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The Reciprocal Links between School Engagement, Youth Problem Behaviors, and School Dropout during Adolescence

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Abstract

Drawing on the self-system model, this study conceptualized school engagement as a multidimensional construct, including behavioral, emotional, and cognitive engagement, and examined whether changes in the three types of school engagement related to changes in problem behaviors from 7th through 11th grade. In addition, a transactional model of reciprocal relations between school engagement and problem behaviors was tested to predict school dropout. Data were collected on 1,272 youth from an ethnically and economically diverse county (58% African American, 36% European American; 51% females). Results indicated that adolescents who had declines in behavioral and emotional engagement with school tended to engage in increased delinquency and substance use over time. There were bidirectional associations between behavioral and emotional engagement in school and youth problem behaviors over time. Finally, lower behavioral and emotional engagement and greater problem behaviors predicted greater likelihood of dropping out of school.

Keywords

school engagement; problem behavior; transactional model; dropout; reciprocal association; multidimensional construct

Adolescence is a critical developmental period in which youth experience the opportunity to self-construct an identity as academically capable, socially integrated, and committed to learning (Skinner, Kindermann, & Furrer, 2009). It is also a period during which adolescents are more prone to declines in academic motivation and achievement and to increases in substance use and delinquency (Schulenberg, 2006). Active engagement in secondary school promotes the skills, competencies, and values that allow adolescents to successfully transition into adulthood (Wang & Eccles, 2012; Wang & Holcombe, 2010). Unfortunately, evidence suggests that students become increasingly disengaged as they progress through secondary school, with some studies estimating that 40% to 60% of youth show signs of disengagement (e.g., uninvolved, apathetic, not trying very hard, and not paying attention) (Steinberg, Brown, & Dornbusch, 1996; Yazzie-Mintz, 2007). Youth who are disengaged from school are more likely to experience academic failure, school dropout, and a host of negative psychosocial outcomes (Li & Lerner, 2011).

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Theoretical and Empirical Framework

School engagement is a multifaceted construct that includes *behavioral*, *emotional*, and *cognitive* components (Fredricks, Blumenfeld, & Paris, 2004; Jimerson, Campos, & Greif, 2003). Behavioral engagement is defined as participation and task involvement in academic activities (Fredricks et al., 2004). Emotional engagement is conceptualized as identification with school, which includes belonging, enjoyment of school learning, and valuing or appreciation of success in school-related outcomes (Finn, 1989; Voelkl, 1997). Cognitive engagement is defined as strategic or self-regulated learning (Pintrich & DeGroot, 1990). These three components of school engagement are dynamically embedded within individuals and provide a rich characterization of how students act, feel, and think.

The concept of engagement is central to many theories explaining the dropout process. Dropping out of school for many students is not an instantaneous event; rather, it is the last step in a long process through which they have become disengaged from school (Finn, 1989). These theories of disengagement are generally based on an ecological framework, which assumes that school engagement evolves over time from a transaction between individual factors and school pathways. Ecological theory asserts that human development stems from complex and dynamic processes among various social contexts with which an individual interacts (Bronfenbrenner & Morris, 1998). Bronfenbrenner (1979) defined an individual's interactions with persons, objects, and symbols in his or her immediate environment as proximal processes and posited that they are the primary mechanism for development. The effect of proximal processes can vary substantially as a function of individual characteristics and contexts. School engagement is one proximal process between social contexts and learning. It is also the direct pathway to cumulative learning, educational achievement, and eventual long-term success.

Self-system model, a motivational framework grounded in self-determination theory (Deci & Ryan, 2000; Skinner, Kindermann, Connell, & Wellborn, 2009) is one ecologically-based theory that can capture the rich complexity of school engagement, problem behavior, and the school dropout process. The self-system model posits that the extent to which adolescents are behaviorally, emotionally, and cognitively engaged with school creates a motivational context that shapes their capacity to deal with difficulties and obstacles in school, bounce back from setbacks and failures, and constructively re-engage with challenging academic tasks (Skinner & Pitzer, 2012). From these effective coping experiences can come the development of durable long-term motivational mindsets and skill-sets and, eventually, ownership of one's success in and beyond school (Skinner et al., 2009).

Failure to engage in school may lead adolescents to seek solace in problem behaviors and associate with delinquent friends, which may in turn exacerbate their alienation from school (Bachman et al., 2008; Morrison, Robertson, Laurie, & Kelly, 2002). Resulting problem behaviors often elicit negative interpersonal interactions with teachers and parents, in turn leading to aggravated disengagement from school (Bachman et al., 2008). Association with deviant peers also provides incentives for truancy and a devaluing of academic achievement (Wang & Dishion, 2012). Over time, the interplay between school engagement and problem behaviors may accumulatively and reciprocally shape the development of youth identity and influence youths' decisions to drop out of school.

Although many theories draw on the concept of disengagement in explaining the dropout process, the empirical research addressing these relations is limited (Finn, 1989; Rumberger, 2004; Wehlage, Rutter, Smith, Lesko, & Fernandez, 1989). Moreover, despite enthusiasm for the multidimensional construct of school engagement, most existing research has failed to capture the multifaceted and interactive nature of school engagement (Fredricks et al.,

2004). Research investigating the differential potentials of the three engagement types to function as precursors for youth problem behavior is particularly sparse (Appleton, Christenson, & Furlong, 2008; Fredricks & McColskey, 2012). Even fewer studies have used longitudinal data to explore how school engagement and problem behavior reciprocally influence each other in ways that lead to dropping out of school.

To address these gaps in the literature, we use data from a four-wave longitudinal study that spans seven years of adolescence to examine whether changes in multidimensional engagement (i.e., behavioral, emotional, and cognitive engagement) relate to changes in delinquency and substance use over time. Our conceptualization of school engagement as multidimensional and interactive enables us to better understand how the three types of school engagement influence youth problem behaviors differentially. In addition, we explore how school engagement and problem behavior reciprocally influence each other in ways that lead to higher school dropout. This study will clarify the extent to which engagement in school predicts later problem behavior versus the extent to which problem behavior predicts less active engagement in school. Such research is critical for identifying intervention targets to promote positive youth development, reduce risky behaviors, and increase high school completion rates.

School Engagement and Youth Problem Behavior

Although most of the literature has focused on the academic benefits of school engagement, its role as a protective factor in reducing problem behaviors has also been acknowledged (Li & Lerner, 2011). Much of this research comes from literature dealing with school connectedness, an aspect of emotional engagement. Several studies have linked school connectedness to a reduction in delinquent behavior and drug and alcohol use (Dornbusch, Erickson, Laird, & Wong, 2001; Loukas, Ripperger-Suhler, & Horton, 2009; Resnick et al., 1997). Adolescents who are emotionally attached and connected to school may show less risky behavior because they generally strive to meet society's expectations and are more likely to form supportive relations with teachers and other engaged peers (Hirschi, 1969; Whitlock, 2006).

