TEACHER SUPPORT AS A MODERATOR BETWEEN STUDENT SIXTH-GRADE TRANSITION EXPERIENCES AND END-OF-YEAR ADJUSTMENT

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ABSTRACT

Nelson Carl Brunsting: Teacher Support as a Moderator between Student Sixth-Grade Transition Experiences and End-of-Year Adjustment
(Under Direction of Jill Hamm)

Working from a conceptual framework based on an integration of self-determination theory (Deci & Ryan, 1985) and life course theory (Elder & Shanahan, 2006), the current study was conducted to examine the relationships between perceived sixth-grade transition experience, perceived teacher support, and student externalizing and internalizing behavior problems. Data were collected from participants at six schools from the fall and the spring of sixth grade (N = 515; 52.62% female, 46.02% minority, and 45.63% free-/reduced-lunch status). Structural models revealed an interaction effect of perceived teacher support and perceived sixth-grade transition experience on students' defiance in spring, controlling for student gender, minority status, free-/reduced-lunch status, and fall scores on defiance. However, post hoc analyses of the interaction effect were inconclusive, as a three-factor mixed design ANOVA did not replicate the interaction effect. Teacher support predicted a decrease in student spring defiance, accounting for student gender, minority status, free-reduced-lunch status, fall transition experience, and fall scores on defiance. No significant associations were documented between the independent variables and the internalizing behavior outcome, social anxiety. The findings provide both initial evidence that teacher support influences student defiance and initial but inconclusive evidence of an interaction effect of perceived transition experience and perceived teacher support on sixth grade student defiance.

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LIST OF ABBREVIATIONS AND SYMBOLS

ANOVA	Analysis of Variance
CFA	Confirmatory Factor Analysis
CASSS	Child and Adolescent Social Support Scale
CFI	Comparative Fit Index
CI[,]	Confidence Interval
F	*F* statistic
FIML	Full Information Maximum Likelihood
GPA	Grade point average
HSD	Honestly Significant Difference
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
M	Mean
MAR	Missing at Random
MCAR	Missing Completely at Random
MNAR	Missing Not at Random
N/n	Sample size
p	Probability
r	Pearson product correlation
RMSEA	Root Mean Square Error of Approximation
SAT-MS	Survey of Adaptational Tasks of Middle School
SAT-MS-R	Survey of Adaptational Tasks of Middle School—Revised
SCARED	Screen for Child Anxiety Related Emotional Disorders, Child Version

SD	Standard deviation
SE	Standard error
SEALS	Supporting Early Adolescents' Learning and Social Success
SEsk	Standard error skewness
SEku	Standard error kurtosis
SEM	Structural Equation Modeling
SES	Socioeconomic status
SGTE	Sixth Grade Transition Experience
t	*t* statistic (Student's *t* test)
TLI	Tucker-Lewis Index
TSR	Teacher-Student Relationship
VIF	Variance Inflation Factor
WLSMV	Weighted Least Squares Means and Variances Adjusted
WRMR	Weighted Root Mean Residual
α	Cronbach's alpha
β	Beta
γ	Gamma
χ^2	Chi-squared

CHAPTER 1: INTRODUCTION

As students enter and progress through the first year of middle school, they encounter new academic, procedural, and social demands such as higher academic expectations, frequent class changes, and new peer group interaction (Wigfield, Byrnes, & Eccles, 2006). Unfortunately, these changes coincide with student social, emotional, and behavioral maladjustment, including greater internalizing and externalizing behavior problems (Rudasill, Pössel, Black, & Niehaus, 2014; Witherspoon & Ennett, 2011). Internalizing behavior problems occur when an individual directs pressure or frustration inward resulting in symptoms such as depression, anxiety, and avoidance of social contact; whereas individuals with externalizing behavior problems project pressure or frustration outward by inappropriately seeking attention, being excessively defiant, or by using verbal or physical aggression (Lane et al., 2015; Walker, Ramsey, & Gresham, 2004). It is important for researchers and practitioners to understand factors in the schooling environment that influence student internalizing and externalizing behavioral issues in sixth grade, because antisocial behaviors often become more engrained and difficult to ameliorate as students progress through adolescence, often leading to incarceration (Dishion & Dodge, 2005; Moffitt, 1993). Moreover, long-term financial, health, and interpersonal outcomes for adolescents experiencing internalizing behavior issues (e.g., social anxiety, panic, etc.) have been documented to be worse than those for adolescents who do not exhibit internalizing problems (Copeland, Angold, Shanahan, & Costello, 2014).

One approach to delineating the factors that lead to these negative outcomes during the first year of middle school is to directly assess students' perception of the transition experience.

During this transition, students undergo a host of new challenges, including higher expectations for academic performance; integration into new and evolving peer social networks in multiple new contexts (e.g., bus, lunchroom, classroom, lockers, hallways, etc.), frequent class changes, and multiple teachers with whom to form relationships (Eccles & Roeser, 2010; Schunk, Pintrich, & Meece, 2008). Recent studies have documented that the degree to which students perceive they are meeting the new situational demands early in the first year of middle school has an effect on their end-of-year schooling adjustment, including behavioral problems (Day, Hamm, Lambert, & Farmer, 2014; Malley, Hamm, Harris, & Farmer, under review). As this line of research grows, it is important to understand how students' perception of the transition experience interacts with their perception of other aspects of the schooling environment—specifically teacher support—to influence their social-emotional and behavioral development.

During their transitions into new schooling environments, students have membership in multiple groups. Ongoing relationships containing two or more individuals, termed *social convoys*, represent critical contexts in which individuals experience interrelated growth and development (Moen & Hernandez, 2009). Typically students are embedded in various social convoys including family, peer groups, friends, and teachers (Benner, 2011; Entwisle, Alexander, & Olson, 2003). As students' teachers have specific knowledge of the demands and expectations of middle school in addition to experience teaching students to meet these new challenges, they represent a focal social convoy for supporting student adjustment during academic transitions (Benner, 2011). Findings from a number of studies document a positive relationship between student perception of teacher support early in middle school and their subsequent emotional and behavioral adjustment (Demaray, Malecki, Rueger, Brown, & Summers, 2009; Reddy, Rhodes, & Mulhall, 2003; Rudasill, Pössel, et al., 2014). An important

next question to assess is the extent to which teacher support can amplify or attenuate the relationship between students' perception of their transition experience during the first year of middle school and their subsequent end-of-year social, emotional, and behavioral adjustment.

The current study extends the literature by investigating whether or not students' perception of teacher support by their team of teachers moderates the relationship between students' experience of the transition at the beginning of sixth grade and their end-of-year internalizing and externalizing problems. We know from prior research that students who feel they are having difficulty responding to the new academic, social, and procedural demands of middle school exhibit greater externalizing behavioral problems (Malley et al., under review); we know that students who perceive their teachers as supportive experience fewer internalizing and externalizing issues (Tennant et al., 2014; Wang & Dishion, 2012); but we do not know whether or not students who experience difficulty with new situational demands will also experience differentiated social-emotional and behavioral adjustment based on the degree of teacher support they perceive. This study was designed to test the hypothesis that the level of teacher support students perceive during the first year of middle school will moderate the relationship between their perceived transition experience and their internalizing and externalizing behavioral outcomes in spring of sixth grade. If perceived teacher support influences the relationship between perceived transition experience and behavioral adjustment outcomes, teacher support would provide another point of entry for interventions targeting student internalizing or externalizing behavioral issues during the sixth-grade transition.

Depending on the school configuration, the middle school transition year can occur during the fifth, sixth, seventh, or eighth grade years, with the sixth-grade year being the most common year for the middle school transition in the United States (Juvonen, Le, Kaganoff,

Augustine, & Constant, 2004). The sample of students in this study transitioned to middle school in sixth grade; thus, the sixth-grade year will be the focal timeframe, and supporting evidence will be drawn from research on students in the middle school transition year as defined within the context of each study.

Adjustment in the Middle School Transition Year

The potential for students' perception of teacher support to reduce student social-emotional and behavioral problems is encouraging, especially for students in the first year of the middle school transition, as the new situational demands students experience during the middle school transition increase the risk of developing antisocial habits and problematic behaviors (Eccles et al., 1993; Eccles & Roeser, 2009). Indeed, students' navigation of challenges during the middle school transition year can be a turning point in their development, as students' adjustment outcomes often begin a long-term decline in sixth grade which continues in subsequent grades (McGill, Hughes, Alicea, & Way, 2012; Roeser & Peck, 2003). These declines during the middle school transition year occur across a range of developmental areas (Anderman & Mueller, 2010), and include behavioral (Eccles & Roeser, 2009; Way, Reddy, & Rhodes, 2007; Witherspoon & Ennett, 2011) and social-emotional adjustment (Lanson & Marcotte, 2012; Pössel et al., 2013). These downward trends are especially concerning, as student antisocial attitudes and behaviors not attenuated in early adolescence can persist through the life span (Moffitt, 1993).

The struggles experienced by students during the first year(s) of middle school occur in part because students need to adapt to new contextual demands, which include switching classes more frequently, integrating into a new peer group or social dynamic, and encountering higher educational and behavioral expectations from teachers (Juvonen et al., 2004; Wigfield et al.,

2006). Due to the effect that successful or unsuccessful navigation of the contextual demands students face in sixth grade has on their developmental outcomes, researchers have investigated linkages between students' perception of their sixth-grade transition experience and their subsequent behavioral and schooling adjustment (Day et al., 2014; Malley et al., under review). Malley et al. (under review) documented that the contextual demands of the first year of middle school encompassed academic, procedural, and social challenges. The current study investigates the same construct as did Malley et al.: students' perception of their sixth-grade transition experience; however, it will be referred to as students' *transition experience* for brevity.

Teacher Support and the Teacher-Student Relationship

Within the schooling ecology, the teacher-student relationship (TSR) has been identified as an integral and critical context for student development (Bronfenbrenner & Morris, 2006; Eccles & Roeser, 2010). Using self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) as a lens, I define the TSR as the interactive context between a student and one or more teachers that promotes optimal adjustment when the student perceives teacher support for his or her needs, specifically the psychological needs of autonomy, relatedness, and competence. As the TSR is frequently conceptualized and measured by student perception of teacher support (e.g., Reddy et al., 2003; Wang, Brinkworth, & Eccles, 2013), the focal variable in this study is student perception of teacher support within the context of the TSR, or *teacher support*. Self-determination theorists typically focus on students' perception of support, as students' perception of autonomy, competence, and relatedness undergirds their feeling of self-determination and subsequent adjustment (Ryan & Deci, 2000; Ryan & Grolnick, 1986).

Teacher support is especially important for students struggling with school adjustment, and it has been associated with a wide range of student outcomes including academic, social,

behavioral, and emotional adjustment (Tennant et al., 2014). Recent studies have focused on the influence of students' perception of teacher support on students' social-emotional and behavioral adjustment due multiple factors: the relationship between emotional-behavioral problems and students' long-term academic, social, and life outcomes (Sanford et al., 2011); the importance of emotional well-being for human development (Biglan, Flay, Embry, & Sandler, 2012); and the negative effect student behavioral problems can have on the teacher and peers (Dishion & Dodge, 2005; Martin, Sass, & Schmitt, 2012). Findings are positive, as students' perception of teacher support is associated with lower rates of anxiety and depression (Galand & Hospel, 2013; Raufelder, Hoferichter, Schneeweiss, & Wood, 2015; Rueger, Chen, Jenkins, & Choe, 2014), fewer behavior problems, (Wang, Selman, Dishion, & Stormshak, 2010), less aggression and hyperactivity (Demaray & Elliott, 2001), and fewer disciplinary issues (Crosnoe, Johnson, & Elder, 2004). In other words, teacher support appears to lessen the frequency and severity of student internalizing problems and externalizing problems during early adolescence (Davidson & Demaray, 2007; Reinke & Herman, 2002). Unlike many of the previous studies, this study conceptualizes teacher support from students' social convoy, which includes all the teachers that students interact with inside and outside of the classroom, rather than from one teacher in a classroom context. This conceptualization is reflected in the measurement of perceived teacher support, as the questions focus on students' perceptions of *their teachers* or *the teachers at this school*. This approach to perceived teacher support aligns with both the broader focus of the study (e.g., student experience in a new schooling context) and the measurement of the students' sixth-grade transition experience which also assesses students' experiences inside and outside of the classroom.

The current study was designed to extend the literature by examining the extent to which students' perception of teacher support (a) increases the strength of the expected relationship between a positive transition experience and decreased student social-emotional and behavioral issues and (b) attenuates the linkage between negative transition experience and increases in student social-emotional and behavioral problems. While investigating these relationships, it is important to control for student individual differences (e.g., gender, race/ethnicity, free-and-reduced lunch status) as there are instances in the literature of differences in perception of teacher support based on gender (i.e., girls typically report higher teacher support than boys; Niehaus, Rudasill, & Rakes, 2012; Rueger, Malecki, & Demaray, 2010) and differences of strength of relationship between teacher support and adjustment outcomes based on socio-economic status (i.e., students of lower SES report higher teacher support; Way et al., 2007) and minority status (i.e., minority students report higher teacher support; Dornbusch, Erickson, Laird, & Wong, 2001). The current study includes gender, minority status, and free-and-reduced lunch status as control variables. The focus of the study is understanding the influence of students' perceptions of processes in the schooling ecology which the school faculty and administration have the ability and responsibility to curate. Investigating the differential impact of demographic characteristics on student schooling outcomes is critical research; however, these are variables that the schooling ecology is not designed to alter. The current study is designed to further delineate linkages among schooling processes that can serve as potential targets for intervention and preservice preparation.

The Current Study

The goal of the current study was to test for relationships between students' perception of transition experience, students' perception of teacher support, and student internalizing and

externalizing behavior to determine whether perception of teacher support moderates relationships between students' perception of the transition experience at the beginning of the year and their subsequent adjustment outcomes at the end of the year. The specific research hypotheses are:

1. Controlling for individual demographic differences and social anxiety symptoms and defiance at the beginning of the school year, students who perceive themselves as having a positive transition experience at the beginning of the sixth grade will report lower levels of social anxiety symptoms and defiance at the end of the school year.
2. Controlling for individual demographic differences and social anxiety symptoms and defiance at the beginning of the school year, students who perceive greater teacher support at the end of sixth grade will report lower levels of social anxiety symptoms and defiance at the end of the school year.
3. Controlling for individual demographic differences and social anxiety symptoms and defiance at the beginning of the school year, end-of-year teacher support will moderate the relationships between transition experience at the beginning of the year and the end-of-year outcomes social anxiety and defiance, such that students who rate their transition experience as positive early in the school year will report lower levels of social anxiety symptoms and defiance when they perceive higher levels of teacher support as compared when they perceive lower levels of teacher support. Similarly, students who rate their transition experience more negatively will report higher levels of social anxiety symptoms and defiance when they also perceive lower levels of teacher support as compared to higher levels of teacher support.

CHAPTER 2: THEORETICAL FRAMEWORK

The current study was guided by a combination of life course theory and self-determination theory, as proponents of both theorize that the interaction between individuals and the contexts and environments they encounter is the driving force behind change in human behavior. Below, an integration of the two frameworks provides a rationale for students' perception of their meeting situational imperatives in the transition experience influencing sixth-grade emotional and behavioral adjustment; students' perception of teacher support predicting sixth-grade internalizing and externalizing problems; and students' perception of teacher support moderating the relationship between students' perception of the transition experience and their sixth-grade school adjustment.

Transition Experience and Sixth-grade Adjustment

As students enter the middle school transition year they encounter new contextual demands such as higher expectations for academic performance, integration into new and evolving peer social networks, frequent class changes, and multiple teachers with whom to form relationships (Eccles & Roeser, 2010; Schunk, Pintrich, & Meece, 2008). Contextual demands are viewed in life course theory as *situational imperatives*, or the behavioral demands inherent in a context which individuals need to navigate in order to adjust successfully and thrive in that new context (Elder & Shanahan, 2006). Individuals who are able to meet the situational imperatives in their environments typically experience better outcomes in those environments (Elder, 1974). According to the life course principle of *human agency*, adaptability when facing situational imperatives depends in part on individuals' perceptions and expectations of their context (Elder,

1998). Thus, we expect students who perceive that they transition well to the realities of sixth grade will experience better adjustment outcomes at the end of the year. However, students do not learn to meet the many new situational imperatives of sixth grade alone: the life course theory principle of *linked lives* states that individuals' development is influenced by the relationships and interactions with the people around them (Elder, 1998, 2000). It is with these principles and mechanisms (human agency, linked lives, and situational imperatives) that self-determination theory not only aligns with life course theory but also extends it by providing an explanation of the types of support individuals need from their linked lives in order to become fully agentic and self-determined in meeting their situational demands.

