# EFFECTS OF STUDENT BELONGING AND ENGAGEMENT IN AN AT-RISK POPULATION OVER TIME

A Dissertation

by

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ABSTRACT

The purpose of this study was to examine changes in students' school belonging and behavioral engagement across the transitions to middle school and high school in an academically at-risk population. Growth curve modeling (GCM) was used to examine general trends in the target variables over time, repeated measures ANOVAs were used to examine differences in means for the target variables across the six waves, and an autoregressive cross-lagged model was used to determine directionality and causality in the relationships between the target variables. GCM results indicated that both school belonging and behavioral engagement decreased for students across the six waves. Females reported higher levels of belonging and engagement compared to males; however, this finding was not significant. Students who had been retained reported higher school belonging but lower behavioral engagement than students who had never been retained. With the ANOVA analyses, the greatest decreases in belonging for all students occurred from 7$^{th}$ to 9$^{th}$ grades and decreases in engagement were greatest from 6$^{th}$ to 7$^{th}$ grade and at the transition to high school. Both school belonging and behavioral engagement increased for all students at the transition to middle school, regardless of sex. Females reported higher levels of belonging at the transition to middle school than males, and males reported higher belonging at the transition to high school. Females reported higher levels of engagement at the transitions to both middle school and high school. The cross-lagged model revealed that school belonging was significantly and positively associated with behavioral engagement 1 year later across almost all waves of measurement; however, behavioral engagement was not significantly associated with school belonging one year later across all waves of measurement. All synchronous paths between belonging and engagement were significant. There were no significant differences between sex

or retention status. Study limitations, implications for interventions, and future research directions are discussed.

# DEDICATION

This dissertation is dedicated to my family, who have provided me with endless support throughout my doctoral journey. To my sister Ashlyn who made time for phone calls and Isabela who helped take on the household responsibilities so I could focus on my studies and dissertation. To my amazing husband, Zachary, who supported and encouraged me through the ups and downs of my education and this dissertation. Lastly, and most importantly, to my parents Diana and Scott, who funded my education and made this dream a reality.

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The data analyzed for Chapter III was provided by Professor Jan. The analyses depicted in Chapter IV were conducted in part by Hsiang Yu Chien of the Department of Educational Psychology. Syntax was developed with help from Shuling Liu from and Professor Oi-Man Kwok from the Department of Educational Psychology.

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# CHAPTER I

# BELONGING AND ENGAGEMENT

## Introduction

School belonging and behavioral engagement are variables that have been found to be linked to both positive and negative outcomes, and ultimately, they can predict high school completion. The literature outlines many definitions of school belonging, but for the purposes of the current study, school belonging is referred to as feelings of acceptance and value from others in the school setting that affects the degree of attachment an individual feels to school (Willms, 2000). School belonging often is difficult to measure, as it usually is done so by self-report, and it is not a variable that is observable by others or that can be measured by others apart from the individual.

School belonging has been found to decrease during primary and secondary school (Anderman, 2003; Marks, 2000). Additionally, research has uncovered critical periods in which the largest decreases in school belonging occur, and these critical periods are marked by the transition from elementary to middle school as well as the transition from middle school to high school (Benner, Boyle, & Bakhtiari, 2017; Marks, 2000; Martin, Marsh, McInerney, et al., 2009).

School belonging is associated with academic, behavioral, employment, and mental health outcomes. High levels of school belonging are linked to less involvement in health-risk behaviors (McNeely & Falci, 2004), lower rates of anxiety and depression, better academic performance (Garcia-Reid, 2007; Hallinan, 2008; Wang & Eccles, 2012a), and lower rates of school dropout (Kuperminc, Darnell, & Alvarez-Jimenez, 2008; Pittman & Richmond, 2007; Slaten, Elison, Hughes, et al., 2015). Low levels of school belonging are linked to engagement in

risk-taking behavior and school attrition (Allen & Boyle, 2016) as well as low self-esteem and low self-efficacy (Due, Riggs, & Augoustinos, 2016). Further, researchers have found a significant, inverse relationship between school belonging and depressive symptoms (Newman, Griffen, O'Connor, et al., 2007).

Behavioral engagement also has value when determining the academic success of a student and ultimately high school completion. Like school belonging, it has many definitions, but for the current study, it is defined as active involvement in academic and other school-related activities, as it relates to attending to tasks and following school rules (Fredricks, Blumenfeld, & Paris, 2004). Unlike self-reported feelings of belonging, behavioral engagement is a construct that can be measured by other individuals who are external to the student (Appleton, Christenson, Kim, et al., 2006).

Consistent with school belonging, behavioral engagement decreases over time (Fredricks et al., 2004), and students exhibit the greatest decrease in behavioral engagement during the transitions to middle school and high school (Benner et al., 2017; Marks, 2000; Martin et al., 2009).

Behavioral engagement has ties to academic, behavioral, employment and mental health outcomes. Greater levels of behavioral engagement are associated with higher levels of association with school, greater achievement, higher levels of motivation, and greater aspirations for the future (Burns, Martin, & Collie, 2017; Martin, Marsh, McInerney, Green, & Dowson, 2007; Martin et al., 2009; Meece, Wigfield, & Eccles, 1990). Lower levels of behavioral engagement are associated with negative academic outcomes for students including lower grades (Goodenow, 1993), lower scores on standardized exams (Roderick & Engel, 2001), and higher

rates of school dropout (Croninger & Lee, 2001). Additionally, these students evidence emotional withdrawal and poor school identification (Finn, 1989).

Although school belonging and behavioral engagement have been extensively studied, the direct relationship between the two variables has been given little attention. Researchers who have studied the relationship of school belonging and behavioral engagement often examine the impact of school belonging on behavioral engagement (Knifsend & Graham, 2012). These studies have found that greater levels of belonging are associated with higher levels of behavioral engagement, whereas low levels of belonging are associated with lower disengagement. Through the literature review, there is only one study that discussed the impact of engagement on belonging (Osterman, 2000). This research has found that higher levels of engagement coincide with high levels of belonging. Due to a shortage of literature in this area, research should begin to focus on the bidirectional relationship of these variables not only cross-sectionally but also longitudinally.

**Problem Statement**

Research has found significant decreases in school belonging (Anderman, 2003; Ding & Hall, 2007; Neel & Fuligni, 2013) and behavioral engagement (Archambault, Janosz, Morizot, et al., 2009; Fredricks et al., 2004; Marks, 2000; Skinner, Furrer, Marchand, et al., 2008) across primary and secondary school. Specifically, the literature has found critical transition periods during which scores associated with these variables significantly decline (Benner et al., 2017; Marks, 2000; Martin et al., 2009). Consequently, decreases in school belonging and behavioral engagement puts students at risk for non-completion of school. This has been evidenced by one out of five students graduating later than expected (Stetser & Stillwell, 2014) and seven percent of all students failing to obtain a high school diploma by the age of 24 (National Center for

Education Statistics, 2014). Over the span of an individual's lifetime, high school non-completion costs the government roughly $250,000 (Stark, & Noel, 2015). This results not only in negative outcomes for students in the short-term, but also in the long-term. Students who drop out of school often are unable to earn a living wage, and job prospects are small, as many employers require a high school diploma or the equivalent. Throughout adulthood, the implications include experiencing negative outcomes such as being fired, being incarcerated, having poor health, using illicit substances, and being on assistance from the government (Lansford, Dodge, Pettit, et al., 2016).

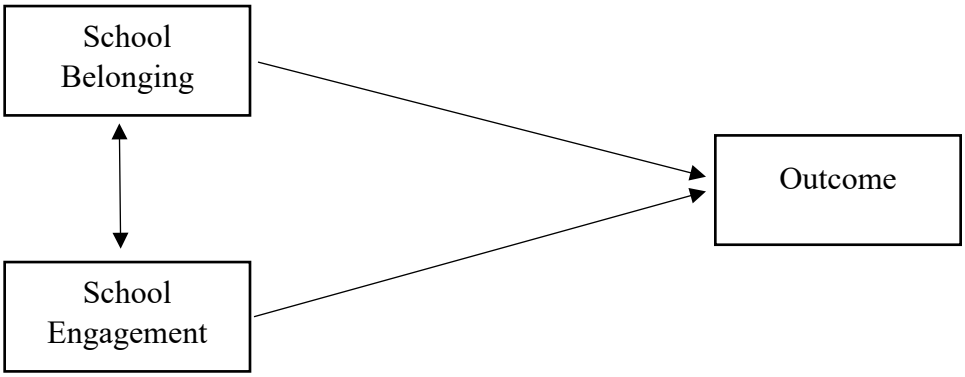
Researchers in the field of education mainly have examined school belonging and behavioral engagement as they relate to outcome variables such as academic performance, delinquency, motivation, high school completion, and mental health difficulties (Allen & Boyle, 2016; Anderman, 2002; Newman et al., 2007). Additionally, research has examined differences in sex and ethnicity (Chiu, Pong, Mori, et al., 2012; Dotterer, McHale, & Crouter, 2007; Due et al., 2016; Uslu & Gizir, 2017); however, the direct effects of school belonging and behavioral engagement on one another has not been extensively studied. By examining patterns of belonging and engagement over time, it may be possible to intervene as early as possible using the most effective interventions to ensure the highest levels of belonging and engagement for students, resulting in higher rates of school completion and better academic, employment, and mental health outcomes.

**Conceptual Framework**

Based on this research, a model was created which demonstrates a simplified example of the relationship between school belonging and engagement. Figure 1 reflects findings in the literature indicating a bidirectional relationship between school belonging and behavioral engagement as well as both variables influencing a given outcome. Consistent with the literature,

the bidirectional relationship demonstrates that changes in school belonging impact levels of engagement and changes in engagement impact the degree of school belonging students experience. This model will be used as a foundation for the purposes of conceptualizing and analyzing the data in this study. During analyses, this model will be expanded upon to answer the research questions.

*Figure 1. Model of relationship between belonging and engagement on an outcome.*




**Gaps in the Literature**

Through a review of the literature, many important factors have been found to impact school belonging and engagement. These factors can be analyzed both cross-sectionally and longitudinally, so summaries of findings in the literature – what is known and what is unknown – are provided in these contexts.

**Gaps in Cross-Sectional Literature.** Studies have shown that belonging and engagement are tied with academic, social, and psychological outcomes. Cross-sectionally, greater levels of belonging and engagement result in better academic performance (Burns et al., 2017; Garcia-Reid, 2007; Hallinan, 2008; Martin et al., 2007, 2009; Meece et al., 1990; Wang &

Eccles, 2012a) and social outcomes (Hussong, 2000; Martin et al., 2009; Vollet, Kindermann, & Skinner, 2017). Lower levels of belonging and engagement result in worse academic performance (Croninger & Lee, 2001; Goodenow, 1993; Roderick & Engel, 2001), worse socialization (Anderson, Hamilton, & Hattie, 2004; Waters, Cross, & Shaw, 2010), and mental health (Anderman, 2002; Newman et al., 2007). In addition, the literature addresses the impact of belonging on engagement, but only slightly addresses the impact of behavioral engagement on belonging, and these relationships typically are viewed through associations rather than determining causality. Due to the large role belonging and engagement play in the functioning of a student, it is of great importance to understand the relationship between the two variables. If students exhibit low belonging or engagement at specific time periods, school staff and administrators will be able to implement school-wide or grade-wide interventions to combat decreases in these variables just before the identified periods and take a proactive approach, rather than a reactive approach which may be too late. Additionally, understanding how belonging and engagement relate to each other over time as well as the causal links between the two can inform the specific interventions used. Do we focus efforts on increasing engagement? Do we intervene on belonging? Do we intervene on both? Answering these questions can help determine the most effective and efficient interventions. This need to explore the relationship between belonging and engagement will be addressed through the current study, which will examine both variables at each time point.

**Gaps in Longitudinal Literature.** Longitudinally, greater levels of belonging and engagement are associated with greater academic, mental health, social, occupational, and ultimately, more positive outcomes. These variables tend to naturally decrease over the course of an individual's primary and secondary education (Benner et al., 2017; Martin et al., 2009), and

lower levels of belonging and engagement are associated with poorer grades, high school dropout, depression and anxiety, worse post-secondary occupational opportunities, and ultimately more negative outcomes. The literature addresses the cross-sectional relationship of belonging on engagement and views longitudinal changes independently of one another. These longitudinal studies usually include only a few waves and typically view changes over critical periods. The longer-term trajectories of the variables and their interactions are not addressed by the literature. Due to these gaps in the research literature, the current study will explore trajectories of belonging and engagement and the interaction of the variables over six waves in a sample of academically at-risk students.

**The Current Study**

The most relevant areas in the literature with limited research findings are with regard to the longitudinal trajectories of school belonging and engagement over many waves of time and the causal relationships between school belonging and engagement, particularly longitudinally. The current study examines school belonging and engagement independently and causally over the span of six years (T4 to T 9) using Project Achieve data. The six years encompass the late elementary school years, the middle school years, and the beginning of the high school years. The transitions from elementary school to middle school and middle school to high school are thought to be the most critical periods in which decreases in school belonging and behavioral engagement are most evident, and these decreases pose a significant threat to high school completion. The current study will address these gaps in the literature specific to these time points and answer the following research questions:

## Research Questions

**Research Question 1.** Will school belonging decrease over the six waves consistent with findings from the literature? Will there be any differences with regard to sex or retention status?

**Research Question 2.** Will the most significant decreases in school belonging occur during the critical transition periods from elementary school to middle school and middle school to high school? Will there be any differences in sex for students who have never been retained?

**Research Question 3.** Will behavioral engagement decrease over the six waves consistent with findings from the literature? Will there be any differences with regard to sex or retention status?

**Research Question 4.** Will the most significant decreases in behavioral engagement occur during the critical transition periods from elementary school to middle school and middle school to high school? Will there be any differences in sex for students who have never been retained?

**Research Question 5.** What are the directions of the effects between school belonging and behavioral engagement?

## Significance of the Study

Research examining school belonging and behavioral engagement have allowed researchers and practitioners to understand the mechanisms of high school completion and drop out and how school belonging and behavioral engagement impact a student throughout the course of their primary and secondary education. The impact of both school belonging and behavioral engagement on specific outcomes have been examined and have been explored independently longitudinally to some degree; however, few research studies have directly

examined the interaction between school belonging and behavioral engagement, particularly from causal and longitudinal perspectives.

By examining the relationship between these variables in the current study, researchers and practitioners will have a better understanding of the trajectories of school belonging and behavioral engagement as well as the importance of these variables on a student's success. Additionally, researchers and practitioners will have a better understanding of critical periods in which intervention targeting school belonging or behavioral engagement is most vital. With the current study investigating differences between sex and retention status, this information will further enable practitioners to identify critical periods for both males and females, as well as students who have been retained and those who have not, as opposed to general trends across a multitude of students with various backgrounds.

Although school belonging and behavioral engagement have been examined in previous research and have been found to directly impact many student outcomes both in the present and long-term, few studies have observed the two variables simultaneously. This begs the question: to what degree does growth in school belonging increase behavioral engagement and vice versa? Understanding the trajectories of school belonging and behavioral engagement for different types of students will allow teachers and schools to respond in a more time-sensitive manner to meet the needs of students. Further, schools may be more sensitive to this matter and either begin implementing an intervention targeting school belonging and engagement or adjust their current interventions to combat decreases more efficiently in order to promote school completion for their students. By understanding how the two of these variables interact over time, approaches to interventions can be developed to promote the best outcomes for students.

# CHAPTER II

## LITERATURE REVIEW

The goal of this literature review is to understand different factors that promote and threaten levels of school belonging and engagement, resulting in high school non-completion, and to identify gaps in this specific literature (both cross-sectionally and longitudinally) that warrant further analysis. In educational research, there has been a focus on the relationship between students' sense of belonging and engagement in the classroom and their impact on later outcomes. Research shows that school belonging and engagement directly impact student outcomes, including academic attainment, mental health, and future career placement. School belonging and engagement also interact with each other to influence these different outcomes. It appears the more a student feels part of their school, the more involved they tend to be, which results in better outcomes for the student in multiple areas (Garcia-Reid, 2007; Hallinan, 2008; Kuperminc et al., 2008; McNeely & Falci, 2004; Pittman & Richmond, 2007; Slaten et al., 2015; Wang & Eccles, 2012a). Likewise, the more engaged a student is at school, the more they feel a sense of belonging to their school (Osterman, 2000). If school belonging and engagement play important roles in student outcomes, then it is of utmost importance to ensure that students maintain high levels of school belonging and engagement to ensure the best possible outcomes for students not only in the short term, but also in the long term.

With these implications in mind, legislation has made attendance in United States schools compulsory in an attempt to promote school completion through the twelfth grade; however, legislation itself cannot directly impact engagement (Mosher & McGowan, 1985). Only the experiences and perceptions of students can influence their social and academic outcomes (Appleton, Christenson, & Furlong, 2008). With continued concerns with students not

completing high school, sense of belonging and active engagement have been identified as malleable variables (Finn & Zimmer, 2012) that affect outcome (see Figure 1). With this knowledge, interventions can be implemented to increase levels of belonging and engagement that hopefully will result in greater levels of belonging and engagement as well as better outcomes for students, including school completion. The available research on school belonging and engagement will be reviewed in this context.

## School Belonging

### Defining school belonging.

Belonging generally refers to "a psychological construct that is related to attachment to school and is underpinned by feelings of acceptance and value by others within the school community" (Willms, 2000). School belonging functions as an umbrella term, encompassing a variety of terms that not only include the above, but also include school connectedness (Jose, Ryan, & Pryor, 2012; Libbey, 2004), school bonding (Hawkins, Blumstein, & Farrington, 1996), school identification (Sirin & Rogers-Sirin, 2004; Wang & Eccles, 2012b), and school attachment (Hallinan, 2008), with many of these terms used interchangeably (Anderman, 2002; Rowe & Stewart, 2009). Often, it also is mistakenly referred to as student engagement, likely due to its overlap with engagement (Finn, 1993), sense of community (Osterman, 2000), social identity (Tajfel, 1972), and positive interactions with others (Hamm & Faircloth, 2005). However defined, a greater sense of school belonging results in less involvement in health-risk behaviors (McNeely & Falci, 2004), better mental health outcomes (Resnick, 2000), better academic performance (Garcia-Reid, 2007; Hallinan, 2008; Wang & Eccles, 2012a), and lower rates of school dropout (Kuperminc et al., 2008; Pittman & Richmond, 2007; Slaten et al., 2015).

