

## ABSTRACT

AYERS, ASHLEY NICHOLE. The Factorial and Concurrent Validity of the Dimensions of Self-Concept Measure (Form H) with a Sample of Graduate and Undergraduate Students across the United States. (Under the direction of Dr. Joan J. Michael.)

This study seeks to add to the current literature that examines the construct and concurrent validity of the academic self-concept measure, *Dimensions of Self-Concept* (Form H), for college level students. By utilizing a sample of 429 undergraduate and graduate students from across the United States, this study provides supplemental information previously unavailable through the use of community college populations or small undergraduate populations. This investigation had four purposes: (1) to investigate the construct or factorial validity of the *Dimensions of Self-Concept* (Form H) for college students, (2) to examine the concurrent validity of the DOSC (Form H) with self-reported cumulative grade point average, 3) to determine if there would be significant gender, racial, age, or academic classification group differences at the college level and (4) to determine if the construct validity of the DOSC (Form H) generalizes across different groups, regardless of age, race, gender or academic classification.

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The Factorial and Concurrent Validity of the Dimensions of Self-Concept  
Measure (Form H) with a Sample of Graduate and Undergraduate  
Students across the United States

by  
Ashley Nichole Ayers

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APPROVED BY:

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Samuel B. Pond III

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S. Bartholomew Craig

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Joan J. Michael  
Chair of Advisory Committee

## DEDICATION

I would like to dedicate this to my alterno-IO cohort and to my mom and dad. Without their support, the completion of this thesis would not have been possible.

## BIOGRAPHY

Ashley Nichole Ayers was born November 3, 1982 in Burnsville, North Carolina. She graduated from Mountain Heritage High School in 2001. Next, she attended North Carolina State University, graduating summa cum laude in 2005 with Bachelor of Arts degrees in Psychology and Communication. In the fall of 2005, Nichole began her graduate studies in the Industrial and Organizational Psychology program at North Carolina State University.

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## Section 1: Literature Review

It had been proposed that there is a relationship between academic self-concept and academic performance, but until Michael and Smith (1976) developed a measure of academic-self concept, the *Dimensions of Self-Concept* (DOSC), a scale to test this relationship did not exist. In their development of an academic self-concept scale they hypothesized that academic self-concept was a multidimensional construct and they hypothesized there were five different dimensions of academic self-concept. To set this study in perspective, the review of the literature details their development of the DOSC measure and its various forms, with a focus on Form H which targeted college students.

### *Dimensions of Self-Concept Development*

Michael and Smith (1976) considered academic self-concept a multidimensional construct and hence developed a scale that would measure five hypothesized dimensions of academic self-concept. When they commenced developing a self-concept measure, there were already several scales designed to measure one or more dimensions of self-concept, but there were a lack of scales intended to measure self-concept primarily as it related to school activities. Initially, they developed three different forms of an academic self-concept measure, each corresponding to a different level of education: elementary school, junior high school, and senior high school.

In terms of rationale for construction of the instrument, Michael and Smith's (1976) initial interest in developing the measure was to obtain data regarding the profiles of gifted students on dimensions of self-esteem, but eventually the three DOSC forms were modified for use with *all* students so that information gained could be provided to teachers for their use in planning activities that would enhance the self-concepts of both gifted and non-gifted students. Five dimensions of affectivity were chosen to represent the school-related constructs judged to be central to self-concept: Level of Aspiration, Anxiety, Academic Interest and Satisfaction, Leadership and Initiative, and Identification versus Alienation (Michael & Smith, 1976).

The DOSC was developed to measure non-cognitive factors associated with self-esteem in a school setting with the goal of predicting academic success. Level of Aspiration represents behavior that reflects the degree to which achievement and academic activities of students are consistent with their perception of their potential. Anxiety reflects behaviors associated with emotional instability, extreme concern about tests, and the preservation of self-esteem relative to academic performance. On the other hand, Academic Interest and Satisfaction measures the love of learning and pleasure obtained by doing academic work. The Leadership and Initiative factor is intended to measure aspects that represent demonstration of mastery of knowledge, initiating classroom assignments or projects, and assisting others. Finally, the Identification vs. Alienation scale is intended to measure the degree to which a student feels accepted as a part of the academic setting (Michael, Vladovic, Lehn, & Cooper, 1980).

With the possible exception of the Identification vs. Alienation dimension, Michael and Smith (1976) concluded their preliminary investigation of their academic *Dimensions of Self-Concept* measure offered promise of providing relatively reliable measures of individuals at three levels of education on five reasonably homogeneous dimensions of self-concept. They suggested future revisions at the item level should be performed with the goal of obtaining evidence of a relationship with external criteria including grades and standardized achievement tests.

Michael, Smith and Michael (1978) continued refinement and validation studies of their academic self-concept measure. On the basis of previous analyses (Michael & Smith, 1976), Michael, et al. (1978) determined the degree of correspondence between the junior high school and senior high school forms was so great that they should be combined into a single form (Form S) for students grades 7-12. Michael et al. (1978) found low to substantial intercorrelations among Level of Aspiration, Academic Interest and Satisfaction, Leadership and Initiative, and Identification vs. Alienation, indicating that perhaps these four constructs constitute a general factor indicative of learning, whereas Anxiety might reflect a dimension that is incongruent with or at least relatively independent of the other four dimensions. With respect to the item analysis, only four items in the two revised forms failed to yield a high correlation with scales for which they had been constructed. This suggests that Michael et al. (1978) had a high degree of success in redesigning and revising the original DOSC scales.

### *Early Validity Studies*

Lehn, Vladovic, & Michael. (1980) noted that the self-concept construct has been recognized by educators and psychologists as having a persistent relationship to academic achievement, but there has been little statistical evidence in the literature defining the psychometric strength of this relationship. They hoped to find a significant relationship between measures of self-concept and academic performance in their study. Lehn et al. (1980) noted that, without statistically reliable correlations, one could not determine whether an improvement in self-concept leads to improved school performance.

Lehn et al. (1980) used the revised Form S in a concurrent validity study with a population of ethnically-diverse high school students. Specifically, they used a standardized reading test, the DOSC (Form S), and the academic self-concept measure, *Mathematics Interest Inventory*, to predict high school performance of four different ethnic groups: Caucasians, Asians, Blacks, and Latinos. Their criteria included history grades, English grades, science/mathematics grades, and high school grade point average (GPA) which was represented by a composite of the three course grades. They found that a standardized reading test appears to be a more valid predictor of academic performance than measures of academic self-concept; even though the DOSC measure did contribute additional statistically significant variance to the prediction of overall GPA, the reading test explains more of the unique variance. Additionally, they found that, irrespective of ethnicity, Level of Aspiration and Academic Interest and Satisfaction afforded promise as predictors of school success. Their suggestion to practitioners was to use a combination of a cognitive measure with an

affective measure that will add statistically significant variance, such as a measure of self-concept, in order to achieve the best prediction of academic success.

Michael, Vladovic, Lehn and Cooper (1980) utilized the same data from the ethnically-diverse high school population used by Lehn et al. (1980). They were interested in determining whether the constructs underlying the cognitive and affective measures were comparable across ethnically-diverse groups. If the results indicated similarity of constructs and factorial invariance across groups, this finding would suggest that the same measures could be used for students of ethnically-diverse backgrounds. On the other hand, a lack of invariance would indicate the need to develop or modify the measures per ethnic group.

