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# Development and Validation of the Contextual Achievement Motivation Measure

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ABSTRACT

This study investigated the factorial validity of the Contextual Achievement Motivation Measure, assessing achievement motivation in multiple settings with a sample of 493 undergraduate and graduate students. Exploratory factor analysis identified a four-factor model: School (6 items), Employment/Work (6 items), Family (5 items), Community (4 items). These factors accounted for approximately 60% of the variance and correlated in the expected directions with a criterion measure, the Adult Hope Scale. Confirmatory factor analysis indicated that the identified four-factor model fit the data, $\chi 2(182)= 348.10$, $p< .001$; $\chi 2/df = 1.91$, Tucker-Lewis index (TLI)= .92, comparison fit index (CFI)= .93, root mean square error of approximation (RMSEA) [.058, .080]= .069, and standardized root-mean square residual (SRMR)= .063. In addition, the scale showed partial scalar invariance between genders. The responses are subject to bias and increased the error in reliability and validity. Implications of the research, at a macro-level, draws attention to the importance of work; and one's performance within family, school and community settings.

Keywords:
Contextual achievement motivation scale, achievement motivation in multiple settings, factor analyses, measurement invariance

## 1. Inroduction

Research on achievement motivation has a long and distinguished history (Alschuler, 1971; Alschuler, 1973; Atkinson, 1957; Atkinson & Feather, 1966; Dweck, 2000; Eccles & Wigfield 1995; Eccles, Wigfield & Schiefele, 1998; Kolb, 1965; McClelland, Atkinson, Clark & Lowell, 1953; McClelland, 1961; McClelland, 1965; Singh, 2011; Smith, 2011; Smith, 2015; Smith & Troth 1975; Steinmayr & Spinath, 2009). A significant number of studies on achievement motivation include samples from business settings. Many of these studies consisting of managers and business professionals are published in The Achieving Society (McClelland, 1961). Research findings in The Achieving Society documents investigations covering twenty-three countries from 1929 to 1950. Findings supported the hypothesis of achievement motivation as a significant predictor of success within the business environment (McClelland, 1961). A lesser number of investigations on achievement motivation have taken place in the educational setting. These studies, often using small samples of public school or college students, have produced mixed results when assessing achievement motivation as a predictor of performance (Awan & Noureen, 2011; Bücker, Nuraydin, Simonsmeier, Schneider, & Luhmann 2018; Kolb, 1965; Lazowski & Hulleman, 2016; Singh, 2011; Smith & Troth, 1975). Extant studies on achievement motivation have been limited to business and educational settings. Perhaps there is a need to broaden the scope of research on achievement motivation by studying individuals performing work life roles in a variety of other settings (Aslan & Kirikkanat, 2013; Elliot & Fryer, 2008; Ogwa, 2018).

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A plethora of assessments are available that measure one's general level of achievement motivation (Byrne et al., 2004; Freund, Kuhn, & Holling, 2011; Hermans, 1970; Lang & Fries 2006; Man, Nygard, & Gjesme, 1994; Mandel, Friedland, & Marcus; 1996; Schuler & Prochaska, 2000; Smith, Karaman, Balkin, & Talwar, 2019; Smith, 2015; Smith, 1972). Measures assessing overall levels of achievement motivation often fail to adequately address context including sample, setting, and role of participants. This is considered relevant since a comprehensive reporting of context can allow for generalizability and transferability. For example, does one's level of achievement motivation at work, differ from involvement with family and community activities, or does one's level of achievement motivation remain constant across multiple settings? A further examination of this query led the researchers to question whether achievement motivation is constant across settings, or specific to context. The researchers posited that measuring achievement motivation in context was the first step to address these questions.

The significance of the life roles involving family, and community further support the argument for examining achievement motivation in multiple settings. Achievement motivation perhaps is as relevant when working within the family and community as it is in a business, university, or government agency. To argue otherwise, is to minimize specific life roles and perhaps devalue individuals working in settings as the family and community There is extant support for examining achievement motivation in multiple settings involving participants who are engaged in a variety of life roles (Aslan & Kirikkanat, 2013; Dahraei & Adlparvar, 2016; Elliot & Fryer, 2008; Heckhausen, 1967; Ogwa, 2018).