**History of student belonging.**

Belonging is connected to seminal work in psychology (Maslow, 1943; Rogers, 1951). Belonging was first mentioned in Maslow's (1943, 1954) hierarchy of needs through the lens of his human motivation theory. Maslow theorized that there are five fundamental needs, organized hierarchically, driving human behavior. He posits that humans have a fundamental need for love and belongingness; however, this need would only appear after physiological needs and the need for safety have been met. The establishment of genuine relationships to family, friends, social groups, and community is related to the motivation to belong. Maslow's theory regarding the need to belong inspired subsequent research on human motivation (Baumeister & Leary, 1995; Bronfenbrenner, 1977). In addition, Dewey (1938) with his theory of supportive school environment, Vygotsky (1962) with his examination of social environment in school, and Erikson's (1968) with his research on social identification in the school setting have merged the theory of belonging with the school setting.

Other educational and psychological theories have slight relation to belonging; however, another seminal work relating to belonging was posited by Baumeister and Leary (1995). Baumeister and Leary proposed the belonging hypothesis which suggests that belonging is a fundamental motivator for humans and that belonging is based on evolution. Association with a group provides the necessary means for survival. The hypothesis proposes that belonging motivates individuals to create bonds, and when the need for bonds is not met, this leads to detriments to physical health and psychological functioning. Additionally, two criteria must be met in order for belonging to exist. The individual must engage in frequent personal contacts with others, and they must perceive having a stable relationship (Baumeister & Leary, 1995).

**Current Research on School Belonging.**

Regardless of how it is defined, a greater sense of school belonging results in less involvement in health-risk behaviors (McNeely & Falci, 2004), better mental health outcomes (Resnick, 2000), better academic performance (Garcia-Reid, 2007; Hallinan, 2008; Wang & Eccles, 2012a), and lower rates of school dropout (Kuperminc et al., 2008; Pittman & Richmond, 2007; Slaten et al., 2015). Research has found that for adolescents, school belonging is a significant predictor of positive and negative affect (Shochet, Smith, Furlong, et al., 2011). Similarly, positive correlations between school belonging and grade point average (GPA) have been found (Anderman, 2002). In the long-term, higher levels of school belonging were found to predict greater academic competence and expectations (Hernández, Robins, Widaman, et al., 2016).

In contrast, a lack of school belonging can negatively impact students, leading to mental health concerns, engagement in risk taking behavior, and school attrition (Allen & Boyle, 2016) as well as low self-esteem and low self-efficacy (Due et al., 2016). Further, researchers have found a significant, inverse relationship between school belonging and depressive symptoms (Newman et al., 2007); as students experience less school belonging, they exhibit higher levels of depressive symptoms. Other mental health research has found negative correlations between perceived school belonging and social rejection, depression, and school problems (Anderman, 2002). Newman et al. (2007) also found that during the transition period from primary to secondary school, sense of belonging decreases while depressive symptoms increase.

## Protective and Risk Factors to School Belonging

### *Self-concept and self-efficacy.*

Research has investigated the relationship between self-concept and engagement; however, in recent years, little research has been conducted focusing on the relationship between self-concept and belonging. While examining self-concept on academic and engagement outcomes, the research found that students who perceive themselves to have low academic evidence greater levels of test anxiety and lower academic achievement, which is related to negative perceptions of school (Reis & McCoach, 2000). Research indicates that individuals who experience negative perceptions of school evidence less school belonging, and it has been documented that low levels of school belonging result in low self-esteem and low self-efficacy (Due et al., 2016). Additionally, one study (McMahon, Wernsman, & Rose, 2009) found that positive and supportive classroom environments and school belonging were associated with self-efficacy in language arts, math, and science; however, levels of self-efficacy for math and science depended on difficulty. Although there is little empirical evidence to conclude that low self-concept results in low levels of school belonging, there appears to be an indirect relationship between the two variables.

### *Child and family factors.*

Native (individuals who were born and raised in a given country), ethnic (students who speak another language at home), and immigration status can impact engagement (Chiu et al., 2012). Native students relative to ethnic and immigrant students exhibit worse attitudes toward school or less cognitive engagement, but they had a greater sense of school belonging. When focusing on the adjustment of refugee children, it was found that refugee children can use aspects

of their school environment that reflected their values and identity and their relationships with teachers and peers to create a sense of belonging at school (Due et al., 2016).

For children in primary school, family involvement at school predicted school belonging for boys whereas family involvement at home predicted school belonging for females (Uslu & Gizir, 2017). Additionally, family communication is linked to lower levels of depression which can be a result of school belonging or could cause lower levels of school belonging (Gattis, 2014). Greater levels of familism in the Latinx culture is associated with lower levels of depression and greater levels of school belonging for males and females (Cupito, Stein, & Gonzalez, 2015).

The transition from middle school to high school marks a decrease in belonging. During this time, adolescents are at greater risk for negative outcomes. Research investigating the impact of family on school belonging has found the impact of family to be of great importance. During the transition to junior high school, research has found that students whose parents fostered individual positivity and tolerance for intimacy exhibited greater levels of self-esteem and positive attitudes toward school (Lord, Eccles, & McCarthy, 1994). The transition to high school is marked by turbulence, as students gain more autonomy (Adams & Laursen, 2001) and spend less time overall with their family (Collins & Laursen, 2004). During this time, students are at a greater risk for depression (Newman et al., 2007).

***Social system/relationships.***

Relationships with peers can impact levels of school belonging. Peer relationships can sustain levels of school belonging, and they can combat depression levels (Giordano, 2003). Conversely, a lack of positive peer relationships can result in loneliness (thus, low levels of school belonging), internalizing symptoms such as depression, aggression, substance use,

dropout, and criminal behavior (Hussong, 2000). Compared to White, non-Hispanic counterparts, Hispanic students report having friends or best friends at school less often; however, students from either background who had a best friend reported greater school belonging and fewer problems with engagement (Vaquera, 2009).

Student-teacher relationships also can impact levels of school belonging. When teachers promote respect between students and create a safe environment, school belonging increases, even though longitudinally, levels of belonging are expected to decrease (Anderman, 2003). Further, students who report having a positive relationship with their teacher evidence greater levels of school belonging than those who perceive having a negative relationship with their teachers (Crouch, Keys, & McMahon, 2014). Additionally, Crouch et al. (2014) found that both teacher ratings and student ratings of the student's school belonging were consistent.

***School factors.***

Not only can social support provided by teachers positively impact school belonging, but academic support also can positively impact school belonging. When teachers are perceived as promoting mastery goal orientation in the classroom, students report higher rates of school belonging (Stevens, Hamman, & Olivarez, 2007). School belonging also was influenced when academic pressure was applied by teachers. The researchers argued these approaches may encourage ideas and promote learning over performance which facilitated the student's sense of belonging. Overall, students reported relationships with peers and teachers do have the most impact on school belonging (Booker, 2004).

Involvement in extracurricular activities also can enhance a student's sense of school belonging. Compared to peers, students involved in extracurricular activities reported higher rates of belonging (Blomfield & Barber, 2010), and this holds true for both males and females

(Dotterer et al., 2007). An optimal level of extracurricular activities exists; however, as students who were only involved in two extracurricular activities experienced the highest levels of school engagement, even better than students involved in too many activities or those involved in none (Knifsend & Graham, 2012).

Other factors influencing students' sense of belonging include student safety (Cunningham, 2007; Hamilton, 2008), school climate (Libbey, 2004), classroom climate, school size, opportunities to socialize (Anderson et al., 2004; Waters et al., 2010), and school location with indications that sense of belonging is lower in urban school students than in suburban school students (Anderman, 2002). Additionally, retention status plays a role in student belonging. Some studies posit that students who have been retained are developmentally ahead of their peers which results in a desire for engagement with same-aged peers (usually outside of the school setting) and a lack of attachment to school (Jimerson, 2001a; Mahoney & Stattin, 2000).

**Longitudinal findings.**

A small body of research has explored the long-term impacts of school belonging. Across elementary school, the research has found significant, bidirectional relationships between school belonging and subjective well-being, indicating that across time, changes in school belonging will impact well-being, and changes in well-being will impact school belonging (Tian, Zhang, Huebner, et al., 2016). In the middle school years, research has found interactive effects of sex and ethnicity for school belonging. Particularly, females evidenced identical growth trajectories from 5$^{th}$ to 8$^{th}$ grade and reported higher initial levels of school belonging than Euro-American or Latino males (Hughes, Im, & Allee, 2015). Further, Euro-American and Latino males evidenced lower initial levels of school belonging than did African American males. School belonging

during 5th grade predicted 8th grade reading scores for females and math for both males and females. Increases in school belonging only predicted achievement in 8th grade for African American students (Hughes et al., 2015).

Also, during adolescence, school belonging is lower in urban schools than in suburban schools (Anderman, 2002). Further, individual student perceptions of belonging were inversely related to depression, social rejection, and school problems, whereas aggregated belonging was related to greater reports of social rejection and school problems and to higher grade point average (Anderman, 2002). During the high school years, school belonging is initially greater for females than males. Over time, school belonging decreases for females and remains stable for males (Gillen-O'Neel & Fuligni, 2013).

Regarding Latino and ethnic studies, English language learners evidenced a decrease in school belonging in 4th grade, but English proficient classmates did not. Additionally, sense of belonging in 4th grade was found to be associated with teacher evaluations, whereas perceptions in 6th grade were influenced by peer self-concept (Morrison, Cosden, O'Farrell, et al., 2003). Students who indicated experiencing increases in ethnic incongruence from middle school to high school reported decreases in school belonging. These students experienced increases in worries related to academic success. These findings may be due to changes in the school composition which may negatively impact these students' affect toward school (Benner & Graham, 2007). For males, ethnic pride has been found to be associated with greater levels of self-esteem, which is associated with increases in school belonging, and the relationship between these variables is bidirectional. For females, ethnic pride was linked to later school belonging (Hernández, Robins, Widaman, et al., 2017).

School belonging has lasting effects, impacting individuals into adulthood. For example, researchers have found that career decision making was significantly impacted by school belonging, meaning that the more belonging a student felt to school, the more confidence they experienced when making a career decision (Slaten & Baskin, 2014). Further, higher levels of school belonging are associated with higher occupation status 20 years later (Abbott-Chapman, Martin, Ollington, et al., 2014), so it is important to target school belonging and engagement to promote the best outcomes for students, and this begins as soon as the child enters the school setting.

## Gaps in the Literature

### Cross-sectionally.

Cross-sectionally, research has examined the impact of school belonging on academic, mental health, and behavioral outcomes. Additionally, the literature has examined how school belonging is influenced by child factors and family factors, teacher and peer influences, and school organization. Sex and ethnic differences also have been explored. Although the cross-sectional literature has thoroughly investigated school belonging, little literature exists on the reciprocal relationship between school belonging and engagement.

### Longitudinally.

Longitudinally, studies have focused on academic outcomes as well as differences in sex and ethnicity. Studies have also examined the occupational considerations of school belonging. School belonging is often looked at by its trajectories over time, and outside factors are sometimes included such as well-being, mental health, and peer and teacher influences. Compared to the cross-sectional literature, less research has been conducted longitudinally, and

the reciprocal and causal relationships between school belonging and behavioral engagement have not been examined longitudinally.

### Implications of student belonging.

School belonging plays an important role in the academic, social, emotional, behavioral, and occupational outcomes of an individual. The importance of school belonging not only matters in late elementary school, middle school, and high school, but it plays a vital role in the success of an individual even as early as preschool. Further, a general sense of belonging prior to enrollment in school provides individuals with protection from the naturally occurring trajectories of belonging and engagement over primary and secondary school. Additionally, this protection allows individuals to be resistant to negative outcomes in early life. Though the research has analyzed school belonging thoroughly, the lack of research on the reciprocal and causal relationships between school belonging and behavioral engagement warrants further analysis.

## Behavioral Engagement

### History of behavioral engagement.

The earliest review to include the term "engagement" was conducted by Mosher and McGowan (1985) and discussed the significance of school engagement on school outcomes. Finn's (1989) seminal work regarding engagement discussed the underpinnings of school dropout and completion, and even more recent conceptualizations view engagement as a multidimensional construct that includes emotion, behavior, and cognition (Fredricks et al., 2004). These various definitions expand beyond the idea of engagement being defined as time in which an individual is simply academically engaged.

Research in engagement focused on direct intervention to prevent at-risk students from dropping out of school. The importance of social context of schooling emerged as a result of this work, and the research focus shifted from dropout prevention to school completion to ensure success in post-secondary enrollment options (Christenson, Sinclair, Lehr, et al., 2001; Reschly & Christenson, 2006). Shifting from dropout prevention to school completion allows students to develop skills to meet the demands of school, to create bonds to peers and adults in the school setting, and to engage in future-oriented thinking necessary for post-secondary success (Reschly & Christenson, 2006).

Finn's (1989) seminal theory proposing the Participation-Identification Model outlined variables critical to student engagement as well as the processes of dropout and school completion. The process of school completion is viewed as participation resulting in school success and school success resulting in identification (or school completion). The dropout process begins with non-participation resulting in poor school performance which then results in emotional withdrawal (dropout). Of note, school completion and dropout are not events that occur, but they are processes that occur over time due to engagement and disengagement. In this model, engagement consists of behavior in the form of participation as well as affect in which a student values or belongs to their school (Finn, 1989).

This theory highlights the importance of development of the student prior to entering the school setting, as students' skills, behaviors, and attitudes can affect successful participation, identification with school, and overall school success. Early childhood experiences have evidenced developmental pathways to dropout and completion (Garnier, Stein, & Jacobs, 1997; Jimerson, Egeland, Sroufe, et al., 2000). Further, early childhood programs have evidenced

positive long-term effects on academic achievement and high school graduation (Schweinhart & Weikart, 1999).

Dropout rates have been a great concern since the beginning of engagement research. Although awareness efforts have been made with regard to this topic and prevention efforts have been undertaken, interventions to combat this issue largely have been ineffectual (Christenson et al., 2001; Dynarski & Gleason, 2002). The most promising interventions address student engagement and learning, thus, addressing student engagement appears to be the most promising dropout prevention and intervention effort (Christenson, Reschly, Appleton, et al., 2008). An important difference between theory (Finn, 1989) and intervention implementation is the emphasis on context that hinder or enhance student engagement (Christenson et al., 2008; Reschly & Christenson, 2006). These contexts include family, peers, school, and community impacts on an individual.

**Defining behavioral engagement.**

School engagement is a broad term that encompasses multiple facets: emotional engagement, cognitive engagement, and behavioral engagement (Cooper, 2014; Fredricks et al., 2004; Yazzie-Mintz & McCormick, 2012). Emotional engagement refers to a student's affect toward school, particularly their feelings toward their classmates, their teachers, and their academics (Fredricks et al., 2004; Stefansson, Gestsdottir, Geldhof, et al., 2016). Also, it includes a sense of belonging, liking of school, and general happiness with school (Fredricks et al., 2004; Reschly & Christenson, 2012). Cognitive engagement consists of a student's investment in their learning and effort put forth to assimilate new and challenging information (Christenson, Reschly, & Wylie, 2012; Fredricks et al., 2004; Li, & Lerner, 2013; Quin, Hemphill, & Heerde, 2017). Behavioral engagement refers to students' active involvement in

academic and other school-related activities, as seen in attending to tasks and following school rules (Fredricks et al., 2004). Because cognitive engagement and behavioral engagement are closely related and may look similar, it is not uncommon for the two to be combined (Fredricks et al., 2004; Reschly & Christenson, 2012).

Whereas belonging consists of an individual's sense of connectedness, community, and overall identity as a function of their educational environment, engagement refers to "the quality of a student's connection or involvement with the endeavor of schooling and hence with the people, activities, goals, values, and place that compose it" (Skinner, Kindermann, & Furrer, 2009, p. 494). For the purposes of this study, student engagement refers to active involvement in academic and other school-related activities, as it relates to attending to tasks and following school rules (Fredricks, Blumenfeld, & Paris, 2004) involvement, commitment, or attachment to academic and social activities in the school setting (Li & Lerner, 2013). Higher levels of engagement are associated with higher academic achievement (Sirin & Rogers-Sirin, 2004) and other related variables such as attendance and school completion (Finn, 1989; Marks, 2000; Rumberger & Rotermund, 2012).

The literature has uncovered a bidirectional relationship between student engagement and belonging, with belonging often influencing a student's degree of engagement in the classroom, and student engagement also impacting a student's sense of belonging to school (Osterman, 2000). Students who participate in school tend to experience emotional engagement and higher levels of association with school. A positive academic intent results in greater achievement, higher levels of motivation, and greater aspirations for the future (Burns et al., 2017; Martin et al., 2007, 2009; Meece et al., 1990). Further, student enjoyment of school also impacts student academic outcomes (Lee, Sheldon, & Turban, 2003; Remedios, Lieberman, & Benton, 2000).

Individuals with low participation or a lack of engagement in school experience emotional withdrawal and poor school identification (Finn, 1989).

### Developmental Perspectives and Engagement

Researchers have attempted to identify the trajectory of engagement as students advance through grades. While there is some evidence that engagement develops beginning as early as kindergarten (Pagani, Fitzpatrick, & Parent, 2012), the transitions at key grades seem to be critical. In particular, Benner et al. (2017) found that the transition from middle to high school can significantly impact engagement and belonging. When the transition results in a disruption of supportive relationships, adolescents' socioemotional well-being is negatively impacted, and their academic engagement also can be compromised. Stable or even increasing friend support and school belonging can serve to reduce the socioemotional disruptions and increase school engagement during this transition period (Benner et al., 2017).