The assumption at the core of self-determination theory is that all humans have three innate, inborn needs: competence, autonomy, and relatedness (Deci & Ryan, 1985; Ryan & Deci, 2000). From this assumption, self-determination theory posits that the degree to which the environment meets individuals' needs is the primary factor in individuals' development. When individuals perceive that their needs for competence, autonomy, and relatedness are met, they become self-determined in their motivation and behaviors and have optimal development, functioning, and social-emotional outcomes. Conversely, students whose needs for competence, autonomy, and relatedness are thwarted become less able to direct the course of their experiences, are more externally controlled, and experience diminished motivation and social-emotional outcomes (Deci, Vallerand, Pelletier, & Ryan, 1991). In linking with life course theory, students who have their three innate needs met through interaction with others (linked lives) are able to become more agentic and self-determined in meeting current and future situational demands, leading to better adjustment outcomes.

Social-emotional and behavioral adjustment. From the perspective of both theoretical approaches in this study, students' social-emotional and behavioral adjustment during the transition year of middle school is of primary importance. The situational imperatives students face during their first year of middle school can be unfamiliar and daunting, and the pressure or stress inherent in these interpersonal situations are considered to be precursors to a range of internalizing and externalizing issues (Herres & Kobak, 2015). Further, as the school year moves on, students who do not perceive they are adapting well may feel increased pressure, frustration, or alienation, all of which are theorized to increase students' risk of developing internalizing and externalizing behavior problems (Walker et al., 2004). It is important to consider both internalizing and externalizing aspects when investigating students' adjustment, as some students' emotional-behavioral problems can be inwardly directed (i.e., internalizing), outwardly directed (i.e., externalizing), or both (i.e., internalizing-externalizing; Lane et al., 2015). The current study includes one externalizing outcome, defiance, and one internalizing outcome, social anxiety symptoms. Both adjustment outcomes were selected to align with specific situational imperatives students face in the middle school transition.

Defiance is similar to disruptive behavior, which has been defined as "student engagement in behaviors that disrupt or disturb the classroom" (Midgley et al., 2000, p. 26). While defiant behaviors can disrupt or disturb the classroom, defiance in this study refers to student engagement in behaviors that demonstrate non-cooperation with the teacher or the expectations, rules, or norms that the teacher is enforcing. Some defiance is to be expected from students, especially as they enter new environments where they do not yet feel comfortable or trust the teachers (Gregory & Ripski, 2008). If students have a tendency to externalize their frustration when they feel they are not having a positive transition experience, we would expect

them to exhibit defiant and disruptive behaviors. As the current study focuses on the influence of teacher support, the degree to which students exhibit defiant behaviors toward their teachers provides a more useful indicator than their generalized disruptive behavior to investigate how well students are being supported by their teachers during the sixth-grade transition.

The study also included social anxiety symptoms as an internalizing outcome measure in order to capture students' social-emotional adjustment. Generalized anxiety is an important outcome and is commonly assessed in the middle school literature as the median onset age of anxiety is eleven (Kessler et al., 2005); however, social anxiety is better aligned with specific challenges students face in the sixth-grade transition, including making new friends, entering new social and physical surroundings, and building relationships with multiple teachers. In addition, students in middle school experience increased pressure for performance relative to their classmates as well as increased comparisons to their peers (Anderman & Anderman, 1999; Eccles & Midgley, 1989). In accordance with the life course theory principle of linked lives and the innate needs posited in self-determination theory, as students receive autonomy, competence and relatedness support from their teachers, they will experience fewer social anxiety symptoms during the sixth-grade transition.

Approaches to the Teacher-Student Relationship and Teacher Support

Due to the importance of teacher support for student schooling adjustment for students of all ages and for those undergoing the middle school transition year, researchers have approached the TSR from multiple perspectives. Some, drawing from attachment theory, view the TSR as closeness and conflict between student and teacher (Pianta & Stuhlman, 2004; Silver, Measelle, Armstrong, & Essex, 2005). Researchers approaching the TSR through attachment theory typically study the TSR in elementary school, though research on the TSR from this perspective

has been conducted for middle school students (Murray & Zvoch, 2011) and high school students (Al-Yagon, 2012; Demanet & Van Houtte, 2012). A second perspective to the TSR takes a more structural and process-oriented approach to the ongoing social interactions between teacher and student. Building on social-cognitive learning theory, researchers have viewed the TSR as a context wherein students both receive information through modeling and interaction as to which behaviors are accepted and receive information relating to their inherent worth based on the way others interact with them (Chang et al., 2004; Wentzel, 2010; Wentzel, Battle, Russell, & Looney, 2010). A third approach, and the one taken in the current study, is to approach the TSR as a context in which teacher support influences student adjustment through developing self-determined behaviors and attitudes (Deci et al., 1991; Ryan & Shim, 2012).

Self-determination theory provides a useful lens for investigating the TSR during the middle school transition year because it enhances life course theory by delineating the types of support (e.g., autonomy support, emotional support, and competence support) necessary for individual adjustment and well-being. Researchers using a self-determination framework for the TSR have found that teacher support influences school engagement, behavior problems, and depressive symptoms of middle schoolers (Klem & Connell, 2004; Ryan & Shim, 2012; Way et al., 2007) as well as grade-point average for sixth graders (Niehaus et al., 2012). With regards to research on the TSR, emotional support is frequently assessed and connected with a wide range of outcomes (e.g., Anderman, 2003; Barber & Olson, 2004; Ryan & Patrick, 2001; Wang et al., 2013). However, studies that include competence support and autonomy support within the conceptualization of the TSR are infrequent (e.g., Klem & Connell, 2004). Overreliance on emotional support as a measure for the TSR is concerning. On the one hand, teacher warmth and attentiveness is critical for student engagement; on the other hand, teachers are expected to

enhance students' learning by providing them information and organization (e.g., competence support) and by scaffolding their approach to learning (e.g., autonomy support; Deci et al., 1991). Theoretically sound studies of self-determination support in the TSR should assess for all three types of support, especially when using the TSR to predict student schooling adjustment.

Students' Experience of Support in the TSR as a Potential Moderator

In the life course theory principle of linked lives, individuals' development is influenced by the relationships and interactions with the people around them (Elder, 1998). Students' schooling adjustment is viewed as occurring through interaction with other individuals in *social convoys*. These social convoys are the contexts in which individuals experience day-to-day events and inter-related development and growth (Moen & Fernandez, 2009). By integrating the life course conceptualization of social convoys with self-determination theory, one can hypothesize that students who experience support within their convoys will develop the skillsets to successfully adapt to the situational imperatives of the sixth-grade transition. This section contains two primary theoretical arguments: (a) students' teachers represent a critical social convoy "ferrying" them through the first year of middle school, and (b) students' experience of autonomy support, competence support, and relatedness within their teacher social convoy will lead students to internalize the behaviors necessary to meet their situational demands and experience positive schooling adjustment. These arguments support the hypothesis that students' perception of teacher support moderates the relationship between their perception of their transition experience to sixth grade early in the year and their adjustment outcomes at the end of year. That is, we would expect students who perceive a challenging transition experience to report fewer social-emotional and behavioral issues if they perceive a high level of teacher support than if they perceived a low level of support from their teachers.

Teachers as social convoys. Although any of these social convoys may be disrupted during the sixth grade transition, the social system that is normatively and structurally altered during the timeframe is that of the students' teachers (Juvonen et al., 2004). In elementary school, students traditionally have one classroom teacher and may only have other teachers for extracurricular classes. However, in sixth grade, students typically take a range of classes, often led by different teachers (Juvonen et al., 2004; Wigfield et al., 2006). Although structurally normative, the disruption in students' teacher social convoy has the potential to influence student adjustment, as social convoys serve as buffers during transitions (Almeida & Wong, 2009; Benner, 2011). Teacher social convoys have relevant prior knowledge of the middle school environment whereby they can help a student understand the academic, social, and procedural norms and behavioral expectations of their classrooms and school. Benner (2011) applied the idea of social convoys to the teachers of individual high school students, stating that students' relationships with teachers in their social convoy can have long-term impact on their schooling adjustment and outcomes. Students' peers also form an integral and important social convoy that is frequently disrupted during the middle school transition as well; however, the peer social convoy is beyond the scope of the proposed study.

In this study, I extended the idea of the social convoy of sixth-grade students' teachers to include the group of teachers who interact with the students both inside and outside the classroom throughout their time in school. This focus on perceptions of teacher support from the social convoy of teachers rather than from one classroom teacher is consistent with overall design of the study, including the assessment of perceived transition experience, which occurs both inside and outside of the classroom. Specifically, I view students' sixth-grade teachers as a near-term social convoy ferrying students from the beginning of sixth grade to the summer

before seventh grade. Roeser and Peck (2003) use *near-term* to differentiate duration of relationships: near-term relationships are those that typically have a confined and relatively short time period. As sixth-grade teachers tend to work with sixth-grade students for one year before students move to seventh grade and a different set of teachers (Wigfield et al., 2006), sixth-grade teachers constitute a near-term social convoy. Thus, the TSR may provide a buffering context wherein students who perceive they are not adapting well can be supported with autonomy, competence, and relatedness by their teacher social convoy. Students receiving teacher support may feel more successful in managing or alleviating their social-emotional and behavioral issues despite initial challenges in meeting the situational imperatives of the sixth-grade transition.

The importance of conceptualizing teachers as a social convoy is more transparent when considering student needs for self-determination within the TSR. Sixth-grade students have multiple teachers; they may perceive a supportive TSR with one teacher, but not with others. One teacher might provide competence support in one subject, but not provide support in other areas. In this study students' perception of the overall support from all of their teachers for autonomy, competence, and relatedness is conceptualized as a more encompassing factor for their adjustment than support from one individual teacher.

Thus, an integration of life course theory and self-determination theory provides a rationale for the influence that both students' perception of the transition experience and teacher support of autonomy, competence, and relatedness in the TSR have on student adjustment during the middle school transition year. Through the process of internalization students' perception of support from their teacher social convoy can foster their learning and enacting of new behaviors, attitudes, and values, which in turn lead to adjustment and development.

Internalization through the TSR social convoy. According to self-determination theorists, internalization is the process by which individuals adopt the academic, social, and behavioral values of those who support their intrinsic needs for autonomy, relatedness, and competence (Grolnick, Gurland, Jacob, & DeCourcey, 2002; Ryan & Deci, 2009). Students enter sixth grade with different desires (e.g., good grades, popularity, teacher attention, and perfect attendance) and may struggle to achieve those desires in their new environment. As students receive assistance from their teachers, they typically begin to experience more success in their endeavors; it is at this point where a supportive TSR can influence student behavior through student desire for relatedness with, further competence support from, or greater autonomy from teachers (Reeve, 2009). Through continued interaction and support received in the TSR, students may realize the benefits of certain attitudes and behaviors, or they may enjoy the relatedness in the relationship with the teacher, or both. Students seeking competence or relatedness then begin to test the new attitudes or behaviors unbidden (Hardre & Reeve, 2003). Eventually, as students continue to see positive results, they autonomously integrate the tried and tested behaviors into their identity and sense of self (Ryan & Deci, 2009). Assuming a supportive TSR, the students' values and behaviors necessary to navigate new situational imperatives become more internalized, requiring less teacher support until the point that the student fully internalizes them.

Salience of students' perception. In the current study, teacher support is assessed by student report rather than teacher report or observational data; this choice is due to the salience of the individual's perception in self-determination theory. Human action and behavior are processed through individuals' perception of the world around them (Deci et al., 1991), and research has shown that students in the same classroom differentially perceived the classroom ecology with respect to themselves, and that differences in their perception correlated with

student social-emotional outcomes (Ryan & Grolnick, 1986). In addition to theoretical justification for the use of students' perception of teacher support, evidence for concurrent validity has been documented between the construct and observer ratings of teacher support (Patrick, Turner, Meyer, & Midgley, 2003).

Thus, students' perception of support in the TSR across teachers in students' social convoy should help them meet situational imperatives and experience positive school adjustment. Therefore, I hypothesize that students' relationship with the teachers in their social convoy is an important context and process which magnifies or offsets the relationship between the students' perception of the sixth-grade transition experience and their adjustment outcomes.

Demographic Differences in Sixth-grade Adjustment

To best understand the relationships between students' transition experiences, teacher support, and adjustment outcomes, it is important to consider and account for students' individual demographic differences. Adjustment during the sixth-grade transition may be objectively similar for all students; however, the subjective experience may be quite different for students of different genders, ethnicities, and economic backgrounds. Life course theory provides a mechanism for the differences, as students' level of exposure to stressors and the access to supports and coping mechanisms during transitions influences their chances of navigating situational imperatives successfully (Elder & Shanahan, 2006). Middle school entry can be a critical time for minority students, as early adolescents are both relatively inexperienced at navigating racial cues and becoming more attuned to discrimination (Rivas-Drake, Hughes, & Way, 2009; Brown & Bigler, 2005). Because minority students' transition experiences can include a larger number of new situational imperatives and stressors, it is important to control for these differences when investigating relationships between individual, school context, and

outcomes during sixth grade. Similarly, gender differences can affect students' subjective experience of the sixth-grade transition, as pubertal timing and maturation occur during sixth grade more frequently for girls than for boys (Marceau, Ram, Houts, Grimm, & Susman, 2011). Last, despite equal capacity for educational development, students with lower socioeconomic status (SES) typically enter school behind their higher SES peers and are unable to catch up throughout the year (Entwisle et al., 2003), resulting in a large cumulative disadvantage by the time students enter middle school. Again, the transition experience is subjectively different for students from lower SES families, as they navigate exposure to—among other stressors—the social stigma of visibly receiving free-and-reduced lunch (Bhatia, Jones, & Reicker, 2011; Mirtcheva & Powell, 2009). Although this study included gender, minority status, and free-and-reduced lunch status as control variables, the focus of the study was understanding the influence of certain malleable schooling processes (e.g., transition challenges, teacher support) on student internalizing and externalizing behavioral adjustment. A better understanding of the interaction between these particular schooling processes would allow researchers to better develop new—and hone current—interventions, provide school administrators with actionable recommendations, and improve practitioner training and professional development. It will be necessary for future research to be conducted to determine the effect of individual differences on the relationships examined.

The Current Study

In the current study, sixth-grade students' perception of the collective support from their teachers for their self-determination was conceptualized as an important differentiating factor for their adjustment at the middle school transition. As teachers simultaneously set norms and expectations, enforce rules, and guide students in learning and abiding by the norms and

expectations of their classrooms and of the school, they represent a critical social convoy to help students with the challenges inherent in the transition into middle school. Drawing from a framework utilizing self-determination theory and life course theory, I hypothesized that teacher support will moderate the relationship between transition experience and both social-emotional and behavioral problems during the sixth-grade year.

CHAPTER 3: LITERATURE REVIEW

The middle school transition year can be a time of upheaval. Students experience a host of new challenges, including higher expectations for academic performance, multiple teachers with whom to form new relationships, a new social structure to navigate, and increased behavioral expectations (Eccles & Roeser, 2010; Schunk et al., 2008). These contextual tasks coincide with decreases in a full range of schooling adjustment factors during the middle school transition year (Anderman & Mueller, 2010; Eccles & Roeser, 2009). Relevant to the current study, sixth graders experience increases in internalizing symptoms (Rudasill, Pössel, et al., 2014; Lanson & Marcotte, 2012) and behavioral problems (Theriot & Dupper, 2010; Witherspoon & Ennett, 2011) across the school year. Unfortunately, deterioration in schooling adjustment does not appear to lessen or reverse after sixth grade; rather adjustment continues to trend downward through high school (Barber & Olsen, 2004; McGill et al., 2012).

Although the decreased schooling adjustment outcomes across the middle school transition year are disconcerting, an investigation of the convergence of two traditional approaches—teacher support and students' perception of the middle school transition experience—may provide new opportunities for attenuating or even reversing these trends. The current study aims to provide practitioners and researchers with a better understanding of the relationships between teacher support, students' transition experiences, and student internalizing and externalizing adjustment across the middle school transition year. The literature review is organized into four sections: (a) teacher support and internalizing and externalizing problems, (b) students' transition experience and internalizing and externalizing problems, (c) teacher support

as a potential moderator of the relationship between transition experience and outcomes, and (d) student characteristics and individual differences.

