Development and Validation of the Persistent Academic
Possible Selves Scale for Adolescents (PAPSS)

Jieun Lee ^{a,1*}

Northern Arizona University

Jenefer Husman ^b

University of Oregon

Samuel B. Green ^c and Sarah K. Brem ^c

Arizona State University

^aDepartment of Educational Psychology, College of Education, Northern Arizona University, Flagstaff, AZ 86011-5774, USA

^bDepartment of Education Studies, College of Education, University of Oregon, Eugene, OR 97403, USA

^cT. Denny Sanford School of Social and Family Dynamics, Arizona State University, Tempe, AZ 85287-3701, USA

* Corresponding author: Jieun Lee (Ji-Eun.Lee@nau.edu).

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1. Introduction

Adolescents need to think about the future to plan and make healthy decisions as well as to consider the value of their academic tasks (Lens, Paixao, Herrera, & Grobler, 2012; Saint-Eloi Cadely, Pittman, Kerpelman, & Adler-Baeder, 2011). *Academic possible selves* focus on students' future goals (i.e., positive possible selves) and concerns (i.e., negative possible selves) in the academic domain (Oyserman, Bybee, Terry, & Hart-Johnson, 2004; Lee, Husman, Scott, & Eggum-Wilkens, 2015). Common themes of adolescents' academic possible selves are academic achievement (e.g., getting good grades), ideal self (e.g., being a good student), self-regulatory goals (e.g., paying attention), and academic advancement (e.g., passing a class) (Knox, Funk, Elliott, & Bush, 2000; Leondari & Gonida, 2008; Oyserman, 2003; Zhu & Tse, 2015).

It has been argued that envisioning salient academic possible selves helps students manage their motivation and self-regulation to better academic performance (Leondari & Gonida, 2008). Although this argument is fundamental to academic possible selves research, studies have yet to examine simultaneously both future-oriented motivation and future-oriented self-regulated learning pertaining to academic possible selves in one measure. The goals of this study are to theoretically and empirically investigate the constructs of future-oriented motivation and future-oriented self-regulated learning in pursuing academic goals and to validate a new scale that examines these constructs.

1.1. *Academic Possible Selves*

Oyserman and her colleagues have conducted extensive research on academic possible selves with minority adolescents and documented that social identity, personal identity, and self-

regulation are key elements for developing and attaining academic possible selves (Oyserman, 2007; Oyserman & Fryberg, 2006; Oyserman & James, 2009). Social identity is the perception of one's social group memberships, and it plays an important role in plans and actions (Oyserman, 2007; Oyserman, Grant, & Ager, 1995). Among various in-group members, peers become the primary in-group members for adolescents during a period of fluctuation of identities (Steinberg & Silverberg, 1986; Tarrant et al., 2001). Empirical research results demonstrated that adolescents' perception of peer academic performance is positively related to math self-concept, and math self-concept significantly predicts math performance (Jones, Audley-Piotrowski, & Kiefer, 2012). Other researchers found that adolescents' perception about teacher support and student support are correlated but distinctive constructs (Patrick, Ryan, & Kaplan, 2007). These results demonstrated that adolescents perceive their peer group and social group as different entities.

Adolescents can have distinctive personal identities within their social group membership (Oyserman, 2007). For example, intervention programs can support adolescents' personal academic identity, even when these identities are not supported by their social context. Scott and White (2013) provide evidence that two years of participation in a computing enrichment program increased students' technological identity, although these students' technological identity was not supported by their community or social expectations. In sum, social and personal identities play important roles in developing, maintaining, and attaining academic possible selves. However, no measure is available that assesses adolescents' academic possible selves on the basis of their social identity and personal identity (Lee, 2013).

Adolescents can achieve positive academic possible selves and prevent negative academic possible selves through *self-regulation* (Oyserman et al., 2004; Oyserman & James,

2009). A general definition of self-regulation in this context is one's self-directed actions toward achieving academic future goals (Oyserman, 2007; Oyserman & James, 2009). Diverse methodologies have been applied to measure how adolescents use self-regulation to attain academic possible selves. One of the most well-known measures is the Oyserman (2004) open-ended possible selves questionnaire (PSQ). Using the Instructions for Coding Academic Plausibility (Oyserman, 2003), researchers code the adolescents' responses of the PSQ and count the number of academic possible selves and the number of strategies associated with those possible selves. Then, they code self-regulation scores based on the counted numbers of academic possible selves and strategies (e.g., Oyserman et al., 2004). However, the questionnaire responses are difficult to code and have questionable reliability (Lee, 2013; Lee, Husman, Maez, & Scott, 2011).

Other researchers have measured self-regulation along with academic possible selves using close-ended questionnaires (e.g., Garcia & Pintrich, 1995). However, most of these self-regulation measures are not designed with a temporal orientation in that students are not typically directed to report on their self-regulation in the present, past, or future. Measures that lack a temporal orientation are less likely to be useful in research focusing on students' future goals. We argue that the lack of a consistently used method for measuring academic possible selves is due, in part, to a lack of consideration for the implication of temporal orientation when measuring self-regulation about future goals. Researchers of self-regulated learning in social cognitive theory have extensively examined self-regulation process and learning strategies students typically engage in to self-regulate (Zimmerman, 2000; Zimmerman & Martinez-Pons, 2004).

1.2. Self-regulated Learning

Self-regulated learning has been defined as students' independent goal directed behaviors to develop new skills and acquire knowledge (Pintrich, 2000; Shunk, Pintrich, & Meece, 2008; Zimmerman, 1986). Zimmerman and his colleagues proposed a triadic form of self-regulated learning: forethought, performance or volitional control, and self-reflection (Zimmerman, 2000; Zimmerman & Clearly, 2006). In the forethought phase, students define a desired task outcome (i.e., goal setting) based on their competence in completing the task (i.e., self-efficacy). In the performance phase, students assess their performance on the task (i.e., self-monitoring) and evaluate their progress (i.e., critical thinking). In the self-reflection phase, students judge their results (i.e., self-evaluation) and search for causality (i.e., attributions). The triad process is cyclical.

As acknowledged by many researchers (e.g., Garcia & Pintrich, 1994), self is central to all constructs within self-regulated learning. For example, forethought is creating a mental model of yourself in the future. Although not always explicitly acknowledged in research on self-regulated learning, future thinking about the self (i.e., future possible selves) is an essential underlying feature of self-regulated learning. Thus, the forethought phase in self-regulated learning theory and personal identity in academic possible selves theory can be combined to measure students' self-concept to plan and initiate their self-regulated learning. We expect that self-concept and motivational self-regulated learning are correlated but distinctive constructs as they address different future-oriented self-regulated learning processes.

