The Mediating Role of Procrastination and Perceived School Belongingness on Academic Performance in First Term Freshmen

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Abstract

The results of a structural equation model showed that a tendency to procrastinate assessed early in college students' first term was positively related to concerns over social exclusion, but was negatively related to academic task values and grade goal-setting. In addition, the tendency to procrastinate had a direct negative relationship with self-regulatory self-efficacy and perceived school belongingness, and was positively related to perceived stress near the end of the term. There was also a negative total effect of procrastination on end-of-term grade point average (GPA). While no significant relationship was found between procrastination and performance or mastery achievement goal orientations, a performance-approach orientation was positively related to GPA. The relationship between mastery-approach orientation and GPA was not significant.

Goals, Values and Self-regulation

Goals have been conceptualized as internal representations of desires that exist in a hierarchical network (e.g., Austin & Vancouver, 1996; Carver & Scheier, 1998; DeShone & Gillespie, 2005). In this vein, DeShone & Gillespie (2005) have outlined a hierarchical taxonomy that, in addition to agency and esteem, places affiliation as a high-level goal supported by lower level achievement goals. Furthermore, Carver and Scheier (1998) have proposed that goals with a higher degree of complexity or connectedness to other goals or those higher up in the hierarchy are hypothesized to be more important or valued relative to less connected or lower level goals. This implies that the value of achievement goals and the choices they influence are determined to some extent by affiliation goals.

To the extent that self-regulated performance reflects values through the choices students make (Tuckman, 1990) and, in turn, influences important outcomes such as self-efficacy (Sirois, 2004), stress (Tice & Baumeister, 1997), and school belongingness (Anderman & Freeman,

2004) an important issue is the nature of the mediating self-regulatory influence in the relationships between social and academic values and these outcomes.

In the present study, it is hypothesized that the need for belongingness, defined as "a need to form and maintain at least a minimum quantity of interpersonal relationships" (Baumeister & Leary, 1995, p. 499), can motivate behavior in order to gain social acceptance (Baumeister & DeWall, 2005), and may conflict or be congruent with academic self-regulatory behaviors. On the one hand, in situations where academic and social values conflict, a potential arises for a lack of academic self-regulation manifested as a tendency to procrastinate (Tuckman, 1991). This may account for the finding that self-presentational concerns may be a mechanism underlying self-defeating strategies in general (Tice & Baumeister, 1990) and may be one reason that van Eerde's (2003) meta-analysis of research on procrastination showed that receiving negative performance feedback was not as important a factor in procrastination as one's self-image. In addition, research has shown that an important aspect of academic procrastination involves conflicts between studying and social concerns such as socializing or leisure activities (Dietz, Hofer & Fries, 2007; Schouwenburg & Groenewoud, 2001; Hofer, Schmid, Fries, Dietz, Clausen, & Reinders, 2007; Senecal, Julien, and Guay (2003). Thus, when the need for belongingness is thwarted and affiliation goals cannot be sufficiently achieved, perceptions and concerns over the potential of social exclusion can disrupt persistence, cognition, and self-regulation (Baumeister & DeWall, 2005; Baumeister, DeWall, Ciarocco, & Twenge, 2005; Baumeister, Twenge, & Nuss, 2002). On the other hand, when affiliation goals in educational achievement contexts are congruent with academic achievement goals, an important convergence can take place such that self-regulated choices reflect those of the educational contexts (Urdan & Maehr, 1995). For example, DeWall, Baumeister, and Vohs (2008) showed that participants, led to believe that they should expect a future of poor social relationships and loneliness, performed

better than participants led to believe that they should expect a future of good social relationships when tasks were framed as diagnostic of traits desirable for good social relationships. This implies that an active need for belongingness can engender a search for contexts that support affiliation goals and may be problematic only if contexts are antithetical to academic achievement (Dishion, Spracklen, Andrews, & Patterson, 1996; Finn, 1989; Fordham & Ogbu, 1986; Fries & Dietz, 2007; Hofer, et al., 2007; Hymel, Comfort, Schonert-Reichl, & Mcdougall, 1996; Juvonen, 2006; Mounts & Steinberg, 1995; Osterman, 2000).

Thus, behaviors associated with non-social tasks that are unpleasant in some way (e.g., boring, arduous, tedious, etc.), may not be self-regulated in a way that is productive if belongingness needs are active and the tasks are not perceived as socially relevant or meaningful. Given limitations of executive processing, a choice to self-regulate in one domain implies less willingness to self-regulate in another domain (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister & Heatherington, 1996; Baumeister, Muraven, &Tice, 2000; Muraven & Baumeister, 2000). Students' tendency to procrastinate, as a trait (Schouwenburg, 2004), may be one of the long-term consequences of socially irrelevant academic tasks.

However, high attainment, intrinsic, and/or utility values (Eccles, 2005) associated with academic tasks should be negatively related to procrastination due either to a convergence with social values (Urdan & Maehr, 1995) or perhaps independently of them. Regardless, academic values are known to be positively related to study management and effort (Pintrich, Smith, Garcia, and McKeachie, 1993) and thus should be negatively related to the tendency to procrastinate.

The tendency to procrastinate, as a factor in decisions regarding which task to pursue, contributes in the modulation of the goal action hierarchy by helping determine what goal linkages are activated. For example, the extent that academic goals are subjectively irrelevant or

aversive, their completion is delayed until their perceived utility surpasses the utility of all other competing goals (Steel, 2007; Steel & König, 2006). Over the long term, however, chronic procrastination may lead to negative relationships with academic achievement goal orientations, a decrease in one's sense of self-efficacy (Haycock, McCarthy, & Skay, 1998; Klassen, Krawchuk, & Rajani, 2008; Sirios, 2004; Tuckman, 1991; Wolters, 2003) and an increase in perceived stress (Blunt and Pychyl, 2000; Flett, Blankstein, & Martin, 1995; Lay, Edwards, Parker, & Endler, 1989; Rothblum, Solomon, & Murakami, 1986; Schraw, Wadkins, & Olafson, 2007; Solomon & Rothblum, 1984; Tice & Baumeister, 1997). Furthermore, to the extent that academic procrastination reduces important academic motivational outcomes, it may also have negative relationship with one's perception of belonging to an academic institution or to an "academy" more generally. Specifically, since self-regulated performance reflects the choices students make (Tuckman, 1990) it incorporates not only social values such as a desire for inclusion, but academic task values as well. Furthermore, there is evidence that perceived academic task value is positively related to perceptions of school belonging in middle school students (Anderman, 2003). It is therefore reasonable to assume that the tendency to procrastinate should also influence feelings of school belonging by virtue of its role in decision making based on these values. Thus, in academic contexts, procrastination, as a reflection of choice among values regarding belongingness, academic tasks, and grades, may be a linchpin linking these values to achievement goal orientation, academic self-regulatory self-efficacy, perceived stress, perceived belongingness in school, and ultimately, academic performance.

In addition to their hypothesized association with self-regulation, academic and social values may play an important direct role in students' achievement goal orientation and perceived school belongingness. Harackiewicz, Durik, Barron, Linnenbrink-Garcia, and Tauer (2008) showed how values can influence the degree to which different achievement goals are selected in

that both individual interest and work-mastery values (i.e., satisfaction with working hard, see Spence & Helmreich, 1983) positively predicted mastery goals, but negatively predicted work avoidance and performance-avoidance goals and were unrelated to performance-approach goals. However, values associated with the construct of competitiveness (Spence & Helmreich, 1983) positively predicted performance-approach goals as well as performance-avoidance and work-mastery goals but were negatively related to mastery goals. Thus, different values may relate in specific ways with achievement goals that may account for some of the differences and similarities between performance-approach, performance-avoidance, and mastery goals (Anderman & Wolters, 2006; Kaplan & Maehr, 2007).

Finally, direct positive relationships have been found between school belonging and both academic task values and grade point average (Anderman, 2003; Anderman & Freeman, 2004). In addition, social values, manifested as concerns over social exclusion, should motivate students' attempts to achieve a sense of belonging in school as they transition into their new environment. For example, the research reviewed by Anderman and Freeman (2004) corroborates the notion of the importance of congruency between social and academic goals in understanding academic achievement, motivation, and well-being and that this congruency depends in part on a student's sense of belongingness "in school" as well as "at a school". To the extent that a student feels that s/he belongs to an *academy* and/or at a particular school, the values held and goals attempted will more likely be those associated with those endorsed by the academy and/or the school. Thus, concerns about potential social exclusion or, equivalently, a desire for inclusion may motivate students to seek out other students and faculty and thereby directly increase the likelihood of becoming involved in activities at the institution as well as feeling a sense of belonging in the academy. To this extent, a desire for social inclusion can have beneficial consequences working through increases in feelings of school belonging.