Michael et al. (1980) conducted a factor analysis of the intercorrelations of scores on a standardized reading test, the DOSC (Form S), the *Mathematics Interest Inventory*, and grades earned in history, English, and science/mathematics courses for each of the four different ethnic groups (Black, Caucasian, Asian and Latino). Their results revealed three dimensions of academic self-concept, which they labeled as academic achievement, positive academic affect, and anxiety. Additionally, they found that these three factor dimensions were invariant across the four ethnic samples. In conclusion, they suggested that for academic prediction a cognitive measure, such as a standardized reading test, should be used as the primary contributor and that an affective measure, like the DOSC scales, should be a secondary contributor.

Omizo, Hammet, Loffredo, and Michael (1981) looked at the relationship between self-concept and academic performance in a population of Mexican-American students. They

studied the concurrent validity of the DOSC (Form S) scales with scores on three subscales (math, language, and composite) of a basic skills test. They were also interested in exploring whether there was differential validity of the DOSC scales across male and female students in their sample of male and female Mexican-American junior high school students. Overall, Omizo et al. (1981) found the Level of Aspiration and Anxiety scales produced the highest correlations with scores on the skills test. These two scales produced statistically significant correlation coefficients with all three of the criterion variables. Additionally, they found that the Academic Interest and Satisfaction dimension significantly correlated with the composite measure. They also found that males had higher Level of Aspiration scores and lower Anxiety scores. They did not find any significant differences for any of the other self-concept measures.

#### *Dimensions of Self-Concept (Form H) – College Students*

Traditionally, college admission decisions have been based on high school GPA, rank, and standardized achievement test scores, but these measures may not be universally effective in predicting academic success for all students (Gottlieb & Rogers, 2002). The research described in the following studies suggests that there is a link between academic self-concept and academic success as a college student.

Michael, Kim and Michael (1984) first explored the possibility of using the DOSC measure to predict the performance of college students. Initially, they chose to test Form S (created for students grades 7-12) on a sample of college students to determine if the same factor structure would exist. They used a sample consisting of both college students and

eighth grade students. The eighth grade sample consisted of 234 students primarily from middle-class Caucasian families, and the college sample consisted of 193 community college day-time students in an introductory psychology course. Nearly all of the students were under the age of 30, and the sample represented diverse ethnic subgroups (50 percent Caucasian, 20 percent black, 20 percent Hispanic, and 10 percent Asian).

The main goal of Michael, Kim and Michael's (1984) study was to investigate the underlying factorial validity of the DOSC. They found that college students tended to have higher average scores on the positive measures of academic self-construct, the exception being the Anxiety dimension. This could be due to a greater degree of maturity or the fact that older students are more likely to chose more socially desirable responses. Even though Michael et. al. (1984) concluded that dimensions of academic self-concept appear to become differentiated as a function of age, the DOSC (Form S) does possess factorial validity over a substantial age range. They concluded by saying that it shows at least limited promise as a valid indicator of academic self-concept for college level students.

Even though the Form S showed promise as a valid indicator of academic self-concept for college students, Michael, Denny, Knapp-Lee, & Michael (1984) created a new form specifically tailored for college level students entitled DOSC (Form H). At the time, it was unknown if any other measures existed to test the academic self-concept of college students, but the authors thought such an instrument would be useful in research and college counseling activities.

### *Validity of DOSC (Form H)*

Michael, Denny, Ireland-Galman, and Michael (1986-87) conducted a factorial validity study using the newly developed DOSC (Form H) scale. The goal of their investigation was to obtain evidence regarding the construct validity of a multidimensional measure of academic self-concept. Their sample consisted of 181 community college students. Michael et al. (1986-87) found that all items exhibited the strongest correlation with the dimension of which it was a hypothesized member. They found five identifiable rotated factors which gave empirical support to the presence of the five hypothesized factors. They concluded that they had found promising support for the construct validity of the DOSC (Form H).

Halote and Michael (1984) and Caracosta and Michael (1986) were interested in providing more construct validity evidence, adding concurrent validity evidence, and evaluating the DOSC measure against other related measures, one of academic self-concept and one of locus of control, respectively. Both studies utilized the DOSC (Form H) scale.

Halote and Michael (1984) were interested in distinguishing between the DOSC (Form H) measure of academic self-concept and a academic self-concept scale by Reynolds, Ramirez, Magrina, and Allen (1980), the *Academic Self-Concept Scale* (ASCS). The goal of the ASCS was to assess general academic self-concept. This is different from the goal of the DOSC, which is to assess the multidimensional nature of academic self-concept by assessing several dimensions within the domain of academic self-concept.



In describing the difference between the DOSC and the ASCS, Halote and Michael (1984) stated, "...the DOSC was constructed to furnish an operational definition of each of five hypothesized subconstructs derived from a theory of academic self-concept. On the other hand, the ASCS was assembled on the basis of painstaking content analysis of studies pertaining to academic self-concept" (p. 994). Since these two measurements were constructed using two distinct approaches, Halote and Michael (1984) found it important to empirically distinguish the two by showing that they did not measure the same construct. Specifically, they were hoping to provide further evidence that academic self-concept is a multidimensional, rather than a unidimensional, construct.

Halote and Michael's (1984) sample consisted of 202 community college students who were administered both measures of academic self-concept. The criterion measures selected for use in this study were self-report measures of high school level, an estimate of high school class rank, an estimate of college GPA, and grade they anticipated receiving in their current college course. In terms of the factor structure of the DOSC (Form H) scale, Halote and Michael (1984) found Anxiety, Leadership and Initiative, and Identification vs. Alienation were clearly defined factors; while Level of Aspiration and Academic Interest and Satisfaction appeared to fuse onto one factor. In terms of the ASCS, they found that the ASCS is probably more accurately interpreted as a unidimensional measure of academic self-concept. In terms of concurrent validity, they found that the DOSC appeared to have higher concurrent validity coefficients with the self-report measures of academic achievement than did the ASCS. Specifically, the Level of Aspiration dimension showed considerable promise

as a potentially valid predictor of college academic success. They concluded by stating that the ASCS and the DOSC do not measure the same constructs.

Caracosta and Michael (1986) were interested in examining the relationship between the DOSC (Form H) measure of academic self-concept and a locus of control measure, the *Intellectual Achievement Responsibility Questionnaire* (IAR). The IAR is a locus of control measure that involves learning-related activities in the school setting (Crandall, Katkovsky, & Crandall, 1965). Caracosta and Michael (1986) were interested in determining if the DOSC and IAR contained any shared variance or if they were distinct scales measuring distinct constructs. Caracosta and Michael (1986) linked a locus of control measure to their measure of academic self-construct because they thought common sense would suggest that:

...individuals relatively high in locus of control who perceive that school success is a consequence of their own self-directed actions would be the very ones who would exhibit a comparatively high level of aspiration, minimal anxiety about learning, considerable academic interest and satisfaction gained from the accomplishment of personally set goals, qualities of initiative emerging from intrinsic motivation associated with past performance, and a positive identification with the educational establishment (p. 736).