Other research has examined the association between behavioral engagement and problem behavior (Hirschfield & Gasper, 2011; Li & Lerner, 2011). For example, Li and Lerner (2011) found that youth who experienced positive pathways of behavioral and emotional engagement were less likely to be involved in delinquency and drug use. Classroom participation and time spent on homework have also been linked to lower drug use and delinquency (Barnes et al., 2007; Morisson et al., 2002; Wong, 2005). Behavioral engagement may be related to lower risk behavior because it limits the time and energy available for deviant activities and also strengthens a youth's connection to the institution.

The research testing the effects of cognitive engagement on problem behavior is limited. However, there are several reasons why being a strategic and self-regulated learner might result in lower delinquency. Self-regulation includes goal setting, planning, monitoring, and use of metacognitive learning strategies (Pintrich, 2004). These self-regulatory skills may buffer youth against problem behaviors by helping them to avoid risky situations and modulate their reactions to negative environments (Gardner, Dishion, & Connell, 2008). In support of this hypothesis, Gardner and colleagues (2008) found youths' self-regulatory abilities in both school and home settings moderated the association between peer deviance and antisocial behaviors. It is also possible that the effects of cognitive engagement on delinquency are mediated through achievement. Self-regulated learning is predictive of higher grades, performance, and standardized test scores (Pintrich & DeGroot, 1990;

Wigfield et al., 2008), and school performance is a protective factor against problem behaviors (Tremblay et al., 1992).

We were only able to locate one study testing the link between a multidimensional construct of school engagement (behavioral, emotional, and cognitive) and problem behavior. Among a low-income sample of African American and Latino elementary school youth, Hirschfield & Gasper (2011) found that both behavioral and emotional engagement predicted decreases in school misconduct and youth delinquency. However, contrary to their hypotheses, they documented that cognitive engagement was associated with an increase in delinquency. The explanation proposed for this unexpected finding was that higher cognitive engagement, defined in this study as a psychological investment in school, may result in frustration and lower school attachment if improved performance does not result from this psychological investment.

Reciprocal Relations between Engagement and Problem Behavior

Other interpretations for the relation between problem behavior and engagement are that problem behaviors lower school engagement or that a reciprocal relationship exists between the two factors (Steinberg & Avenevoli, 1998; Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1991). The limited research testing bidirectional links between problem behavior and school engagement has been equivocal. The majority of this research has focused on the emotional dimension. Some studies support a cross-lagged model between emotional engagement and delinquency, with delinquency predicting lower school connectedness over time among samples of suburban and high-risk middle school youth (Loukas, Ripperger-Suhler, & Horton, 2009; Thornberry et al., 1991). School delinquency may lower emotional engagement by increasing peer rejection and negative attitudes towards school and by lowering youths' attachment to the institution (Ford, 2005; French & Conrad, 2001). In contrast, Steinberg and Avenevoli (1998) found that delinquency predicted increased emotional engagement (i.e., bonding with teachers, school orientation), but failed to provide an explanation for this unexpected finding.

There is less research examining the effects of problem behavior on behavioral and cognitive engagement. Problem behavior may lead to lower behavioral engagement by reducing the time and energy students have to participate in school activities. Furthermore, problem behavior may lead to lower cognitive engagement by increasing youths' exposure to deviant peers who tend to be less invested in learning (Wang & Dishion, 2012). In the only study to test bidirectional links in a multidimensional model of engagement, Hirschfield & Gasper (2011) found that across two waves of data, delinquency predicted decreased school engagement in the cognitive domain only. They claim that this finding might reflect similarity in the conceptualization of behavioral and cognitive engagement in this study. In addition, they argue that delinquency may reflect an underlying factor, like impulsivity, that relates to both cognitive engagement and delinquency.

School engagement is considered a critical mechanism through which motivational processes lead to academic achievement (Skinner & Pitzer, 2012). Students may become increasingly disengaged over time as they receive negative academic feedback in the form of grades. Indeed, research indicates that academic performance is strongly associated with school engagement and problem behaviors (Fredricks et al., 2004; Wang & Eccles, 2012). In this study, we include measures of academic achievement to control for the influence of performance feedback on school engagement and problem behaviors over time. Specifically, we include the direct associations between academic achievement, school engagement, and problem behavior.

According to the self-system model, school engagement is also responsive to contextual characteristics and optimized when individuals perceive that the social context supports their developmental needs. One of these developmental needs is the need for relatedness, which is conceptualized as experiencing oneself as connected to other people (Skinner & Ptizer, 2012). Children's need for relatedness is likely to be fostered when parents and teachers create a supportive family and school environment. Strong relationships with parents and teachers can function as a motivational resource when children are faced with difficulties and challenges in school (Furrer & Skinner, 2003). Researchers have demonstrated a positive association between teacher support and indicators of behavioral, emotional, and cognitive engagement (Furrer & Skinner, 2003; Klem & Connell, 2004; Ryan and Patrick, 2001). Additionally, there is evidence linking parental support to higher behavioral and emotional engagement (Furrer & Skinner, 2003; Ryan, Stiller, & Lynch, 1994). Thus, it is important to account for the effects of parents and teachers in the model when examining the association between school engagement and problem behaviors.

The Effect of School Engagement and Problem Behavior on Dropout

School engagement can function as a protective factor that prevents school dropout and encourages adolescents to stay in school. Using data from the National Longitudinal Study of Adolescent Health, South, Haynie, & Bose (2007) found that students who are behaviorally engaged, attached to school, and participate in school learning activities are less likely to drop out of school the following year. Ethnographic studies also suggest that an emotional connection to the school can be a protective factor that reduces dropout rates (Farrell, 1990; Fine, 1991; Wehlage et al., 1989). Other studies show that behavioral disengagement in the early middle school years predicts early withdrawal from high school (Alexander, Entwisle, & Horsey, 1997; Jimerson, Egeland, Sroufe, & Carlson, 2000). Absenteeism and discipline problems have been also linked to school dropout (Rumberger, 2004; Rumberger & Larson, 1998).

However, few studies have examined the relation between a multidimensional construct of school engagement and school dropout (Archambault et al., 2009; Janosz, Archambault, Morizot, & Pagani, 2008). In a large sample of French Canadian students, Archambault and colleagues (2009) found that a measure of global disengagement was associated with dropping out of school. However, when broken into sub-components, only behavioral engagement predicted school dropout. Additionally, Janosz et al. (2008) used growth mixture modeling to document links between unstable pathways of school engagement and dropping out of school. They found that students who showed rapid declines in engagement and students who reported low levels of engagement at the beginning of adolescence were the most likely to dropout.