Research further indicates that the differences between primary and secondary educational settings can significantly impact the engagement and achievement of a student. For example, Marks (2000) found that throughout secondary school, students' classroom engagement significantly decreases. In high school, engagement is at its lowest, with a significant proportion of students being chronically disengaged (Martin et al., 2009). Notably, this decrease in engagement occurs across diverse groups of students (Chiu et al., 2012; Qu & Pomerantz, 2015). Several differences have been identified to explain these results.

During primary school, students have few teachers at most and spend the majority of their time with one teacher. In secondary school, students have many teachers, upwards of seven or more which means they spend less time with each teacher. Secondary schools tend to be larger than primary schools and less personal with fewer positive experiences than in a smaller school

(Bergin & Bergin, 2009; Hargreaves, 2000). It has been argued that these differences between primary and secondary schools means that student relationships with teachers are less important for secondary school student engagement and achievement than for primary school students; however, it also has been posited (Roorda, Koomen, Spilt, et al., 2011) that secondary school students may be more sensitive to teacher warmth and support due to less time spent with teachers and less positive bonds with teachers. Because of this, Roorda et al. (2011) argued that teacher-student relationships might be more important for secondary school students. The results of their research indicated that the association between teacher-student relationships and engagement is indeed stronger for secondary school students than for primary school students (Roorda, Jak, Zee, et al., 2017). The researchers attempted to explain this phenomenon through the existing findings that students tend to become more disengaged as they get older and that their relationship with teachers is more important for students with low engagement and greater academic risk.

Conner and Pope (2013) found that even in higher academically performing schools, upwards of two-thirds of the students were not engaged fully in academic work on a regular basis (i.e., they did not regularly report high levels of cognitive, affective, or behavioral engagement). The researchers also found that few of these students enjoyed their work or found it valuable, and when combined, these factors lead to higher levels of school stress, higher rates of cheating, greater physical stress symptoms, and more internalizing and externalizing symptoms (Conner & Pope, 2013). In addition to identifying critical transition periods for belonging and engagement, researchers have worked to uncover the variables that facilitate and undermine belonging and engagement.

### Current Research on Behavioral Engagement

Although emotional and cognitive engagement play an important role in the overall engagement of any student, these facets are internal to an individual and typically are not observable by others. Behavioral engagement on the other hand provides opportunities for observation and can be measured by other individuals. For this reason, schools and teachers use behavioral engagement as an indicator of academic success and emotional functioning (Lee et al., 2003; Remedios et al., 2000).

Educationally engaged students exhibit high academic achievement in part because they express the desire to participate in school activities, and they deem school and education as valuable experiences (Klem & Connell, 2004). Higher levels of engagement mean that students experience better relationships with parents, teachers, and peers (Murray, 2009), and they engage in delinquent behaviors less often than peers (O'Farrell & Morrison, 2003). In contrast, disengagement has been found to result in negative academic outcomes for students including lower grades (Goodenow, 1993), lower scores on standardized exams (Roderick & Engel, 2001), and higher rates of school dropout (Croninger & Lee, 2001).

There is a clear difference between students who are engaged and those who are disengaged, but there also is a difference among students who are disengaged. Some disengaged students can be disruptive, fail to complete academic work, and have higher rates of truancy, while others typically behave in class, attend school, and complete work, but exhibit low emotional investment in their work (Conner & Pope, 2013; Newmann, Wehlage, & Lamborn, 1992).

## Protective and Risk Factors of Engagement

### *Self-concept and self-efficacy.*

A student's self-concept in relation to school impacts academic abilities and academic achievement. Students who perceive their academic abilities to be high are likely to exhibit greater academic effort (Brunner, Keller, Dierendonck, et al., 2010; Green, Liem, Martin, et al., 2012; Yeung, 2011). Conversely, students who perceive their academic abilities to be low evidence greater test anxiety and lower academic achievement, which is related to negative perceptions of school (Reis & McCoach, 2000). With academic achievement is being associated with school engagement (Finn & Rock, 1997; Wang & Holcombe, 2010) and school self-concept being associated with academic achievement, then greater levels of school self-concept are associated with behavioral engagement. If a student perceives their academic abilities to be high, they will exercise greater academic effort which means they will engage more in the classroom and exhibit greater levels of behavioral engagement.

### *Child and family factors.*

It is important to understand how familial factors can influence the degree of engagement students exhibit. Family support has been found to be positively related to behavioral engagement, and thus, negatively related with truancy (Virtanen, Lerkkanen, Poikkeus, et al., 2014). Further, parent education, family income, and generational status have been found to have direct effects on academic expectations and competence of students (Hernández et al., 2016), which highlights the significance of contextual factors that can either facilitate or hinder the engagement or performance of students in the classroom.

Research has found that for two-parent families, family distance regulation (a balance of connectedness and separateness) positively influences school engagement through parental

monitoring of school activities (Bartle-Haring, Younkin, & Day, 2012). Additionally, chronic stress was found to be negatively related to school engagement. Regarding divorced families, the literature has uncovered that parent-child relationship mediates the association between post-divorce living arrangements and school engagement (Havermans, Vanassche, & Matthijs, 2017). Additionally, factors such as time since divorce as well as levels of conflict pre-divorce impact children's levels of school engagement.

When examining adverse family experiences, research has found that students whose families have endured at least three adverse experiences exhibit lower likelihood of completing all homework and greater odds of failing to express resiliency compared to students whose families have no adverse experiences (Kasehagen, Omland, Bailey, et al., 2018). This indicates that students with more family adverse experience are more likely to exhibit difficulties in school that impact engagement.

When studying the behavior of students, research has found that externalizing difficulties are negatively correlated with the school achievement and engagement of adolescents, and this was especially the case in families with demanding kin relations (Taylor, 2018). Additionally, research has found that school engagement also can relate to mental health outcomes. One study (Nguyen, Watanabe-Galloway, Hill, et al., 2019) found school engagement to have a direct, inverse relationship with ADHD and that an increase in engagement results in a decrease in ADHD diagnosis.

***Social system/relationships.***

One significant way engagement plays out in the school setting is in the association between the teacher-student relationship and academic achievement. The relationships students have with their teachers also impacts student engagement. Positive, high quality relationships

with teachers have been found to facilitate student participation, aspirations, and enjoyment (Martin et al., 2007, 2009).

There have been two types of theories dominant in the teacher-student relationship on academic adjustment research that include the social–motivational theories and the extended attachment perspective (Davis, 2003). The social-motivational theories argue that when a student's basic psychological needs for relatedness, competence, and autonomy are met, then the student will engage in their schoolwork (Connell & Wellborn, 1991; Deci, Vallerand, Pelletier, et al., 1991). By showing involvement, providing structure, and supporting student autonomy, teachers can fulfill these needs to increase student engagement. This in turn will result in improved grades and performance on achievement tests (Skinner, Wellborn, & Connell, 1990). Teacher behaviors may look like teachers expressing interest in the student, establishing rules, and allowing students the freedom to make independent decisions.

The extended attachment perspective (Pianta, 1999; Verschueren & Koomen, 2012) maintains that teacher-student relationships with high levels of closeness and low levels of conflict enable children to feel emotionally secure. In children, this security fosters the exploration of learning environments and academic engagement, which results in better academic performance (Bergin & Bergin, 2009; Koomen, van Leeuwen, & van der Leij, 2004).

Research investigating engagement as a mediator of positive relationships has found that in a sample of Latino middle school students, student satisfaction with school mediated the relationship between teacher support and student grades (Woolley, Kol, & Bowen, 2009). Research also found that the association between teacher-student relationships and grades in a high school sample was mediated by the student's engagement (Zimmer-Gembeck, Chipuer, Hanisch, et al., 2006). One meta-analysis even found stronger associations between teacher-

student relationships and engagement than for associations between teacher-student relationships and achievement (Roorda et al., 2011).

Vollet et al. (2017) found that peer group engagement was a greater factor at promoting change in engagement for students who experienced low teacher involvement; however, engagement versus disaffection of the student's peer group determined whether the peer effects were positive or negative. The most engaged students experienced support from both peers and teachers, and students who had relatively uninvolved teachers and engaged with disaffected peers experienced steep declines in engagement (Vollet et al., 2017). In addition, higher levels of student attention in the classroom as early as kindergarten were linked to a greater likelihood of school belonging and better classroom engagement trajectories compared with the lowest classroom engagement trajectory (Pagani et al., 2012). Further, improvements in teacher attention in kindergarten increased the probability of belonging to a more productive classroom engagement trajectory throughout elementary school, even when taking family and child factors into account (Pagani et al., 2012). This leads to better overall outcomes for students later in life.

***School factors.***

When examining the relationship between engagement and school factors, much of the literature focuses on safety, school climate, and extracurricular activities. A general trend of belonging suggests that students who feel safe at school are more engaged (Côté-Lussier & Fitzpatrick, 2016). Additionally, students who felt safe demonstrated fewer depressive symptoms. Students who identify as part of the lesbian, gay, bisexual, and transgender community exhibit higher rates of engagement when they have access to a high number of safe adults at school (Seelman, Forge, Walls, et al., 2015). Further, the presence of Gay-Straight

Alliance (GSA) was not directly associated with engagement for these students; however, when schools had a more present GSA, these students exhibited greater engagement.

Studies investigating school climate have found that when unfairness, hostility, and victimization were used to predict teacher reports of engagement as well as academic achievement, the relationship depended on whether these variables were examined within schools or between schools (Ripski & Gregory, 2009). When examining within-school differences, victimization perceptions predicted lower engagement as well as low achievement in math and reading. Between-school analyses found that hostility perceptions predicted low engagement and reading achievement (Ripski & Gregory, 2009). As might be expected from these findings, within-school differences in bullying perception have been found to be related to low commitment to school (Mehta, Cornell, Fan, et al., 2013). Further, between-school differences in bullying perceptions were related to low commitment and involvement in school activities.

Extracurricular activities provide support for school engagement. When enjoyment of these arts and physical education were examined, high levels of enjoyment were highly correlated with engagement, and this was especially true for physical education in early adolescence (Bengoechea, Lorenzino, & Gray, 2019). Other research has found that when participating in school teams, length of participation mattered, with levels of school engagement increasing as participation in school teams increase (Yanik, 2018).

A lack of engagement can result in negative academic outcomes (Lee, 2014). When teachers are able to provide support to students through more active opportunities to respond to instruction, modeling of academic behaviors, and by providing feedback, students tend to be more engaged and evidence improvements in their academic performance (Harbour, Evanovich,

Sweigart, et al., 2015). Additionally, if students who are in need of greater supports such as through a 504 Plan or an Individualized Education Plan (IEP) are afforded these by their schools, this can allow the student to be more engaged and more academically successful (Demirdağ, 2014). Students who are retained have been found to have less engagement, and they are less likely to complete high school than their low-achieving peers who have never been retained (Alexander, 2003; Jimerson 2001a, Jimerson, 2001b). It is hypothesized that this is due to a weak sense of belonging in combination with perceived lack of ability resulting in low effort and persistence.

**Longitudinal findings.**

In a longitudinal study of students from early seventh through eighth grade, Qu and Pomerantz (2015) found less cognitive engagement among American students relative to Chinese students, as well as a greater decline in cognitive engagement over the course of the two grades.

With students spending about one-third of their days at school, the impact of teachers undoubtedly influences levels of engagement. Research has found that positive teacher-student relationships result in greater levels of behavioral engagement over time (Engels, Colpin, Van Leeuwen, et al., 2016). Further, negative teacher-student relationships and high levels of likeability and popularity result in less behavioral engagement over time. Not unexpectedly, high initial levels of teacher support and peer acceptance as well as increases in teacher support reduce declines in behavioral engagement over time (De Laet, Colpin, Vervoort et al., 2015). Additionally, students perceived as more popular in fifth grade evidenced less engagement in sixth grade.

Research on teacher approaches to mastery of material has found that when students are placed in classrooms with a new teacher who provides less emphasis on performance goal practices, behavioral engagement increases, and sex did not moderate these results (Hughes, Wu, & West, 2011). More specifically in the literature, a mastery-approach predicted behavioral engagement, whereas a performance approach did not (Putwain, Symes, Nicholson, et al., 2018). These levels of behavioral engagement then predicted achievement in math, and behavioral engagement also mediated the relationship between mastery-approach and achievement in subsequent math scores.

The effects of peers also play an important role in the engagement of students. Peer support positively predicts behavioral and emotional school engagement (Li, Doyle Lynch, Kalvin, et al, 2011). Conversely, involvement with problem-behaving peers or bullying evidenced negative associations with cognitive and behavioral engagement. As students aged, positive peer support influences were stronger, and the negative effects of engaging with problematic peers also strengthens over time (Li et al., 2011). Likeability positively relates to emotional and behavioral engagement in the seventh grade (Engels et al., 2017). Popularity was found to be associated with lower levels of behavioral engagement but not cognitive engagement.

Behaviors internal to students can impact their behavioral engagement. The little longitudinal research on this topic has found that concerns and striving for perfection were related to engagement, with only perfectionistic strivings predicting greater school engagement over time (Damian, Stoeber, Negru-Subtirica, et al., 2017).

### Gaps in the Literature

#### *Cross-sectionally.*

Cross-sectionally, research has examined the impact of behavioral engagement mostly on academic outcomes with studies also exploring its impact on mental health outcomes. Additionally, the literature has examined how behavioral engagement is influenced by child factors and family factors, teacher and peer influences, and school climate. Sex and ethnic differences also have been explored. Although the cross-sectional literature has thoroughly investigated behavioral engagement, little literature exists on the impact of school belonging on behavioral engagement and even less literature explores the impact of behavioral engagement on school belonging.

#### *Longitudinally.*

Longitudinally, studies have focused on academic outcomes as well as teacher, peer, and parent influences. Similar to school belonging, behavioral engagement is often looked at over time, and peer, teacher, parent, and intrinsic factors often are explored. Compared to the cross-sectional literature, less research has been conducted longitudinally, and the effects of behavioral engagement on school belonging have not been examined longitudinally.

### Implications of behavioral engagement.

Behavioral engagement plays an important role in the academic and occupational outcomes of an individual. The importance of behavioral engagement rests in that it provides individuals with protection from the naturally occurring trajectories of disengagement and subsequent negative outcomes throughout primary and secondary school. Though the research has thoroughly analyzed behavioral engagement cross-sectionally, the lack of research on

behavioral engagement longitudinally warrants further analyses, particularly on its impact on school belonging.

**Interaction of School Belonging and Engagement**

School belonging and engagement have been extensively studied throughout the research literature. Often, there appears to be significant overlap between the two variables, where belonging and engagement predict the same academic and mental health outcomes; however, belonging evidences relationships with additional variables over and above the influence of behavioral engagement. Further, both variables are influenced by relationships and interactions with peers, parents, and teachers. In the model proposed in Figure 1, the relationship between belonging and engagement can be seen, where both variables influence an outcome, and they also influence one another. This relationship has been validated by the literature; however, gaps in the relationship between the two variables still exist, so research is warranted to uncover this relationship, particularly longitudinally and causally. Research questions and plans for analyses are presented in Chapter III.

# CHAPTER III

# METHODS

The purpose of this chapter is to describe the methods and research design for the current study which examined school belonging and behavioral engagement in two cohorts over the span of six years. The current study used a longitudinal, quantitative approach to answer the research questions and conducted secondary data analysis of an existing data set, with no identifying information. Structural equation modeling also was used to analyze the data and answer research questions.

## Participants

Participants were drawn from Project Achieve, a 14-year longitudinal study of academically at-risk students (Hughes & Kwok, 2006). The 784 original participants were recruited into the study during their first time in first grade in three Central and Southeast Texas schools (two small city districts and one urban). The participants formed two cohorts, one which began first grade in the fall of 2001 (N=449) and the second which began first grade in the fall of 2002 (N=335). The participants were tracked through the fifth year following high school graduation (Hughes & Kwok, 2006, 2007; Im, Hughes, Cao, et al., 2016). This study only considers students through T9.

All students who were included in the original study were considered at-risk, meaning each student had scored below the median score on a state approved district-administered measure of literacy at the end of kindergarten or at the beginning of first grade. Additionally, these students had not been previously retained, had not been served by special education, spoke either English or Spanish, and had written permission from a parent to participate in the study

(Cham, Hughes, West, et al., 2015; Hughes & Kwok, 2006, 2007; Im, Hughes, Cao, & Kwok, 2016).

Participants had a mean age of 6.57 (SD = .39) upon entering first grade, and most were White Hispanic (37%) followed by White non-Hispanic (34%), African American (23%), Asian or Pacific Islander (4%), and Other (2%). Most students were eligible for free or reduced lunch (61.3%) and had an average IQ of 92.91 (SD = 14.62) based off the Universal Nonverbal Intelligence Test (UNIT; Hughes & Kwok, 2006, 2007; Im et al., 2016).

For the present study, a total of 505 students were included, as they met the current study's inclusion criteria. To meet inclusion criteria, students needed to have scores for both school belonging and behavioral engagement for at least three out of the six time points (Time 4 [T4] through Time 9 [T9]). This was determined in order to prevent missing data from skewing the results of the analyses.

Participants in the current study had a mean age of 6.57 (SD = .37) upon entering first grade, and most were Hispanic (37%) followed by Caucasian (35%), African American (25%), Asian or Pacific Islander (2%), and Other (1%). Additionally, 279 were male (55%) and 328 had never been retained (65%). Most students were from the Bryan school district (57%), followed by College Station (29%) and Spring (14%). Descriptive data for participants are depicted in Table 1 below.

**Mobility and Attrition.**

During the first five years of the study, 27% of the recruited students moved from one of the schools participating in the study to a non-participating school. These students continued to be included in the study unless they moved out of the United States or were deceased. Annual assessments for students who moved greater than 200 miles away from any of the three original

participating school districts included questionnaires from teachers and parents as well as school records. Ninety-one students moved outside of the original school districts by T5. At T6, research staff members attempted to conduct student interviews for individuals who had moved over 200 miles away from the original school districts; however, the research staff did not attempt to obtain performance data for these students. Informed parental consent was obtained at T1 and was provided through T5. After the fifth year, re-consent was sought, and 569 parent provided continued consent (Im et al., 2016). At T9, the sample included 549 students (Hughes & Kwok, 2006). Each year in the longitudinal study was coded a time label of T1 to T14.