The Benefits of Feelings of School Belongingness

One factor that may be important for understanding student academic engagement is that of a student's sense of belonging in school generally, as well as a sense of belonging at a particular school (Anderman & Freeman, 2004). There is evidence that a sense of school belonging may be positively related to a students' academic motivation and achievement as well as their overall subjective well being (Anderman, 2003; Anderman & Freeman, 2004; Freeman, et al., 2007). Anderman and Anderman, (1999) and Anderman (1999) have shown how perceived school belonging can have beneficial effects during a period of transition. In these studies, the transition involved children moving from elementary to middle school, a period that can have detrimental effects on students' motivation and self-concept (e.g. Midgley, Anderman, & Hicks, 1995). Another important academic transition in many students' lives is that between high school and college. Interestingly, many of the same buffering effects on motivation and achievement behavior seen in younger students are also seen in late adolescents' transition to college (Freeman, Anderman, & Jensen, 2007; Pittman & Richmond, 2007; 2008). In a longitudinal study Pittman and Richmond (2008) showed that perceived university belonging was positively related to academic and social competence and negatively related to feelings of depression and anxiety as students transitioned from high school to college. Freeman, Anderman, and Jensen (2007) also showed the importance of perceived class belonging in college. That is, students sense of class belonging was positively related to self-efficacy, intrinsic motivation, and academic value during students first semester at a university. In addition, they showed that perceived social acceptance of peers and professor caring were positively related to an overall sense of university belonging. The finding that students' perception of social acceptance by peers was related to their sense of university belonging,

underscores the importance of the role of peer relationships in affect, motivation, and achievement in college.

Second, perceived school belongingness may play a role as a buffer against the effects of stress. There is research that suggests that feelings of school belonging are positively associated with well-being (Anderman & Freeman, 2004) and self-efficacy (Freeman, et al., 2007; Roeser, Midgley, & Urdan, 1996). For example, feelings of school belonging are negatively related to depression (Anderman, 2002), and positively associated with positive affect (Anderman, 1999; Roeser, et al., 1996). Anderman (1999) found that for fifth graders transitioning to middle schools and experiencing a sense of school belonging in the new school reported feeling happier and less frustrated and bored relative to the old school. In addition, Freeman et al. (2007) reported significant positive correlations between self-efficacy and class and university belonging.

Finally, while there has not been that much research on the relationship between school belonging and self-efficacy, Freeman et al. (2007) have reported significant positive correlations between self-efficacy and class and university belonging. In addition, Anderman and Freeman (2004) suggested a model whereby school belonging has indirect effects on academic achievement through affective, cognitive, motivational variables. The model proposed in the current study is similar to this in that school belonging is proposed to influence academic outcomes indirectly through perceived stress and self-efficacy.

Self-Efficacy as a Mediating Influence on Perceived Stress and Academic Performance

There is a considerable evidence suggesting that perceived academic self-efficacy is positively related to academic outcomes (Bandura, 1997; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Gore, 2006; Kahn & Nauta, 2001; Pajares, 1996; Pintrich & DeGroot, 1990; Roeser, et al., 1996; Schunk & Pajares, 2005; Tuckman, 1990; Tuckman & Sexton, 1990; 1991;

Zimmerman, 2000; Zimmerman, Bandura, & Martinez-Pons, 1992; Zimmerman & Kitsantas, 2005; 2007). However, in this study, in addition to direct effects on academic performance, self-regulatory self-efficacy is hypothesized to play another potential role in academic achievement as a mediator of the influence of achievement goal orientations, procrastination, and a sense of school belonging on academic performance and perceived stress. Specifically, self-efficacy beliefs can change over the course of an academic term (Sexton & Tuckman, 1991; Sexton, Tuckman, & Crehan, 1992) and estimates of self-efficacy early in a term tend to be poor estimators of performance (Tuckman & Sexton, 1990). Thus, to the extent that self-efficacy develops over time, it is reasonable to assume that is influenced by a number of motivational, social, and dispositional factors. Therefore, the influence of self-efficacy on academic performance is hypothesized in this study to be a function achievement goal orientations (e.g., Breland and Donovan, 2005; Middleton and Midgley, 1997; Phillips and Gully, 1997; Skaalvik, 1997; Wolters, Yu, & Pintrich, 1996) procrastination (Sirois, 2004), and a sense of school belonging (see Anderman & Freeman, 2004).

Finally, it appears that self-efficacy may help attenuate the effects of anxiety either through viewing situations as challenging, as opposed to threatening, and/or through appraisals of one's possession of the necessary resources and decision skills (Bandura, 1997). To the extent that self-efficacy can help students attend to and master skills and knowledge, regulate study behavior and management skills, and see failures as opportunities, it increases the likelihood of believing that one has the necessary coping resources to deal with potentially threatening situations and thus the tendency to view these situations as challenges rather than threats (Chemers, Hu, & Garcia, 2001). For example, Chemers et al. (2001) found a direct negative relationship between students' beliefs about their capabilities to deal with academic demands and general perceived stress. In the present study, it is expected that self-regulatory self-efficacy

beliefs should decrease the perception of end-of-term activities as threatening thereby reducing reports of perceived stress.

Purpose of the Study

This study tests the hypothesis that procrastination, influenced by academic and social values measured early in college students' first term, affects subsequent achievement goal orientation, self-efficacy, school belongingness, and stress later in the term. In addition, these latter factors are hypothesized to affect academic performance at the end of the first term. Specifically, the tendency to procrastinate and academic and social values were assessed during the second week and achievement goal orientation and self-efficacy, perceived school belongingness, and perceived stress were assessed during the eighth week of a ten-week term (quarter). First term GPA was assessed after final examinations were completed.

Table 1 provides a summary of all the major hypotheses of this study. The criteria variables are presented as columns and each row is an exogenous or endogenous predictor. Plus and minus signs indicate a hypothesized significant positive or negative relationship whereas zeros indicate that a non-significant relationship is expected. Question marks indicate that the relationship is tested, but no specific hypothesis is presented. Finally 'N/A' indicates that the relationship is not of interest, or not possible.

Methods

Participants

Two-thousand and forty-four first term freshmen (mean age at the beginning of the study = 18.2 [SD = 0.70]; 48.3% women; 14.8% minority; 77.2% White-Non Hispanic; 8.0% Undesignated Ethnicity), enrolled in a freshmen survey course at a large mid-western university during their first term of enrollment (autumn 2008), were requested to participate in the study. At

the beginning of the study 50.0% of students had declared a major in the College of Business. The remaining students had undeclared majors.

There were two rounds of questionnaires, the first during the second week of the term and the second during the eighth week of the term. Of the 2,044 students initially requested to participate, 671 completed both the first and second round questionnaires. Only students completing both rounds were included in the analysis of the study's full model and core hypotheses. The mean age of this sample at the beginning of the study was 18.2 years (SD = 0.75) and was composed of 60.4% women, 10.3% minority, 78.2% White-Non Hispanic, and 11.5% Undesignated Ethnicity. At the beginning of the study 61.4% of the sample had declared a major in the College of Business. The remaining students had undeclared majors.

Procedure

Data Collection

Students were recruited during a meeting of their freshmen survey course in the first week of autumn term 2008 and were given bonus credit for the course for participating in the study. All students were introduced to the study by their survey course instructor who handed out a cover letter and informed students that participation in the study was just one of a number of extra credit bonus options for the course. E-mail notifications were subsequently sent from the experimenter to all students at the end of the first week of the term and again at the end of the seventh week of the term to remind them of the study and bonus credit, to give details regarding the instructions for completing the online questionnaire, and to notify students who had possibly missed the class in which the cover letter was handed out. Just prior to completing both web-based questionnaires, all students were required to read and electronically sign a release form permitting the experimenter access to their grades and demographic information available from university records. If students did not electronically sign the release form they were prevented

from completing the questionnaires. Upon agreeing with the conditions of the study and electronically signing the form, the questionnaire was made immediately available. The questionnaires were available to students for seven days (i.e. Monday through Sunday of the second and eighth weeks respectively). Finally, all students who completed a questionnaire were sent an e-mail thanking them for their participation, reminding them that they had given their consent authorizing the experimenter access to certain information, and that they were free to leave the study at any time without penalty.

