

**Personal and Ecological Assets and Academic Competence in Early Adolescence: The  
Mediating Role of School Engagement<sup>1</sup>**

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### **Abstract**

Although the role of school engagement in influencing children's academic competence has been recognized in past theory and research, how school engagement may mediate the relationships between ecological and personal resources and academic competence remains largely unknown. Using structural equation modeling procedures, the present study was aimed to examine the role of school engagement in mediating the associations between ecological and personal assets and academic competence. Data from 960 participants (45.6% boys) who took part in the Grades 5 and 6 assessments in the longitudinal, 4-H Study of Positive Youth Development were used. Evidence was found for a model positing two distinct school engagement components, Behavioral and Emotional, and for the role of these facets of school engagement in the relationships between developmental assets and later academic competence. Personal and ecological assets had indirect effects on later academic competence, via behavioral and emotional school engagement. Behavioral and emotional school engagement predicted academic competence differently. Emotional engagement was indirectly linked to academic competence, via behavioral engagement. Behavioral and emotional engagement also had different individual and contextual antecedents. Implications of the findings for evaluating the role of behavioral and/or emotional school engagement in academic competence and positive youth development are discussed.

*Keywords:* School engagement; academic competence; mediation; developmental assets, structural equation modeling

Academic success is crucial for children and adolescents to grow into adults who fully participate in the economic, social, and civic activities of contemporary society. Not surprisingly, from early adolescence, schools “begin to dictate many consequences for the present and future lives of young people” (Elmore, 2009, p.194). Thus, the quality of school performance of youth in the United States has long been an issue of national concern (Redd, Brooks, & Mcgarvey, 2002). Unfortunately, the years marking the transition to early adolescence involve a decline in many young people’s academic success; this trend is often continued throughout the rest of their educational careers (Eccles, 2004). Given the significant consequences of such negative trends among adolescents, it is important to identify factors that may promote academic competence. In the present article, academic competence is defined as skills and capabilities important for youth to succeed in school; such success can be represented by actual or self-perceived achievement (Ma, Phelps, Lerner, & Lerner, 2009). Accordingly, the main goal of this study was to understand how school engagement mediates the influence of personal and ecological factors on adolescents’ perceived academic competence.

Many contemporary developmental scientists have noted that positive adolescent outcomes, such as academic competence, occur as a result of a complex, bidirectional relational process between the strengths of the adolescent and the positive features of his or her social ecology (Lerner, 2006; Theokas & Lerner, 2006). These positive qualities of the individual and the social context are examples of developmental assets, which are defined as important skills, relationships, opportunities and commitments that adolescents need to thrive (Benson, Scales, Hamilton, & Sesma, 2006). Benson et al. (2006) hypothesized that youth who possess more

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developmental assets are more likely to exhibit positive developmental outcomes than those who experience fewer assets.

Unfortunately, theory or research has yet to distinguish systematically the effects of specific assets or how particular assets function in the presence or absence of other assets. For example, abundant positive assets in one social context may not fully supplement the role of personal competence and motivation, nor can they replace the role of the assets in another setting. Accordingly, we examined assets from multiple contexts, such as family, school, and peers, as well as positive qualities of the person, i.e., self-regulation and educational expectations, in order to provide preliminary, descriptive information about how developmental assets alone or in combination contribute to positive features of youth development and, in regard to the present research, to academic success. Doing so allows us to integrate research that focuses on the role of ecological factors in competence with research focusing on personal cognitive factors and demographical disparities in competence (Furrer & Skinner, 2003; Hughes & Kwok, 2007).

Understanding how to promote academic competence among adolescents has long been a complicated and challenging task. Most of the past efforts aimed at enhancing competence have focused on capitalizing on adolescents' positive social relationships, believing that students will do better in contexts where their psychological needs are met (Fredricks & Eccles, 2004). Studies have shown that families, schools, and peers are all important contextual predictors for various domains of adolescent development, including academic outcomes (e.g., Hughes, Luo, Kwok, & Loyd, 2008; Leventhal & Brooks-Gunn, 2000). For instance, youth whose parents are more involved in their education gain better grades in school (Woolley & Grogan-Kaylor, 2006). Parental monitoring is also associated with better academic achievement in school for boys

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(Parcel & Dufur, 2001). In addition, parental warmth is among the ecological variables that influences multiple facets of adolescent functioning (Murray, 2009). Perceptions of positive atmosphere at school also have important implications for adolescents' academic adjustment (Klem & Connell, 2004; Meehan, Hughes, & Cavell, 2003). Although less is known about how peers influence academic achievement, evidence of the influence of peer groups on achievement is beginning to accumulate (e.g., Kindermann, 2007; Ryan, 2001). These five ecological variables (i.e., parental monitoring, parental involvement, maternal warmth, peer support, and school climate) were included in this study as potential developmental assets for academic competence in adolescence.

In addition to these potential contextual covariates of academic competence, there are facets of individual characteristics that have been found to be associated with successful functioning in school. For instance, demographic variables, such as sex and socioeconomic status, have been found to be strong predictors of student achievement (Sirin, 2005). For instance, girls have been found to outperform boys across school subjects (Pomerantz, Altermatt, & Saxon, 2002). In addition, individual characteristics beyond these marker variables have been found to play crucial roles in producing positive academic outcomes. For example, successful self-regulation among students is linked to participating proactively in learning activities which, in turn, is associated with knowledge acquirement and skill development (Zimmerman & Schunk, 2001). Moreover, youth who expect to be educated beyond high school exhibit higher academic competence than youth who only plan to graduate from high school (Waxman, Huang, & Padron, 1997). Similarly, future orientation, or one's imagined future, may be another important developmental asset that provides bases for youth educational motivation, goals, and commitments. Evidence suggests that future orientation is related to task engagement and

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performance in the present and can be a powerful motivator of current behaviors (Greene & DeBacker, 2004). Thus, future orientation may function to motivate and engage youth in their schoolwork and other academic activities. Given the constantly changing and multilayered nature of social ecologies and of the person, investigations that examine systematically the effects of assets from multiple social ecologies as well as assets within the person would inform the field about the respective predictive power of these factors in academic competence.