Additionally, they thought that internal locus of control may mediate the relationship between academic self-concept and academic success. The goals of their study included determining the factor dimensions of both the DOSC and IAR, investigating if there were any shared dimensions between the two, and determining concurrent validity estimates with respect to their chosen criterion measures. Caracosta and Michael's (1986) sample consisted of 239 undergraduate university students who were administered both the DOSC and IAR measures. The criterion measures selected for use in their study were self-report measures of estimated college GPA,

the grade they anticipated receiving in their current college course, and an indication of typical high school grade received (Caracosta & Michael, 1986). Overall, they determined that the dimensions of the DOSC are distinct from the ones associated with the IAR. In terms of concurrent validity, they found that the DOSC appeared to have higher concurrent validity coefficients with the self-report measures of academic achievement. Specifically, the Level of Aspiration dimension showed considerable promise as a potentially valid predictor of college academic success. They concluded by stating that the DOSC and IAR measure distinct constructs.

Gottlieb and Rogers (2002) conducted a fairly recent investigation into the concurrent validity of the DOSC (Form H). They were specifically interested in a small population of students in a physical therapy program. Their population included 32 undergraduate students enrolled in a therapist assistant program at a state university during the spring semester of 1998. The criterion variable they chose was the average GPA from the core courses of the physical therapy program. They computed Pearson Product Moment correlations to examine the relationship between GPA and each of the five dimensions of the DOSC scale. Their results indicated a weak, but positive correlation between GPA and the Leadership and Initiative dimension of the DOSC, and they concluded by saying the relationship between academic success and the DOSC should be investigated further (Gottlieb & Rogers, 2002).

#### *Dimensions of Self-Concept (Form W) – Workplace*

It is relevant to briefly discuss the development and validation of yet another form of the *Dimensions of Self Concept* scale: Form W. In 1985, Gold and Michael used the DOSC

(Form S) to investigate the relationship between academic self-concept and potential burnout for a sample of first semester elementary school teachers. They conducted this study even before the validation of the DOSC (Form H), but it was the first sample to include working adults as the population of interest.

Four years later in 1989, Crowder and Michael began a three-step process to develop and validate a dimension of self-concept measure designed for employees in a work setting (Crowder & Michael, 1989a; Crowder & Michael, 1989b; Crowder & Michael, 1991). In designing the new instrument, the key assumptions they made were as follows:

Motivational features underlying learning and achievement in the school setting do not differ appreciably from the motivational characteristics central to job performance and achievement for adults in employment situations. This assumption implied that the same strong commitment to academic excellence in elementary, secondary, and higher education would translate and extend to a commitment for excellence on the job (Crowder & Michael, 1989b, p. 20).

In addition to using the five dimensions in the previous forms of the test, they decided to include one more construct: job stress. Job stress was added as a dimension because it was identified as central to the understanding of the self-concept of working adults. At the end of the construction and validation process, Crowder & Michael (1991) concluded their scale showed promise as a reliable and valid measure that could provide relevant information to personnel directors and counselors who assist employees psychologically struggling with problems related to the six dimensions of the self-concept scale.

Further construct validity evidence was provided by exploratory and confirmatory factor analyses conducted by Foraker and Michael (1994) and by Smith, Michael, and Gribbons (1997). Foraker and Michael (1994) concluded that the six factors appeared to be

reliable and homogeneous and suggested the exploratory and confirmatory factor analyses provided evidence for the construct validity of the six hypothesized dimensions.

The research on the sixth dimension of self-concept added to the DOSC (Form W), job stress, sparked interest in investigating this dimension for use in the college student population, (Form H). The rationale behind this being that, “college students at present are often described as underprepared for college work, with more of their time demanded by extracurricular activities, community service, and part-time jobs than in previous years. It is reasonable to expect that college students are going through stress associated with various aspects of their life” (Paik & Michael, 2000, p.626). Therefore, the stress factor dimension could be a useful addition to the DOSC (Form H).

Paik and Michael (2000) conducted an investigation into the construct validity of a six dimension version of DOSC (Form H) through confirmatory factor analysis. The results of their confirmatory factor analysis indicated that none of the models met minimum cut off values for the fit statistics. They commented that this was problematic, however, because the six-factor model fit the data better than did other tested models. They concluded that further investigations should be conducted to look at job stress as a potential sixth dimension in the DOSC (Form H) scale.

### *Current Study*

The current study seeks to add to the current literature that examines the construct and concurrent validity of the academic self-concept measure *Dimensions of Self-Concept* (Form H) for college level students. There were several purposes for the current study. The first

purpose was to investigate the construct or factorial validity of the DOSC (Form H) for college students, the second purpose was to examine the concurrent validity of the DOSC (Form H) with self-reported cumulative grade point average (GPA), the third purpose was to determine if there would be significant gender, racial, age, or academic classification group differences at the college level and, finally, the fourth purpose was to determine if the construct validity of the DOSC (Form H) generalizes across different groups, regardless of age, race, gender or academic classification.

The first purpose was to investigate the construct validity of the *Dimensions of Self-Concept* (Form H) for college students by examining its factor structure. Previous research has indicated support for a five-factor multidimensional measure of academic self-concept and three preliminary studies that specifically examined construct validity of the DOSC (Form H) scale utilized populations of community college students (Michael et al., 1984; Michael, et al., 1984; Michael et al., 1986-87). Thus, it was concluded that establishing construct validity utilizing a large undergraduate and graduate population from colleges and universities across the United States may contribute additional information regarding the construct validity of the DOSC (Form H). Based on this information, the following hypothesis was proposed:

Hypothesis 1: Construct validity of the *Dimensions of Self-Concept* (Form H) will be supported by finding five factors that will be congruent with the proposed five dimensions of the academic self-concept measure.

The second purpose was to examine the concurrent validity of the DOSC (Form H) with self-reported cumulative GPA. Several of the previous concurrent validity studies included populations of community college students or small samples from university students (Gottlieb & Rogers, 2002; Caracosta & Michael, 1986; Halote & Michael, 1984). Thus it was concluded that utilization of a large undergraduate and graduate population from colleges and universities across the United States would supplement the current literature. Additionally, preliminary support has been found for the Level of Aspiration and Leadership and Initiative dimensions of the DOSC (Form H) as valid predictors of academic performance (Halote & Michael, 1984; Caracosta & Michael, 1986; Gottlieb & Rogers, 2002). Halote and Michael (1984) and Caracosta and Michael (1986) operationalized academic success by collecting self-reported criteria (e.g. high school GPA, high school class rank, and grade expected to be earned in current college course); while Gottlieb and Rogers (2002) operationalized academic success by averaging grades earned from the core courses of an academic program. They all found support for Level of Aspiration as a valid predictor, and Gottlieb and Rogers (2002) found positive, yet weak, evidence of the Leadership and Initiative factor as a predictor of academic success. For the current study, self-reported cumulative GPA was used as the criterion variable. Based on this previous research, the following hypotheses and research questions were developed:

Hypothesis 2: The Level of Aspiration dimension will demonstrate a significant relationship with self-reported, cumulative college GPA's.

Hypothesis 3: The Leadership and Initiative dimension will demonstrate a significant relationship with self-reported, cumulative college GPA's.

Research Question 1: Will the Anxiety dimension be significantly correlated with self-reported, cumulative college GPA's?

Research Question 2: Will the Academic Interest and Satisfaction dimension be significantly correlated with self-reported, cumulative college GPA's?