Background of Achievement Motivation and Methods of Measurement

McClelland and his colleagues (1953) defined achievement motivation as "a distinct human motive that involves striving for excellence and personal achievement" (p. 76). The Contextual Achievement Motivation Scale (CAMS) is based on research (Alschuler, 1971; Atkinson, 1957; McClelland, 1965; McClelland et al., 1953) of personality characteristics of high achieving individuals, including cognitive and behavioral patterns associated with one's drive to perform to a standard of excellence. For over three decades, McClelland and his associates researched the personality characteristics of high achieving individuals. Findings targeted a prototype of high achieving individuals who utilize a set of thoughts and behavior strategies when approaching a task or assignment. Research findings (Alschuler, 1971; Atkinson, 1957; McClelland, 1965; McClelland et al., 1953) support thoughts associated with high achievers.

The first thought associated with high achievers is Achievement Imagery (AI). It refers to thoughts of excellence, including competition with others, competition with self, unique accomplishments, and long-term involvement. The second thought is Need (N). Motivational thinking involves deeply wanting to achieve something. The third characteristic is Action (ACT)—thoughts about action needed to achieving excellence. Another thought of high achieving individuals is Hope of Success (HOS)—thinking of and expecting success before it is achieved. Fear of Failure (FOF) is the opposite of HOS and refers thinking about failing before it happens; worry thoughts. Two other important thoughts are related to feelings. Success Feelings (SF) is thinking about the good feelings after success and Failure Feelings (FF) is thinking about how it will feel after failure. High achievers think of obstacles including World Obstacles (WO) in the environment that could interfere with success and Personal Obstacles (PO) internal to an individual as procrastination, negative thinking, and desire to misuse substances. Help (H) refers to thinking about resources, human and technical, that can help achieve success.

In addition to thoughts that are often used by high achievers, four action strategies / behavior, patterns characterize high producing individuals (Alschuler, 1971; Atkinson, 1957; McClelland, 1965). The action strategies, updated and identified as behavior patterns (Smith, 2015) include:

1) Moderate Risk Taking (MRT)—High achieving individuals tend to take moderate risks. On occasion, it might seem as an individual is taking a high risk. However, in these circumstances it is likely a moderate risk is the result of research already completed. Therefore, the risk is mediated, as it has been carefully assessed. In addition, moderate risk-taking also involves setting goals that are challenging, rather than being unreasonably difficult or not demanding.

2) Use of Immediate Concrete Feedback to Modify Goals (ICF)—High achievers want and then utilize feedback. They desire immediate feedback or an assessment on how they are doing, and therefore seek situations that offer immediate concrete feedback.

3) Personal Responsibility (PR)—Individuals with a high need to achieve like to test how much they can personally accomplish. They like situations where they have a high degree of personal responsibility for their success or failures. They initiate activities in which they can assume personal responsibility.
4) Researching the Environment (RE)—Persons with high levels of achievement motivation are prepared before approaching new situations. They do their research ahead of time so they are confident and intentional. They size up situations, checking out the limits and possibilities—with the end in mind of accomplishing or moving toward a goal.

Thematic Appreciation Test

Researchers initially used the Thematic Appreciation Test (TAT; Murray, 1943) as a method to assess ones' level of achievement motivation. The Thematic Apperception Test, a projective instrument, elicited unconscious thoughts through oral and written expressions. The developers, Christiana Morgan and Henry Murray, believed that one's interpretation of ambiguous cues provided indications of personality, drives, and motivation. Adaptations of the TAT evolved, using of a wide range of picture images as a means to assess achievement thinking. Subjects responded to images by writing stories (Atkinson, 1957; Alsuhuler, 1971). The picture activity generated stories that were scored according to the number of achievement images. Subjects completed a narrative describing thoughts, emotions and behaviors of individuals in ambiguous pictures (for example, a child sitting in front of a violin). The stories were coded for achievement-related content including indicators of competition, accomplishments, and commitment to achieve. This technique, labeled as the Picture Story Exercise, (PSE), was used in a number of studies that examined the relationship of n-Ach and performance (Kaplan, Lichtinger, & Gorodetsky 2009).

Self-report Measures

Self-report, paper-pencil instruments measuring achievement motivation evolved as the result of dubious interpretations of projective and quasi-projective tests. The advantage of self-report measures included their ability to be employed in a group setting, and their efficiency of administration time and scoring. The Achievement Motivation Measure, (AMM), is an example of a recently developed psychometrically sound self-report measure that uses 13 items to assesses achievement thinking and behavior patterns, (Smith, et. al., 2019).