A relation between deviant behavior and dropping out of school has been consistently reported in both the substance use and delinquency literature (Townsend, Fischer, & King, 2007). Alcohol and drug use predicts school dropout, even after controlling for other risk factors (Garnier, Stein, & Jacobs, 1997; Lynskey et al., 2003; Mensch & Kandall, 1988). Additionally, prior delinquency has been found to predict dropping out of school, beyond the influence of poor academic achievement (Battin-Pearson et al., 2000).

Overview of the Current Study

Several gaps in the literature regarding the impact of school engagement on adolescent problem behavior remain. First, research has indicated that adolescents undergo developmental changes in school engagement patterns (Wang & Eccles, 2012) and in patterns of problem behavior (Wang, Dishion, Stormshak, & Willett, 2011). However, to date, research has been based on cross-sectional or short-term longitudinal studies focusing

only on two time points. Our use of latent growth modeling with multiple time points will enable us to construct a more nuanced portrait of the developmental course of adolescent school engagement and of problem behaviors across the middle to high school years. In addition, although the reciprocal association between adolescent school engagement and problem behavior is theoretically compelling, the research testing a transactional model is limited. Failure to include different types of school engagement within the same study, as well as the failure to collect multiple waves of longitudinal data imposes serious limits on our understanding of the academic and behavioral development of adolescents. For instance, do the three types of school engagement each play a unique and active role in adolescent problem behavior? Do school engagement and problem behavior mutually predict one another, or does one of these variables stand out as a primary predictor? Finally, our model includes several important confounds in the reciprocal associations between school engagement and problem behavior, including demographics, academic achievement, parent support, and teacher support. The study of transactional lagged effects accounting for these important covariates will enable us to test for the relative contribution of different types of school engagement to youth problem behavior and identify the temporal effects.

Using a longitudinal study of school and family influences on academic, behavioral, and psychological development, we aim to (1) examine whether changes in school engagement are associated with changes in adolescent problem behaviors from 7th through 11th grades; and (2) investigate the reciprocal association between school engagement and youth problem behavior as an explanation for adolescent high school drop-out. Based on the prior literature, we hypothesize that declines in school engagement will be associated with increases in substance use and delinquency over time. We also expect to document a negative bidirectional relation between school engagement and problem behavior. Finally, we expect these relations to differ by type of engagement, with the strongest associations for behavioral and emotional engagement. The transactional model is presented in Figure 1.

Method

Sample

Participants were from a multi-wave longitudinal study of approximately 1,300 youth and their families. Youth were recruited from 23 public schools in a socioeconomically, ethnically diverse county on the East Coast of the United States. This county is unique in that there is a broad range of income levels in both the African American and European American families. From the 1,861 who expressed interest in participating in the study, a sample of 1,372 families was selected to participate based on a stratified sampling procedure designed to obtain a representative sample of families from each of the 23 middle schools. 1,272 families returned consent forms and agreed to participate in the study. We examined four waves of data: Wave 1, collected when the adolescents were in 7th grade (n = 1,272); Wave 2, collected when the adolescents were in 9th grade (n = 1,157); Wave 3, collected when most of the adolescents were in 11th grade (n = 1,084); and Wave 4, collected when most of the adolescents were one year after high school (n = 997). Of these adolescents, approximately 58% were African American, 36% were European American, and 6% were either biracial or other ethnic minorities. Approximately 51% of the adolescents were female. This sample is broadly representative of different socioeconomic levels, and 86% of primary caregivers reported being employed, 54% were high school graduates, and 40% were college graduates.

Procedures

Adolescents were recruited through letters to their families. Those families that were interested in participating in the study were asked to sign and return a consent form.

Adolescents and their primary caregivers completed questionnaires for each wave. Data collection took place in adolescents' homes, with the race of the questionnaire administrator —primarily females with bachelor's degrees—matching the race of the adolescents. The questionnaire took approximately thirty minutes to complete. Participating adolescents were offered $20 at each wave to participate.

Measures

High school dropout status—School dropout was based on youth-report surveys and school data obtained from youths' high schools. Adolescents who (1) did not graduate from high school (2) did not obtain their General Educational Diploma (GED), and (3) were not enrolled in any school by wave 5 (one year after expected graduation from high school) were identified as school dropouts. Out of the 1,272 students, 90 students (7.08%) were identified as dropouts.

Youth problem behaviors—We focused on two types of problem behaviors: substance use and delinquency from 7^{th} to 11^{th} grade. For substance use, adolescents reported their frequency of alcohol consumption, marijuana, and cigarette use during the past month. The frequency scale ranged from 0 (*never*) to 6 (*nearly everyday*). Delinquency was assessed with four items derived from the Monitoring the Future questionnaire (Bachman, Johnston, & O'Malley, 2000), including, stealing, hitting or beating up someone, getting in trouble with police, and vandalism during the past three months (α's = .74 – .77). The response format ranged from 1 (*never*) to 5 (*10 or more times*). These scales have been used in prior large-scale studies and have shown good internal consistency, construct and predictive validity (Li & Lerner, 2011; Schulenberg et al., 1996).

School engagement—We measured three dimensions of student engagement in school from 7^{th} to 11^{th} grade. Behavioral engagement was measured by five items from the School Participation scale (α's = .75–.77). Example items are: "How often do you get homework done?", "How often do you participate actively in class activities?", and "How often do you pay attention in class?" Emotional engagement was measured by six items from the School Identification scale (α's = .74–.76). Example items are: "I feel like a real part of this school", "I find school work interesting", and "I feel happy when I am in school." Cognitive engagement was measured by five items from the Self-Regulated Learning scale (α's = .81–.87). Example items are: "How often do you try to relate what you are studying to other things you know about?", "How often do you check your homework to make sure it is done correctly when you finish it?", and "How often do you make plans for solving academic problems?" All the items were rated on a 5-point scale, ranging from 1 (*almost never*) to 5 (*almost always*) and were coded such that higher ratings indicated greater school engagement. These scales were adapted from existing well-established scales (e.g., Finn & Voelkl, 1993; Pintrich, 2004; Skinner & Wellborn, 1994) and have been shown to have strong psychometric properties, including convergent and divergent validity, and measurement invariance across gender, ethnicity, and socioeconomic status (e.g., Wang & Holcombe, 2010; Wang, Willett, & Eccles, 2011).