Teacher Support and Internalizing and Externalizing Behavioral Problems

The school and classroom climate are focal areas for research on student adjustment as students spend the majority of their waking hours in schools (Juvonen et al., 2004). Within the middle school and classroom climate, students' interactions with teachers and the support they perceive from their teachers are particularly relevant for their adjustment (Eccles & Roeser, 2009; Wenztel, 2010). Teacher support is most commonly assessed as teacher emotional support, or the degree to which students feel their teachers care about them and make the classroom an environment in which they can express their ideas and opinions freely (Wang, 2009). Students who perceived emotional support from their teachers were more likely to meet their teachers' expectations, resulting in decreased misconduct and problem behaviors (Patrick, Ryan, & Kaplan, 2007). With regard to internalizing problems, students who reported higher levels of teacher emotional support experienced fewer depressive symptoms in sixth grade (Rudasill, Pössel, et al., 2014).

Emotional support is an important factor for emotional-behavioral adjustment; however, there are other ways teachers can provide students support. Within a self-determination framework, students require support for their autonomy, competence, and relatedness in order to experience optimal development. Emotional support is best aligned with relatedness, and studies have documented that teacher emotional support increases students' positive feelings of connectedness to their teacher and school (Rueger et al., 2010; Wang & Holcombe, 2010). Autonomy support and competence support, while equally important as emotional support in the theoretical framework, have received less empirical attention. Demaray and colleagues have

conducted a series of studies to investigate the effect of teacher, peer, close friend, and parent support on student schooling adjustment investigating four different types of support: emotional, informational, instrumental, and appraisal (Demaray & Elliott, 2001; Malecki & Demaray, 2003; Rueger et al., 2010). Informational, instrumental, and appraisal support align with competence support in the self-determination framework, and a composite variable of the four types of support has been negatively associated with school misconduct and depression (Malecki & Demaray, 2003; Rueger et al., 2010). Wang (2009) included both teacher emotional support and promotion of autonomy, finding that both were negatively related to student emotional and behavioral outcomes. Researchers have investigated teacher support of student adjustment during middle school from a self-determination perspective; however, the one study (Klem & Connell, 2004) that included all three types of teacher support did not investigate internalizing or externalizing behavior outcomes. The current study is designed to address this gap in the literature.

In terms of outcomes, teacher support is frequently associated with student adjustment across four major domains: academic, behavioral, emotional, and social (Wang, 2009). Researchers have typically examined its impact on academic or social outcomes, whereas the current study investigates the more under-developed literature on students' emotional and behavioral outcomes. Because associations between teacher support and the specific internalizing and externalizing behavioral outcomes included in this study, social anxiety and defiance, have not been documented, studies with similar behavioral outcomes are reviewed.

Teacher support and internalizing/externalizing behavior problems. Although it is more common for researchers to investigate internalizing or externalizing behavior outcomes in separate studies, the linkages between teacher support and both internalizing and externalizing

behavior problems for middle school students have been investigated in multiple studies. Wang (2009) tested the influence of teacher emotional support and promotion of autonomy on student adjustment, finding that both factors were negatively related with student problem behaviors and depression. Davidson and Demaray (2007) found that teacher emotional and competence support predicted internalizing and externalizing behavior problems for both male and female middle school students. Way et al. (2007) tested for bi-directionality in the relationship, determining that teacher support had a positive unidirectional effect on psychological and behavioral adjustment. In addition, autonomy opportunities were negatively associated with behavior problems and depressive symptoms (Way et al., 2007). Thus, all three types of teacher support have documented associations with internalizing and externalizing problems.

Teacher support and externalizing behavior problems. Teachers are responsible for setting behavioral rules and expectations as well as enforcing consequences when students' behavior becomes disruptive (Farmer et al., 2006; Farmer et al., 2013). The decline across the middle school transition year in both student behavioral outcomes (Theriot & Dupper, 2010) and the teacher support they receive (Reddy et al., 2003; Way et al., 2007) is not a coincidence. Students experiencing teacher support are more likely to participate in adaptive solutions like help seeking (Patrick et al., 2003; Ryan & Shim, 2012), while students whose needs are not met by their teachers do not have optimum adjustment (Deci et al., 1991) and externalize their frustration through problematic behaviors, experience internalization outcomes like anxiety, or both (Walker et al., 2004).

The research evidence supporting the relationship between teacher support and sixth-grade behavioral outcomes is strong. Teacher support is associated with less cheating and disruptive behavior for sixth-grade students (Patrick et al., 2003), less misconduct (Wang et al.,

2013), and fewer discipline problems for middle schoolers (Crosnoe et al., 2004). Longitudinal evidence exists as well. Increased levels of perceived teacher emotional support in sixth grade correlated with fewer externalizing behavior issues in sixth grade, and changes in teacher emotional support predicted behavioral problems throughout middle school (Wang & Dishion, 2012). The practical significance of the teacher support-behavioral outcome relationship appears to be strong, as teacher emotional and competence support predicted 30% of the variance in school maladjustment for students in grades 5-8 (Malecki & Demaray, 2003). The relationship between teacher support and student externalizing behavior is not solely a North American phenomenon, as one study documented findings supporting the relationship for middle school students in Norway (Bru, Murberg, & Stephens, 2001).

A similar approach to teacher support is to investigate closeness and conflict within the teacher-student relationship. Closeness within the TSR predicted student aggressiveness, with less closeness in the TSR corresponding to more aggressive behavior for sixth-grade students (Davidson, Gest, & Welsh, 2010). Similarly, students with more closeness and less conflict in the TSR exhibited less risky behavior in sixth grade (Rudasill, Reio, Stipanovich, & Taylor, 2010). Students at risk for emotional and behavioral problems in grades 5 through 8 who felt more connection, more trust, and less alienation from their sixth-grade teachers had fewer conduct problems (Murray & Zvoch, 2011). No study was identified, however, that explicitly examined the effect of teacher support on student defiance of the teacher. The current study will address this gap.

Teacher support and social-emotional problems. Teacher support is an important factor in students' emotional and mental health (Demaray et al., 2009). Consistent with self-determination theory, individuals who do not experience support for autonomy, competence, and

relatedness experience declines in their emotional adjustment (Ryan & Deci, 2000). The most frequently assessed emotional adjustment outcome for sixth graders in studies of teacher support is depression or depressive symptoms. Teacher support has been linked to social self-concept or depressive symptoms for American, Australian, Belgian, Canadian, and Norwegian middle school students (Demaray et al., 2009; Galand & Hospel, 2013; Lanson & Marcotte, 2012; Murberg & Bru, 2004; Pössel, Rudasill, Sawyer, Spence, & Bjerg, 2013), with multiple studies supporting an association between increased levels of perceived teacher support and either increases in social self-concept or decreases in depressive symptoms for sixth-grade students (Demaray et al., 2009; Rudasill, Pössel, et al., 2014). One study revealed the teacher support-depression association maintains after the transition year, as teacher emotional and competence support at middle school entry was associated with lower depressive symptoms 20.5 months after student entry into middle school (Rueger et al., 2014). Rudasill, Pössel et al. (2014) documented evidence that students' perception of support in the TSR and teacher perception of bonding in the TSR were correlated and both predicted decreases in student depressive symptoms during sixth grade. The correlation and concurrent predictive validity between student and teacher perception of support in the TSR strengthens the rationale for using students' perception of teacher support as theoretically sound and empirically supported, specifically with regard to associations with sixth-grade students' internalizing outcomes. A review of the literature, however, did not yield a study linking teacher support with the internalizing outcome of social anxiety for students in the middle school transition year.

This study examined a possible relationship between teacher support and social anxiety. Anxiety and depression are correlated constructs (Watson et al., 1995), especially during the middle school transition (Duchesne, Ratelle, Poitras, & Drouin, 2009). With regard to the TSR,

Furrer and Skinner (2003) found that relatedness in the TSR—in the presence of low relatedness to parents and peers—was linked with higher emotional engagement for third- through sixth-grade students, with the strongest effects for students in sixth grade. Because anxious students tend to withdraw physically and emotionally, the findings of Furrer and Skinner (2003) lend empirical support for the hypothesis that teacher support will be associated with social anxiety symptoms across the middle school transition year. Beyond teacher support, another important factor influencing student behavior outcomes is students' experiences of the transition to the situational imperatives of the middle school transition year.

Students' Perception of the Middle School Transition Year

Research investigating the relationship between students' perception of the middle school environment and their adjustment outcomes is relatively robust (Eccles & Roeser, 2009; Wang & Eccles, 2012). Recent research has replicated prior findings that students' perception of support in the school context decreases across the middle school transition year (Roeser & Eccles, 1998; Rudasill, Niehaus, Crockett, & Rakes, 2014; Wang & Dishion, 2012). Students' perception of their experience of the transition itself, on the other hand, has received substantially less attention. Elias and colleagues (1992) made a foray into students' perception of the middle school transition and provided solid conceptual ground that, although not explicitly mentioned by the authors, is in alignment with life course theory and the mechanism of situational imperatives. They tested the accumulative effect of stress from new situational demands on students' schooling adjustment during the middle school transition year. Elias et al. (1992) identified five latent constructs for transition demands: academic pressure, substance abuse, peer relations, conflicts, and adaptation difficulty; these five constructs were associated with students' perceived academic competence in the expected directions. For instance students experiencing

higher levels of academic pressure, substance abuse, and conflicts reported lower levels of perceived academic competence.

Akos and colleagues (Akos, 2002; Akos & Galassi, 2004a; 2004b) provided further evidence for specific contextual demands in the middle school transition via descriptive studies of student concerns and worries. Upon entering middle school, sixth graders were most concerned about getting lost, being tardy to class, handling an increased homework load, and being bullied (Akos, 2002; Akos & Galassi, 2004a). Based on these findings, the authors concluded that adjustment during transitions is a process with intertwined components in three different areas: academic, procedural, and social. Malley et al. (under review) documented further evidence for these three transition process components, finding that the latent constructs in an assessment of students' perception of their sixth-grade transition experience were aligned with the academic, procedural, and social situational imperatives students experience during their middle school transition year. Further, students' sixth-grade transition experience predicted students' subsequent schooling adjustment outcomes, with positive academic and social transition experiences in the fall of sixth grade predicting increases in student school belonging and academic achievement, as well as decreases in defiant behaviors in the spring of sixth grade (Malley et al., under review). When considering student adjustment during the sixth-grade transition, it is important to understand which contexts—such as the TSR—can serve as a moderator between students' perception of the transition experience at the beginning of sixth grade and their end-of-year adjustment.

Teacher Support as a Moderator

The teacher support students receive within the context of the TSR is well-suited to serve as a moderator to associations involving school-related constructs such as the one between

students' sixth-grade transition experience and their schooling adjustment outcomes. Although a direct link between student transition experience and teacher support has yet to be empirically established, theory and empirical support exists to test for a relationship.

Teacher support and students' transition experience. Teachers' familiarity with the challenges students face put them in a unique position to support students in the three areas of situational imperatives: academic, procedural, and social demands.

***Academic demands*.** Teachers set the academic expectations for students and are tasked with supporting students' academic growth. Multiple studies have investigated the differential impact of support source (e.g., teacher, peer, parent, close friend) on student academic adjustment, finding teacher support to be the best predictor. Malecki and Demaray (2003) tested parent, teacher, classmate, and close friend support across four dimensions: emotional, informational, appraisal, and instrumental. Teacher emotional support was the only indicator of the sixteen tested that was associated with student academic competence (Malecki & Demaray, 2003). In another study both teacher and peer support predicted academic initiative (Danielsen, Wiium, Wilhelmsen, & Wold, 2010). However, a latent variable formed by a combination of teacher emotional support and autonomy support suppressed peer support, causing it to drop out of the model for predicting academic initiative. Thus the TSR provides a context wherein students can receive the support they need to adapt to academic challenges in the middle school transition year.

***Procedural demands*.** As students transition through middle school, they are expected to exert autonomy and control in their preparation for class and in their movement in and out of the classroom (McMullen, Shippen, & Dangel, 2007). Not only do students have to adapt their behaviors to meet new procedural demands, but they also may have to enact them differently in

each of their classes, because teachers often differ in how they want students to prepare and act in class (Davis, 2006; Lane, Wehby, & Cooley, 2006). Wentzel (2002) investigated the impact of teacher expectations, verbal feedback, rule setting, fairness, and motivation, finding they impacted sixth graders' responsibility goal pursuit, class interest, and prosocial behavior. Similarly, teacher emotional support accounted for almost a third of the variance in student school maladjustment for students in grades 5 through 8, and peer, close friend, and parent support were not significantly associated with student school maladjustment (Malecki & Demaray, 2003). These findings suggest that the TSR provides a promotive context for students to adapt behaviorally to middle school procedural demands.

Social demands. In many schooling situations the teachers establish the classroom social context through their interaction and communication with students about what types of social behavior is acceptable (Farmer, Lines, & Hamm, 2011). Although not always fully successful, teachers are situated to be the leaders of the classroom (Farmer, 2000). There is evidence that supportive teacher relationships impact student social adjustment relative to other sources of support. Demaray et al. (2009) assessed support from teachers, parents, classmates, and close friends. Results indicated that the frequency of support from each source predicted student self-concept. However, for perceived importance of support, only support from teachers predicted students' self-concept. Malecki and Demaray (2003) also documented that only teacher emotional support was associated with student social skills competence—classmate, close friend, and parent support did not have a significant association.

As a whole these studies do not discount the importance of other sources of support for students' adaptation to academic, procedural, and social demands and subsequent school

adjustment; however they provide evidence of teachers' critical role in supporting student academic adjustment across the sixth-grade year, even relative to other sources of support.

Empirical evidence for teacher support as a moderating variable. Directional relationships have been established between teacher support and behavioral adjustment (e.g., Reddy et al., 2003) as well as transition experience and behavioral adjustment (Elias et al., 1992; Malley et al., under review). Teacher support has been documented as a moderating variable in similar school-related relationships. In a longitudinal study with a sample of students beginning at age 13, teacher support in the TSR moderated multiple relationships including effortful control and misconduct as well as conflict with parents and misconduct (Wang et al., 2013). In other words, for students with less effortful control or more conflict with parents, those who experienced optimal teacher support exhibited less misconduct than those who did not experience high quality teacher support (Wang et al., 2013). As misconduct is a similar behavioral adjustment outcome as defiance, Wang et al.'s finding supports the possibility of teacher support predicting defiance. Similarly, a supportive TSR moderated the relationship between self-criticism and internalizing behavior problems for a diverse group of sixth- and seventh-grade students (Kuperminc, Leadbeater, & Blatt, 2001). Teacher emotional and competence support attenuated the development of internalizing behavioral issues for students who were bullied, both for male middle school students (Davidson & Demaray, 2007) and for students of both sexes (Galand & Hospel, 2013). In a longitudinal study, teacher emotional support moderated the relationship between deviant peer influence and externalizing behavior problems (Wang & Dishion, 2012). Taken together, these studies demonstrate the potential of teacher support to attenuate the effect that student personal characteristics, negative peer influence, and peer victimization has on their emotional-behavioral adjustment. It is therefore

reasonable to expect it to moderate the relationship between students' perception of their transition to sixth-grade situational imperatives (which include a social component) and their end-of-year internalizing and externalizing outcomes.

However, it is important to note that teacher support might not always yield a positive outcome. In a large study of Australian adolescents in grades 8 through 12, emotional support from the teacher was found to affect the relationship between student stressful life events and depression (Pössel et al., 2013). Students who reported both more stressful life events and high teacher support experienced less depression than students who reported low teacher support. On the other hand, students with fewer stressful life events reported more depression if they experienced high teacher emotional support than low teacher emotional support. The authors may have not have found this iatrogenic effect if they had assessed for autonomy and competence support as opposed to solely emotional support, as students with fewer stressful events may have needed more of other types of support in the TSR. Indeed, some students reported valuing teacher provision of choice of reading material and completing difficult projects more than gaining teacher praise (Daniels & Arapostathis, 2005). As the proposed study assesses all three types of support in the TSR, iatrogenic effects are not anticipated. Teacher support is expected to moderate the relationship between transition experience and student schooling adjustment.

Student Characteristics and Individual Differences

Although there are a variety of potential individual differences that can impact the focal relationships of the current study, there are three primary demographic factors to consider: gender, ethnicity, and socio-economic status.