*Table 1. Descriptive Statistics*

| Variable | Mean (SD) | Frequency (%) |
|---|---|---|
| Sex | | |
| Male | | 279 (55.2) |
| Female | | 226 (44.8) |
| Age | 6.57 (.37) | |
| Ethnicity | | |
| Native American/Alaskan Native | | 1 (.2) |
| Asian/Pacific Islander | | 9 (1.8) |
| African American | | 128 (25.3) |
| Hispanic | | 186 (36.8) |
| Caucasian | | 177 (35) |
| Other | | 4 (.8) |
| Retention Status | | |
| Retained | | 167 (33.7) |
| Not Retained | | 328 (66.3) |
| District | | |
| Bryan | | 290 (57.4) |
| College Station | | 144 (28.5) |
| Spring | | 70 (13.9) |
| Other | | 1 (.2) |
| *N* | 505 | |

## Procedures

The original study received human subjects approval from Texas A&M University (Hughes, & Cao, 2018) and was funded by many grants from the National Institute of Child Health and Human Development. Assessments were conducted annually by research staff members, including unpaid undergraduate psychology students enrolled in a field experience course, paid undergraduate psychology students who completed the field experience course, and graduate research assistants in the school psychology doctoral program at Texas A&M University. Assessors received at least 12 hours of training in assessment administration, and they were required to demonstrate proficiency in administration before being allowed to conduct assessments in the schools. Research staff reviewed assessment protocols for errors, which were corrected, if possible (Hughes & Kwok, 2006).

Data for the current study were used from the original study after the University Institutional Review Board at Texas A&M University approved use of the archival data.

### Tracking Students.

Students at any Texas public school are provided a unique identification number. These numbers were used to track students in the participating schools from year to year. Every September, the participating schools provided school enrollment data for the students participating in the study. The information includes school campus, grade, and parent phone number and address. For the original study, this information was included in a tracking database for the year. If students transferred to school districts not participating in this study, the school district was contacted with a request to verify the student's enrollment for the given year. Researchers from the original study contacted the most recent schools of students who were not included in a given school district's enrollment list. The school was asked to complete a form

requesting information on the student's whereabouts, including the student's current school and the most recent address of the student or parent(s) of the student. If the student could not be located using these methods, attempts were made to gather this information from parents by phone, email, or the United States Postal Service. Both parents and students were paid $25 upon completion of each annual questionnaire (Hughes, Cao, West, et al., 2017; Hughes & Kwok, 2006; Im et al., 2016).

## Measures

### Demographic Information.

Demographic data were collected through a questionnaire that was mailed out at T1 to parents who consented to participate in this study. Annual school records and teacher reports provided information regarding special education or bilingual education status, as well as grade placement for each student. (Hughes & Kwok, 2006).

### Psychological sense of school membership scale.

The Psychological Sense of School Membership Scale (PSSM; Goodenow, 1993) consists of 18 items and assesses a student's perceived respect, feelings of inclusion, acceptance, and encouragement for participation. The scale asks students to rate their degree of agreement for each of the statements on a 5-point Likert scale ranging from 1, or Not true at all, to 5, or Very true. In the Project Achieve study, the PSSM was administered once a year from T4 to T9, and internal consistency for the first four time periods has been greater than .83.

***Reliability.*** Previous literature has found internal consistency on the PSSM to range from .71 to .88 for one middle school student sample (Goodenow, 1993) and .88 for middle school and high school students in another sample (Hagborg, 1994). A shortened version consisting of only four items from the PSSM was used in one study (Bosworth, Espelage, & Simon, 1999), and

items had an internal consistency of .63, which is acceptable, but not necessarily good or ideal. When modified for Turkish college students, researchers found internal consistency of .84 (Alkan, 2016), and when modified into a 13-item Japanese scale, researchers found internal consistency of .82 and .87 over two time points (Togari, Sato, Yamazaki, et al., 2011). Hagborg (1994) also found a test-retest reliability value of .78 across four weeks. Shochet, Smyth, and Homel (2007) found stability in the PSSM scores over time, as 12-month test-retest correlations were .56 for boys and .60 for girls.

***Construct Validity.*** Hagborg (1994) conducted a principal-components factor analysis to examine construct validity and uncovered three factors comprising the PSSM: belonging, rejection, and acceptance. Although the PSSM may appear a valuable multidimensional tool, only three and four items loaded on the rejection and acceptance factors, respectively (Hagborg, 1994).

***Concurrent and Predictive Validity.*** In the study conducted by Hagborg (1994), it was found that the students whose scores on the PSSM were in the low range had been previously identified by the school psychologist as emotionally distressed and had been receiving counseling for a significant period. This shows that the PSSM may be a useful tool at identifying students who are at risk for poor adjustment or school dropout. These individuals could be identified and treated early so as to improve adjustment and encourage school completion. You, Ritchey, Furlong, et al., 2011) identified that PSSM scores positively correlated with school success, expectations for positive life outcomes, and lower levels of depression and anxiety. Additionally, You et al. (2011) found that PSSM scores negatively correlated with depression and scores on the strengths and difficulties questionnaire. Higher PSSM correlated with greater levels of school attendance, self-efficacy, and academic competence, as well as grade point

average. These results provide evidence that both positive and negative academic and mental health outcomes can be predicted using the PSSM.

**Classroom engagement questionnaire.**

The Project Achieve study created the 18-item Classroom Engagement Questionnaire by combining items from the Teachers' Ratings of Student Engagement (Skinner, Zimmer-Gembeck, & Connell, 1998) and the Student Rating of Engagement (Skinner et al., 1998). Items from the Student Rating of Engagement were rephrased to read from the teacher's perspective of the student, and teachers rated each statement on a Likert scale of 1 being "Not true at all" about the student being rated, and 4 being "Very true" about the student being rated. Ten of the items from the Classroom Engagement Questionnaire assessed behavioral engagement, four assessed student interest, and four assessed emotional engagement. Through exploratory factor analysis, 11 items were identified as loading greater than .45 on the behavior engagement factor and were combined to create a mean behavioral engagement score. From T4 to T9, teachers reported students' behavioral engagement in the classroom as measured by 11 items chosen from both the Classroom Engagement Questionnaire and the Student Rating of Engagement, where the items were rephrased for teacher completion.

***Construct validity.*** The Classroom Engagement Questionnaire evidenced acceptable factorial validity (masked) as well as internal consistency, as the computed alphas at baseline and grade 9 were .92 and .91, respectively (Chen, Hughes, Liew, et al., 2010).

***Concurrent and predictive validity.*** Due to this scale being created for the original Project Achieve study, little is known regarding the scale's concurrent validity and predictive abilities.

## Planned Analyses

The current study utilized descriptive and correlational analyses as well as latent growth curve modeling (LGCM) and structural equation modeling (SEM). Descriptive and correlational analyses were used to describe the participants in the study and the relationship between school belonging and behavioral engagement. Longitudinal examination of both school belonging and behavioral engagement was conducted using growth curve modeling, and the causal relationship between school belonging and behavioral engagement was conducted using an autoregressive cross-lagged model, which is a type of structural equation modeling. Two sets of analyses were conducted for each school belonging and behavioral engagement model to test the hypotheses that (1) females are more engaged than males and report higher levels of belonging and (2) students who have never been retained are more engaged than students who have been retained and report higher levels of belonging. Two sets of autoregressive cross-lagged models were conducted to determine the causal relationships between school belonging and behavioral engagement over T4 to T9 for both sex and retention status.

## Statistical Software

All descriptive and correlational data were completed using SPSS version 25 (IBM Corp., 2017). Latent growth curve models and autoregressive cross-lagged models were conducted in Mplus version 8.0 (Muthén & Muthén, 1998-2017) which has the ability to analyze data with missing values, given data are missing completely at random or missing at random. Furthermore, models were considered to be nested within sex and retention status due to the examination of differences in these variables.

### Missing data.

Previous studies conducted with the Project Achieve data have found that missing data were missing at random and that there were no differences between individuals with complete data and those with incomplete data across multiple studies (Hughes et al., 2017; Im, Hughes, & West, 2016; Liew, McTigue, Barrois, et al., 2008; Willson, & Hughes, 2009). As a result, analyses were able to be conducted in M*plus* version 8.0 (Muthén & Muthén, 1998-2017) where the missing at random function is used to estimate models with missing data.

With the proposed statistical analyses, the ideal sample size for a structural equation modeling analysis is 20 times the numbers of parameters to be estimated; however, 10 times the number of parameters to be estimated is also acceptable but not ideal (Kline, 2016). In this study, the ideal number of participants are expected to range from 220 to 760, but an acceptable range would be 110 to 380. The final number of participants in the current study was 505.

## Research Questions

### Research Question 1

Will school belonging significantly decrease from T4 to T9? Are there significant differences in sex or retention status?

1A. Research has found that school belonging decreases across the primary and secondary school years (Anderman, 2003; Benner et al., 2017; Marks, 2000; Martin et al., 2009; Gillen-O'Neel & Fuligni, 2013), with scores at any given time impacting the subsequent time point for which data is collected. It is hypothesized that in the current study, the sample of at-risk students will evidence significant decreases in school belonging over T4 to T9. The model to test this hypothesis is shown below in Figure 2.

*Figure 2. Growth curve model of school belonging*

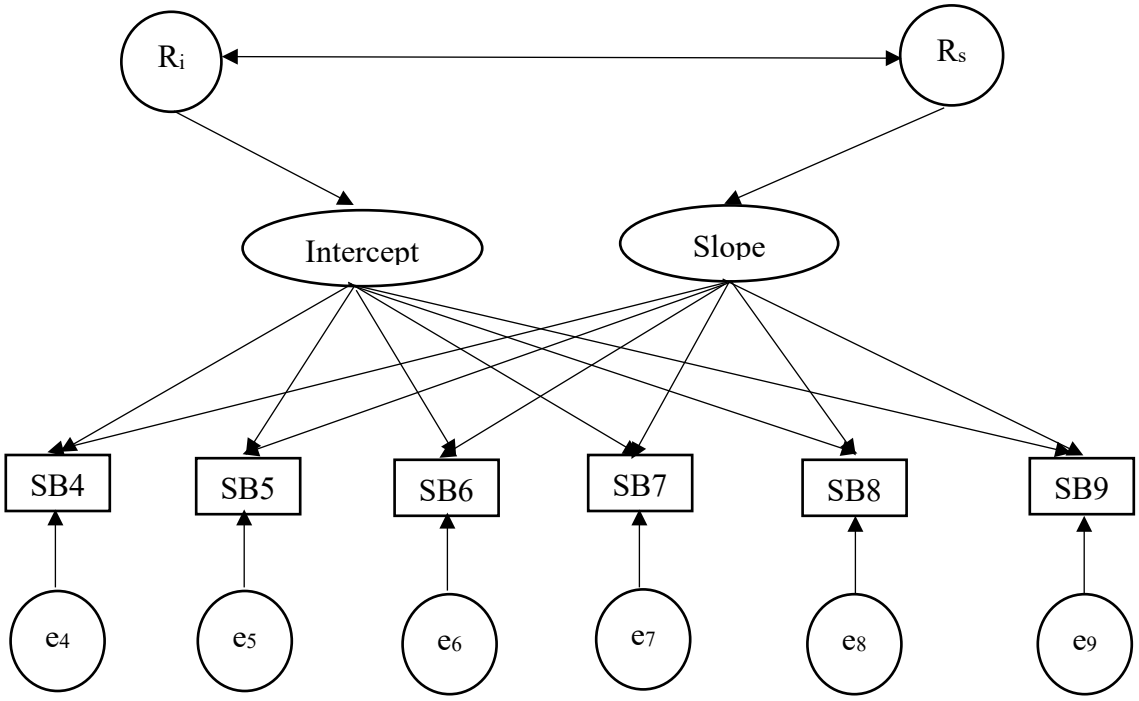



Figure 2 shows school belonging scores across T4 and T9. To measure the change in school belonging over time, growth curve modeling will be used.

1B. Research has found mixed results regarding sex differences in school belonging, with some studies finding greater sense of belonging in females and other studies finding greater belonging in male students. In the current study, it is hypothesized that females will exhibit greater levels of school belonging. The model to test this hypothesis is below.

*Figure 3. Growth curve model of school belonging nested by sex.*

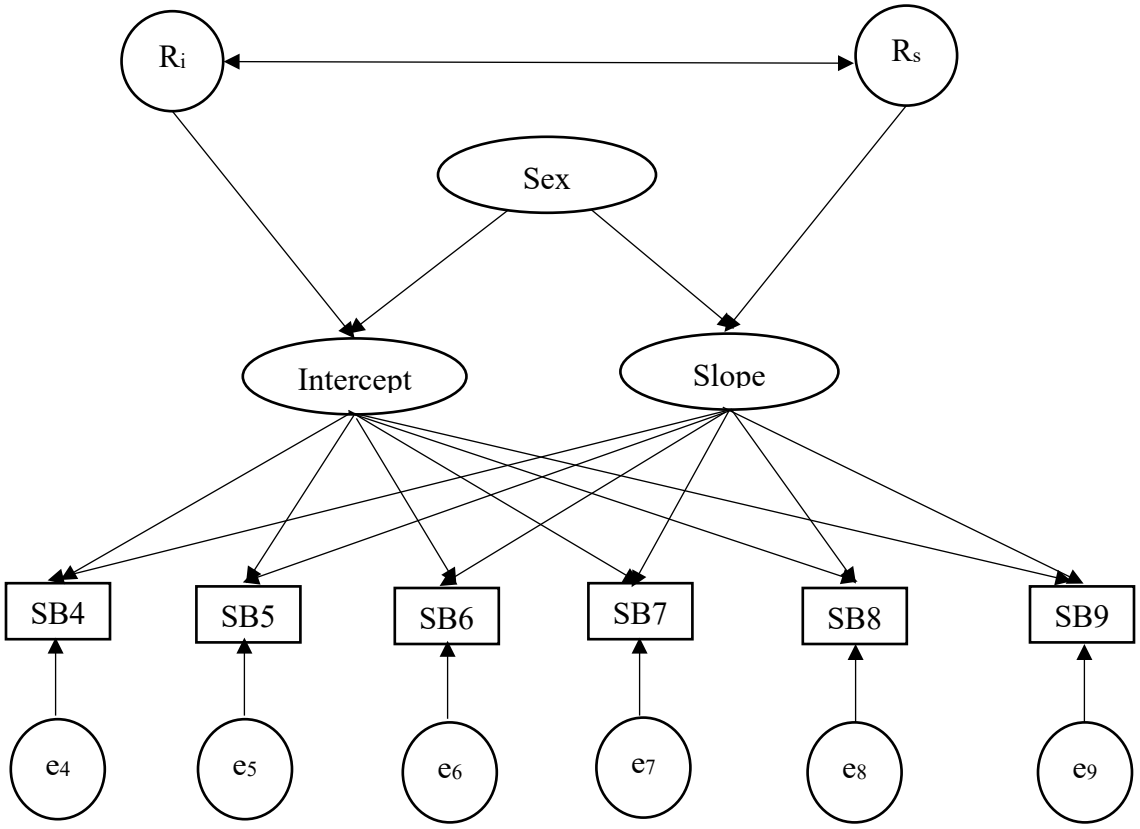



Figure 3 shows school belonging scores across T4 and T9 nested by sex. To measure the change in school belonging over time between the male and female groups, growth curve modeling was used with and without constraints. Then chi square difference testing was conducted to determine significant differences. If significant differences were found, paths were constrained one at a time to determine which specific time points have significant sex differences.

1C. Research has found that students who are retained have lower levels of belonging. In the current study, it is hypothesized that students who have been retained will have significantly lower school belonging scores than students who have never been retained. The model to test this hypothesis is below.

*Figure 4. Growth curve model for school belonging nested by retention status.*

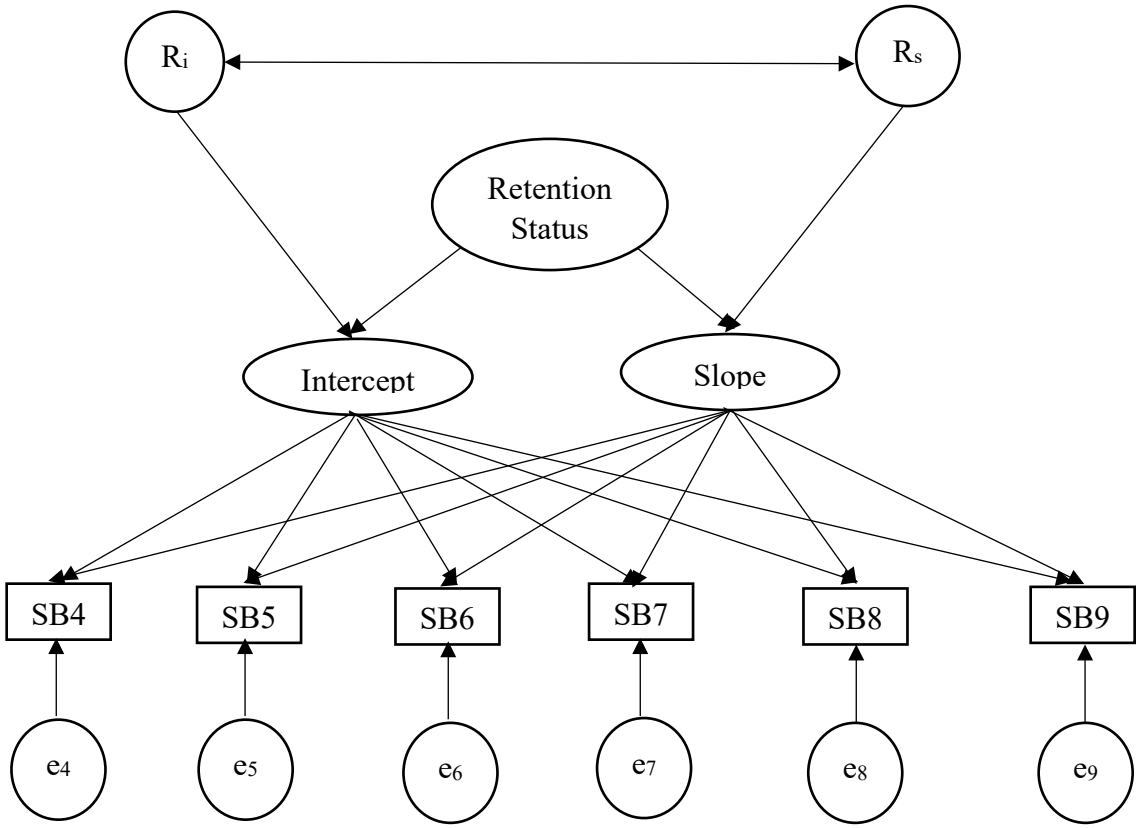



Figure 4 shows school belonging scores across T4 and T9 nested by retention status. To measure the change in school belonging over time between the retained and not retained groups, growth curve modeling was used with and without constraints. Then chi square difference testing was conducted to determine significant differences. If significant differences were found, paths were constrained one at a time to determine which specific time points have significant retention status differences.