Social cognitive researchers developed questionnaires for measuring self-regulated learning in educational settings. These questionnaires have been shown to be significant predictors of students' academic achievements (Zimmerman, 2008). All of the major self-regulated learning measures (e.g., Motivated Strategies for Learning Questionnaire (MSLQ:

Printrich, Smith, Garcia, & McKeachie, 1991), Self-regulated Learning Interview Schedule (SRLIS: Zimmerman & Martinez-Pons, 1986, 1988), and Self-Efficacy for Learning Form (SELF: Zimmerman & Kitsantas, 2005, 2014)) assess students' use of self-regulated learning strategies or perceived ability to use self-regulated learning strategies in the present. However, they are not designed to measure *future-oriented self-regulated learning*, the commitment to use self-regulated learning strategies to pursue academic future goals. Future-orientation is a critical component of self-regulation because students must invoke multiple processes over time, including planning, conducting, monitoring, and evaluating self-regulation (Demetriou, 2000). We argue that scales should consider the implications of temporal orientation in the assessment of self-regulated learning in conjunction with academic possible selves.

2. Development and Description of the PAPSS

2.1. Iterative scale development process

Based on theory and research, we have argued that there is a need for a measure to assess adolescent future-oriented motivation and future-oriented self-regulated learning to achieve academic possible selves. Accordingly, we developed the *Persistent Academic Possible Selves Scale for Adolescents (PAPSS)* using an iterative process over five years. The process included (a) conducting content analysis, (b) creating an item pool, (c) empirically evaluating the item pool, (d) revising and removing undesirable items, and (e) evaluating psychometric properties of the revised item pool (DeVellis, 2003; Spector, 1992). We repeated these steps iteratively until we attained a psychometrically sound and theoretically meaningful measure (e.g., Lee, 2013; Lee & Husman, 2012).

2.2. Description of the scale

To ensure a comprehensive assessment of the constructs of the PAPSS, we created 17 theoretical statements (see Table 1). Social identity and personal identity statements were derived from possible selves theory in social psychology (Oyserman, 2007, 2008; Oyserman et al., 1995). Self-regulated learning statements were adopted from social cognitive theory in educational psychology (Zimmerman, 2000; Zimmerman & Clearly, 2006). Among the three phases of self-regulated learning, the forethought and performance phases were utilized for developing self-regulated learning items in the PAPSS. However, the self-reflection phase was excluded because the PAPSS was intended to measure students' use of self-regulated learning to achieve academic future goals.

In our previous study (Lee et al., 2015), we utilized the Oyserman (2004) open-ended possible selves questionnaire (PSQ) to examine the development of adolescent girls' academic possible selves as they participated in a longitudinal STEM intervention research. In this study, we followed the PSQ protocol and asked adolescent girls participating in the intervention and a comparison group to respond to the questions "Next year I expect to be. . ." and "Next year I want to avoid. . ." In preparation for the development of the PAPSS, we compared the themes present in the comparison group students' responses (Lee et al., 2011) with themes described in other related academic possible selves research (e.g. Knox et al., 2000; Leondari & Gonida, 2008). After additional content validation studies with multiple groups of adolescents of both genders and field experts (Lee, 2013), we selected three academic future goals ("Improving my classroom grades", "Being a better student", and "Paying more attention in class"). Using the 3 goals and 17 statements, we developed 51 positively-worded items (3 goals x 17 statements). The PAPSS takes approximately 20 minutes to administer in a classroom setting. The directions, items, and response options are shown in Appendix A.

3. The Purpose of the Validation Study

The objectives of the validation study are to examine the internal structure of the PAPSS and to compare the PAPSS and the Oyserman (2004) open-ended possible selves questionnaire (PSQ) in predicting six external measures. Five external measures were selected because they should relate to the PAPSS and the PSQ (i.e., convergent validity), whereas the remaining measure was included because it should not relate to these measures (i.e., discriminant validity).

4. Materials and Methods

4.1. Participants

We recruited 142 adolescents from two engineering summer camps and 353 adolescents from two public schools in a southwest metropolitan city between the summer of 2012 and the spring of 2013 ($N = 495$). All participants returned their parental consent and student assent forms and completed a survey including the PAPSS. As survey incentives, students in the summer camps received pens, whereas students in public schools received movie tickets or five dollars. The average age was 13.95 years ($SD = 1.96$), with a range of 10 to 18 years. Most of the students were female (53%), in 7th (28%) or 9th (18%) grades, and White (56%) or Hispanic (23%).

Only 302 of the respondents completed the measures to assess convergent and discriminant validity. Students in the engineering summer camp and in one public school classroom ($N = 51$) did not complete these measures due to time-constraints. For the 302 students, the average age was 14.77 years ($SD = 1.79$), with a range of 12 to 18 years. Most of the students were female (62%), in 7th (28%) or 9th (27%) grades, and White (65%) or Hispanic (19%).

4.2. Measures

4.2.1. PAPSS

We have previously described the development of the PAPSS. The reliability of the PAPSS total score was very high ($\alpha = .97$).

4.2.2. PSQ

Students were asked to write as many as four positive possible selves (“Next year, I expect to be . . .”). If they were doing something to attain these possible selves, they were asked to write strategies next to them (“What I am doing now to be that way next year . . .”). Then, the students were asked to write as many as four negative possible selves (“Next year, I want to avoid . . .”). If they were avoiding becoming these possible selves, they were asked to write avoidance strategies next to them (“What I am doing now to avoid being that way next year . . .”).

Two trained research assistants double-coded the questionnaire responses for 1/3 of the data ($n = 109$) to assess inter-rater reliabilities. The rates of agreement were 77% and 66% for the number of academic possible selves and the number of strategies, respectively. When there were discrepancies, mean scores were computed. Given acceptable inter-rater reliability for 1/3 of the data, each research assistant coded a different half of the remaining questionnaires.

4.2.3. *Future Time Perspective-Connectedness*

Students’ abilities to make meaningful connections between present activities and future goals were measured using the *Connectedness subscale* in the Future Time Perspective Scale (Husman & Shell, 2008). The subscale includes 12 items (e.g., “One should be taking steps today to help realize future goals”) that are responded to on a 5-point scale (1 = strongly disagree to 5 = strongly agree). After reverse scoring eight negative-worded items, all items were averaged to create a composite score ($\alpha = .76$).