Covariates—We included individual- and school-level characteristics as statistical controls in the model because these characteristics co-vary with school engagement and with problem behaviors (Wang et al., 2011). Individual-level characteristics included adolescents' gender (MALE: female = 0; male = 1), race/ethnicity (WHITE: black = 0; white = 1), socioeconomic status (SES), and academic achievement from 7^{th} to 11^{th} grade (GPA). We standardized and added the parent's education, employment, and annual family income to create the SES score. In addition, we included four self-reported items to assess teacher social support (e.g., How often does your teacher really understand how you feel?)

and six parent-reported items to assess parent social support (e.g., How often do your child and you talk about what is going on in his/her life?) in 7th grade. Each item question was rated along a 5-point scale, ranging from 1 (*almost never*) to 5 (*almost always*). In addition, four school-level covariates drawn from school records were included in all models: school size, racial composition, teacher-student ratio (calculated by dividing the total number of students by the number of teachers at the school), and school SES (percentage of students receiving free or reduced-price meals). The school racial compositions were calculated with Simpson's (1949) index of diversity, which accounts for both the relative proportion of each racial group in the school and the number of racial groups represented within the school.

Analytic Strategies

All analyses were conducted in Mplus v.6. The Mplus estimation procedure handles missing data through the full-information maximum likelihood (FIML) method. FIML fits the covariance structure model directly to the available raw data for each participant rather than estimating missing data, as is the case with mean- or regression-based imputation techniques. FIML should adequately account for missing data that may not be missing at random in this study sample, since the predictors of missingness were included in the model (Widaman, 2006). Models were estimated with a procedure (CLUSTER) designed to address violations of independence assumptions related to the multilevel nature of the data (students nested in schools), thereby achieving robust standard errors.

Specifically, our analyses were conducted in two steps. First, we fit five unconditional linear latent growth models for behavioral, emotional, and cognitive engagement, substance use, and delinquency from 7th through 11th grade, respectively. In order for the intercept to represent initial status in the seventh grade, the slope factor loadings were constrained at 0, 1, and 2. Then we used multivariate latent growth models to test associations between each dimension of school engagement and substance use as well as delinquency. We estimated all correlations between intercepts, correlations between intercept and slope factors, and correlations between slope factors simultaneously. Second, we fit two separate full transactional models by using an autoregressive cross-lagged panel design (Cole & Maxwell, 2003). The first transactional model included school engagement, delinquency, and dropout, while the other transactional model included school engagement, substance use, and dropout. To account for the effects of potential third variable explanations on the associations between school engagement, problem behavior, and dropout, we included individual- and school-level characteristics as well as teacher and parent support at 7th grade and academic achievement from 7th to 11th grade as covariates and adjusted the models if necessary to build a more parsimonious one.

Results

Table 1 displays descriptive statistics and correlations for each measure across time points. Correlation analyses indicated that the bivariate relations among the key study variables were statistically significant and in the expected directions.

Slope to Slope Association between School Engagement and Problem Behavior

Consistent with our hypothesis, correlations were found between mean levels of each of the three school engagement variables and mean levels in delinquency and substance use over time. In addition, changes (i.e., the slope) in behavioral and emotional engagement were associated with changes in delinquency and substance use. Specifically, declines in adolescents' behavioral and emotional engagement were correlated with increases in delinquency and substance use from 7th to 11th grade. The rate of change in cognitive engagement was not associated with the rate of change in delinquency or substance use. In

summary, adolescents' behavioral, emotional, and cognitive engagement levels in 7th grade were significantly associated with levels of delinquency and substance use in 7th grade, after accounting for individual- and school-level covariates. In addition, adolescents who reported a decline in behavioral and emotional engagement experienced increases in delinquency and substance use over time.

Reciprocal Association between School Engagement and Problem Behavior

First, we tested a baseline model (Model 1 in Table 2) that explored the temporal stability of school engagement and problem behavior across time and the relation of these variables to dropout. The fit indices indicated that the model was acceptable for delinquency, χ^2 (55, 1,030) = 162.25, $p < .001$, CFI = .93, RMSEA = .05, SRMR = .07 and substance use, χ^2 (55, 1,030) = 153.22, $p < .001$, CFI = .91, RMSEA = .06, SRMR = .09. We then examined an alternative model (Model 2 in Table 2) that simultaneously examined the effects of school engagement on problem behavior and of problem behavior on school engagement while controlling for the temporal stability of school engagement and problem behavior over time. This model fit the data well for both delinquency and substance use. Model 2 also fit the data significantly better than the baseline model for both delinquency, $\Delta\chi^2$ (12, N = 1,030) = 24.06, $p < .01$ and substance use, $\Delta\chi^2$ (12, N = 1,030) = 21.00, $p < .05$. Finally, we removed path coefficients that did not reach significance in the next model (Model 3 in Table 2). The chi-square difference test was not significant for delinquency, $\Delta\chi^2$ (5, N = 1,030) = 5.13, *ns*, and substance use, $\Delta\chi^2$ (5, N = 1,030) = 3.19, *ns*, indicating that removing the nonsignificant paths did not affect the fit of the model. Since Model 3 is more parsimonious than Model 2, we selected this trimmed model as our final model.

Results for the delinquency outcome indicated that, after accounting for individual- and school-level covariates, the model accounted for a moderate amount of variability in dropout, R^2 = .54. The model examining substance use as an outcome accounted for a moderate amount of variability in dropout, R^2 = .46. In Figures 2 to 3, we present results regarding the different types of school engagement in separate panels. Nevertheless, all paths were estimated in the same analysis, as presented in Figure 1. The numbers are standardized path coefficients showing the magnitude of the association between the constructs.

Description of Significant Paths

Control variables—As predicted, individual differences in the initial levels of the main study variables could be predicted by academic achievement and demographic characteristics of the adolescents. Females had higher behavioral, emotional, and cognitive engagement and lower delinquency and substance use than males at 7th grade. European Americans had higher behavioral engagement and substance use and lower emotional engagement and delinquency than African Americans at 7th grade. Adolescents with higher SES had higher emotional and cognitive engagement and lower delinquency and substance use than adolescents with lower SES at 7th grade. Adolescents who experienced greater teacher support and parent support were more behaviorally, emotionally, and cognitively engaged in school. Adolescents with higher academic achievement had greater behavioral, emotional, and cognitive engagement, and lower delinquency and substance use from 7th to 11th grade. In addition, school-level covariates (i.e., school size, racial composition, teacher-student ratio, and school SES) were not significantly associated with any predictor or outcome variables.