Individual differences and teacher support. The studies reviewed found gender differences in teacher support, with girls experiencing more school support in sixth grade (Niehaus et al., 2012; Reddy et al., 2003) higher levels of relatedness with teachers (Rueger et al., 2010), and higher teacher social expectations (Wentzel et al., 2010). However boys may experience better outcomes when teacher support serves as a moderator, as boys who evidenced low effortful control but perceived higher teacher support reported fewer depressive symptoms than their female counterparts (Wang et al., 2013). Differences related to ethnicity have also been documented, as the results from two studies revealed that the relationship between the TSR and school engagement is more strongly positive for African American students (Downey & Ainsworth-Darnell, 2002; Ferguson & Mehta, 2004). Similarly, students from minority groups tend to experience greater benefit from supportive or close TSRs than non-minority students (Crosnoe et al., 2004). A study with a low-income minority student sample found students with a high quality TSR had better emotional, behavioral, and schooling adjustment (Murray & Zvoch, 2011). Comparatively, students from lower socio-economic backgrounds fared better when experiencing a supportive TSR than did students from higher socio-economic backgrounds (Crosnoe et al., 2004; Dornbusch et al., 2001). Although the TSR can have differential influence, the lack of consensus and shortage of evidence makes it difficult to expect certain relationships based on individual differences.

Individual differences and transition experience. With regard to individual differences and the transition experience, Malley et al. (under review) assessed for gender, ethnicity, and free-and-reduced lunch status differences, finding boys had a less positive academic transition experience than did girls during sixth grade. She also documented individual differences in predictive relationships between students' transition experiences during the fall of sixth grade

and their defiance in the spring of sixth grade. Girls'—but not boys'—perception of their procedural transition experience predicted their end-of-year defiance. Similarly, a positive academic transition experience predicted lower defiance for students who were full pay in comparison to students who received free or reduced lunch. Lastly, procedural transition experience predicted higher defiance for students receiving free or reduced lunch than for full pay students.

Hypotheses

As there is ample evidence for a relationship between students' perception of meeting sixth-grade situational imperatives and their behavioral adjustment and strong evidence to support the assertion that teacher support influences behavioral adjustment during sixth grade, the current study investigated whether teacher support will amplify the relationship between students' perception of the sixth-grade transition experience and positive internalizing and externalizing outcomes and mitigate the relationship between negative transition experience and negative adjustment outcomes. The specific hypotheses that were tested are:

1. Controlling for individual demographic differences and social anxiety symptoms and defiance at the beginning of the year, students who perceive themselves as having a more positive transition experience at the beginning of the sixth grade will report lower levels of social anxiety symptoms and defiance at the end of the school year.
2. Controlling for individual demographic differences and social anxiety symptoms and defiance at the beginning of the year, students who perceive greater teacher support at the end of sixth grade will report lower levels of social anxiety symptoms and defiance at the end of the school year.

3. Controlling for individual demographic differences and social anxiety symptoms and defiance at the beginning of the year, teacher support will moderate the relationships between transition experience and the end-of-year outcomes social anxiety symptoms and defiance, such that students who rate their transition experience as positive will report lower levels of social anxiety symptoms and defiance when they perceive higher levels of teacher support as compared when they perceive lower levels of teacher support. Similarly, students who rate their transition experience more negatively will report higher levels of social anxiety symptoms and defiance when they also perceive lower levels of teacher support as compared to higher levels of teacher support.

CHAPTER 4: METHOD

The current study used data from six control schools which participated in the *Supporting Early Adolescents' Learning and Social Support (SEALS)* research study. The study was a cluster-randomized control trial of the impact of the SEALS professional development intervention (Farmer et al., 2013) for sixth-grade teachers on students' middle school adjustment. Researchers grouped schools into matched pairs based on demographic and geographic similarities, and one school in each pair was randomly assigned to receive the intervention.

Participants

Schools. All schools in the sample were non-charter public schools from metropolitan areas in three states: two in the Southeast and one in the Northeast. School demographic data (Table 1) were collected from the National Center for Educational Statistics (NCES) for the 2012-2013 school year (NCES, 2014). School size ranged from 459 to 835 (M = 592.50, SD = 124.71), and the number of students in sixth grade ranged from 152 to 264 (M = 188.67, SD = 36.60). The sample consisted of only schools in the non-intervention (i.e. control) group.

Students. The original sample included 630 sixth-grade participants attending the six middle schools. Once students who did not participate in both fall and spring surveys administrations were removed, the final sample numbered 515. The overall consent rate was 54.14%. The percentage of participants who identified as minority race/ethnicity within each school ranged from 13.00 to 67.01% (M = 40.94, SD = 16.70), and the percentage of participants within each school who received free or reduced lunch ranged from 28.01 to 60.27% (M = 45.93, SD = 11.54). The participants' average rate of math proficiency score by school ranged from

17.70 to 80.40 (M = 45.18, SD = 22.06) and the participants' average reading proficiency score by school ranged from 35.20 to 83.00 (M = 57.03, SD = 18.70).

Procedures

Data were collected from all students who were present on the days of survey administration and whose parents provided consent for their participation. At the appointed time, students were released to a location within the school and were seated at intervals by project staff to decrease students' ability to talk with each other or to see one another's answers during the survey administration. Students were also provided a blank sheet of paper and encouraged to cover their answers as they progressed. Once all students were seated a member of the project staff informed students about the purpose of the study as well as their parents' consent for their participation. The staff member reminded students that their participation was voluntary, that they could leave at any time, and that they could ask questions either before, during, or after the survey. The students were instructed to raise their hands if they needed anything, and the other staff member(s) present would attend to them. According to established protocol, the staff member then read through the survey as students answered the prompts and other staff members monitored students. Students were given school supplies for their participation.

Students completed the surveys in the fall and spring of sixth grade. Survey administration dates were determined in coordination with school recruitment dates and school scheduling preferences, particularly to avoid spring testing. Surveys were administered between four and five months apart in time at each school. With one exception, fall surveys were administered in late October to mid-November and spring surveys were administered between late March and late April. The fall survey administration was held in October and November to

provide students time to experience new behavioral demands and form new relationships with teachers and peers. The survey administration at one school occurred in December and May.

Measures

Student participants completed a comprehensive survey about their and their peers' social, behavioral, and academic adjustment and middle school experiences. The measures included in the current study focus on students' perception of their transition experience, teacher support, and emotional-behavioral adjustment in sixth grade. Only data from surveys completed during fall and spring of sixth grade were included in this study.

Perceived sixth-grade transition experience. The SAT-MS-R: Survey of Adaptational Tasks of Middle School—Revised (Malley et al., under review) is a 15-item measure adapted from the SAT-MS (Elias et al., 1992). The SAT-MS-R assesses sixth-grade students' adaptation to new academic and social behaviors required of them during the middle-school transition year, such as dealing with peer pressure, handling an increased academic workload, and managing multiple textbooks. Student response options are on a four-point Likert-type scale, anchored by *No problem* (1) and *Large Problem* (4). The SAT-MS-R has demonstrated good internal consistency, with its three subscales each having Cronbach's alphas greater than or equal to .70: procedural subscale $\alpha = .70$, academic subscale $\alpha = .72$, and social subscale $\alpha = .79$. Measurement invariance across gender and partial, invariance across ethnicity has been documented (Malley et al., under review). In addition, all subscales of the SAT-MS-R demonstrated concurrent and predictive validity with measures of student adjustment, including academic achievement, school belonging, teacher defiance (Malley et al., under review). SAT-MS-R data from the fall administration of the survey are included in the study.

Perceived autonomy support. Students' perception of teachers' support of autonomy is adapted slightly from a two-item measure that Danielsen et al. (2010) altered from a larger scale assessing student involvement in high school (Fraser, 1989). The clause "in my classes" was added to each item to parse students' perception of teacher support of autonomy from potential conflation with their perception of teacher autonomy support of students in other classes or grades. Items were "students in my classes have a say in their use of class time" and "students in my classes have a say in classroom activities." Students reported their agreement on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The two items were shared a high correlation (r = .86) based on a sample of 13-year-old students (Danielsen et al., 2010). The measure has also been documented to form a second-order latent construct "pedagogical caring and autonomy support" with the perceived emotional support measure included in this study. The pedagogical caring and autonomy support second-order latent construct explained 74% of the variance in academic initiative of early adolescents (Danielsen et al., 2010), providing evidence for the convergent and predictive validity of the measure. Perceived autonomy support data from the spring administration of the survey are included in the study.

Perceived competence support. Students' perception of teachers' competence support was assessed using the teacher informational support subscale of the Child and Adolescent Social Support Scale (CASSS; Malecki, Demaray, & Elliott, 2000). The measure consists of three questions designed to assess the students' perception of the support they receive from the teacher in terms of school information or advice (Malecki & Demaray, 2002). The measure was slightly adapted for the middle school context, such that it asks for students' perception of the overall support from all of their teachers rather than from an individual teacher. Moreover, the response options were altered from a six point Likert-type scale based on frequency to a five

point Likert-type scale for agreement, with anchors at 1 (*Strongly Disagree*) and 5 (*Strongly Agree*). In its original format, the subscale has been demonstrated to have high internal consistency for a sample 5th through 8th grade students (α = .81-82; Malecki & Demaray, 2003). Test-retest correlations over an eight-week period range between .60 and .76 for the CASSS subscales (Malecki & Demaray, 2002). The three items are: "my teachers explain things when I'm confused", "my teachers give good advice", and "my teachers in this school help me solve problems". With regard to convergent validity, the CASSS has demonstrated a strong correlation (.70) with the Social Support Scale for Children (Harter, 1985). The CASSS has been documented to have predictive validity for a range of student adjustment outcomes including attention in school, anxiety, depression, self-esteem, and GPA (Rueger et al., 2010). Perceived competence support data from the spring administration of the survey are included in the study.

Perceived emotional support. A two-item measure was adapted from Torsheim, Wold, and Samdal (2000) to assess students' perception of emotional support from the teachers in their school. The items are "most of my teachers are friendly" and "most of my teachers treat me fairly". The second item was slightly altered from its original form "our teachers treat us fairly" in order to assess the students' perception of the emotional support they received from teachers rather than their generalized sense of whether or not teachers were supportive of other students in the school. The response options for the two items are arranged on a five point Likert-type scale, anchored at 1 (*strongly disagree*) and 5 (*strongly agree*). This two-item measure has been demonstrated to have high internal item correlation on a sample of 13-year-old students (r = .80; Danielsen, et al., 2010), and test-retest correlation (r = .69) was strong on a sample of adolescents at a 7-to-10 day interval (Torsheim et al., 2000). Criterion and convergent validity have been documented for the original measure, with correlations between the perceived

emotional support measure and both a school motivation scale and a perceived teacher support availability scale (Danielsen et al., 2010). Perceived emotional support data from the spring administration of the survey are included in the study.

Social anxiety symptoms. A seven-item subscale of the Screen for Child Anxiety Related Emotional Disorders, Child Version (SCARED) screening instrument for childhood social fears (Birmaher et al., 1999) was used to assess student social anxiety. An example item is "I feel nervous when I am with people I don't know well". The directions for the scale ask children to read a list of sentences and to decide whether each statement is "Not True or Hardly Ever True," "Somewhat True or Sometimes True," or "Very True or Often True" for them over *the last 3 months*. A meta-analysis of studies utilizing the SCARED with older children and adolescents across seven countries revealed that the social anxiety subscale consistently emerges as an independent factor with high internal reliability across cultures (mean α = .80, range = .75 - .89; Hale, Crocetti, Raaijmakers, & Meeus, 2011). Social anxiety data from both the fall and spring survey administrations were included in the study.

Defiance. The defiance scale is a five-item measure that assesses students' perception of the frequency of their defiant behaviors (Midgley et al., 2000). Students are asked to indicate how true statements are for them on a five-point Likert scale, anchored on 1 = *not at all true* and 5 = *very true*. An example item is "I sometimes don't follow my teacher's directions during class". The defiance scale has been demonstrated to have high internal reliability (α = .91; Gregory & Ripski, 2008) and to be associated with other classroom social environment constructs (Ryan & Patrick, 2000). Defiance data were included from both the fall and spring survey administrations in the study.

Demographic variables. Students' gender, minority status, and free/reduced lunch status were obtained from school record data. Gender, minority status, and free/reduced lunch status were dummy coded so that 0 = female, non-minority, and full-pay lunch status, respectively. Participants' fall scores on both outcome variables were used as control variables for their spring outcomes.

Plan of Analyses

The purpose of the proposed study was to investigate the extent to which students' perception of teacher support and students' perception of the sixth-grade transition experience directly and interactively influenced their schooling adjustment outcomes at the end of sixth grade. Structural equation modeling (SEM) was chosen as the primary method of analysis because it permits researchers to partition measurement error and estimate relationships between latent variables (Bowen & Guo, 2012).

MPlus version 7.31 (Muthén & Muthén, 2015) was selected to perform the structural models because of its capability to handle the unique characteristics of the data in the study: ordinal variables with potentially non-normal univariate and bivariate distributions; clustered data (i.e., students nested in schools); and missing data. The MPlus program includes the weighted least squares means and variances adjusted (WLSMV) estimator that can account for potential violations of univariate and multivariate normality associated with the ordinal nature of the data (Brown, 2006) as well as documented violations of multivariate normality in the SAT-MS-R (Malley et al., under review). The WLSMV estimator allows for clustering of data; thus, recommendations to account for the non-independence of observations due to the nested nature of the data (Hoyle, 2012; Rabe-Hesketh, Skrondal, & Zheng, 2012) were heeded by incorporating the school identification number as a clustering variable. The WLSMV estimator

also includes the full information maximum likelihood (FIML) procedure, which incorporates all data regardless of whether a case had any missing values. FIML has been documented to handle missing data better than other procedures (Enders & Bandalos, 2001).

Testing of alternative models is a recommended practice when using SEM analysis (Kline, 2005). Alternative model testing allows researchers to compare competing models to determine which model fits the data best. In the current study, the hypothesized measurement model was estimated first, and subsequent measurement models were estimated to determine whether a second-order factor structure for either or both independent variables best fit the data. Then the total effects structural model which includes both direct effects and the latent interaction term was tested for each outcome. If a significant relationship was revealed for the interaction construct, a second structural model testing only direct effects was estimated in order to determine which structural model best fit the data. To determine the appropriateness of the proposed models for the data, model fit indices were analyzed including comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA) and the weighted root mean square residual (WRMR). The CFI is robust to small sample size (Tabachnick & Fidell, 2007), which provides assurance despite the adequate sample size of the current study. Recommended cut-off scores will be used for each indicator: CFI and TLI > .95 (Hu & Bentler, 1999), RMSEA < .08 (MacCallum, Browne, & Sugawara, 1996), and WRMR < .09 (Muthén & Muthén, 2013).

Multiple measurement models were estimated to determine whether the hypothesized second-order factor structure (Figure 1) or a first-order factor structure for independent variables provided the best fit. Structural equation models were estimated to test for direct effects and for an interaction effect of perceived teacher support and transition experience on spring defiance

and social anxiety. Student gender, minority status, and free/reduced lunch status were included in the structural models as control variables as well as the fall scores of the dependent variable.

Post hoc analyses were conducted to probe significant predictive relationships between the interaction latent variable and outcome. Using the Statistical Package for Social Sciences (IBM Corp., 2015) Version 23, cases were grouped by median split into four groups: low-low, low-high, high-low, and high-high groups based on composite scores on independent variables (i.e., cases in the low-high group had scores below the transition experience median and above the teacher support median). Median split allows for probing of mean difference over time and has been used successfully in other studies of interactions with teacher support and similar constructs (Blankemeyer, Flannery, & Vazsonyi, 2002; Flaspohler, Elfstrom, Vanderzee, Sink, & Birchmeier, 2009). Three-way mixed design ANOVA was conducted to provide both an additional test of the interaction effect and to allow for probing of the interaction effect with follow-up tests of simple effects.

Internal consistency was examined in order to ensure that each of the measurements included in the current study met standards of reliability. Coefficient alphas were calculated. Maximal reliability was estimated for each latent construct in the study. A construct's maximal reliability score (H) represents the reliability when a construct is optimally weighted (Geldhof, Preacher, & Zyphur, 2014). Following Geldhof et al., (2014) maximal reliability was calculated by inputting the standardized factor loadings from each construct in the final measurement model (Figure 2) in the formula below.

$$H = \frac{\sum_{i=1}^{k} \frac{\lambda_i^2}{1-\lambda_i^2}}{1 + \sum_{i=1}^{k} \frac{\lambda_i^2}{1-\lambda_i^2}}$$

CHAPTER 5: RESULTS

Missing Data

The data set contained 630 students who participated in the study during their sixth-grade year. Missing data can be either at the unit-level (i.e., when participants are absent or opt out) or at the item-level (i.e., when participants skip certain items, either purposefully or accidentally; Dong & Peng, 2013). With regard to unit-level data, sixteen (2.54%) students did not provide data on the focal variables of the current study for either the fall or the spring. Of the 614 students who provided data on the focal variables of the study, 36 (5.86%) did not provide any data during the fall and 63 (10.26%) did not provide any data in the spring, yielding 515 complete cases (e.g., students who provided data during both the fall and the spring). Although we do not have data on student non-participation, students may have skipped whole parts of the survey administration, chosen to leave the study, were sick or otherwise absent during administration day, or may no longer have attended one of the schools participating in the study. Below, using Tabachnick and Fidell's (2007) guidelines for assessing missing data, the following information is reported: count and percentage of missing values, number of missing data within a case, number of cases with missing data, and patterns or correlations of missing data.