**Research Question 2**

Will the most significant decreases in school belonging be the critical transition periods from T5 to T6 and T8 to T9 for students who have not been retained (i.e., are in grade 9 at T9)? Are there differences by sex?

2A. Research has identified critical periods from elementary school to middle school and middle school to high school, in which school belonging dramatically decreases (Anderman, 2003; Benner et al., 2017; Gillen-O'Neel & Fuligni, 2013; Marks, 2000; Martin et al., 2009). In the current study, it is expected that for the sample of at-risk students, the same critical periods in school belonging scores will be found. Repeated measures ANOVA was conducted to examine differences in mean between each time point from T4 to T9.

2B. With evidence supporting decreases in school belonging over time and sex differences, these differences were explored with regard to the critical periods. The same analysis conducted in 2A was run with sex as the grouping variable. It is expected that males will evidence significant decreases in school belonging at the critical periods when compared to their female counterparts.

**Research Question 3**

Will behavioral engagement significantly decrease from T4 to T9? Are there significant differences in sex or retention status?

3A. Decreases in behavioral engagement over time also have been found (Benner et al., 2017; Fredricks et al., 2004; Marks, 2000; Martin et al., 2009), with scores at one time impacting subsequent scores (Finn, 1989; Garnier et al., 1997; Jimerson et al., 2000). In the current study, it is expected that the sample of at-risk students also will evidence decreases in behavioral engagement from T4 to T9. The model for the hypothesis is shown below in Figure 5.

*Figure 5. Growth curve model of behavioral engagement*

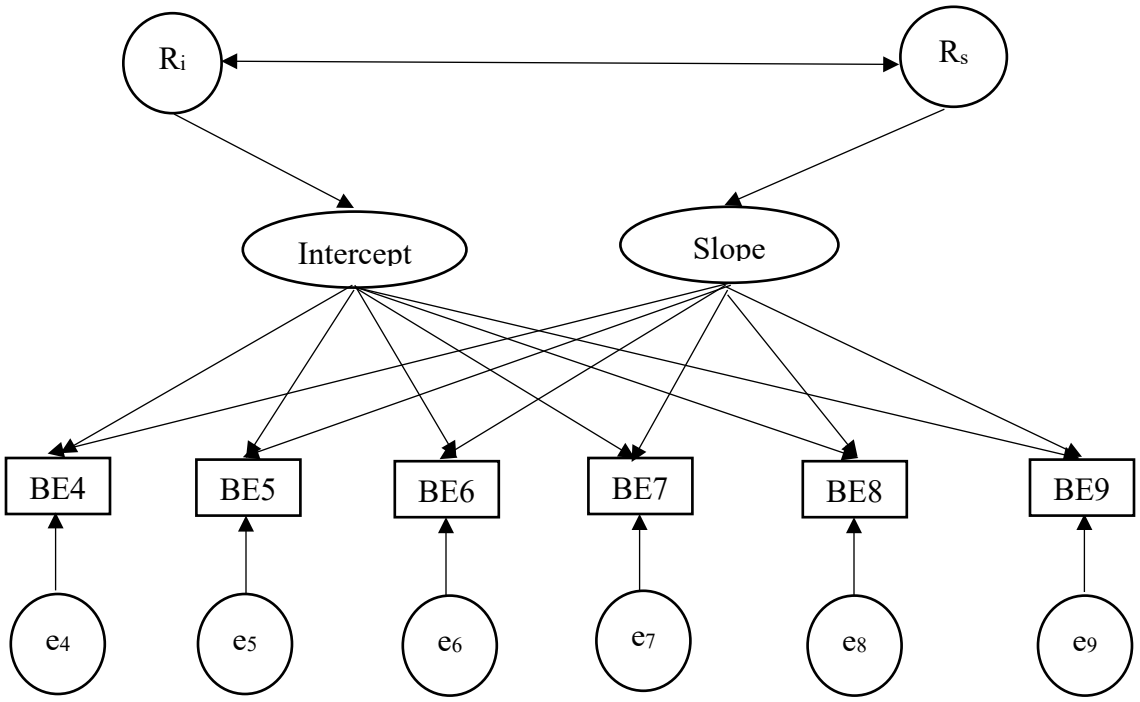



Figure 5 shows school behavioral engagement scores across T4 and T9. To measure the change in behavioral engagement over time, growth curve modeling was used.

3B. Research has found that females have greater levels of behavioral engagement compared to their male counterparts. In the current study, it is hypothesized that females will exhibit greater levels of behavioral engagement than males. The model to test this hypothesis is below.

*Figure 6. Growth curve model of behavioral engagement nested by sex.*

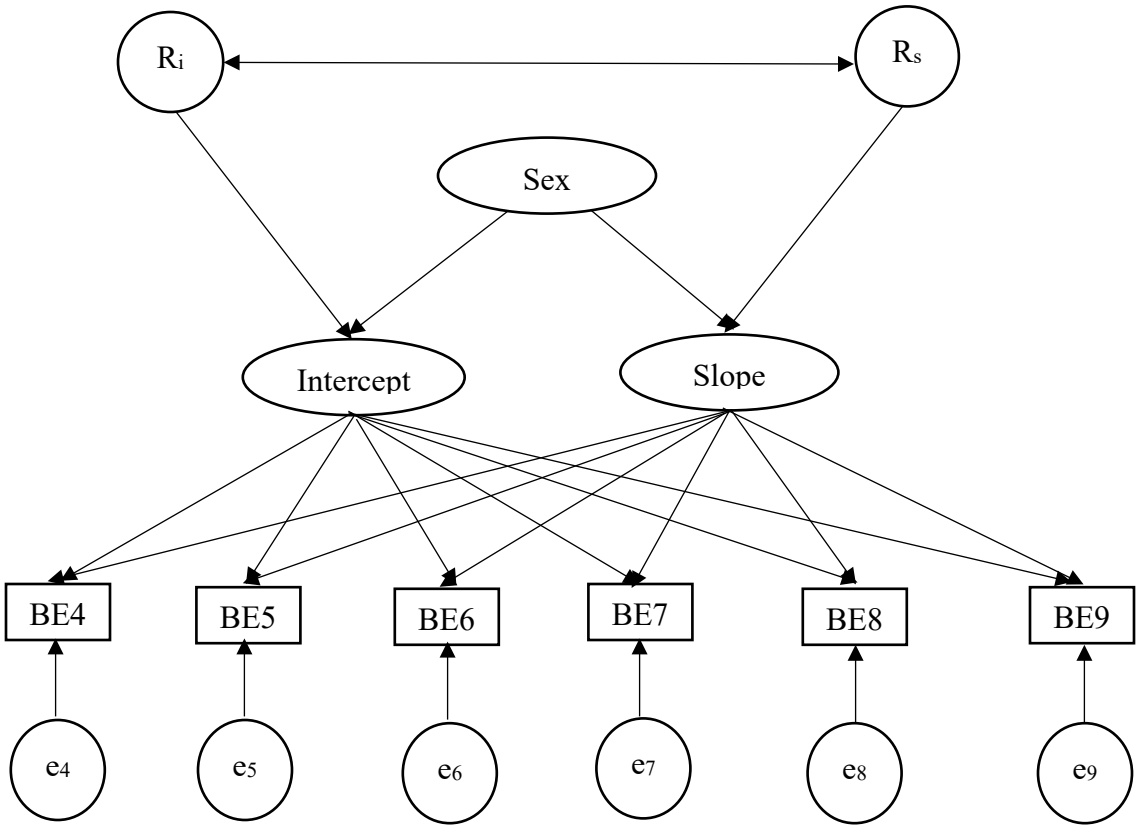



Figure 6 shows behavioral engagement scores across T4 and T9 nested by sex. To measure the change in behavioral engagement over time between the male and female groups, growth curve modeling was used with and without constraints. Then chi square difference testing was conducted to determine significant differences. If significant differences were found, paths were constrained one at a time to determine which specific time points have significant sex differences.

3C. Research has found that students who are retained have lower levels of engagement. In the current study, it is hypothesized that students who have been retained will have significantly lower behavioral engagement scores than students who have never been retained. The model to test this hypothesis is below.

*Figure 7. Growth curve model of behavioral engagement nested by retention status.*

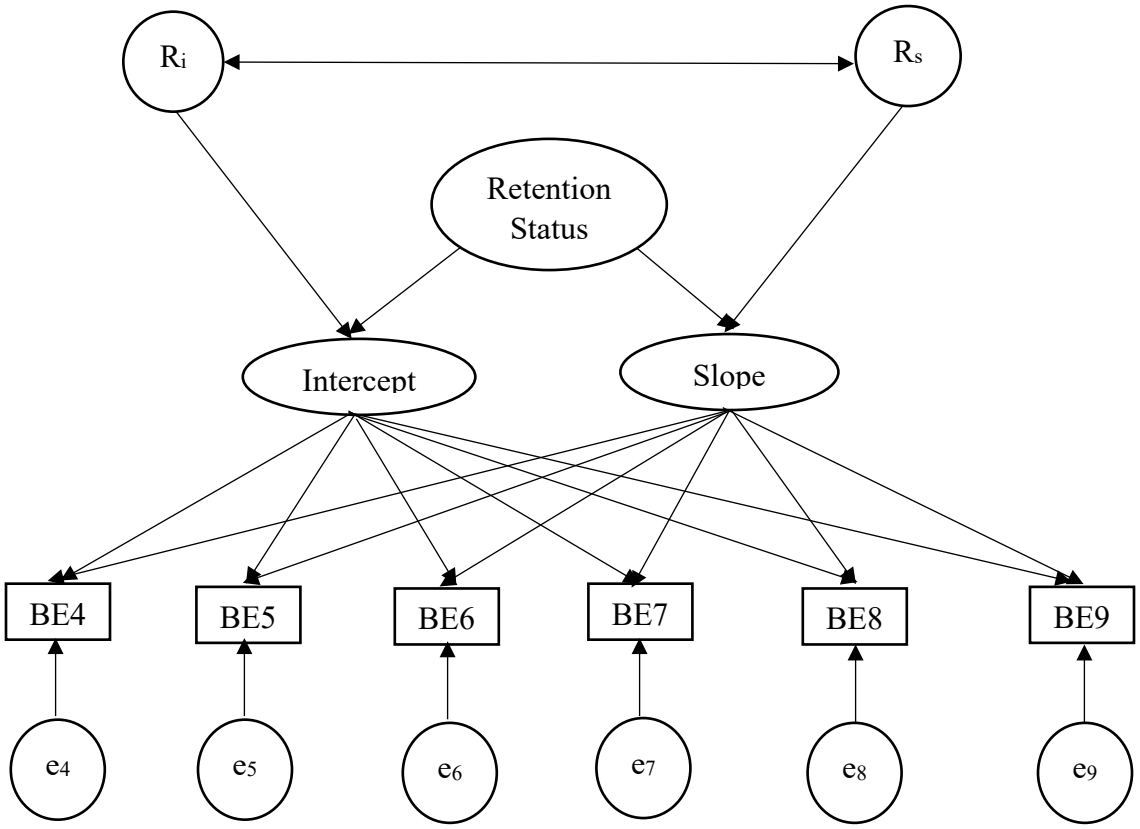



Figure 7 shows behavioral engagement scores across T4 and T9 nested by retention status. To measure the change in behavioral engagement over time between the retained and not retained groups, growth curve modeling was used with and without constraints. Then chi square difference testing was conducted to determine significant differences. If significant differences were found, paths were constrained one at a time to determine which specific time points have significant retention status differences.

**Research Question 4**

Will the most significant decreases in behavioral engagement be the critical transition periods from T5 to T6 and T8 to T9 for students who have not been retained (i.e., at T9)? Are there differences by sex?

4A. Research has uncovered critical periods from elementary school to middle school and middle school to high school, in which school belonging dramatically decreases (Anderman, 2003; Benner et al., 2017; Gillen-O'Neel & Fuligni, 2013; Marks, 2000; Martin et al., 2009). The literature also has supported interactions between school belonging and behavioral engagement, thus, it is expected that as school belonging decreases during these critical periods, so, too, will behavioral engagement. In the current study, it is expected that for the sample of at-risk students, the same critical periods will be found when examining behavioral engagement. A repeated measures ANOVA was conducted to explore differences in behavioral engagement at the time points from T4 to T9.

4B. With evidence supporting decreases in behavioral engagement over time and sex differences, these differences were explored with regard to the critical periods. The analysis conducted in 4A was used with sex as the grouping variable. It is expected that males will evidence significant decreases in behavioral engagement at the critical periods when compared to their female counterparts.

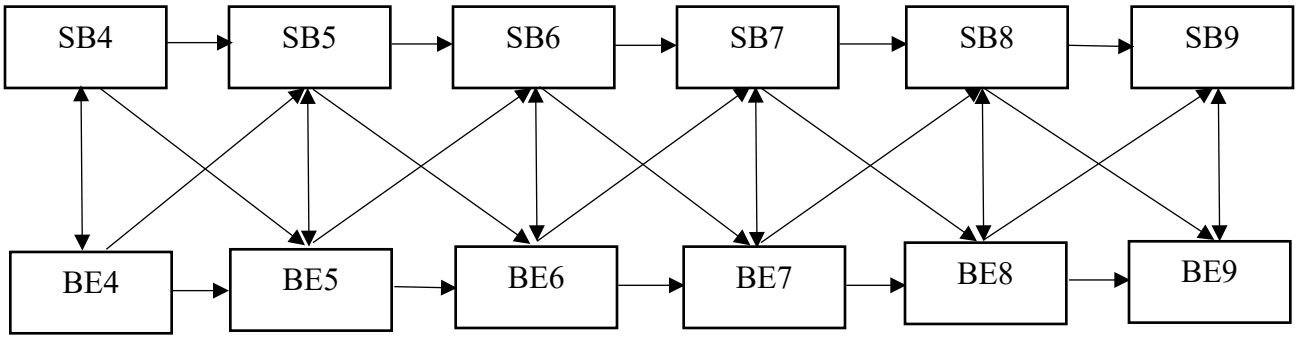
**Research Question 5**

What are the directions of the effects between school belonging and behavioral engagement?

5A. Research has shown that both school belonging and behavioral engagement decrease over time and tend to have critical periods; however, few studies have examined both variables

over the span of 6 years and fewer have examined these variables in tandem. This begs the question: are there reciprocal relationships between school belonging and behavioral engagement across the 6 timepoints? To answer this question, an autoregressive cross-lagged panel model was used and is depicted below in Figure 8.

*Figure 8. Autoregressive cross-lagged panel model*




With research supporting steady decreases in both variables over time, it is expected that findings in the current study will indicate a reciprocal interaction between school belonging and behavioral engagement, where decreases in school belonging lead to decreases in behavioral engagement and decreases in behavioral engagement led to decreases in school belonging. Although not being explored in this study, it also is expected that increases in school belonging will lead to increases in behavioral engagement and increases in behavioral engagement will lead to increases in school belonging.

5B. The literature and previous hypotheses suggest differences in sex with regard to school belonging and behavioral engagement. Will the associations between school belonging and behavioral engagement in the autoregressive cross-lagged panel model be stronger for females than males? In the current study, it is expected that results will show differences by sex.

The model in Figure 8 was used to answer this question. The model was run comparing sex both with and without constraints. Then a chi-square difference test was conducted to determine significant differences. If found, each path was then constrained individually to determine significance through further chi-square difference testing.

5C. Lastly, evidence in the literature also has shown differences in school belonging and engagement between students who have been retained and those who have not. Based on this knowledge, will the associations between school belonging and behavioral engagement be stronger for students who have not been retained compared to those who have been? It is expected that results will show differences in retention status and will favor students who have never been retained. The model in Figure 8 was used to answer this question. The model was run comparing retention status both with and without constraints. Then a chi-square difference test was conducted to determine significant differences. If found, each path was then constrained individually to determine significance through further chi-square difference testing.

For all models, fit was evaluated by chi-square goodness of fit, the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). CFI values of .95 or greater, SRMR values .08 or lower, and RMSEA values of .06 or lower are considered acceptable fit (Hu & Bentler, 1999).

# CHAPTER IV

# RESULTS

Results will be separated into three sections. First, correlations between school belonging and behavioral engagement across the timepoints will be reviewed. Second, the growth curve models will be discussed testing the hypotheses that (1) school belonging will evidence decreases across T4 to T9, (2) the most significant decreases in school belonging will be at the critical periods of T5 to T6 and T8 to T9, (3) there will be sex and retention status differences in the school belonging analyses, (4) behavioral engagement will evidence decreases across T4 to T9, (5) the most significant decreases in behavioral engagement will be at the critical periods of T5 to T6 and T8 to T9, and (6) there will be sex and retention status differences in the behavioral engagement analyses. Lastly, the results of the autoregressive cross-lagged panel model will be assessed.