Contextual Achievement Motivation Measure

The Contextual Achievement Motivation Measure is an adaptation of two previous instruments, Achievement Motivation Inventory (AMI; Smith, 1972) and the AMM (Smith, et. al., 2019). The CAMM is a unique measure that assesses achievement motivation in multiple settings. The CAMM evolved due to an absence of instruments measuring achievement motivation in diverse life role-work environments. Expanding the scope of the AMM, the CAMM allows researchers the opportunity to investigate levels of achievement motivation across cultures and within several settings. The CAMM measures achievement motivation in context of school, work, family and community. Research questions explored in the study:

1. Are the CAMM scores valid and reliable?
2. Does the CAMM have factorial invariance across gender?

**Study 1: Initial Review of Items and Factor Structure**

The items used in this survey were derived from the Achievement Motivation Inventory, AMI (Smith, 1972). This inventory consisted of 57 items. Item selection was based on the Achievement Motivation Theory developed by McClelland and colleagues in 1948. McClelland (1961) described achievement motivation as a drive for success, evidenced by persistence and effort in the face of difficulties. Research by McClelland and colleagues identified characteristics; thinking and behavior patterns of high achieving individuals. Based on experts' feedback of items, and research team collaboration, it was decided to divide the AMI into two measures – The Achievement Motivation Measure (a general assessment of achievement motivation) and the

Contextual Achievement Motivation Measure (an assessment of achievement motivation in multiple settings). This decision was based on the following reasons (a) theoretical foundation of McClelland's theory and (b) practical use- both instruments can be used independently to assess different criteria of achievement motivation. This study investigated the factorial validity of the CAMM. Thirty-six items were retained. That supported the framework of McClelland's theory. An exploratory factor analysis (EFA) was conducted.

**Method**

**Participants and Procedure**

The Institution Review Board at the university approved this study. When validating an instrument developed a long time ago, it was important to check if the content was still relevant. Specifically for this instrument, evidence of test content included the examination of item wording and applicability to the present day. Since this instrument was meant for adults, it was administered to a group of 14 graduate students. The researchers discussed all items with the group, and upon agreement with fellow researchers, recommended changes. The process included removing dated examples, altering language, and changing double-barreled items. The items were also re-arranged and streamlined in terms of Achievement Motivation at School, Employment/Work, Family, and Community.

Three hundred and three graduate (n= 102) and undergraduate (n= 201) students participated in this study, including 124 males (41%) and 179 females (179%). The mean age of participants was 23.20 years (SD = 4.69; range, 18-59 years). Participants identified themselves as White or Caucasian (n = 136, 45%), Hispanic or Latino (n = 121, 40%), African American (n = 30, 10%), Asian American (n = 10, 3%), and others (n= 6, 2%).

**Measure**

Contextual Achievement Motivation Measure. The 36-item form of the CAMM was administered. Participants responded to the items using a 5-point scale (0= never----- 4=always), similar to the range that was used in the AMI (Smith, 1972). Thirty-six items were included, intending to measure achievement motivation in the school, employment/work, family, and community settings.

**Preliminary Analysis**

First, descriptive statistics and alpha coefficients were computed for the instrument (see Table 1). Next, the assumption of normality was examined using the cutoff critical values of 2.0 for skewness and 7.0 for kurtosis (Rodriguez, Flores, Flores, Myers, & Vriesema, 2015; West, Finch, & Curran, 1995). All of the items had skewness values less than 2.0 and kurtosis values less than 7.0. To determine if the data were appropriate for factor analysis, the Kaiser-Meyer-Olkin (KMO) was examined. The KMO value of .82 indicated that the data were appropriate for factor analysis.

Table 1
*Descriptive and Comparative Statistics for the CAMM Scale and Correlations for the CAMM and ATHS*

| | EFA Data Set ($n$= 303) | | | | CFA Data Set ($n$= 190) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 |
| School | * | .52* | .19* | .17* | * | .52* | .30* | .33* | .57* |
| Employment | | * | .18* | .26* | | * | .32* | .28* | .32* |
| Family | | | * | .24* | | | * | .27* | .21* |
| Community and Leisure | | | | * | | | | * | .28* |
| Hope | | | | | | | | | * |
| *M* | 2.84 | 3.04 | 1.98 | 1.49 | 2.81 | 3.12 | 2.16 | 1.47 | 53.22 |
| *SD* | .84 | .86 | 1.12 | 1.07 | .88 | .91 | 1.16 | 1.12 | 6.43 |
| $\alpha$ | .87 | .87 | .85 | .66 | .88 | .93 | .87 | .76 | .78 |