Across both data collection time-points in the study, the overall percentage of missing data for the original 630 student sample was 9.86%. After removal of the 115 students who did not provide data in either the fall or spring, or both, the overall percentage of item-level missing data in the study was 0.69% (168 missing data points from 24336 total). For within-case missing data, 430 of the 515 (83.50%) cases were missing no data across time points and another 77 of

the 515 (14.95%) cases were missing between one and two data points. Two cases were missing 10 data points, and one case was missing 15 data points.

In order to assess potential patterns of missing data to determine whether data were missing completely at random (MCAR), Little's MCAR test (Little, 1988) was performed. The null hypothesis for Little's MCAR test is that the data are MCAR; thus, significant chi-squared values can be interpreted to suggest the data are not MCAR. Little's (1988) MCAR test was statistically significant for both fall ($\chi^2 = 913.94$, $df = 744$, $p < .001$) and spring ($\chi^2 = 377.88$, $df = 329$, $p = .033$) when all variables were included, suggesting the data were not MCAR and were thus either missing at random (MAR) or missing not at random (MNAR). A within-variable MCAR test revealed no statistically significant MCAR tests. Additional analyses were conducted to determine whether the data were MAR or MNAR, including correlations between missing values, cross tabulation tables, *t* tests from the SPSS missing value analysis package, and converting items into dummy variables (i.e., coding 0 for data, 1 for missing data) and regressing the dummy variables on demographic variables to determine whether missing values were predicted by demographic characteristics. No associations were found between missing values and gender, free/reduced lunch status, or minority status. An examination of the cross tabulation tables revealed that missing values were more likely to be clustered within one self-report scale rather than across scales. A total of 13 of missing value analysis *t* tests were significant, with 5 in fall and 8 in the spring, again usually between items within one self-report scale. Correlations between missing values revealed that missing data tended to be clustered on one scale. With respect to school membership, all individual items were answered by > 95% of students at all schools completed except for students at one school (School A), where 87.87% ($n = 29$) of the participants completed the first item on the perceived autonomy support scale, and 93.94% ($n =$

31) of the participants completed the second item on the perceived autonomy support scale and the first item on the perceived competence support scale.

Given the small amount of missing data within the 515 cases, the lack of association between demographic characteristics and missing values, the non-significant within-variable MCAR tests, the relatively low number of significant missing value analysis *t* tests, the strong item-level covariance coverage for all measurement item pairings (> 95%), and only one potential school effect at the smallest school in the sample, it appeared that the data were MAR. When the data are either MAR or MNAR, the WLSMV estimator is recommended for conducting structural equation modeling (SEM) in MPlus provided the covariance coverage is > 90% (Muthén & Muthén, 2013). Because the WLSMV estimator imputes values for missing data, it is critical that no pair of items have a large amount (i.e., > 10%) of missing data. The covariance coverage for all item pairings in the study was > 95%.

Descriptive Statistics

In order to diagnose potential issues of the dataset for structural modeling procedures, descriptive statistics of the data were inspected. Means, standard deviations, skewness, and kurtosis were computed for all item-level data to screen for violations of univariate normality. Due to the ordinal nature of the data (except gender, free/reduced lunch status, and minority status), violations of univariate and multivariate normality were more likely than with continuous data (Brown, 2006). Multivariate normality was examined with the Herze-Zirkler's Multivariate Normality Test (R, 2014) and multivariate outliers were assessed using Mahalnobis' distance. Item variance inflation factors (VIFs) for each measure were estimated in order to assess for multicollinearity, using Kline's recommendation to beware of item correlations greater than .85. Because a measurement model including all latent constructs in the study (Figure 1) was

estimated prior to the general SEM, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was used to determine whether the common variance between items is appropriate for factor analysis (Kerns, 2007).

Univariate statistics. Descriptive statistics for all items measured in fall and spring were calculated in SPSS (IBM Corp., 2015) and are displayed in Tables 3 and 4, respectively. Means of defiance and social anxiety were relatively low at both time-points, suggesting that students generally were not exhibiting high levels of externalizing or internalizing behavior challenges in sixth grade. On average, students perceived relatively low problems meeting procedural and social transition challenges and a moderate challenge meeting academic demands. Defiance score and transition challenge subscale score ranges in the current study are comparable to those in a recent sample of sixth grade students (Malley et al., under review). Students in the current sample reported relatively high teacher emotional support and teacher competence support, and moderate teacher autonomy support, indicating that students on the whole made a relatively smooth transition into middle school and perceived their teachers as supportive. Teacher support ratings were similar to those in other studies which included the same measures (Danielsen et al., 2010; Malecki & Demaray, 2003). Spring means on social anxiety were lower than fall means (t[506] = 2.04, p = .04), while spring mean scores on defiance were higher than those in the fall (t[503] = -5.92, p < .001). With regard to univariate normality, the skewness of items in the study ranged -0.78 to 2.27, and the kurtosis of items ranged from -1.59 to 4.42. No items in the study had skewness or kurtosis scores considered to be extreme (i.e., skewness ± 2 or 3 or kurtosis + 5; Bowen & Guo, 2012; Ware, Ferron, & Miller, 2013; West, Finch, & Curran, 1995).

Multivariate normality. Multivariate normality was examined using the Henze-Zirkler's Multivariate Normality test in the MVN statistical package in R 3.2.3. Results suggested the data

were not multivariate normal (H-Z value = 1.00, $p < 0.001$). This finding further underscored the importance of using the WLSMV estimator in MPlus, as it is robust to violations of normality. With regard to multicollinearity, it is important to assess for two types: structural multicollinearity and data-based multicollinearity. To reduce structural multicollinearity in the test of the interaction effect, the product interaction term was double-mean centered, following the recommendation of (Lin, Wen, Marsh, & Lin, 2010). To test for databased multicollinearity, independent variable items were regressed on each other and the VIFs were screened. All VIFs were under 2.5, well under the suggested threshold of 10 which represents a potential problem of multicollinearity (Kline, 2005).

Multivariate outliers. Eight cases were identified as multivariate outliers (i.e., Mahalanobis' values with probability less than .001) and were later removed from analyses as structural model fit indices were worse when the outliers were included in the data.

Power

Statistical power is the estimation of the probability of rejecting a false null hypothesis, taking into account the sample size and effect size (Cohen, 1988). Generally sample sizes greater than 200 are considered ample for factor analytic techniques (Kline, 2011). All confirmatory factor analyses (CFAs) tested in the current study meet the recommendation for at least 10 participants per item (Kline, 2011). For each general structural equation model (SEM) tested in the current study, the sample size > 500 and $df > 400$, which provided sufficient power ($\beta = 1.00$) according to the calculations suggested by MacCallum and colleagues (MacCallum, Browne, & Cai, 2006; MacCallum et al., 1996).

Measurement Reliability

To assess the reliability of measures used in the study, coefficient alphas and maximal reliability (H) were calculated for each measure (Table 5). The procedural subscale of the SAT-MS-R has been documented to have lower internal consistency in some samples (Malley et al., under review). Confirmatory factor analysis was conducted for each measure to test for item loadings. All items loaded at ≥ .35 except for SAT-MS-R Item 11 on the sixth-grade transition experience social subscale; the item was subsequently removed from analysis.

Measurement Models

After establishing reliability of the measurements, four different measurement models were estimated, beginning with the hypothesized unrestricted measurement model with all latent constructs allowed to correlate (Figure 1). The hypothesized measurement model included both dependent variables at fall and spring as well as two second-order latent variables each comprised of three first-order variables: perceived teacher support by perceived autonomy support, perceived competence support, and perceived emotional support; and perceived sixth-grade transition experience by its academic, procedural, and social subscales. Due to the use of repeated measures of the dependent variables (fall and spring), each measurement model was tested to determine whether correlating the error terms of the dependent variables across time (e.g., defiance item one in the fall with defiance item one in the spring) provided better fit. Only in one occasion for one item across all measurement models was the model fit improved. Thus, dependent variable item error term correlations were not added to the models. The hypothesized model had relatively good fit ($\chi^2[924] = 1167.06$, $p < .001$; RMSEA = 0.02 90% CI [0.02, 0.03]; CFI = .98; TLI = .98; WRMR = 1.83); however these results were obscured by an issue with multicollinearity between the emotional support and competence support constructs ($r = 0.87$).

This multicollinearity between the two constructs combined with low correlations between the two constructs and the autonomy support construct indicated that the emotional and competence support constructs might load on a second-order factor or be combined into one first-order factor if theory permits (Bowen & Guo, 2012). Despite the good model fit, the hypothesized model was rejected due to the issues with multicollinearity.

A second measurement model was estimated with a new construct, teacher support, indicated by the five items from emotional support and competence support. Autonomy support was removed from the second model and all subsequent measurement and structural models as model fit improved with its removal. Follow-up analyses demonstrated that retaining autonomy support in the models did not influence the hypothesized relationships tested in the structural models. Again, all latent constructs were allowed to correlate. Model fit was almost identical ($\chi^2[842] = 1100.79$, $p < .001$; RMSEA = 0.03 90% CI [0.02, 0.03]; CFI = .98; TLI = .98; WRMR = 1.91), and no issues with multicollinearity were identified. In addition, the new teacher support variable had high reliability ($\alpha = .88$, H = .91). In order to test whether the data were a better fit for a model with sixth-grade transition experience subscales as first-order factors with no second-order transition experience factor, a third measurement model was estimated. Model fit improved slightly ($\chi^2[832] = 1050.433$, $p < .001$; RMSEA = 0.02 90% CI [0.02, 0.03]; CFI = .98; TLI = .98; WRMR = 1.72). Although an argument could be made for retaining the second model with a second-order sixth-grade transition experience factor despite the model being a slightly poorer fit for the data, the first-order factors for transition experience were found to differentially influence defiance in subsequent structural models. Thus, the third measurement model included no second-order factors. The fourth and final measurement model (Figure 2) included the items for the latent product interaction term. All latent factors were allowed to

correlate in both the third and fourth measurement models, and no error terms were allowed to correlate.

Creating the latent product interaction term. A matched-pair approach was used to construct the latent product interaction items, as it is more robust than a single-pair or an all-pairs approach (Marsh et al., 2004). In a matched-pair approach, it is recommended that all items from both scales be used but that no item be used more than once (Marsh, Wen, Nagengast, & Hau, 2012). As the teacher support variable had five items and the subscales of the sixth-grade transition experience variable had a combined total of fourteen items, four teacher support items were matched with three unique transition experience items, and one teacher support item was matched with two unique transition experience items (Table 6). The transition experience item scores were averaged and mean centered then multiplied by the mean-centered teacher support item score. Each product interaction term item was then scaled by double-mean-centering, to decrease the likelihood of correlation between the interaction term and its first-order variables (Aiken, & West, 1991; Little, Card, Boviard, Preacher, & Crandall, 2007). Although others recommended residual-centering for complete orthogonality between first- and second-order variables (Little et al., 2007), Lin et al. (2010) warned of potential issues including a greater biased effect of the interaction term for non-normal variables.

Final measurement model. The interaction term was included in the final measurement model (Figure 2). The final measurement model had slightly better fit than that of its third iteration ($\chi^2[1044] = 1173.64$, $p < .001$; RMSEA = 0.02 90% CI [0.02, 0.03]; CFI = .98; TLI = .98; WRMR = 1.72). All measurement model fit indices are presented in Table 7.

Direct and Interactive Effects of the Independent Variables on Defiance in Spring

It is recommended practice when using SEM for analysis to test alternative models (Kline, 2005). Thus, two general SEMs were used to evaluate whether the data best fit a direct effects model or an interactive effects model with both direct and interactive effects of students' perception of teacher support and sixth-grade transition experience on their spring reports of defiance. The first SEM was conducted to test the interactive effects model, which included predictive relationships of teacher support, academic transition experience, procedural transition experience, social transition experience, and the interaction term on spring defiance, controlling for gender, free/reduced lunch status, minority status, and fall defiance (Figure 3). All latent constructs were allowed to correlate. The cluster function was used to account for the nested nature of the data, as student participants attended different schools. Significant results were obtained for both direct and interactive effects. The latent interaction factor predicted spring defiance scores ($\gamma = .02$, $p = .03$). As expected, the strongest predictor of spring defiance was fall defiance ($\gamma = .77$, $p < .001$). Fall perception of increased teacher support predicted a decrease ($\gamma = -.30$, $p < .001$) in spring defiance. Control variables gender and free/reduced lunch status also predicted spring defiance scores, with males ($\gamma = .08$, $p < .01$), non-minority students ($\gamma = -.08$, $p < .01$) and students receiving free/reduced lunch ($\gamma = .21$, $p < .001$) reporting higher levels of defiance. The model fit was good ($\chi^2[587] = 783.40$, $p < .001$; RMSEA = 0.03 90% CI [0.02-0.03]; CFI = .99; TLI = .98; WRMR = 1.68).

A second SEM was estimated which did not include the interaction factor (Figure 4). With regard to direct effects, the results of the second SEM were similar to the results from the first SEM: fall defiance was associated with increased defiance in the spring, while increased teacher support was associated with decreased defiance in the spring. Model fit was similar, with

incrementally better fits in three of the five indices ($\chi^2[431] = 616.38$, $p < .001$; RMSEA = 0.03 90% CI [0.02, 0.03]; CFI = .99; TLI = .99; WRMR = 1.66). With comparable model fit between the interaction model and the direct effects only model, the more informative interaction model was retained for further analysis.

Factorial analysis. Median split procedures were used to separate students into four groups based on their scores on teacher support and transition experience: high-high, high-low, low-high, and low-low (e.g., the high-low group was comprised of students who scored above the median on teacher support and below the median on transition experience). A three-factor mixed-design ANOVA (within-groups: time; between-groups: teacher support and transition experience) was conducted to provide both an additional test of the interaction effect and to allow for probing of the interaction effect with follow-up tests of simple effects. The results are displayed in Table 8. Based on the results of Levene's Test, the assumption of equal variances was not met for fall ($F = 7.67$, $p < .001$) or spring ($F = 9.29$, $p < .001$). Thus, Pillai's Trace was consulted for the multivariate tests due to its robustness when the assumption of equal variances is violated (Pillai & Hsu, 1979). There was a significant main effect for time, as the difference in defiance scores were significantly higher in the spring compared to the fall (Pillai's Trace = .068, $F = 35.58$, $p < .001$). With regard to between-subjects effects, both teacher support and transition experience yielded significant main effects (teacher support: $F = 86.04$, $p < .001$; transition experience: $F = 14.52$, $p < .01$). Pairwise comparisons of estimated marginal means revealed that students in the high teacher support group reported significantly less defiance in the spring ($M = 1.85$, $SD = .06$) compared with students in the low teacher support group ($M = 2.45$, $SD = .07$; $\Delta M = -.60$, $p < .001$), and students in the less problematic transition experience group reported significantly less defiance ($M = 2.03$, $SD = .06$) than those in the more problematic transition

experience group (M = 2.27, SD = .07; ΔM = -.25, $p < .01$). The interaction effect, however was non-significant (teacher support x transition experience: F = .66, p = .57). The purpose of the three-factor ANOVA was to probe the interaction effect found in the structural modeling; thus, further analyses were suspended due to a non-significant interaction effect.