## Preliminary Analyses

### Assumption Checking

It is assumed in growth curve modeling that the data are linear and independent and that the errors are independent and normally distributed with have constant variance. Evaluation of the residuals for the study sample indicated that the assumptions of linearity, equal variance, and independence are reasonable.

Data were examined for outliers. Skewness and kurtosis for all study participants are depicted in Table 2. No scores had skewness greater than 2 standard deviations or kurtosis greater than 7 standard deviations from the mean scores, indicating no outliers (West, Finch, & Curran, 1995).

*Table 2. Means, Standard Deviations, Skewness, and Kurtosis of Analysis Variables*

| Variable | *N* | Mean | *S.D.* | Skewness | Kurtosis |
|---|---|---|---|---|---|
| PSSM T4 | 491 | 3.88 | 0.65 | -1.07 | 1.77 |
| PSSM T5 | 491 | 3.93 | 0.63 | -0.74 | 0.50 |
| PSSM T6 | 493 | 3.86 | 0.69 | -0.57 | -0.03 |
| PSSM T7 | 489 | 3.85 | 0.66 | -0.46 | -0.34 |
| PSSM T8 | 481 | 3.88 | 0.66 | -0.31 | -0.64 |
| PSSM T9 | 466 | 3.84 | 0.67 | -0.39 | -0.43 |
| TWBENG T4 | 402 | 2.80 | 0.67 | -0.23 | -0.69 |
| TWBENG T5 | 420 | 2.80 | 0.68 | -0.14 | -1.05 |
| TWBENG T6 | 423 | 2.75 | 0.68 | -0.10 | -0.88 |
| TWBENG T7 | 415 | 2.71 | 0.69 | -0.05 | -0.87 |
| TWBENG T8 | 420 | 2.69 | 0.72 | -0.01 | -1.03 |
| TWBENG T9 | 388 | 2.72 | 0.66 | -0.01 | -1.02 |

Finally, bivariate correlations were computed. Table 3 presents the bivariate correlations for school belonging and behavioral engagement for all study participants across the six timepoints of interest. Patterns in the correlations were expected: school belonging scores were significantly correlated with other school belonging scores across waves, ranging from $r = .23$ to $r = .67$, and behavioral engagement scores were significantly correlated with other behavioral engagement scores across waves, ranging from $r = .32$ to $r = .60$. School belonging at T4 was significantly correlated with behavioral engagement scores from T4 to T7. At T5, school belonging was significantly correlated with behavioral engagement from T4 to T5. School belonging at T6 was significantly correlated with engagement at T4 to T7. Belonging at T7 was significantly correlated with engagement at all waves. Belonging at T8 and T9 were significantly correlated with engagement from T5 to T9.

*Table 3. Pearson correlations for variables*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PSSM T4 | 1.00 | | | | | | | | | | | |
| 2. PSSM T5 | .44** | 1.00 | | | | | | | | | | |
| 3. PSSM T6 | .27** | .38** | 1.00 | | | | | | | | | |
| 4. PSSM T7 | .33** | .36** | .58** | 1.00 | | | | | | | | |
| 5. PSSM T8 | .23** | .32** | .48** | .67** | 1.00 | | | | | | | |
| 6. PSSM T9 | .27** | .26** | .40** | .55** | .65** | 1.00 | | | | | | |
| 7. TWBENG T4 | .21** | .12* | .10* | .20** | .09 | .08 | 1.00 | | | | | |
| 8. TWBENG T5 | .11* | .11* | .11* | .14** | .13** | .11* | .54** | 1.00 | | | | |
| 9. TWBENG T6 | .16** | .05 | .15** | .19** | .14** | .13* | .55** | .60** | 1.00 | | | |
| 10. TWBENG T7 | .11* | .09 | .12* | .23** | .14** | .20** | .35** | .37** | .51** | 1.00 | | |
| 11. TWBENG T8 | .07 | .04 | .05 | .19** | .14** | .22** | .34** | .39** | .45** | .54** | 1.00 | |
| 12. TWBENG T9 | .06 | .02 | .07 | .17** | .13* | .18** | .35** | .32** | .45** | .46** | .45** | 1.00 |

** Correlation is significant at the .01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed)

## Main Analyses

### Research Question 1

1A. To investigate changes in school belonging across T4 to T9, a latent growth curve model was tested for all participants using Mplus 8.0. Although the chi-square was significant $\chi 2$ ($N$ = 505, 11) = 28.62, $p < 0.01$, alternative fit indices suggested the model fit the data well, CFI = 0.98, SRMR = 0.07, RMSEA = 0.06. The average baseline score on the belonging scale was 3.88 ($\alpha 0 = 3.88$), and there was significant variability in these scores across individuals at baseline ($\psi 00 = 0.14$, $p < .01$). On average, scores on the school belonging scale declined by .39 each year, and this decrease was significant ($p < .01$). Slopes did not significantly vary ($\psi 11 = 0.003$, ns; $p > .05$), suggesting that all individuals changed over time at approximately the same rate. There was a significant negative correlation between baseline scores and slopes ($\psi 01 = -0.016$, $p < .01$), however, indicating that those with higher school belonging at the beginning of the study were most likely to experience decline in belonging over time.

1B. To examine sex differences in school belonging, multiple-group analyses were conducted with and without constraints. A chi-square difference test followed to determine

*Table 4. Nested Model Comparisons Testing for Sex Differences in School Belonging Trajectory Parameter Estimates*

| Model | $\chi^2$ | df | $\chi^2_{diff}$ | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|---|
| Model 1: Unconstrained | 44.04 | 22 | | .98 | .06 | .12 |
| Model 2: Constrained | 53.73 | 27 | 9.69 | .97 | .06 | .09 |
| | | | df = 5, p = .08 | | | |

whether sex moderated the associations of school belonging over time. Table 4 shows the fit statistics with and without sex constraints on school belonging trajectory parameters (intercept and slope means, variances, and covariance). As shown, nested model comparisons using chi-square differential tests indicated that forcing sex constraints led to no significant differences in fit to the data.

Table 5 provides intercept and slope parameter estimates by sex. Figure 9 presents trajectories based on these estimates. As was hypothesized, females reported higher initial school belonging than males; however, as stated above, these findings were not significant. For both males and females, there was significant variance in intercept estimates, indicating significant, between-person variability in baseline belonging scores; however, only males had significant variance in slope estimates, indicating significant, between-person variability in change over time for males but not for females. Overall, the statistical significance of parameters for males versus females suggested some sex specificity in trajectories.

*Figure 9. School Belonging Trajectories by Sex*

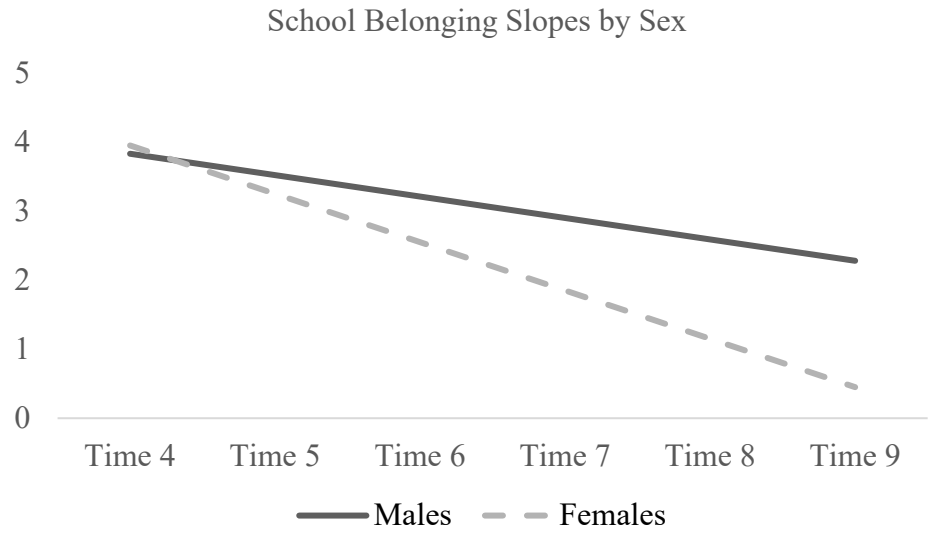


*Table 5. Coefficients and Variances for Growth Curve Parameters for School Belonging Trajectories for Males and Females*

| Parameter | Coefficient | Variance |
|---|---|---|
| Intercept | | |
| Males | 3.83** | 0.16** |
| Females | 3.95** | 0.001** |
| Slope | | |
| Males | -0.31** | 0.006* |
| Females | -0.70** | 0.79 |

* $p < .05$
** $p < .01$

1C. To examine retention status differences in school belonging, multiple-group analyses were conducted with and without constraints. A chi-square difference test followed to determine whether retention status moderated the associations of school belonging over time. Table 6 shows the fit statistics with and without retention status constraints on school belonging trajectory parameters (intercept and slope means, variances, and covariance). As shown, nested model comparisons using chi-square differential tests indicated that forcing retention status constraints led to significant differences in fit to the data.

*Table 6. Nested Model Comparisons Testing for Retention Status Differences in School Belonging Trajectory Parameter Estimates*

| Model | $\chi^2$ | df | $\chi^2_{diff}$ | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|---|
| Model 1: Unconstrained | 42.16 | 22 | | .98 | .06 | .06 |
| Model 2: Constrained | 59.16 | 27 | 16.99 | .97 | .07 | .11 |
| | | | $df = 5, p < .001$ | | | |

Due to the significant differences found for school belonging with regard to retention status, further analyses were conducted. In these analyses, each school belonging path was individually constrained to be equal for students who have been retained and those who have never been retained. Each of these models was then compared to the freely estimated model to determine differences in retention status at each timepoint. Results are presented in Table 7.

*Table 7. Model Fit Indices for Moderation Models*

| Model | $\chi^2$ | $\chi^2_{diff}$ | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|
| Model 1: Unconstrained | 42.16 | | .98 | .06 | .06 |
| Retention Status Moderation T4 - T5 | 52.16 | 9.99** | .97 | .07 | .11 |
| Retention Status Moderation T5 - T6 | 53.02 | 10.86** | .97 | .07 | .11 |
| Retention Status Moderation T6 - T7 | 52.54 | 10.38** | .97 | .07 | .11 |
| Retention Status Moderation T7 - T8 | 52.94 | 10.78** | .97 | .07 | .11 |
| Retention Status Moderation T8 - T9 | 53.50 | 11.33** | .97 | .07 | .11 |

** $p < .01$

All models for the constrained pathways (T4 to T5, T5 to T6, T6 to T7, T7 to T8, and T8 to T9) were significantly different from the freely estimated model, $\chi$2diff(1) = 9.99, $p < .01$; $\chi$2diff(1) = 10.86, $p < .01$; $\chi$2diff(1) = 10.38, $p < .01$; $\chi$2diff(1) = 10.78, $p < .01$; $\chi$2diff(1) = 11.33, $p < .01$, respectively, indicating moderation by retention status at each wave.

Table 8 provides intercept and slope parameter estimates by retention status. Figure 10 presents trajectories based on these estimates. Contradictory to what was hypothesized, students who had been retained reported higher initial school belonging than non-retained students. For both students who had been retained and those who had not been, there was significant variance in intercept estimates, indicating significant, between-person variability in baseline belonging scores; however, only students who had not been retained had significant variance in slope

estimates, indicating significant, between-person variability in change over time for students who had not been retained but not for students who had been retained. Overall, the statistical significance of parameters for retained versus non-retained students suggested some retention status specificity in trajectories.

*Figure 10. School Belonging Trajectories by Retention Status*

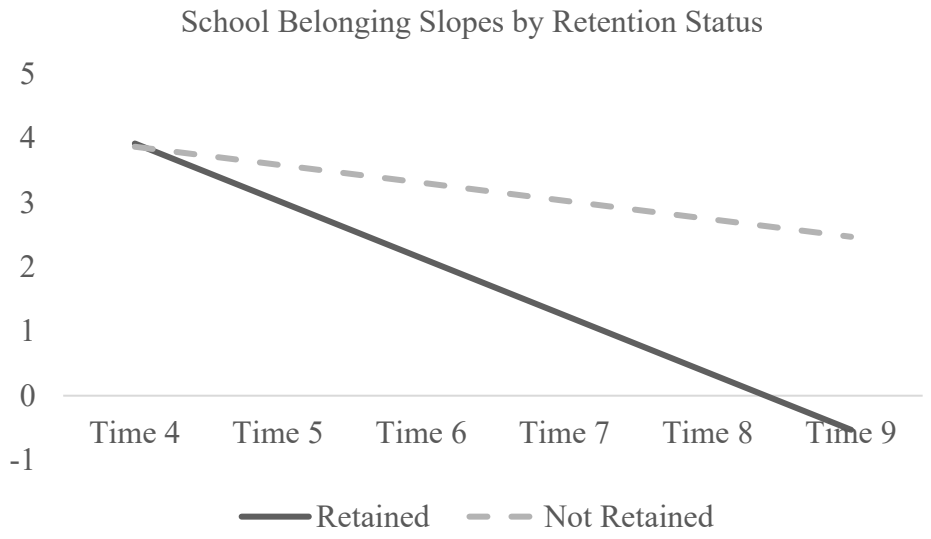



*Table 8. Coefficients and Variances for Growth Curve Parameters for School Belonging Trajectories for Retained and Not Retained Students*

| Parameter | Coefficient | Variance |
|---|---|---|
| Intercept | | |
| Retained | 3.92** | 0.08* |
| Not Retained | 3.87** | 0.15** |
| Slope | | |
| Retained | -0.89** | 0.00 |
| Not Retained | -0.28** | 0.005* |

* $p < .05$
** $p < .01$

**Research Question 2**

2A. To investigate whether there are critical periods in school belonging from T5 to T6 and T8 to T9, a series of ANOVAs were conducted using SPSS version 25. Means and standard deviations are presented in Table 9, and a graph examining differences in mean over time are depicted in Figure 11. It was hypothesized that the lowest belonging scores would be from T5 to T6 and T8 to T9. Results indicate that for students who had never been retained, there was a statistically significant impact of time on school belonging $F(1, 327) = 2507.42$, $p < .001$. The greatest decreases for all students were from T7 to T8 and T8 to T9. This suggests that school belonging decreased the most during late middle school and at the transition to high school, with the transition to high school resulting in the greatest decrease. Whereas it was hypothesized that the transition from elementary school to middle school would see large decreases in belonging, this transition period conversely evidenced increases in school belonging.

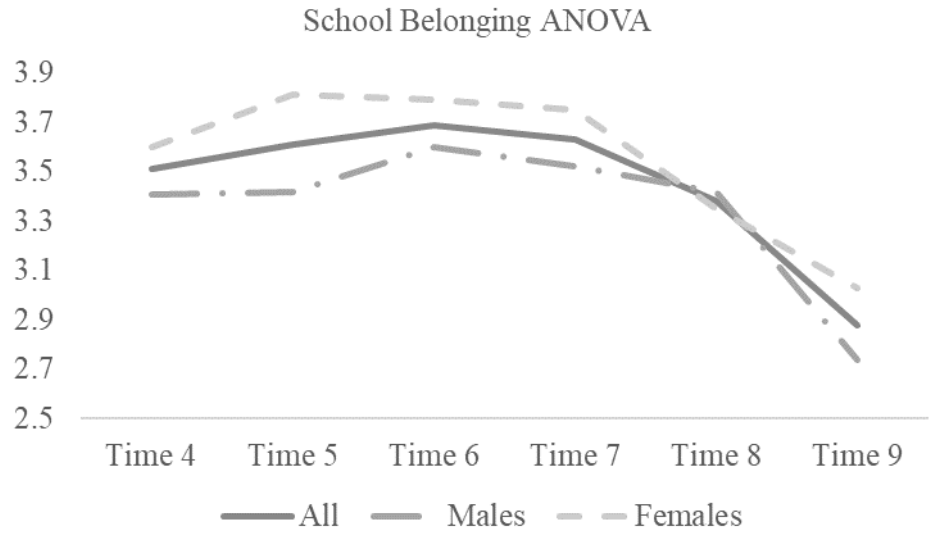
2B. To determine whether or not there were sex differences at these critical periods, additional ANOVAs were conducted with sex as a grouping variable. Results of the series of ANOVAs are presented in Table 9, and they indicate a statistically significant impact of time on school belonging for both males $F(1, 166) = 1317.94$, $p < .001$ and females $F(1, 160) = 1206.61$, $p < .001$. It was hypothesized that females would report greater belonging at these critical periods, and the results indicate that at the transition to middle school, females had higher levels of school belonging. At T8, males reported higher initial levels of belonging than females but greater decreases from T8 to T9. The greatest decreases for males were from T7 to T8 and T8 to T9. At the transition from elementary school to middle school (T5 to T6), males experienced the greatest rate of growth in belonging as opposed to hypothesized decreases. Similar to the males, females evidenced the greatest decreases in school belonging from T7 to T8

and T8 to T9. In contrast to the males, females reported decreases in belonging at the transition to middle school; however, belonging scores were higher for females than males at both T5 and T6.

