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RELIABILITY AND VALIDITY OF THE ACADEMIC MATURITY SCALE

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Abstract

Academic maturity is defined as the extent to which college students maximize their academic potentials. Addison, Althoff, and Pezold (2009) designed the 100-item Academic Maturity Scale (AMS) to measure this construct. Through factor analyses, the AMS was reduced to 30 items and four factors: motivation, responsibility, focus, and time management. The current study examined the reliability and validity of the 30-item AMS. Data from 425 participants supported the internal consistency of the AMS subscales, and results from 88 participants who completed the AMS, the Academic Motivation Scale (Vallerand et al., 1992), and the Time Management Questionnaire (TMQ; Britton & Tesser, 1991) yielded significant, positive correlations between scores on the AMS time management subscale and TMQ scores, and between scores on the AMS motivation subscale and those on the Academic Motivation Scale. These findings support the validity of the time management and motivation subscales of the AMS.

Reliability and Validity of the Academic Maturity Scale

Factors related to success in college are a major concern for college admissions offices, high school counselors, parents, students, and teachers. Often, these groups examine a student's GPA or standardized test scores, such as the ACT or SAT, in order to predict whether the student will succeed in college. However, these measures generally do not inform college admissions officers if a student is making the most of his or her academic potential. An aptitude test score may show that a student has the *ability* to learn, but it does not indicate that said student will make use of that ability (Credé & Kuncel, 2008). Admissions committees want to ensure that the students they admit have a reasonable chance of success in college, parents want to see their children do well, and teachers want their students to learn. These concerns have prompted the development of many instruments designed to measure academic factors that influence whether a student will make the most of his or her potential and be deemed a "success" in college. There are numerous instruments available, measuring anything from broad concepts to a single quality. But what are these academic factors that help students make the most of their potentials?

Factors Related to Success in College

Motivation. One of the more prominent factors of academic success is motivation. Without the appropriate level of motivation, a student may not feel able to finish college, remain in a class, or even finish an assignment. In order to measure academic motivation, researchers have developed several scales (Busato, Prins, Elshout, & Hamaker, 2000). Among the most popular of these scales is the Academic Motivation Scale (AMS), which was designed to measure the three types of academic motivation: intrinsic motivation, extrinsic motivation, and amotivation (Vallerand et al., 1992). Intrinsic motivation occurs when students want to learn simply for the sake of learning. Intrinsically motivated students may choose to go to class or

read extra material just for the sake of learning. There are three subtypes of intrinsic motivation (intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation). Students who are motivated by incentives or limits fall under the second category of motivation; they are said to be extrinsically motivated. An extrinsically motivated student may be working toward a goal, such as getting good grade in a class or receiving praise from parents. There are three subtypes of extrinsic motivation (external regulation, introjected regulation, and identification). The third type of motivation, amotivation, occurs when students are neither intrinsically nor extrinsically motivated. Students who are amotivated are easily discouraged because they are not able to make clear connections between their actions and the results of those actions.

The Academic Motivation Scale (Vallerand et al., 1992) consists of 28 “reasons why students go to college,” on which students rate their level of agreement using a 7-point scale. Each of the items corresponds to one of the 7 subtypes of motivation. The AMS is particularly popular when studying the relationship between motivation and student grades; scores on the scale are usually positively correlated with academic performance (Busato et al., 2000). This relationship suggests that motivation is an important factor in student success.

Organization. Students who maximize their potentials in college are also well organized (Credé & Kuncel, 2008). In order to examine the relationship between elements of organization and academic performance, researchers have used organization inventories such as the Survey of Study Habits and Attitudes (SSHA), developed by Brown and Holtzman in 1965 (as cited in Ozsoy, Memis, & Temur, 2009), or the Learning and Study Strategies Inventory (LASSI), developed by Wienstein, Palmer, and Schulte in 1987 (as cited in Petersen, Lavelle, & Guarino, 2006). The LASSI measures students’ use of study strategies. It consists of 10 subscales that

measure different aspects of studying behavior, including time management, study practices, and techniques for reviewing information. Each of the subscales can be placed into the category of study skills, habits, or attitudes. According to Credé and Kuncel (2008), the SSHA and the LASSI are the most popular and valid measurements for study skills, habits, and attitudes. In previous research, scores on both of these inventories were strongly correlated with and predictive of academic performance (Credé & Kuncel, 2008; Ozsoy et al., 2009; Yip, 2009).

Responsibility. Responsibility is another important quality of students who succeed in college. Successful college students are responsible enough to finish assignments and turn them in on time, study for exams, and attend classes. For example, Launius (1997) found that class attendance was related to academic performance.