Note. *$p$< .01

**Results**

An EFA using principal axis factoring (PAF) with a direct oblimin rotation was conducted on the data. We used an oblique rotation method hypothesizing the relationship between the components of achievement motivation (Tabachnick & Fidell, 2013). Three rules were used to determine what factors were retained, Eigenvalues greater than 1, analysis of the scree plot, and an examination of pattern matrix. Four factors were retained and a corresponding number of scales were created accounting for approximately 60% of the variance in the model. The identification of the 4 factors was based on factor loadings of .40 or greater. Items that were cross-loaded and had loadings less than .40 were omitted. Of the 36 original items included on the CAMM, 15 items were removed reducing the final items to N= 21. The identified four-factor model is School (6 items; Eigenvalue=6.06, σ2= %29), Employment/Work (6 items; Eigenvalue=1.79, σ2= %8.50), Family (5 items; Eigenvalue=3.03, σ2= %14.50), Community (4 items; Eigenvalue=1.78, σ2= %8.50). Table 2 includes factor loadings of the retained items.

Table 2
*Instrument Items and Factor Loadings*

| | Scale Items | S | W | F | C |
|---|---|---|---|---|---|
| | **In school work, I am (was)** | | | | |
| 1. | An achiever | **.85** | | | |
| 2. | Productive | **.78** | | | |
| 3. | Ambitious | **.73** | | | |
| 4. | Competent | **.68** | | | |
| 5. | Thorough | **.76** | | | |
| 6. | Efficient | **.78** | | | |
| | **At My place(s) of employment I am (was)** | | | | |
| 7. | An achiever | | **.81** | | |
| 8. | Productive | | **.80** | | |
| 9. | Ambitious | | **.76** | | |
| 10. | Energetic | | **.75** | | |
| 11. | Thorough | | **.72** | | |
| 12. | Efficient | | **.74** | | |
| | **Answer each of the following questions how you really are, not how you would like to be** | | | | |
| 13. | Much of my spare time is well spent with my family. | | | **.72** | |
| 14. | Our family actively plays and works together. | | | **.85** | |
| 15. | Our family works as a unit so we can use our time effectively together. | | | **.87** | |
| 16. | As a family unit we carefully pre-plan our activities. | | | **.69** | |
| 17. | I think what is best for the family, discuss it, and then work toward that goal. | | | **.73** | |
| 18. | I intentionally set time aside so that I can help to develop efficient expenditure of community funds and provide the most effective community functions. | | | | **.76** |
| 19. | I play an active role in several community organizations. | | | | **.81** |
| 20. | I carefully plan recreational activities. | | | | **.60** |
| 21. | I take an active part in organizing and seeing that parties are entertaining. | | | | **.54** |

*Note*. Factor loadings >.40 are in boldface. S= School; W= Work; F= Family; C= Community. Item in bold indicate scale loading.

To establish further evidence, estimates of reliability for the normative sample were assessed using Cronbach's Alphas. The reliability estimates for the scores on the sub-scales were between moderate and strong: School (.87), Employment (.87), Family (.85), and Community (.79). Table 1 contains the descriptive

statistics, inter-correlations of the scores from the respective subscales, and results from reliability analysis of scores from each of the individual scales developed as the result of the factor analysis of the CAMS.

**Study 2: Confirmation of Factor Structure and Construct Validity**

In this part of the study, we administered the CAMM to a second group of participants. A confirmatory factor analysis (CFA) and correlational analyses were conducted to demonstrate evidence of internal structure and to confirm factor structure of CAMM (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014). In addition, we tested the configural, metric, and scalar equivalence of the instrument across men and women by using a multiple group CFA (MGCFA) and CFI difference test (ΔCFI).

Further analyses included the construct validity of the CAMMby examining its correlation with hope. We hypothesized that CAMM scores would be positively correlated with hope since previous studies showed the statistically significant relationship between achievement motivation and hope (Curry, Snyder, Cook, Ruby, & Rehm, 1997; Pang, Villacorta, Chin, & Morrison, 2009)

**Method**

**Participants**

Participants were 190-college freshman enrolled in a First-Year Seminar course in a Learning Communities Program at a regional, public four-year university in South Texas. The mean age of the participants was 18.81 years (SD = .93; range, 18-26 years). More female (n=109, 57.4%) than male (n=81, 42.6%) students participated. Participants identified as White or Caucasian (n=60, 31.6%), African American (n=19, 10%), Asian American (n=5, 1.1%), Hispanic or Latino (n=98, 51.6%), and other (n=8, 4.3%).

**Measures**

Achievement motivation. The 21-item measure, analyzed with the use of AMOS, was retained in Study 1, and was administered to measure achievement motivation.