Analyses

The hypotheses above imply a nomological network that is best assessed using a path analytic procedure utilizing the methodology of structural equation modeling (SEM). *Mplus 5.2* statistical software (Muthén & Muthén, 2007) was used in all exploratory and confirmatory factor analyses and the analysis of the structural models. Unreduced correlation matrices were analyzed in the exploratory factor analyses (EFA) and covariance matrices were analyzed in the confirmatory measurement (CFA) and structural models (SEM). In addition, since the indicator variables were nonnormal and some variables had missing values (a maximum of 3.1% missing for high school class rank), the MLR estimator and a sandwich estimator for estimating standard errors available in *Mplus 5.2* was used for all EFA, CFA, and SEM models. The MLR estimator is asymptotically equivalent to the rescaled T2* statistic of Yuan and Bentler (2000) (Muthén & Muthén, 2007) and has been recommended for non-normal, medium size data sets with missing data.

Measurement of Constructs

Description of Instruments

Social Exclusion Concerns (CSE): This six item scale, developed for this study, was intended as a measure of concern over social exclusion and desire for belongingness. The six

items that make up this scale are part of a larger 18-item instrument. There is no published reliability or validity data on this instrument. However, the internal reliability of these six items for current sample of 671 students was 0.82. The items and pattern weights along with the factor determinacy and internal reliability of the scale is shown in Table 2. The procedure for determining the construction of this scale is described below.

Academic Values (AV): This construct is based on an adaptation of the 12 items of the *Motivated Strategies for Learning Questionnaire* (MSLQ) Task Value scale which was intended to represent "judgments of how interesting, useful, and important the course content is to the student" (Pintrich, et al., 1993, p. 802). The adaptation for the present study involved asking students about the challenge, interest, importance, and utility of all their classes. It has a published internal consistency of 0.90 (Pintrich, et al., 1993). The internal consistency for the current sample was 0.86.

Grade Values (GV): This construct is measured using two items adapted from Zimmerman, et al. (1992) that asks students what grade point average would be minimally satisfying for the current term and for the current academic year. The internal consistency of these two items was 0.92 in this study. Because these items request information specifically about a grade point average, they are conceptualized here to reflect the value of demonstrating success in college defined specifically in terms of grades.

Procrastination/Lack of Self-Regulation (PROC): Two separately developed scales were used to measure this construct. The *Self Control Scale* (SCS) was developed by Tangney, Baumeister, & Boone (2004) to measure aspects of self-control such as restraint or impulse control, self-discipline, and distractibility. The current research uses the 13-item Brief Form of this instrument. The authors reported a test-retest reliability coefficient of 0.89 and internal reliabilities ranging from 0.83 to 0.85 for the 13-item version.

The second scale is *The Tuckman Procrastination Scale* (TPS) (Tuckman, 1991). This is a 16-item scale that was designed to detect the tendency to procrastinate in completing college assignments. The author reported an internal consistency coefficient of 0.86. This scale is a widely used measure of procrastination and was designed specifically for college student populations.

Prior pilot research suggested that the separate latent constructs of self-control based on the SCS and procrastination based on the TPS were highly correlated (r = -0.741). Therefore, the items from both instruments were combined in a factor analysis in order to extract dimensions as a preliminary step in creating parcel indicators for this construct. (More detail regarding the construction of parcel indicators is discussed below.) Preliminary factor analysis of these items resulted in the combination of 12 of the original 13 items from the SCS (all items reverse scored) and 14 of the original 16 items from the TPS. One item from SCS and two items TPS were removed from further analyses because their similar wordings resulted in dimensions including only those items. The internal consistency of the 26 items was 0.93. This construct represents procrastination as a lack of self-regulation associated with weak impulse control, distractibility, and lack of work discipline.

School Belongingness (SB): This construct is based on an adaptation of Goodenow's (1993) *The Psychological Sense of School Membership (PSSM) Scale*. This is an 18-item instrument that measures what Goodenow refers to as "the extent to which students feel personally accepted, respected, included, and supported by others in the school social environment" (p. 80). Internal reliabilities reported by the author ranged from 0.82 to 0.88 for fifth through eight graders. The internal reliability for the present study of college freshman was 0.89.

Achievement Goal Orientation: This is an adapted version of a 12-item scale developed by Elliot and McGregor (2001) that was intended to measure the approach and avoidance dimensions of mastery and performance goal orientations. The four subscales in this instrument, reflecting the 2 x 2 dimensions, have reported reliabilities ranging from 0.83 to 0.92. The adaptation of this instrument for this study involved rewording the items so that students would attend to a given achievement goal specifically in the context of their first term at the university. Thus all twelve items began with the phrase "In setting my academic goals for the end of this term, I am focused on . . ." This phrase was then followed by an achievement goal.

Self-Regulatory Self-Efficacy (SE): The current research adapts 13 of the 19 items of the *Self-Efficacy of Learning Form (SELF-A)* (Zimmerman & Kitsantas, 2007). This scale assesses beliefs regarding their use of self-efficacy regulatory processes in academic settings. The authors reported an internal consistency of 0.97. However, preliminary factor analyses of the full 19-item version with the current sample of students showed that six of the items loading together as a separate dimension had an unacceptable internal consistency (alpha = 0.687) and factor determinacy (r = 0.873) and were thus removed from further analyses. The internal reliability for the 13 adapted items in the present sample was 0.89.

Perceived Stress (PS): *The Perceived Stress Scale,* developed by Cohen, Kamarck, and Mermelstein (1983), is used in this study to measure the construct of perceived stress defined as "the degree to which situations in one's life are appraised as stressful" (Cohen et al., 1983, p. 394). The internal consistency reported in the original report averaged 0.85 over three samples. The 14-item version used in this study had an internal reliability of 0.88.

High School Class Rank (HSCR) and Standardized Test Scores (ACT): These scores, pulled from the university's central records database, were used as measures of ability. HSCR is measured as a percentile. Standardized test scores were the highest ACT composite or SAT

verbal/math composite a student supplied to the university. SAT composite scores were converted to ACT scores using a standard concordance table.

Academic Achievement. Achievement was measured as the first term grade point average (GPA), on a scale from 0.00 to 4.00, at the end of the autumn term

All questionnaire items were scored on an 11-point scale. The two GV items, which reflect grade point averages, were anchored at 0.0 [F] at the low end and 4.0 [A] at the high end. The remaining 9 values increased from 1.0 to 4.0 in units representing grade letter values at the university (i.e., 1.0 [D], 1.3 [D+], 1.7 [C-], 2.0 [C], 2.3 [C+], 2.7 [B-], 3.0 [B], 3.3 [B+], and 3.7 [A-]). All other items were anchored at 0 as "That Is Not Me For Sure" and at 10 as "That Is Me for Sure". The items of all scales were presented in random order in an attempt to attenuate method variance due to item similarity. HSCR, ACT, and GPA were scored in their own units.

The Construction of Parcel Indicators

Given the large number of variables used in this study (103 items plus two ability measures and one achievement measure), the first concern in constructing a measurement model is the very large correlation matrix that would result and the number of parameters that need to be estimated. The problem with a large correlation matrix is that a model is less likely to fit the data even if it provides a good description of a given phenomenon (Coffman & MacCallum, 2005). Therefore, it is desirable to seek some balance between the number of indicators per construct and the reduction in the order of the correlation matrix (Little, Lindenberger, & Nesselroade, 1999) while including all of the information contained in the individual items.

One technique that can reduce the number of indicators while utilizing the information from all of the items is the creation of parcels (Cattell & Burdsal, 1975; Coffman & MacCallum, 2005; Kishton & Widaman, 1994; Little, Cunnignham, Shahar, & Widaman, 2002; MacCallum & Austin, 2000). A parcel is an aggregated indictor created by summing or averaging two or

more items (Little, et al., 2002). Parceling has the advantage of reducing the likelihood of correlated residual error and dual factor loadings (Little, et al., 2002). Parcels also tend to have higher reliability and communality, can deviate less from a normal distribution as the number of items in a parcel increase, and are more efficient than individual items because they tend to be closer to the true construct centroid (Little, et al., 1999; Little, et al., 2002). In addition, parceling increases the degrees of freedom of the model (Coffman & MacCallum, 2005) and thereby increases the power of the tests assessing model fit (MacCallum, Browne, & Sugawara, 1996).

One particularly useful method for creating parcels is referred to as the domain-representative approach (Kishton & Widamen, 1994). For multidimensional constructs, items from each dimension are summed or averaged to create each parcel indicator (Little, et al., 2002) thereby permitting each parcel to represent all dimensions. The domain-representative approach was used to create parcel indicators in this study for all multidimensional latent constructs. For unidimensional constructs, parcel indicators were created by randomly assigning items to parcels. The achievement goal orientations and GV constructs were measured by the individual items since there were only three item indicators for each of the achievement goal orientation constructs and two item indicators for the GV constructs.