Outcome variables—As predicted, adolescents' academic achievement as well as behavioral and emotional engagement in 11th grade was negatively related to dropout. Adolescents who earned higher grades, participated in school more actively, and had a better

sense of identification with school were less likely to drop out of high school. The magnitude of the relation was different, with behavioral engagement being more predictive of dropout than emotional engagement. Adolescents' cognitive engagement was not related to dropout. In addition, adolescent delinquency and substance at grade 11 was positively related to dropout: adolescents who engaged in delinquency and substance use were more likely to drop out of school.

Association between concurrent measures—Figure 2 shows that significant concurrent, negative associations were found between adolescents' behavioral, emotional, and cognitive engagement and delinquency in grades 7, 9, and 11. For school engagement and substance use (see Figure 3), adolescents' behavioral and emotional engagement were concurrently and negatively related to substance use in grades 7, 9, and 11. Adolescents' cognitive engagement was concurrently and negatively related to substance use in grade 11 only. Adolescents' academic achievement was concurrently and positively related to school engagement and negatively related to problem behaviors.

Stability—Adolescents' academic achievement as well as behavioral, emotional, and cognitive engagement were moderately stable, with significant relationships throughout all intervals. Similarly, we found stable and significant relationships between youth problem behaviors, including delinquency and substance use.

Cross-Lagged Associations

Delinquency model—The top panel of Figure 2 shows that lower levels of behavioral engagement predicted increases in delinquency consistently from grades 7 through 11. Lower levels of delinquency also predicted increases in behavioral engagement from grades 7 through 11. The middle panel of Figure 2 shows that low levels of emotional engagement predicted later increases in delinquency from grades 7 through 11. Similarly, higher levels of delinquency predicted decreases in emotional engagement. The bottom panel of Figure 2 shows that cognitive engagement did not predict changes in delinquency at any interval, nor did high levels of delinquency predict decreases in cognitive engagement between grades 7 and 11.

Substance use model—The top panel of Figure 3 shows that lower levels of behavioral engagement predicted increases in substance use from grades 7 to 11. Higher levels of substance use predicted decreases in behavioral engagement from grades 7 to 11. The middle panel of Figure 3 shows that lower levels of emotional engagement predicted increases in substance use from grades 7 through 11. Similarly, higher levels of substance use predicted decreases in emotional engagement from grades 7 to 11. The bottom panel of Figure 3 shows that cognitive engagement did not predict changes in substance use at any interval, and nor did high levels of substance use predict decreases in cognitive engagement between grades 7 and 11.

Discussion

Although an extensive literature has linked school engagement to indicators of academic adjustment, research regarding the effects of engagement on other facets of youth development is limited. This study extends prior research by using multi-wave longitudinal data to test whether changes in behavioral, emotional, and cognitive engagement relate to changes in youth problem behavior from 7^{th} to 11^{th} grade. In addition, we test the reciprocal relations between school engagement and problem behavior as an explanation for dropping out of school. The coverage of adolescence through seven years of assessments and the inclusion of three types of school engagement allow for an examination of normative

developmental changes in the contribution of different types of school engagement to youth problem behavior and vice versa. Since engagement is correlated with several protective factors such as teacher support, parent support, and academic achievement, we adjusted for these covariates in all our models. After accounting for these covariates, as predicted, the rates of change in behavioral and emotional engagement were negatively associated with the rate of changes in problem behaviors over time. Findings also confirmed our expectation of bidirectional associations between behavioral and emotional engagement in school and youth problem behavior over time. Furthermore, lower behavioral and emotional engagement and greater problem behaviors predicted greater likelihood of dropping out of school.

Our findings support the self-system model which posits that behavioral, emotional, and cognitive engagement are assets that help students to cope with the stressors, setbacks, and difficulties they face in school. Engagement with school learning can be seen as playing a role in the reciprocal and dynamic process of resilience, functioning as an industrious asset that helps adolescents to cope more adaptively and reengage with academic tasks (Deci & Ryan, 2000).Youth who are engaged with school feel more academically competent, are more connected to the institution, and elicit more positive reactions from their teachers and parents. In contrast, disengaged youth have academic difficulties, receive less positive support from teachers, and are more likely to associate with disengaged peers (Skinner & Pitzer, 2012).

The Slope to Slope Association between School Engagement and Problem Behavior

We first tested a parallel processing model of how behavioral, emotional, and cognitive engagement was interrelated with youth delinquency and substance use over time. In line with our hypotheses, the associations between school engagement and problem behaviors varied across the different types of engagement. Adolescents who had declines in behavioral and emotional engagement with school had increased delinquency and substance use over time. This finding is consistent with prior research linking behavioral disengagement to higher levels of problem behavior (Morrison et al., 2002), and it corroborates an extensive literature on school connectedness as a protective factor in reducing risky behaviors (Dornbusch, et al., 2001; Loukas et al., 2009; Resnick et al., 1997). Adolescents who are disengaged from school are more likely to experience peer rejection and associate with other peers who are also disconnected from school (Crosnoe, 2002; Dishion et al., 1991). Disengaged students also tend to receive less positive support and instruction from teachers (Sutherland & Oswold, 2005). According to social control theory, a weaker school bond reduces student concern for disapproval of misconduct (Hirschi, 1969). Youth who invest more time and effort in academic activities have less time and opportunities to engage in problematic behavior.

In contrast, the rate of change in adolescent cognitive engagement in school was not related to the rate of change in problem behaviors. This finding may reflect our operationalization of cognitive engagement as self-regulated learning. Planning, monitoring, and evaluating one's cognition may be more strongly related to academic outcomes than to problem behavior. Several studies have found that the use of self-regulatory strategies predicts achievement-related outcomes (Wolters, 2010). In contrast, research linking self-regulation to deviant behavior is more limited. Another possible explanation is that the influence of cognitive engagement on delinquency is mediated by behavioral engagement (Archambault et al., 2009). Manifestations of behavioral disengagement may be more proximal to problem behavior and may be a consequence of cognitive disengagement. Future research should test the developmental roles of each dimension in the dropout process. Furthermore, the findings suggest that student engagement in school is not static but continues to change over time. As a result, it is necessary to take into account the dynamic nature of these associations when

examining the mutual influence between school engagement and behavioral adjustment (Fredricks et al., 2004).

The Reciprocal Association between School Engagement and Problem Behavior

This study is one of the first in the literature to examine the reciprocal relations between school engagement and problem behavior. Our findings suggest that school engagement and delinquency and substance use are mutually reinforcing over time. Specifically, changes in adolescents' delinquency and substance use were predicted by their early levels of behavioral and emotional engagement in school. In turn, changes in behavioral and emotional engagement in school were predicted by early delinquency and substance use. Findings are consistent with limited research testing the reciprocal relations between school connectedness and delinquency (Loukas et al., 2009; Thornberry et al., 1991) and theoretical arguments that adolescents actively shape their own behavioral outcomes (Loukas et al., 2009). It is noteworthy that the strength of the reciprocal links between behavioral and emotional engagement and problem behaviors did not change substantially over time. This suggests that the transactional processes between school engagement and youth problem behavior are likely stable and progressive across stages rather than sharply defined at one stage. These findings affirm that transactional conceptualizations of youth development are critical in understanding the progression of adolescent academic and behavioral maladjustment during adolescence.

