appendix F). *My Feelings about School* will be administered to students in the sample of the current study in the 12-item format. Sample items of *My Feelings about School* are, "I almost never get nervous when taking tests" and "I am comfortable talking about my grades with teachers." As with *The People I Know*, one of the purposes of the current study is to lend further psychometric support for *My Feelings about School*. Summary statistics, internal consistency and a factor analysis conducted on *My Feelings about School* will be given in the Results chapter.

RESULTS

Although an analysis of the descriptive statistics for each of the measures is not related to any of the formal hypotheses of the current investigation this information is germane to understanding the statistical analyses of the hypotheses and the relationships between the constructs and measures described below. All summary statistics for each of the measures are listed in Table 1.

Respondents demonstrated high scores on the SIS ($M = 81.51$, $SD = 17.79$) indicating that in general students reported high levels of academic self-efficacy. The AHS mean score (52.70 ; $SD = 6.05$) demonstrates that students in this sample reported on average lower levels of academic hardiness than academic self-efficacy. The mean of the totals for *The People I Know* (27.31 ; $SD = 8.12$) indicated that on average students report moderate levels of exposure to academic models, and the mean score for *My Feelings about School* (40.67 ; $SD = 8.17$) indicates that students generally feel little emotional arousal (higher scores indicate a lack of emotional arousal) about school work and academic activities. None of these measures exhibited problematic distributions according to tests for skewness and kurtosis. The measures appear to be normally distributed.

It should be noted that the CRPSS-VE showed a significant skew and kurtosis based on the responses of this sample, which indicates a peaked distribution with a small variance. This ceiling effect may be attenuating the magnitude of correlation between the CRPSS-VE and the other measures because of the lack of variability at the high range of scores. Participants reported high scores on the CRPSS-VE ($M = 26.26$; $SD = 4.46$), indicating high levels of parental verbal persuasion. The CRPSS-VE in the current sample

of students yielded similar levels of internal consistency to those reported by the test developers (Chronbach's $\alpha = .84$).

The average GPA score (2.31, $SD = .88$) for participants in this study was normally distributed while there seemed to be some floor effect in the IOWA percentile rank scores. This floor effect may be affecting the magnitude of correlation between IOWA scores and the other measures in the current investigation. There appears to be a lack of variability among the IOWA scores at the low range in this sample.

Preliminary Hypothesis: Reliability & Factor Analysis of

The People I Know and My Feelings about School

The preliminary hypothesis suggested that the instruments created for this study (*The People I Know*, and *My Feelings about School*) would be reliable (internally consistent) measures that demonstrate evidence of construct validity in factor analyses. As a first step in this analysis, the psychometric properties of these measures were evaluated. Factor analyses and internal consistency reliability coefficients were calculated for both instruments. The exploratory factor analyses utilized the method of principal axis factoring with varimax rotation. Principle axis factoring analyzes only the variance in the items that is shared with other items. The varimax (orthogonal) rotation maximized the dispersion of the loadings within the factors so that loading a smaller number of items onto each factor results in "cleaner" or interpretable clusters of factors. These procedures were done to determine if the items in each of the instruments formed a unified structure and were sampling the same factor. Summary statistics and a Chronbach's α were also conducted to determine if the responses on the measures were normally distributed and adequately reliable.

The People I Know

The People I Know demonstrated good internal consistency before the factor analysis (Cronbach's $\alpha = .85$). There was no evidence of a skewed distribution or kurtosis. A complete listing of the summary statistics is provided in Table 1. A factor analysis and its accompanying scree plot showed that there were two significant factors being assessed by this instrument. On the first factor, all of the ten items had un-rotated factor loadings greater than .35 and 9 of the ten items had communalities greater than or equal to .30. Item number 4 had low communalities on both factors. The two factors accounted for 44.3% of the variance in scores. Factor one accounted for 37.61% of the variance (eigenvalue = 4.29), while Factor two accounted for only 6.69% of the variance (eigenvalue = 1.18). Because the first model accounted for a substantially larger percentage of the variance, the researcher felt justified in concluding that the items were holding together and measuring one factor. However, there were three items with high loadings (greater than .50) on the second factor after rotation. It could be that there is a small subset factor being assessed by items one, three, and five. Each of these items was created in order to assess the extent that individuals completing this instrument had personal acquaintances that either left for, or are currently enrolled in college. Items three and five were the only items phrased, "I know many people..." Notwithstanding this possibility, the amount of variance of the scores explained by Factor two (6.69%) was not significant enough to conclude that the items are measuring different constructs. It was concluded that item four might not be necessary due to its inability to demonstrate significant loadings on either factor. This was the only item asking about teachers the

students know. All of these teachers went to college for their teaching certificate; therefore, the content of this question is not as pertinent as that of the other items.

Because of the different nature of the question and the statistical findings of the initial factor analysis, item four was omitted, and a second factor analysis and scree plot was conducted. Once again a two-factor model was shown to be most appropriate. Factor one accounted for 40.33% of the variance in scores (eigenvalue = 4.14) and both factors explained a total of 47.32% of the variance. As in the previous models, the vast majority of the variance of scores is explained by the first factor. All nine of the remaining items had communalities greater than .35, and all of the items loaded on to factor one before rotating. Factor loadings and communalities (with item four omitted) are shown in Table 2, while the scree plot is shown in Figure 2. The reliability of this instrument remained at $\alpha = .85$ after omitting item four.

Table 2

Results of the Factor Analysis of the Nine-item The People I Know

Item	Extraction	Before Rotation		After Rotation	
	Communalities	1	2	1	2
1	0.466	0.63	-0.264	0.304	0.612
2	0.237	0.414	0.256	0.481	0.077
3	0.676	0.618	-0.542	0.113	0.814
4	0.499	0.679	-0.194	0.387	0.591
5	0.408	0.636	0.049	0.514	0.379
6	0.377	0.556	0.26	0.591	0.166
7	0.497	0.7	0.082	0.583	0.396
8	0.547	0.709	0.21	0.674	0.305

Note. Extraction Method: Principle Axis Factoring

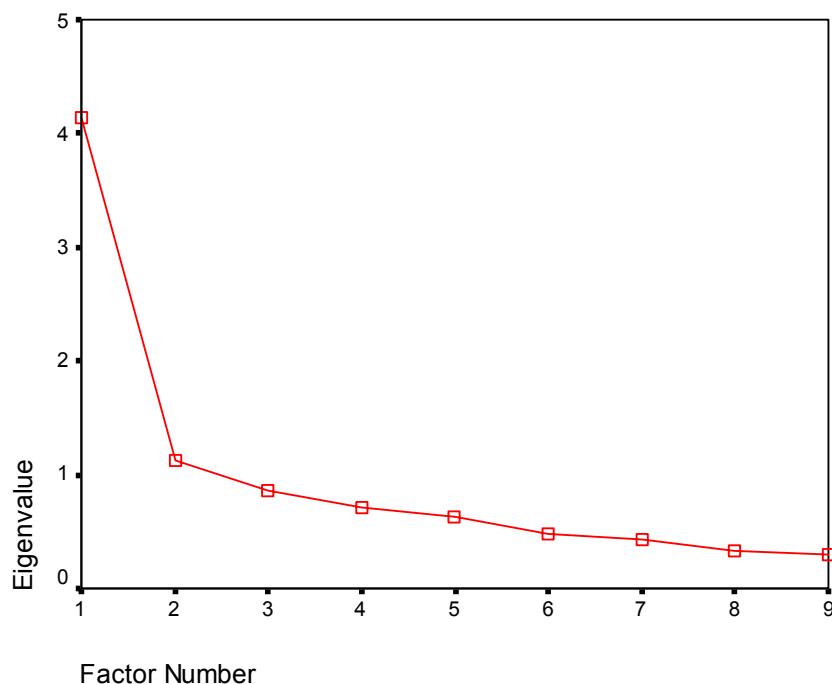


Figure 2. Scree plot for nine-item *The People I Know*.