**Hope.** The Adult Trait Hope Scale (ATHS; Snyder et al., 1991), which measures a person's level of hope based on goal-directed thinking, was used. The 12-item, self-report scale consists of two subscales: the Pathways subscale and the Agency subscale each comprised of 4 items with 4 remaining distracter items that are not scored. Pathways thinking reflect an individual's belief he or she can generate successful strategies to achieve his or her goals, and agency thinking indicates an individual's motivation to pursue his or her goals (Snyder et al., 1991).

Participants' responded to an 8-point Likert scale to indicate the degree an item best described them. Responses could range from 1 = "Definitely False" to 8 = "Definitely True." An overall score for hope is calculated by adding the scores on the two subscales, the Pathways subscale and the Agency subscale. Overall scores can range from 8 to 64, with higher scores representing higher levels of hope. Research finding support internal reliability of the ATHS with Cronbach's alphas ranging from .74 to .84 (Snyder et al., 1991). Additionally, Snyder et al. (1991) established test-retest reliability reporting correlations of .80 or higher at intervals of 10 weeks or more. For the current study Cronbach's alpha was .78.

**Preliminary Analysis**

First, descriptive statistics and correlations among instruments were computed for the instruments (see Table 1). Next, the assumption of normality was examined using the Kolmogorov-Smirnov test and was not met ($p < .01$). Upon analyzing the boxplots and skewness (-.79), the value was considered acceptable in order to prove normality (George & Mallery, 2010). We conducted a power analysis to identify a sample size for detecting model fit using Stevens' (2002) criteria, $n/p \geq 5$. Given our sample size of 190, we consider our sample size sufficient for making statistical inferences about model fit.

**Results**

Based on the results of the EFA, the researchers hypothesized that a four-factor model would be an appropriate fit with the data. We conducted a CFA including chi-square, chi-square and degree of freedom ratio ($\chi 2/df$ ), root-mean-square error of approximation (RMSEA), Tucker-Lewis index (TLI), comparative fit

index (CFI), and standardized root-mean square residual (SRMR) to examine the proposed four-factor model. When inspecting these values, we used standards in which an acceptable model fit is represented in values for the $\chi 2$ ($p > .05$), $\chi 2/df < 2.00$, TLI > .90, CFI > .90, SRMR< .08, and RMSEA< .08 [90% CI] (Dimitrov, 2012; Marsh, Hau, & Wen, 2004). Analyses were conducted using AMOS version 23. Reliability estimates in the normative sample were evaluated using Cronbach's alpha ($\alpha$) to assess internal consistency (see Table 1).

The initial model included four latent variables: School, Employment/Work, Family, and Community. The results showed that the $\chi 2$ was significant for the hypothesized model, $\chi 2(183)= 390.24$, $p< .05$; $\chi 2/df = 2.13$. The fit indices indicated an acceptable fit for the data, TLI= .90, CFI= .91, RMSEA= .077 (90% CI= .067- .088), and SRMR= .062. The authors reviewed modification indices (MIs) to reach a better model fit.

Modification indices suggested adding an error covariance between item 11 and item 12 to improve the model. After examining item 11 (i.e. At my place [s] of employment I am [was] through) and item 12 (i.e. At my place [s] of employment, I am [was] efficient), we determined that these two items were under the same latent variable (Employment) [see Figure 1] and measured similar constructs. After adding an error covariance between item 11 and 12, the model was rerun; $\chi 2(182)= 348.10$, $p< .001$; $\chi 2/df = 1.91$, TLI= .92, CFI= .93, RMSEA = .069 (90% CI= .058- .080), and SRMR= .063. The $\Delta\chi 2$ result indicated that the modified model improved dramatically, $\Delta\chi 2(1)= 42.14$, $p< .001$. Although, there were few additional modifications, we did not make additional changes since it would not result in significant changes in fit indices.