Research Question 3: Will the Identification versus Alienation dimension be significantly correlated with self-reported, cumulative college GPA's?

The third purpose was to determine if there would be significant gender, racial, age, or academic classification group differences in academic self-concept. Research was conducted on the DOSC Forms E and S to determine if there were group differences across gender and ethnic groups (Michael et al., 1980; Omizo et al., 1981). Overall, the researchers found no variance across ethnic groups (Michael et al., 1980). There were few differences found between male and female scores on the DOSC (Form S), mainly that males had higher Level of Aspiration scores and lower Anxiety scores than did females (Omizo et al., 1981). These studies looked into gender and ethnic group differences of elementary and high school students, but there has been no published research at the college level (Michael et al., 1980; Omizo et al., 1981). To add to the current literature on group differences at the college level DOSC (Form H), the following research question was proposed:



Research Question 4: Will there be significant gender, racial, age, or academic classification group differences at the college level on the DOSC (Form H) measure?

Finally, the fourth purpose of this study was to determine if the construct validity of the DOSC (Form H) generalizes across different groups, more specifically, will the factor structure remain the same across various groups. There has been no previous research investigating the generalizability of the factor structure of the DOSC (Form H). It is important to determine that there is consistent construct validity of the DOSC (Form H) regardless of the age, race, gender or academic classification of the end-user. Evidence of generalizable construct validity would assist to ensure there are no adverse impacts on minority groups that are administered the DOSC (Form H). One practical application of the DOSC (Form H) could be to assist college admissions decisions, the idea being that students high in academic self-concept will be successful college students. If the underlying factor structure did not remain consistent across various ethnic groups, it could unfairly impact a students' opportunity to be admitted into the school of their choice. The current study hopes to begin an investigation into the generalizability of this measure.

Research Question 5: Will the construct validity of the DOSC (Form H) generalize across groups, regardless of age, race, gender and academic classification?

## Section II: Method

### *Participants*

The participants for this study were 429 undergraduate and graduate students enrolled in a college or university in the United States who volunteered to participate in the study. Participants had at least sophomore status so that a cumulative GPA was available from completing at least one year of academic work. Participants volunteered to participate in the study through a variety of outlets. Students were recruited from an introductory psychology course at a large southeastern university; these students received credit towards a course research requirement for their participation. All other students were recruited via email and participated by clicking the link to the online survey.

### *Procedure*

Introductory psychology students signed up for the experiment via a university experiment sign-up website. All other students took the survey via a link provided in an email requesting their participation. Upon entering the online survey, participants were presented with the informed consent form necessary for participation in the study (see Appendix A); and they completed the demographics questionnaire (see Appendix B). Before beginning the DOSC (Form H), all participants were required to read and accept an instructional screen. The instructional screen indicated there were no correct or incorrect answers and that they should respond as honestly as possible to the statements. In addition, they were asked to select the one response that most accurately described their attitudes,

feelings, or opinions about the given statements. Finally, they were informed that their responses to the DOSC (Form H) and the demographics questionnaire would be anonymous.

### *Measures*

*Dimensions of Self-Concept Form H.* This self-report instrument required between 25 and 45 minutes to complete. The five response options, *never*, *seldom*, *about half the time*, *very often*, and *always* were measured using a Likert-type scale and assigned weights of 1, 2, 3, 4, and 5, respectively, in terms of the amount of agreement the respondent indicated for each item. The range on each of the five factor subscales falls between a minimum of 16 and a maximum of 80 because each dimension contains 16 items. Thus, the higher the score obtained on any dimension the greater the degree of possession of the hypothesized construct associated with that dimension.

*Demographic items.* Several demographic items were included on the survey (see Appendix A). Specifically, information concerning age, gender, ethnicity, grade classification, and cumulative GPA was collected.

### *Analyses*

To test Hypothesis 1, a confirmatory factor analysis (CFA) was conducted. Mplus® (Muthen & Muthen, 1989) was used to determine if a five-factor multidimensional structure was supported for academic self-concept. Hu and Bentler (1999), Millsap (2002), and Vandenburg and Lance (2000) have developed criteria to determine model fit assessments. First, a ratio of chi-square to degrees of freedom ( $\chi^2/\text{df}$ ) was derived. For this fit test, ratios less than 2.0 indicate a good fit. In addition, two other relative indices, the comparative fit

index (CFI) and the Tucker and Lewis index (TLI) were used to investigate model fit (Tanaka, 1987; Tucker & Lewis, 1973). For these indices, good fit was indicated by coefficients closer to one and acceptable fit was indicated by the index being greater than 0.90 (Marsh, Balla, & McDonald, 1988). The final assessment of model fit used was the root mean square error of approximation (RMSEA). When the RMSEA was less than 0.05, the model fit well, when values ranged from 0.05 to 0.08, the model fit moderately well, and when values exceeded 0.08, the model fit relatively poorly (Browne & Cudeck, 1993).

To test Hypotheses 2 and 3 and Research Questions 1-3, Pearson Product Moment Correlation Coefficients were computed between each of the five academic self-concept dimensions and the self-reported cumulative college GPA. Factor scores were calculated for each subscale and these scores were used to run the correlation coefficients.

Research Question 4 was analyzed by conducting an analysis of variance (ANOVA) for each dependent variable. An ANOVA was used to compare group means to determine if there were differences among groups. To run the ANOVAs, each dependent variable, gender, race, age, and classification was dichotomized. The two groups for gender were male and female. The two groups for race were whites and non-whites (or minorities). Age was dichotomized two ways: age median and age mean. First, the two groups for age median were those above 21 years of age, and those below 21 years of age. Secondly, the two groups for age mean were those above 23 years of age and those below 23 years of age. Classification was also dichotomized two ways: logically and evenly grouped. The logically grouped analysis grouped juniors, sophomores and seniors together, while the graduate

students were grouped together. This makes logical sense because one would assume undergraduate students would have more similar or shared academic self-concepts, while graduate students would have more in common in comparison. The evenly grouped analysis simply divided the sample in half with a younger group consisting of sophomores and juniors and an older group consisting of seniors and graduate students. The independent variables for all ANOVAs were the five reported dimensions of the DOSC (Form H)

Finally, to test Research Question 5 simultaneous multi-group factor analyses were conducted to analyze measurement equivalence. Vandenberg and Lance (2000) created a sequence of four recommended steps to test factor structure. The first step is an overall test of covariance matrices which, for the current study, was achieved through Hypothesis 1, the confirmatory factor analysis to determine the factor structure of the DOSC (Form H). If support is found for the five-factor model of the DOSC (Form H), then Vandenberg and Lance would recommend moving on to the second step of their sequence, the test of same factor structure. This is the goal of Research Question 5, to determine if the factor structure is generalizable regardless of age, race, gender or academic classification. Again, if support is found for this second step, then Vandenberg and Lance (2000) recommend continuing with the remaining steps of their sequence. Third, they recommend a test of equal factor loadings, and fourth, they recommend a test of equal item intercepts. For the purposes of the current study, only steps one and two of this recommended sequence were investigated.