*Table 9. School Belonging ANOVA results Total and by Sex.*

| Time | Total | | Males | | Females | |
|---|---|---|---|---|---|---|
| | Mean (SD) | Change | Mean (SD) | Change | Mean (SD) | Change |
| School Belonging T4 | 3.51 (2.20) | | 3.41 (2.27) | | 3.60 (2.12) | |
| School Belonging T5 | 3.61 (2.09) | + .10 | 3.42 (2.48) | + .01 | 3.81 (1.57) | + .21 |
| School Belonging T6 | 3.69 (1.56) | + .08 | 3.60 (1.53) | + .18 | 3.79 (1.58) | - .02 |
| School Belonging T7 | 3.63 (1.83) | - .06 | 3.52 (1.82) | - .08 | 3.75 (1.85) | - .04 |
| School Belonging T8 | 3.38 (2.59) | - .25 | 3.42 (2.27) | - .10 | 3.35 (2.89) | - .40 |
| School Belonging T9 | 2.88 (3.40) | - .50 | 2.74 (3.48) | - .68 | 3.03 (3.33) | - .32 |

*Figure 11. School Belonging Means at each Time Point Total and by Sex.*



**Research Question 3**

3A. To investigate changes in behavioral engagement across T4 to T9, a latent growth curve model was tested for all participants using Mplus 8.0. Although the chi-square was significant, $\chi 2$ ($N$ = 505, 11) = 34.43, $p < 0.01$, alternative fit indices suggested the model fit the data well, CFI = 0.97, SRMR = 0.07, RMSEA = 0.07. The average baseline score on the engagement scale was 2.78 ($\alpha 0 = 2.78$), and there was significant variability in these scores across individuals at baseline ($\psi 0 = 0.26$, $p < .01$). On average, scores on the behavioral engagement scale declined by .12 each year, and this decrease was significant ($p < .01$). Slopes significantly varied ($\psi 11 = 0.005$, ns; $p < .05$), suggesting that individuals' engagement scores changed over time at different rates. There was a significant negative correlation between baseline scores and slopes ($\psi 01 = -0.03$, $p < .01$, however, indicating that those with higher behavioral engagement at the beginning of the study were most likely to experience decline in engagement over time.

3B. To examine sex differences in behavioral engagement, multiple-group analyses were conducted with and without constraints. A chi-square difference test followed to determine whether sex moderated the associations of behavioral engagement over time. Table 10 shows the fit statistics with and without sex constraints on behavioral engagement trajectory parameters (intercept and slope means, variances, and covariance). As shown, nested model comparisons using chi-square differential tests indicated that forcing sex constraints led to no significant differences in fit to the data. Figure 12 presents trajectories based on these estimates. As was hypothesized, females reported higher initial behavioral engagement than males; however, as stated above, these findings were not significant. For both males and females, there was significant variance in intercept estimates, indicating significant, between-person variability in

baseline belonging scores; however, only females had significant variance in slope estimates, indicating significant, between-person variability in change over time for females but not for males. Overall, the statistical significance of parameters for males versus females suggested some sex specificity in trajectories.

*Table 10. Nested Model Comparisons Testing for Sex Differences in Behavioral Engagement Trajectory Parameter Estimates*

| Model | $\chi^2$ | df | $\chi^2_{diff}$ | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|---|
| Model 1: Unconstrained | 44.39 | 22 | | .97 | .06 | .08 |
| Model 2: Constrained | 46.78 | 27 | 2.39 | .97 | .05 | .08 |
| | | | df = 5, p = .79 | | | |

*Figure 12. Behavioral Engagement Trajectories by Sex*

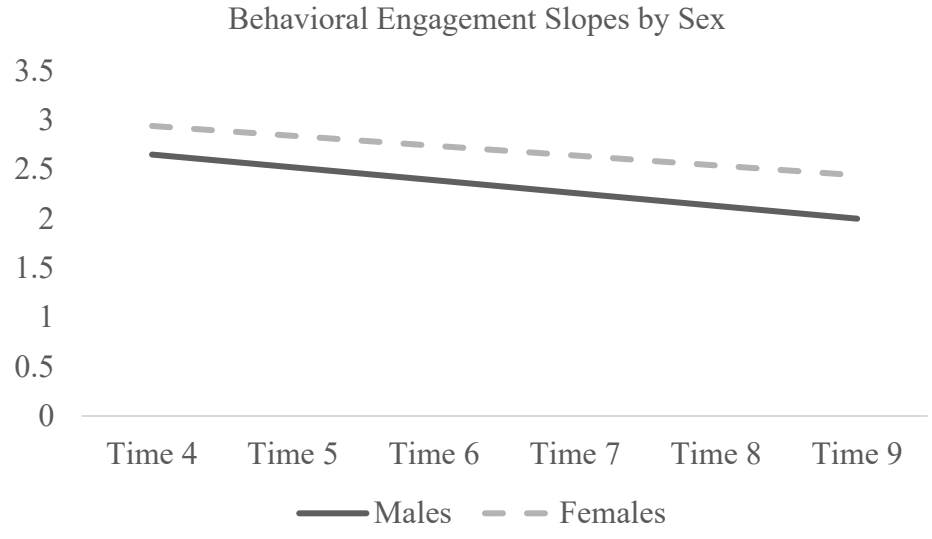


*Table 11. Coefficients and Variances for Growth Curve Parameters for Behavioral Engagement Trajectories for Males and Females*

| Parameter | Coefficient | Variance |
|---|---|---|
| Intercept | | |
| Males | 2.65** | 0.23** |
| Females | 2.94** | 0.26** |
| Slope | | |
| Males | -0.13* | 0.003 |
| Females | -0.10* | 0.008** |

* $p < .05$
** $p < .01$

3C. To examine retention status differences in behavioral engagement, multiple-group analyses were conducted with and without constraints. A chi-square difference test followed to determine whether retention status moderated the associations of behavioral engagement over time. Table 11 shows the fit statistics with and without retention status constraints on behavioral engagement trajectory parameters (intercept and slope means, variances, and covariance). As shown, nested model comparisons using chi-square differential tests indicated that forcing retention constraints led to no significant differences in fit to the data.

Table 12 provides intercept and slope parameter estimates by retention status. Figure 13 presents trajectories based on these estimates. As was hypothesized, students who had not been retained reported higher initial behavioral engagement than students who have been retained; however, as stated above, these findings were not significant. For both students who had been retained and those who had not been, there was significant variance in intercept estimates, indicating significant, between-person variability in baseline belonging scores. Neither group had significant variance in slope estimates, indicating no between-person variability in change over

time. Overall, the statistical significance of parameters for retained versus non-retained students suggested only a few retention status specificities in trajectories.

*Table 12. Nested Model Comparisons Testing for Retention Status Differences in Behavioral Engagement Trajectory Parameter Estimates*

| Model | $\chi^2$ | df | $\chi^2_{diff}$ | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|---|
| Model 1: Unconstrained | 40.65 | 22 | | .97 | .06 | .08 |
| Model 2: Constrained | 43.45 | 27 | 2.80 | .98 | .05 | .08 |
| | | | df = 5, p = .73 | | | |

*Figure 13. Behavioral Engagement Trajectories by Retention Status*

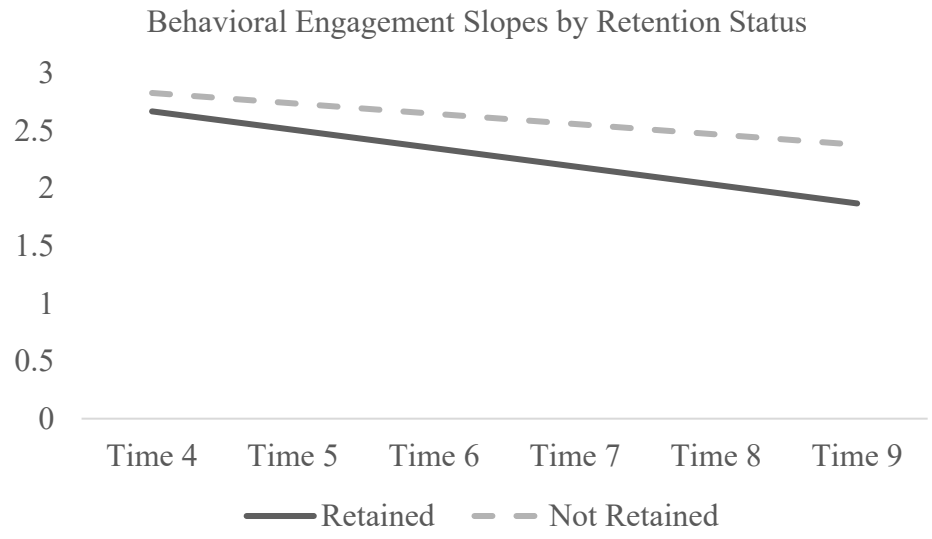


*Table 13. Coefficients and Variances for Growth Curve Parameters for Behavioral Engagement Trajectories for Retained and Not Retained Students*

| Parameter | Coefficient | Variance |
|---|---|---|
| Intercept | | |
| Retained | 2.67** | 0.26** |
| Not Retained | 2.83** | 0.25** |
| Slope | | |
| Retained | -0.16* | 0.007 |
| Not Retained | -0.09 | 0.004 |

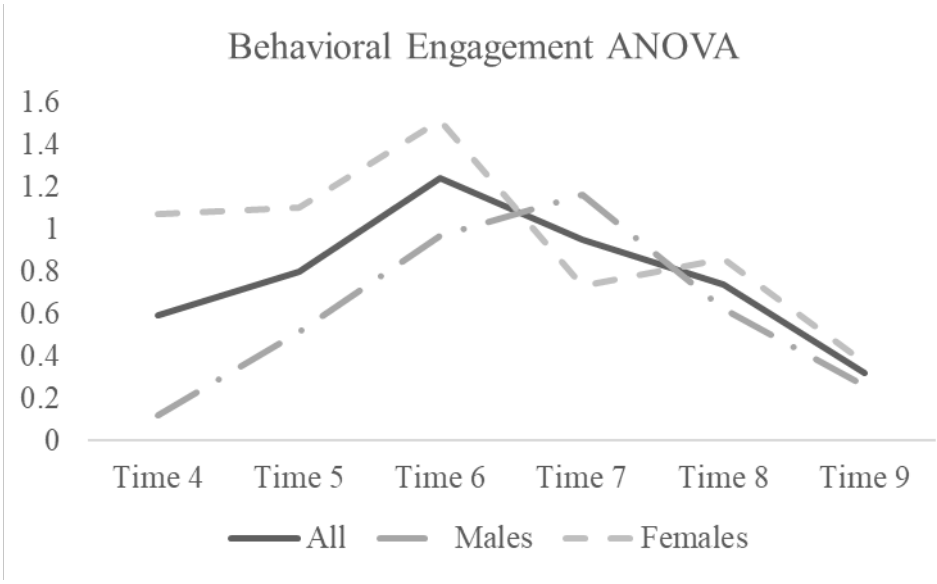
* $p < .05$
** $p < .01$

**Research Question 4**

4A. To investigate whether there are critical periods in behavioral engagement from T5 to T6 and T8 to T9, a series of ANOVAs were conducted using SPSS version 25. Means and standard deviations are presented in Table 13, and a graph examining differences in mean over time are depicted in Figure 14. It was hypothesized that the lowest engagement scores would be from T5 to T6 and T8 to T9 and consistent with school belonging scores. Results indicate that for students who had never been retained, there was a statistically significant impact of time on behavioral engagement $F(1, 327) = 50.90$, $p < .001$. The greatest decreases for all students were from T6 to T7 and T8 to T9. This suggests that behavioral engagement decreased the most from $6^{th}$ to $7^{th}$ grade and at the transition to high school, with the transition to high school resulting in the greatest decrease. The decrease from T8 to T9 was consistent with decreases in school belonging; however, the decrease from T6 to T7 was not. Although it was hypothesized that the transition from elementary school to middle school would see large decreases in engagement,

this transition period resulted in an increase in behavioral engagement, and this is consistent with the change in school belonging.

*Figure 14. Behavioral Engagement Means at each Time Point Total and by Sex.*




4B. To determine whether or not there were sex differences at these critical periods, additional ANOVAs were conducted with sex as a grouping variable. Results of the series of ANOVAs are presented in Table 14, and they indicate a statistically significant impact of time on behavioral engagement for both males $F(1, 166) = 16.43$, $p < .001$ and females $F(1, 160) = 36.71$, $p < .001$. It was hypothesized that females would report greater engagement at these critical periods, and the results indicate that at the transition to middle school, females had higher levels of behavioral engagement; however, males evidenced greater increases than females. Further, both males and females showed increases in engagement as reported by their teacher from T5 to T6 which is inconsistent with the study's hypothesis. At the transition to high school, females reported higher levels of engagement than males, and they experienced greater decreases in engagement from T8 to T9. These results support the study's hypotheses. The greatest

decreases for males were from T7 to T8 and T8 to T9 which is only somewhat consistent with hypotheses. The greatest decreases in engagement for females were from T6 to T7 and T8 to, which is similar to engagement for males in that the only decrease consistent with the study's hypotheses was the decrease from T8 to T9.

*Table 14. Behavioral Engagement ANOVA Results Total and by Sex.*

| | Total | | Males | | Females | |
|---|---|---|---|---|---|---|
| Time | Mean (SD) | Change | Mean (SD) | Change | Mean (SD) | Change |
| BE T4 | .59 (4.72) | | .12 (4.91) | | 1.07 (4.47) | |
| BE T5 | .80 (4.54) | +.21 | .51 (4.67) | +.39 | 1.10 (4.39) | +.03 |
| BE T6 | 1.24 (4.08) | +.44 | .97 (4.14) | +.46 | 1.51 (4.01) | +.41 |
| BE T7 | .95 (4.27) | -.29 | 1.16 (3.91) | +.19 | .73 (4.62) | -.78 |
| BE T8 | .74 (4.47) | -.21 | .62 (4.47) | -.54 | .86 (4.49) | +.13 |
| BE T9 | .32 (4.81) | -.42 | .26 (4.73) | -.36 | .37 (4.89) | -.49 |

**Research Question 5**

5A. An autoregressive cross-lagged panel model was used to test the longitudinal relationships between school belonging and behavioral engagement. This form of regression analysis was used to test for direct causal effects in relation to the hypotheses underlying the purpose of the study.

Means and standard deviations of study variables for the total sample and by Sex and retention status can be found in Table 15 Correlations between study variables by sex and retention status are presented in Table 16 and Table 17, respectively. Most autoregressive pathways for belonging were significant and positive, while only one autoregressive pathway

from engagement from T4 to T5 was significant but negative. All synchronous correlations in the base model were significant and positive. Most of the parameter estimates for the cross-lag pathways from school belonging to behavioral engagement one year later were significant and positive, except from the belonging at T8 to engagement at T9.

*Table 15. Means and Standard Deviations of Study Variables for Total Sample, Sex, and by Retention Status*

| | Total | Males | Females | Retained | Not Retained |
|---|---|---|---|---|---|
| Variable | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* |
| School Belonging | | | | | |
| T4 | 3.52 (2.21) | 3.37 (2.48) | 3.71 (1.82) | 3.62 (2.09) | 3.51 (2.20) |
| T5 | 3.58 (2.21) | 3.39 (2.59) | 3.80 (1.61) | 3.49 (2.50) | 3.61 (2.09) |
| T6 | 3.55 (2.08) | 3.47 (2.11) | 3.66 (2.03) | 3.57 (2.11) | 3.69 (1.56) |
| T7 | 3.44 (2.34) | 3.37 (2.23) | 3.52 (2.48) | 3.57 (1.85) | 3.63 (1.83) |
| T8 | 3.27 (2.82) | 3.22 (2.78) | 3.33 (2.87) | 3.39 (2.51) | 3.38 (2.59) |
| T9 | 2.85 (3.49) | 2.68 (3.65) | 3.07 (3.29) | 3.04 (3.28) | 2.88 (3.40) |
| Behavioral Engagement | | | | | |
| T4 | .40 (4.80) | .08 (4.90) | 0.80 (4.66) | .10 (4.91) | .59 (4.72) |
| T5 | .81 (4.46) | .59 (4.53) | 1.09 (4.37) | .80 (4.36) | .80 (4.54) |
| T6 | .84 (4.38) | .64 (4.39) | 1.09 (4.37) | .23 (4.72) | 1.24 (4.08) |
| T7 | .62 (4.53) | .76 (4.27) | 0.46 (4.83) | .48 (4.59) | .95 (4.27) |
| T8 | .72 (4.43) | .73 (4.27) | 0.71 (4.62) | 1.05 (3.98) | .74 (4.47) |
| T9 | .00 (4.98) | -0.20 (4.99) | .25 (4.97) | -0.49 (5.22) | .32 (4.81) |

*Table 16. Correlations Among Study Variables by Sex*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. SB (T4) | 1 | .28** | .04 | -.01 | -.01 | .00 | .19** | .13 | -.07 | -.01 | -.02 | -.02 |
| 2. SB (T5) | .19** | 1 | .04 | .03 | .03 | .03 | -.05 | .17** | .03 | .03 | .15* | .09 |
| 3. SB (T6) | -.02 | .00 | 1 | .20** | .02 | .10 | .12 | .09 | .19** | .16* | .03 | -.02 |
| 4. SB (7) | -.04 | .00 | .38** | 1 | .44** | .36** | -.03 | -.05 | .06 | .32** | .29** | .02 |
| 5. SB (T8) | -.01 | .00 | .19** | .48** | 1 | .69** | -.02 | -.02 | .04 | .16* | .35** | .07 |
| 6. SB (T9) | -.06 | .02 | -.08 | .19** | .33** | 1 | .05 | -.06 | .00 | .13 | .23** | .14* |
| 7. BE (T4) | .26** | .12* | .09 | .06 | -.02 | -.07 | 1 | -.07 | .07 | .08 | .06 | .04 |
| 8. BE (T5) | .15* | .17** | -.06 | -.04 | .02 | .08 | -.08 | 1 | .03 | .01 | -.06 | -.08 |
| 9. BE (T6) | .03 | .17** | .20** | .12 | .03 | -.02 | .10 | -.01 | 1 | .09 | .16* | -.04 |
| 10. BE (T7) | .10 | -.03 | .14* | .22** | .08 | .06 | .05 | -.02 | .00 | 1 | .14* | .05 |
| 11. BE (T8) | .02 | .03 | .20* | .18** | .12 | -.01 | .00 | .12* | -.01 | .02 | 1 | .10 |
| 12. BE (T9) | .03 | .00 | -.11 | -.04 | .02 | .28** | -.03 | -.01 | .02 | .07 | -.04 | 1 |

Note: Correlations for females are above the diagonal; correlations for males are below the diagonal

*Table 17. Correlations Among Study Variables by Retention Status*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. SB (T4) | 1 | .36** | .02 | -.03 | -.01 | -.02 | .26** | .10 | .04 | .04 | .06 | .07 |
| 2. SB (T5) | .01 | 1 | .02 | .02 | .02 | .00 | .08 | .21** | .15** | -.07 | -.02 | .02 |
| 3. SB (T6) | .00 | .02 | 1 | .06 | .04 | .09 | .06 | .05 | .05 | .03 | .12* | .01 |
| 4. SB (T7) | .02 | .02 | .09 | 1 | .46** | .35** | .01 | -.02 | .04 | .14** | .09 | .01 |
| 5. SB (T8) | .01 | .02 | .04 | .30** | 1 | .52** | -.06 | .01 | .04 | .14** | .18** | .01 |
| 6. SB (T9) | -.05 | .09 | -.04 | .17* | .36** | 1 | .01 | .04 | .01 | .09 | .06 | .13* |
| 7. BE (T4) | .16* | .06 | .20** | .12 | .06 | -.07 | 1 | -.09 | .19** | .02 | .05 | .05 |
| 8. BE (T5) | .17* | .12 | .00 | -.01 | .03 | .02 | -.05 | 1 | .02 | -.03 | .06 | -.06 |
| 9. BE (T6) | -.06 | .10 | .17* | -.03 | -.04 | .01 | -.08 | .01 | 1 | .05 | .12* | .01 |
| 10. BE (T7) | .03 | .09 | .10 | .14 | -.07 | .00 | .14 | .05 | -.05 | 1 | .01 | .05 |
| 11. BE (T8) | -.09 | .25** | -.03 | .23** | .09 | .08 | .03 | .03 | -.08 | .08 | 1 | .01 |
| 12. BE (T9) | -.05 | .06 | -.13 | -.09 | -.01 | .31** | -.07 | .02 | -.01 | .06 | .03 | 1 |

Note: Correlations for not retained are above the diagonal; correlations for retained are below the diagonal

None of the parameter estimates for the cross-lag pathways from behavioral engagement to school belonging one year later were significant. Fit indices suggested that the base model fit was poor, $\chi^2(505) = 33.92$, $p > .05$; TLI = 1.00; CFI = 1.00; RMSEA = .00 (90% confidence interval [0.00, 0.02], SRMR = .03).