Given the results of the factor analysis and the strong reliability of the instrument without item four, it was determined that it would be omitted permanently from the instrument. The strong loadings on the first factor of the second model created by the factor analysis (40.33% of the variance in scores, eigenvalue = 4.14), as well as the acceptable reliability coefficient (Chronbach's $\alpha = .85$) lead to the conclusion that the nine-item version of *The People I Know* measures the intended construct on a consistent basis. This version of *The People I Know* is shown in Appendix G.

My Feelings about School

This measure also demonstrated good levels of internal consistency (Chronbach's $\alpha = .81$). There was no evidence of a skewed distribution or kurtosis. A complete listing of the summary statistics is provided in Table 1. The findings of the factor analysis and the scree test demonstrated that a three-factor model was shown to be the most

appropriate. All three factors accounted for 43.07% of the variance in the scores. The first factor accounted for 32% of the variance (eigenvalue = 4.41), the second factor accounted for 6.45% of the variance (eigenvalue = 1.35), and the third factor accounted for 4.27% of the variance (eigenvalue = 1.09). Eleven of the 12 items had significant communalities. After rotation, nine of those 11 items loaded significantly (greater than or nearly equal to .35) onto factor one. Item one negatively loaded on the first factor after rotation. Item one was the only question assessing individuals' feelings about learning. It appears likely that this question assesses a different construct. Because of the nature of the question, the lack of significant a communality coefficient, and the negative loading on factor one, it was determined to omit item one and conduct another factor analysis.

With the omission of item one, the reliability coefficient increased to $\alpha = .85$. After omitting item one, a two-factor model was shown to be the most appropriate. Both factors accounted for 40% of the variance in scores with factor one accounting for 34.9% of that (eigenvalue = 4.41) and factor two accounting for the other 6.1% (eigenvalue = 1.19). The communalities and factor loadings are shown in Table 3 and the scree plot is shown in Figure 3. All of the communalities were approaching or greater than .35.

All items loaded on to the first factor before rotating. After rotating there were three items that loaded on to factor two more strongly than they did to factor one. There appears to be a small subset of items (10, 11 and 12) in *My Feelings about School* that assess not only the intended construct but also a secondary construct. Items 11 and 12 were similar in nature. They sought to assess a student's level of comfort with discussing their grades. Item 10 seemed to have little in common with items 11 and 12, so it was not clear how the content of this item contributed to the factor extracted.

Table 3

Results of the Factor Analysis of the 11-item My Feelings about School

Item	Extraction	Before Rotation		After Rotation	
	Communalities	1	2	1	2
1	0.376	0.605	0.098	0.427	0.44
2	0.52	0.683	-0.231	0.686	0.223
3	0.256	0.498	-0.09	0.453	0.226
4	0.214	0.462	0	0.371	0.276
5	0.541	0.693	-0.246	0.703	0.217
6	0.382	0.605	-0.127	0.561	0.26
7	0.351	0.553	-0.213	0.571	0.159
8	0.406	0.606	-0.199	0.604	0.202
9	0.344	0.462	0.362	0.154	0.566
10	0.475	0.65	0.228	0.384	0.572
11	0.642	0.624	0.503	0.199	0.776

Note. Extraction Method: Principle Axis Factoring

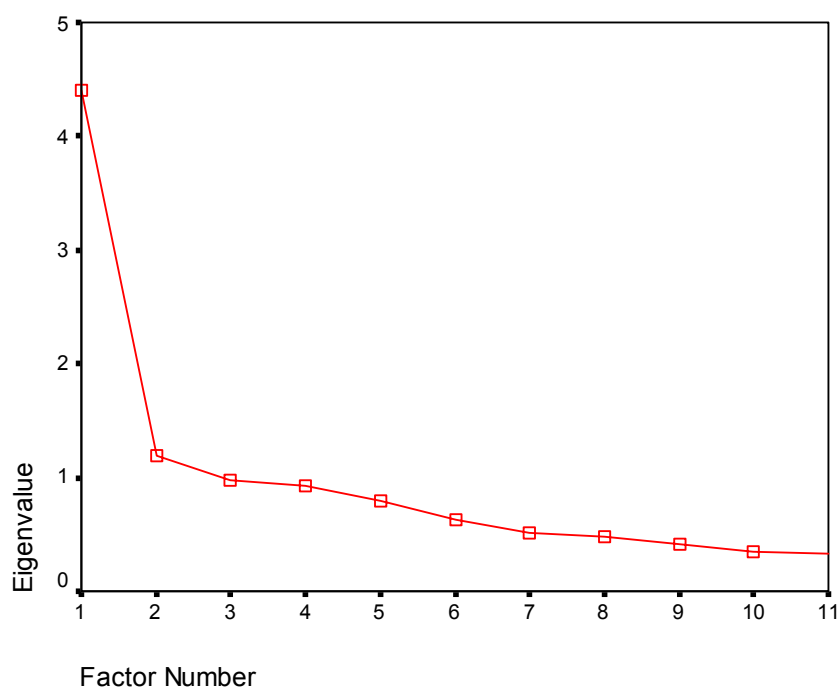


Figure 3. Scree Plot for 11-item *My Feelings about School*.

These items may be measuring something different from internalized feelings regarding school and schoolwork. However, a similar argument could be made for this instrument as was made previously for *the People I Know*. There is a significant amount of discrepancy in the amount of variance explained by the two factors. The subset factor explains so little variance that it is possible to conclude that this instrument is measuring the intended construct. It was decided to use the 11-item version of *My Feelings about School* for the rest of the analyses conducted for this study. This version of *My Feelings about School* is given in Appendix H.

Hypothesis #1: Correlations

The first hypothesis of the current investigation suggested that reported totals on the SIS would be correlated with the reported totals on the AHS at a statistically significant level. The purpose of collecting students' GPA's, IOWA standardized test scores and scores on the five selected measures was to better define the construct of academic self-efficacy in the populations of Navajo American Indians. Another purpose for collecting this information was to compare the SIS and the AHS. The preliminary statistical analysis involved generating a correlation matrix of all of the variables to see how the measures used in this study related to one another. All of the correlations were conducted utilizing Pearson's correlation coefficient, except those involving the IOWA scores for each participant. Since IOWA scores were percentile ranks, the non-parametric Spearman's-Rho correlation was conducted for these six coefficients. Results of this correlation matrix are in Table 4. The results indicated that there is a significant strong correlation between the totals on the two measures ($r = .51, p < .01$).

This level of correlation was expected given that these are related constructs, and confirms the first hypothesis.

Table 4

Intra-Scale Correlations

Measure	AHS	GPA	IOWA*	People	Feelings	CRPSS-VE
SIS	.51**	.51**	.42**	.38**	.67**	.56**
AHS		.14	-.18	.40**	.39**	.38**
GPA			.47**	.30**	.33**	.28**
IOWA*				.18	.29**	.16
People					.38**	.35**
Feelings						.33**

*-All correlations with IOWA used Spearman's Rho.

** -Indicates significance at the .01 level.

Another comparison between the SIS and AHS made by the primary investigator was analyzing the multiple linear regression equations for each of the measures and the measures of performance accomplishments. Regression equations for both of the measures determined if one subset of explanatory variables is more associated with one measure or the other. Additionally, the regression analyses gave information about the possibility that the instruments were measuring one or more of the dependent variables more sensitively, notwithstanding high or low correlation between the measures. In summary the present researcher wanted to determine if the two instruments were measuring SIS and AHS scores in a different manner than one another and utilized separate multiple regression equations as part of the analysis. While there seems to be a significant relationship between the constructs of academic hardiness and academic self-efficacy, they appear to have differences in how self-report scores on the AHS and SIS

are predicted by the other measures in this study. The results of this comparison will be further mentioned below in the Hypothesis #3 section of the current chapter.