4.2.4. *State Hope*

Students' cognitive ability to generate goal-oriented thinking in the present was measured using the State Hope Scale (Snyder et al., 1996). It differs from other dispositional hope scales as it measures temporal status of hope (Snyder et al., 1996; Snyder, 2002). Six items were rated on an 8-point scale (1 = definitely false to 8 = definitely true) and were averaged to create a composite score ($\alpha = .77$).

4.2.5. *Academic Self-concept*

Students' evaluation about their academic competency was measured using an 8-item adapted version of the *General School subscale* in the Academic Self-Description Questionnaire II (Marsh, 1990). On these items, we replaced "school subjects classes" with "most school subjects", "most of my school subjects", or "most subjects in school" to clarify their meaning (e.g., "I get good marks in most of my SCHOOL SUBJECTS."). All items were rated on an 8-point scale (1 = definitely false to 8 = definitely true), and were averaged to create a composite score ($\alpha = .88$).

4.2.6. *Self-reported grades*

Students reported their last grades ("What grades did you receive last semester?"), expected grades ("What grades do you expect to receive this semester?"), and hopeful grades ("What grades do you hope to receive this semester") using an 8-point scale (1 = mostly A's; 2 = About half A's and B's; 3 = Mostly B's; 4 = About half B's and C's; 5 = Mostly C's; 6 = About half C's and D's; 7 = Mostly D's; 8 = Mostly below D's). The students' responses were reverse-coded to make higher scores represent higher grades. The *expected grade changes* were computed by subtracting last grades from expected grades. Similarly, the *hopeful grade changes* were calculated by subtracting last grades from hopeful grades. Students' last grades, expected grade changes, and hopeful grade changes were used in this study.

4.3. Analyses

Descriptive statistics for the measures are presented in Appendix B. We conducted structural equation modeling (SEM) using Mplus 7.11 (Muthén & Muthén, 1998-2012). Because the PAPSS item responses are ordered categorical data, we computed thresholds and polychoric correlation, and used robust weighted least squares estimation (WLSMV: Flora & Curran, 2004; Yu, 2002). The factor variances were fixed to ones for identification purposes.

4.3.1. Internal validity models

We proposed a Multi-Goal Multi-Theory (MGMT) model to underlie the PAPSS. This non-standard model can be conceptualized as extensions of a bifactor model or a multitrait-multimethod (MTMM) model. The MGMT model is similar to a bifactor model in that items for a particular goal are a function of a general factor and multiple group factors (e.g., Reise, 2012; Reise, Scheines, Widaman, & Haviland, 2013). The general factor is a particular goal factor, whereas group factors are theory-based factors. The MGMT model also is similar to a MTMM model, which specifies each measure as a function of a method factor and a trait factor (e.g., Marsh & Grayson, 1995; Widaman, 1985). In particular with the PAPSS, each item was hypothesized to be a function of an academic goal factor and a theory-based factor.

Prior to investigating the MGMT model, we evaluated two baseline models to assess whether these parsimonious models would be sufficient to explain the covariation among the items. One baseline model specified three correlated academic goal factors, and the other model hypothesized three correlated theory-based factors underlying the PAPSS items. We then combined the two baseline models to test the first MGMT model. Unlike traditional SEM modeling, the MGMT approach allows us to model the variance across the three theory based factors and examine that variance for each of three academic goals. One step in this modeling

process is to constrain the relationship of an individual goal factor and an individual theory-based factor. This constraint allows us to model the three persistent academic goal factors while acknowledging the latent structure of the variance across the three theory based factors. We used the results of the first MGMT model to help us formulate the latter two MGMT models, but were primarily guided by our knowledge of the measure in relation to relevant theories (i.e., five theory-based factors).

4.3.2. External validity models

We selected six measures to assess the convergent and discriminant validity of the PAPSS (see Table 2). Five measures focusing on general or academic constructs in the present or for the future were hypothesized to be related to the PAPSS. One measure examining last semester's grades was hypothesized to be unrelated to the PAPSS. We chose the grades because students who did not receive high grades in the past semester may have future-oriented motivation and future-oriented self-regulated learning to improve their academic performance for the next year.

We specified six models, one for each external variable. Each model included the measurement model for the PAPSS, the two PSQ scores (i.e., number of academic possible selves and number of strategies), and an external variable. We compared the correlations between the PAPSS factors and the six measures with the correlations between the PSQ scores and the six measures.

5. Results

5.1. Internal validity results

5.1.1. Baseline factor models

The first baseline model specified three correlated academic goal factors underlying the PAPSS (F1: improving grades, F2: better student, F3: more attention in class). The model fit poorly based on the global fit indices (CFI = .81, TLI = .80, RMSEA = .12, 90% CI [.12, .12]).

The second baseline model specified three correlated theory-based factors (F1: social identity, F2: personal identity & forethought, and F3: performance). The model fit better than the first baseline model, but did not demonstrate close fit (CFI = .85, TLI = .84, RMSEA = .11, 90% CI [.10, .11]).

5.1.2. MGMT model 1

The first MGMT model combined the two baseline models, and any item in the model became a function of an academic goal factor and a theory-based factor (see Figure 1). The model fit approached adequate fit (CFI = .93, TLI = .92, RMSEA = .08, 90% CI [.07, .08]). However, some of the factor loadings suggested possible modifications to the model. The sign of the loadings on the social identity factor suggested one model revision. The sign of the loadings for items that referred to people in general was opposite to the sign of the loadings for items that referenced peers. This finding is consistent with other research indicating the importance of peer perspective for adolescents (Jones et al., 2012; Tarrant et al., 2001). Thus, we hypothesized that 4 of the 6 items (12 items across all 3 goals) previously identified as a social identity factor would load on a social group identity factor, whereas 2 of the 6 items (6 across all 3 goals) would load on a peer group identity factor. We allowed the correlation between these newly formulated factors to be freely estimated to assess whether they were distinctive.

The item loadings on the personal identity and forethought factor also suggested model changes. The loadings for items addressing self-consequences were opposite in sign to the

loadings for the remaining items on this factor. This result is consistent with the literature that the use of self-consequences is a motivational self-regulated learning strategy (Wolters, Pintrich, & Karabenick, 2003; Wolters & Rosenthal, 2000). Accordingly, we hypothesized that 1 of the 6 items (3 items across all 3 goals) on the previously hypothesized personal identity and forethought factor would load on a motivational self-regulated learning factor and the remaining 5 item (15 items across all 3 goals) on a self-concept factor (Marsh, 2007; Marsh, Byrne, & Shavelson, 1988). We allowed for a correlation between these two newly formulated factors to assess whether they were distinct.