The dimensions for six latent constructs (i.e., CSE, AV, PROC, SE, SB, and PS) were first determined separately for each instrument representing a construct via a series of oblique rotation (Geomin) maximum likelihood exploratory factor analyses. Given the consistent and widespread agreement that no one method is sufficient for determining the number of factors or dimensions underlying a correlation matrix (e.g., Nunnally & Bernstein, 1994; Fabrigar, Wegener, MacCallum, & Strahan, 1999; Rummel, 1970; Zwick & Velicer, 1986), a number of criteria were used to determine the number of dimensions indicating a construct.

First, using O'Conner's (2000) SAS® implementation, the method of parallel analysis (Horn, 1965; Montanelli & Humphreys, 1976; O'Conner, 2000) was performed to ascertain the initial number of dimensions for each construct. This method compares a pre-specified percentile (e.g. 95th percentile) of a distribution of eigenvalues of a series of correlation matrices of randomly generated data (using the same number of subjects and variables as in the real sample data) with the eigenvalues of the correlation matrix of the real sample data. The crossover point, where the eigenvalues of the sample correlation matrix equal the eigenvalues of the random data, indicates where random and insignificant dimensions of the sample data begin (Nunnally & Bernstein, 1994).

Second, after the eigenvalues were examined in the parallel analysis phase, two different exploratory factor analysis models were run for each instrument representing a latent construct. Each factor analysis extracted a different number of dimensions that varied as a function of the number of dimensions determined in the parallel analysis. Thus, if p dimensions were determined by a parallel analysis of a given instrument, two exploratory factor analyses were run extracting p and p+1 dimensions and the fit indices for each of the three exploratory factor analyses were examined. Indices indicating the best fit for a given number of dimensions, in combination with a high degree of factor determinacy, interpretability, and low factor specificity (see below) were used as criteria in selecting the number of dimensions. The determination of fit was based on examining the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root-Mean-Square Error of Approximation (RMSEA), and Standardized Root-Mean-Square Residual (SRMR) of different models with varying number of dimensions generated from exploratory factor analyses using maximum likelihood estimation and *Mplus* implementation of oblique Geomin rotation.

Factor determinacy was used as a third criterion. Factor determinacy refers to the uniqueness of the factor scores (Rummel, 1970) and reflects their conceptual meaning (Schönemann & Wang, 1972). Specifically, factor determinacy reflects the multiple correlation between each factor and the measured variables (Rummel, 1970) and is an indication of the correlation between the estimated factor scores with the true factor scores (Grice, 2001; Rummel, 1970). There are no known standards or rules of thumb as to a minimal cutoff value for factor determinacy, but any value less than 0.90 implies that the smallest correlation among all the factor score estimates and the true factor score is less than 0.62[1]. This criterion can help temper the tendency of maximum likelihood estimation to extract too many factors leaving either trivial or poorly determined factors (Schönemann & Wang, 1972). Also, while not used as a criterion for dimension extraction, Cronbach's alpha was also calculated for the variables of the extracted dimensions. Internal reliability estimates in this study relate only to the variables with the highest loadings on a dimension and not to the determinacy of that dimension. Nevertheless, if these variables represent an internally consistent dimension then Cronbach's alpha should approach acceptable levels (e.g., greater than 0.80).

A fourth criterion is parsimony or a lack of highly specific dimensions. Extracted factors with only one or two variables loading highly and the remaining variables showing low loadings may be too highly specific. The search at this phase of the analysis is for common dimensions. Overextraction of dimensions can represent a violation of parsimony if a solution with one less extracted dimension shows an acceptable fit.

The final criterion is interpretability. This may help prevent underextraction of small, yet meaningful dimensions. Rummel (1970) claims that "smaller factors . . . may tap conceptually new or unsuspected influences in a domain" (p. 362). As such, a small meaningful dimension

with only three items loading heavily on it with an acceptable factor determinacy would be considered if a significant increase in fit was evidenced.

After the dimensions were determined, the items were assigned to parcels using the domain-representative approach for multidimensional constructs and random assignment for unidimensional constructs. Once achieved, the parcels indicator values for each student were created by averaging the items assigned to each parcel.

Estimation of the Measurement Model

In line with the recommendations of Anderson and Gerbing (1988), a confirmatory measurement model was estimated separately and before the estimation of the structural model. The rationale for this procedure is to ascertain the measurement stability of the latent constructs. That is, the measures should indicate the same construct for both the measurement and structural models. This is assessed by noting the changes in the pattern coefficients from the measurement and structural model. Specifically, the coefficients estimated in the measurement model should not change or "should change only trivially" (Anderson & Gerbing, 1988, p. 418) in the structural model. The confirmatory measurement model used the domain-representative parcels as indicators of the latent constructs (with the exception of grade value and goal orientation constructs which used individual items). The primary hypothesis of the confirmatory factor model is that the indicators load only on the constructs they are intended to measure (i.e. simple structure with no cross loadings) and that there is no significant correlation among any of the indicator errors. As this is a saturated model, all of the latent constructs were correlated.

Estimation of the Structural Model and Testing of the Structural Hypotheses

To test the hypotheses outlined in Table 1 a number of structural models were tested. First, a model (Model S1) was run that estimated all of the structural paths not identified as

"N/A". As such, this may be considered to be a saturated or full model with respect to the hypotheses.

After Model S1 was run a series of planned tests, based on the recommendations of Gonzalez & Griffen (2001), were implemented involving the placement of constraints on all structural path coefficients one at a time to the freely estimated parameters. Constraints specified by each hypothesis were forced on the model one at a time and chi-square likelihood ratio tests[2] with one degree of freedom were used to assess the reasonableness of each imposed constraint. After each individual constraint was tested and assessed, it was removed (i.e., freely re-estimated) while the next individual constraint was forced and tested. After testing all the individual constraints, all structural paths assessed to be not significantly different from zero were constrained to zero and the new model (S2) retested freely estimating the remaining parameters. This model was then compared to the theoretical model specified by the eight hypotheses.

Results

Preliminary factor analyses used to determine the dimensionality of six constructs (i.e., CSE, AV, PROC, SE, SB, and PS) suggested one dimension for CSE (see Table 2) and SE, two dimensions for AV, PROC, SE, and PS, and three dimensions for SB. As such, parcel indicators were created using the domain-representative approach for AV, PROC, SE, and PS and random assignment for CSE and SE respectively. Table 3 shows the means, standard deviations, and correlations for all indicators of all the constructs.

Model M1, with no cross loadings or correlated indicator errors and all latent constructs correlated, resulted in an acceptable fit to the data (χ^2 = 1015.83, df = 409, $p < .0001$, CFI = .951, TLI = .940, RMSEA = .047, RMSEA 90% CI = [.043, .051], P(RMSEA ≤ .05) = .910, SRMR = .042).

Having determined that the hypothesized measurement model adequately fit the data, an examination of the correlations among the latent variables revealed an extremely high positive correlation (0.859) between PAP and PAV. Given that the performance achievement goal orientation variables are conceptualized as predictors of end-of-term GPA, the potential for problems due to the collinearity between them needed to be addressed. The effects of collinearity of the magnitude seen here are well known, among them being very large standard errors of the structural path coefficients (Marsh, Dowson, Pietsch, & Walker, 2004) and unacceptably high Type II error rates (Grewal, Cote, & Baumgartner, 2004).

While it is known that students may not distinguish between the approach and avoidance dimensions of performance goals in the ways researchers intend (Urdan & Mestas, 2006) and there is at least one other study that found performance-approach and performance-avoidance goals to be highly correlated (Elliot & Murayama, 2008), at present there is no theoretical or empirical justification for combining performance-approach and performance-avoidance constructs. As such, rather than combining the approach-avoidance dimensions, it was decided to narrow the scope of the hypotheses to mastery and performance distinctions along the approach dimension. The approach dimension was chosen because there is considerably more research studying mastery-approach relative to mastery-avoidance and in order to study the potential mastery/performance distinction without confounding the approach/avoidance dimensions, the performance-avoidance and mastery-avoidance orientations were removed.

The confirmatory factor analysis was re-run as model M2 with PAV and MAV removed. This model, with no cross loadings or correlated indicator errors and all latent constructs correlated, resulted in an acceptable fit to the data (χ^2 = 585.68, df = 263, $p < .0001$, CFI = .968, TLI = .960, RMSEA = .043, RMSEA 90% CI = [.038, .047], P(RMSEA ≤ .05) = .995, SRMR = .038). The correlation matrix of the latent variables for model M2 is shown in Table 4.