Direct and Interactive Effects of the Independent Variables on Spring Social Anxiety

A general SEM was estimated in order to test for predictive relationships of teacher support, academic transition experience, procedural transition experience, social transition experience, and the interaction term on end-of-year defiance, controlling for gender, free/reduced lunch status, minority status, and beginning-of-year defiance (Figure 5). The cluster function was used to account for the nested nature of the data, as student participants were clustered in different schools. Contrary to expectation in all three hypotheses, the SEM revealed no significant relationships between the independent variables or the interaction term and the social anxiety outcome measure in spring. Two control variables did predict social anxiety in spring: fall social anxiety (γ = .88, $p < .001$), and gender (γ = -.09, $p < .01$). In other words, students who had higher levels of fall social anxiety or were female were more likely to have higher levels of social anxiety in spring. Model fit was adequate (χ^2[737] = 910.05, $p < .001$; RMSEA = 0.02 90% CI [0.02-0.03]; CFI = .95; TLI = .95; WRMR = 1.60). A second general SEM was not conducted to compare model fit as there were no significant direct or indirect effects of independent variables on social anxiety in the first SEM. In addition, no post hoc analyses were conducted. Thus, the data did not provide support for any of the three hypotheses with social anxiety as the outcome variable.

Summary of Findings

The data did not yield support for Hypothesis One for either of the outcome measures. Students' perception of their academic, procedural, and social transition experience to sixth grade did not predict their spring defiance or social anxiety ratings when demographic variables, fall defiance or social anxiety ratings, and spring teacher support scores were included in the model. The data supported Hypothesis Two for defiance: students' perception of teacher support significantly and negatively predicted defiance; on the whole, students who perceived greater levels of teacher support reported lower levels of defiance. Hypothesis Three (i.e., students who perceived greater transition challenges and greater teacher support would report less spring defiance than students perceiving similarly great transition challenges but less teacher support) received initial support with a significant interaction effect in the structural model. However, a three-factor mixed design ANOVA did not reveal a significant interaction effect. Without a significant interaction effect in the ANOVA, additional post hoc analyses designed to parse the interaction effect found in the structural model were not conducted. There were no findings to support any of the three hypothesized relationships with social anxiety as an outcome measure.

CHAPTER 6: DISCUSSION

In this study a short-term longitudinal design was used to investigate whether students' perception of teacher support could serve as a moderator between their perceived sixth-grade transition experience in the fall and their externalizing and internalizing behaviors in the spring. The discussion is focused on three central findings. First, a self-determination theory approach to the teacher-student relationship was partially supported, as strong associations between perceived competence support and emotional support suggested that a broader teacher support measure is a viable construct. However, perceived autonomy support had weaker associations with competence and emotional support and was thus not integrated into the broader teacher support measure. Second, students' perception of teacher support was linked with their defiance in the classroom such that students who felt supported by teachers exhibited less defiance. Third, there was initial evidence to support the theory that students' expected levels of defiance based on the difficulty of their transition experience varied depending on how supportive they felt their teachers to be; however, analyses did not permit further interpretation of the interaction between teacher support and transition experience. Limitations of the study are discussed, applications of the findings are outlined for teacher training and professional development, and recommendations are provided for future research.

Self-Determination Approach to the Teacher-Student Relationship Partially Supported

Based on prior research and theory, three different aspects of support in the teacher-student relationship were expected to be highly correlated and form a single construct of teacher support: autonomy support, competence support, and emotional support. Perceived emotional

support and perceived competence support shared strong associations, which merited the combination of the measures into a single perceived autonomy support measure. Contrary to expectation perceived autonomy support did not have a strong association with perceived emotional support or perceived competence support. The findings partially corroborate a self-determination theory approach to teacher support in that two of the three types of support expected to gauge student were closely aligned and able to be merged into one teacher support construct. Although the inclusion of emotional and competence support in a study of sixth grade student adjustment is not novel, the current study revealed much stronger associations between the two constructs than was documented in a previous study (Demaray & Elliott, 2001). In another study researchers investigated the same three types of teacher support as the ones in the current study, but did not use factor analysis to determine whether the three types of teacher support loaded onto one first- or second-order construct (Klem & Connell, 2004). Thus, data from the current study reveal a closer alignment between perceived emotional support and perceived competence support for sixth grade students than has been documented previously.

Unexpectedly, perceived autonomy support did not share strong associations with emotional support or competence support. It is possible that the autonomy support measure did not accurately assess perceived autonomy support despite convergent validity established in a prior study (Danielsen et al., 2010). In the current study perceived autonomy support had a lower correlation with perceived emotional support than in Danielsen et al. (2010). It may be that the measure items (e.g., "students in my classes have a choice in activities" and "students in my classes have a say in their use of free time") capture perceived autonomy rather than perceived autonomy support from teachers. Whereas autonomy is often synonymous with choice, autonomy support provides students opportunities to be agentic and engage in their learning

(Reeve, 2009; Reeve & Halusic, 2009). For example, a student with autonomy may choose how she spends her free time in class; whereas a student whose autonomy is being supported will be provided with opportunities to respond and participate in the flow of learning in the classroom (Reeve & Jang, 2006). A teacher who supplies autonomy support does not solely offer students choice; rather the teacher scaffolds the students' motivation and decision-making around learning—processes which positively impact student adjustment (Deci et al., 1991; Ryan & Deci, 2000). Thus it is plausible that the measure intended to assess perceived autonomy support in the current study may be, more accurately, a measure of student autonomy. Autonomy has been associated with increases in antisocial behavior in middle school (Barber & Olson, 2004), whereas autonomy support has been associated with less depression, fewer behavior problems, and decreased academic alienation among students in their first and second year of middle school (Eccles, Early, Fraser, Belansky, & McCarthy, 1997), further underscoring the difference between provision of autonomy support and solely autonomy.

Perceived Teacher Support Influences Student Defiance

The current study extends the literature by providing initial evidence for a relationship between perceived teacher support and defiance for sixth grade students. Students' perception of teacher support has been documented to influence disruptive behavior (Patrick et al., 2003), school maladjustment (Malecki & Demaray, 2003), and behavior problems (Way et al., 2007) for sixth-grade students. The current finding is particularly relevant to the literature as the defiance scale in the current study solely measures defiant behaviors directed toward teachers, whereas measures of externalizing problems used in other studies yield an assessment of a more diverse range of students' externalizing behaviors, including harassing other students (Patrick et al., 2003), lying and skipping school (Way et al., 2007), and a broad sample of school adjustment

behaviors (Malecki & Demaray, 2003). A clearer understanding of the potential for teacher support to ameliorate defiance toward teachers may facilitate better outcomes for students. Most discipline referrals are given for student defiant behavior in classrooms (Gregory & Weinstein, 2008), which in turn leads to a host of negative outcomes, including lower academic achievement (Arcia, 2006). Moreover, students' defiance increases teacher stress and burnout (Chang, 2013), and student defiant behavior increases throughout early adolescence (Olson et al., 2013). Whereas any type of externalizing behavior may lead to negative consequences or outcomes for students, their defiant behavior toward teachers in the classroom has the potential to disrupt the primary context for learning for all students in the classroom. Indeed, over half of the students at high poverty schools reported disruptions from defiant behaviors in the classroom hindered their learning opportunities (National Center for Education Statistics, 2005).

The findings from the current study show that students are less likely to defy teachers if they perceive the teachers are supportive. This finding was expected, as externalizing behavior problems are often exhibited when individuals do not feel able or competent to act effectively in a context or do not feel that they are cared for by others in that context (Walker et al., 2004). This result provides partial support for the application of self-determination theory to the sixth grade transition in that students who perceived that their needs for competence and relatedness were being met were likely to have better behavioral adjustment within that setting.

Perceived Teacher Support, Sixth Grade Transition Experience, and Defiance

The current study provides evidence for the potential of teacher support to attenuate linkages between school context and students' adjustment outcomes. Whereas previous studies have documented that teacher support mitigated the development of behavioral issues for middle school students who experienced social challenges such as bullying (Davidson & Demaray,

2007; Galand & Hospel, 2013) and deviant peer influence (Wang & Dishion, 2012), the current study highlighted the potential for teacher support to influence the relationship between non-social challenges in sixth grade (e.g., procedural and academic) and students' externalizing behavior.

The findings in this study, however, were inconclusive. In one set of analyses wherein structural equation modeling techniques were used, there was an interaction effect between teacher support and transition experience on student defiance. In the other set of analyses designed to provide additional information about the interaction effect (e.g., do students reporting high teacher support and high transition problems document lower defiance than students reporting low teacher support and low transition problems?), the interaction effect was non-significant, which precluded additional analyses into the nature of the interaction.

Although it was unexpected that the results of the two statistical procedures differed from one another, it is possible that measurement error may account for the discrepancy. Structural equation modeling techniques partition error variance, which allows for more accurate—and often more powerful—indications of the relationships between latent constructs such as the ones in the study. The interaction effect in the structural equation modeling was significant, but the amount of change in student defiance predicted by the interaction effect was small. Thus, when measurement error was reintroduced to the latent constructs of teacher support, transition experience, and defiance in the ANOVA procedure, the precision necessary to determine a significant interaction effect was lost. Therefore, the current study provides initial evidence that a combination of transition experience and teacher support influences students' spring defiance in sixth grade. Additional research is needed to illuminate the nature of the interactive effect.

Perceived Teacher Support, Perceived Transition Experience, and Social Anxiety

Despite a relatively strong literature base for an association between teacher support and internalizing outcomes such as depression and anxiety (Rudasill et al., 2014), no relationship was documented in the current study between perceived teacher support and social anxiety. Although a non-finding does not guarantee no relationship exists, it is worth considering potential reasons for a non-finding where theory suggests a relationship should exist. One possibility is that social anxiety is a relatively stable construct unlikely to change significantly in the course of a school year. The SCARED social anxiety measure assesses the degree to which students felt socially anxious over the past three months. It is possible that not enough time passed between the original assessment of the measure in the fall and the second assessment of the measure in the spring to expect teacher support or other study variables to influence social anxiety; however, social anxiety decreased slightly but significantly from fall to spring, which suggests the social anxiety does vary over a short period of time. It is also possible that social anxiety is a greater concern later in middle school, as one study showed that prevalence of social anxiety was twice as high for students between the ages of 13-14 as it was for students ages 11-12 (Copeland et al., 2013).

Limitations

Although the current study has a strong theoretical framework and a relatively large sample size, there are some limitations to note. The study includes only one sample, falling short of recommendations to calibrate a structural model on one sample of data and verify it with second sample (Kline, 2005). The findings from the structural model are in line with theory and the hypotheses, and replication of the findings from the model on data from a second sample would increase confidence in the model.

With regard to measurement, there are two limitations. First, focal variables in the study were assessed by student report due to the importance of students' perception for their schooling adjustment. Nonetheless, the study would have been strengthened by inclusion of teacher or observer report of both teacher support and student internalizing and externalizing behaviors in order to triangulate those constructs and provide a richer representation of the hypothesized relationships. Second, one of the strengths of the study may represent a limitation. Because the students were in middle school and had multiple teachers, the assessment of students' perception of the support they received from their teacher social convoy was intended to yield a more encompassing score of the total level of support they experienced than a measure of their relationship with only one teacher. This is a worthy distinction, as some teachers may provide more of one type of support than another, and the overall support students receive from their social convoy is theorized to be predictive of their adjustment (Benner, 2011). However, it is quite possible that students visualized their interactions with some but not all their teachers when responding to the items on this measure, or that students' responses were skewed by one teacher whose support was more extreme. Research is needed to determine the degree to which the assessment of teacher support captures support from all their teachers rather than from one or a handful of teachers. As research projects frequently are designed to investigate students' adjustment within the larger school context, it is important for measurement to be consistent with the goals of the studies; instruments designed to capture students' perceived support from one teacher in one classroom may need to be reconsidered and redesigned to assess students' perceived support from all the teachers with whom they interact in the schooling environment.

Implications for Practice

With the caveat that replication of the results is needed to bolster confidence in their generalizability, the findings from the current study broadly align with others in the field in documenting the importance of a supportive teacher-student relationship for student schooling adjustment (e.g., Davis, 2003; Wentzel, 2010). Provision of emotional and competence support to students is an essential skill that is not always covered as part of teacher training and professional development. One study revealed that over 30% of general education teachers could not remember having any pre-service training on how to provide students social support similar to the teacher support construct in this study, and an additional 31% of teachers remembered only receiving a broad overview of the topic (Pavri, 2004). The current study adds to the literature by illustrating the link between perceived teacher support and the particular externalizing behavior of defiance. Based on findings from the present study, teacher training and professional development courses should be designed to help teachers analyze student behavior in connection with their own provision of support. These recommendations align with findings from one study with a small sample of African-American high school students revealed that students' defiant behavior differed by teacher, and that students were more likely to defy teachers whom they perceived to treat them unfairly (Gregory & Thompson, 2010).

Implications for Future Research

Educational researchers would benefit from continued pursuit of a broader understanding of what constitutes teacher support. Teacher support is often narrowly assessed in the literature, with many studies including only one type or aspect of teacher support, usually emotional support (Wang, 2009). The current study revealed that perceived emotional support and perceived competence support shared a strong association and were best represented as a

singular teacher support construct. Autonomy support did not share strong associations with the teacher support construct; however, autonomy support as it was measured in the current study may more accurately be termed *perceived autonomy*. Indeed, the measure in the study assesses students' perceptions of their freedom to do what they want in class, which provides an indication of their autonomy. Perceived autonomy support, on the other hand, typically refers to how students' feel the teacher is providing opportunities for autonomy and scaffolding the students' ability to use their autonomy successfully and productively (Reeve, 2009). Future research is needed to determine whether or not items from other measures of perceived autonomy support can be combined with the perceived competence and emotional support measures used in the present study to form a broader teacher support factor for sixth grade students. Inclusion of such a measure would also allow for comparison of the relative influence of both perceived autonomy and perceived autonomy support from teachers on student adjustment during the sixth-grade transition as well as potential interaction and mediation effects of either construct with other contextual factors in the sixth grade transition. Additionally, a comparison between perceived autonomy and perceived autonomy support would provide an opportunity to test the applicability of self-determination theory to teacher support during the sixth grade transition. Findings indicating a strong influence of perceived autonomy on student adjustment would support stage-environment fit theory (Eccles et al., 1993) for the sixth grade transition, while self-determination theory would be bolstered by documented associations between perceived autonomy support and student adjustment. Because students undergoing the sixth grade transition typically are unaccustomed to the new realities of the schooling environment (Juvonen et al., 2004), we might expect them to need more autonomy support and less pure autonomy; seventh and eighth grade students, on the other hand, having already

adapted to the middle school environment, may have greater needs for autonomy than sixth grade students. One study revealed that seventh grade students report significantly more classroom autonomy than sixth grade students, suggesting that reality may mirror expectation; on the other hand, results from the same study indicated that seventh grade students who perceived themselves as having classroom autonomy exhibited more antisocial behaviors (Barber & Olsen, 2004). There is need for further research determining the relative influence of autonomy and autonomy support on early adolescent students, with particular attention to whether there are differences by grade level within the middle school environment.

Because sixth-grade students interact with multiple teachers, research is needed to better understand how students ascribe teacher support from their social convoy of teachers. Perhaps students report teacher support based on one particularly strong relationship with a teacher, and that teacher in effect carries the burden of support for that student. Thus, the quality of teacher support, the substance or type of teacher support, and the degree to which teacher support is perceived as being provided by one teacher relative to a group of teachers are all elements to be considered when researching teacher support.

Future research is also needed to provide further investigate the potential of perceived teacher support to moderate the relationship between perceived transition experience and defiance for sixth-grade students. If results continue to be inconclusive, there may be need to reassess the author's argument that life course theory and self-determination theory are the most salient frameworks for the influence of perceived teacher support and sixth-grade transition experience on student emotional and behavioral adjustment. A subsequent study which included a measure more aligned with perceived autonomy support would provide the opportunity to better determine whether a self-determination approach to teacher support differentially

influences the anticipated moderating relationship on transition experience and student emotional and behavioral adjustment. If autonomy support does not share strong associations with competence and emotional support, perhaps teacher support for sixth grade students is better explained by a theory which focuses on teacher warmth and fairness, such as attachment theory.

Additionally, as the literature base for teacher support grows, researchers should examine the extent to which relationships between students' academic, procedural, and social sixth grade transition experience and other internalizing and externalizing adjustment outcomes are moderated by teacher support.

Conclusion

The current study provided initial empirical evidence that support from a student's group of teachers has the potential to decrease the level of defiance exhibited when transitioning into and through sixth grade. Additionally, there was partial but inconclusive support that teacher support and students' transition experience may combine to influence student defiance. The results suggest that an integration of life course theory and self-determination theory may present an innovative approach for understanding how sixth-grade students interpret support from their social convoy of teachers; however more conclusive results are needed. With better comprehension of the ways in which teacher support interacts with other processes in the school ecology to influence student adjustment, we can better support teachers in their mission of helping students learn, grow, and develop to meet the challenges of the sixth grade transition.

Table 1.