Consistent with prior studies, lower behavioral and emotional engagement and greater problem behaviors were associated with dropping out of school (Finn, 1989). Behavioral and emotional engagement at school, as well as problem behavior, all influenced each other to predict the likelihood of dropping out of school. These findings support the assumption that the path to school dropout is multidimensional and complex (Christenson, Sinclair, Lehr, & Godber, 2001). Dropping out of high school is not a spontaneous decision but rather a long, cumulative process influenced by increasing levels of school disengagement and involvement in risky behaviors (Finn, 1989).

There are many long-term academic and educational benefits to be gained from encouraging adolescents to engage in school and flourish academically (Wang & Eccles, 2012; Wang & Holcombe, 2010). Similarly, there are clear benefits in the prevention of delinquency and substance use in adolescence, not the least of which pertain to the reduction of substantial physical and mental health risks (Masten, 2004). This study adds to the literature suggesting that early behavioral and emotional engagement in school can buffer against participation in problem behavior, including delinquency and substance use. Our findings suggest that interventions which aim to improve school engagement may promote positive youth development, including reducing involvement in problem behaviors. By increasing student behavioral participation in classroom and school-based activities and nurturing their connection to school, we can potentially reduce youth problem behavior. However, our findings by no means lessen the necessity to target adolescent delinquency and substance use directly. Rather, our study demonstrates that behavioral and emotional engagement in school can promote academic development and also function as protective factors in buffering against delinquency and substance use in adolescents.

Limitations, Future Research, and Implications

There were some limitations to this study. These results are based on findings from a community-based sample in a single county on the East Coast which has unique characteristics in terms of socioeconomic diversity. Although we expect the basic associations to hold across demographic groups, certain relations might be stronger in some populations than others. For example, the association between disengagement and problem

behavior might be stronger in a low-income urban sample. Furthermore, prior research suggests that disengagement begins in the early years and is cumulative over time (Alexander et al., 1997; Finn, 1989). By studying engagement only in adolescence, we narrow our understanding of these developmental processes. Another potential limitation is that we did not include other types of social experiences that could provide a richer understanding of the processes influencing student academic and behavioral development. For example, information regarding peer relationships might be particularly useful, as the adolescent context is likely to interact with peer characteristics to predict school dropout. The contribution of various aspects of peer relationships to academic and behavioral development, their interaction effects, and their underlying social processes are an important area for future research (Wang & Eccles, 2012). Finally, the use of variable-centered rather than person-oriented approaches may have overlooked important subgroups, including, for example, students with high emotional engagement but low cognitive engagement as compared to students with high behavioral engagement but low emotional engagement. Failure to consider these heterogeneous groups impedes our understanding of developmental processes and ability to design targeted interventions for specific groups of students. Future use of person-centered approaches would provide a better understanding of various developmental processes and the desirability of various patterns of engagement and synergy among the components (Wang & Peck, 2013).

Despite these limitations, this study makes an important contribution to our understanding of the reciprocal, dynamic interplay between school engagement and problem behaviors. Although our study cannot indicate causal relationships between constructs, our longitudinal-transactional design provides information about the possible direction of effects from middle to high school. The general pattern of significant and non-significant results can provide useful insight for model building and guidance for future intervention design. The inclusion and distinction of three types of school engagement enabled us to identify differences in the pattern of relation with problem behaviors for cognitive engagement as compared to the two other dimensions.

Examining school engagement as a multidimensional construct is critical to our future understanding of the dropout process. This research will help to determine if there are distinct aspects of behavior, emotion, and cognition that impact an adolescent's decision to stay in school. Another benefit of using a multidimensional approach to measuring engagement is the ability to test for additive and interactive effects between the three components and to develop models of how these three components change over time. A multidimensional construct also allows for a richer characterization of individuals and the possibility to test whether there are certain patterns of school engagement that either facilitate or undermine positive youth development.

Finally, another advantage of a multidimensional approach is that it can provide more specific prescriptions for both intervention and prevention strategies (Christenson & Thurlow, 2004). For example, although both behavioral and emotional engagement predicted dropping out of school, the magnitude of the relation was different. Behavioral engagement was more predictive of dropping out of school. Findings about differences in the strength of relations have important implications for prevention efforts and where to target resources. Promising interventions include parent trainings to increase homework completion, school-level interventions that focus on relationship building and monitoring early warning signs of withdrawal, and programs that work directly with students to teach problem solving skills.

Adolescence is a key developmental period for youth to construct an identity as academically capable, socially integrated, and committed to learning (Skinner et al., 2009;

Wang & Eccles, 2013). Academic engagement shapes adolescents' everyday experiences in school, both academically and socially. Thus active engagement with school can be conceptualized as a protective factor and a positive force in the lives of youth, especially for those at risk for underachievement and dropping out of school (Deci & Ryan, 2000; Skinner & Wellborn, 1994). When students have the ability to cope effectively with academic setbacks and challenges, they are more likely to stay focused on problem solving and academic self-improvement and less likely to fall into a downward spiral of school disengagement leading to substance use and other problem behaviors. Therefore, early educational interventions for low-engaging students could be effective in decreasing delinquency and substance use and preventing adolescents from dropping out of high school.