Structural Model: Direct Effects

The full model (S1) estimating all the structural paths fit the data well (χ^2 = 801.39, df = 327, $p < .0001$, BIC = 61,996; CFI = .955, TLI = .944, RMSEA = .046, RMSEA 90% CI = [.042, .051], P(RMSEA ≤ .05) = .920, SRMR = .045). One relationship hypothesized to be positive (SB on GV) was found to be non-significant. In addition, two relationships hypothesized to be negative (PAP on PROC and MAP on PROC) were also found to be non-significant. Finally, one relationship hypothesized to be non-significant (GPA on GV) was found to be significantly positive.

A second model (Model S2) was run constraining to zero all structural parameters found to be zero in S1 including the three parameters originally hypothesized to be significantly different from zero. Six of the correlations among the exogenous variables found to be non-significant in S1 were constrained to zero in S2. All other structural parameters that were free in S1 were free in S2. As such, S2 is nested within S1 and the differences between the models may be assessed by a chi-square difference test with 24 degrees of freedom. Model S2 fit the data adequately (χ^2 = 853.11, df = 351, $p < .0001$, BIC = 61,976; CFI = .952, TLI = .945, RMSEA = .046, RMSEA 90% CI = [.042, .050], P(RMSEA ≤ .05) = .945, SRMR = .055), but was significantly different from the full model ($\Delta\chi^2(24) = 51.887$, $p = 0.0008$).

In comparing the originally hypothesized model with model S2, it was noted that there were only four paths that differed between it and the empirically derived model. The originally proposed model hypothesized that a significant positive relationship would exist between SB and GV and that significant negative relationships would exist between PAP and PROC and MAP and PROC respectively. However, the empirical model (Model S2) suggests that these relationships are not significantly different from zero. Finally, the hypothesized model specified

that the relationship between GV and GPA would be non-significant but Model S2 suggests that these constructs are positively related.

In order to test the proposed model against the empirically derived model, the following testing procedure was used. Model S2 was nested in a third model, model S3, where the three structural parameters found to be zero in S2 (i.e. PAP on PROC, MAP on PROC, and SB on GV) were freed. Freeing these parameters partly conforms to the theoretical model. The reasoning behind this procedure is that if model S3 is significantly different from model S2 it would suggest that freeing these three paths may be warranted. Further, if this were the case, then a fourth model (S4, the theoretical model) could be compared against model S3 by constraining the path of GPA on GV to zero. This fourth model would be nested in model S3 differing by one degree of freedom. However, if models S2 and S3 are not different then model S2 should be chosen as the "best" model because it is the most parsimonious.

Model S3 fit the data adequately (χ^2 = 845.24, df = 348, $p < .0001$, BIC = 61,977; CFI = .953, TLI = .945, RMSEA = .046, RMSEA 90% CI = [.042, .050], P(RMSEA ≤ .05) = .946, SRMR = .052) and the addition of three extra parameters resulted in a trivial penalty according the BIC criterion. However the difference between models S2 and S3 was only marginally significant ($\Delta\chi^2(3) = 7.814$, $p = 0.05$).

Even though this result, in combination with the fact that S2 is more parsimonious than S3, suggests that S2 should be accepted, model S4 was run to see if the path from GV to GPA should be dropped. Constraining this path produced a model (S4) that had an adequate fit to the data (χ^2 = 857.87, df = 349, $p < .0001$, BIC = 61,988; CFI = .951, TLI = .944, RMSEA = .047, RMSEA 90% CI = [.043, .051], P(RMSEA ≤ .05) = .920, SRMR = .053), but was significantly different from S3 ($\Delta\chi^2(1) = 12.635$, $p = 0.0004$). Furthermore the BIC value for model S4 is higher than the BIC values of either S2 or S3 suggesting that S4 is inferior to models S2 and S3.

Given these results and the fact that model S2 is more parsimonious, model S4 (the originally proposed hypothetical model) is rejected and model S2 tentatively accepted as the best model.

One final model (Model S2B) was run to assess the importance of the path from SB to GPA. It was hypothesized that SB would positively predict GPA. However, a significant negative relationship between these constructs was found. This may be due to a suppression effect (J. Cohen & P. Cohen, 1975), and implies that for any level of self-efficacy, performance-approach orientation, perceived stress, grade value, ACT, and high school class rank, GPA tends to decrease with increasing level of perceived school belongingness. In particular, the relatively large correlations between SB and SE and between SB and PS (0.55 and -0.57 respectively; see Table 4) suggest that the relationship between SB and GPA may be due to strong relationships among the predictor variables and that removing the influence of these variables reveals a slightly debilitating influence of school belongingness on GPA. It turns out, however, that constraining the path from SB to GPA creates a model (S2B), while producing and acceptable fit to the data (χ^2 = 857.27, df = 352, p < .0001, BIC = 61,977; CFI = .952, TLI = .945, RMSEA = .046, RMSEA 90% CI = [.042, .050], P(RMSEA ≤ .05) = .942, SRMR = .055), differed significantly from model S2 ($\Delta\chi^2(1) = 4.931$, p = 0.0264). Based on this finding, it was concluded that the path with a negative structural coefficient from SB to GPA should not be removed from the final model. The final model (S2) is shown in Figure 1. Table 5 shows the unstandardized and standardized factor loadings for the final model along side the measurement model (M2). As can be seen the loadings in the measurement and structural models differ only trivially.

Structural Model: Total and Total Indirect Effects

Of interest in this study is an assessment of the total and indirect effects of social and academic values on the endogenous variables. Table 6 shows the total and total indirect effects

of social, grade, and academic task values on all the endogenous variables. In addition, the total and indirect effects of school belongingness and procrastination on GPA are also shown.

First, with the exception of the insignificant total effect of grade values on mastery-approach, all of the total effects of values on achievement goal orientations were significant (although the total effect of social exclusion concerns on mastery-approach was small). Also, it is clear that the magnitudes of the total effects were in the direction of the hypotheses. That is, the strongest total effects were from social exclusion concerns and grade values to performance-approach and from academic task values to mastery-approach.

Second, while there was a significantly negative (albeit small) indirect effect of social exclusion concerns on perceived school belonging, the total effect was positive as predicted. However, while the direct effects of social exclusion concerns and academic task values on perceived school belonging were similar (see Figure 1), the total effect of academic task values on perceived school belongingness was twice that of social exclusion concerns.

Third only academic task and grade values had significant total effects on self-efficacy and perceived stress. It is noteworthy that both academic task and grade values had positive total effects on self-efficacy and negative total effects on perceived stress.

Finally, there were significant positive total effects of academic task and grade values, but not social exclusion concerns, on GPA. In addition, procrastination had a significant negative total effect on GPA. Interestingly, the total effect of perceived school belonging on GPA was not significant, but the indirect effect was. This corroborates the notion that school belonging may have its beneficial effects on academic performance indirectly through its positive association with self-efficacy and its negative association with perceived stress.

Discussion

First, evidence was found for the predictions regarding the relationships between values and procrastination: academic and grade values negatively predicted and social exclusion concerns positively predicted procrastination respectively. Thus, in addition to providing further evidence of the beneficial influence of academic task values (Pintrich, et al., 1993), this study corroborates experimental findings of the deleterious influence of social exclusion on self-regulation (Baumeister, et al., 2002; Baumeister, et al., 2005; DeWall & Baumeister, 2005). It was also shown that individual difference variables such as values and the tendency to procrastinate, assessed early in an academic term, were significantly related to school belongingness, achievement goal orientations, self-efficacy, and perceived stress assessed six weeks later. In addition, this is the first study that we are aware of to show the potentially deleterious influence of procrastination on perceived school belongingness.

Second, the results of this study corroborate findings of previous research (see Anderman & Wolters, 2006 and Kaplan & Maehr, 2007 for reviews) showing the differences between mastery- and performance-approach goals. Mastery-approach orientation was found to be positively related to academic values but not grade values and had no significant relationship to end-of-term grades. Performance-approach orientation was found to be significantly related to grade values and significantly (and positively) predicted end of term grade point average. In addition, the relationships between school belongingness and academic values, mastery-approach orientation, and self-efficacy found in prior research were also found in the present study (Anderman, 2003; Anderman & Freeman, 2004).