Participating schools' characteristics and percentage of sixth-grade students consenting

School	School size	% minority students	% free/ reduced lunch	% math proficient	% reading proficient	Sixth grade N	% Consented
A	477	48.43	58.91	17.70	35.20	152	47.37
B	589	48.39	60.27	25.00	36.60	180	40.00
C	459	36.60	40.96	34.50	50.90	158	26.58
D	557	32.14	28.01	48.50	57.30	190	45.80
E	835	67.10	49.60	65.00	83.00	264	92.05
F	638	13.00	37.80	80.40	79.20	188	59.04

Note. School data obtained from National Center of Educational Statistics 2012-2013 (NCES, 2014).

Table 2.

Participant sample characteristics

Characteristic	***N* = 515 (%)**
Gender (Female)	271 (52.62%)
Free/Reduced Lunch	235 (45.63%)
Minority	237 (46.02%)

Table 3.

Item-level descriptive statistics in fall

Variable	Item	Mean	SD	Skewness	SESk	Kurtosis	SEKu
Defiance	1	2.15	1.34	0.93	0.11	-0.38	0.22
Defiance	2	2.19	1.36	0.95	0.11	-0.34	0.22
Defiance	3	2.10	1.36	0.99	0.11	-0.32	0.22
Defiance	4	1.89	1.20	1.37	0.11	0.94	0.22
Defiance	5	1.71	1.14	1.71	0.11	2.00	0.22
Social Anxiety	1	1.00	0.61	0.00	0.11	-0.33	0.22
Social Anxiety	2	1.01	0.75	-0.02	0.11	-1.23	0.22
Social Anxiety	3	0.94	0.75	0.10	0.11	-1.20	0.22
Social Anxiety	4	0.89	0.79	0.19	0.11	-1.36	0.22
Social Anxiety	5	1.05	0.83	-0.09	0.11	-1.53	0.22
Social Anxiety	6	0.70	0.74	0.55	0.11	-1.02	0.22
Social Anxiety	7	0.59	0.74	0.84	0.11	-0.72	0.22
SAT-MS-R: Academic	3	2.14	1.08	0.46	0.11	-1.09	0.22
SAT-MS-R: Academic	4	2.23	1.04	0.26	0.11	-1.15	0.22
SAT-MS-R: Academic	7	2.30	1.15	0.27	0.11	-1.37	0.22
SAT-MS-R: Procedural	1	1.46	0.72	1.63	0.11	2.33	0.22
SAT-MS-R: Procedural	2	1.34	0.73	2.27	0.11	4.43	0.22
SAT-MS-R: Procedural	6	1.70	0.89	1.18	0.11	0.53	0.22
SAT-MS-R: Procedural	14	1.37	0.77	2.17	0.11	3.86	0.22
SAT-MS-R: Procedural	15	1.44	0.80	1.87	0.11	2.71	0.22
SAT-MS-R: Social	5	1.40	0.81	2.09	0.11	3.36	0.22
SAT-MS-R: Social	8	2.22	1.16	0.39	0.11	-1.33	0.22
SAT-MS-R: Social	9	1.56	0.89	1.50	0.11	1.20	0.22
SAT-MS-R: Social	10	1.57	0.89	1.47	0.11	1.08	0.22
SAT-MS-R: Social	11	1.67	0.88	1.40	0.11	0.87	0.22
SAT-MS-R: Social	12	1.55	0.91	1.56	0.11	1.27	0.22
SAT-MS-R: Social	13	1.47	0.84	1.75	0.11	2.01	0.22

Note. SEKu = standard error of kurtosis; SESk = standard error of skewness; SAT-MS-R = Survey of Adaptational Tasks of Middle School—Revised (Malley et al., under review).

Table 4.

Item-level descriptive statistics in spring

Variable	Item	Mean	SD	Skewness	SESk	Kurtosis	SEKu
Defiance	1	2.44	1.46	0.61	0.11	-1.03	0.22
Defiance	2	2.44	1.43	0.63	0.11	-0.94	0.22
Defiance	3	2.28	1.39	0.80	0.11	-0.66	0.22
Defiance	4	2.11	1.32	1.02	0.11	-.017	0.22
Defiance	5	1.92	1.30	1.27	0.11	0.33	0.22
Social Anxiety	1	1.02	0.66	-0.02	0.11	-0.67	0.22
Social Anxiety	2	0.95	0.75	0.07	0.11	-1.20	0.22
Social Anxiety	3	0.86	0.76	0.24	0.11	-1.24	0.22
Social Anxiety	4	0.83	0.79	0.30	0.11	-1.34	0.22
Social Anxiety	5	1.00	0.84	-0.01	0.11	-1.59	0.22
Social Anxiety	6	0.65	0.75	0.67	0.11	-0.94	0.22
Social Anxiety	7	0.57	0.73	0.88	0.11	-0.61	0.22
Autonomy Support	1	2.82	1.24	0.09	0.11	-0.81	0.22
Autonomy Support	2	2.81	1.24	0.12	0.11	-0.90	0.22
Competence Support	1	3.84	1.13	-0.75	0.11	-0.30	0.22
Competence Support	2	3.61	1.22	-0.62	0.11	-0.53	0.22
Competence Support	3	3.57	1.26	-0.64	0.11	-0.59	0.22
Emotional Support	1	3.40	1.29	-0.43	0.11	-0.84	0.22
Emotional Support	2	3.72	1.21	-0.78	0.11	-0.32	0.22

Note. SEKu = standard error of kurtosis; SESk = standard error of skewness.

Table 5.

Reliability estimates of study measures

Variable	Assessment timeframe	Cronbach's alpha	Maximal reliability (H)
Defiance	Fall	.90	.94
Defiance	Spring	.93	.96
Social Anxiety	Fall	.79	.89
Social Anxiety	Spring	.84	.91
SAT-MS-R: Academic subscale	Fall	.72	.79
SAT-MS-R: Procedural subscale	Fall	.63	.78
SAT-MS-R: Social subscale	Fall	.75	.87
Autonomy Support	Spring	.69	N/A
Competence Support	Spring	.85	N/A
Emotional Support	Spring	.78	N/A
Teacher Support	Spring	.88	.91

Note. Teacher support scale comprised the five items from the emotional support and competence support measures. Maximal reliability estimates drawn from the final measurement model (Figure 2). N/A = not applicable; SAT-MS-R = Survey of Adaptational Tasks of Middle School—Revised (Malley et al., under review).

Table 6.

Latent interaction term item construction using a matched-pair products strategy

Teacher support items	**Sixth grade transition experience items**
1. Our teachers in this school treat us fairly	4. Having to do harder school work 10. Kids trying to talk you into things you don't want to do
2. Most of my teachers are friendly	2. Forgetting your locker combination 7. Getting too much homework 13. Not being in the "in group", like not being able to go around with the group of kids you'd like to hang around with
3. My teachers explain things when I'm confused	1. Getting lost and not being able to find your way around school 5. Finding kids I can sit with at lunch 14. Having to change classes
4. My teachers give good advice	11. Being bothered by the older kids 12. Other kids teasing you 15. Understanding new rules
5. My teachers in this school help me solve problems	3. Having a tough teacher 6. Not having the right books or supplies for class 9. Having trouble making new friends

Note. Item matching followed the guidelines of Marsh et al. (2012): all items be used and no item should be reused. Item matching choices were guided by theory and by item correlation values, with the highest being matched together.

Table 7.

Model fit indices for measurement models

Model	χ^2	**RMSEA**	**CFI**	**TLI**	**WRMR**
Hypothesized model	$\chi^2(924) = 1167.06$, $p < .001$	.02	.98	.98	1.83
Teacher support first-order factor, SGTE second-order factor, PAS removed	$\chi^2(842) = 1100.79$, $p < .001$	.03	.98	.98	1.91
First-order factor only model, PAS removed	$\chi^2(832) = 1050.43$, $p < .001$	.02	.98	.98	1.72
Final model, interaction factor added	$\chi^2(1044) = 1273.64$, $p < .001$	.02	.98	.98	1.72

Note. Hypothesized model yielded multicollinearity issues. PAS = perceived autonomy support; SGTE = sixth-grade transition experience. Final model was only model with interaction term included.

Table 8.

Three-factor mixed design ANOVA testing for effects on defiance

Tests of within-subject effects

Source	SS	df	MS	F	*p*
Time	13.48	1	13.48	35.58	< .001
Time x Teacher support	6.61	1	6.61	17.45	< .001
Time x Transition experience	1.05	1	1.05	2.77	.10
Time x Teacher support x Transition experience	.00	1	.00	.00	1.00
Error	186.10	491	.379		
Total	207.24	495			

Tests of between-subject effects

Source	SS	df	MS	F	*p*
Intercept	4413.61	1	4413.61	2171.06	< .001
Teacher support	86.04	1	86.04	42.33	< .001
Transition experience	14.52	1	14.52	7.14	< .01
Teacher support x transition experience	.66	1	.66	.33	.57
Error	998.17	491	998.17		

Note. Three factors include: time (within-subjects factor), teacher support (between-subjects factor), and transition experience (between-subjects factor). Each factor had two levels (time: fall and spring; teacher support: high and low; and transition problems: high and low). Levene's test was significant at < .001, suggesting an inequality of error variances across groups. The Huynh-Feldt correction was used when evaluating within-subjects effects, as the Huynh-Feldt is considered to be the more powerful correction for within-subject effects compared to the Greenhouse-Geisser (Abdi, 2010).

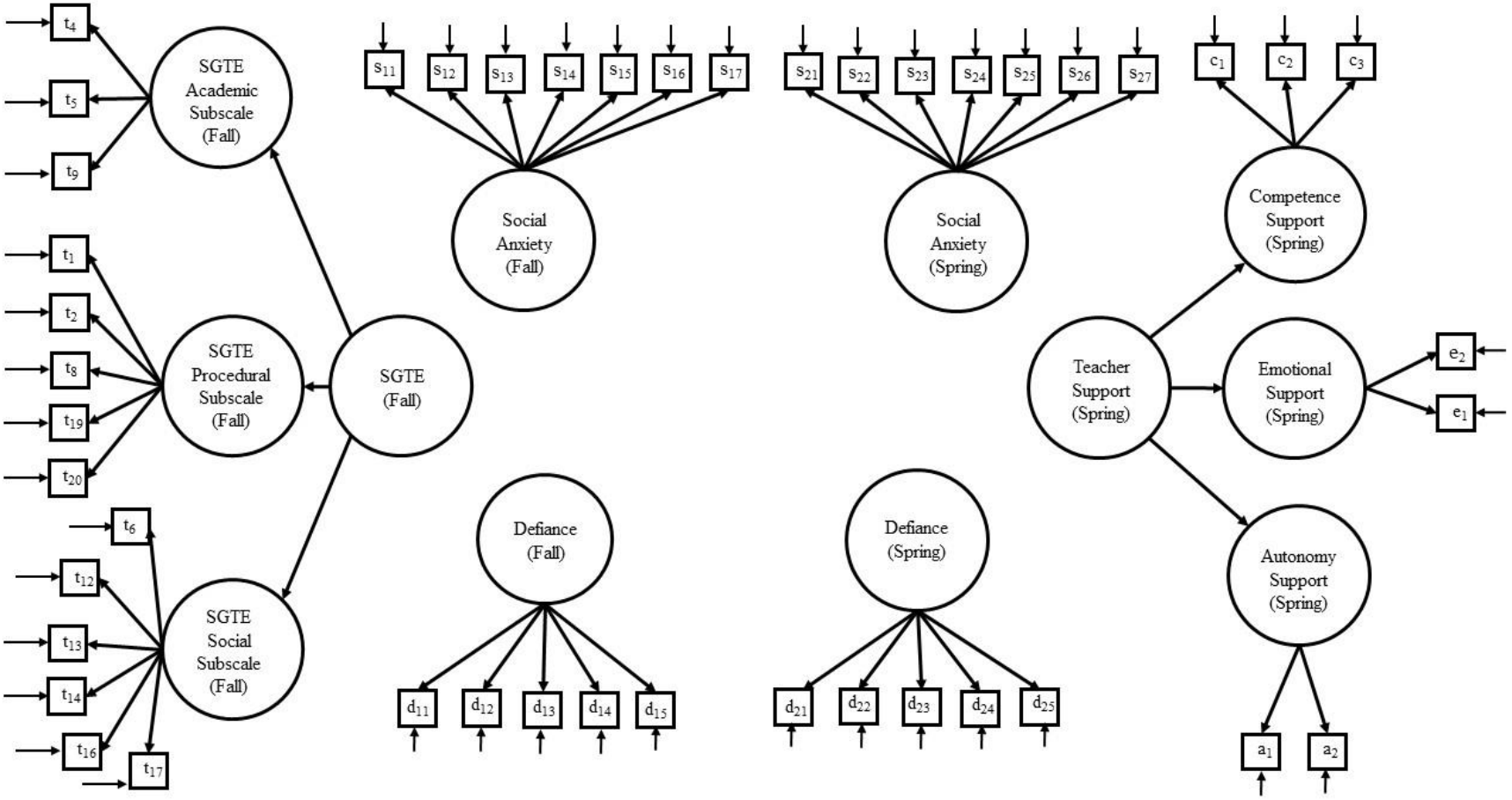

Figure 1. Hypothesized unrestricted measurement model for testing direct and effects of perception of teacher support (spring) and perception of sixth-grade transition experience (fall) on defiance and social anxiety. All latent factors allowed to correlate. SGTE = sixth-grade transition experience.

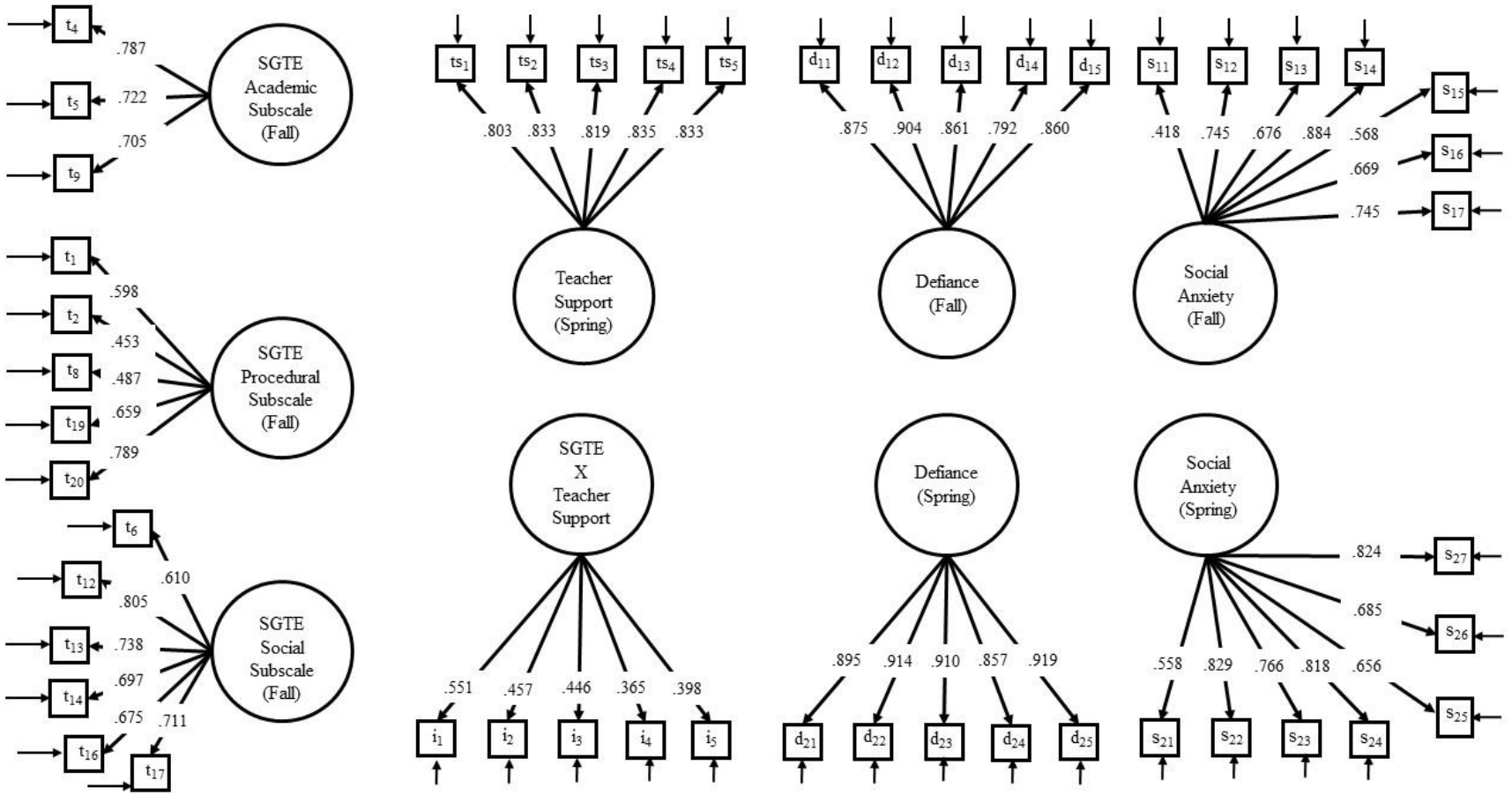

Figure 2. Final measurement model for testing direct and interactive effects of perception of sixth-grade transition experience (fall) and perception of teacher support (spring) on defiance and social anxiety. Autonomy support was removed from the model. All latent factors allowed to correlate. All loadings standardized and significant at $p < .001$. SGTE = sixth-grade transition experience. Model fit indices: $\chi^2(1044) = 1273.64$, $p < .001$; RMSEA = 0.02, 90% CI [0.02, 0.03]; CFI = .98; TLI = .98, WRMR = 1.72.