Some of the intra-scale correlations were high, although most of the sub-constructs were moderately correlated with one another. SIS demonstrated a strong positive correlation with the AHS, GPA, *My Feelings about School*, and the CRPSS-VE. The SIS also demonstrated moderate positive correlations with the other measures of the sub-constructs (IOWA and *The People I Know*). AHS had moderate positive correlations with all the sub-constructs with the exception of GPA and IOWA percentile rank. Neither of the correlations with GPA nor IOWA scores was significant. GPA showed weak positive correlations to *The People I Know* and the CRPSS-VE, and moderately positive correlations to the IOWA scores, *My Feelings about School*, and SIS. The IOWA scores for those participating in the study correlated weakly with the measure of emotional arousal but showed no significant correlations to the measure of exposure to models and parental involvement.

The People I Know showed a moderate positive correlation with *My Feelings about School* and a weak positive correlation with the CRPSS-VE. *My Feelings about School* and the CRPSS-VE showed a moderate positive correlation. While many of the sub-constructs demonstrated a significant amount of correlation to each other, none of these relationships were high enough to cause multicollinearity in the regression analyses. Notwithstanding these findings, collinearity diagnostics (tolerance and variance-inflation factors-VIF) were conducted on all of the regression models. None of the findings were significant.

Hypotheses #2 & #3:

Prediction of GPA and IOWA Scores by Sub-constructs

The second and third hypothesis postulated that the three measures of the components of academic self-efficacy, *The People I Know*, the CRPSS-VE and *My Feelings about School*, would not predict performance accomplishments as measured by GPA or IOWA percentile rank scores. Therefore, two regression equations were utilized to determine how these measures predict GPA and IOWA scores. The y variable in one of these equations was GPA, and in the other it was IOWA scores. Through the analysis of the correlation matrix and the series of regression equations, the researcher was able to determine the types of relationships that exist among these constructs and if the independent variables were indeed moderating scores on the measures of the dependent variable (academic self-efficacy). It also allowed for further exploration for the potential effects of multicollinearity in the predictive models for SIS and AHS.

Grade Point Average (GPA)

In this regression model GPA was the dependent (y) variable with the three-predictor (x) variables being *The People I Know*, *My Feelings about School* and the CRPSS-VE. This model proved to be statistically significant ($F = 6.09$, $p < .001$, $R^2 = .16$), but accounted for only 16% of the variance in cumulative GPA (the summary of this regression analysis for variables predicting GPA scores is given in Table 5). The only statistically significant predictor of GPA was *My Feelings about School* ($b = .02$, $t = 2.079$, $p = .04$). The results of the tolerance and VIF statistics on each of the models listed with these four variables indicate that the effects on the larger regression

equations were not statistically significant. There is evidence which indicates that *My Feelings about School* is predicting a significant amount of variance in GPA. Given these findings, as well as the aforementioned GPA regression model, there is some indication that there could be some moderating effects between independent variables in the larger models predicting scores on the SIS and AHS measures, however the effects appear to be practically and statistically minimal.

Table 5
Summary of Regression Analysis for Variables Predicting GPA Scores (N = 116)

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
CRPSS-VE	.03	.02	1.25	.22
Feelings	.02	.01	2.08	.04*
People	.02	.01	1.79	.94

Note. $R^2 = .13$.

*-Indicates significance at $p < .05$.

Composite Achievement Percentile Rank Scores (IOWA Tests of Educational Development)

When IOWA scores were placed as the dependent variable in a regression model the results were very similar to the predictive model for GPA (the summary of this regression analysis for variables predicting IOWA scores is given in Table 6). The model was statistically significant ($F = 3.79$, $p < .01$, $R^2 = .11$), but accounted for only 11% of the variance in IOWA scores. As in the GPA model, only *My Feelings about School* was found to be a significant predictor of IOWA percentile rank ($b = .71$, $t = 2.54$, $p = .01$). The results of the tolerance and VIF statistics on each of the models mentioned above with these four variables indicate that the effects on the larger regression equations were

not statistically significant. Once again these findings, in conjunction with the IOWA regression model, indicate that there could be some moderating effects between independent variables in the larger models predicting scores on the SIS and AHS measures, however the effects appear to be practically and statistically minimal.

Table 6

Summary of Regression Analysis for Variables Predicting IOWA Scores (N = 92)

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
CRPSS-VE	.30	.07	-.07	.54
Feelings	.71	.30	2.54	.01*
People	-.02	-.01	.61	.08

Note. $R^2 = .11$.

*-Indicates significance at $p < .01$.

Hypothesis #4: Prediction of Self-efficacy as Measured by SIS

Hypothesis number four suggested that the four components of academic self-efficacy as measured by the GPA, IOWA scores, CRPSS-VE, *The People I Know* and *My Feelings about School* would explain a statistically significant amount of variance in SIS scores. Thus, the next step of the analysis consisted of creating several multiple linear regression models. This was done to determine the ability of each of the measures of the components of academic self-efficacy GPA and IOWA scores, CPRSS-VE, *The People I Know*, and *My Feelings about School* to predict scores on the SIS and AHS in the presence of one another. These analyses allowed the researcher to determine how much SIS and AHS scores changed as levels of the purported explanatory variables changed. The dependent (y) variable in the one of the equations was the total score from the SIS, and the dependent (y) variable in the other was the total score on the AHS. The summary

statistics for the results of the completed SIS measures in the current study is given in Table 1. The internal consistency of this measure for the current sample was good (Chronbach's $\alpha = .96$), comparable to the value reported by Downs (2005).

The multiple regression of the SIS that included GPA scores showed statistical significance ($F = 41.21, p < .001$), accounting for 60 % of the variance in SIS scores ($R^2 = .60$). Significant predictors included GPA ($b = 5.56; t = 4.19, p < .001$), *My Feelings about School* ($b = .98; t = 6.538, p < .001$) and the CRPSS-VE ($b = 1.02; t = 3.63, p < .001$). *The People I Know* did not show the ability to consistently predict SIS total scores (the summary of this regression analysis for variables predicting SIS scores is given in Table 7).

Table 7
Summary of Regression Analysis for Variables Predicting SIS Scores (N = 116; GPA Predictor for Past Success)

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
GPA	5.56	1.33	4.99	<.001*
CRPSS-VE	1.02	.28	3.63	<.001*
Feelings	.98	.16	6.36	<.001*
People	.08	.15	.57	.57

Note. $R^2 = .60$.

*-Indicates significance at $p < .01$.

The regression model which included IOWA scores was also significant ($F = 30.73, p < .000; R^2 = .59$) accounting for slightly less variance than the GPA model (the summary of this second regression analysis is given in Table 8). IOWA scores ($b = .19; t = 2.66, p < .01$), *My Feelings about School* ($b = .94; t = 4.85, p < .001$) and CRPSS-VE ($b = 1.24; t = 4.852, p < .001$) were significant predictors of reported SIS totals.

Table 8

Summary of Regression Analysis for Variables Predicting SIS Scores (N = 92; IOWA Scores Predictor for Past Success)

Variable	B	SE B	t	p
IOWA	.19	.07	2.66	<.01*
CRPSS-VE	1.24	.33	3.79	<.001*
Feelings	.94	.41	4.85	<.001*
People	.28	.18	1.55	.13

Note. $R^2 = .59$.

*-Indicates significance at $p < .01$.

The People I Know ($t = 1.55$, $p = .25$) was once again unable to accurately predict variance in SIS scores.

Hypothesis #5: Prediction of Academic Hardiness as Measured by AHS

Hypothesis number five suggested that the four components of academic self-efficacy as measured by GPA scores, IOWA scores, CRPSS-VE, *The People I Know* and *My Feelings about School* would explain a statistically significant amount of variance in AHS scores. In the current study the AHS demonstrated moderately low levels of internal consistency (Chronbach's $\alpha = .69$). The summary statistics for the completed AHS measures in this sample are given in Table 1. The first regression model constructed with GPA as the predictor variable representing past success was statistically significant ($F = 9.22$, $p < .001$, $R^2 = .25$) but accounted for only 25% of the variance in the AHS total scores. Two of the predictor variables were shown to be significant predictors of AHS total scores, while the other two were not. *The People I Know* ($b = .20$, $t = 3.02$, $p < .01$) and *My Feelings about School* ($b = .16$, $t = 2.34$, $p < .05$) were shown to be

significant while GPA and the CRPSS-VE demonstrated no significance (the summary of this regression analysis for variables predicting AHS scores is given in Table 9).

Table 9

Summary of Regression Analysis for Variables Predicting AHS Scores (N = 116; GPA Predictor for Past Success)

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
GPA	-.42	.60	-.68	.49
CRPSS-VE	.22	.13	1.73	.09
Feelings	.16	.07	2.36	.02*
People	.20	.07	3.02	<.001**

Note. $R^2 = .25$.

*-Indicates significance at $p < .05$.

** -Indicates significance at $p < .01$.

The regression model on the AHS that included IOWA scores as the indicator of past performance explained a higher percentage of the variance than the model using GPA ($F = 17.394, p < .001, R^2 = .44$). However IOWA scores were a negative predictor of AHS total scores ($b = -.12, t = -4.52, p < .001$), meaning that for each point of higher reported AHS totals, an individual's percentile rank on the IOWA in this sample was .10 lower (the summary of this regression analysis for variables predicting AHS scores is given in Table 10). *The People I Know* ($b = .25, t = 3.90, p < .001$) and *My Feelings about School* ($b = .23, t = 3.20, p < .01$) also significantly predicted reported levels of academic hardiness. Both contributed to a positive slope in this regression model. The CRPSS-VE was once again found to be an insignificant contributor to the model.

The four regression equations discussed above indicated that the independent variables were better predictors of higher reported levels of academic self-efficacy as

measured by SIS scores than levels of academic hardiness as measured by the AHS. Neither GPA nor IOWA scores were significant predictors of the AHS. Only *My Feelings about School* and *The People I Know* were statistically significant predictors of the AHS. However, the combined variance explained by these variables was quite small ($R^2 = .23$). In contrast, results from the regression analyses with SIS as the dependent variable demonstrated a statistical and practical significance, accounting for 60% of the variance in SIS scores with GPA and 57% of the variance with IOWA percentile rank. Only *The People I Know* was found to be an insignificant predictor in multiple models while the other measures had significant coefficients in each equation. Given the differences in the way the independent variables predicted performance on the AHS and SIS it is concluded that the AHS and SIS are measuring similar, yet distinct concepts centered on academic confidence and motivation.

Table 10

Summary of Regression Analysis for Variables Predicting AHS Scores (N = 92; IOWA Scores Predictor for Past Success)

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
IOWA	-.12	.12	-4.52	<.001*
CRPSS-VE	.22	.07	1.87	.06
Feelings	.23	.07	3.20	<.001*
People	.25	.07	3.90	<.001*

Note. $R^2 = .44$.

*-Indicates significance at $p < .01$.

CONCLUSIONS AND DISCUSSION

This investigation examined the following components of academic self-efficacy among Navajo American Indian students: past success as measured by GPA and IOWA percentile rank scores, exposure to models as measured by *My Feelings about School*, verbal persuasion as measured by the CRPSS-VE, and emotional arousal as measured by *My Feelings about School*. The main purpose of the current study was to further refine understanding about the nature of this concept in Navajo American Indians. This was done by assessing whether the aforementioned components could predict levels of academic self-efficacy as reported by Navajo high school students. According to the results of our analysis, three of the four components were significant predictors of self-reported levels academic self-efficacy: past success, verbal persuasion and emotional arousal. Past success as measured by GPA was the most significant predictor of academic self-efficacy.

Another purpose of the current study was to compare two similar concepts which seek to explain motivation in high school students-academic self-efficacy (as measured by the SIS), and academic hardiness (as measures by the AHS) to determine if they were both relevant to Navajo students at this educational level. The findings suggest that these two concepts are related to one another. However the findings also indicate that there are dramatic differences in the way the two concepts are predicted by the components of academic self-efficacy. Levels of academic hardiness were predicted only by two of the four components of academic self-efficacy: modeling and emotional arousal. Results also indicated that for each higher reported level of academic hardiness, students achieved related lower percentile rankings on nationally standardized achievement tests.

Before the statistical analyses were conducted there was a need to construct instruments, which sought to measure levels of exposure to appropriate academic models and the amount of emotional arousal centered on schoolwork and academic activities felt by Navajo high school students. There were no existing self-report instruments, which did so. The two instruments were developed for this purpose. *The People I Know* was created to assess exposure to models for this study. *My Feelings about School* was created to assess for levels of emotional arousal in the current sample of Navajo American Indian high school students. Both measures demonstrated good levels of consistency in this sample and results indicated that the measures assessed one factor respectively.

Analysis of The People I Know and My Feelings about School

As previously stated, there were no existing self-report measures seeking to assess exposure to models or emotional arousal. Thus, two self-report instruments, *The People I Know* and *My Feelings about School*, were created and analyzed. The factor analyses conducted on each of these measures indicated that each instrument included one item that was problematic. Therefore both instrument omitted this item from the analysis throughout the remainder of the investigation, creating a nine-item version of *The People I Know*, and an 11-item version of *My Feelings about School*. Both measures exhibited a small subset of items loading onto a second factor. Notwithstanding these small subsets, the differences in the amount of variance explained by the first and second models in each analysis was so great that it could be concluded that this measure was assessing only one factor. Each measure expressed good levels of internal consistency (Chronbach's $\alpha = .85$).

The researcher is able to state with a degree of confidence that *My Feelings about School* and *The People I Know* are reliable instruments. It should be noted that while these instruments have demonstrated good levels of reliability these instruments were not scrutinized to determine psychometric validity. It has been established by previous research findings (Bryan, 2003; Downs, 2005) that academic self-efficacy explains some of the variance in academic achievement. Results from the current study indicate that the two instruments created for this study explain some of the variance in academic self-efficacy. These findings were expected, and follow Bandura's (1977a, 1997) model. We can conclude that these measures have some degree of construct validity. These findings support the first hypothesis of the current investigation.

The author can further state with some degree of confidence that these items are measuring different constructs based on the moderate correlation between the two ($r = .38, p < .01$). One would expect these instruments to be related to some extent as they are purported to be measurements of sub-components in a larger construct (academic self-efficacy). The lack of a strong correlation likely shows that these instruments are measuring different factors. It can be confidently stated that these instruments were distinct psychometrically and measure separate components of a larger construct. Further statistical analyses to determine the temporal stability of these measures, the validity of these instruments, as well as obtaining more information about the nature of what they are measuring could be the focus of future investigation.

The People I Know and *My Feelings about School* exhibit some psychometric properties, which indicate that they might be useful tools to assess exposure to models and emotional arousal centered on school assignments and academic activities. Exposure

to appropriate academic models has been shown to be an important piece of information to assess and improve in order to increase levels of overall academic self-efficacy (Mayo & Christenfeld, 1999; Schunk, 2003). However, in the present study, exposure to models as assessed by *the People I Know* did not predict variance in academic self-efficacy. The implications of this finding are discussed below. Moderate levels of school and academic-related emotional arousal have also been shown to be best for academic achievement (Anderson & Betz, 2001; Matsui, Matsui, & Ohnishi, 1990). The results from the statistical analysis for this hypothesis lead to the conclusion that these instruments, particularly *My Feelings about School*, could be helpful in the schools. An understanding of the reasons why students report low levels of academic self-efficacy could help educators to improve overall scores in students needing the most help. These instruments could provide information about the component(s) of academic self-efficacy that is the most problematic for each student in order to intervene and improve levels of academic self-efficacy in a more individualized manner. The present author hopes that these instruments will help determine why overall scores in academic self-efficacy may be low.

Correlations

A correlation matrix was designed to assess the relationships between the constructs measured in this investigation. Strong relationships impair the ability of constructs to accurately predict dependent variables in regression models. A common rule is to examine for relationship $r > .80$. Correlations at or above this level introduce problems of multicollinearity. There were no problematic relationships among the constructs according to the results of the current study. However further statistical

analyses (Tolerance and VIF statistics) were calculated for each regression model to assess for the potential of multicollinearity and none were significant. These findings indicate that the constructs as operationalized in this study were likely separate enough from each other to be utilized in the current investigation and may be useful in future research.

Prediction of Measures of Past Success by Sub-constructs

These first two regression models were calculated to assess for the effects of multicollinearity in the predictive models for academic self-efficacy. The model with GPA scores as the dependent (y) variable demonstrated statistical significance. However, the measure for emotional arousal was the only statistically significant predictor ($p = .04$) accounting for only 16 % of the variance in GPA scores. Therefore it was concluded that there could be some moderating effects between the measure of emotional arousal and GPA score as a measure of past success in the predictive models of academic self-efficacy. While there is some statistical evidence to support this notion via the regression model, the practical significance is minimal. The lack of significant tolerance and VIF statistics in each of the regression models supports this notion. It is concluded that the moderating effects between the measure of emotional arousal and this measure of past success are not significant enough to warrant concern, which implies that the regression models were not experiencing any of the effects of multicollinearity. This finding supports the second hypothesis of the current study.

The regression model created for IOWA scores as predicted by the other three components of academic self-efficacy was also statistically significant. As in the GPA models, the measure for emotional arousal was the only component with a significant

predictive slope accounting for only 11% of the variance in past success as measured by IOWA percentile ranks. As in the GPA model, it might be concluded that there are some moderating effects between emotional arousal and past success as measured by IOWA percentile rank in the predictive models of academic self-efficacy. However, because of the small amount of variance explained by this regression model, the weak correlation between the constructs and the lack of significant tolerance and VIF statistics, it was concluded that the moderating effects between emotional arousal and past success were not significant enough to warrant concern. This conclusion implies that the regression models involving IOWA percentile scores as a measure of past success, were not experiencing any of the effects of multicollinearity. The findings from these regression models support the third hypothesis of this study.

Comparison of Academic Self-efficacy and Academic Hardiness

Academic self-efficacy and academic hardiness demonstrated a strong, statistically significant bivariate correlation ($r = .51, p < .01$). These results indicate that these concepts, academic hardiness and self-efficacy, are related concepts. However, as previously indicated, there are significant differences in the way they are predicted by the component measures in the regression models for this study. To analyze the component structures of academic self-efficacy and academic hardiness, separate regression models were created in which the dependent (y) variables were the general self-report measures of these two constructs. There were five independent (x) variables: the two measures of past academic success, GPA and IOWA percentile ranks; a self-report measure of verbal persuasion; a self-report measure of exposure to models; and a self-report measure of emotional arousal (anxiety) about school and school work. The four predictors of

academic self-efficacy created distinct predictive models for academic self-efficacy and academic hardiness.

Predictive Models for Academic Self-efficacy

Both measures of past success, verbal persuasion, and the emotional arousal were significant predictors of academic self-efficacy. This regression model explained a large amount of the variance (nearly 60%) in reported levels of academic self-efficacy. Many studies suggest that past successful experiences are the most powerful component of academic self-efficacy (Bandura, 1982, 1997; Betz, 1992; Luzzo et al., 1999). This was the case for GPA but not for IOWA scores. It was expected that this sub-construct would have the greatest effect on the slope of a regression model with the other three components. In the current investigation, GPA seemed to be a better predictor of overall academic self-efficacy. This finding supports the use of GPA as the main predictor of past successful academic performance. This is supported by numerous studies previously conducted on academic achievement (Kluger & Koslowsky, 1988; Lent, Lopez, & Bieschke, 1991; Lufi, Parish-Plass, & Cohen, 2003; Malouff et al., 1990; Stader & Licht, 1992). The main source of feedback given to students is grades. Students are given grades on several different levels, daily assignments, weekly quizzes, and term grades, which all indicate to a student whether he/she is succeeding academically. It is likely that the consistent assignment of grades by teachers is a more readily available source of feedback to students, thus more influential in the development of an individual's perception of past academic performance.

Another explanation for the IOWA's lack of prediction of academic self-efficacy could be the biases of standardized testing, which have been shown to inaccurately

estimate levels of academic achievement of minorities (Fagan, 1987; Geisinger, 2005; Williams, 1983). Psychometricians have struggled to measure whether a test has inherent biases as well as the extent these biases may affect performance (Williams, 1983). What is certain is that standardized tests purporting to measure academic achievement tend to underestimate levels of academic achievement in minority students (Fagan, 1987; Geisinger, 2005; Williams, 1983), including American Indian students (Geisinger, 2005).

A puzzling finding was the inability of the measure of exposure to like models (*The People I Know*) to explain variance in general academic self-efficacy. Bandura (1986a, 1997) suggested that modeling does not as powerfully influence efficacy beliefs as past success. However, he suggests that modeling should explain a greater percentage of variance than emotional arousal or verbal persuasion. He further suggested, and research has confirmed, that modeled behavior should lead to significant changes in behavior (Bandura 1986a, 1997; Luzzo et al., 1999; Pajares, 1996). These findings give no support for modeling as a predictive element of self-reported levels of academic self-efficacy with this sample of American Indians. Thus, the regression model for academic self-efficacy, involved only three significant predictive components: past success, parental involvement, and emotional arousal.

This finding is contrary to the fourth hypothesis of this study. While there are studies indicating that modeling may not be as important a source of efficacy information as past success (Bandura, 1986a, 1997), previous findings suggest that modeling provides some information about the levels of overall academic self-efficacy (Schunk, 2003). What is unclear is whether the lack of significant findings in the present study is attributable to the conceptualization of modeling or the construct validity of the

instruments measuring the effects of modeling and levels of academic self-efficacy. It could be that positive academic models are not a significant component of academic self-efficacy in Navajo high school students. However, this is highly unlikely as many studies suggest that modeling is important for the self-efficacy of ethnic minorities (Mayo & Christenfeld, 1999; Powers & Rossman, 1984; Tashakori & Thompson, 1991).

A more likely possibility for this finding is problems with the instruments, the SIS and *The People I Know*. It could be that the SIS does not assess exposure to like models as one of the components of academic self-efficacy. A more likely explanation is that *The People I Know* is not accurately assessing levels of exposure to appropriate academic models. Most students in high school on the Navajo reservation know few people that have successfully completed college or post-secondary training. It might be that *The People I Know* is not sensitive enough to differentiate between the minimal contacts the students have with individuals that would be appropriate academic role models. This instrument may need to be refined to reflect that the American Indian students on reservation schools do not know many American Indian role models that are in college or have successfully completed post-secondary schooling. Nonetheless, researchers should not abandon the idea of looking at ways modeling influences academic self-efficacy with this population. Research has shown that this is a significant component of efficacy information (Anderson & Betz, 2001; Schunk, 2003). Further use and refinement of *The People I Know* may help strengthen its usefulness in assessing levels of exposure to models in this population.

There was a large amount of variance in levels of academic self-efficacy explained (60%) by the regression model, which included three predictive components of

academic self-efficacy. According to these results, it might be beneficial for school administrators, counselors, and educators working with Navajo students to focus on creating successful academic experiences and help raise interest in school and schoolwork with appropriate academic environments (Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003). Research findings also suggest that environments which raise academic interest may include: caring teachers whose efforts center on decreasing the fear of failure; communicating educational professionals' concern, acceptance and empathy for those not academically motivated; appropriate modeling of academic enthusiasm from teachers and other professionals; classrooms which focus on effort instead of ability; setting specific challenging yet attainable academic goals for each individual; helping students set long-term career and educational goals; focusing on improvement instead of deficits; arranging for successful learning experiences; teaching learning and study strategies which are often lacking in individuals with low levels of motivation; and relating learning to individuals' interests outside of the classroom (Morrone & Pintrich, 1997; Stipek, 1993). M. B. Brown and Keith (1998) suggest that positive relationships with professionals, classroom organization, which ensures success, and interesting instructional practices can enhance student interest in school. Other researchers (Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003) have found that relationships with faculty members can have positive influence.

Academic Hardiness Models

The regression models involving academic hardiness as the dependent (y) measure demonstrated less statistical significance than the academic self-efficacy models; the first model with GPA as a predictor of past success accounted for only 25% of the

variance in reported levels of academic hardiness. This model included only two significant predictors, modeling and emotional arousal. The second model with IOWA scores as predictors of past success included three significant predictors of Academic Hardiness: IOWA scores, modeling, and emotional arousal.

Neither measure of past success contributed significantly in an expected manner to explained variance. As previously mentioned it should be expected that the measures of past success are the biggest predictors of reported levels of academic self-efficacy (Betz, 1992; Luzzo et al., 1999). This was not the case for either of the independent (x) variables for past success used in the current investigation. Indeed, the model including IOWA percentile rank as the measure of past success demonstrated that IOWA scores significantly decreased as reported levels of academic hardiness increased. It appears that academic hardiness may not be a good indicator of academic confidence or motivation with this population.

In this sample, academic self-efficacy and academic hardiness appear to be distinct constructs. What is particularly puzzling about the findings related to academic hardiness in the current investigation is the lack of a significant predictive relationship between totals from this measure and the measures of past academic success. One would expect students that have experienced greater academic success in the past to report being more committed to schooling, more in control of their academic situation, and more accepting of the challenges schooling presents. Self-efficacy theory posits that past success should be the most significant predictive component to general academic self-efficacy (Bandura, 1997; Betz, 1992; Luzzo et al., 1999). Given the relationship between the two constructs, one would assume that the components of academic self-efficacy

would also predict academic hardiness. Given the lack of a positive predictive relationship between academic hardiness and the measures of past success in the regression models, it is concluded that in this sample academic self-efficacy is a more useful construct in explaining of academic performance. These findings are contrary to the first and fifth hypotheses of this study.

There are subtle differences that could account for differences in the regression models between academic self-efficacy and academic hardiness. Academic self-efficacy is hypothesized to explain the extent to which individuals believe they can execute the behaviors required to produce successful academic outcomes (Smith, 1988; Downs, 2005). Academic hardiness is hypothesized to explain academic motivation, operationalized as the level of commitment for completing an education, the extent to which one believes challenge is a normal part of the academic process and the amount of control an individual has in their academic environment (Benishek & Lopez, 2001). According to these definitions, academic self-efficacy, or the extent to which one believes oneself capable of successfully executing academic behaviors which lead to one's academic success, is different from hardiness, which is an individual's level of commitment, perceived control and understanding of challenge in the academic environment. It seems that academic self-efficacy explains a person's belief about his/her ability to successfully perform behaviors, not the actual execution of these behaviors. Otherwise stated, academic self-efficacy explains a person's *belief in the ability to complete the process* of succeeding in school, while academic hardiness seems to examine levels at which individuals *express behaviors during process*.

It might be that academic hardiness is not a useful construct in this population. It was expected that academic hardiness was related enough to academic self-efficacy that totals scores on both measures would be predicted by all four components of self-efficacy. However, this was not the case. There was a significant correlation between academic hardiness and academic self-efficacy, but even from this correlation they appear to be measuring different constructs. The correlation between the two constructs explains only 26% of the variance. It could be that, while academic self-efficacy and academic hardiness are related concepts, they are indeed different in some aspects. Academic hardiness seeks to explain motivation through levels of academic commitment, attitudes about academic challenge, and the perceived level of control over their academic functioning. Academic self-efficacy is defined as an individual's judgments of their capabilities to organize and execute courses of action required to attain successful academic performances. Academic self-efficacy does not seek to explain commitment, control or the acceptance of academic challenge, although these concepts appeared to the present author to be closely related to academic self-efficacy. The differences in scope and purpose of these constructs may seem subtle, but could be enough to explain the differences in the way the four components of self-efficacy predicted self-reported levels of academic self-efficacy and academic hardiness.

It could also be that academic hardiness is not a concept that is as valid in the Navajo American Indian population as academic self-efficacy. Academic self-efficacy has a significant relationship to academic performance with this population (Downs, 2005; Bryan, 2006). In this sample students reported high levels of academic self-efficacy suggesting that these individuals, on average, believe they are capable of performing

behaviors, which lead to successful school performance. However, these same students, on average, report relatively low levels of academic hardiness. Academic hardiness may not be acting, as we would expect in a sample of European American high school students. The notions of control, challenge and commitment have an individualistic flare. These ideas are consistent with promoting individuals' goals, and persistence. Navajo culture promotes attitudes and values that are more collectivistic. These values promote more cooperative behaviors and deemphasize competitive climates (Durtshi, 1997).

Another interesting finding in the current investigation is the evident relationship between academic hardiness and modeling and the relationship between academic self-efficacy and verbal persuasion. In both regression models created for academic self-efficacy, modeling was not a predictive indicator, while verbal persuasion was. The opposite is true for the two regression models created for academic hardiness. Verbal persuasion was not a significant predictor of reported levels of academic hardiness in either of the regression equations, while modeling was a significant indicator in both models. This finding is indicative of another difference between academic self-efficacy and academic hardiness. According to this finding there seems to be something about the way these two constructs operate in this population which relates academic self-efficacy to verbal persuasion but not to modeling and academic hardiness to modeling but not to verbal persuasion.

It has been mentioned that academic hardiness may be a more individualistic, European American construct. Returning to this issue might shed some light on potential explanations for the differences in academic self-efficacy and academic hardiness in their relationships with verbal persuasion and modeling. Modeling may be a concept more

related to individualistic values. Individualistic cultures promote individual effort and achievement in order to stand out from the majority to create choice and opportunity.

Bandura (1977) believed that individuals *persuade themselves* of an ability to accomplish behaviors as they see others do so and subsequently increase persistence in their efforts.

The emphasis on comparison to others and motivation to achieve coming from within the individual her/himself seems more closely tied to individualistic values and concepts. It would not be a stretch to suggest the possibility that modeling and the AHS are related because the concepts both seem to be somewhat individualistic.

On the other hand, the notion of verbal persuasion is one that seems to be more collectivistic. Collectivistic societies place the emphasis on family values and focus on what is good for the group above that of the interest of the individual. The concept of verbal persuasion as operationalized in this study (parents as the main source of verbal persuasion) seems to be consistent with these values. It has been previously mentioned that Navajo parents may indeed be aware of the need for education and encourage their children to achieve academically for the betterment of their family and the Navajo nation as a whole. Students may give more credence to this type of information because of their beliefs in strong family values and respect for tribal leaders. Both academic self-efficacy and verbal persuasion appear to be applicable cross-culturally. Their relationship might be explained by the values of each concept, which appear to be more collectivistic than academic hardiness and modeling.

Limitations, Cultural Implications and Future Investigations

The findings of the current investigation are limited by several factors. The first limitation is the small sample size. An ideal number to obtain accurate reliability

coefficients as well as to be able conduct a more powerful factor analysis is around 10 participants per item of the newly created instrument(s) (MacCallum et al., 1999; Tucker & MacCallum, 1997). An ideal sample for the current investigation to meet this criterion would be around 200. Improving on the sample size might add power to the regression models and the predictive ability of *The People I Know* to predict academic self-efficacy. Further investigations should include more participants to further and more accurately explore the nature of the newly created instruments.

Second, there were some problems with the measures used in this investigation. The CRPSS-VE was not normally distributed. There was a significant skew in the responses of this sample, which indicates a peaked distribution with a small variance. It could be that the actual variance in the responses reported by the participants in this study was underestimated. Improvements in the assessment of verbal persuasion could better the results of the current study. It could be that a measure involving more items, which more broadly assesses the varied levels and activities associated with parental verbal persuasion (e.g., discussions at parent-teacher conferences, or at the twice yearly student educational and occupational plan [SEOP] meeting), would more accurately estimate the actual variance in student responses. Such a measure does not currently exist. Development of an instrument with the psychometric properties of a normal distribution assessing a variety of verbal interactions between parents and students could greatly improve the ability of researchers to estimate levels of verbal persuasion in this population.

However a probable cultural implication of the high levels of verbal persuasion provided by parents lies in the levels acculturation in the parents of Navajo American

Indian students. Hill's (2004) findings suggest that individuals who perform well in school are more acculturated, which means that higher achieving students are better able to navigate school settings based largely on European American, individualistic values and assumptions. It stands to reason that parents of students who are performing well in school may be more acculturated as well. While there are still major cultural differences between European American and Navajo culture it could be that parents have a narrow band of acculturation centered on education and school. These schools are run by Local Education Agencies (LEA's), which employ teachers and administrators that are, for the most part European American. School functions and parental interactions with school personnel are a cross-cultural exercise. It is not a stretch to imply that students reporting higher levels of verbal persuasion, which predicts high levels of academic self-efficacy could be influenced by the levels of acculturation of their parents.

IOWA percentile ranks also exhibited a problematic low mean level, or floor effect, which indicates that the variance in the scores was attenuated at the lower levels. An implication of this finding is that these numbers highlight the lower than expected levels of academic achievement in this population. According to these results, Navajo American Indian students tend to academically perform at lower than expected levels, a notion that is supported by previous studies (Brown & Kurpius, 1997; Benjamin, 1993; Downs, 2005; Hill, 2004; Pipes, Westby, & Inglebret, 1993; Rindone, 1988).

Another limitation of the current investigation lies with the measure for academic hardiness. In this study this instrument demonstrated lower levels of internal consistency than reported in previous studies. The low level of reliability in this study (Chronbach's $\alpha = .69$) is of some concern as the measure seemed unable to consistently measure what it

purported to measure. Given the number of items in the AHS an acceptable level of Chronbach's α is .70 (Netemeyer et al., 2003). While the Chronbach's α approaches the acceptable level of internal consistency for an instrument of its size, it could be that either the measure, or the construct of academic hardiness itself, is not a reliable in this population. Inconsistent totals from this instrument may have negatively influenced the regression analyses involving academic hardiness. A higher level of internal consistency on this measure would help clarify the predictive models and may strengthen the relationships between the AHS and the measures of the components of academic self-efficacy, in particular the measures of past success.

The third limitation involves the instruments created for the purposes of this study, *My Feelings about School* and *The People I Know*. In the factor analyses conducted on each instrument, both exhibited a subset of items that loaded significantly onto another factor. There were some loose conceptual commonalities among the problematic items in each measure. Yet these common features did not seem to affect these instruments' ability to measure one lone factor. While these subsets have very little practical significance, and all of the items loaded onto one factor, this problem was not a major contribution to difficulties in the statistical analyses. However further investigation may refine the properties of *My Feelings about School* and *The People I Know* to make them more distinct measures on one factor. Future investigations should establish validity of *The People I Know* and *My Feelings about School*. While there is some psychometric evidence supporting the discriminant validity of these measures, more evidence should be demonstrated regarding their content and concurrent validity.

Another weakness of this study was the inability of *The People I Know*—the instrument measuring modeling—to significantly predict variance in the self-reported levels of academic self-efficacy. As previously discussed, this finding was contrary to hypotheses two. While there are studies indicating that modeling may not be as important a source of efficacy information as past success (Bandura, 1986a, 1997), findings should suggest that modeling provides some information about the levels of overall academic self-efficacy (Schunk, 2003). As mentioned above, it is unclear whether the lack of significant findings is attributable to the conceptualization of modeling or the sensitivity of *The People I Know* to measure such low levels of exposure to appropriate academic models. What is clear is that future investigation might search to identify which of the aforementioned aspects of these measures is problematic. Past research indicates that modeling should be a significant predictor of academic self-efficacy (Anderson & Betz, 2001; Bandura, 1986a, 1997; Schunk, 2003), and future studies should look to establish this construct with this population.

It should be noted that the purpose of this study was not to describe causal factors of academic self-efficacy. None of the findings should be interpreted as causal. The models created in this study sought to add further understanding about the nature of academic self-efficacy and its function in Navajo American Indian high school students. Previous investigations have sought to name and describe the relationships of relative constructs affecting lower than expected levels of academic achievement and post-secondary retention (Brown & Kurpius, 1997; Bryan, 2004; Downs, 2005; Hill, 2004; Jackson & Smith, 2001; Jackson, Smith, & Hill, 2003; Lin, 1990; Wells, 1989). This investigation sought to move the research body from naming and describing to accurately

predicting levels of academic self-efficacy, since this construct has been shown to be a relevant construct in successful Navajo students (Bryan, 2003; Downs, 2005; Hill, 2004). Future research should look at ways to increase levels of academic self-efficacy in Navajo students. This increase in academic self-efficacy could help these students perform better in school and may lead them to complete further academic training.

Another potential future investigation lies in examining the nature of the relationship between academic self-efficacy and academic hardiness in a sample of European American high school students. The findings of the current investigation have lead to speculation about the nature and utility of the academic hardiness construct with Navajo American Indian high school students. These findings suggest that there might be cultural differences in the ability of academic hardiness to explain school-related motivation between European American samples and samples of Navajo American Indian students. Much of the speculation centers on the seemingly individualistic notions of control, challenge and commitment, which are the postulated sub-factors of academic hardiness (Kobasa, 1979). These individualistic notions could prove difficult to extrapolate to individuals from collectivistic cultures, such as Navajo culture. A study that examines the relationship between academic self-efficacy and academic hardiness in a sample of European American students (who are raised primarily in individualistic cultures) would shed some light on this area of speculation.

A further problem is that the present study was conducted in a relatively restricted geographical location of the Navajo Reservation. The Navajo Nation lies in three different states: Arizona, New Mexico and Utah. There are over 40 high schools located on or near tribal lands in which Navajo students comprise a significant majority of the

school population. This study assessed the components and levels of academic self-efficacy in only three of these high schools, and in only one state. The Navajo Nation depends on state and Local Education Agencies (LEAs) to provide the educational services at each of these high schools.

It is likely that each of these states has different policies regarding the education of high school students and that each LEA has state education models. The Navajo Nation has recently taken steps to improve the accountability and consistency of the LEAs in the Navajo Nation by passing of the Dine' Sovereignty in Education Act (Norell, 2005). Since this is a recent development, it is possible that the effects of this legislation have not yet fully developed. Due to the potential conflict between LEAs, future research should investigate the strengths, limitations and effects on levels of academic self-efficacy in a more representative number of states and LEAs on the Navajo Reservation. Future studies may seek broader findings that could lead to the development of a set of interventions or specific programs that would be useful on a larger scale for Navajo high school students.

Notwithstanding the limitations of the study, the findings of the current investigation should not be minimized. The findings of the current study indicated that self-efficacy is predicted by academic performance. It suggests some steps to improve students' beliefs in their ability to be successful academically. Promoting these beliefs may lead to improved level of achievement. Future interventions aimed at increasing levels of academic self-efficacy in Navajo American Indian high school students should promote successful academic experiences, and increase interest in school and academic activities. Teachers and other professionals should create steps to intercede appropriately.

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Appendix A

Glossary of Terms

Academic Self-Efficacy: An individual's judgments of his/her capabilities to organize and execute courses of action required to attain successful academic performances.

Past Success: (enactive attainments/performance accomplishments): The source of efficacy information based on personal mastery experiences in specific domains. This source of efficacy information was operationalized for the purposes of this study as GPA and IOWA percentile rank scores.

Modeling: (vicarious experience): The source of efficacy information by which one observes others successfully performing activities in a given domain. In so doing an individual can become more confident that she/he can also successfully perform tasks in that domain. Exposure to appropriate models was assessed in the current investigation by the newly created measure, *The People I Know*.

Verbal Persuasion: The source of efficacy information by which an individual is led to believe she/he can successfully complete tasks in a specific domain through verbal suggestion. Verbal persuasion was operationalized as a student's perception of the verbal persuasion his/her parents use with him/her. This was assessed by the CRPSS-VE.

Emotional Arousal: The source of efficacy information by which individuals assess her/his levels of physiological arousal (levels of stress/anxiety) to determine if she/he is capable of successfully performing tasks in a given domain. Emotional arousal was

operationalized in the current study as the amount of anxiety an individual feels about school assignments and projects. Levels of the school-related anxiety were assessed by the newly created instrument *My Feelings about School*.

Appendix C

Academic Hardiness Scale (AHS) Measure

Name _____ Date _____

School _____ Grade _____

This questionnaire gathers information about your attitudes regarding grades and academic success. Indicate how true or untrue each item is of your own personal beliefs and of your current school-related work habits using the four point rating scale provide.

1. Doing well in school is as important to me as it is to my parents.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

2. I work hard for all the grades I get.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

3. If possible, I tend to avoid enrolling in difficult classes.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

4. Getting good grades isn't a terribly important goal for me.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

5. I enjoy the challenge of taking difficult classes.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

6. Right now I'm very involved in all my classes.

Completely	Mostly	Mostly	Completely
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FALSE	FALSE	TRUE	TRUE
1	2	3	4

7. I find it difficult to “bounce back” from academic disappointments.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

8. I become less motivated to study for a class when I don’t get the grades I want right away.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

9. Right now, I’m more interested and involved in activities outside of my classes.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

10. I take my work as a student very seriously.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

11. I try to avoid classes that I know will require a lot of extra work.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

12. If I begin to do poorly in a class, I start to doubt my ability as a student.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

13. I consider myself a dedicated student.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

14. I don’t see the purpose of taking a class if I’m not totally confident I will get a good grade.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

15. I only work as hard as I need to pass my classes.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

16. I try to get into classes where I pretty much know I can do well.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

17. Regardless of the class I'm in, I try to do my best work.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
--------------------------	----------------------	---------------------	-------------------------

18. I often make personal sacrifices in order to get the good grades I want.

Completely FALSE 1	Mostly FALSE 2	Mostly TRUE 3	Completely TRUE 4
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Appendix D

Career Related Parent Support Scale-Verbal Encouragement Subscale Measure

	Does not describe me			Describes me very well	
1. My parents reward me for doing my schoolwork.	1	2	3	4	5
2. My parents encourage me to learn as much as I can at school	1	2	3	4	5
3. My parents encourage me to make good grades.	1	2	3	4	5
4. My parents encourage me to get more education after I graduate.	1	2	3	4	5
5. My parents told me they expect me to finish school.	1	2	3	4	5
6. My parents tell me they are proud of me when I do well in school.	1	2	3	4	5

Appendix E

The People I Know Measure (Administered to participants in the study)

Name: _____

Date: _____

School: _____

Grade: _____

The People I Know

	Does not describe me well					Describes me very well				
	1	2	3	4	5	1	2	3	4	5
1. I know many people that went to college.	1	2	3	4	5	1	2	3	4	5
2. My friends want to go to college.	1	2	3	4	5	1	2	3	4	5
3. Many members of my family went to college.	1	2	3	4	5	1	2	3	4	5
4. My favorite teachers talk about their college experience.	1	2	3	4	5	1	2	3	4	5
5. I know many people in college right now.	1	2	3	4	5	1	2	3	4	5
6. I know many people from my community that are in college right now.	1	2	3	4	5	1	2	3	4	5
7. I have made trips to college campuses.	1	2	3	4	5	1	2	3	4	5
8. I have visited people I know at their college.	1	2	3	4	5	1	2	3	4	5
9. I have opportunities to talk to people that go to college.	1	2	3	4	5	1	2	3	4	5
10. I have opportunities to talk with people that graduated from college.	1	2	3	4	5	1	2	3	4	5

Appendix F

My Feelings about School Measure (Administered to participants in the study)

Name: _____

Date: _____

School: _____

Grade: _____

My Feelings about School

	Does not describe me well			Describes me very well	
1. I am not excited about learning more in my classes.	1	2	3	4	5
2. I am comfortable at school.	1	2	3	4	5
3. I am calm when given assignments.	1	2	3	4	5
4. I don't worry about my ability to complete assignments.	1	2	3	4	5
5. I almost never get nervous when taking tests.	1	2	3	4	5
6. I feel confident when I take a test.	1	2	3	4	5
7. I feel good about trying hard on tough assignments.	1	2	3	4	5
8. I am not anxious when working on assignments and tests.	1	2	3	4	5
9. I am calm when giving presentations at school.	1	2	3	4	5
10. I am comfortable around my friends at school.	1	2	3	4	5
11. I feel comfortable talking about my grades with teachers.	1	2	3	4	5
12. I feel comfortable talking about my grades with friends.	1	2	3	4	5

Appendix G

The People I Know-Revised

Name: _____

Date: _____

School: _____

Grade: _____

The People I Know

	Does not describe me well			Describes me very well	
1. I know many people that went to college.	1	2	3	4	5
2. My friends want to go to college.	1	2	3	4	5
3. Many members of my family went to college.	1	2	3	4	5
4. I know many people in college right now.	1	2	3	4	5
5. I know many people from my community that are in college right now.	1	2	3	4	5
6. I have made trips to college campuses.	1	2	3	4	5
7. I have visited people I know at their college.	1	2	3	4	5
8. I have opportunities to talk to people that go to college.	1	2	3	4	5
9. I have opportunities to talk with people that graduated from college.	1	2	3	4	5

Appendix H

My Feelings about School-Revised

Name: _____

Date: _____

School: _____

Grade: _____

My Feelings about School

	Does not describe me well			Describes me very well	
1. I am comfortable at school.	1	2	3	4	5
2. I am calm when given assignments.	1	2	3	4	5
3. I don't worry about my ability to complete assignments.	1	2	3	4	5
4. I almost never get nervous when taking tests.	1	2	3	4	5
5. I feel confident when I take a test.	1	2	3	4	5
6. I feel good about trying hard on tough assignments.	1	2	3	4	5
7. I am not anxious when working on assignments and tests.	1	2	3	4	5
8. I am calm when giving presentations at school.	1	2	3	4	5
9. I am comfortable around my friends at school.	1	2	3	4	5
10. I feel comfortable talking about my grades with teachers.	1	2	3	4	5
11. I feel comfortable talking about my grades with friends.	1	2	3	4	5