Third, this study supported prior research in showing a significant negative relationship between procrastination and self-efficacy (Bandura, 1997; Haycock, et al., 1998; Klassen et al., 2008; Sirois, 2004; Steel, 2007; van Eerde, 2003; Wolters, 2003) and a significant positive relationship between procrastination and perceived stress (Flett, et al., 1995; Lay, et al., 1989;

Rothblum, et al., 1986; Schraw, et al., 2007; Tice & Baumeister, 1997; Solomon & Rothblum, 1984).

Fourth, this study showed that school belongingness, self-efficacy, and perceived stress measures assessed three weeks prior to first term freshmen's first final examinations contributed significantly in predicting grade point average even after ability measures were controlled.

Finally, the results of this study provide support for the pedagogical practice of offering courses and programs in the first term designed to help students overcome procrastination and manage their time (e.g. Tuckman, 2002; Tuckman, Abry, & Smith, 2008). It was found that students who tend not to procrastinate also tend to report stronger feelings of school belongingness, lower perceived stress, and higher self-efficacy and, indirectly, somewhat higher end-of-term GPAs. Clearly, programs and pedagogies designed to reduce the likelihood of procrastination during students' first term can be one expedient to increasing self-efficacy, reducing end-of-term stress, and possibly even fostering a sense of school belongingness that may actualize as a successful and satisfying first term.

Limitations of the Study

This study has a number of limitations that need to be addressed. First, the data reported in this study is based on a convenience sample. Specifically, the sample of students who agreed to participate was overrepresented with respect to high-ability students and women and underrepresented with respect to minorities. Caution is thus warranted when generalizing to the desired population.

Second, since this study was correlational, causal statements cannot be implied by the directionality of the hypotheses. At best, the relationships between constructs measured at different times are predictive. In addition, there is always the potential for method variance to

confound interpretations of relationships between constructs measured at the same time. Thus, an assessment of causal relationships among these constructs awaits experimental evidence.

Finally, this study was unable to demonstrate distinct performance-approach and performance-avoidance constructs. It appears that students did not distinguish among the items measuring these putatively distinct constructs and it was thus necessary to drop the avoidance-dimension constructs. Much of the literature in this area has shown that these constructs are related but distinct. Nevertheless, despite a general consensus regarding the distinction between these constructs, other research has shown the potential for research participants to conflate these constructs. For example, Urdan and Mestas (2006) showed that students may not distinguish the constructs and Elliot and Murayama (2008), in a revision of the instrument used in this study, showed an attenuated correlation of 0.68 between performance-approach and performance-avoidance. It is reasonable to assume that a disattenuated correlation would be even higher.

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Footnotes

[1]Letting ρ represent the multiple correlation between each factor and the measured variables, the degree to which competing orthogonal factor scores can be computed for the same factor is $r_{min} = 2\rho^2 - 1$ and represents the smallest correlation of all of the factor score estimates and the true factor scores (Rummel, 1970). If $r_{min} = 2\rho^2 - 1 = 1$, then the estimated factor scores are said to be unique. Thus, high positive values of r_{min} are necessary if meaningful factor interpretation is to be achieved.

[2]The chi-square value for the MLR estimator in *Mplus* can not be used for chi-square difference tests because they are weighted or scaled chi-squares (Muthén & Muthén, 2008). This weight is referred to as a scaling correction factor (*cf*). In order to compute chi-square difference statistics using the MLR, Muthén & Muthén (2008) have provided a formula (available at http://www.statmodel.com/chidiff.shtml). Let χ_n^2 and χ_c^2 be values from a chi-square with df_n and df_c degrees of freedom for the nested and comparison models respectively. Further, let T_n^* and T_c^* be the Yuan-Bentler scaled chi-square statistics with scaling factors cf_n and cf_c and df_n and df_c degrees of freedom for the nested and comparison models respectively. The difference test statistic is distributed as chi-sqaure with $df_n - df_c$ degrees of freedom (Asparouhov & Muthén, 2005) and may be calculated as:

$$\Delta\chi^2(df_n - df_c) = \frac{\left[\left(cf_n \times T_n^*\right) - \left(cf_c \times T_c^*\right)\right]}{\left[\frac{\left(df_n \times cf_n\right) - \left(df_c \times cf_c\right)}{df_n - df_c}\right]}.$$

Table 1: Hypothesized Directions of the Structural Relationships[†]

Predictor Variables*		Endogenous Criteria Variables*								
		PROC	SB	PAP	PAV	MAP	MAV	SE	PS	GPA
Exogenous Variables	CSE	+	+	+	+	0	?	0	0	0
	AV	-	+	0	-	+	?	0	0	0
	GV	-	+	+	-	0	?	0	0	0
	ACT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	+
	HSCR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	+
Endogenous Variables	PROC	N/A	-	-	+	-	?	-	+	0
	SB	N/A	N/A	+	+	+	?	+	-	?
	PAP	N/A	N/A	N/A	N/A	N/A	N/A	+	0	+
	PAV	N/A	N/A	N/A	N/A	N/A	N/A	-	0	-
	MAP	N/A	N/A	N/A	N/A	N/A	N/A	+	0	0
	MAV	N/A	N/A	N/A	N/A	N/A	N/A	?	0	?
	SE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	+
	PS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-

[†]0 = No relationship predicted; '+' = Significant positive relationship predicted; '-' = Significant negative relationship predicted; '?' = Important but unknown relationship; 'N/A' = Not Applicable for this study

*CSE = Social Exclusion Concerns; AV = Academic Values; GV = Grade Values; ACT = Standardized Test Score; HSCR = High School Class Rank; PROC = Procrastination/Lack of Self-regulation; SB = School Belongingness; PAP = Performance-approach; PAV = Performance-avoidance; MAP = Mastery-approach; MAV = Mastery-avoidance; SE = Self-regulatory Self-Efficacy; PS = Perceived Stress; GPA = First Quarter Grade Point Average

Table 2: Items, Pattern Loadings, Factor Determinancy, and Internal Reliability for the Social Exclusion Concerns Scale

Social Exclusion Concerns (CSE)	Pattern Weights
I think it would be hurtful for my friends or people close to me to exclude me from being or doing things with them.	***0.773***
I think it is painful to be without friends or social relationships.	***0.731***
I am a person who likes to have a lot of friends.	***0.530***
I can't imagine anything more painful than my friends excluding me from being or doing things with them.	***0.727***
I don't really care if my friends or people close to me exclude me from doing things with them.	***0.724***
I would be upset if I lose friends because something I said or did made them angry or sad.	***0.475***
Factor Determinancy	0.920
Cronbach's Alpha	0.822