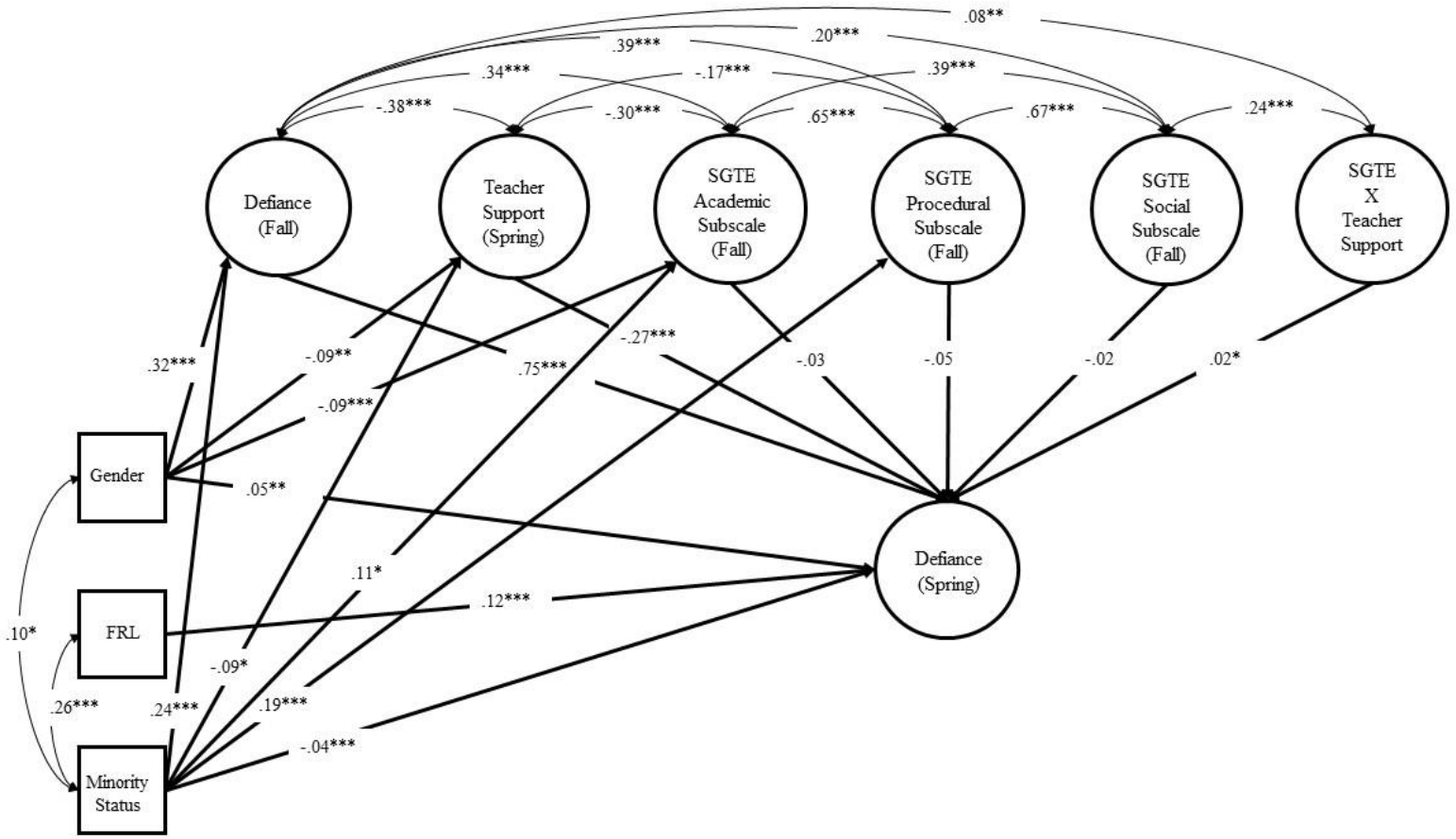

Figure 3. Structural model testing for direct and interactive effects of perception of sixth-grade transition experience (fall) and perception of teacher support (spring) on student defiance. All coefficients are standardized and all constructs were allowed to correlate. All regression paths for defiance shown. Only significant correlation paths shown. *$p < .05$, **$p < .01$, ***$p<.001$. FRL = free/reduced lunch status; SGTE = sixth-grade transition experience. Model fit indices: $\chi^2(587) = 783.40$, $p < .001$; RMSEA = 0.03, 90% CI [0.02, 0.03]; CFI = .99; TLI = 0.98; WRMR = 1.68.

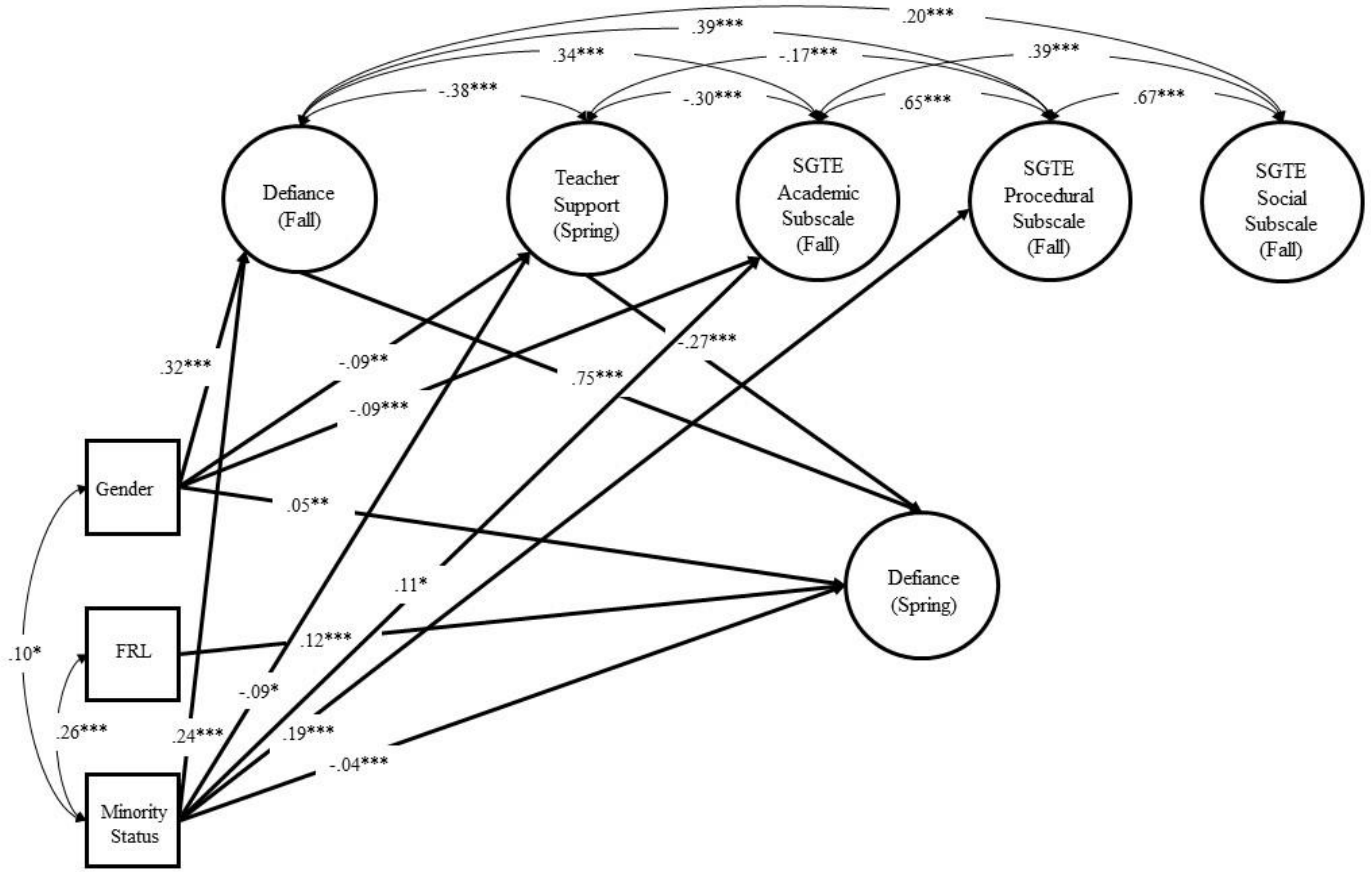

Figure 4. Structural model testing for direct effects of perception of sixth-grade transition experience (fall) and perception of teacher support (spring) on student defiance. All coefficients are standardized and all constructs were allowed to correlate. Only statistically significant relationships shown. *$p < .05$, **$p < .01$, ***$p<.001$. FRL = free/reduced lunch status; SGTE = sixth-grade transition experience. Model fit indices: $\chi^2(431) = 616.38$, $p < .001$; RMSEA = 0.03, 90% CI [0.02, 0.03]; CFI = .99; TLI = 0.99; WRMR = 1.66.

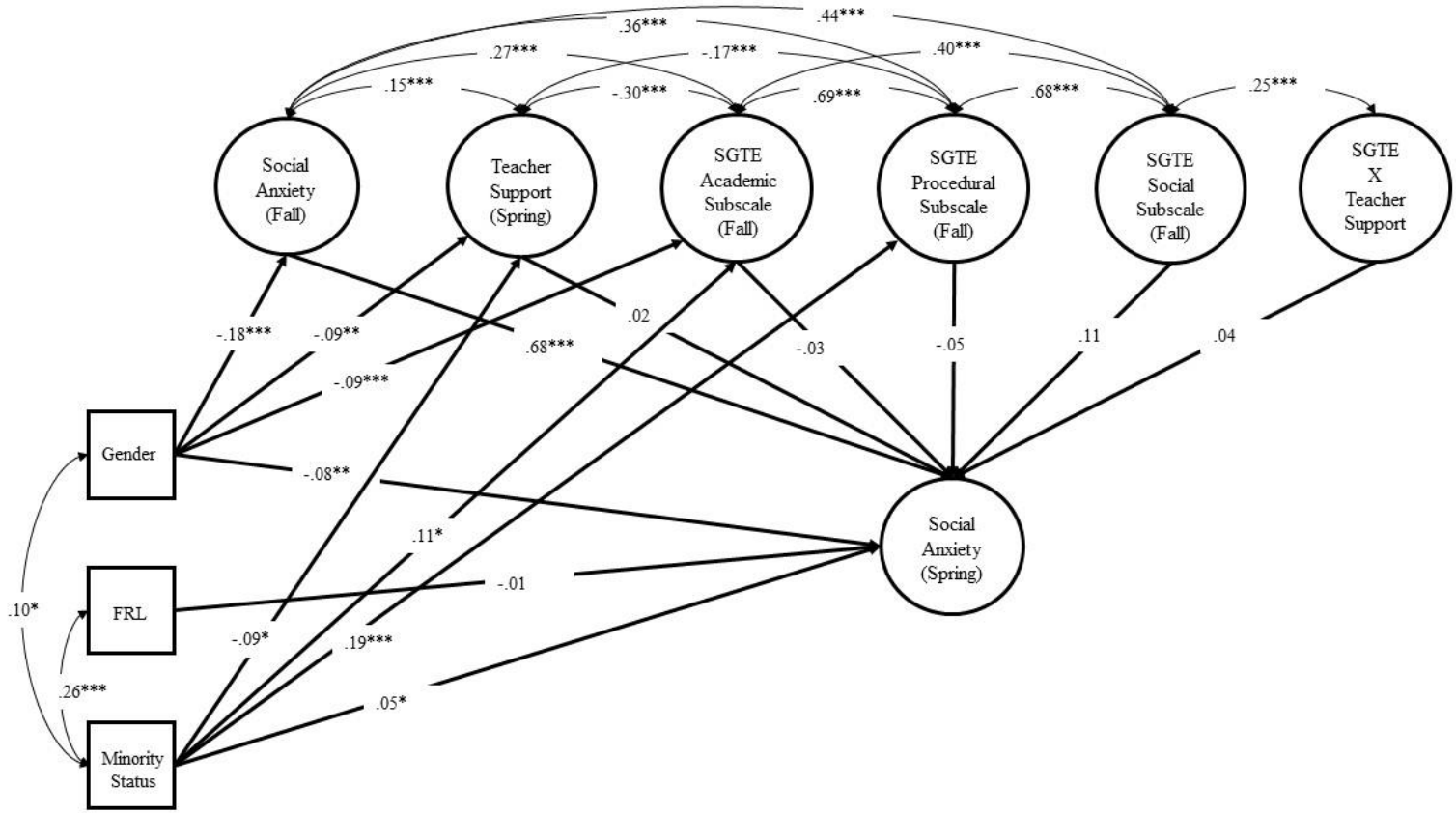

Figure 5. Structural model testing for direct and interactive effects of fall sixth-grade transition experience and spring teacher support on spring student social anxiety. All coefficients are standardized, and all latent constructs were allowed to correlate. All regression paths shown for social anxiety (spring). Only significant correlation paths shown. *$p < .05$, **$p < .01$, ***$p<.001$. FRL = free/reduced lunch status; SGTE = sixth-grade transition experience. Model fit indices: $\chi^2(737) = 910.05$, $p < .001$; RMSEA = 0.02, 90% CI [0.02, 0.03]; CFI = .95; TLI = 0.95, WRMR = 1.59.

APPENDIX 1: STUDY MEASURE ITEMS

Perceived Sixth-grade Transition Experience

Academic subscale (α = .72)
3. Having a tough teacher.
4. Having to do harder school work.
7. Getting too much homework.

Procedural subscale (α = .63)
1. Getting lost and not being able to find your way around school.
2. Forgetting your locker combination.
6. Not having the right books or supplies for class.
14. Having to change classes.
15. Understanding new rules.

Social subscale (α = .75)
5. Finding kids I can sit with at lunch.
8. Not getting to see your friends from elementary school enough.
9. Having trouble making new friends.
10. Kids trying to talk you into things you don't want to do.
11. Being bothered by older kids.
12. Other kids teasing you.
13. Not being the "in group", like not being able to go around with the group of kids you'd like to hang around with.

Teacher Support

Perceived autonomy support (α = .69)
1. Students in my classes have a say in their use of class time.
2. Students in my classes have a say in classroom activities.

Perceived competence support (α = .85)*
1. My teachers explain things when I'm confused.
2. My teachers give good advice.
3. My teachers in this school help me solve problems.

Perceived emotional support (α = .78)*
1. Most of my teachers are friendly.
2. Most of my teachers treat me fairly.

*The five items from the perceived competence support and perceived emotional support subscales were combined to form a first-order teacher support latent variable with high internal consistency (α = 88).

Social Anxiety Symptoms (fall α = .79, spring α = .84)

1. I don't like to be with people I don't know well.
2. I feel nervous with people I don't know well.
3. It is hard for me to talk with people I don't know well.
4. I feel shy with people I don't know well.
5. I feel nervous when I am with other children or adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport).
6. I feel nervous when I am going to parties, dances, or any place where there will be people that I don't know well.
7. I am shy.

Defiance (fall α = .90, spring α = .93)

1. I sometimes annoy my teacher during class.
2. I sometimes get into trouble with my teacher during class.
3. I sometimes behave in a way during class that annoys my teacher.
4. I sometimes don't follow my teacher's directions during class.
5. I sometimes disturb the lesson that is going on in class.

Demographic Variables

1. Gender
2. Minority status
3. Free/reduced lunch

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