Lastly, we freely estimated the correlation between the motivational self-regulated learning factor and the performance factor. This respecification is consistent with the literature that suggests that these two factors are associated with self-regulated learning (Wolters et al., 2003).

5.1.3. MGMT model 2

The revised MGMT model included eight factors: the same three persistent academic goal factors as the previous model plus five theory-based factors, as shown in Figure 2. The theory-based factors were *social group identity* (F4), *peer group identity* (F5), *self-concept* (F6), *motivational self-regulated learning* (F7), and *performance* (F8). The model fit well (CFI = .96, TLI = .95, RMSEA = .06, 90% CI [.06, .06]).

As we found in the previous MGMT model, all three goal factors were strongly correlated ($r_s = .77 - .94, p_s < .001$). The two self-regulated learning factors were significantly correlated ($r_{F7F8} = .22, p < .001$). However, the remaining correlations between the social group and peer group factors ($r_{F4F5} = .07, p = .166$) and between self-concept and motivational self-regulated learning factors ($r_{F6F7} = .07, p = .186$) were nonsignificant. Given these results, we

chose to fix these factor correlations to zero in a revised model. We also checked all loadings and found low loadings on one of the self-concept items across all three goals (items 10, 27, and 44); the standardized loadings for these items ranged from .02 to .09. Consequently, the loadings for these items were constrained to zero on the self-concept factor in the reformulated model.

5.1.4. MGMT model 3 (Final model)

The revised MGMT model consisted of eight factors: the same three persistent goal factors and five theory-based factors as with the previous model, but constrained two factor correlations and three factor loadings to zero, as just previously discussed. The model is shown in Figure 3. This model fit very well (CFI = .96, TLI = .96, RMSEA = .06, 90% CI [.05, .06]). In addition, the parameter estimates were consistent with expectations. The three persistent goal factors were strongly correlated ($r_s = .77$ to $.94$, $p_s < .001$). The self-regulated learning factors were correlated, but to a lesser extent ($r_{F7F8} = .20$, $p < .001$). The standardized factor loadings are presented in Table 3.

5.2. External validity results

5.2.1. Convergent validity evidence

To assess convergent validity, we specified models that included not only the PAPSS factors, but also the two PSQ scores (i.e., number of academic possible selves and number of strategies) and an external measure that was hypothesized to be related to the PAPSS and PSQ. The models for assessing convergent validity for the external measures demonstrated adequate global fit (CFIs = .95; TLIs = .94 - .95; RMSEAs = .06 [90% CIs: .06 - .06]).

The convergent validity coefficients (i.e., correlations) based on the models are presented in Table 4. The correlations between three persistent academic goal factors and the five external measures generally were stronger than the correlations between the two PSQ scores and the

external measures, with a couple of exceptions. The exceptions were non-significant correlations between the improving grades factor and hopeful grade changes and between the more attention factor and academic self-concept.

Compared to the persistent academic goal factors, the five theory-based factors—except for the self-concept factor—were not as highly related with the five external measures. The self-concept factor was significantly correlated with future time perspective-connectedness, academic self-concept, and state hope.

5.2.2. Discriminant validity evidence

To assess discriminant validity, we examined a model that included the PAPSS factors, two scores from the PSQ, and last grades—a variable that was hypothesized to be weakly related to the PAPSS and PSQ. The discriminant model had adequate global fit (CFI = .95; TLI = .95; RMSEA = .06 [90% CI: .06 - .06]).

The discriminant validity coefficients (i.e., correlations) are presented in Table 4. The three persistent academic goal factors were not significantly correlated with last grades, whereas the number of strategies was significantly correlated with grades. Among the five theory-based factors, self-concept factor was significantly related to last grades.

6. Discussion

6.1. The constructs

For the construct clarity of the relationship between academic possible selves and self-regulation, the PAPSS adopted the forethought and performance phases of self-regulated learning (Zimmerman, 2000; Zimmerman & Martinez-Pons, 2004). These two phases describe how students can plan, develop, and manage self-regulated learning. This adaptation is a contribution both to the development of Possible Selves theory and measurement due to the

importance of self-regulation within possible selves theory and the insufficient construct clarity of self-regulation within possible selves research (Lee, 2013; Hoyle & Sherrill, 2006). The PAPSS items examine adolescents' motivation for developing academic possible selves (i.e., future-oriented motivation) and their perceptions of conducting self-regulated learning to attain these possible selves throughout next year (i.e., future-oriented self-regulated learning).

6.2. Evidence based on internal structure

The internal structure of the PAPSS provides evidence for the validity of student responses to the PAPSS. The PAPSS adopted a Multi-Goal Multi-Theory (MGMT) model. The MGMT includes three persistent academic goal factors—improving grades factor (F1), better student factor (F2), and paying more attention in class factor (F3) and five theory-based factors—social group identity factor (F4), peer group identity factor (F5), self-concept factor (F6), motivational self-regulated learning factor (F7), and performance factor (F8). The goal factors (F1, F2, and F3) are highly correlated with one another, demonstrating that they are somewhat distinctive, but share a common, underlying goal of persistent academic possible selves. The two self-regulated learning factors (F7 and F8) are moderately correlated, which supports the students' consistency in utilizing self-regulated learning.

6.3. Evidence based on external relations

The PAPSS has advantages over other available possible selves measures based on relationships with external measures. The three goal factors performed better than the PSQ measures (i.e., number of academic possible selves and number of strategies) in predicting hypothesized convergent and discriminant measures. The convergent validity results demonstrated that the three goal factors were significantly related to general and academic future constructs as well as present constructs. Overall, these correlations were stronger than the

comparable correlations for the PSQ measures. In terms of the discriminant validity, the three goal factors were not significantly related to last grades, but the number of strategies was significantly related to last grades.

We found several interesting relationships of the PAPSS with external measures. Whereas improving grades factor and better student factor were significantly related to academic self-concept factor, more attention in class factor was not significantly related to academic self-concept factor. Students who have high academic self-concept might not feel that paying more attention in class is an academic future goal for them. In other words, it is possible that these students do not feel that the goal requires as much of their future-oriented motivation and future-oriented self-regulated learning as other goals. We also found that improving grades factor was significantly related to expected grade change, but not hopeful grade change. These findings are consistent with prior non-educational research which associated motivation and self-regulation with expected rather than hoped for outcomes. Oettingen and her colleagues have found that when people hope for future goals, they are far less likely to engage in strategic behavior than when they have realistic expectations of both the possibility of failure and expectations for success (Oettingen, Pak, & Schnetter, 2001). We argue that our measure captures students' motivation and self-regulated learning for the future rather than their fantasies or dreams for the future.