Similar to the CFA, Mplus® (Muthen & Muthen, 1989) was used to determine if the construct validity of the DOSC (Form H) would generalize across different groups,

regardless of age, race, gender or academic classification. A multi-group factor analysis was completed for each group (the same groups utilized in the ANOVA were used here): gender, race, age median, age mean, classification logically grouped, and classification evenly grouped. As mentioned previously, the same goodness of fit indexes were utilized here to determine model fit: a ratio of chi-square to degrees of freedom ( $\chi^2/df$ ), the comparative fit index (CFI), the Tucker and Lewis index (TLI), and the root mean square error of approximation (RMSEA).

### Section III: Results

Tables 1-5 display the factor loadings and standard errors produced by the DOSC (Form H) CFA. In answer to H1, that support for construct validity of the Dimensions of Self- Concept (Form H) would be demonstrated by finding five interpretable empirical factors congruent with the proposed five dimensions of the academic self-concept measure, this model,  $\chi^2 (3070, N = 429) = 7584.80, p = .00$ , did not produce adequate fit ( $\chi^2/df = 2.59$ , CFI = .71, TLI = .70, RMSEA = .06). Hall, Snell & Foust (1999) suggested that item parceling can be used to improve overall model fit and reduce the ratio of items per factors. Therefore, items were parceled in an attempt to assist a better model fit. In the original confirmatory factor analysis there were sixteen items per factor, since this number is high for a CFA, it was determined that parceling the items that were most highly correlated with each other may improve the results of the CFA and produce a better model fit. The correlation matrices for each factor can be found in Tables 6-10.

A second CFA that included the eight revised items per factor was tested. This analysis,  $\chi^2 (730, N = 429) = 2725.18, p = .00$ , also did not produce adequate fit ( $\chi^2/df = 3.73$ , CFI = .78, TLI = .77, RMSEA = 0.08). Tables 11-15 display the factor loadings and standard errors produced by this revised factor analysis.

No additional analyses were completed to determine the correct model fit; therefore the results to H1 were inconclusive.

To address H2 and H3, that Level of Aspiration and Leadership and Initiative would be valid predictors of cumulative GPA, and RQ1, RQ2 and RQ3, which asked if the Anxiety, Academic Interest and Satisfaction, and Identification versus Alienation dimensions would have significant concurrent validity with cumulative college GPAs, the Pearson Product Moment Correlation Coefficients results indicated that Level of Aspiration ( $r = .39, p < .0001$ ), Leadership and Initiative ( $r = .40, p < .0001$ ), Academic Interest and Satisfaction ( $r = .36, p < .0001$ ), and Identification vs. Alienation ( $r = .26, p < .0001$ ) had significant positive relationships with self-reported cumulative GPA, while Anxiety ( $r = -.27, p < .0001$ ) had a significant negative relationship with self-reported cumulative GPA.

To answer RQ 4, which asked if there would be significant gender, racial, age, or academic classification group differences at the college level on the DOSC (Form H) measure, an ANOVA was used to compare group means and determine if there were differences among groups. The group differences for all the dependent variables can be found in Tables 16-21. All ANOVAs were significant.

Because no additional tests were conducted to determine the correct model fit in the first step, the simultaneous multigroup factor analyses were not conducted. Without the correct model fit, conducting these analyses would have produced inconclusive results.

Based on this, to answer RQ5, which asked if the construct validity of the DOSC (Form H) would be generalize across groups regardless of age, race, gender, or academic classification, it was found that it was inconclusive.

#### Section IV: Discussion

This study attempted to add to the current literature examining the construct and concurrent validity of the academic self-concept measure, *Dimensions of Self-Concept* (Form H). By utilizing a sample of 429 undergraduate and graduate students from colleges and universities across the United States, this study sought to provide additional information unavailable in the past due to the use of community college populations or small undergraduate populations.

This investigation sought support for the construct validity of a five dimensional measure of academic self-concept. Based on previous research, I expected to find five empirical factors of the DOSC (Form H), but within the realm of analyses conducted in this study, the best model fit was not found. There could be a couple explanations; one being that perhaps the age of the test impacted results. This scale was first copyrighted in 1984 which was twenty-five years ago. Perhaps students, and their academic self-concepts, have changed in the past twenty-five years and the scale should be updated or changed to ensure it accurately measures academic self-concept as it is for today's current students. Another



explanation could be that the sample in the current study was too diverse in terms of location and age. Respondents attended schools across the United States and because undergraduate and graduate students participated the age range was quite dramatic as well. It is recommended to conduct a sample comparison in terms of geography and age to determine if these factors could have impacted the model fit in the current study.

Additionally, this study sought to provide confirming evidence that the Level of Aspiration and Leadership and Initiative dimensions would be good predictors of academic performance. This study also sought to find evidence to support the concurrent validity for the remaining three dimensions of the DOSC (Form H). Four factors exhibited significant positive relationships in terms of concurrent validity, and one factor, Anxiety, produced a significant negative relationship. These results were as expected, because logically, students high in Anxiety would not be expected to be high performers. This is especially interesting since the confirmatory factor analysis conducted did not yield adequate model fit, yet each factor showed a fairly strong relationship with cumulative GPA.

Finally, evidence was sought to support the DOSC (Form H)'s ability to measure dimensions of academic self-concept for all groups regardless of gender, age, race, or academic classification. All ANOVAs were significant; this is evidence that there are group differences in terms of academic self-concept across gender, race, age and academic classification. Socially speaking, this is not a desirable finding because in an academic

setting treating one demographic group differently based solely on their inclusion in that demographic group, could instigate discussions on adverse impact or even discrimination. One would hope that all groups would be generally equal or the same in terms of academic self-concept.

In terms of exploring whether the construct validity of the DOSC (Form H) generalizes across different groups, none of the simultaneous multi-group factor analyses were conducted. Because the original five-factor structure confirmatory factor analysis did produce adequate fit, and because further analyses was not conducted to determine the best model fit, it was impossible to complete the multi-group CFAs.

#### *Limitations and Future Research*

Administering the survey online may have had an adverse impact on the results. It is difficult to control the atmosphere and distraction factors when participants take the survey at their own convenience. However, to obtain a reasonably large sample size it was necessary to collect the data via the internet. Also, the use of self-reported cumulative GPAs could have impacted the integrity of the analysis, it would have been preferable to have actual cumulative GPAs as reported from the higher education institution. Because the sample population included students at colleges and universities nationwide, it was impossible to collect actual GPA's from the institutions directly; it was necessary to rely on students self-reported GPA to collect data for this study.

Furthermore, since several concurrent validity studies have been conducted it would have been useful to conduct a predictive validity study. While it is helpful to understand the relationship between the DOSC (Form H) and college GPAs earned, it would add a lot of insight to conduct a predictive validity study which could provide more tangible proof of the relationship between academic self-concept and academic performance. A comparison between a predicted GPA and actual GPA earned is recommended for future research. Finally, to reiterate limitations discussed above, the age of the test and the diversity of the sample (in terms of age and region) may have impacted the results as well.

It is recommended that future studies limit the breadth and scope of hypotheses and research questions. It is recommended to first determine the factorial validity of the DOSC (Form H). Because academic self-concept of students is not a static characteristic perhaps there are no longer five empirical factors. Additional research may show that perhaps there are two, three, or four factors instead of five. Once the factorial structure is determined and supported, the concurrent and predictive validity should be studied. Again, as mentioned above, it is also recommended that several samples be collected nationwide, with both undergraduate and graduate populations to determine how the DOCS (Form H) performs with the varying demographic groups. With this information it could be determined whether the measure is generalizable across groups.

It is also recommended that future studies examine the *Dimensions of Self-Concept* (Form W) for the work-place. It would be interesting for Industrial-Organizational

psychologists to conduct further examination of the relationship between self-concept and professional success.

### Section V: Conclusion

In conclusion, even though the confirmatory factor analyses completed in this study did not produce adequate model fit, as had been expected, this study still presented some intriguing results; for example, that each of the five proposed factors had a significant relationship with the self-reported cumulative grade point average. This shows that that DOSC (Form H) does have some degree of concurrent validity and could be considered in an academic setting to help aid educators in the academic success of their students by examining their academic self-concept.

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## APPENDICES

## Appendix A

### INFORMED CONSENT FORM for RESEARCH

Title of Study: The Factorial and Concurrent Validity of the Dimensions of Self-Concept Measure (Form H)

Principal Investigator: Nichole Ayers

Faculty Sponsor: Dr. Joan J. Michael

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You are invited to participate in a research study. The purpose of this study is to determine the factorial and concurrent validity of the Dimensions of Self-Concept Scale (Form H).

#### **INFORMATION**

If you agree to participate in this study, you will be asked to complete a short demographics form and then complete the Dimensions of Self Concept (Form H) scale. The experiment should take approximately 30-50 minutes to complete.

#### **RISKS**

There are no feasible risks in this study.

#### **BENEFITS**

This research will provide information regarding the factorial and concurrent validity of the Dimensions of Self-Concept (Form H) scale, which could then be used to help improve academic performance of college students.

#### **CONFIDENTIALITY**

The information in the study records will be kept strictly confidential. Data will be stored securely and will be made available only to persons conducting the study unless you specifically give permission in writing to do otherwise. No reference will be made in oral or written reports which could link you to the study.

#### **COMPENSATION**

For NCSU PSY 200 Students only: for participating in this study you will receive 2 credits. Other ways to earn the same amount of credit are to write a research paper on a topic within the field of study. If you withdraw from the study prior to its completion, you will receive 2 credits.

#### **CONTACT**

If you have questions at any time about the study or the procedures, you may contact the researcher, Nichole Ayers, at nichole.ayers@gmail.com, or [919-696-7402]. If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton,

Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514), or Joe Rabiega, IRB Coordinator, Box 7514, NCSU Campus (919/515-7515).

**PARTICIPATION**

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed.

**CONSENT**

I have read and understand the above information. I have received a copy of this form. I agree to participate in this study.

**Subject's signature**\_\_\_\_\_ **Date** \_\_\_\_\_

**Investigator's signature**\_\_\_\_\_ **Date** \_\_\_\_\_

## Appendix B

## Demographics Questionnaire

*Please check the response that corresponds to your answer to the following questions.*

1. What is your gender?

☐ Female

☐ Male

2. What is your classification (according to credit hours earned)?

☐ Freshman,

☐ Sophomore

☐ Junior

☐ Senior

☐ Graduate Student

☐ Other

3. What is your ethnicity?

☐ African American

☐ Asian American

☐ Caucasian

☐ Hispanic

☐ Native American

☐ Other

4. How old are you?

\_\_\_\_\_ years

5. What is your major? \_\_\_\_\_

6. What is your Cumulative Grade Point Average (GPA)? Please report your GPA on a 4.00 scale. \_\_\_\_\_

Table 1

*DOSC (Form H) Academic Interest and Satisfaction Factor Loadings*

Item	$\lambda$	S.E.
Academic Interest and Satisfaction 1	0.56**	0.04
Academic Interest and Satisfaction 2	0.67**	0.04
Academic Interest and Satisfaction 3	0.47**	0.06
Academic Interest and Satisfaction 4	0.69**	0.05
Academic Interest and Satisfaction 5	0.55**	0.04
Academic Interest and Satisfaction 6	0.50**	0.04
Academic Interest and Satisfaction 7	0.61**	0.04
Academic Interest and Satisfaction 8	0.64**	0.04
Academic Interest and Satisfaction 9	0.29**	0.05
Academic Interest and Satisfaction 10	0.44**	0.05
Academic Interest and Satisfaction 11	0.73**	0.05
Academic Interest and Satisfaction 12	0.58**	0.04
Academic Interest and Satisfaction 13	0.61**	0.04
Academic Interest and Satisfaction 14	0.64**	0.05
Academic Interest and Satisfaction 15	0.63**	0.04
Academic Interest and Satisfaction 16	0.61**	0.05

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 2

*DOSC (Form H) Anxiety Factor Loadings*

Item	$\lambda$	S.E.
Anxiety 1	0.53**	0.05
Anxiety 2	0.54**	0.05
Anxiety 3	0.42**	0.04
Anxiety 4	0.61**	0.05
Anxiety 5	0.62**	0.04
Anxiety 6	0.79**	0.05
Anxiety 7	0.65**	0.04
Anxiety 8	0.70**	0.06
Anxiety 9	0.80**	0.05
Anxiety 10	0.90**	0.06
Anxiety 11	0.67**	0.05
Anxiety 12	0.84**	0.05
Anxiety 13	0.44**	0.04
Anxiety 14	0.68**	0.05
Anxiety 15	0.86**	0.05
Anxiety 16	0.72**	0.05

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$



Table 3

*DOSC (Form H) Aspiration Factor Loadings*

Item	$\lambda$	S.E.
Aspiration 1	0.67**	0.04
Aspiration 2	0.44**	0.03
Aspiration 3	0.57**	0.04
Aspiration 4	0.47**	0.05
Aspiration 5	0.58**	0.04
Aspiration 6	0.71**	0.05
Aspiration 7	0.61**	0.04
Aspiration 8	0.80**	0.05
Aspiration 9	0.57**	0.05
Aspiration 10	0.46**	0.05
Aspiration 11	0.67**	0.04
Aspiration 12	0.80**	0.04
Aspiration 13	0.77**	0.05
Aspiration 14	0.36**	0.05
Aspiration 15	0.54**	0.05
Aspiration 16	0.44**	0.05

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 4

*DOSC (Form H) Identification vs. Alienation Factor Loadings*

Item	$\lambda$	S.E.
Identification vs. Alienation 1	0.43**	0.03
Identification vs. Alienation 2	0.35**	0.03
Identification vs. Alienation 3	0.37**	0.04
Identification vs. Alienation 4	0.42**	0.03
Identification vs. Alienation 5	0.50**	0.03
Identification vs. Alienation 6	0.50**	0.04
Identification vs. Alienation 7	0.37**	0.03
Identification vs. Alienation 8	0.43**	0.03
Identification vs. Alienation 9	0.45**	0.04
Identification vs. Alienation 10	0.47**	0.04
Identification vs. Alienation 11	0.36**	0.04
Identification vs. Alienation 12	0.51**	0.04
Identification vs. Alienation 13	0.50**	0.03
Identification vs. Alienation 14	0.32**	0.06
Identification vs. Alienation 15	0.32**	0.03
Identification vs. Alienation 16	0.39**	0.04