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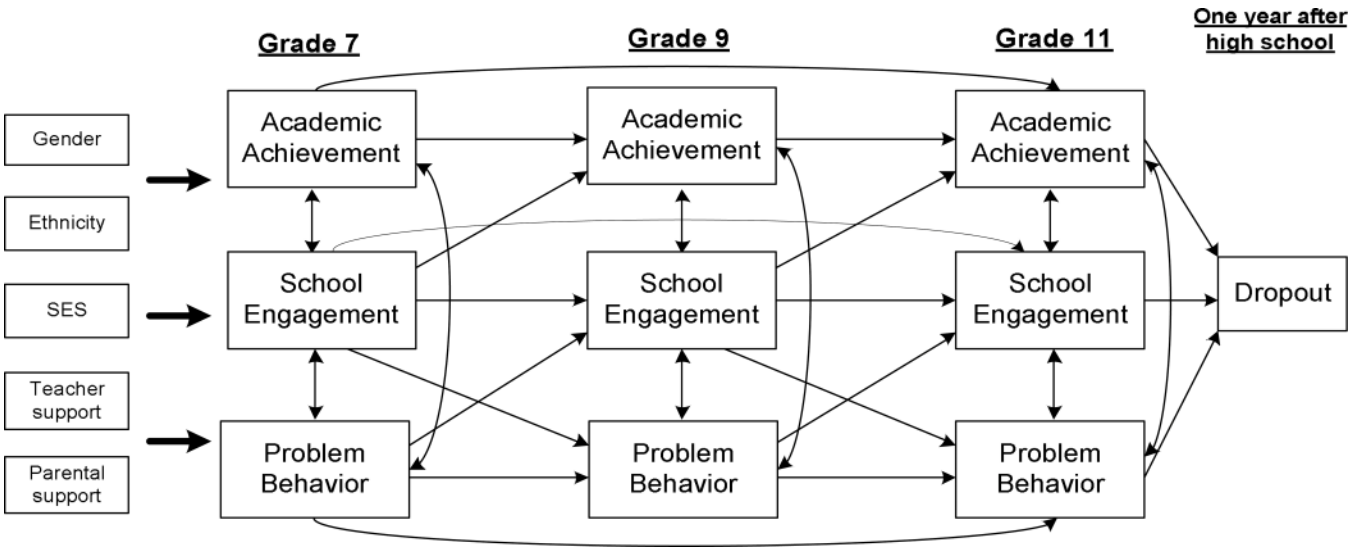

Figure 1.
Theoretical model depicting reciprocal associations between school engagement and problem behavior and how the interplay between school engagement and problem behavior influencing youth decisions to drop out of school.

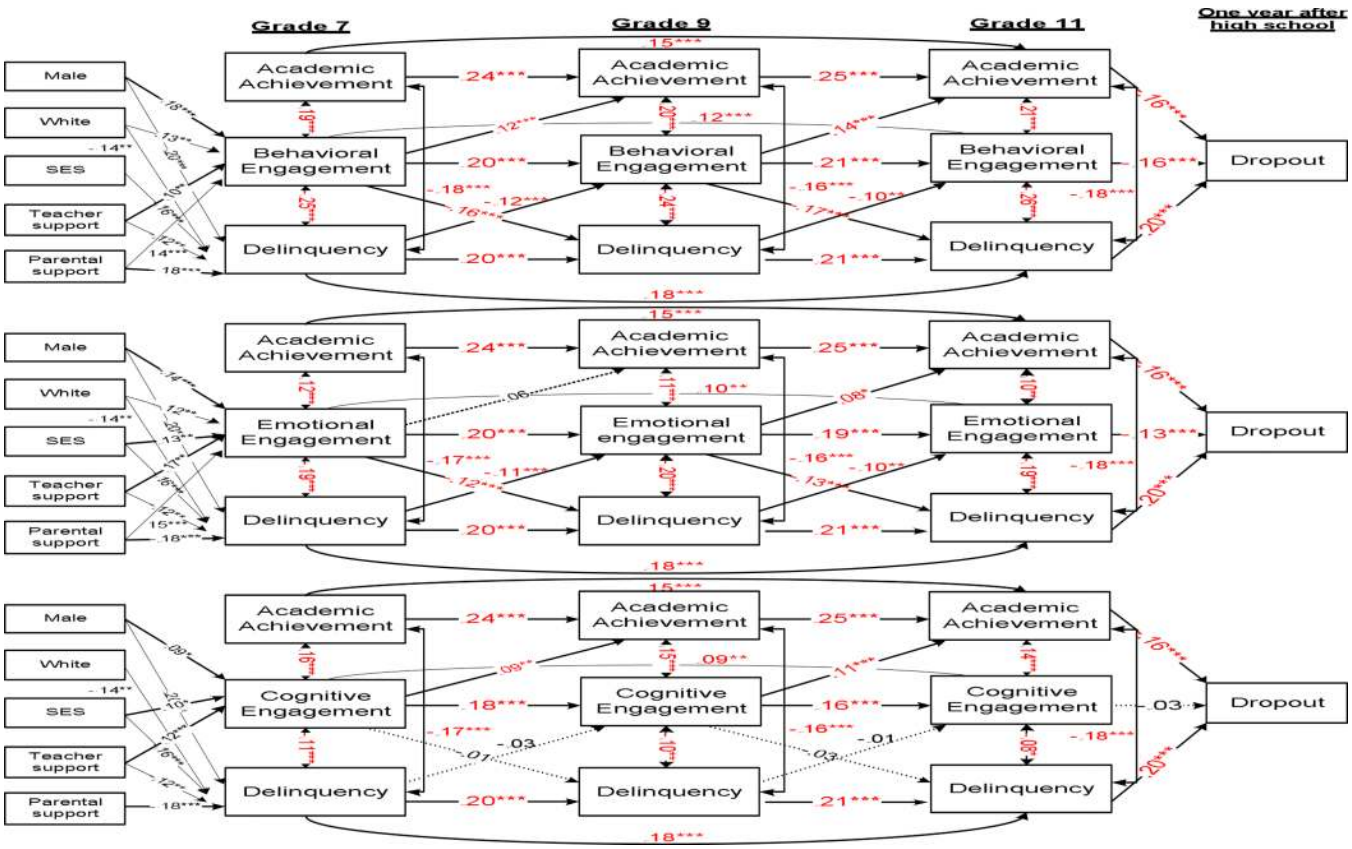

Figure 2.

Path model depicting reciprocal associations between school engagement and delinquency (Model 3 in Table 2; trimmed model). All paths were estimated in the same analysis but results are presented in three panels for clarity. Bold, red numbers and asterisks represent standardized path coefficients; dotted lines represent non-significant results. The top panel presents results involving behavioral engagement and delinquency. The middle panel presents results involving emotional engagement and delinquency. The bottom panel presents results involving cognitive engagement and delinquency. * p <.05. ** p < .01. *** p <.001.