### **School Engagement as a Mediator**

There is increasingly accumulating evidence about the significant role of developmental assets in academic competence. However, with only a few notable exceptions (e.g., Hughes & Kwok, 2006), little research has been devoted to understanding how and why assets lead to variations in competence. It seems reasonable to postulate that contextual and personal factors exert influence via underlying psychological processes. For instance, one would not expect peers to influence a student's academic achievement directly; rather, one may propose that interactions with peers expose a youth to a set of norms and values, which, in turn, encourage or discourage him or her to be engaged in certain behaviors. Thus, we hypothesized that ecological resources are important assets for children, but their effect on developmental outcomes, such as competence, can only be instantiated when youth actively capitalize on what social contexts offer.

School engagement has been identified as a mediational construct that links ecological and personal resources and children's academic competence (Fredricks, Blumenfeld, & Paris, 2004; Hughes et al., 2008; Hughes & Kwok, 2006), because it not only predicts student success (Newmann, Wehlage, & Lamborn, 1992), but also responds to variations in context and the person (Fredricks, et al., 2004). A small but growing number of empirical studies support the

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mediational role of school engagement. For instance, Hughes and Kwok (2006) expected and found that children's school engagement (operationalized as classroom engagement) mediated the effect of the teacher-student relationship on peer acceptance. Evidence of how school engagement mediates the impact of other contextual factors, such as parental or peer variables, and individual characteristics (e.g., self-regulation, educational expectations, and future orientation) is yet to be identified.

There is a consensus that school engagement is a multifaceted construct, encompassing multiple components, for example, behavioral and emotional characteristics (Fredricks et al., 2004; Glanville & Wildhagen, 2007). Behavioral engagement often refers to involvement in school-based activities or to the absence of disruptive behaviors (Fredricks et al., 2004). Emotional engagement entails positive emotional reactions to the school, the teacher, and schoolmates (Stipek, 2002). These two types of school engagement are likely to be predictive of different outcomes and to be influenced by different variables. For instance, researchers have found that intensively disliking school is the primary reason for a student to leave school (Finn, 1989). In turn, participation in school activities leads to positive academic outcomes (Marks, 2000). Emotional bonds with school prevent negative developmental outcomes among adolescents, such as delinquency (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004). Unfortunately, with a few exceptions, most empirical studies have either combined the two components into a general construct or only tested one of them (e.g., Lee & Smith, 1995; Marks, 2000); such treatment does not allow a nuanced understanding of how each type of school engagement may be influenced uniquely by different developmentally-relevant ecological and personal assets; it does not afford an opportunity to disentangle any unique contributions of

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different types of engagement on academic competence (Fredricks et al., 2004; Hughes et al., 2008).

Furthermore, aggregating the two types of engagement also prevents the possibility of understanding how different types of engagement may interact. In his participation-identification model, Finn (1989) has postulated that active participation (behavior) leads to an increased sense of belongingness and to a commitment to learning in students (emotions). However, as suggested by Fredricks et al. (2004), it is also possible that emotional engagement leads to increases in behavioral engagement, or in other words, when students feel more attached to school, they are more likely to be involved in school-based activities. Although the direction of the relationships between behavioral and emotional engagement are yet to be determined, we hypothesized that while young children may start their schooling by participating in activities before feeling that they belong in the school, adolescents, as experienced students, need to experience positive feelings toward school to, at least, maintain effort. In other words, positive emotional engagement may lead to increased behavioral involvement; yet behavioral involvement may not have the same impact on emotional engagement.

**The effect of school engagement on academic competence.** The literature suggests that the concept of school engagement is essential in predicting academic outcomes and preventing school drop-out (Kindermann, 2007). A positive association between behavioral engagement and academic outcomes is well established (Fredricks et al., 2004). For instance, Finn and Rock (1997) reported that disengagement behaviors such as being inattentive and disruptive, predicted lower grades. However, the strength of the association between engagement and competence has been found to vary, depending on how competence is measured, whether school engagement is teacher or self reported, and the racial/ethnic composition of the samples that are studied

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(Shernoff & Schmidt, 2008). In addition, there is some evidence of a positive association between emotional engagement and achievement (Fredricks et al., 2004). For instance, Voelkl (1997) found significant correlations between emotional engagement (termed identification) and achievement test scores for European American students. However, few studies have examined simultaneously the associations between behavioral and emotional engagement and academic competence.

**Ecological and personal assets and school engagement.** School engagement can be influenced by factors within and outside of the school (Shernoff & Schmidt, 2008). It can also result from variations within the person (Fredricks et al., 2004). However, school engagement is rarely studied with both the person and the context in consideration, making it particularly hard to tease apart the influence of individual and ecological factors on engagement. Nevertheless, a few theoretical conceptualizations exist about the links between features of the person, the context, and school engagement (Hughes et al., 2008). Literatures on attachment, parenting, motivation, and self-regulation have provided these ideas (e.g., Bowlby, 1980; Gest et al., 2005; Howes, Hamilton, & Matheson, 1994). For instance, according to motivational models, students' self-system processes (e.g., self-regulatory skills and educational expectations) link their experience of the school context and their actual academic outcomes (Skinner, Furrer, Marchand, & Kindermann, 2008). Some studies have shown that high educational expectations are associated with academic competence among at-risk youth (Waxman et al., 1997). Similarly, future orientation may be important personal asset that provides bases for youth educational motivation, goals, and commitments. In addition, future orientation is related to task engagement and performance in the present and can be a powerful motivator of current behaviors (Greene & DeBacker, 2004). Therefore, future orientation may function to motivate and engage youth in

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their schoolwork and other academic activities. However, few studies have tested what contextual and personal features foster what types of school engagement. This omission is unfortunate, because lack of knowledge about the associations between assets and engagement make it problematic to design and implement effective and nuanced interventions promoting school engagement.

Research on the effects of teacher and peers on school engagement has found that children who receive more support from teachers and peers like school more and participate more actively in class activities (e.g., Cothran & Ennis, 2000; Furrer & Skinner, 2003; Gest et al., 2005; Ryan & Patrick, 2001). In addition, Whitlock (2006) found that other school factors, such as safety and interesting class materials, also affected levels of emotional school engagement. Positive relationships with parents also enhance students' school engagement (e.g., Englund, Luckner, Whaley, & Egeland, 2004). For instance, Morrison, Robertson, Laurie and Kelly (2002) found that Latino adolescents who received parent supervision and support were more likely to be engaged in school. Furthermore, parents' interest and involvement in their children's education were also associated with higher levels of behavioral and emotional school engagement for youth from diverse backgrounds (Englund et al., 2004).