6.4. Limitations and future research

The PAPSS is most suitable for adolescent students who are attending traditional junior high and high schools because of the item contents used to develop the measure. A possible concern for the PAPSS is that it is a self-report measure. However, we believe that self-report is an appropriate method for assessing the constructs underlying the PAPSS. Students do actively

construct their self-beliefs and approaches to learning and have access to those beliefs (Wolters et al., 2003). Moreover, students' perceptions about their social and peer groups are critical to the development of their academic selves (Dennis, Phinney, & Chuateco, 2005; Patrick et al., 2007).

There are several limitations in the study design. Firstly, due to administration time limits, we could not administer a full survey to all participants in our study. We recommend that researchers should replicate this study, but include a wide variety of external measures to assess convergent and discriminant validity. Secondly, researchers have found that self-reported grades are less reliable than school reported grades (Kuncel, Credé, & Thomas, 2005; Sanchez & Buddin, 2015). Thus, we recommend that future studies should consider collecting school-reported grades along with self-reported expected and hopeful grade changes. Future studies should also utilize the PAPSS to better understand the effect of interventions on student academic possible selves, and extend possible selves theory development.

6.5. Conclusion

Assessing adolescents' formation and attainment of academic possible selves is critical for researchers, teachers, and parents. This study provides a framework for thinking about the relationships between academic possible selves and their students' future-oriented motivation and future-oriented self-regulated learning. The study also introduced the PAPSS, a measure of future-oriented motivation and future-oriented self-regulated learning in the pursuit of academic future goals. We hope this framework and measure will provide researchers, teachers, and parents with new perspectives on how to examine and support the development future academic possibilities for all students.

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References

- Demetriou, A. (2000). Organization and development of self-understanding and self-regulation: Toward a general theory. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 209-251). San Diego, CA: Academic Press.
- Dennis, J. M., Phinney, J. S., & Chuateco, L. I. (2005). The role of motivation, parental support, and peer support in the academic success of ethnic minority first-generation college students. *Journal of College Student Development* 46(3), 223-236.
- DeVellis, R. F. (2003). *Scale development: Theory and applications*. Thousand Oaks, CA: Sage Publications.
- Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods*, 9(4), 466-491.
- Garcia, T. & Pintrich, P. R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D. H. Schunk and B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 127-153). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Garcia, T. & Pintrich, P. R. (1995, April). *The role of possible selves in adolescents' perceived competence and self-regulation*. Paper session presented at the annual meeting of the American Educational Research Association, San Francisco, CA
- Hoyle, R. H., & Sherrill, M. R. (2006). Future orientation in the self-system: Possible selves, self-regulation, and behavior. *Journal of Personality*, 74(6), 1673-1696. doi: 10.1111/j.1467-6494.2006.00424.x

- Husman, J., & Shell, D. F. (2008). Beliefs and perceptions about the future: A measurement of future time perspective. *Learning and Individual Differences, 18*(2), 166-175.
- Jones, M. H., Audley-Piotrowski, S. R., & Kiefer, S. M. (2012). Relationships among adolescents' perceptions of friends' behaviors, academic self-concept, and math performance. *Journal of Educational Psychology, 104*(1), 19-31.
- Knox, M., Funk, J., Elliott, R., & Bush, E. G. (2000). Gender differences in adolescents' possible selves. *Youth & Society, 31*(3), 287-309. doi: 10.1177/0044118X00031003002
- Kuncel, N. R., Crede, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research, 75*(1), 63-82.
- Lee, J. (2013). *The validation study of the persistent academic possible selves scale for adolescents* (Doctoral dissertation). Retrieved from https://repository.asu.edu/attachments/114450/content/Lee_asu_0010E_13193.pdf
- Lee, J., & Husman, J. (2012, September). The pilot study of the persistent academic possible selves scale for adolescents (PAPSS). In W. Lens (Chair), *The future motivates the present*. Symposium conducted at the meeting of the 1st International Conference on Time Perspective, Coimbra, Portugal.
- Lee, J., Husman, J., Maez, C., & Scott, K. A. (2011, April). *The outcome space of the open-ended possible selves questionnaire of female adolescents in poverty*. Poster session presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

- Lee, J., Husman, J., Scott, K. A., & Eggum-Wilkens, N. D. (2015). COMPUGIRLS: Stepping stone to future computer-based technology pathways. *Journal of Educational Computing Research*, 52(2), 199-223. doi:10.1177/0735633115571304
- Lens, W., Paixao, M. P., Herrera, D., & Grobler, A. (2012). Future time perspective as a motivational variable: Content and extension of future goals affect the quantity and quality of motivation. *Japanese Psychological Research*, 54(3), 321-333.
- Leondari, A., & Gonida, E. N. (2008). Adolescents' possible selves, achievement goal orientations, and academic achievement. *Hellenic Journal of Psychology*, 5, 179-198.
- Marsh, H. W. (1990). The structure of academic self-concept: The Marsh/Shavelson model, *Journal of Educational Psychology*, 82(4), 623-636.
- Marsh, H. W. (2007). *Self-concept theory, measurement and research into practice: The role of self-concept in educational psychology*. Leicester, UK: British Psychological Society.
- Marsh, H. W., Byrne, B. M., & Shavelson, R. J. (1988). A multifaceted academic self-concept: Its hierarchical structure and its relation to academic achievement. *Journal of Educational Psychology*, 80, 366-380.
- Marsh, H. W., & Grayson, D. (1995). Latent variable models of multitrait-multimethod data. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage Publications.
- Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide*. Seventh Edition. Los Angeles, CA: Muthén, & Muthén.
- Oettingen, G., Pak, H., & Schnetter, K. (2001). Self-regulation of goal setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology*, 80(5), 736-753. doi: 10.1037//0022-3514.80.5.736

- Oyserman, D. (2003). *Instructions for Coding Academic Plausibility*. Ann Arbor, MI: University of Michigan. Retrieved from http://www.sitemaker.umich.edu/culture.self/files/plausibility_instructions_only012903.doc
- Oyserman, D. (2004). *Possible selves citations, measure, and coding instructions*. Ann Arbor, MI: University of Michigan. Retrieved from http://www.sitemaker.umich.edu/culture.self/files/possible_selves_measure.doc
- Oyserman, D. (2007). Social identity and self-regulation. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (pp. 432-453). New York, NY: Guilford Press.
- Oyserman, D. (2008). Possible selves: Identity-based motivation and school success. In H. Marsh, R. Craven, & D. McInerney (Eds.), *Self-processes, learning and enabling human potential dynamic new approaches*, Vol. 3 (pp. 269-288). Charlotte, NC: Information Age Publishing.
- Oyserman, D., Bybee, D., Terry, K., & Hart-Johnson, T. (2004). Possible selves as roadmaps. *Journal of Research in Personality*, 38, 130-149.
- Oyserman, D. & Fryberg, S. A. (2006). The possible selves of diverse adolescents: Content and function across gender, race and national origin. In C. Dunkel & J. Kerpelman (Eds.), *Possible selves: Theory, research, and applications* (pp. 17-39). Huntington, NY: Nova.
- Oyserman, D., Grant, L., & Ager, J. (1995). A socially contextualized model of African American identity: Possible selves and school persistence, *Journal of Personality and Social Psychology*, 69(6), 1216-1232.

- Oyserman, D., & James, L. (2009). Possible selves: From content to process. In K. D. Markman, W. M. P. Klein, & J. A. Suhr (Eds.), *Handbook of imagination and mental stimulation* (pp. 373-394). New York, NY: Psychology Press.
- Patrick, H., Ryan, A. M., & Kaplan, A. (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. *Journal of Educational Psychology, 99*(1), 83-98. doi: 10.1037/0022-0663.99.1.83
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451–502). San Diego, CA: Academic Press.
- Pintrich, P.R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the motivated strategies for learning questionnaire (MSLQ)*. Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning, University of Michigan.
- Reise, S. P. (2012). The rediscovery of bifactor measurement models. *Multivariate Behavioral Research, 47*(5), 667-696. doi: 10.1080/00273171.2012.715555
- Reise, S. P., Scheines, R., Widaman, K. F., & Haviland, M. G. (2013). Multidimensionality and structural coefficient bias in structural equation modeling: A bifactor perspective. *Educational and Psychological Measurement, 73*(1), 5-26. doi: 10.1177/0013164412449831
- Saint-Eloi Cadely, H., Pittman, J. F., Kerpelman, J. L., & Adler-Baeder, F. (2011). The role of identity styles and academic possible selves on academic outcomes for high school students. *Identity: An International Journal of Theory and Research, 11*(4), 267-288. doi: 10.1080/15283488.2011.613580

- Sanchez, E., & Buddin, R. (2015). How accurate are self-reported high school courses, course grades, and grade point average? (ACT Report No. WP-2015-03). Iowa City, IA: ACT.
- Schunk, D. H., Pintrich, P. R. & Meece, J. L. (2008). *Motivation in education: Theory, research, and applications* (3rd ed.). Upper Saddle River, NJ: Pearson.
- Scott, K. A., & White, M. A. (2013). Compugirls' standpoint: Culturally responsive computing and its effect on girls of color. *Urban Education*, 48(5), 657-681. doi: 10.1177/0042085913491219
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, 13(4), 249-275. doi: 10.1207/S15327965PLI1304_01
- Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). Development and validation of the state hope scale. *Journal of Personality and Social Psychology*, 70(2), 321-335.
- Spector, P. E. (1992). *Summated rating scale construction: An introduction*. Newbury Park, CA: Sage Publications.
- Steinberg, L., & Silverberg, S. B. (1986). The vicissitudes of autonomy in early adolescence. *Child Development*, 57, 841-851.
- Tarrant, M., North, A. C., Edridge, M. D., Kirk, L. E., Smith, E. A., & Turner, R. E. (2001). Social identity in adolescence. *Journal of Adolescence*, 24, 597-609. doi:10.1006/jado.2000.0392
- Widaman, K. F. (1985). Hierarchically nested covariance structure models for multitrait-multimethod data. *Applied Psychological Measurement*, 9(1), 1-26.

- Wolters, C. A., Pintrich, P. R., & Karabenick, S. A. (2003, March). *Assessing academic self-regulated learning*. Paper session presented at the Conference on Indicators of Positive Development: Definitions, Measures, and Prospective Validity, Washington, DC.
- Wolters, C. A., & Rosenthal, H. (2000). The relation between students' motivational beliefs and their use of motivational regulation strategies. *International Journal of Educational Research*, 33, 801-820.
- Yu, C. (2002). *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes* (Doctoral dissertation). Retrieved from <http://www.statmodel.com/download/Yudissertation.pdf>.
- Zhu, S., & Tse, S. (2015). Possible selves, strategies, and perceived likelihood among adolescents in Hong Kong: Desire and concern, *International Journal of Adolescence and Youth*. Advance online publication. doi: 10.1080/02673843.2015.1031683
- Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary Educational Psychology*, 11, 307-313.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego, CA: Academic Press.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego, CA: Academic Press.
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166-183. doi: 10.3102/0002831207312909

- Zimmerman, B. J., & Clearly, T. J. (2006). Adolescents' development of personal agency: The role of self-efficacy beliefs and self-regulatory skill. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 45-69). Greenwich, CT: Information Age Publishing.
- Zimmerman, B. J., & Kitsantas, A. (2005). Homework practices and academic achievement: The mediating role of self-efficacy and perceived responsibility beliefs. *Contemporary Educational Psychology, 30*, 397-417. doi:10.1016/j.cedpsych.2005.05.003
- Zimmerman, B. J., & Kitsantas, A. (2014). Comparing students' self-discipline and self-regulation measures and their prediction of academic achievement. *Contemporary Educational Psychology, 39*, 145-155. doi: 10.1016/j.cedpsych.2014.03.004
- Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal, 23*(4), 614-628.
- Zimmerman, B. J., & Martinez-Pons, M. (1988). Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology, 80*(3), 284-290.
- Zimmerman, B. J., & Martinez-Pons, M. (2004). Pursuing academic self-regulation: A 20-year methodological quest. In J. Ee, A. Chang, & O. S. Tan (Eds.), *Thinking about thinking* (pp. 3-30). Singapore: McGraw Hill.

Table 1

The Theoretical Components of the PAPSS

Theoretical components	Categories	Sub-categories	17 different types of statements
Social identity	APS	Social expectation	People who care about a student expect his/her achievement of APS next year.
		Social support	People who care about a student encourage him/her to achieve APS next year.
		Peer environment	In general, a student's friends want to achieve APS next year.
	SR	Social expectation	People who care about a student expect he/she can create a plan to achieve APS next year.
		Social support	People who care about a student will encourage his/her effort to achieve APS next year.
		Peer environment	In general, a student's friends are likely to use study skills to achieve APS next year.
Personal identity and forethought phase in self-regulated learning	APS	Intrinsic motivation	A student would like to achieve APS next year.
		Future time perspective	A student can see achieving his/her APS next year.
		Self-efficacy	A student is confident that he/she can achieve APS next year.
	SR	Self-efficacy	A student is confident that he/she will have a plan to achieve APS next year.
		Outcome expectation	A student recognizes that with hard work, he/she can achieve APS next year.
		Self-consequences	A student will treat something like if he/she achieves APS next year.
Performance phase in self-regulated learning	SR	Critical thinking	Throughout next year, a student will evaluate his/her plan to achieve APS.
		Help-seeking	Throughout next year, a student will look for help when facing problems in achieving APS.
		Self-recording	Throughout next year, a student will keep track of his/her progress in achieving APS.
		Self-monitoring	Throughout next year, a student will assess his/her progress in achieving APS.
		Metacognition	Throughout next year, a student will seek ways to create a better plan for achieving APS.

Note. APS = Academic possible selves; SR = Self-regulation.

Table 2

External Validity Measures

Time	Domain	Measures	Validity evidence
Future	General	Future Time Perspective-Connectedness	Convergent
	Academic	Expected Grade Change	Convergent
		Hopeful Grade Change	Convergent
Present	General	State Hope	Convergent
	Academic	Academic Self-concept	Convergent
Past	Academic	Last Grade	Discriminant

Table 3

Standardized Factor Loadings for the Final Factor Model

Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8	
Improving		Better		More		Social		Peer		Self-concept		Motivational		Performance	
grades		student		attention in		group		group				Self-regulated			
				class								Learning			
P1	.63	P18	.65	P35	.76	P1	.42	P3	.56	P7	.31	P12	.83	P13	.24
P2	.58	P19	.68	P36	.71	P2	.55	P6	.62	P8	.47	P29	.86	P14	.38
P3	.36	P20	.46	P37	.59	P4	.37	P20	.68	P9	.40	P46	.75	P15	.23
P4	.68	P21	.74	P38	.82	P5	.56	P23	.67	P11	.39			P16	.20
P5	.58	P22	.68	P39	.76	P18	.42	P37	.56	P24	.29			P17	.23
P6	.47	P23	.58	P40	.64	P19	.52	P40	.54	P25	.51			P30	.26
P7	.61	P24	.69	P41	.72	P21	.32			P26	.49			P31	.42
P8	.68	P25	.70	P42	.75	P22	.50			P28	.35			P32	.45
P9	.72	P26	.75	P43	.75	P35	.29			P41	.27			P33	.47
P10	.85	P27	.87	P44	.89	P36	.50			P42	.45			P34	.25
P11	.60	P28	.68	P45	.72	P38	.25			P43	.44			P47	.33
P12	.39	P29	.41	P46	.52	P39	.46			P45	.25			P48	.42
P13	.79	P30	.84	P47	.84									P49	.50
P14	.62	P31	.64	P48	.72									P50	.48
P15	.57	P32	.73	P49	.70									P51	.37
P16	.61	P33	.77	P50	.74										
P17	.82	P34	.82	P51	.81										

Note. $N = 495$. P = PAPSS item; All $ps < .001$.

Table 4

External Validity Results

Model	Convergent 1	Convergent 2	Convergent 3	Convergent 4	Convergent 5	Discriminant
Measure	FTPC	ASC	State Hope	Expected Grade Change	Hopeful Grade Change	Last Grade
<i>PAPSS</i>						
F1: Improving grades	.45***	.23***	.49***	.14*	.09	-.06
F2: Better students	.35***	.19***	.44***	.16*	.12*	-.05
F3: More attention in class	.31***	.09	.32***	.18**	.15**	-.11
F4: Social group identity	.12*	.14*	.07	-.02	-.05	.10
F5: Peer group identity	-.05	-.02	-.02	-.07	.00	.01
F6: Self-concept	.25***	.29***	.13**	-.10	-.12	.21**
F7: Motivational self-regulated learning	.03	-.06	-.06	.07	.09	-.08
F8: Performance	.09	.05	.09	.02	-.02	.03
<i>PSQ</i>						
Numbers of APS	.14*	.11	.13*	-.02	-.05	.06
Numbers of strategies	.23***	.16**	.19***	-.05	-.11*	.10*

Note. $N = 302$. F1 to F3 are persistent academic goal factors and F4 to F8 are theory-based factors. PSQ = Oyserman (2004) open-ended possible selves questionnaire; APS = Academic possible selves; FTPC = Future Time Perspective-Connectedness; ASC = Academic self-concept. $*p < .05$, $**p < .01$, $***p < .001$.

Figure 1. Multi-Goal Multi-Theory model 1.

Figure 2. Multi-Goal Multi-Theory model 2.

Figure 3. Multi-Goal Multi-Theory model 3.

Appendix A

The Persistent Academic Possible Selves Scale for Adolescents (PAPSS)**Administration**

The PAPSS measure diverse aspects of adolescents' future-oriented motivation and future-oriented self-regulated learning in pursuing their academic future goals. Items which relate to *Improving Class Grades* are 1 – 17, items which relate to *Being a Better Student* are 18 – 34, and items which relate to *Paying More Attention in Class* are 35 – 51. When administering the PAPSS, use the following questionnaire.

Questionnaire

Students differ in their academic possible goals. Students also may use different academic strategies for achieving their academic possible goals. Please take a moment to think about **YOUR** academic possible goals and strategies. Then, tell us **YOUR** thoughts and feelings about them.

Using the following seven-point scale, please indicate how strongly you agree (or disagree) with the following statements.

Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1. People who care about me think I will improve my classroom grades next year.
2. People who care about me will encourage me to improve my classroom grades next year.
3. In general my friends want to improve their classroom grades next year.
4. People who care about me think I can create a plan to improve my classroom grades next year.
5. People who care about me will encourage my efforts to improve my classroom grades next year.

6. In general my friends are likely to use study skills to improve their classroom grades next year.
7. I would like to improve my classroom grades next year.
8. I can see myself improving my classroom grades next year.
9. I am confident that I can improve my classroom grades next year.
10. I am confident that I will have a plan to improve my classroom grades next year.
11. With hard work, I can improve my classroom grades next year.
12. If I improve my classroom grades next year, I will treat myself to something I like.
13. Throughout next year I will evaluate my plan to improve my classroom grades.
14. Throughout next year I will look for help when I face problems in improving my classroom grades.
15. Throughout next year I will keep track of my classroom grades.
16. Throughout next year I will assess my classroom grades.
17. Throughout next year I will seek ways to create a better plan for improving my classroom grades.
18. People who care about me think I will be a better student next year.
19. People who care about me will encourage me to be a better student next year.
20. In general my friends want to be better students next year.
21. People who care about me think I can create a plan to be a better student next year.
22. People who care about me will encourage my efforts to be a better student next year.
23. In general my friends are likely to use study skills to be better students next year.
24. I would like to be a better student next year.
25. I can see myself being a better student next year.
26. I am confident that I can be a better student next year.
27. I am confident that I will have a plan to be a better student next year.
28. With hard work, I can be a better student next year.
29. If I am a better student next year, I will treat myself to something I like.
30. Throughout next year I will evaluate my plan to be a better student.
31. Throughout next year I will look for help when I face problems in being a better student.

32. Throughout next year I will keep track of my progress in becoming a better student.
33. Throughout next year I will assess my progress in becoming a better student.
34. Throughout next year I will seek ways to create a better plan for being a better student.
35. People who care about me think I will pay more attention in class next year.
36. People who care about me will encourage me to pay more attention in class next year.
37. In general my friends want to pay more attention in class next year.
38. People who care about me think I can create a plan to pay more attention in class next year.
39. People who care about me will encourage my efforts to pay more attention in class next year.
40. In general my friends are likely to use study skills to pay more attention in class next year.
41. I would like to pay more attention in class next year.
42. I can see myself paying more attention in class next year.
43. I am confident that I can pay more attention in class next year.
44. I am confident that I will have a plan to pay more attention in class next year.
45. With hard work, I can pay more attention in class next year.
46. If I pay more attention in class next year, I will treat myself to something I like.
47. Throughout next year I will evaluate my plan to pay more attention in class.
48. Throughout next year I will look for help when I face problems in paying more attention in class.
49. Throughout next year I will keep track of how much I pay attention in class.
50. Throughout next year I will assess how much I pay attention in class.
51. Throughout next year I will seek ways to create a better plan for paying more attention in class.

Appendix B

Descriptive Statistics

	N	Min	Max	M	SD	Skewness	Kurtosis
P1	495	1.00	7.00	5.91	1.13	-1.07	0.89
P2	495	1.00	7.00	6.35	0.94	-2.07	6.23
P3	493	2.00	7.00	5.55	1.11	-0.58	-0.12
P4	494	1.00	7.00	5.67	1.27	-1.24	1.68
P5	493	1.00	7.00	6.15	0.95	-1.59	4.03
P6	495	1.00	7.00	5.15	1.26	-0.65	0.28
P7	495	1.00	7.00	6.57	0.82	-2.70	9.55
P8	493	1.00	7.00	6.17	0.96	-1.73	4.78
P9	493	1.00	7.00	6.14	1.01	-1.47	3.19
P10	494	1.00	7.00	5.64	1.27	-1.03	0.94
P11	495	1.00	7.00	6.43	0.88	-2.34	7.97
P12	495	1.00	7.00	5.57	1.41	-0.96	0.46
P13	495	1.00	7.00	5.50	1.21	-1.10	1.16
P14	495	1.00	7.00	5.88	1.17	-1.30	1.89
P15	495	1.00	7.00	6.21	1.00	-1.84	4.91
P16	492	2.00	7.00	5.98	0.95	-0.87	0.34
P17	494	1.00	7.00	5.75	1.15	-1.15	1.54
P18	493	1.00	7.00	5.92	1.10	-1.16	1.70
P19	492	1.00	7.00	6.08	1.09	-1.58	3.32
P20	493	1.00	7.00	5.54	1.15	-0.65	0.27
P21	494	1.00	7.00	5.70	1.21	-1.25	1.85
P22	494	1.00	7.00	6.06	1.07	-1.68	3.85
P23	493	1.00	7.00	5.25	1.24	-0.61	0.14
P24	493	1.00	7.00	6.51	0.76	-2.24	8.16
P25	494	1.00	7.00	6.22	0.95	-1.52	3.22
P26	493	1.00	7.00	6.24	0.92	-1.41	2.74
P27	494	1.00	7.00	5.69	1.27	-1.12	1.10
P28	495	1.00	7.00	6.43	0.84	-2.20	7.77
P29	494	1.00	7.00	5.59	1.43	-1.05	0.68
P30	495	1.00	7.00	5.57	1.22	-0.99	0.94
P31	495	1.00	7.00	5.84	1.15	-1.31	2.02
P32	494	1.00	7.00	5.87	1.14	-1.15	1.38
P33	495	1.00	7.00	5.82	1.13	-1.17	1.64
P34	494	1.00	7.00	5.68	1.19	-1.05	1.08
P35	495	1.00	7.00	5.69	1.21	-1.08	1.30
P36	495	1.00	7.00	5.86	1.25	-1.39	1.90

P37	493	1.00	7.00	5.17	1.34	-0.69	0.33
P38	494	1.00	7.00	5.53	1.34	-1.17	1.40
P39	495	1.00	7.00	5.88	1.21	-1.70	3.75
P40	493	1.00	7.00	5.13	1.43	-0.75	0.17
P41	495	1.00	7.00	6.16	1.01	-1.48	2.71
P42	494	1.00	7.00	5.88	1.16	-1.28	2.00
P43	492	1.00	7.00	5.97	1.11	-1.28	1.76
P44	495	1.00	7.00	5.52	1.41	-1.10	0.89
P45	494	1.00	7.00	6.18	1.06	-1.65	3.14
P46	494	1.00	7.00	5.37	1.52	-0.89	0.19
P47	495	1.00	7.00	5.40	1.36	-0.97	0.78
P48	495	1.00	7.00	5.60	1.40	-1.13	0.91
P49	495	1.00	7.00	5.23	1.53	-0.84	0.17
P50	495	1.00	7.00	5.29	1.47	-0.94	0.39
P51	495	1.00	7.00	5.38	1.51	-1.02	0.54
APS	302	0.00	10.00	3.20	1.78	0.84	1.23
Strategies	302	0.00	10.00	3.17	2.07	0.75	0.36
FTP-C	302	2.33	5.00	4.19	0.45	-0.57	0.82
ASC	302	3.13	8.00	6.31	1.05	-0.81	0.10
State Hope	302	2.00	8.00	6.30	0.94	-0.88	1.46
EGC	302	-2.00	7.00	0.69	1.31	1.70	4.54
HGC	302	-1.00	7.00	1.22	1.45	1.42	2.23
Last grade	302	1.00	8.00	6.31	1.69	-1.12	0.78

Note. P = PAPSS items, APS = Number of academic possible selves, Strategies = Number of strategies, FTP-C = Future Time Perspective-Connectedness, ASC = Academic self-concept, EGC = Expected grade change, HGC = Hopeful grade change.