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 5

*DOSC (Form H) Leadership and Initiative Factor Loadings*

Item	$\lambda$	S.E.
Leadership and Initiative 1	0.60**	0.05
Leadership and Initiative 2	0.73**	0.05
Leadership and Initiative 3	0.40**	0.04
Leadership and Initiative 4	0.40**	0.05
Leadership and Initiative 5	0.77**	0.06
Leadership and Initiative 6	0.57**	0.04
Leadership and Initiative 7	0.69**	0.05
Leadership and Initiative 8	0.51**	0.04
Leadership and Initiative 9	0.64**	0.05
Leadership and Initiative 10	0.34**	0.03
Leadership and Initiative 11	0.37**	0.06
Leadership and Initiative 12	0.64**	0.05
Leadership and Initiative 13	0.82**	0.06
Leadership and Initiative 14	0.50**	0.05
Leadership and Initiative 15	0.59**	0.05
Leadership and Initiative 16	0.66**	0.05

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 6

*DOSC (Form H) Academic Interest and Satisfaction Item Correlations*

Item												
ACA1	1.00											
ACA2	0.45**											
ACA3	0.27**	0.27**										
ACA4	0.42**	0.41**	0.30**									
ACA5	0.31**	0.37**	0.23**	0.45**								
ACA6	0.45**	0.42**	0.18**	0.31**	0.34**							
ACA7	0.41**	0.40**	0.28**	0.49**	0.32**	0.22**						
ACA8	0.57**	0.54**	0.28**	0.47**	0.40**	0.47**	0.47**					
ACA9	0.17**	0.19**	0.10*	0.08	0.23**	0.26**	0.12*	0.20**				
ACA10	0.29**	0.25**	0.16**	0.20**	0.22**	0.34**	0.21**	0.32**	0.11*			
ACA11	0.37**	0.41**	0.33**	0.49**	0.41**	0.27**	0.49**	0.40**	0.11*	0.23**		
ACA12	0.38**	0.34**	0.23**	0.49**	0.46**	0.29**	0.42**	0.45**	0.15**	0.19**	0.40**	
ACA13	0.43**	0.48**	0.23**	0.44**	0.37**	0.44**	0.38**	0.55**	0.25**	0.31**	0.29**	0.39**

Table 6 (continued).

Item												
ACA14	0.36**	0.42**	0.19**	0.39**	0.31**	0.32**	0.43**	0.44**	0.22**	0.25**	0.37**	0.32**
	0.48**											
ACA15	0.39**	0.41**	0.21**	0.42**	0.32**	0.32**	0.52**	0.46**	0.21**	0.29**	0.42**	0.39**
	0.43**	0.49**										
ACA16	0.35**	0.34**	0.43**	0.46**	0.30**	0.18**	0.43**	0.33**	0.08	0.12**	0.49**	0.38**
	0.36**	0.37**	0.36**									

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 7

*DOSC (Form H) Anxiety Item Correlations*

Item												
ANX1	1.00											
ANX2	0.18**											
ANX3	0.14**	0.42**										
ANX4	0.22**	0.50**	0.43**									
ANX5	0.32**	0.28**	0.32**	0.35**								
ANX6	0.51**	0.16**	0.17**	0.26**	0.53**							
ANX7	0.31**	0.27**	0.33**	0.29**	0.54**	0.55**						
ANX8	0.29**	0.33**	0.31**	0.26**	0.27**	0.32**	0.34**					
ANX9	0.50**	0.21**	0.19**	0.27**	0.42**	0.58**	0.47**	0.39**				
ANX10	0.46**	0.24**	0.28**	0.34**	0.43**	0.54**	0.49**	0.47**	0.69**			
ANX11	0.21**	0.52**	0.45**	0.63**	0.43**	0.31**	0.37**	0.32**	0.31**	0.39**		
ANX12	0.40**	0.22**	0.26**	0.31**	0.50**	0.55**	0.53**	0.33**	0.52**	0.54**	0.40**	
ANX13	0.18**	0.21**	0.37**	0.30**	0.44**	0.33**	0.54**	0.26**	0.34**	0.41**	0.36**	0.49**

Table 7 (continued).

[illegible]

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 8

*DOSC (Form H) Aspiration Item Correlations*

Item												
ASP1	1.00											
ASP2	0.49**											
ASP3	0.41**	0.45**										
ASP4	0.25**	0.29**	0.28**									
ASP5	0.52**	0.55**	0.43**	0.33**								
ASP6	0.47**	0.34**	0.31**	0.21**	0.47**							
ASP7	0.40**	0.38**	0.33**	0.26**	0.43**	0.43**						
ASP8	0.46**	0.36**	0.39**	0.24**	0.42**	0.45**	0.48**					
ASP9	0.34**	0.33**	0.38**	0.30**	0.36**	0.33**	0.33**	0.33**				
ASP10	0.24**	0.23**	0.28**	0.32**	0.25**	0.28**	0.35**	0.34**	0.22**			
ASP11	0.56**	0.54**	0.46**	0.34**	0.56**	0.50**	0.50**	0.54**	0.43**	0.41**		
ASP12	0.64**	0.53**	0.39**	0.25**	0.56**	0.58**	0.49**	0.52**	0.39**	0.23**	0.62**	
ASP13	0.49**	0.33**	0.35**	0.22**	0.38**	0.55**	0.46**	0.55**	0.33**	0.26**	0.49**	0.66**



Table 8 (continued).

Item												
ASP14	0.11*	0.26**	0.20**	0.22**	0.22**	0.18**	0.26**	0.21**	0.21**	0.35**	0.30**	0.20**
	0.20**											
ASP15	0.29**	0.35**	0.36**	0.23**	0.35**	0.27**	0.31**	0.33**	0.47**	0.28**	0.43**	0.37**
	0.28**	0.45**										
ASP16	0.27**	0.26**	0.24**	0.31**	0.28**	0.27**	0.36**	0.20**	0.30**	0.27**	0.37**	0.29**
	0.28**	0.17**	0.31**									

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 9

*DOSC (Form H) Identification vs. Alienation Item Correlations*

Item												
IDN1	1.00											
IDN2	0.37**											
IDN3	0.36**	0.26**										
IDN4	0.35**	0.28**	0.33**									
IDN5	0.41**	0.34**	0.31**	0.36**								
IDN6	0.34**	0.30**	0.28**	0.42**	0.33**							
IDN7	0.32**	0.28**	0.26**	0.47**	0.27**	0.41**						
IDN8	0.44**	0.24**	0.32**	0.34**	0.48**	0.32**	0.38**					
IDN9	0.35**	0.28**	0.30**	0.28**	0.36**	0.32**	0.28**	0.35**				
IDN10	0.27**	0.31**	0.21**	0.23**	0.40**	0.32**	0.22**	0.35**	0.37**			
IDN11	0.16**	0.24**	0.25**	0.31**	0.31**	0.29**	0.30**	0.23**	0.29**	0.14**		
IDN12	0.36**	0.24**	0.27**	0.24**	0.38**	0.39**	0.19**	0.36**	0.34**	0.44**	0.21**	
IDN13	0.53**	0.36**	0.40**	0.42**	0.41**	0.46**	0.45**	0.52**	0.37**	0.29**	0.32**	0.35**

Table 9 (continued).

[illegible]

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 10

*DOSC (Form H) Leadership and Initiative Item Correlations*

Item												
LEA1	1.00											
LEA2	0.59**											
LEA3	0.19**	0.26**										
LEA4	0.24**	0.19**	0.18**									
LEA5	0.38**	0.51**	0.21**	0.18**								
LEA6	0.29**	0.36**	0.47**	0.24**	0.31**							
LEA7	0.42**	0.47**	0.23**	0.27**	0.49**	0.27**						
LEA8	0.34**	0.41**	0.34**	0.13**	0.34**	0.43**	0.28**					
LEA9	0.33**	0.40**	0.40**	0.20**	0.44**	0.42**	0.51**	0.39**				
LEA10	0.34**	0.32**	0.29**	0.21**	0.28**	0.26**	0.33**	0.28**	0.44**			
LEA11	0.15**	0.21**	0.23**	0.09	0.09**	0.15**	0.12*	0.29**	0.21**	0.24**		
LEA12	0.29**	0.33**	0.40**	0.25**	0.30**	0.35**	0.31**	0.50**	0.43**	0.27**	0.28**	
LEA13	0.33**	0.38**	0.21**	0.27**	0.45**	0.39**	0.41**	0.40**	0.36**	0.18**	0.14**	0.45**

Table 10 (continued).

Item												
LEA14	0.28**	0.32**	0.19**	0.21**	0.28**	0.25**	0.34**	0.24**	0.23**	0.17**	0.34**	0.23**
	0.31**											
LEA15	0.36**	0.42**	0.28**	0.15**	0.28**	0.33**	0.29**	0.31**	0.34**	0.22**	0.08	0.27**
	0.37**	0.21**										
LEA16	0.35**	0.40**	0.36**	0.20**	0.32**	0.53**	0.29**	0.57**	0.42**	0.31**	0.19**	0.44**
	0.41**	0.30**	0.38**									

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 11

*DOSC (Form H) Academic Interest and Satisfaction Parceled Item Factor Loadings*

Item	$\lambda$	S.E.
Academic Interest and Satisfaction 1	1.19**	0.06
Academic Interest and Satisfaction 2	1.20**	0.07
Academic Interest and Satisfaction 3	1.29**	0.09
Academic Interest and Satisfaction 4	1.23**	0.08
Academic Interest and Satisfaction 5	1.24**	0.07
Academic Interest and Satisfaction 6	1.20**	0.07
Academic Interest and Satisfaction 7	0.85**	0.07
Academic Interest and Satisfaction 8	0.91**	0.08

*Note.* \* $p < 0.05$ , \*\* $p < 0.01$

Table 12

*DOSC (Form H) Anxiety Parceled Item Factor Loadings*

Item	$\lambda$	S.E.
Anxiety 1	1.25**	0.09
Anxiety 2	1.72**	0.10
Anxiety 3	1.08**	0.09
Anxiety 4	1.69**	0.09
Anxiety 5	1.11**	0.07
Anxiety 6	1.50**	0.08
Anxiety 7	0.94**	0.07
Anxiety 8	1.26**	0.09

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 13

*DOSC (Form H) Aspiration Parceled Item Factor Loadings*

Item	$\lambda$	S.E.
Aspiration 1	1.52**	0.08
Aspiration 2	1.25**	0.06
Aspiration 3	1.11**	0.06
Aspiration 4	1.40**	0.08
Aspiration 5	1.09**	0.08
Aspiration 6	0.82**	0.08
Aspiration 7	0.90**	0.08
Aspiration 8	1.31**	0.07

*Note.* \* $p < 0.05$ , \*\* $p < 0.01$



Table 14

*DOSC (Form H) Identification vs. Alienation Parceled Item Factor Loadings*

Item	$\lambda$	S.E.
Identification vs. Alienation 1	0.91**	0.05
Identification vs. Alienation 2	0.87**	0.05
Identification vs. Alienation 3	0.76**	0.06
Identification vs. Alienation 4	0.98**	0.07
Identification vs. Alienation 5	0.83**	0.06
Identification vs. Alienation 6	0.81**	0.05
Identification vs. Alienation 7	0.73**	0.05
Identification vs. Alienation 8	0.68**	0.07

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 15

*DOSC (Form H) Leadership and Initiative Parceled Item Factor Loadings*

Item	$\lambda$	S.E.
Leadership and Initiative 1	1.30**	0.08
Leadership and Initiative 2	1.12**	0.07
Leadership and Initiative 3	1.31**	0.08
Leadership and Initiative 4	0.94**	0.07
Leadership and Initiative 5	1.47**	0.09
Leadership and Initiative 6	0.85**	0.09
Leadership and Initiative 7	1.36**	0.09
Leadership and Initiative 8	0.75**	0.07

*Note.* \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 16

*ANOVA Gender Results*

Item	F	df	$\eta^2$
Academic Interest and Satisfaction	9.21**	1, 427	0.02
Aspiration	27.49**	1, 427	0.06
Anxiety	3.65*	1, 427	0.01
Identification vs. Alienation	7.28**	1, 427	0.02
Leadership and Initiative	4.42*	1, 427	0.01

*Note.* \* $p < .05$ , \*\* $p < .01$ .

Table 17

*ANOVA Race Results*

Item	F	df	$\eta^2$
Academic Interest and Satisfaction	5.79*	1, 427	0.01
Aspiration	2.83*	1, 427	0.01
Anxiety	0.03	1, 427	0.00
Identification vs. Alienation	0.61	1, 427	0.00
Leadership and Initiative	5.19*	1, 427	0.01

*Note.* \* $p < .05$ , \*\* $p < .01$ .

Table 18

*ANOVA Age Median Results*

Item	F	df	$\eta^2$
Academic Interest and Satisfaction	27.54**	1, 427	0.06
Aspiration	3.76*	1, 427	0.01
Anxiety	44.21**	1, 427	0.09
Identification vs. Alienation	9.19*	1, 427	0.02
Leadership and Initiative	48.33**	1, 427	0.10

*Note.* \* $p < .05$ , \*\* $p < .01$ .

Table 19

*ANOVA Age Mean Results*

Item	F	df	$\eta^2$
Academic Interest and Satisfaction	47.95**	1, 427	0.10
Aspiration	15.00**	1, 427	0.03
Anxiety	40.86**	1, 427	0.03
Identification vs. Alienation	23.56**	1, 427	0.05
Leadership and Initiative	58.80**	1, 427	0.12

*Note.* \* $p < .05$ , \*\* $p < .01$ .

Table 20

*ANOVA Classification Logically Grouped Results*

Item	F	df	$\eta^2$
Academic Interest and Satisfaction	51.28**	1, 427	0.11
Aspiration	12.90**	1, 427	0.03
Anxiety	54.30**	1, 427	0.11
Identification vs. Alienation	25.95**	1, 427	0.06
Leadership and Initiative	72.12**	1, 427	0.14

*Note.* N=429. \* $p < .05$ , \*\* $p < .01$ .

Table 21

*ANOVA Classification Evenly Grouped Results*

Item	F	df	$\eta^2$
Academic Interest and Satisfaction	23.62**	1, 427	0.05
Aspiration	2.73	1, 427	0.01
Anxiety	38.69**	1, 427	0.08
Identification vs. Alienation	9.27**	1, 427	0.02
Leadership and Initiative	44.02**	1, 427	0.09

*Note.* \* $p < .05$ , \*\* $p < .01$ .