### **The Present Study**

The first purpose of this study was to test the hypothesis that ecological (i.e., parental monitoring, parental involvement, maternal warmth, peer support, and school climate) and personal assets (i.e., self-regulation, educational expectations, and future orientation) positively predict adolescents' academic competence, even when accounting for their previous year's level of competence. Second, we hypothesized that school engagement mediates the positive effect of ecological and personal assets on academic competence. Furthermore, we examined the

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dynamics between the behavioral and emotional types of school engagement. More specifically, we hypothesized that, when adolescents experience positive affect, such as interest and enjoyment, towards people and activities in the school setting, there is an increased behavioral involvement in activities, although both directions of the relationship are examined.

Figure 1 summarizes the hypothesized pathways among Grade 5 ecological assets, personal attributes, school engagement, and Grade 6 academic competence. Indirect paths between assets and academic competence reflect the operation of two sets of pathways. First, after Grade 5 academic competence was taken into account, ecological assets at Grade 5, such as parental involvement, parental monitoring, peer support and school climate, and personal assets, including self-regulation, future orientation, and educational expectations are hypothesized to be associated with higher levels of behavioral school engagement concurrently, which leads to adolescents' Grade 6 academic competence. Second, personal assets and ecological assets are linked to emotional engagement, which either leads directly to academic competence or to behavioral engagement and then to academic competence.

### **Method**

The current investigation was conducted as part of the 4-H Study of Positive Youth Development (PYD), a multi-wave longitudinal investigation that started in 2002 by assessing 5<sup>th</sup> grade youth in the United States and their parents. Full details of the methodology of the 4-H study can be found in prior reports (Lerner et al., 2005; Phelps et al., 2009; Theokas & Lerner, 2006). Accordingly, we present here those features of methodology pertinent to the focus of this investigation.

### **Participants**

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In fifth grade, participants came from sites located in 13 states that provided regional, rural-urban, and racial/ethnic diversity. Assessment was conducted in 57 schools and in four after-school programs. The sample consisted of 1,710 fifth grade adolescents (48.1% boys;  $M = 11.03$  years,  $SD = 0.53$  years; 51.9% females,  $M = 10.92$  years,  $SD = 0.52$  years) and 1,135 of their parents.

In sixth grade, youth who were in the fifth grade during Wave 1 were retested. In addition, an additional sample of previously untested sixth graders was assessed, in order to control for the influence of prior testing on the findings. A total of 1,944 youth (42.5% boys;  $M = 12.13$  years,  $SD = .68$  years; 57.5% girls,  $M = 12.06$  years,  $SD = .71$  years) and 1,221 of their parents participated in Wave 2 data collection, sampled from 53 schools and 5 after-school programs in 20 states across the nation. The sample varied in race/ethnicity, socioeconomic status, family structure, rural-urban location, geographic region, and program participation experiences (Lerner et al., 2005).

The longitudinal sample reported here contains 960 participants who completed surveys in both Waves 1 and 2 of data collection (45.6% boys,  $M$  in Grade 6 = 12.10 years,  $SD = .50$  years; 54.4% girls,  $M$  in Sixth Grade = 11.96 years,  $SD = .57$  years) from 13 states. Overall, 57.6% of the participants described themselves as European American, 15.1% described themselves as Latino/a, 5.0% identified themselves as African American, 2.5% as Native American, 4.4% as Asian American, and 3.9% as multiethnic/multiracial. The remaining 11.5% of the youth reported their race/ethnicity inconsistently from Wave 1 to Wave 2.

Attrition in the 4-H sample is not randomly distributed across schools. At Wave 2, some principals withdrew consent for their schools to participate, and, thus, these students “dropped out” without our having had the opportunity to ask them if they wanted to remain in the study.

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For example, in one state where we were unable to collect data in Wave 2 resulted in the loss of over 250 participants. Overall, we lost 561 participants in Wave 2 because of the absence of principal or superintendent permission to continue. In turn, however, attrition from Wave 1 to Wave 2 for students who *were* allowed to be asked to remain in the study was only 10%.

The two groups of Wave 1 youth—those who continued into Wave 2 and those who did not were compared on several background and outcome variables. Youth who continued in the study were slightly more advantaged, as indexed by family income ( $M = \$61,577.22$ ) and mothers' education ( $M = 14.11$  years), than was the case for the attrition sample ( $M$  of family income =  $\$54,288.35$ , and  $M$  of mothers' education =  $13.31$  years). In addition, there were small differences in the race/ethnic distribution of the two groups: there were more European American and fewer African American youths within the longitudinal sample (57.6% and 5.0%, respectively) than was the case within the non-longitudinal sample (i.e., 51.4% and 13.7%, respectively;  $p < .01$  in both cases). There was also a larger portion of girls (54.4%) in the longitudinal sample than was the case in the attrition sample (47.2%). When considering outcome variables measured in Wave 1, both groups had equivalent levels of perceived academic competence and school engagement.

### **Procedure**

Participants were tested in groups within their schools or within after-school programs. In both Wave 1 and 2, teachers or program staff gave each youth an envelope to take home to their parent, containing a letter that explains the study, a consent form, a parent questionnaire (PQ), and a self-addressed envelop for returning the parent questionnaire and consent form. For those youth who received parental consent, data collection was conducted either in the school or program by trained study staff or hired assistants for remote locations. The procedure began with

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reading the instructions for the student questionnaire (SQ) to the youth. Data collection took approximately two hours, which included one or two short breaks. In Grade 6, youth who were unable to be surveyed at their school or 4-H site, in that they were either absent during the day of testing or the school superintendent did not allow testing to occur in the school, received a survey in the mail.

### **Measures**

Several demographic questions were asked about youth and their families (date of birth, sex, race/ethnicity, and family backgrounds). In addition, the present study utilized measures that pertained to the assessment of the behavioral and emotional components of school engagement and to youth perception of academic competence. All of the measures used in the present report, except those of family income and mothers' education, come from the Student Questionnaire (SQ). All scale scores were computed for participants where at least 55% of the items were answered to allow for missing data on individual items.