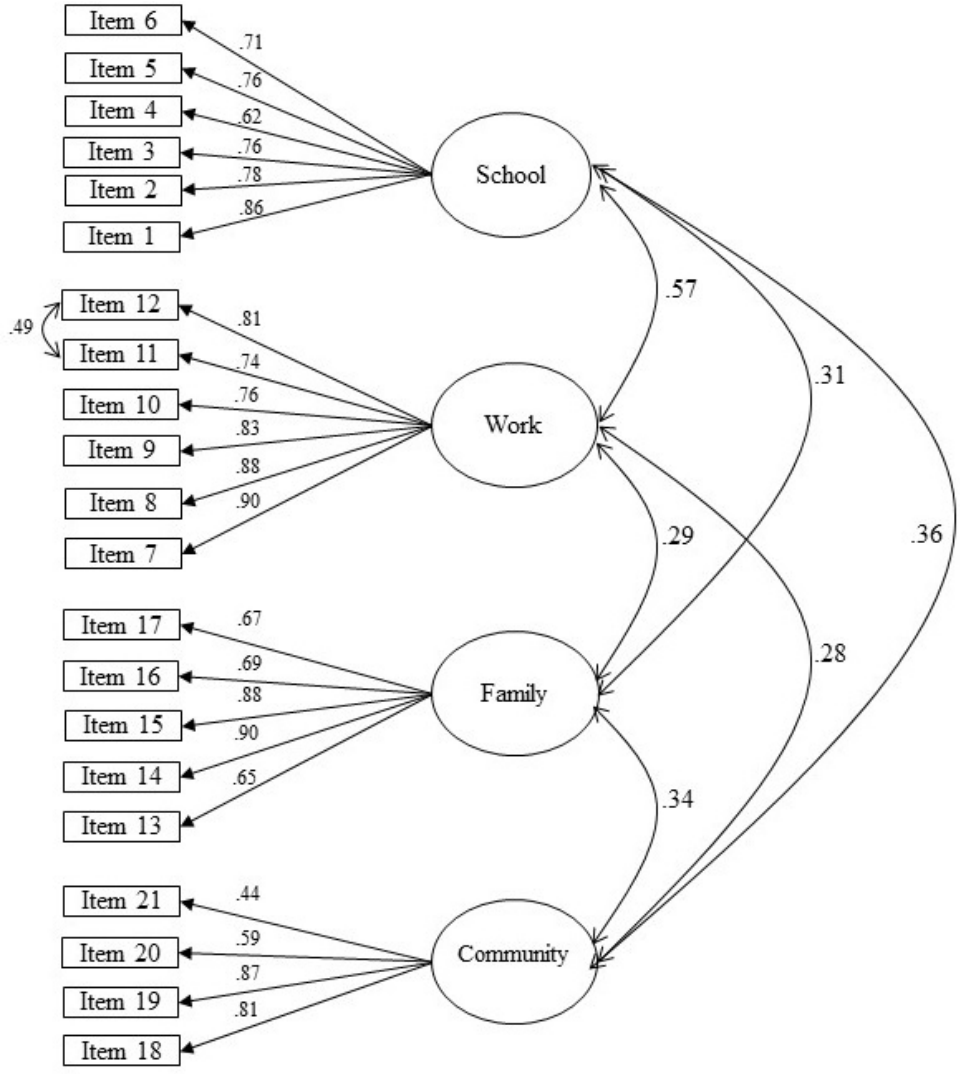


*Figure 1.* The final confirmatory factor analysis model of Contextual Achievement Motivation Measure (CAMM). The standardized parameter estimates for the CAMM are listed. Error covariance was added between Items 11 and 12. Rectangles indicate the 21 items on the CAMM, and ovals represent the 4 latent factors of subscales.

**Measurement Invariance**

In this step, we examined the measurement invariance of the four-factor model across gender. There are two commonly used methods, which are chi-square difference test ($\Delta\chi2$) and CFI difference test ($\Delta$CFI), well documented in the literature (e.g. Byrne, 2010; Dimitrov, 2010; Sulik et al., 2010) to testing for measurement invariance. Chi-square difference test is the classical approach testing the difference between the $\chi2$ values for the configural and other models (Byrne, 2010; Jöreskog, 1971). The $\Delta\chi2$ should not be statistically significant at a pre-specified alpha level (e.g., .05) across groups for measurement invariance. Over the past decades, it has been well-documented that $\chi2$ test is sensitive to sample size (Cheung & Rensvold, 2002; Dimitrov, 2010). Cheung and Rensvold (2002) recommended using the CFI difference since it was not affected by measurement accuracy in the overall model (Dimitrov, 2010). Cheung and Rensvold (2002) suggested using .010 cutoff score for $\Delta$CFI test. Taking into account our sample size of 190 in the Study 2, we decided to compare change in both $\chi2$ and CFIs.