In 2005, Zimmerman and Kitsantas conducted one of the few studies designed to measure responsibility. For their study, students completed an 18-item questionnaire relating to perceived responsibility. For each item, students indicated who they believed was more responsible for an assignment and its result: the students (themselves) or the teachers. Researchers scored items on a scale from 1 (the teacher's responsibility) to 7 (the student's responsibility). Not surprisingly, the results showed that students earned higher grades when they perceived themselves as more responsible for academic tasks than their teachers. This relationship provides evidence that responsibility is a factor in student success, helping students reach their potential.

Self-awareness. Lastly, students who succeed academically tend to be aware of their own potentials. Successful students know their abilities and limitations, and are able to adjust their organizational strategies and motivation accordingly (Zimmerman & Kitsantas, 2005). These students know that in order to succeed at something that challenges them, they may have to work harder. There are two main types of self-awareness: self-efficacy and self-concept.

According to Zimmerman and Kitsantas (2005), self-efficacy is a person's beliefs about his or her own ability to carry out a task in a satisfactory manner. However, a person creates a self-concept by comparing him- or herself to *other* people (Bong & Clark, 1999).

Researchers have used a number of instruments designed to measure self-awareness. Some scales, like the College Academic Self-Efficacy Scale (CASES), created by Owen and Froman in 1988, specifically measure academic self-efficacy (Choi, 2005). The Academic Self-Concept Scale (ASCS), developed by Reynolds in 1998, measures academic self-concept (Lent, Brown, & Gore, 1997). The Self-Efficacy for Learning Form (SELF; Zimmerman & Kitsantas, 2005) focuses on measuring self-efficacy for self-regulated learning. The instrument consists of 57 items for which students indicate how confident they are in their own abilities to complete a task on a scale from 0 (cannot do it) to 100 (can do it).

Instruments measuring multiple factors of success. A few instruments attempt to measure more than one dimension of academic performance. One of these is the Motivated Strategies for Learning Questionnaire, or MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1993). According to Duncan and McKeachie (2005), the MSLQ is designed to assess students' motivation and learning strategies. Consisting of 81 items, the MSLQ contains 15 subscales that can be used together or individually in order to measure a specific factor, such as test anxiety or organization. Students respond to items by indicating their agreement with statements using a 7-point scale (1 = not at all true of me, 7 = very true of me) (Duncan & McKeachie, 2005).

This scale may appear to measure several of the behaviors that contribute to student success in college, but the MSLQ is not meant to measure overall behaviors. It is a "course level" inventory, rather than a "general level" one (Garcia & Pintrich, 1995, p. 6). In other

words, the MSLQ assesses behaviors at the course level rather than evaluating overall patterns of behavior.

Academic Maturity

In an attempt to combine several factors related to academic achievement, Addison, Althoff, and Pezold (2009) developed the Academic Maturity Scale (AMS). They defined academic maturity as “the tendency to motivate oneself to develop and apply effective strategies in time management, self-discipline, and organization, and the ability to use these strategies in accordance with an understanding of one’s academic strengths and limitations so as to maximize learning opportunities.” The AMS is unique in that it was designed not to measure academic performance per se, but rather to determine if a student is utilizing his or her academic potential by using a combination of factors of academic success that had not been previously grouped together in one instrument.

Addison et al. (2009) designed the AMS to measure four dimensions of academic maturity at a general level rather than at a course level. All of the dimensions chosen to be included in the instrument (organization, motivation, responsibility, and self-awareness) were linked to academic success in college in previous research. These dimensions also corresponded to the four proposed subscales on the AMS. The original instrument consisted of 100 statements on which students indicated their level of agreement on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). Sample AMS items included: “Pride in my academic achievements motivates me to continue working hard” (motivation), “I use strategies (e.g., acronyms, tunes, stories, etc.) for memorizing important facts in a class” (organization), “I attend all of my classes regularly” (responsibility), and “I have a good sense of my academic strengths and weaknesses” (self-awareness).

Because academic maturity is a new concept, there is little research on it. However, we do know something about the relationships between academic maturity and related concepts. Early studies of academic maturity examined the associations between scores on the AMS and scores on other scales. Addison et al. (2009) examined the relationship between academic maturity and critical thinking scores. Fifty-three undergraduate college students completed the AMS and the Watson Glaser Critical Thinking Appraisal. Results showed no significant relationship between critical thinking and scores on the AMS, which suggests that academic maturity is not a function of intelligence. Instead, academic maturity is a result of behaviors that constitute the utilization of one's potential as a student. Consistent with this notion, Addison et al. (2009) found that AMS scores were positively related to GPAs.

Because most factors that lead to a student utilizing his or her academic potential also lead to higher academic performance, the correlation between academic maturity and academic performance provided initial support for the validity of the AMS. The relationship was only moderate, but that is not surprising. For some students, being academically mature could lead to earning a high GPA (such as a 4.0). For others, it could mean earning a 2.5 GPA but still behaving as an academically mature student would behave. How academic maturity manifests itself depends on that particular student's potential.

