Longitudinal Predictors of High School Completion

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This longitudinal study examined predictors of dropout assessed in elementary school. Student demographic data, achievement, attendance, and ratings of behavior from the Behavior Assessment System for Children were used to predict dropout and completion. Two models, which varied on student sex and race, predicted dropout at rates ranging from 75% to 88%. Model A, which included the Behavioral Symptoms Index, School Problems composite, Iowa Tests of Basic Skills battery, and teacher ratings of student work habits, best predicted female and African American dropouts. Model B, which comprised the Adaptive Skills composite, the Externalizing composite, the School Problems composite, referral for a student support team meeting, and sex, was more accurate for predicting Caucasian dropouts. Both models demonstrated the same hit rates for predicting male dropouts. Recommendations for early warning indicators and linking predictors with interventions are discussed.

Keywords: high school dropout, engagement, ACT Early

High school dropout is a widespread problem in the United States that has high stakes for students, schools, communities, and society (Reschly & Christenson, 2006). Dropouts have higher rates of substance abuse, criminal activity, and mental health disorders than those students who graduate (Office of Juvenile Justice and Delinquency Prevention, 1995). Society is also impacted as dropouts not only bring in lower tax revenues to support governmental services, but also need more aid in the form of social services, health care, and incarceration costs (U.S. Department of Health and Human Services, 2000). Moreover, educators are facing increasing pressure to meet federal and state completion rate goals.

In addition to those realities, there is a paucity of information regarding effective dropout prevention strategies (Prevatt & Kelly, 2003; Reschly & Christenson, 2006). Historically, many programs are not evaluated and of those that are, there is little evidence of effectiveness. In addition, although scholars have good reason to believe that early childhood development and

school experiences are related to dropout and completion, only a handful of longitudinal studies exist.

Student Engagement

For a number of years, student engagement has been considered the basis of theory explaining dropout and completion (e.g., Finn, 1993) and the cornerstone of interventions to address this phenomenon (Christenson et al., 2008). The foundation of student engagement theory is Finn's (1993) participation–identification model. Finn argued that those students who participate in school and classroom activities identify and feel a sense of belongingness with the school and, consequently, are more likely to complete their degree. He suggested that belongingness, or feeling accepted by teachers and peers in the classroom, is essential for ensuring high school completion. On the other hand, Finn argued that those students who do not participate in classroom and school functions are less likely to experience a sense of identification with and belongingness at the school and, thus, are less likely to complete high school. This argument has been supported in the literature as student feelings of belongingness are negatively related to both absenteeism and noncompletion (Osterman, 2000). Belongingness is also positively related to positive attitudes to-

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ward education, engagement, and participation in the classroom.

Researchers have found that indicators of belongingness distinguish completers and noncompleters among at-risk students. For instance, Finn and Cox (1992) found that completers and noncompleters differ in their levels of participation in elementary school. In particular, researchers have concluded that students with a low socioeconomic status may have lower high school completion rates because they do not participate and, thus, presumably fail to fully identify with the school and classroom (Miller-Cribbs, Cronen, Davis, & Johnson, 2002). Based on Finn's (1993) participation–identification model, the engagement theoretical framework reinforces the importance of a positive relationship between certain characteristics of the school and the student.

Numerous predictors of dropout and completion have been identified and a variety of categorizations of these variables offered. One distinction is among nonschool correlates (Rosenthal, 1998); another is the proximity to the behavior of concern (attendance vs. family characteristics; Rumberger & Larson, 1998); yet another is the amenability to intervention. *Unalterable* or demographic variables generally refer to characteristics of a student or family that are inherent or difficult to change, such as race, socioeconomic status, disability, region of the country, and so forth. *Alterable* variables, however, are predictive of completion status and amenable to intervention, such as homework completion, attendance, and school behavior. Alterable variables can further be differentiated into those that are risk and protective factors and are associated with students, families, or schools (Reschly & Christenson, 2006). Demographic and alterable variables may be useful for school identification and prevention efforts. Demographic variables may be useful for identifying groups of students that are at increased risk, and functional risk variables are used to determine which students are most in need of intervention (Christenson, 2008). Engagement is inherently alterable and, therefore, of interest in longitudinal studies and for the purposes of linking research to intervention.