Table 3: Means, Standard Deviations, and Correlations of Indicators

Construct Label[a]	Indicator Label[b]		M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
GPA	GPA	1	3.4	0.6																	
ACT	ACT	2	27	3.0	.17																
HSCR	HSCR	3	87.8	9.6	.18	.06															
	PAP1	4	6.2	2.6	.15	-.02	-.03														
PAP	PAP2	5	6.5	2.5	.15	-.03	-.02	.79													
	PAP3	6	6.3	2.6	.16	-.04	-.08	.89	.79												
	PAV1	7	6.5	2.7	.07	-.09	.00	.68	.72	.67											
PAV	PAV2	8	5.6	2.7	.14	.03	-.01	.67	.62	.66	.57										
	PAV3	9	6.4	2.7	.09	-.07	-.01	.72	.74	.70	.82	.63									
	MAP1	10	7.6	1.8	.10	-.07	.03	.25	.27	.24	.26	.21	.27								
MAP	MAP2	11	7.6	1.8	.17	-.09	.08	.22	.20	.20	.21	.19	.23	.60							
	MAP3	12	7.0	2.0	.19	-.06	.07	.27	.27	.26	.25	.24	.28	.63	.68						
	MAV1	13	6.1	2.5	.12	.15	.03	.20	.14	.16	.16	.41	.17	.33	.32	.33					
MAV	MAV2	14	6.2	2.7	.13	.13	.05	.19	.18	.16	.18	.37	.18	.21	.23	.21	.60				
	MAV3	15	5.7	3.0	.15	.18	.03	.16	.13	.15	.13	.37	.14	.23	.19	.22	.62	.69			
	CSE1	16	7.8	1.9	.08	.06	-.05	.11	.15	.11	.11	.11	.14	.05	.06	.09	.05	.07	.05		
CSE	CSE2	17	6.7	2.1	.05	.11	-.05	.06	.12	.07	.06	.08	.09	-.10	-.10	.00	.00	.03	.03	.58	
	CSE3	18	7.9	1.7	.06	.07	.04	.10	.14	.10	.10	.07	.11	.02	.03	.05	.03	.00	.02	.58	.61
	AV1	19	7.3	1.3	.12	.05	.07	.16	.17	.14	.15	.11	.16	.51	.47	.48	.22	.15	.19	.07	-.10
AV	AV2	20	6.6	1.6	.11	.04	.02	.17	.19	.16	.16	.13	.14	.47	.44	.44	.21	.16	.16	.04	-.10
	AV3	21	6.4	1.8	.11	.05	.02	.03	.04	.05	.03	.05	.06	.42	.41	.36	.19	.17	.19	.02	.00
GV	GS1	22	3.3	0.3	.25	.23	.08	.13	.14	.15	.07	.10	.06	.11	.18	.16	.16	.08	.11	.10	.02
	GS2	23	3.3	0.3	.24	.30	.08	.12	.13	.13	.04	.10	.05	.08	.17	.13	.14	.08	.10	.09	.02
	SR1	24	4.2	1.5	-.20	.06	-.15	-.13	-.13	-.13	-.12	-.08	-.10	-.30	-.30	-.30	-.10	-.01	-.11	.01	.05
PROC	SR2	25	5.0	1.5	-.17	.05	-.15	-.08	-.08	-.08	-.09	-.05	-.10	-.30	-.30	-.30	-.10	-.01	-.06	.16	.12
	SR3	26	4.1	1.6	-.17	-.02	-.14	-.10	-.11	-.10	-.09	-.05	-.10	-.30	-.30	-.30	-.20	-.06	-.10	.03	.07
	BLNG1	27	7.5	1.5	.06	.02	.00	.17	.18	.19	.20	.15	.16	.31	.30	.30	.19	.12	.11	.19	.02
SB	BLNG2	28	6.9	1.4	.14	-.03	.07	.16	.18	.17	.16	.12	.13	.34	.37	.31	.20	.12	.11	.13	.02
	BLNG3	29	6.7	1.4	.13	.01	.02	.21	.24	.23	.20	.16	.17	.34	.32	.30	.19	.08	.11	.19	.05
	SE1	30	6.4	1.5	.20	-.08	.04	.27	.27	.27	.22	.18	.23	.47	.51	.51	.26	.15	.16	.05	-.10
SE	SE2	31	6.6	1.4	.22	.01	.05	.30	.28	.29	.23	.18	.23	.45	.46	.49	.30	.19	.22	.08	-.10
	SE3	32	6.6	1.4	.22	-.06	.07	.28	.31	.28	.27	.22	.26	.48	.50	.52	.30	.20	.20	.05	-.10
	PSS1	33	5.0	1.4	-.15	-.07	.01	-.05	-.05	-.07	-.03	-.06	.01	-.10	-.20	-.10	-.20	-.14	-.13	-.04	.00
PS	PSS2	34	3.9	1.6	-.15	-.01	.00	-.14	-.15	-.17	-.15	-.14	-.10	-.30	-.30	-.30	-.20	-.16	-.16	-.01	.05
	PSS3	35	4.5	1.8	-.20	-.02	-.01	-.11	-.12	-.15	-.10	-.10	-.10	-0.2	-.20	-.20	-.20	-.16	-.17	-.05	.00

[a]GPA = first term grade point average; ACT = standardized test score; HSCR = high school class rank; PAP = performance-approach goal orientation; PAV = performance-avoidance goal orientation; MAP = mastery-approach goal orientation; MAV = mastery-avoidance goal orientation; CSE = concern over social exclusion; AV = academic task values; GV = grade values; PROC = procrastination/lack of self-regulation; SB = perceived school belongingness; SE = self-regulatory self-efficacy; PS = perceived stress

[b]Indicators for constructs CSE, AV, PROC, SB, SE, and PS are parcel indicators.

Table 3: Continued

Construct Label[a]	Indicator Label[b]		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	AV1	19	.03																
AV	AV2	20	.00	.78															
	AV3	21	-.03	.62	.73														
GV	GS1	22	.05	.20	.16	.15													
	GS2	23	.06	.21	.16	.15	.85												
	SR1	24	.00	-.43	-.40	-.40	-.17	-.16											
PROC	SR2	25	.12	-.39	-.38	-.37	-.16	-.14	.77										
	SR3	26	.07	-.40	-.40	-.36	-.17	-.15	.81	.77									
	BLNG1	27	.10	.24	.19	.18	.02	.01	-.23	-.16	-.25								
SB	BLNG2	28	.06	.31	.29	.28	.04	.03	-.28	-.22	-.31	.76							
	BLNG3	29	.13	.27	.27	.26	.08	.05	-.27	-.20	-.28	.73	.73						
	SE1	30	-.01	.40	.44	.33	.16	.16	-.45	-.39	-.45	.39	.41	.45					
SE	SE2	31	.00	.39	.41	.31	.21	.18	-.38	-.32	-.43	.44	.43	.44	.75				
	SE3	32	.01	.39	.40	.29	.19	.16	-.43	-.37	-.43	.42	.42	.45	.77	.73			
	PSS1	33	.08	-.09	-.13	-.11	-.02	.02	.18	.24	.28	-.37	-.39	-.31	-.26	-.34	-.31		
PS	PSS2	34	.04	-.22	-.20	-.21	-.04	.01	.33	.32	.38	-.50	-.49	-.45	-.43	-.47	-.51	.73	
	PSS3	35	.04	-.15	-.18	-.12	-.06	-.04	.25	.29	.34	-.40	-.43	-.38	-.36	-.39	-.39	.75	.71

[a]GPA = first term grade point average; ACT = standardized test score; HSCR = high school class rank; PAP = performance-approach goal orientation; PAV = performance-avoidance goal orientation; MAP = mastery-approach goal orientation; MAV = mastery-avoidance goal orientation; CSE = concern over social exclusion; AV = academic task values; GV = grade values; PROC = procrastination/lack of self-regulation; SB = perceived school belongingness; SE = self-regulatory self-efficacy; PS = perceived stress

[b]Indicators for constructs CSE, AV, PROC, SB, SE, and PS are parcel indicators.

Table 4: Correlation Matrix of Latent Variables from Model M2

	Latent Variables*	1	2	3	4	5	6	7	8	9
1	PAP									
2	MAP	.33								
3	CSE	.14	.03							
4	AV	.18	.64	-.00						
5	GV	.16	.20	.09	.21					
6	PROC	-.13	-.42	.10	-.51	-.20				
7	SB	.24	.46	.15	.34	.06	-.33			
8	SE	.36	.72	-.00	.51	.24	-.58	.55		
9	PS	-.15	-.32	.03	-.22	-.04	.39	-.57	-.52	
10	GPA	.17	.21	.09	.13	.27	-.20	.13	.25	-.20

*PAP = Performance-approach; MAP = Mastery-approach; CSE = Social Exclusion Concerns; AV = Academic Values; GV = Grade Values; PROC = Procrastination/Lack of Self-regulation; SB = School Belongingness; SE = Self-regulatory Self-Efficacy; PS = Perceived Stress; GPA = End-of-term Grade Point Average

$r > |0.09|$, $p <= 0.05$

Table 5: Factor Loadings for Final Structural Model S2 Compared to Measurement Model M2

		Measurement Model Loadings Without Avoidance Goals (Model M2)				Structural Model Loadings Without Avoidance Goals (Model S2)			
		Unstandardized Factor Loadings		Standardized Factor Loadings		Unstandardized Factor Loadings		Standardized Factor Loadings	
Construct	Parcel Indicator[a]	EST	SE	EST	SE	EST	SE	EST	SE
Social Exclusion Concerns (CSE)	CSE1	1.000	0.000	0.759	0.028	1.000	0.000	0.757	0.028
	CSE2	1.159	0.079	0.772	0.030	1.167	0.077	0.776	0.029
	CSE3	0.927	0.065	0.783	0.031	0.926	0.063	0.781	0.030
Procrastination-Lack of Self-Regulation (PROC)	SR1	1.000	0.000	0.896	0.012	1.000	0.000	0.896	0.012
	SR2	0.949	0.032	0.858	0.014	0.949	0.033	0.858	0.014
	SR3	1.092	0.034	0.909	0.011	1.092	0.034	0.909	0.011
Self-Efficacy (SE)	SE1	1.000	0.000	0.833	0.016	1.000	0.000	0.832	0.016
	SE2	0.949	0.044	0.840	0.018	0.946	0.044	0.835	0.018
	SE3	0.976	0.036	0.867	0.015	0.970	0.036	0.861	0.016
School Belongingness (SB)	BLNG1	1.000	0.000	0.869	0.014	1.000	0.000	0.901	0.012
	BLNG2	1.056	0.041	0.879	0.015	1.103	0.041	0.848	0.017
	BLNG3	0.979	0.037	0.842	0.016	0.922	0.038	0.823	0.018
Perceived Stress (PS)	PSS1	1.000	0.000	0.853	0.018	1.000	0.000	0.853	0.018
	PSS2	1.151	0.051	0.869	0.018	1.149	0.050	0.867	0.018
	PSS3	1.216	0.046	0.844	0.018	1.219	0.046	0.846	0.018
Academic Task Values (AV)	AV1	1.000	0.000	0.851	0.016	1.000	0.000	0.851	0.016
	AV2	1.297	0.053	0.923	0.013	1.296	0.052	0.922	0.013
	AV3	1.200	0.064	0.779	0.019	1.197	0.063	0.777	0.019
Grade Values (GV)	GS1	1.000	0.000	0.952	0.044	1.000	0.000	0.885	0.031
	GS2	0.913	0.095	0.899	0.046	1.056	0.074	0.967	0.030
Performance Approach (PAP)	PAP1	1.000	0.000	0.952	0.009	1.000	0.000	0.951	0.009
	PAP2	0.862	0.026	0.840	0.019	0.863	0.026	0.839	0.019
	PAP3	0.996	0.019	0.943	0.011	0.999	0.019	0.945	0.011
Mastery Approach (MAP)	MAP1	1.000	0.000	0.765	0.022	1.000	0.000	0.763	0.023
	MAP2	1.019	0.064	0.803	0.024	1.027	0.066	0.808	0.025
	MAP3	1.177	0.062	0.837	0.023	1.177	0.063	0.836	0.023