We specified three models, configural model (factor loadings and intercepts vary between groups), metric model (factor loading are equal between groups but intercepts vary), and scalar model (both intercepts and loadings are equal between groups), to test the measurement invariance. The configural model fit the data well [$\chi2(365)= 561.87$, RMSEA = .054 (90% CI= .045- .062), CFI= .920, TLI= .908] , as did the metric model [$\chi2(382)= 583.95$, RMSEA = .053 (90% CI= .044- .061), CFI= .918, TLI= .909]. The $\Delta\chi2$ test between the configural and metric models was nonsignificant, $\chi2(17)= 22.08$, $p= .18$, suggesting that invariance between the genders was achieved. The $\Delta$CFI test (.002) gave same result, suggesting the metric model fit as well as configural model. Next, we examined the scalar invariance. This model had an acceptable fit, $\chi2(403)= 637.83$, RMSEA = .056 (90% CI= .047- .064), CFI= .904, TLI= .900, but the $\Delta\chi2$ test between the metric and scalar models was significant, $\chi2(21)= 53.88$, $p< .001$. Furthermore, the $\Delta$CFI test value (.014) was over the cutoff score showing that full scalar invariance was not met. Following Dimitrov's (2010) and Sulik et al.'s (2010) suggestions, we examined MIs for a higher drop in the model's $\chi2$. After reviewing MIs, we found that item 20 and item 21 had greater and significant values. Following the recommendation to free one parameter at a time, intercept for item 21 was allowed to have different estimates across the genders. However, the resulting $\Delta\chi2$ test was still significant and $\Delta$CFI had a value over .01. After freeing the intercepts for both items, modification indices produced a model with acceptable fit, $\chi2(391)= 598.25$, RMSEA = .053 (90% CI= .044- .061), CFI= .915, TLI= .909, and resulted in a nonsignificant $\chi2$ test, $\chi2(9)= 14.3$, $p= .11$. The $\Delta$CFI test had also a better result (.003). Based on these results, we can conclude that the CAMMhas partial measurement invariance.

**Validity Evidence Based on Relations with Other Variables**

To address evidence of relationship to other variables (AERA, APA, & NCME, 2014) for the AMOS, correlational analysis were conducted with the ATHS (Snyder et al., 1991). We examined bivariate correlations of the subscale scores. Table 3 provides the descriptive data and correlations for each of the instruments. As this table shows, we found evidence for criterion validity. A statistically significant and positive relationship was found between the CAMM subscales and the ATHS subscales. Based on this analysis, higher achievement motivation scores were correlated with higher level of hope.

**Discussion**

The purpose of this study was to develop and validate a broad and unique achievement motivation measure assessing this concept in multiple settings (School, Work, Family, and Community). Despite the large number of measures developed to assess achievement motivation, an instrument focusing on achievement motivation in multiple settings has not been developed. The CAMM is an instrument that assesses achievement motivation in the context of school, work, family, and community. The CAMM evolved from research findings that tested the psychometric properties of previous measures, the AMI and AMM. The CAMM presents researchers with a broader perspective of achievement motivation, emphasizing its relevance in performing a number of activities considered important and valued in society. Access to the CAMM allows researchers to investigate levels of achievement motivation in multiple settings and compare findings across cultures.

The current study, supported by McClelland and Atkinson's achievement motivation theory of personality characteristics and the AMI, led to the creation a contextual measure of achievement motivation. Achievement motivation theory of personality characteristics include cognitive and behavioral patterns associated with one's drive to perform to a standard of excellence. The original instrument used to assess achievement motivation in multiple settings, AMI, highlighted four settings (School, Work, Family, and Community) measuring achievement motivation patterns of individuals. The EFA explored the theory and assessed the AMI, producing a 4-factor-21-item model.

The first factor, School Setting, refers to all levels of education and school types, and includes six items. This factor had the highest eigenvalue (6.03) and explained 29% of the variance across all of the items. The factor measures both past and current perception of achievement in school work. A sample statement is "In school work, I am (was) an achiever." In this way, the perception of achievement in school in one's life who is currently not a student can be measured. In addition, a student's current and past perception of achievement can be measured. The second factor, Family Setting and measures how an individual really are, not how he/she would like to be. This factor included five items and had an eigenvalue of 3.03 and it explained 14.50% of the variance. This factor measures how much an individual can integrate with his family and spend time efficiently with items like "Our family works as a unit so we can use our time effectively together." The third factor is Work Setting, refers to one's places of employment or is the place one's activities will benefit his/her professional development. The eigenvalue for this scale was 1.79 and it explained 8.50% of the variance. This factor includes six items like "At my place(s) of employment I am (was) efficient." The last factor, Community Setting, refers to individuals' roles and responsibilities they get in communities and organizations. The eigenvalue for this scale was 1.78 and it explained 8.50% of the variance. This factor measures one's achievement motivation through four items like "I play an active role in several community organizations."

The CFA confirmed the hypothesized 4-factor-21-item model. Although the four-factor structure was acceptable for the sample, there were modifications suggested between items 11 and 12. Item 11 (i.e. At my place(s) of employment I am (was) thorough) and item 12 (i.e. At my place(s) of employment I am (was) efficient), which had a correlation of .49 and both fall under the Work Setting factor. We believe that the meanings of these adjectives were close and participants may have marked them with similar considerations. Thorough is "painstaking and careful not to miss or omit any detail while efficient is making good, thorough, or careful use of resources" (WikiDiff, n.d.). As seen in this definition, "thorough" is a part of "efficient" as well.

The results supported the theoretical based 4-factor model providing good evidence based on relations to other variables (AERA et al., 2014). As we hypothesized, CAMM scores were positively correlated with hope. This finding was consistent with previous studies (Curry et al., 1997; Pang et al., 2009) stating higher achievement motivation was associated with higher hope. In the current study, the highest correlation was between hope and achievement motivation in school setting ($r$= .57). One reason of this could be related to participants. Individuals in the study were university students and may have evaluated and associated their current role (student) with hope. Moreover, reliability analysis showed that the CAMM was a reliable instrument based on Cronbach's alpha scores. The alpha scores ranged from moderate to strong. While the lowest score was belong to Community Setting subscale ($\alpha$= .76), the highest score was belong to Work Setting subscale ($\alpha$= .93).

Another important finding worth discussion was measurement invariance. The validation process included comparison between males and females on the CAMM. It is important to be sure that an instrument measures same theoretical construct in the same way for each group (Dimitrov, 2010). Therefore, configural model (factor loadings and intercepts vary between groups), metric model (factor loading are equal between groups but intercepts vary), and scalar model (both intercepts and loadings are equal between groups) were tested. The results indicated that after freeing items 20 and 21 parameters, the CAMM had partial measurement invariance. In other words, all the items except items 20 and 21 measured same construct for both males and females. This finding supported the construct validity of the CAMM.

**Limitations**

The present study contributed to the empirical literature on measures of achievement motivation. A significant contribution was the development of a measure to assess achievement motivation in context, involving several settings. However, the findings from this study are limited in the generalizability of results due to the sample employed. The sample consisted of undergraduate and graduate students attending a university in Southwest Texas. Therefore the potential for demographic representation to be fairly homogenous exists. In addition self-reported responses on questionnaires and surveys were used. The responses are subject to bias and increased the error in reliability and validity. Participants may have selected socially desirable responses.

Limitations can be corrected by repetition of the study in diverse settings, as well as using varied sampling procedures. In order to safeguard against dishonest responses to survey items dummy questions could be employed to assess unusual survey markings. Additional measures beyond the Adult Hope Scale will allow an assessment of discriminate validity for the instrument developed in this study.

**Implications**

During the last several decades there has been a plethora of instruments created to measure achievement motivation. The majority of these measures assessing achievement motivation have been employed in business work settings including managers and chief executives. There is a void of instruments designed to measure achievement motivation in settings beyond one's work environment. The researchers posit however, that achievement motivation concepts play an important role in most settings; including family, school, and the community. Could it be that achievement motivation concepts are not viewed as relevant to those taking care of one's family, working in the community or attending school? Are these settings viewed as less important because many are nonpaying? By ignoring research on levels of achievement motivation in settings other than business and education it could be implied that concepts as goal setting, success feelings, fear of failure, taking personal responsibility for task completion, and desiring feedback, are not relevant in family, community, or school environments. A psychometrically sound instrument, the CAMS, provides researchers with a way to assess levels of achievement motivation in multiple settings.

Implications of the research, at a macro-level, draws attention to the importance of work, and one's performance within family, school, and community settings. The lack of instruments measuring levels of achievement motivation in settings outside of business and education is alarming. Yet, it is clear from observation, there are high achieving, high performing individuals in multiple settings. The impact of this study perhaps could include a change in perception and values attributed to individuals involved in life roles, working within the family and community. These are the work settings, part-time and full time, performed by a large number of individuals in society. The ability to assess levels of achievement motivation of high performers in multiple settings, perhaps will lead to further recognizing the value of the roles and individuals' performing in these settings.

Micro-level implications include the utilization of an achievement motivation measure focusing on multiple settings. By exploring achievement motivation in multiple settings, implications for broadening the scope of research is promising. Researchers are presented with exploring an unlimited number of study possibilities. The availability of the CAMM and other measures will hopefully encourage research that assesses achievement motivation levels in family, community, school and multiple settings, along with reporting and comparing findings across cultural groups.

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