**Directionality of the School Belonging and Behavioral Engagement Link**

Examination of the cross-lag associations between school belonging and behavioral engagement 1 year later suggested that school belonging predicts subsequent behavioral engagement (see Figure 15). School belonging in grade T was significantly associated with behavioral engagement in grade T + 1 across five out of the six years (T4-5: $\beta = 0.34$, $p < .01$; T5-6: $\beta = 0.25$, $p < .05$; T6-7: $\beta = 0.32$, $p < .01$; and T7-8: $\beta = 0.43$, $p < .01$).

*Table 18. Nested Model Comparisons Testing for Sex and Retention Status Differences in Autoregressive Cross-Lagged Panel Model*

| Model | $\chi^2(df)$ | $\chi^2_{diff}$ | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|
| Sex | | | | | |
| Model 1: Unconstrained | 255.76(80) | | .89 | .09 | .09 |
| Model 2: Constrained | 286.76(100) | 31.00 | .89 | .09 | .12 |
| | | $df = 20$, $p = .06$ | | | |
| Retention Status | | | | | |
| Model 3: Unconstrained | 258.29(80) | | .89 | .10 | .10 |
| Model 4: Constrained | 279.74(100) | 21.45 | .89 | .09 | .11 |
| | | $df = 20$, $p = .37$ | | | |

*Figure 15. Autoregressive cross-lagged structural equation modeling results*

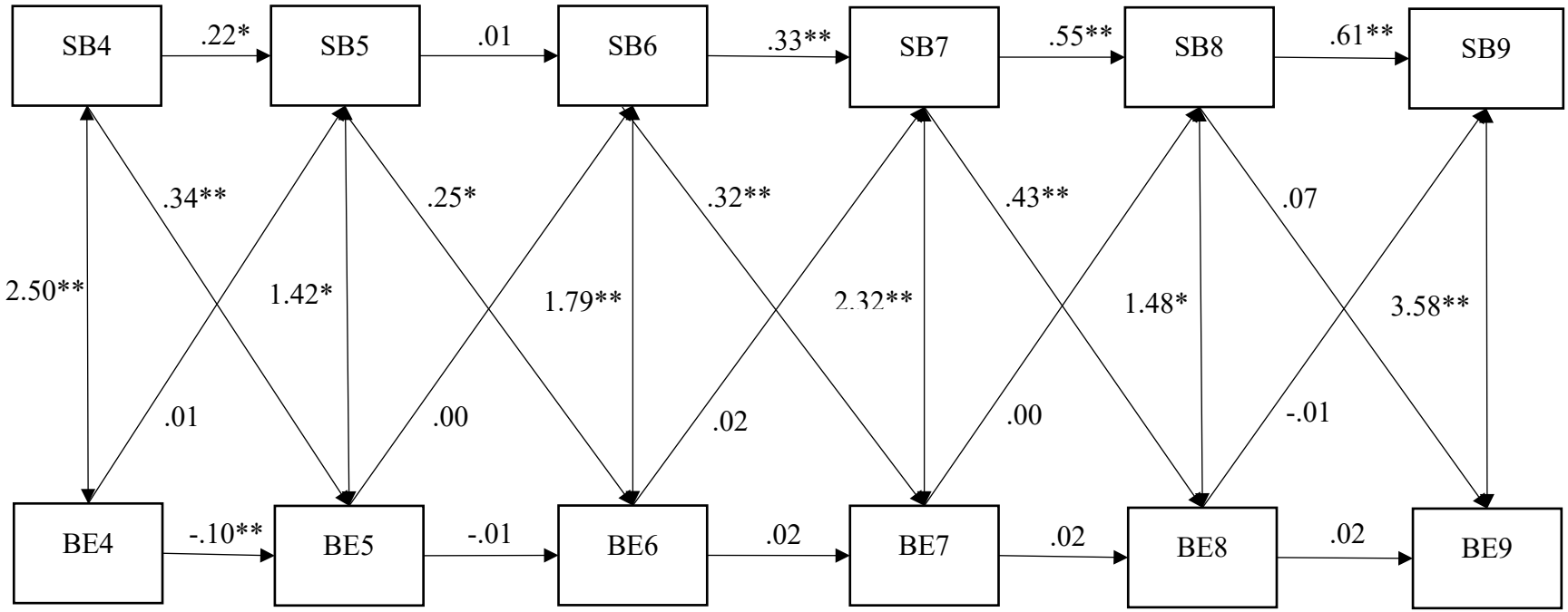


*Table 19. Model Fit Indices for Base Model and Moderation Models*

| Model | $\chi^2$(*df*) | $\chi^2$diff(*df*) | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|
| Base Model | 361.85 (65) | | 1.00 | .00 | .03 |
| Base Model Grouped by Sex | 255.76 (80) | | .89 | .09 | .09 |
| Sex Moderation T4 to T5 | 255.86 (81) | 0.1 (1) | .89 | .09 | .09 |
| Sex Moderation T5 to T6 | 256.17 (81) | 0.41 (1) | .89 | .09 | .09 |
| Sex Moderation T6 to T7 | 257.74 (81) | 1.98 (1) | .89 | .09 | .10 |
| Sex Moderation T7 to T8 | 256.41 (81) | 0.65 (1) | .89 | .09 | .09 |
| Sex Moderation T8 to T9 | 256.48 (81) | 0.72 (1) | .89 | .09 | .10 |
| Base Model Grouped by Retention Status | 258.29 (80) | | .89 | .10 | .10 |
| Retention Moderation T4 to T5 | 258.38 (81) | 0.09 (1) | .89 | .10 | .10 |
| Retention Moderation T5 to T6 | 258.29 (81) | 0 (1) | .89 | .10 | .10 |
| Retention Moderation T6 to T7 | 258.35 (81) | 0.06 (1) | .89 | .10 | .10 |
| Retention Moderation T7 to T8 | 258.50 (81) | 0.21 (0) | .89 | .10 | .10 |
| Retention Moderation T8 to T9 | 258.68 (81) | 0.39 (1) | .89 | .10 | .10 |

5B. Multiple-group analyses were used to test whether sex moderated the associations between school belonging and behavioral engagement 1 year later. For these analyses, models with the path from school belonging to behavioral engagement 1 year later constrained to be equal for males and females were compared to a freely estimated model (see Table 18). Each path from school belonging to behavioral engagement was constrained in a separate model (see Table 19). None of the constrained models were found to be significantly different from the freely estimated model, indicating no moderation by sex.

5C. Multiple-group analyses were used to test whether retention status moderated the associations between school belonging and behavioral engagement one year later. For these analyses, models with the path from school belonging to behavioral engagement a year later

constrained to be equal for retained and not retained students were compared to a model in which the path was freely estimated (see Table 18). Each path from school belonging to behavioral engagement was constrained in a separate model (see Table 19). None of the constrained models were found to be significantly different from the freely estimated model, indicating no moderation by retention status.

# CHAPTER V

# DISCUSSION

This study aimed to better understand the relationship between school belonging and behavioral engagement in an academically at-risk population over the span of six years. Specifically, the study examined these variables longitudinally over six assessment waves and causally through latent growth curve modeling and autoregressive cross-lagged modeling.

It was expected that school belonging and engagement would decrease across the waves and that sex as well as retention status differences would be found. Further, the greatest decreases were expected to occur at the critical transition periods from elementary school to middle school and middle school to high school. Finally, it was expected that causal relationships between school belonging and behavioral engagement one year later as well as behavioral engagement and school belonging one year later would be found.

This study expanded upon previous research in the following ways:

1. By using a sample with data at six waves, the longitudinal analyses provided more insight into school belonging and behavioral engagement across late elementary school to the beginning of high school.
2. By examining sex and retention status differences in school belonging and behavioral engagement in the longitudinal study.
3. By using longitudinal panel data for the sample, the mediational and moderational relationships between school belonging and behavioral engagement were modeled with the purpose of understanding temporal processes and mechanisms of influence.

Consistent with hypothesis 1 and hypothesis 3, both school belonging and behavioral engagement decreased over the six waves for all students. This was expected, given previous

research on these variables that have found these same trends over time (Benner et al., 2017; Marks, 2000; Martin et al., 2009). Surprisingly, although there were sex differences with regard to both variables, these were not significant. This was not expected, as this contradicts findings that suggested females had higher levels of belonging and engagement (Gillen-O'Neel & Fuligni, 2013; Hughes, Im, & Allee, 2015). Further inconsistent with hypotheses, students who had been retained reported higher school belonging than students who had not been retained, and this was significant; however, retained students evidenced greater decreases over time. Higher initial belonging was not expected but greater decreases for retained students was expected based on literature indicating that students who are retained tend to report less belonging (Jimerson, 2001a; Mahoney & Stattin, 2000). At the same time, there were no retention status differences in behavioral engagement. This was not expected, as research has shown that students who have been retained have lower levels of engagement compared to non-retained students (Alexander, Entwisle, & Dauber, 2003; Pagani, Tremblay, Vitaro, et al., 2001).

Somewhat inconsistent with hypothesis 2, the greatest decreases in belonging for all students were from 7$^{th}$ to 9$^{th}$ grades. Females had higher levels of belonging at the transition to middle school, but males had higher belonging at the transition to high school. These findings both support and contradict previous research. The literature has established that the transition from elementary school to middle school is one critical period where school belonging decreases the most (Marks, 2000). Findings from this study indicate that the critical period occurs later than expected after students have made the adjustment to middle school. It might be the case that as students make the transition to middle school, they may be more excited about the change and thus, more connected which then decreases as they settle into their middle school routine and the novelty wears off. Further, the study supports the transition from middle school to high school as

the second critical period which was expected, as it is consistent with existing research (Benner, Boyle, & Bakhtiari, 2017). It was expected that females would consistently have higher levels of belonging than males due to prior research (Hughes, Im, & Allee, 2015), so findings from the current study suggesting that males have higher levels of belonging at the transition to high school was not expected.

Somewhat inconsistent with hypothesis 4, the greatest decreases in engagement were from 6th to 7th grade and 8th to 9th grade. The current study's engagement results suggest that only after transitioning to middle school do students' engagement levels decrease. This was not expected based on studies reporting that the transition happens at the transition to middle school and high school (Benner et al., 2017, Marks, 2000). Engagement was higher for females at the transitions to both middle school and high school which was expected, given research supporting this hypothesis.

Consistent with hypothesis 5, the cross-lagged model revealed that school belonging was significantly and positively associated with behavioral engagement one year later across almost all waves of measurement. This was expected, as precious literature has provided much support for the relationship between belonging and engagement (Wang & Eccles, 2012a). In contrast to expectations based on existing research indicating that there is a bidirectional relationship with between school belonging and behavioral engagement (Tian, Zhang, Huebner, et al., 2016) behavioral engagement was not significantly associated with school belonging one year later across all waves of measurement which was a surprising finding. It was expected that just as belonging predicted engagement, so too would engagement predict belonging. All synchronous paths between belonging and engagement were significant, which was consistent with hypotheses and previous research (Wang & Eccles, 2012a; Vaquera, 2009), as it was expected

that belonging and engagement would be predictive of one another at any given time. Autoregressive paths were almost all significant for belonging and almost all not significant for engagement. This was consistent with hypotheses in that it was expected belonging would predict subsequent belonging; however, engagement not predicting subsequent engagement was an unexpected finding. It was hypothesized that engagement would be as stable as belonging over time. Instead, it seems to be a more malleable variable. No significant differences between sex or retention status were found when the autoregressive cross-lagged model was applied, and this was inconsistent with hypotheses. Given the rest of the findings, however, this was not surprising.

Some findings were consistent with existing literature while others were not. These inconsistencies may be due to the large number of waves included in the longitudinal study. Often, other studies included two to four waves of data; however, the current study examined data across six waves. With this large number of waves, students in this study may be older than those in studies with less waves, so age could be a possible moderator. Lastly, the study's population characteristics may differ from other research samples which may explain slight variations in findings.

**Implications**

Over the middle school and high school years, students' belonging and engagement decrease, resulting in greater likelihood of school non-completion and many negative outcomes if a student attrits (Lansford, Dodge, Pettit, et al., 2016). Considering the high rates of dropout among students who are academically at-risk, the results of the present study underscore the need for intervention to be focused on academically at-risk students. Often, academically at-risk students experience a multitude of factors that impact their success; however, being academically

at-risk does not definitely determine whether or not a student will complete primary and secondary education or impede students from experiencing meaningful relationships with peers and teachers.

Chronic academic difficulties or at-risk scores can indicate to teachers and parents the need for further supports through the school such as tutoring, a 504 plan, or an IEP if warranted (Demirdağ, 2014). This can help improve the student's academic performance and prevent decreases in engagement due to academic underperformance before it becomes problematic. Patterns of underperformance should be identified as soon as possible, requiring performance to be tracked and reflection of progress so that identification of students is made in a timely manner.

Additionally, with this study's findings suggesting that decreases in belonging and engagement for academically at-risk students begin in the middle of middle school, interventions targeting belonging and engagement should be implemented no later than the end of 6$^{th}$ grade or at the beginning of 7$^{th}$ grade to mitigate the natural decreases in belonging and engagement that are expected to occur, thus taking a proactive approach to intervention rather than a reactive approach. Special attention should be given to students who have been retained, as they tend to experience less belonging than students who have not been retained. Interventions targeting belonging may be a practical approach for these individuals, as they may benefit from connecting with their new teachers and classmates.

**Strengths and Limitations**

While this study provided more insight into the relationship between school belonging and behavioral engagement, it is important to recognize its shortcomings. The generalizability of the study's findings is questionable. First, the study included participants who were academically

at-risk, meaning that they scored below the median score on a state approved district-administered measure of literacy at the end of kindergarten or at the beginning of first grade. The question still remains to what extent these findings are generalizable to students who are academically on track or even advanced when beginning first grade. It may be the case that students who are academically satisfactory or ahead experience less threat to their belonging and engagement, although some of them do not complete high school.

Most participants were recruited from two small city districts and some from an urban school, and although they were overall representative of the population of students in Texas schools demographically, the results of this study are not generalizable to the entire student population in Texas due to the small scale of the study. They also are not generalizable to all children or even to all academically at-risk children across the country, as many cities and states are more diverse than Texas.

When examining differences in sex and retention status, this resulted in each group having a smaller number of participants than simply analyzing all participants as one entire group. Further, attrition in the longitudinal study as well as incomplete data resulted in the sample size decreases. This may have led to certain findings being insignificant whereas they may be significant with a greater number of study participants.

**Future Research**

Due to the small sample sizes and lack of generalizability, future studies should seek to have a larger scale and attempt to replicate the study in different geographic locations other than Texas. Additionally, studies should examine differences across academic performance levels (at-risk, satisfactory, and advanced) to uncover differences in belonging and engagement and further tailor school-implemented interventions. Lastly, studies should continue to gather data from

multiple informants (self, parent, and teacher) to prevent biased results. Sampling should also include representation from often under-represented groups and consider potential changes in the school demographics as students move from more neighborhood schools to combining neighborhoods in middle school and then often combining middle schools for high school assignments. The level of diversity across the school student population could be an additional factor in school belonging and school engagement over time.

It may be of interest to explore how teachers' perceptions of students' school belonging and behavioral engagement compare to students' report and parent perceptions of belonging and engagement. As an alternative or additional consideration, student, parent, and teacher perceptions of school climate may warrant consideration. Lastly, as the current study found differences in belonging between students who had been retained and those who had not been, future research should continue to uncover factors that impact school belonging for students who have been retained and interventions to improve students' connectedness.

**Conclusion**

This study explored the longitudinal trajectories of school belonging and behavioral engagement and was the first to explore the causal relationship that theoretically exists between the two variables. Future research will need to further test and replicate initial findings with a larger and more diverse (racially/ethnically, with and without disabilities, varying community sizes, socioeconomic range, and geographically) population. It should also further explore factors impacting belonging for students who have been retained and compare perceptions of school belonging and engagement between multiple raters (student, teacher, and parent). The findings in the current study provide important contributions to the field of education and offer timely

implications for practice and intervention research relevant to belonging and engagement as well as school completion initiatives.

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