[a]Indicators for Grade Values, Performance Approach, and Mastery Approach constructs are not individual items and not parcels

Table 6: Standardized Total and Total Indirect Effects for Values, School Belongingness, and Procrastination

Predictor Variables*	Effect	Endogenous Criteria Variables* GPA		
		β	EST/SE	*p*
CSE	Total	0.01	0.776	0.438
	Total Indirect	0.01	0.776	0.438
AV	Total	0.11	4.478	0.000
	Total Indirect	0.11	4.478	0.000
GV	Total	0.18	3.858	0.000
	Total Indirect	0.03	2.940	0.003
SB	Total	0.05	1.179	0.238
	Total Indirect	0.15	5.283	0.000
PROC	Total	-0.10	-4.779	0.000
	Total Indirect	-0.10	-4.779	0.000

(a)

Predictor Variables*	Effect	PAP			MAP		
		β	EST/SE	*p*	*β*	EST/SE	*p*
CSE	Total	0.13	2.688	0.007	0.04	2.799	0.005
	Total Indirect	0.03	2.531	0.011	0.04	2.799	0.005
AV	Total	0.06	3.416	0.001	0.64	17.113	0.000
	Total Indirect	0.06	3.416	0.001	0.07	4.474	0.000
GV	Total	0.14	3.194	0.001	0.01	1.837	0.066
	Total Indirect	0.01	1.777	0.076	0.01	1.837	0.066

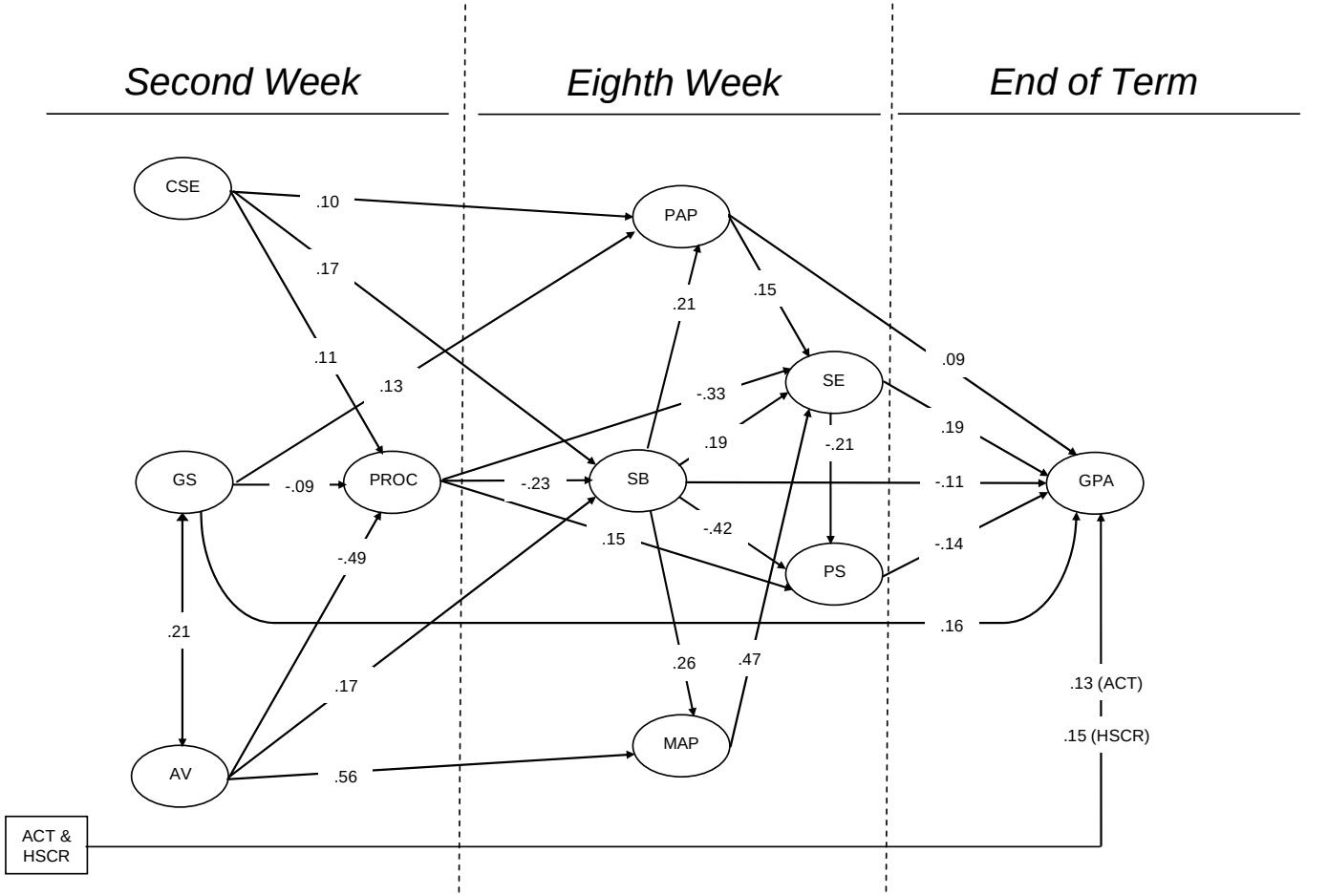
(b)

Predictor Variables*	Effect	SB			SE			PS		
		β	EST/SE	*p*	*β*	EST/SE	*p*	*β*	EST/SE	*p*
CSE	Total	0.14	3.116	0.002	0.03	1.096	0.273	-0.05	-1.833	0.067
	Total Indirect	-0.03	-2.037	0.042	0.03	1.096	0.273	-0.05	-1.833	0.067
AV	Total	0.28	5.794	0.000	0.52	16.286	0.000	-0.30	-8.910	0.000
	Total Indirect	0.11	4.163	0.000	0.52	16.286	0.000	-0.30	-8.910	0.000
GV	Total	0.02	1.930	0.054	0.06	2.720	0.007	-0.03	-2.259	0.024
	Total Indirect	0.02	1.930	0.054	0.06	2.720	0.007	-0.03	-2.259	0.024

(c)

*CSE = Social Exclusion Concerns; AV = Academic Values; GV = Grade Values; PROC = Procrastination/Lack of Self-regulation; SB = School Belongingness; PAP = Performance-approach; MAP = Mastery-approach; SE = Self-regulatory Self-Efficacy; PS = Perceived Stress; GPA = First Quarter Grade Point Average

Figure 1: Path Diagram of the Final Structural Model (S2)



CSE = Concern Over Social Exclusion	MAP = Mastery Goal Orientation	GPA = End of Term Grade Point Average
AV = Academic Value – Challenge	PAP = Performance Goal Orientation	SB = School Belongingness
GS = Grade Goal-Setting	ACT = Standardized Test Scores	SE = Self-Efficacy
PROC = Procrastination/Lack of Self-Regulation	HSCR = High School Class Rank	PS = Perceived Stress

Correlations not shown: $r_{GV.ACT} = 0.298$; $r_{GV.HACR} = 0.093$; $r_{CSE.ACT} = 0.106$