Several unalterable characteristics influence high school completion. Completion rates are lower for students from African American and Hispanic subgroups (Laird, DeBell, & Chapman, 2006), large urban school districts, low-income households (Anderson, Christenson, & Lehr, 2004), and families with a minimal interest in education (Kleine, 1994). Moreover, students with disabilities have lower completion rates, ranging from 4% to 92% depending on a number of factors, including state, race, sex, and special education classification (U.S. Department of Education, 2007).

A key alterable variable, engagement, is a multidimensional construct describing a student's motivation in initiating and completing educational tasks (Anderson et al., 2004) and is described as "the key to noncompletion on the personal side of the equation" (Alexander, Entwisle, & Horsey, 1997, p. 89). This construct is a significant predictor of dropout and the foundation of the engagement model. The engagement model is widely supported in the completion literature (Anderson et al., 2004; Appleton, Christenson, Kim, & Reschly, 2006; Christenson & Thurlow, 2004; Reschly & Christenson, 2006). Several indicators of engagement in elementary school predict dropping out in high school, including academic, behavioral, cognitive, and affective engagement (Alexander, Entwisle, & Kabbani, 2001; Barrington & Hendricks, 1989). Accordingly, there are currently several conceptualizations of engagement.

Academic and *behavioral engagement* are overt behaviors related to classroom participation. Academic engagement refers to variables related to the amount of time a student spends on academic tasks (e.g., completion of schoolwork), whereas behavioral engagement includes actions (e.g., attendance and behavior problems) observed both inside and outside the classroom (Christenson & Thurlow, 2004). On the other hand, *cognitive* and *affective engagement* cannot be directly observed. Cognitive engagement indicators (e.g., motivation and self-determination) are based on the belief that education is an investment that will bring positive opportunities (Finn, 1993). Affective engagement refers to internal indicators that facilitate feelings of belongingness with the educational environment (e.g., peer acceptance and positive relationships with teachers; Ollendick, Weist, Borden, & Greene, 1992).

More recently, however, interest in engagement has expanded to high school reform initiatives (National Research Council, 2004) and to the field of education more broadly (Reschly

& Christenson, 2006). As interest has increased, so too has a number of theoretical and measurement issues. Most theorists agree on the multidimensional nature of engagement and that it likely encompasses aspects of student behavior, emotions, and cognition (Fredricks, Blumenfeld, & Paris, 2004). The model postulated by Christenson, Reschly, Appleton, and colleagues (in press) proposes one additional type of engagement through the bifurcation of behavior into two parts: those related specifically to academics (e.g., homework completion, time on task) and more general behavior (e.g., attendance, extracurricular participation).

Early Identification and Intervention

Disengagement and its probabilistic consequence of dropout begin in early childhood (Alexander et al., 2001; Englund & Luckner, 2004; Jimerson, Anderson, & Whipple, 2002; Lehr, Hansen, Sinclair, & Christenson, 2003). Given the importance of early events in the process of dropout, it is important to identify those at risk for dropping out prior to disengagement and withdrawal. Early intervention is complementary to and dependent on early identification. Once students are identified as possessing risk factors for dropping out, intervention must occur promptly. However, the majority of school-based dropout prevention policies and practices target high school students (Lehr et al., 2003), a time when problems are the most severe and interventions are less likely to be effective.

Recently, there has been an increased focus on rigorous evaluation of dropout prevention programs (e.g., the Institute of Education Sciences What Works Clearinghouse) and on establishing longitudinal data systems and early warning indicators (National Research Council, 2011) so that the identification of students who are at risk for dropping out is more accurate and efficient and to increase the likelihood of intervention efficacy. Recent longitudinal studies have focused on prediction based upon data from late elementary school (Balfanz, Herzog, & Mac Iver, 2007) and early high school (Allensworth & Easton, 2005, 2007; Balfanz et al., 2007). Given the need for early identification coupled with early intervention, this study used a longitudinal data set that originated when students were in the third grade.

The current study predominantly focused on alterable characteristics, as those are amenable to change with effective prevention programs. By addressing these characteristics, it is expected that policies for more effective interventions and prevention strategies can be developed. However, it is important not to disregard the saliency of unalterable characteristics, as interventions can be used for students with a demographic risk for dropout (Lehr at al., 2003). In addition to targeting alterable predictors, focusing on the early identification of at-risk students should be a priority.

Environmental Factors

It is also crucial to determine the most effective environments for intervention. Engagement is thought to be a mediator between environment and student outcomes (Appleton et al., 2006; Christenson et al., 2008; Fredricks et al., 2004). In other words, the interaction of myriad variables that may be found in the home and at school influence engagement and dropout (Alexander et al., 1997; Cairns, Cairns, & Neckerman, 1989; Christenson et al., 2008).

The ability of educators to measure and improve points to the school as the environment in which interventions should occur. Temple, Reynolds, and Miedel (2000) support this idea as they found early school-based intervention decreases dropout rates. Uncovering predictors present in the school environment that could guide intervention was central to the current study.

Purpose and Significance

The overarching purpose of the study was to improve the understanding of high school dropout using the engagement model through uncovering engagement-based predictors. Findings from this study will aid in accurately identifying students at risk for dropout. In addition, the focus on variables that are amenable to intervention can be evaluated early in development and are exhibited in the school environment. Recommendations for early interventions in the school environment that are directly tied to predictors of dropout are offered. These recommendations could potentially guide how schools can best identify, monitor, and prevent

high school dropout. The research questions and hypotheses included the following:

1. Do the completers and dropouts differ in the engagement-based variables examined? *Hypothesis:* It was expected that completers would have significantly higher ratings of engagement-based characteristics.
2. Is there an engagement-based statistical model that predicts completion status? *Hypothesis:* It was expected that both unalterable and alterable variables predict dropout.
3. Is there a stronger association between the predictors for completers and dropouts? The strength of this relationship is indicative of how accurately the two groups can be predicted. *Hypothesis:* It was expected that engagement-based characteristics would significantly predict differences between the completers and the dropouts.
4. Do the predictors have different degrees of influence for various demographic groups of students? *Hypothesis:* Based on the literature in this area, it was expected that the predictive influence of certain variables would vary for different demographic subgroups of students.

Method

Overview of ACT Early

Data were from the longitudinal 7-year ACT Early Project (Advancing the Competencies of Teachers for Early Behavioral Interventions of At-Risk Children; Baker, Kamphaus, & Horne, 1999). ACT Early identified at-risk students by evaluating behavioral difficulties perceived by students, parents, and teachers. The sample was drawn from general education classrooms in a southeastern district with enrollment of approximately 11,000 students and a completion rate of 61%. The students possessed several indicators for dropout, such as high rates of low socioeconomic status (60%) and minority students (70%; Georgia Department of Education, 2006).

The two types of participants involved in this study were regular education teachers and their students. Ninety-six percent of participating teachers were women and 4% were men.

Eighty-four percent of teachers were Caucasian, 14% were African American, and 2% were other. There were 1,643 participating students (51% boys, 49% girls) in kindergarten through fifth grade. Their ethnicities were distributed as follows: 55% African American, 36% Caucasian, 4% Hispanic, 3% Asian/Pacific Islander, 2% multiracial, and <1% other.

Current Study

The current study examined the participating students' third grade data and final completion status via the cohort method. Completers were students who graduated from high school with a college preparatory or technical diploma. Parallel to the definitions used by No Child Left Behind policy (2001), dropouts included students who did not complete high school or earned a graduate equivalency or special education diploma.

After listwise deletion of missing data, the final sample of participants ($n = 201$, 44% boys, 56% girls) included third grade students who were eligible for high school completion in May 2006 or May 2007. The participating students were from the following backgrounds: Caucasian (38%), African American (58%), Hispanic (3%), and Asian/Pacific Islander (1%). Participants receiving a special education services by third grade were categorized as follows: speech impairment ($n = 14$, 6%), attention-deficit/hyperactivity disorder ($n = 15$, 5%), emotional and behavioral disorder ($n = 7$, 3%), specific learning disability ($n = 6$, 3%), intellectual disability ($n = 6$, 3%), and autism ($n = 1$, <1%).

Numerous instruments were used by ACT Early; however, the predictive discriminant analysis included variables that were associated with dropout in the literature, demonstrated appropriate psychometric and descriptive properties, and were found to be significantly different for completers and dropouts. The latter requirement was determined by whether chi-square and t test analyses (see Table 1) revealed significant differences between the two groups. The following variables met all three conditions: sex, race, Adaptive Skills composite, Behavioral Symptoms Index, Externalizing composite, Internalizing composite, School Problems composite, Iowa Tests of Basic Skills (ITBS) bat-

Table 1
Comparison of Transfer and Included Students

Independent measure	t	df	p	In mean	Out mean	In SD	Out SD	Pearson's r
Adaptive skills composite	−0.14	420	.99	48.05	48.07	10.99	10.53	.00
Behavioral symptoms	−0.81	420	.42	46.94	47.73	9.57	9.68	.05
Externalizing composite	−0.68	420	.50	48.59	49.32	10.12	11.09	.03
Internalizing composite	−1.39	420	.17	44.45	45.56	7.65	8.11	.07
School Problems composite	0.53	420	.59	50.78	50.20	10.88	10.44	−.03
ITBS Reading	−0.81	275	.42	179.70	182.84	25.84	35.31	.05
ITBS Language Arts	0.47	268	.64	180.83	178.83	27.33	39.85	−.03
ITBS Math	−0.05	273	.96	185.73	186.01	44.28	31.77	.00
ITBS battery	−0.93	257	.35	182.03	185.69	25.86	33.17	.06
Work habits	−0.96	284	.50	11.29	11.47	1.50	1.30	.06
Attendance	1.39	274	.17	0.97	0.96	3.34	3.20	−.08

Independent measure	χ^2	df	p	In %		Out %		In range	Out range	Φ
Gender	1.75	1	.19	M = 48.00, F = 52.00		M = 54.00, F = 46.00		(0,1)	(0,1)	−.06
Race	15.43	4	.00*	C = 36.71, AA = 59.56, H = 2.62, A/PI = 1.11		C = 49.26, AA = 41.18, H = 5.88, A/PI = 2.94, MR = 0.74		(0,3)	(0,4)	.20
SST referral	0.38	1	.54	No = 67.35, Yes = 32.65		No = 72.13, Yes = 27.87		(0,1)	(0,1)	.26

Note. In = in sample (completers and noncompleters); Out = out of sample (transfer); ITBS = Iowa Tests of Basic Skills; SST = school support team; M = male; F = female; C = Caucasian; AA = African American; H = Hispanic; A/PI = Asian/Pacific Islander; MR = multiracial.
* $p \leq .05$.

tery, student support team (SST) referral, attendance, and work habits.

Several of the included variables were evaluated using the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). This instrument included teacher reports of their students and contained 148 Likert-type items ranging from *never* to *almost always*. The 10 subscales of the BASC Teacher Rating Scale for Children (BASC TRS-C) were reported as *t* scores with a mean of 50 and a standard deviation of 10. The subscales assessed different categories of behavioral difficulties. The Externalizing composite contained the Aggression, Hyperactivity, and Conduct Problems subscales. The Internalizing composite consisted of the Anxiety, Depression, and Somatization subscales. The Attention and Learning Problems subscales were included in the School Problems composite. Lastly, the Adaptability, Social Skills, Leadership, and Study Skills subscales were included in the Adaptive Skills composite. This instrument is psychometrically sound, with empirical support of internal consistency (coefficient alphas for the 10 subscales range from .76 to .94), construct validity, concurrent validity (.92 correla-

tion; Achenbach, 1991), and high test–retest (median value of .91) and interrater reliability (coefficients ranging from .70 to .90; Reynolds & Kamphaus, 1992).

School records provided completion status, race, sex, attendance, SST information, and ITBS scores. The third grade ITBS battery score included the Math, Reading, and Language Arts composite scores. The psychometric properties of this assessment are also sound, with high internal consistency (above .95), high test–retest reliability (range from the .80s to .90s), concurrent validity with the Cognitive Abilities Tests (Cross, 1998), and predictive validity (Canivez & Konold, 2001).

After the Institutional Review Board and participating school district approved the ACT Early Project, teachers and parents were given the option of participation by signing a consent form. Consent allowed for the release of the student's records and teacher reports via the BASC TRS-C. Teachers received a $200 stipend and students received a pencil. Student participation ranged from 68% to 71% at the four schools. In April of each year, the researchers collected information from student records and the BASC TRS-C scores for the participat-

ing students. Completion status was collected after Institutional Review Board and school system approval in 2006.

Statistical Analyses

The statistical analyses in the current study required three steps. First, engagement-based variables demonstrating significant differences for completers and dropouts emerged. Second, two leading models surfaced when variable groupings were assessed via the Morris program (Huberty & Olejnik, 2006). These models were analyzed through predictive discriminant analysis using SAS. We used the external classification rule allowing future cross-validation. The leave-one-out method of sample splitting was used. The quadratic rule was implemented as the covariance matrices were significantly different, $F(10, 165130) = 91.17$, $p = .00$. The priors (0.39 for dropouts and 0.61 for completers) reflected the state rates (Georgia Department of Education, 2006). Third, statistical values (e.g., improvement over chance and the Z statistic) and practical implications were considered when determining the best model for each sex and racial subgroup.

Results

Tables 2 and 3 illustrate the descriptive and psychometric information of the variables. The range of each variable varied on the basis of the distribution of the scale and/or theoretical differences between the variables. The means and standard deviations ranged from 11.44 to 180.04 and 1.27 to 30.03, respectively. Differences in the scales are evident in the indicators of reliability for the instrument ($\alpha = .78$) and its composites ($\alpha = .65$ to $\alpha = .99$). ITBS reliability alpha coefficients for composite scores were greater than .95 (Cross, 1998). Correlations between the variables ranged from $-.56$ (between the School Problems composite and ITBS score) to .79 (between the Behavioral Symptoms Index and the Internalizing composite). No variables were characterized as skewed using the De Carlo method with an absolute value greater than 2 as the cutoff (Huberty & Olejnik, 2006).

Variable groupings revealed two models. Model A consisted of the Behavioral Symptoms Index, the School Problems composite, ITBS battery, and student work habits. Model B included sex, the Adaptive Skills composite, the Externalizing composite, the School Problems composite, and referral for a SST meeting. The hit rates, improvement over chance (*I*) statistic, and the *Z* statistic were calculated to evaluate each model.

Models A and B were applied to the entire sample and each subgroup (i.e., boys, girls, Caucasians, and African Americans) to deter-

Table 2
Descriptive Information of Included Variables

Variable	Mean	*SD*	Reliability
BASC composites			
Adaptive Skills	39.17	21.33	.97
Behavioral Symptoms Index	51.12	11.04	.96
Externalizing	52.36	11.47	.91
Internalizing	47.86	10.13	.99
School Problems	51.45	10.92	.94
ITBS battery	180.04	30.03	
Work habits	11.44	1.27	

Variable	Range	Centrality
Attendance	77–100%	50th percentile = 97%
Sex	(0,1)	56% female, 44% male
Race	(0,3)	Caucasian 38%, African American 58%, Hispanic 3%, Asian < 1%
Completion status	(0,1)	56% completer, 44% dropout

Note. BASC = Behavior Assessment System for Children; ITBS = Iowa Tests of Basis Skills.

Table 3
Correlations of Included Variables

Variable	AC	BSI	Ext.	Int.	SP	ITBS	Work habits	Attention
AC								
BSI	−.21							
Ext.	−.24	.64						
Int.	−.18	.79	.28					
SP	−.31	.71	.41	.54				
ITBS battery	.3	−.27	−.16	−.2	−.56			
Work habits	.15	−.31	−.3	−.11	−.44	.27		
Attention	−.19	−.18	−.15	−.19	−.23	.17	.11	

Note. AC = Adaptive Skills composite; BSI = Behavioral Symptoms Index; Ext.= Externalizing composite; Int.= Internalizing composite; SP = School Problems composite; ITBS = Iowa Tests of Basic Skills.

mine the model that best predicted completion status (see Table 4). Overall, Model A hit rates were 50% for completers and 86% for dropouts, whereas the Model B hit rates were 61% for completers and 80% for dropouts. When the individual sex groups were examined separately, boys had hit rates of 53% and 76% for completers and dropouts, respectively, for Model A; and 56% and 76%, respectively, for Model B. On the other hand, the hit rates for girls were 54% for completers and 88% for dropouts for Model A, whereas their hit rates for Model B were 56% for completers and 82% for dropouts. Regarding African American students, Model A hit rates were 45% for completers and 82% for dropouts, and Model B hit rates were 61% for completers and 75% for

dropouts. Model A hit rates were 38% for completers and 75% for dropouts for Caucasians, whereas their Model B hit rates were 52% for completers and 82% for dropouts.

The improvement over chance statistic (Huberty & Olejnik, 2006) was calculated for each subgroup (see Table 4). For the entire sample, the improvement over chance was 42% and 45% for Models A and B, respectively. In other words, Model A predicted completion 42% better than chance and Model B predicted completion 45% better than chance. For boys, Models A and B had 22% and 27% improvement over chance, respectively. For girls, Model A was 57% more accurate than chance, whereas Model B was 51% better than chance. Model A was 23% better than chance, and Model B was 34%

Table 4
Comparison of Models A and B for Sample Subgroups

Sample/model	Hit rate (%)		Improvement over chance (%)	Z
	Completer	Dropout		
Whole sample				
A	50	86	42	5.32**
B	61	80	45	5.75**
Boys				
A	53	76	22	2.67**
B	56	76	27	3.10**
Girls				
A	54	88	57	4.95**
B	56	82	51	4.19**
African Americans				
A	45	82	23	2.89**
B	61	75	34	4.15**
Caucasians				
A	38	75	36	1.75*
B	52	82	53	4.04**

* $p < .10$.   ** $p < .01$.

better than chance for African Americans. For Caucasian students, improvements over chance were 36% and 53% for Models A and B, respectively.

The two leading models were applied to the entire sample and each subgroup. Both Models A and B predicted status for the entire sample, boys, girls, and African American students at a level of $p < .01$ when assessed using the Z statistic. Models A and B were significant at the levels of $p < .10$ and $p < .01$, respectively, for Caucasian students (see Table 4).

Models were examined for fence riders and outliers. Six participants in Model A and four participants in Model B were classified as fence riders. Three were misclassified as dropouts and three were misclassified as completers in Model A. For Model B, three were predicted to be completers when they were actually dropouts, and the remaining fence rider was predicted to be a dropout when the participant graduated. These findings suggest that there was not an additional, underlying group in the sample and that the fence riders for Models A and B were not the same. Seven participants were classified as outliers for Model A and four participants were classified as such in Model B. All outliers in both groups were dropouts.

Discussion

This study demonstrates that significant differences exist in third grade unalterable and alterable variables between completers and dropouts. Two engagement-based models accurately predicting dropouts emerged. The Z statistic values revealed that both Models A and B were statistically significant at the $p < .01$ level for the entire sample and each subgroup. For the Caucasian subgroup, Model B also reached statistical significance at the $p < .01$ level, whereas Model A's significance was $p < .10$. These findings suggest that both Models A and B can predict completion status at a high level of significance for most students. Model B accounted for the largest improvement over chance for the entire sample ($I = 45\%$), boys ($I = 27\%$), African Americans ($I = 34\%$), and Caucasians ($I = 53\%$), whereas the statistic for girls ($I = 57\%$) was higher for Model A. In addition, the degree to which each model predicted dropout varied by subgroup. Thus, both engagement-based models consisting of third

grade unalterable and alterable variables successfully predicted dropout.

Implications

The two models can provide a framework for educators to monitor students. This novel finding, that the predictive models are more effective for different subgroups of students, is useful for identifying at-risk students and providing the appropriate intervention based on the most effective model for the student's subgroup. A three-pronged approach to prevention is recommended.

The first necessary practice is to determine the most effective predictive model(s) for the school's population of students. In this study, although two engagement-based models predicted dropout, the efficacy of the prediction varied by subgroup. Based on the findings, Model B is most effective for predicting students at risk for dropout for the entire sample, boys, African Americans, and Caucasians, whereas Model A best predicts girls at risk for dropout.

Once the best prediction model for the students and their subgroups is determined, the second practice is to evaluate all students early in their education. The first screener can inform practitioners as to which students are at risk for dropout. School systems can then administer periodic assessments in an effort to monitor each student's risk for dropping out. Intervention must occur promptly if a student is classified as a potential dropout.

The third practice is implementing interventions that are linked to the variables in the predictive model. Although unalterable variables cannot be changed by any intervention, several are significant predictors of completion (Anderson et al., 2004; Cairns et al., 1989; Reschly & Christenson, 2006). Two unalterable variables in the current study (i.e., sex and SST referral) were included in both models. Similar to previous findings, sex independently predicted completion status at a rate of 64% and should be considered when prevention efforts occur (Laird et al., 2006). Similarly, whether or not a student has a SST referral was predictive of completion in Model B and independently predicted a student's dropout at a rate of 62%. Thus, it is recommended that students who require a SST meeting should be identified as at

risk and included in interventions. Students possessing these demographic predictors that place them at risk for dropout should be selected for receiving interventions.

Alterable characteristics placing students at a greater risk for dropping out should be continually monitored and should be a primary focus in interventions. Although all four types of engagement are believed to be influential in completion, the variables involved in the current study were in the areas of academic, behavioral, and affective engagement.

Several outcomes of academic engagement were included in the predictive models for the current sample. A student's ITBS score was a primary predictor in Model A, and the School Problems composite was included in both models. School-level interventions include evidence-based academic support practices, such as implementing interdisciplinary curriculum. Student-level interventions include tutoring in the student's problem area(s) and individualized instruction (Lehr, Johnson, Bremer, Cosio, & Thompson, 2004; Reschly, Appleton, & Christenson, 2007). Using agendas, providing school supplies, and having quality communication between teachers and parents improve performance (Reschly et al., 2007).

Several indicators of behavioral engagement (e.g., teacher ratings of work habits, School Problems composite, Behavioral Symptoms Index, Adaptive Skills composite, and Externalizing composite) were included in the models which supports past findings (Alexander et al., 1997; Jimerson, Egeland, Sroufe, & Carlson, 2000; Vitaro, Larocque, Janosz, & Tremblay, 2001). Monitoring teacher reports of work habits and BASC TRS-C composites scores is essential for identifying students at risk for dropout and intervention development.

School-level interventions for improving behavioral engagement include examining policies (e.g., suspension and expulsion) that facilitate disengagement (Reschly & Christenson, 2006). Student-level interventions, including monitoring behaviors, implementing behavior contracts, providing behavioral training, and positively reinforcing appropriate behaviors, are supported (Reschly et al., 2007). Student-level behavioral difficulties can also be addressed with empirically based interventions for the appropriate clinical population(s). For example, the Keep Your Cool program, which entails

cognitive–behavioral management, demonstrates a high level of efficacy for ameliorating aggressive behaviors (Finch, Nelson, & Moss, 1993).

Indicators of affective engagement that are predictive of dropout are consistent with previous findings (Jimerson et al., 2000). These characteristics should be monitored and included when developing interventions. School-level intervention strategies focusing on cooperative instruction (Reschly & Christenson, 2006) and improving school climate to promote belongingness (Reschly et al., 2007) are recommended. Student-level affective engagement interventions include mentoring, self-esteem programs, social skills training, and the positive reinforcement of interpersonal behaviors (McPartland, 1994; Reschly & Christenson, 2006; Vitaro et al., 2001).

In summary, we recommend a three-step process for improving completion rates. First, a predictive model including unalterable and alterable characteristics within the school should be developed. Second, predictors should be systematically monitored throughout the student's education. Third, early interventions that are parallel to the predictive model should be implemented. Interventions related to the predictors of dropout are reviewed in this study; see Christenson et al. (2008) and Reschly et al. (2007) for a comprehensive list of practices.

Limitations

Despite the potential utility of the results from this study, its limitations should be considered. First, the sample was drawn from one school district, the racial demographics were not similar to state and national norms, and participants were from general education classrooms. Future studies and schools should examine the best predictors for their sample. Second, because the data were not originally collected for examining high school dropout, there is not a clear demarcation between the variables studied and the different types of engagement.

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