Additional research examined academic maturity in relation to academic motivation. Addison, Godwin, and Maceyak (2010) recruited 63 undergraduate participants to complete the Academic Motivation Scale (Vallerand et al., 1992) and the Academic Maturity Scale. Results showed a significant relationship between scores on the Academic Motivation Scale and scores on the motivation subscale of the Academic Maturity Scale. This relationship provides additional support for the validity of the Academic Maturity Scale.

Another study investigated the relationship between academic maturity and the Big Five personality factors. Addison and Althoff (2011) recruited 163 participants who completed both the AMS and the Big Five Inventory (BFI), developed by John, Donahue, and Kentle (1991). Results indicated that of the Big Five factors (openness, extraversion, agreeableness, neuroticism, and conscientiousness), conscientiousness was most strongly related to academic maturity. In fact, the conscientiousness scores accounted for more of the variability in academic maturity than the other four Big Five factors combined. Conscientiousness is associated with “the will to achieve, self-control, persistence, and dependency” (Busato et al., 2000, p. 1059). These results suggest that academically mature students tend to be persistent and that conscientiousness may be a predictor of academic maturity.

Revising the Academic Maturity Scale

In order to use the AMS as an instrument in college settings, it was necessary to analyze and revise the original version. A psychometrically sound, more concise version of the AMS could be used in many settings. For instance, it could be useful in determining whether or not a student is utilizing his or her academic potential and also in identifying what areas a student may need to work on in order to make the most of this potential. With the goal of creating a more practical scale, we took steps to re-evaluate the AMS and modify the instrument accordingly.

To evaluate the scale, we pooled data from previous studies of the AMS, resulting in 425 cases in all. The data were collected from Eastern Illinois University students, primarily in undergraduate psychology courses. First, we conducted a Principal Components Analysis (PCA). Because the AMS was originally created with four dimensions in mind, we hypothesized that the analysis would result in evidence for four factors that would correspond to the four originally intended subscales: organization, motivation, responsibility, and self-awareness.

To begin, we conducted a Principal Components Analysis with a Varimax rotation. This analysis did not support the four-factor hypothesis. Instead, the results indicated evidence for five factors of academic maturity. To reduce the scale, each factor was further analyzed and items were examined for similarity. By using Cronbach's alpha levels, pairs of items that were nearly identical in wording were compared to see which item related better to the factor in question. After testing the Cronbach's alphas of each factor by including one of the two separate like-items, the item that was more reliably related to the factor was saved, while the other was eliminated in order to reduce redundancy. We deleted items in the PCA that did not fall under any of the five factors. This further ensured that the items included in each factor were related to each other. The initial analysis reduced the original 100-item AMS to 50 items distributed among the five factors.

Next, we conducted a second PCA on the remaining items, this time with a Promax rotation, in order to further reduce and strengthen the scale. The analysis showed evidence for only four factors, supporting the original plan for academic maturity as a four-dimensional concept. Following the previously outlined process, we further reduced the AMS to a 30-item instrument.

The Revised AMS. The revised AMS contains four factors and 30 items. After further examination of the item clusters, we named these factors motivation, responsibility, focus, and time management. Although these factors are not identical to the originally hypothesized dimensions, all of the factors in the revised AMS are related to academic success.

Motivation was one of the originally hypothesized factors of academic maturity. Scores on motivation scales (such as the Academic Motivation Scale) have been positively correlated with academic performance (Busato et al., 2000). This correlation provides support for including

motivation as a component of academic maturity. The motivation factor of the 30-item AMS includes 10 items, one of which is reverse-scored. Sample motivation items that remained after revision include: “Pride in my academic achievements motivates me to continue working hard” and “I devote a greater amount of time and effort to the classes I see as especially challenging.”

Responsibility was also one of the four originally proposed dimensions of academic maturity, and it is an important component of success in college. Zimmerman and Kitsantas (2005) found that students who perceived themselves as more responsible tended to earn higher grades. Thus, it makes sense that responsibility would also be an element of academic maturity. The responsibility factor of the AMS includes 7 items. Sample responsibility items on the revised AMS include: “If the class material is especially challenging, I ask the instructor for help” and “If I am struggling with a class, I take advantage of tutoring opportunities.”

The other two factors (focus and time management) are also justifiable as components of academic maturity. Although neither factor was part of the original plan for the scale, both have been related to academic achievement in previous studies.

Focus, or focus of attention, is an element of self-regulated learning. Self-regulated learning, in short, is the practice of actively managing one’s actions to better facilitate learning (McClelland, Acock, Piccinin, Rhea, & Stallings, 2012). A student’s ability to regulate his or her attention is an important part of the self-regulated learning process. According to McClelland et al. (2012), “attention span-persistence refers to selecting and attending to relevant information, such as listening to the teacher, and persisting on a task” (p. 2). A student’s ability to direct his or her own attention is also important for academic success. According to McClelland et al. (2012), attention-span persistence at age 4 predicts math and reading performance at age 7 and 21. Similarly, task persistence, or the push to complete a task, has

been related to academic accomplishments. Andersson and Bergman (2011) found that task persistence can predict adolescents' grades later on in school. Task persistence is important because students must be able to sustain attention long enough to complete a task. If a student becomes bored often and, unable to self-regulate, simply gives up, it is unlikely that he or she will ever finish the task. The focus factor on the revised AMS includes 6 items. Sample focus items include "When I try to study, I quickly become bored and distracted," and "I often get so bored with studying for a class that I stop before I complete my studying." All 6 items of the focus subscale are reverse-scored

Time management, although not originally hypothesized, also makes sense as an aspect of academic maturity. In fact, time management is often included as a component of organization, which *was* one of the originally hypothesized factors. For instance, the previously mentioned Learning and Study Strategies Inventory (LASSI), which measures study skills, habits, and attitudes, includes a time management subscale (Credé & Kuncel, 2008).

Several instruments measure only time management. According to Britton and Tesser (1991), time management involves selecting goals, making a list of tasks, prioritizing those tasks, and completing the tasks in a timely manner. Because college courses often require completing a variety of tasks, all with separate deadlines, Britton and Tesser (1991), who developed a 35-item time management questionnaire, hypothesized that time management skills would influence GPA. When 90 college students completed the Time Management Questionnaire, results showed that time management was positively related to academic achievement. Other researchers have found similar relationships. After adapting Britton and Tesser's (1991) Time Management Questionnaire, Trueman and Hartley (1996) used a 14-item instrument with two subscales: Daily Planning and Confidence in Long-Term Planning. They found that Daily

Planning scores did not correlate with academic performance, but Confidence in Long-Term Planning did, further supporting time-management skills as a component of academic success in college.

Researchers have also examined the importance of time management through studies of procrastination. In one study by Ferrari (2001), participants completed the Adult Inventory of Procrastination. Chronic procrastinators, or those who believed they had plenty of time to complete a task even when time was limited, were less accurate when completing tasks than were non-procrastinators. The difference in accuracy suggests that those who practice good time-management skills are more effective in completing tasks. The time management factor on the revised AMS contains 6 items, 3 of which are reverse-scored. Sample items include, "I usually complete a paper several days in advance so that I have time to proofread it and make changes" and "I often find it difficult to begin working on large projects" (reverse-scored).

Present study

The purpose of the present study was to examine the reliability and validity of the 30-item AMS in order to provide support for its use in educational settings, such as in academic advising. In order to examine the reliability, or internal consistency of the AMS, we conducted an extensive analysis of the Cronbach's alpha levels for the four factors. We also examined the concurrent validity of the AMS. Because the revised AMS includes a motivation dimension, participants completed both the AMS and the Academic Motivation Scale (Vallerand et al., 1992) so that we could examine whether the scores of the two instruments were correlated. We repeated the same process with the AMS and a shortened form of Britton and Tesser's (1991) Time Management Questionnaire. We hypothesized that the AMS would be a reliable and valid measure of academic maturity.

Method

Participants

We used data from several earlier studies in which a total of 425 participants completed the AMS. Participants were primarily students in undergraduate psychology courses at Eastern Illinois University. In addition, 88 EIU students (67 female, 21 male), also recruited from undergraduate psychology classes, completed the 30-item AMS, the Academic Motivation Scale (Vallerand et al., 1992), and the Time Management Questionnaire (Britton & Tesser, 1991). The mean age of these participants was 20.94 (SD = 4.9) with a range from 18 to 56 years of age. The number of participants was distributed fairly evenly among the classes (23 freshmen, 19 sophomores, 25 juniors, and 21 seniors). The Institutional Review Board approved all studies.

Materials

Labeled “Academic Interest Scale” in the research packets, the 30-item AMS is a scale designed to measure four dimensions of academic maturity: motivation, responsibility, focus, and time management. Students indicate their level of agreement with statements on a 6-point Likert-type scale (1 = strongly disagree, to 6 = strongly agree). Examples of statements for each of the subscales include: “I set specific academic goals for myself” (motivation), “I try to meet with the instructor if I am not doing well in a class” (responsibility), “During class, I often find it difficult to keep my attention focused on the instructor” (focus), and “I tend to do most of my studying the night before an exam” (time management). Ten of the revised AMS items are reverse-scored.

The Academic Motivation Scale (Vallerand et al., 1992), labeled “Why do you go to college?” in the packet, is a 28-item inventory measuring academic motivation. Each item on the inventory is a “reason why students go to college” on which students rate their level of

agreement on a 7-point Likert-type scale (1 = does not correspond at all, 7 = corresponds exactly). The Academic Motivation Scale contains 7 subscales that match the 3 types of motivation (intrinsic, extrinsic, and amotivation), along with their various subtypes. Examples of items on the Academic Motivation Scale (Vallerand et al., 1992) are “Because my studies allow me to continue to learn about many things that interest me” (intrinsic motivation), “In order to obtain a more prestigious job later on” (extrinsic motivation) and “I don’t know, I can’t understand what I am doing in school” (amotivation).

Britton and Tesser’s (1991) Time Management Questionnaire (TMQ), meant to measure time management practices, consists of 18 items rated on a 5-point scale (from always to never). Each item falls under one of three categories: Short-Range Planning, Long-Range Planning, and Time Attitudes. The TMQ (Britton & Tesser, 1991), which was labeled “Organization Questionnaire” in the research packet, includes items such as “Do you make a list of things you have to do each day?” (Short-Range Planning), “Do you regularly review your class notes, even when an exam is not imminent?” (Long-Range Planning) and “Do you make constructive use of your time?” (Time Attitudes).

Procedure

The original 425 participants provided informed consent and completed the 100-item AMS, which contained the same items as the 30-item revised AMS, along with the items that were included before the revision. For the purposes of our study, only the 30 items on the revised AMS were included in analyses.

The 88 participants recruited specifically for this study provided informed consent and then completed a research packet (see Appendix). Informed consent forms were kept separate from the research packets in order to maintain anonymity of results. The packet included a

demographic questionnaire, the 30-item AMS, the Academic Motivation Scale, and the TMQ. The three instruments were counterbalanced within the packets to account for order effects. It took participants approximately 15 minutes to complete all materials. They were provided with a debriefing statement following completion of the study.

We examined the internal consistency of the AMS by performing analyses on the 425 cases. Using Cronbach's alpha levels, we compared the AMS items to other items within the same subscale in order to determine if they were consistently measuring the same concept. At a Cronbach's alpha level of 0.7, we considered the correlation between items acceptable. A Cronbach's alpha level above 0.8 was considered good. Ideally, we expected all of the inter-item correlations to result in a Cronbach's alpha level of at least 0.7.

Using the 88 additional cases, we calculated Pearson's correlation coefficients in order to determine if data from the AMS subscales compared to related inventories. Data from each of the additional inventories (the Academic Motivation Scale and Time Management Questionnaire) was compared to that of the relevant AMS subscale. We expected to find that the AMS was a reliable and valid measure of what we call "academic maturity."

Results

The Cronbach's alpha levels all fell above 0.7. The motivation subscale (10 items; $\alpha = .73$), the focus subscale (6 items; $\alpha = .73$), and the time management subscale (6 items; $\alpha = .76$) were all found to be reliable measures of those constructs. The responsibility subscale was found to be highly reliable (8 items; $\alpha = .85$).

Results of six Pearson's r correlation analyses show that at a correlated alpha level of .008 per comparison, students who score higher on the AMS motivation subscale also score higher on the intrinsic motivation subscale of the Academic Motivation Subscale, $r(82) = .67, p$

< .001. The AMS motivation subscale scores accounted for 45% of the variance in intrinsic motivation subscale scores. Students who score higher on the AMS motivation subscale also score higher on extrinsic motivation, $r(81) = .31, p = .005$. The AMS motivation subscale scores accounted for 10% of the variance in extrinsic motivation subscale scores. Results also showed that students who score higher on the AMS motivation subscale score lower on the amotivation subscale of the Academic Motivation Scale, $r(83) = -.30, p = .006$. The AMS motivation subscale scores accounted for 9% of the variance in amotivation subscale scores.

Additionally, students who scored higher on the AMS time management subscale scored higher on the Short Range Planning subscale of the TMQ, $r(84) = .46, p < .001$. Time management subscale scores accounted for 21% of Short-Range Planning scores. Students who scored higher on the AMS time management subscale also scored higher on the Long-Range Planning subscale, $r(84) = .63, p < .001$. Time management subscale scores accounted for 40% of the variance in Long-Range Planning scores. Finally, the students who scored higher on the AMS time management subscale scored higher and the Time Attitudes subscale of the TMQ, $r(82) = .56, p < .001$. Scores on the time management subscale accounted for 31% of the variance in Time Attitudes scores.

Discussion

Results from the Cronbach's alpha tests show that the items within each of the four subscales are all measuring the same construct. In addition, the Pearson's r correlation coefficients between the motivation subscale of the AMS and the Academic Motivation Scale, as well as between the time management subscale of the AMS and the Time Management Questionnaire, suggest that the AMS motivation and time management subscales are valid measures of those dimensions of academic maturity.

Although the AMS has been shown to be a reliable and valid measure of motivation and time management, some limitations of this study should be noted. In order to fully support the validity of the scale, future research should examine the other two AMS subscales, responsibility and focus. Instruments relating to these factors are less numerous, and therefore more difficult to obtain than those on motivation or time management.

Few scales exist to measure responsibility exclusively. One of the few mentioned in the literature is an 18-item instrument, called the Perceived Responsibility for Learning Scale, created by Zimmerman and Kitsantas in 2005. The instrument measures students' perceived responsibility for school tasks and their results. Although the scale was examined for initial reliability and validity, it does not appear to be a time-honored instrument, as the only other study to be found where the scale was used is another study by Zimmerman and Kitsantas in 2009 (as cited by Ramdass & Zimmerman, 2011). It would also be possible to use a responsibility subscale from a well-known instrument. For instance, the California Psychological Inventory (CPI), developed by Gough, McClosky, and Meehl in 1952, contains a responsibility scale (Weekes, 1993). However, using a well-tested instrument such as the CPI would be expensive for these purposes. In addition, the items on the CPI are answered true or false, whereas AMS items are scored on a Likert-type scale, so it may be difficult to compare the two.

Often, studies on focus measure a student's attention during a specific task in the context of an experiment (e.g., Sideridis & Kaplan, 2011). When measuring focus on a more general level, someone other than the subject often completes the instrument in regards to the subject in question. For example, the Colorado Child Temperament Inventory (CCTI), developed by Rowe and Plomin in 1977, contains an attention-span persistence subscale, but parents complete it in

regards to their child (McClelland et al., 2012). Similarly, Andersson and Bergman (2011) collected data on students' task persistence by obtaining ratings from students' teachers. Few instruments measuring focus are actually completed by the participant. In 1987, Lufi and Cohen created a 40-item questionnaire called the Persistence Scale for Children. The original version of this scale, created by Lufi in 1979, was intended for adults to measure persistence in the academic field but later adapted for children (Lufi & Cohen, 1987). However, even if researchers could obtain the original scale, the items are still answered true or false, which is not consistent with scoring of the AMS.

One the AMS has been shown to be a valid measure of the other two subscales, there are numerous possibilities for its use in academic settings. The AMS could be particularly useful in academic advising settings. The scale could help academic advisers identify whether students are utilizing their potentials, as well as help students recognize areas in which they could improve. AMS scores could help advisers tailor their advice to a specific student more effectively, by making better suggestions regarding future careers, as well as short-term goals.

The scale also has possibilities for individual use. It could help students identify their relative strengths and weaknesses. After identifying weaknesses by completing the AMS, students could adjust their study habits or learning techniques to improve those areas and become more academically mature students. For instance, students that score low in time management could begin keeping student planners or utilizing other methods of time management in order to strengthen these skills and make better use of their potentials as students.

There are also many possibilities for future research on academic maturity. Additional research on the AMS could examine the characteristics of academically mature students. Although we did collect some demographic data from those who completed the 30-item AMS for

this study, there was not a large enough sample for meaningful analysis. Future studies could explore whether there is a connection between a person's age and academic maturity level. For instance, do nontraditional, older students, even if they are at a "freshman" class standing, still have a higher academic maturity level, or is academic maturity linked more closely to class standing than age? Trueman and Hartley (1996) found that older mature students (those over age 25) reported using time management practices more than younger students. It is also possible that since nontraditional students are often returning to school and paying their own way, they would be more motivated. Since these are both elements of academic maturity, it is possible that nontraditional students, no matter their class standing, would score higher on the AMS.

It would also be interesting to note whether there are gender differences in students' academic maturity levels. In previous studies, females have been shown to achieve higher levels of academic performance than males (Buchmann & DiPrete, 2006; Sonnert & Fox, 2012). Although academic maturity is not meant to measure academic performance, Addison, Althoff, and Pezold (2009) examined the AMS in relation to academic performance. Results showed that there was a significant relationship between students' AMS scores and GPAs. Since females generally have higher academic achievement levels and there is a relationship between academic achievement and academic maturity, we may also be able to predict that females would have higher academic maturity levels than males.

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Table I.

Correlations Among AMS, Academic Motivation Scale, and TMQ Subscales

	AMS Motivation	AMS Responsibility	AMS Focus	AMS Time Management	Intrinsic Motivation	Extrinsic Motivation	Amotivation	Short-Range Planning	Long-Range Planning	Time Attitudes
AMS Motivation	_____	.763***	.286***	.401***	.670***	.307**	-.295**	.295**	.373***	.327**
AMS Responsibility	.763***	_____	.383**	.462***	.841***	.151	-.298**	.299**	.372***	.367**
AMS Focus	.286***	.383**	_____	.485**	.642***	-.198	-.295**	.376***	.280**	.548***
AMS Time Management	.401***	.462***	.485**	_____	.612***	.018	-.221*	.460***	.630***	.561***
Intrinsic Motivation	.670***	.841***	.642***	.612***	_____	-.037	-.272*	.367**	.449***	.448***
Extrinsic Motivation	.307**	.151	-.198	.018	-.037	_____	-.177	.132	.118	.076
Amotivation	-.295**	-.298**	-.295**	-.221*	-.272*	-.177	_____	-.185	-.153	-.272*
Short-Range Planning	.295**	.299**	.376***	.460***	.367**	.132	-.185	_____	.500***	.532***
Long-Range Planning	.373***	.372***	.280**	.630***	.449***	.118	-.153	.500***	_____	.500***
Time Attitudes	.327**	.367**	.548***	.561***	.448***	.076	-.272*	.532***	.500***	_____

*** $p < .001$ ** $p < .01$ * $p < .05$

Appendix

DEMOGRAPHIC QUESTIONNAIRE

Part 1: Demographic Information

- 1. Age _____
- 2. Male _____ Female _____
- 3. Freshman _____ Sophomore _____ Junior _____ Senior _____
- 4. Major _____
- 5. Do you have an Associates Degree from a 2-year college? Yes _____ No _____
- 6. Please indicate with an "X" which one of the following statements is most true for you.
 - _____ My cumulative grade point average (GPA) is an accurate indication of my academic ability.
 - _____ In terms of my cumulative grade point average (GPA), I consider myself to be an overachiever (i.e., my grades are higher than my academic ability would suggest).
 - _____ In terms of my cumulative grade point average (GPA), I consider myself to be an underachiever (i.e., my grades are lower than my academic ability would suggest).

ACADEMIC INTEREST SCALE**Part 2: Scale items**

For the items below, please use the following scale for your responses:

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

Please circle the corresponding number of your response:

1. I set specific academic goals for myself.	1	2	3	4	5	6
2. I tend to do most of my studying the night before the exam.	1	2	3	4	5	6
3. During class, I often find it difficult to keep my attention focused on the instructor.	1	2	3	4	5	6
4. It is important to me to understand the subject matter of the course.	1	2	3	4	5	6
5. I try to meet with the instructor if I am not doing well in class.	1	2	3	4	5	6
6. I often get so bored with studying for a class that I stop before I complete my studying.	1	2	3	4	5	6
7. I generally proofread or have my papers proofread by someone else before I submit them to the instructor.	1	2	3	4	5	6
8. I plan to go to graduate school after I complete my undergraduate degree.	1	2	3	4	5	6
9. I often procrastinate.	1	2	3	4	5	6
10. If I am struggling with a class, I take advantage of tutoring opportunities.	1	2	3	4	5	6
11. When I try to study, I quickly become bored and distracted.	1	2	3	4	5	6
12. I devote a greater amount of time and effort to the classes I see as especially challenging.	1	2	3	4	5	6
13. If the class material is particularly challenging, I ask the instructor for help.	1	2	3	4	5	6
14. Pride in my academic achievements motivates me to continue working hard.	1	2	3	4	5	6
15. I find it difficult to follow a study schedule.	1	2	3	4	5	6

For the items below, please use the following scale for your responses:

	1	2	3	4	5	6
	Strongly Disagree					Strongly Agree
16. When I do poorly on an exam, I talk to the instructor to find out what I can do to improve.	1	2	3	4	5	6
17. I often find it difficult to begin working on large projects.	1	2	3	4	5	6
18. I try to identify individuals in my classes who I could ask for help if I need it.	1	2	3	4	5	6
19. If I am struggling in a particular class, then I tend to work harder.	1	2	3	4	5	6
20. I usually complete a paper several days in advance so that I have time to proofread it and make changes.	1	2	3	4	5	6
21. When taking notes during class, I tend to write down only what the instructor writes on the board or presents on a transparency or PowerPoint slide.	1	2	3	4	5	6
22. If I do poorly on an exam, I tend to study harder for the next exam.	1	2	3	4	5	6
23. My primary academic goal is to get a high overall grade point average.	1	2	3	4	5	6
24. When I read assigned material, I occasionally have a hard time staying focused.	1	2	3	4	5	6
25. I will seek academic help (from the instructor, a tutor, etc.) if necessary.	1	2	3	4	5	6
26. When I know in advance that I have to miss a class, I contact the instructor to find out what material will be covered that day.	1	2	3	4	5	6
27. I am proud of myself when I succeed in school.	1	2	3	4	5	6
28. I usually begin working on large projects as soon as they are assigned.	1	2	3	4	5	6
29. When I receive negative feedback on my performance, I use this as motivation to work harder.	1	2	3	4	5	6
30. I ask questions in class when I do not fully understand particular points.	1	2	3	4	5	6

WHY DO YOU GO TO COLLEGE ?

Part 3: Scale items

Using the scale below, indicate to what extent each of the following items presently corresponds to one of the reasons why you go to college.

Does not correspond at all	Corresponds a little		Corresponds moderately	Corresponds a lot		Corresponds exactly	
1	2	3	4	5	6	7	

Please circle the corresponding number of your response:

WHY DO YOU GO TO COLLEGE ?

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. Because with only a high-school degree I would no find a high-paying job later on. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Because I experience pleasure and satisfaction while learning new things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Because I think that a college education will help me better prepare for the career I have chosen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. For the intense feelings I experience when I am communicating my own ideas to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Honestly, I don't know; I really feel that I am wasting my time in school. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. For the pleasure I experience while surpassing myself in my studies. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. To prove to myself that I am capable of completing my college degree. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. In order to obtain a more prestigious job later on. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. For the pleasure I experience when I discover new things never seen before. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Because eventually it will enable me to enter the job market in a field that I like. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. For the pleasure that I experience when I read interesting authors. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. I once had good reasons for going to college; however, now I wonder whether I should continue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

	Does not correspond at all	Corresponds a little		Corresponds moderately	Corresponds a lot		Corresponds exactly				
	1	2	3	4	5	6	7				
14. Because of the fact that when I succeed in college I feel important.					1	2	3	4	5	6	7
15. Because I want to have "the good life" later on.					1	2	3	4	5	6	7
16. For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.					1	2	3	4	5	6	7
17. Because this will help me make a better choice regarding my career orientation.					1	2	3	4	5	6	7
18. For the pleasure that I experience when I feel completely absorbed by what certain authors have written.					1	2	3	4	5	6	7
19. I can't see why I go to college and frankly, I couldn't care less.					1	2	3	4	5	6	7
20. For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.					1	2	3	4	5	6	7
21. To show myself that I am an intelligent person.					1	2	3	4	5	6	7
22. In order to have a better salary later on.					1	2	3	4	5	6	7
23. Because my studies allow me to continue to learn about many things that interest me.					1	2	3	4	5	6	7
24. Because I believe that a few additional years of education will improve my competence as a worker.					1	2	3	4	5	6	7
25. For the "high" feeling that I experience while reading about various interesting subjects.					1	2	3	4	5	6	7
26. I don't know; I can't understand what I am doing in school.					1	2	3	4	5	6	7
27. Because college allows me to experience a personal satisfaction in my quest for excellence in my studies.					1	2	3	4	5	6	7
28. Because I want to show myself that I can succeed in my studies.					1	2	3	4	5	6	7

ORGANIZATION QUESTIONNAIRE

Part 4: Scale items

For the items below, please indicate how often the statements apply to you:

1	2	3	4	5
Never	Infrequently	Sometimes	Frequently	Always

Please circle the corresponding number of your response:

-
- | | | | | | |
|---|---|---|---|---|---|
| 1. Do you make a list of the things you have to do each day? | 1 | 2 | 3 | 4 | 5 |
| 2. Do you often find yourself doing things which interfere with your
with your schoolwork simply because you hate to say “No” to people? | 1 | 2 | 3 | 4 | 5 |
| 3. Do you usually keep your desk clear of everything other
than what you are currently working on? | 1 | 2 | 3 | 4 | 5 |
| 4. Do you plan your day before you start it? | 1 | 2 | 3 | 4 | 5 |
| 5. Do you regularly review your class notes, even when a
test is not imminent? | 1 | 2 | 3 | 4 | 5 |
| 6. Do you write a set of goals for yourself each day? | 1 | 2 | 3 | 4 | 5 |
| 7. Do you feel you are in charge of your own time, by and large? | 1 | 2 | 3 | 4 | 5 |
| 8. The night before a major assignment is due, are you usually
still working on it? | 1 | 2 | 3 | 4 | 5 |
| 9. On an average class day do you spend more time with
personal grooming than doing schoolwork? | 1 | 2 | 3 | 4 | 5 |
| 10. Do you make a schedule of the activities you have to do on
work days? | 1 | 2 | 3 | 4 | 5 |
| 11. Do you believe that there is room for improvement in the way
you manage your time? | 1 | 2 | 3 | 4 | 5 |
| 12. Do you have a set of goals for the entire semester? | 1 | 2 | 3 | 4 | 5 |
| 13. Do you make constructive use of your time? | 1 | 2 | 3 | 4 | 5 |
| 14. Do you spend time each day planning? | 1 | 2 | 3 | 4 | 5 |
| 15. Do you continue unprofitable routines or activities? | 1 | 2 | 3 | 4 | 5 |
| 16. Do you set and honor priorities? | 1 | 2 | 3 | 4 | 5 |
| 17. When you have several things to do, do you think it is best
to do a little bit of work on each one? | 1 | 2 | 3 | 4 | 5 |
| 18. Do you have a clear idea of what you want to accomplish
during the next week? | 1 | 2 | 3 | 4 | 5 |