**School engagement.** All the seven school engagement items were derived from the Profiles of Student Life: Attitudes and Behaviors (PSL-AB), created by the Search Institute (Leffert et al., 1998). The items asked youth about their behaviors relevant to academic functioning and their affects towards school. For example, youth were asked whether they attended school regularly, whether they went to school without homework completed, and whether they thought their teachers and schoolmates cared about them. The response formats of four of the items ranged from 1 = strongly disagree to 5 = strongly agree. The other three items ranged from 1 = usually to 3 = seldom. In order to create consistency in item scoring, the three items with 1 to 3 response format were recoded as 1 to 5. In addition, an item, "I do not care

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about school” was reverse coded; thus, higher scores indicated higher engagement levels for all items.

Confirmatory factor analysis (CFA) was conducted to assess the degree to which the two-component model of school engagement fit the data. LISREL 8.80 (Jöreskog & Sörbom, 1996) was used for all analyses. We examined the adequacy of fit of a two-factor model of school engagement where the seven items loaded on two latent school engagement constructs: behavioral engagement and emotional engagement, using Grade 5 data. In this model, the two latent factors were allowed to correlate. Computation of this two-factor model resulted in a chi-square value of 60.56 ( $df = 13, p < 0.01$ ), NNFI = 0.94, CFI = 0.96, GFI = 0.98, and RMSEA = 0.062 (CI = 0.047- 0.078), suggesting a good fit to the data. Given the adequate fit of this model, factor loadings were assessed for statistical significance at the  $p < .05$  level. The Standardized factor loadings for the seven variables were significant and their standardized coefficients ranged from .45 to .74. A simplified one-factor model, where all seven items load on one global school engagement construct was also evaluated and compared against the two-component model. The one-factor model resulted in a chi-square value of 428.96, ( $df = 14, p < 0.01$ ). Other fit indices (CFI = 0.77; NNFI = 0.65; GFI = 0.89; RMSEA = 0.176) also show a poor fit between the modified overall structure of school engagement and our data. In addition, this one-factor model fit with the data significantly worse than the proposed two-factor model ( $\Delta\chi^2 = 368.40, \Delta CFI = -0.19$ ).

**Perceived academic competence.** The Self-Perception Profile for Children (SPPC) was used to assess youth perceived competence in six important life domains, using a structured alternative response format (Harter, 1983). The academic competence subscale, which indexes youth perceptions of their school performance, was employed in the present report. An example

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of an item from the academic competence scale is “Some kids feel like they are just as smart as other kids their age but other kids aren’t so sure and wonder if they are so smart.” Participants first chose between two types of people, and then made judgments about whether they were “really like” those people or just “sort of like” them. Each response is scored on a four-point scale ranging from 1 (not very competent) to 4 (very competent). Every subscale of the SPPC has been shown to have adequate reliability and validity (i.e., Cronbach’s alphas across the subscales range from .76 to .90 (e.g., East et al., 1992; Harter, 1983). In the present study, Cronbach’s alphas for Grades 5 and 6 were 0.72 and 0.78, respectively.

**Intentional self-regulation.** Selection, Optimization, and Compensation (SOC) Questionnaire (Freund & Baltes, 2002) was used to measure intentional self-regulation. The items in SOC are forced-choice format and each item consists of two statements. An example of a statement pair includes “Even if something is important to me, it can happen that I don’t invest the necessary time or effort” and “For important things, I pay attention to whether I need to devote more time or effort.” Youth are asked to decide which statement is more similar to how they would behave. For this investigation, nine items that have been consistently identified in previous analyses examining the SOC processes (Gestsdottir & Lerner, 2007; Zimmerman, Phelps, & Lerner, 2007) were used to measure intentional self-regulation in early adolescent samples. The nine item measure resulted in overall Cronbach’s alphas of 0.55 for Grade 5 and 0.64 for Grade 6.

**Educational expectations.** Educational expectations were assessed by asking youth what were their chances for “graduating from high school,” “going to college,” and “graduating from college.” Scores could range from 1 = very low to 5 = very high, with higher scores corresponding to higher educational expectations. The average score on the three questions was

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the index of one's educational expectations. The Cronbach's alphas for this measure were 0.85 and 0.90 for Grades 5 and 6, respectively.

**Future orientation.** Future orientation was assessed by five questions that asked youth how they perceived their future (i.e., being healthy, being safe, being respected, having a happy family life, and have friends they can count on). The response format ranged from 1 = very low through 5 = very high. Higher scores indicated a greater likelihood of an event happening in the future. The Cronbach's alpha for future orientation was 0.80 for Grade 5 and 0.89 for Grade 6 with this sample.

**Parental involvement in school work.** Parental involvement in school work was measured by four items (from the PSL-AB, Leffert et al., 1998) to assess whether youth think their parents help with their school work and go to meetings or events at school. Higher scores indicated higher perceived parental involvement. The Cronbach's alphas were 0.66 for Grade 5 and 0.79 for Grade 6, with the present sample.

**Maternal warmth.** Maternal warmth Scale was derived from the Child's Report of Parenting Behaviors Inventory (CRPBI) (Schludermann & Schludermann, 1970). Maternal warmth was conceptualized as behaviors that indicate acceptance, nurturance, support, and a feeling of being loved and wanted by the parent (Gray & Steinberg, 1999). Examples of maternal warmth items include "My mother speaks to me in a warm and friendly way" and "My mother cheers me up when I am upset." The response format ranges from 1 almost never to 5 = almost always. Higher scores indicate higher warmth and nurturance. The Cronbach's alphas for maternal warmth for Grades 5 and 6 were 0.94 and 0.96, respectively.

**Parental monitoring.** Parental monitoring was measured by the eight-item Parental Monitoring Scale (PMS) (Small & Kerns, 1993). Parental monitoring assesses the extent to

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which parents know the whereabouts of their children after school and at night and have knowledge of a youth's friends and their parents. PMS scale has been reported to have adequate reliability (Cronbach's  $\alpha = 0.87$ ) and predictive validity (Small & Kerns, 1993). In the present data set, the Cronbach's alphas for Grades 5 and 6 were 0.85 and 0.91.

**Peer support.** Peer Support was assessed with the Peer Support Scale (PSS) (Armsden and Greenberger, 1987). It includes four items to adolescents' relationships with their friends. The sample items were "I trust my friends," and "I feel my friends are good friends." The response format ranged from 1 = always true through 5 = almost never true. Higher scores indicated greater perceived peer support, when all items were reverse coded. The Cronbach's alphas for Grades 5 and 6 were 0.89 and 0.89, respectively.

**Perceived school climate.** Perceived school climate was measured using six items (from the PSL-AB, Leffert et al., 1998). Questions were asked about whether students thought their schools had clear cut rules, whether their teachers pushed them to be the best, and whether their teachers encouraged them to do their best. A sample question was "At my school, everyone knows that you'll get in trouble for using alcohol or other drugs." The response format ranged from 1 = strongly agree through 5 = strongly disagree. All items were reverse coded so that higher scores indicated more positive school climate. The Cronbach's alphas for Grades 5 and 6 were 0.70 and 0.79.

## Results

Our aim in the analyses of data was to examine the associations between personal and ecological assets and perceived academic competence and to disentangle the mediational role played by behavioral and emotional school engagement. Specifically, the analyses were aimed at answering the three key questions proposed in the present investigation: 1. Are earlier personal

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and ecological assets associated with perceived academic competence a year later? 2. What are the roles of behavioral and emotional school engagement in linking developmental assets and academic competence? 3. What are the relationships between behavioral and emotional school engagement? If they function as mediators, is their role the same?

### **Treatment of Missing Data**

Item response missing data ranged from 6.0% to 38% across variables used in this report. To maximize statistical power, replacement values for missing data were estimated using the Expectation-Maximization (EM) algorithm as implemented in PRELIS (Joreskog & Sorbom, 1996). All confirmatory factor analyses were computed using a complete data file containing actual and imputed data.

### **Preliminary Analyses**

Table 1 presents information for the measure scale scores, such as the means, standard deviation, and ranges for these variables. Table 1 also provides correlations between the predictor and outcome variables.

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### **Testing a Mediation Model of School Engagement**

To test the hypothesis that behavioral and emotional school engagement mediates the relationships between developmental assets and academic competence, we followed Baron and Kenny's (1986) guidelines for testing mediation effects. According to Baron and Kenny (1986), the criterion is that there is a significant relation between the predictor and the outcome. The second criterion in the Baron and Kenny's (1986) procedure is that a significant relation between

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the predictor and the hypothesized mediators exists. Third, the mediator variables are also required to be significantly associated with the outcome. The fourth condition is that the impact of the predictors on the outcome variables is less after controlling for the effect of the mediators. Structural equation modeling (SEM) was used to test relationships among the study constructs, following Hoyle and Smith's (1994) method. As recommended by Vandenberg and Lance (2000), changes in chi-square as well as changes in CFI were used as criteria for model comparison.

**Testing direct paths from developmental assets to academic competence.** To test the condition that the predictors (i.e., ecological and personal assets) were significantly associated with the outcome (i.e., grades and self-perceived academic competence), we constrained the paths from the predictor variables to school engagement and all the paths from school engagement to the outcomes to zero, allowing only the direct paths from the predictors to the outcomes to be estimated. The results indicated that the proposed model (Model 1) fit the data fairly well:  $\chi^2 = 1073.98$ ,  $df = 209$ , NNFI = 0.89, CFI = 0.90, GFI = 0.91, RMSEA = 0.065 (0.061 to 0.069). Some but not all of the personal and ecological assets were significant predictors of self-perceived academic competence, controlling for last year's academic competence<sup>2</sup>. Significant personal and ecological predictors of competence included self regulation, maternal warmth, parental monitoring, and school climate.

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Insert Table 2 about here

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**Testing the relationships between developmental assets and school engagement.** The second step we undertook was to test the assets → school engagement model. The paths from

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ecological and personal assets to behavioral and emotional engagement were estimated. The direct paths from assets to academic competence were all fixed to zero. The model (Model 2) provided an adequate fit, resulting in a chi-square value of 513.43 ( $df = 201$ ,  $p < .001$ ), NNFI = 0.96, CFI = 0.97, GFI = 0.95, and RMSEA = 0.040 (0.036 to 0.044). However, most of the personal asset variables were not significantly associated with emotional school engagement, whereas, most of the ecological asset variables were not significantly associated with behavioral engagement. Therefore, we modified the model so that only the paths between ecological assets and emotional engagement and the paths between personal assets and behavioral engagement were estimated. The modified model (Model 2b) resulted in a chi-square value of 570.22 ( $df = 209$ ,  $p < .001$ ), NNFI = 0.96, CFI = 0.96, GFI = 0.95, and RMSEA = 0.042 (0.038-0.046), suggesting a close fit with the data. Although the difference in Chi square was significant, comparison of other fit indices, such as CFI, suggested that there was no significant loss in model fit.

**Testing the relationships between school engagement and academic competence.** We then tested the engagement → competence model (Model 3), estimating the paths from behavioral and emotional engagement to academic competence. All other paths were fixed to zero. The analysis of this model resulted in a chi-square value of 1108.13 ( $df = 215$ ,  $p < .001$ ), NNFI = 0.89, CFI = 0.90, GFI = 0.91, and RMSEA = 0.068 (0.062-0.069), suggesting an acceptable fit with our data. The paths from behavioral engagement and academic competence and from emotional engagement to competence were both significant and positive. Thus, Model 3 indicated that behavioral and emotional school engagement together positively predicted perceived academic competence.

**Testing a Mediation Model of Assets, School Engagement, and Academic**

**Competence.** We hypothesized that there are only indirect effects of developmental asset variables on perceived academic competence. In other words, we expected that these variables exert their influences on competence via behavioral and emotional engagement. Before testing the mediational model, we tested a full model (Model 4) where the direct paths between assets and competence, as well as the indirect paths were included. This model resulted in chi square value of 483.63 ( $df = 199, p < .01$ ), NNFI = 0.97, CFI = 0.97, GFI = 0.96, RMSEA = 0.038 (0.034-0.043). The final criterion for mediation requires that the magnitude of direct paths between the predictors (i.e., individual and ecological assets) and the outcome variable (i.e., academic competence) are substantially reduced after the indirect paths are included (Forman & Davies, 2003). The results supported this criterion, as most of the direct paths between assets and competence became negligible once the mediational paths were also estimated. In fact, other than the path from self-regulation to competence, all the direct paths became insignificant. Thus, in Model 5, we tested a mediational model in which school engagement performed a full mediational role in the relationships of developmental assets and academic competence. To test this model, the path from self-regulation to academic competence was also fixed even though it was significant. The analysis of Model 5 resulted in a chi-square value of 518.83 ( $df = 206, p < .01$ ), NNFI = 0.97, CFI = 0.97, GFI = 0.95, and RMSEA = 0.040 (0.035-0.044), suggesting a close fit to the data. Most of the paths were significant. Although the difference in Chi square was significant, comparison of CFI suggested that there was no significant loss in model fit. Therefore, Model 5 was chosen over Model 4.

Given that the path from emotional school engagement to academic competence became non-significant, we sought to modify the model with theoretically-based modifications. First,

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previous research has found that, despite sparse evidence of associations between emotional engagement and academic achievement (Fredricks et al, 2004), emotional engagement may nevertheless make a unique contribution on academic outcomes. As such, one may hypothesize that emotional engagement does not have a direct effect on academic competence, but only an indirect effect, via its behavioral manifestations, such as finishing homework on time. Therefore, we tested a sixth model, in which emotional engagement had indirect effect on academic competence via behavioral engagement. The revised model (Model 6) provided an equally good fit to the data while gaining one more degree of freedom:  $\chi^2(207) = 516.47, p < .01$ ; RMSEA = 0.039 (0.035-0.043); GFI= 0.95; CFI = 0.97; NNFI = 0.97. The paths from emotional engagement to behavioral engagement and from behavioral engagement to academic competence were both significant. Therefore, this model was selected as the final model. Most of the paths were significant. The standardized coefficients of this retained model are presented in Figure 2.

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 Insert Figure 2 about here  
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As shown in Figure 2, behavioral school engagement at Grade 5 was a significant predictor of Grade 6 self-perceived academic competence, in that higher behavioral engagement was associated with higher self perceived academic competence. Emotional school engagement had a significant indirect impact on academic competence via behavioral engagement, which means that, when youth were more emotionally engaged in school, they were more behaviorally engaged. In turn, such engagement was related to higher academic competence. In other words, the relationships between emotional school engagement and academic competence were mediated by behavioral engagement. With earlier self-perceived academic competence being

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taken into account, personal assets, such as intentional self regulation and educational expectations, were found to positively associated with behavioral engagement, indicating that youth who had higher self regulation and youth who had higher expectations about their education were more behaviorally engaged with school, which then was associated with higher levels of academic competence longitudinally. The association between future orientation and behavioral engagement was not significant.

Most of the ecological assets, such as parental involvement, maternal warmth, peer support, and school climate had indirect effects on academic competence, via emotional school engagement, which exerted effects via behavioral engagement. This finding indicated that youth who received higher levels of warmth and peer support, who had more involved parents, and who perceived a more positive school climate were more likely to have higher perceived academic competence, but only via emotional engagement, which exerted effects via behavioral engagement. In other words, the positive associations between ecological assets and academic competence were fully mediated by behavioral and emotional school engagement.

### **Discussion**

The concept of school engagement has attracted growing attention as a way to promote academic competence. However, the potential contribution of the concept to research on adolescent development has yet to be realized (Fredricks et al., 2004). Several questions that were addressed in the present study are key to research efforts aimed at furthering the understanding of school engagement and its mediational role in the associations between developmental assets and adolescent academic competence. Generally, the results lend support to the contention that school engagement involves behavioral as well as emotional components, and that it plays a mediational role in the associations between developmental assets and academic

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competence. In other words, the results suggest that school engagement covaries with individual and ecological variations and it is also positively associated with competence (Finn & Rock, 1997). As such, the findings of this study contribute to literature on school engagement in three main ways.

First, we included both behavioral and emotional aspects of school engagement, which allows us to disentangle the unique contribution of each type of engagement, a step which is not achievable by the common practice of combining the different dimensions of engagement into a single measure. Furthermore, including both dimensions of engagement provided us with an opportunity to assess the “responsiveness” of different dimensions of engagement to individual and contextual variations that exist in the lives of youth. For instance, although a positive association between behavioral engagement and academic achievement has been well documented, examinations of the unique contribution of emotional engagement are relatively rare (Fredricks et al., 2004). Thus, the present study tells a more nuanced story by testing whether the behavioral and emotional dimensions of school engagement play different roles in promoting academic competence.

Second, although the results indicated that behavioral and emotional school engagement both positively predicted academic competence, emotional school engagement is only associated with academic competence indirectly--via behavioral engagement; the direct path from emotional engagement to academic competence was not significant. This result differs from the participation-identification model (Finn, 1989) that postulates that lack of behavioral engagement leads to unsuccessful school outcomes, which in turn leads to emotional withdrawal and lack of identification with school. Our results seem to support an “identification-participation” model, in which emotional school engagement is an “antecedent” to behavioral

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engagement: Youth who feel they belong to the school may be more likely to attend school, complete homework, and come to class prepared, which are all positively associated with improved academic outcomes. In other words, emotional school engagement leads to better academic attainment by its behavioral manifestation. Still another idea is that the process is cyclical: behavioral engagement and emotional engagement reciprocally influence each other. Further exploration of if, and how, emotional school engagement predicts subsequent behavioral school engagement may help to elucidate the relationships of these two constructs.

Third, we addressed whether the behavioral and emotional components of school engagement have different antecedents and how they might respond to the variations in these individual characteristics and to family and school contexts. Studies of this kind can provide nuanced and systematic information about the routes to school engagement. Our findings suggest that different dimensions of school engagement among youth can be associated with different factors. Personal assets were only linked to behavioral engagement, while ecological assets were linked to emotional engagement. For instance, factors such as maternal warmth and peer support only contributed to emotional school engagement, but had no effects on the levels of behavioral school engagement. Perceived school climate seemed to be the strongest predictor of emotional school engagement, suggesting the importance of the school. According to stage-environment fit theory (Eccles & Midgley, 1989), the extent to which the demands and supports of one's school context meet the needs of an individual youth is crucial for his or her motivation and engagement in pursuing developmental tasks, such as academic competence. Unfortunately, middle and high schools do not always provide appropriate educational environments for adolescents; inappropriate educational environments result in a downward spiral in school engagement, which

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are likely to lead to later academic failure and school dropout (Eccles, 2004). Substantial efforts need to put into promoting positive climates in junior and senior high schools.

Together, these findings suggest that developmental assets are linked to academic competence indirectly, via behavioral and emotional school engagement. In other words, the result suggests that behavioral and emotional school engagement results from the joint effort of the person and his or her context, and is likely to be malleable in response to interventions that attempt to alter the person, bring changes to contexts or change relationships between individuals and contexts. For example, interventions aimed at improving the school climate may be a shortcut to more positive student affect toward school. Participation in meaningful out-of-school-time activities may provide opportunities for youth to exercise successful self-regulation, which may lead to higher levels of behavioral engagement.

The methodology of this study had limitations that require attention in future research. First, some of the items indexing school engagement reflect deficit thinking about youth (Lerner, Phelps, Forman, & Bowers, 2009). This approach may limit our potential to accurately measure this construct. Including questions regarding positive behaviors in, emotions toward, and cognition about school would enhance not only the present line of research but, as well, it would provide the field with a positive tool in assessing school engagement. Second, we only tested the two-factor model of school engagement with one wave of data; determination of retest-reliability of the proposed instrument and the stability of the construct is needed. In addition, the substantial amount of missing data could have significant bearing on the reliability and validity of our findings; this issue warrants caution when interpreting the results. Furthermore, the fact that some variables are not normally distributed may make the estimated covariance matrix, fit indices and significance tests potentially inaccurate (Andreassen, Lorentzen, & Olsson, 2006).

In turn, in assessing the role of school engagement in influencing the relationships among developmental assets and academic competence, several steps could be pursued in future research. First, such research should assess how the interaction of various individual and context characteristics affects the development of engagement. Second, multiple methods should be applied to study school engagement. For example, qualitative studies that allow us to understand how and why school engagement work in the classroom context should be conducted. Third, academic competence is not the sole goal of schooling, and it is not the single most important index of development. Further investigation should be made of how behavioral and emotional school engagement predict other equally important indicators of positive youth development, for example, caring, character, and contribution.

This study was intended to provide support for a broadened conceptualization of school engagement and to further empirical consideration of school engagement and its role in linking developmental assets and academic competence in youth. The longitudinal nature of this study allowed us to examine the direct and mediation effects of school engagement in predicting later academic competence. The two components of school engagement play different roles in linking various personal and ecological resources in youth's daily life to academic competence. Based on the present findings, we believe that school engagement is not just mere "school business." Youth and the key settings in their lives, such as families, neighborhoods, and schools, all need to contribute to school engagement. A child exists in multiple settings, and positive development would be enhanced when the settings work in positive collaboration.



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**Footnote**

<sup>2</sup>Grade 5 academic competence was included to control for Year One competence. Its direct path to Grade 6 academic competence was estimated in each model.

Table 1

*Inter-item Correlations, Means, and Standard Deviations of Variables Included in Model Testing.*

	1	2	3	4	5	6	8	9	10	11	12
1. Grade 5 Academic competence	--										
2. Grade 5 Self-regulation	.28**	--									
3. Grade 5 future orientation	.14**	.26**	--								
4. Grade 5 educational expectations	.34**	.23**	.56**	--							
5. Grade 5 maternal warmth	.25**	.30**	.29**	.27**	--						
6. Grade 5 parental involvement	.12**	.26**	.27**	.16**	.41**	--					
7. Grade 5 parental monitoring	.20**	.21**	.23**	.21**	.29**	.27**	--				
8. Grade 5 peer support	.16**	.21**	.25**	.18**	.24**	.16**	.20**	--			
9. Grade 5 school climate	.16**	.22**	.15**	.16**	.23**	.17**	.35**	.18**	--		
10. Grade 5 behavioral engagement	.38**	.24**	.23**	.31**	.08*	.23**	.30**	.15**	.21**	--	
11. Grade 5 emotional engagement	.20**	.21**	.34**	.28**	.35**	.38**	.38**	.32**	.67**	.23**	--
12. Grade 6 academic competence	.51**	.31**	.13**	.23**	.09*	.26**	.27**	.17**	.22**	.36**	.20**

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	1	2	3	4	5	6	8	9	10	11	12
<i>M</i>	2.97	.74	4.49	4.56	3.04	3.51	4.28	4.21	4.04	4.07	2.99
<i>SD</i>	0.66	0.20	0.58	0.71	0.73	0.63	0.89	4.21	0.88	0.76	0.61
<i>Possible range</i>	1-4	0-1	1-5	1-5	0-4	0-4	1-5	1-5	1-5	1-5	1-4

*Note: \*\**  $p < .01$ ; *\**  $p < .05$ .

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Table 2

*Fit Indices and Fit Change for Structural Models 1 Through 6.*

	$\chi^2$	df	RMSEA	GFI	CFI	$\Delta\chi^2$ ( $\Delta$ df)	$\Delta$ CFI	RMSEA (CI)
M1: Assets-Competence	1073.98	209	0.065	0.91	0.90	--	--	0.061-0.069
M2: Assets-Engagement	513.43	201	0.040	0.95	0.97	-560.55	0.07	0.036-0.044
M2b:Assets-Engagement	570.22	209	0.042	0.95	0.96	-503.76	0.06	0.038-0.046
M3: Engagement-Competence	1108.13	215	0.065	0.91	0.90	34.15	0.00	0.062-0.069
M4: Full Model	483.63	199	0.038	0.96	0.97	-590.35	0.07	0.034-0.043
Model 5: Mediation model	518.83	206	0.040	0.95	0.97	-555.15	0.07	0.035-0.044
Model 6 (final model)	516.47	207	0.039	0.95	0.97	-2.36	0.00	0.035-0.043

*Note: RMSEA = root mean square error of approximation. \*\*  $p < .01$*

*Final model was compared with Model 5. Other models were compared with Model 1.*

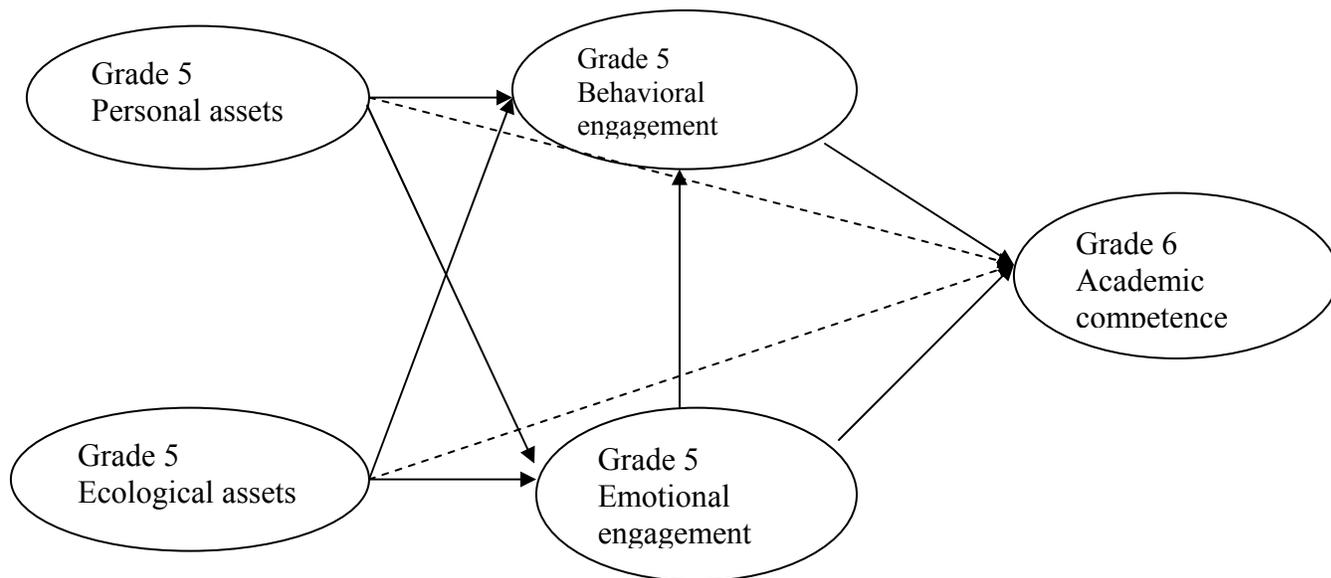
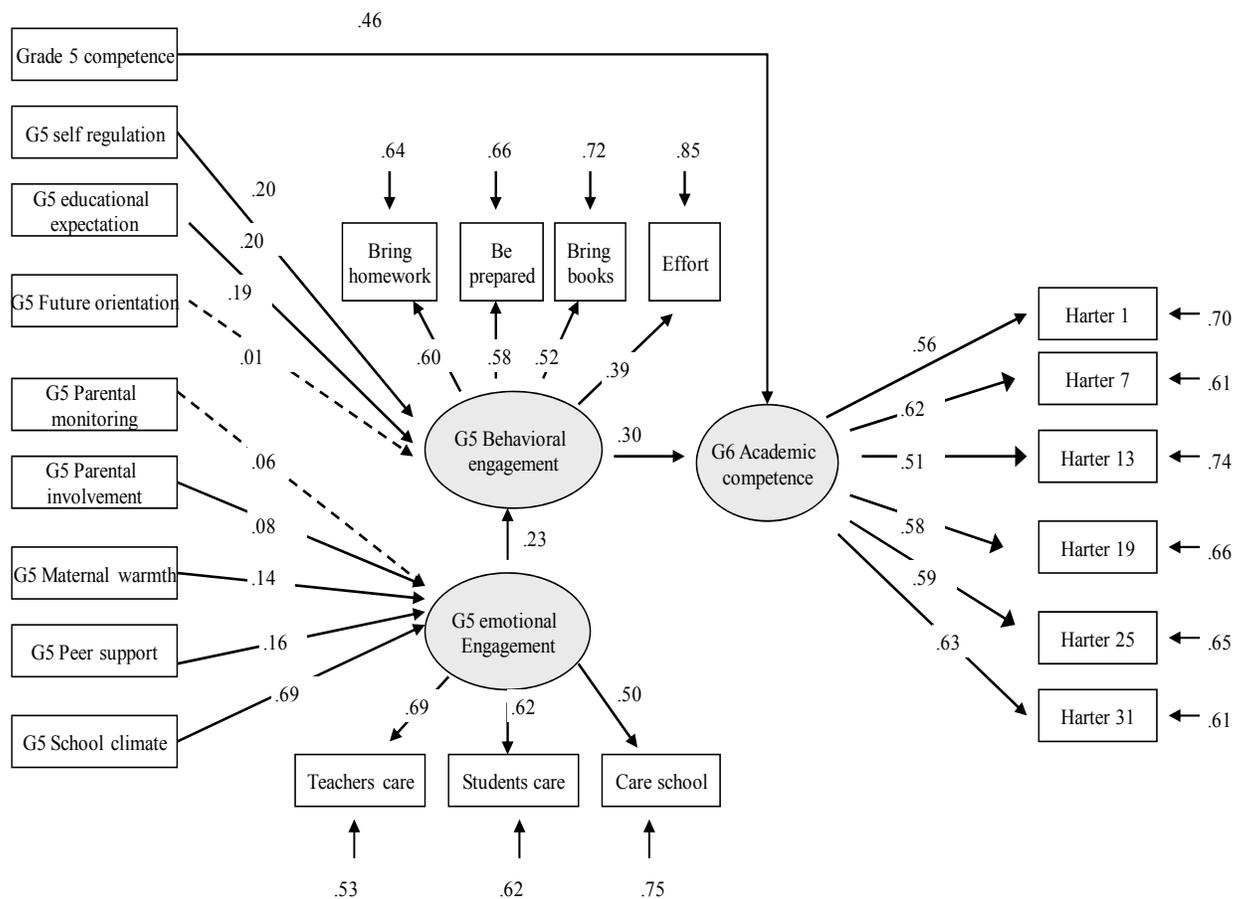


Figure 1. *Conceptual model of personal and ecological assets, school engagement and perceived academic competence.*

*Note: solid lines indicate hypothesized mediational paths and dashed lines indicate hypothesized direct paths from assets to competence.*



$\chi^2 = 516.47, df = 207, p\text{-value} < .001, RMSEA = 0.039$

Figure 2. Structural model (Model 6) of personal and ecological assets, school engagement, and academic competence.

Note: All paths that were estimated are shown; solid lines indicate significant paths and dashed lines non-significant ones. G5= Grade 5; G6=Grade 6.

- Harter 1: very good at their school work vs. worry about whether they can do the school work.
- Harter 7: Feel like as smart as other kids vs. aren't so sure and wonder if they are as smart.
- Harter 13: Are slow in finishing school work vs. can do their school work quickly.
- Harter 19: Often forget what they learn vs. can remember things easily.
- Harter 25: Do very well at their class work vs. don't do very well at their class work.
- Harter 31: Have trouble figuring out the answers vs. almost always can figure out the answers.