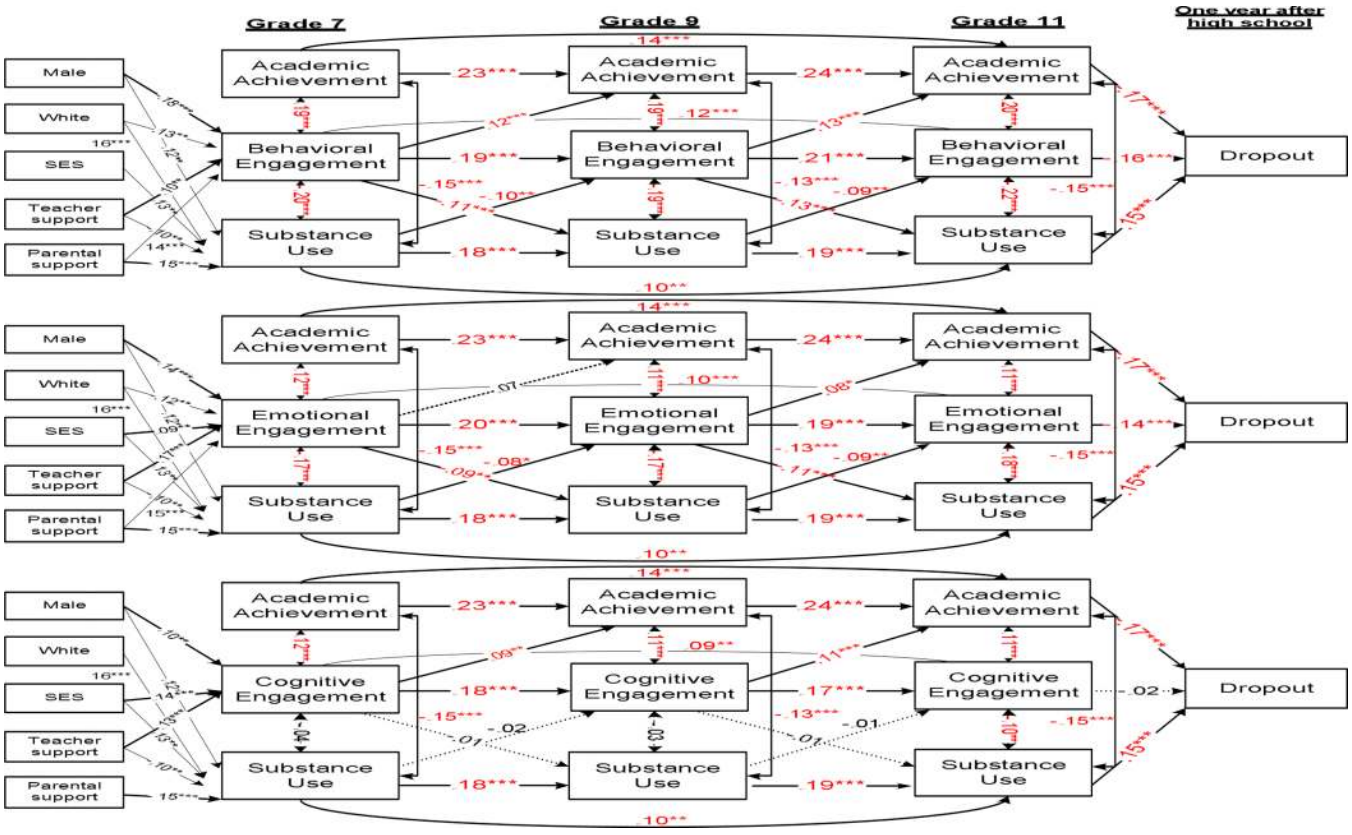

Figure 3.

Path model depicting reciprocal associations between school engagement and substance use (Model 3 in Table 2; trimmed model). All paths were estimated in the same analysis but results are presented in three panels for clarity. Bold, red numbers and asterisks represent standardized path coefficients; dotted lines represent non-significant results. The top panel presents results involving behavioral engagement and substance use. The middle panel presents results involving emotional engagement and substance use. The bottom panel presents results involving cognitive engagement and substance use. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1

Means, Standard Variations, and Bivariate Correlations Between the Key Variables Across All Waves

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Dropout	—															
2. Delinquency (Grade 7)	.10	—														
3. Delinquency (Grade 9)	.19	.35	—													
4. Delinquency (Grade 11)	.34	.16	.29	—												
5. Substance use (Grade 7)	.07[a]	.33	.22	.10	—											
6. Substance use (Grade 9)	.19	.24	.27	.24	.28	—										
7. Substance use (Grade 11)	.25	.21	.18	.40	.20	.29	—									
8. Behavioral engagement (Grade 7)	−.12	−.38	−.29	−.15	−.30	−.21	−.17	—								
9. Behavioral engagement (Grade 9)	−.20	−.24	−.37	−.27	−.20	−.29	−.22	.31	—							
10. Behavioral engagement (Grade 11)	−.27	−.18	−.20	−.39	−.19	−.19	−.31	.19	.28	—						
11. Emotional engagement (Grade 7)	−.05[a]	−.29	−.23	−.11	−.26	−.17	−.14	.25	.12	.06[a]	—					
12. Emotional engagement (Grade 9)	−.18	−.20	−.31	−.22	−.15	−.27	−.20	.17	.20	.20	.30	—				
13. Emotional engagement (Grade 11)	−.25	−.12	−.19	−.31	−.07[a]	−.17	−.28	.15	.13	.26	.20	.31	—			
14. Cognitive engagement (Grade 7)	.02[a]	−.18	−.04[a]	−.02[a]	−.14	−.07[a]	−.03	.09	.03[a]	.07	.26	.15	.04[a]	—		
15. Cognitive engagement (Grade 9)	−.03[a]	−.10	−.16	−.09	−.08	−.10	−.09	.10	.13	.01[a]	.15	.24	.12	.28	—	
16. Cognitive engagement (Grade 11)	−.08	−.03[a]	−.05[a]	−.15	−.04[a]	−.03[a]	−.18	.02[a]	.04[a]	.12	.14	.20	.23	.18	.27	—
Mean	0.07	2.25	2.45	1.87	2.22	3.87	2.30	3.85	3.37	2.96	3.69	3.26	3.04	3.56	3.38	3.25
Standard deviation	—	0.64	0.80	.088	0.61	1.75	1.27	0.82	0.93	1.14	0.69	0.79	0.84	0.76	0.77	0.83

Note. All coefficients are significant ($p < .05$), except with superscript[a]

Table 2

Summary of Goodness-of-Fit Statistics for Hypothesized Model Fitting

Model	χ^2	*df*	*p*	CFI	RMSEA	SRMR
Delinquency						
Model testing						
Model 1: Baseline model	172.25	55	<.001	.93	.05	.07
Model 2: Alternative model	148.19	43	<.001	.97	.02	.04
Model 3: Trimmed model	153.32	48	<.001	.97	.02	.04
Substance use						
Model testing						
Model 1: Baseline model	162.22	55	<.001	.91	.06	.09
Model 2: Alternative model	141.22	43	<.001	.95	.04	.05
Model 3: Trimmed model	144.41	48	<.001	.95	.04	.05

Note. χ^2 = chi-square statistic, CFI = comparative fit index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual.