

4-6-2017

Partial Mediation and Moderation Effects of Class Peer Norms on the Relations of Teacher Support with Student Aggression and Academic Engagement during Early Adolescence

Huanhuan Wang

University of South Florida, huanhuan@mail.usf.edu

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Partial Mediation and Moderation Effects of Class Peer Norms on the Relations of Teacher
Support with Student Aggression and Academic Engagement during Early Adolescence

by

Huanhuan (Joy) Wang

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
in School Psychology
Department of Educational and Psychological Studies
College of Education
University of South Florida

Co-Major Professor: Sarah M. Kiefer, Ph.D.
Co-Major Professor: Shannon M. Suldo, Ph.D.
Linda M. Raffaele Mendez, Ph.D.
John M. Ferron, Ph.D.

Date of Approval:
April 7, 2017

Keywords: teacher support, class peer norm, aggression, academic engagement, early
adolescence

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Acknowledgements

First, I would like to thank Dr. Thomas Oakland (Papa Tom) for introducing me to the field of school psychology and providing me endless support to pursue my professional goals. I appreciate Dr. Oakland planted the seed in me to seek doctoral education, and the numerous supports he provided in my application to doctoral programs and during the first two years of my study at USF. Once I started my program at USF, he called me weekly, discussing my transition, academics, social life, financials, culture differences and others, no matter at which part of the world he was. This consistent mentorship helped me have a very smooth transition despite experiencing challenges. Every accomplishment in my doctoral program and future career has his contribution.

I would like to thank my committee for the guidance, support, and encouragement on my doctoral study, including this dissertation. I am so grateful to have Dr. Sarah Kiefer as my major professor, with whom I have been working since the first day of my study at USF. Thanks to Dr. Kiefer's expertise, mentorship, optimism, and the spirit to have fun when working, I was able to turn our "Panera conversation" into a dissertation, and most importantly I enjoyed the process of completing it. I am also very grateful to have Dr. Shannon Suldo as my co-major professor. I particularly appreciate Dr. Suldo's honest guidance on the timeline to complete my doctoral study. There are very few people whose suggestions I would follow even if I do not quite agree

with initially, and she is one of them. The mentorship she provided through her research team greatly expanded my interest and confidence in conducting research, including this dissertation. There would be no way to complete the dissertation if without Dr. John Ferron's ongoing support in data analysis. I almost had a "panic attack" when I realized I could not visit Dr. Ferron on a regular basis to seek help on data analysis, due to the start of my internship. I appreciate his patience in answering my endless statistics questions. I also would like to thank Dr. Linda Raffaele Mendez for her support and guidance throughout my study at USF. The initial contact with Dr. Raffaele Mendez helped me make connection to the program and eventually made the decision to join the program.

I am grateful to my parents for tolerating me being the oldest student in our entire extended family and probably in the town where my family has been living for generations. Fortunately, I will graduate soon. I am grateful to Roy, my husband. I appreciate he offered or agreed to do the majority of housework when I had to squeeze time to work on my dissertation. I also appreciate the delicious meals he made as rewards for the various milestones I reached in completing this dissertation and the technical support he provided.

Last but not least, I would like to thank the many friends who helped me throughout my study at USF, particularly Wenjun Chen, Natalie Hofmann, Jason Chen, and Stefan Lupkiewicz. Wenjun has been my go-to-person for whatever problems I encounter. Natalie has the magic to make me smile or laugh, even if we start a conversation because of complaining about something. Jason was the only person with whom I could speak Chinese in person regularly during the first year of my study, and he trained me, who knew nothing about vehicles, to get my

driver's license. Stefan generously agreed to read my dissertation proposal and provided me great feedback.

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Abstract

The purpose of this study was to examine the mediation and moderation effects of classroom peer norms (CPN) on the associations of teacher support with student engagement and aggression during sixth grade (first year of middle school). Current literature suggests that early adolescence is a critical developmental period with many changes occurring, including a peak in aggression, decreased academic engagement, increased peer influence, and decreased teacher support. Despite these challenging changes, teachers often serve as a powerful yet “invisible hand” (Farmer, Lines, & Hamm, 2011) that can influence student behaviors directly or indirectly via CPN. However, these two routes of teacher influence have rarely been examined simultaneously. The current study investigated these two routes by examining the partial mediation and moderation effects of CPN on the associations of teacher support with four student behaviors (overt and relational aggression, involved and disruptive behavior) among a diverse sample of 312 students from 32 classrooms across the fall and spring of sixth grade. Students self-reported teacher support (academic, emotional) and engagement (involved, disruptive behavior) and peer-nominated aggression (overt, relational). CPN was computed as a class average of a certain behavior (aggression or engagement). Multilevel modeling was used to test the mediation and moderation effects, considering the nested nature of the data (i.e., students nested within classrooms). Results indicated full mediation effect of CPN on the relations of fall

teacher support with spring overt aggression, relational aggression, and disruptive behavior, and a moderation effect on spring involved behavior. Interestingly, the average classroom perception of teacher support showed a significant direct negative effect on relational aggression and disruptive behavior, and a direct positive effect on involved behavior, all of which became smaller and non-significant when CPN was taken into consideration (i.e., when the indirect or mediation effect was considered). In terms of the mediation effects, classes which had high levels of average perception of teacher support in the fall tended to have low disruptive behavior CPN, which was further associated with low levels of individual student disruptive behavior in the spring. The same mechanism applied to overt and relational aggression, except that the significance level of the relations of CPN with overt and relational aggression was marginal (i.e., $p < .10$). The moderation effect suggests that students who reported high levels of teacher support in the fall (relative to his/her classmates, regardless of the class average) tended to report high levels of involved behavior in the spring only if the fall involved behavior CPN was also high. These findings highlight the importance to investigate both teacher and peer influence within a classroom in order to better understand student behaviors during the first year of middle school. Theoretical and practical implications are discussed, as well as limitations and future directions.

Chapter One: Introduction

Statement of the Problem

Early adolescence is a critical developmental stage with many changes occurring, including a peak in aggression (Pellegrini & Long, 2002) and decline in academic engagement (Eccles et al., 1993; Lamote, Broeck, Van Den Noortgate, & Van Damme, 2013). During this stage, aggression (both overt and relational) is significantly associated with peer status (Bellmore, Villarreal, & Ho, 2011; Rodkin, Ryan, Jamison, & Wilson, 2013; Rose, Swenson, & Waller, 2004). Youth display increasingly more aggression in part to obtain and/or maintain peer status. This may be especially salient upon entering middle school when the peer hierarchy is in flux and youth navigate within a new school context (Pellegrini & Long, 2002). In contrast, academic engagement becomes increasingly incompatible with high peer status during this stage, and is less valued among middle school students compared to their elementary school counterparts (Galvan, Spatzier, & Juvonen, 2011).

Another significant change during early adolescence is the increase of peer influence in school (Berndt, 2004; Larson & Richards, 1991). Classroom peers are in a particularly influential position due to the proximity and structured time they spend together (Chang, 2004; Ladd, Herald-Brown, & Kochel, 2009). It is concerning that peer norms of aggression and academic

engagement develop in a negative trend during early adolescence in that they become more favorable towards aggression and less favorable towards academic engagement (Bellmore et al., 2011; Galvan et al., 2011).

In addition to peers, teachers are another unique, influential force on early adolescents' behaviors in school (Farmer et al., 2011). High levels of teacher support can protect students from aggressive behaviors (Luckner & Pianta, 2011) and promote academic engaged behaviors (Partick, Ryan, & Kaplan, 2007; Roorda, Koomen, Split, & Oort, 2011). In addition to influencing individual student behaviors, teachers may shape class peer norms as well (Farmer et al., 2011; Hamm, Farmer, Dadisman, Gravelle, & Murray, 2011; Hamm, Farmer, Lambert, & Gravelle, 2014), which have significant implications for early adolescents' behaviors (Chang, 2004). In summary, teachers have two routes to influence students' behaviors: a direct route and an indirect route via class peer norms. However, these two routes have rarely been examined simultaneously (Bierman, 2011; Farmer et al., 2011). The current study aimed to investigate these two routes simultaneously, so that we could learn the unique and joint influences of teachers and classroom peers on early adolescents' behaviors (aggression and engagement) during the first year of middle school.

Examining aggression and engagement during early adolescence. Aggression (overt and relational) can have maladaptive consequences for early adolescents' school adjustment. For example, engaging in aggression may interfere with students' learning and interpersonal relationships (Crick, 1996; Malecki & Elliott, 2002), inhibit the establishment of close teacher-

student relationships and negatively impact classroom dynamics (Stipek & Miles, 2008; Thomas, Bierman, & Powers, 2011), as well as cause harm towards students whom the aggression is targeted (Juvonen, Graham, & Schuster, 2003; Nansel et al., 2001). Although aggression may garner students some positive consequences under certain conditions, such as high peer status (LaFontana & Cillessen, 2002; Juvonen, Wang, & Espinoza, 2013), this often comes at a cost, such as undermined intimacy (Ojanen, Findley, & Fuller, 2012). More importantly, the occurrence of aggression and susceptibility to peer influence peak during early adolescence (LaFontana & Cillessen, 2010; Moffit, 1993; Pellegrini & Long, 2002). Many school-based aggression prevention/intervention programs have been developed to reduce aggressive behaviors, such as Coping Power (Lochman & Wells, 2008), indicating an awareness regarding the importance to help students to build in skills to cope with anger and aggression and to create an environment free of aggression. However, the effectiveness of such programs often is mitigated due to negative peer dynamics, such as peer contagion (Dishion & Tipsord, 2011; Larson & Lochman, 2011), which indicates the necessity to investigate aggression from a contextual perspective.

Academic behavioral engagement (involved and disruptive behavior) is a fundamental precursor to students' school success (Fredricks, Blumenfeld, & Paris, 2004). Students who are highly engaged are more likely to obtain higher academic achievement (Ladd et al., 2009) and complete school (Finn & Rock, 1997; Reschly & Christenson, 2006). Engagement has also been proven to be an important mediator between a supportive classroom context and the actual gains

in student achievement (Dotterer & Lowe, 2011; Reyes, Brackett, Rivers, White, & Salovey, 2012). Additionally, behavioral engagement has implications for student well-being in domains other than academics, such as mental health and problem behaviors (Li & Lerner, 2011; Wang & Fredricks, 2014; Wang & Peck, 2013). However, students are not engaged in school as much as we might expect. Oftentimes students do not have enough opportunities to be engaged in academics due to school structural factors, including losing time to non-learning activities such as transition and waiting (Gettinger & Walter, 2012). In addition to having limited time available to engage academically, many students experience boredom due to a non-challenging curriculum (Eccles & Roeser, 2011). This is especially prominent during the beginning of the middle school years, when there is often a mismatch between curriculum and students' developmental needs (Eccles & Roeser, 2011; Larson, 2000). As a result of not having their developmental needs met within the learning environment, students' academic engagement may significantly decrease when entering into middle school (Eccles et al., 1993; Lamote et al., 2013; Li & Lerner, 2011), despite engagement having significant long-term implications for student academic success (Balfanz, Herzog, & Mac Iver, 2007).

Influence of class peer norms. Peers are an important developmental context for students, and students' susceptibility to peer influence peaks during early adolescence (LaFontana & Cillessen, 2010; Larson & Richards, 1991). There are multiple peer contexts during adolescence, including best friends, peer groups, and classroom peers (Rubin, Bukowski, & Bowker, 2015). Classroom peers are particularly influential for early adolescents' social and

academic adjustment because of the physical proximity and the large amount of structured time they spend together daily (Ladd et al., 2009). Research indicates the average level of a certain behavior within a classroom (defined as class peer norms in this study) has significant implications for individual student's adjustment, including aggression and academic engagement (Chang, 2004). Class peer norms often serve as criteria from which students infer what desired behaviors are in the class and subsequently conform to such perceptions (Chang, 2004; Farmer et al., 2011; Henry, 2008), regardless of the accuracy of their perception (Helms et al., 2014). For instance, students incur fewer negative consequences such as peer rejection for their aggression and gain more positive consequences such as perceived popularity within classrooms with high average levels of aggression (Bellmore et al., 2011; Rodkin et al., 2013). When placed in such classrooms, students show larger increases in aggression than their counterparts in classrooms with low average levels of aggression (Barth, Dunlap, Dane, Lochman, & Wells, 2004; Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Mercer, McMillen, & DeRosier, 2009).

This may be the case in particular for students at-risk, such as students with high initial level of aggression (Barth et al., 2004) or students with high social status (Bellmore et al., 2011). Similarly, students in high achieving classrooms are more likely to experience positive consequences as a result of their positive academic adjustment (Jonkman, Trautwein, & Lüdtke, 2009) and display greater increases in academic engagement when placed in such classrooms (Barth et al., 2004). However, class peer norms generally develop in a negative trend during early adolescence in that aggression becomes more valued and prevalent and engagement

becomes less valued (Galvn et al., 2011). Therefore, it is important to investigate what factors may influence such changes in addition to further examine the impact of class peer norms on individual student’s aggression and engagement.

Influence of teacher support. Teacher support, which is conceptualized as students’ perception of the emotional and academic support they receive from teachers (Johnson & Johnson, 1983; Johnson, Johnson, & Anderson, 1983), is another important component of the classroom social system shaping students’ behaviors (Crosnoe & Benner, 2015). High levels of teacher support are a developmental asset that can protect students from behavioral and academic problems (Baker, 2006; Farmer et al., 2011; Roorda et al., 2011; Sabol & Pianta, 2012). High levels of teacher support are associated with low levels of student aggression (Luckner & Pianta, 2011; Murray-Harvey & Slee, 2010) and predict decreased student aggression over time (O’Connor, Dearing, & Collins, 2011). Similar influences are observed regarding student academic adjustment. Research indicates positive associations between high levels of teacher support and high student academic engagement (Garcia-Reid, Reid, & Peterson, 2005; Murray, 2009; O’Connor & McCartney, 2007; Patrick et al., 2007; Roorda et al., 2011) and positive relations between low levels of teacher support and low levels of student academic engagement (Hamre & Pianta, 2005).

There are several concerning trends in teacher support during middle school. Students tend to receive less support from teachers when they become older (O’Connor, 2010), despite teachers having a stronger influence on adolescents than children (Roorda et al., 2011). Students

who engage in aggressive behavior are often at risk, as they tend to develop low quality relations with their teachers and receive less support (Stipek & Miles, 2008). In addition, middle school teachers reported less competence in managing social interactions within a classroom than their elementary school counterparts (Ryan, Kuusinen, & Bedoya-Skoog, 2015), and one third of middle school teachers are unsure or do not believe in the importance of supportive teacher-student relationships (Davis, 2006). Therefore, it is critical to examine the influence of teacher support on student adjustment upon entering middle school, which may provide insight into teacher support during this significant period and have implications as how to help teachers to provide more support to students so that the prevalence of student aggressive behaviors will be minimized and academic engagement will be maximized.

Compared to the well-known impact of teacher support on individual student's adjustment, much less is studied about its influence on the classroom as a whole (Bierman, 2011; Farmer et al., 2011). Teachers are in a unique and powerful position to set the overall structure and tone for the classroom dynamic (Farmer et al., 2011; Troop-Gordon, 2015). It is promising that recent school-based intervention studies indicate teachers can shape peer norms, in addition to their direct influence on individual student's behaviors (Hamm et al., 2014; Hamm, Farmer, et al., 2011). However, more evidence is needed.

Partial mediation model: Class peer norms. The first primary aim of this study was to examine the partial mediation effect of class peer norms on the association between teacher support and individual student behaviors (overt and relational aggression, involved and

disruptive behavior). As discussed above, class peer norms and teacher support have significant implications for early adolescents' social and academic behaviors. Recent research provides promising initial evidence that teachers can be an important 'invisible hand' (Farmer et al., 2011) that shapes individual student behaviors via two routes – both directly and indirectly – through class peer norms (i.e., a partial mediation model, see Figure 1). However, these two routes have rarely been examined together (Bierman, 2011; Farmer et al., 2011). It is important to examine this partial mediation model as students are exposed to both teacher and peer influences within a classroom (Neal & Neal, 2013; Thomas et al., 2011). It is critical to consider both sources of influence, as teachers and peers take on an increasingly salient and unique role during early adolescence when students strive to construct their own values (Cairns & Cairns, 1994; Farmer, Xie, Cairns, Hutchins, 2007; Farmer et al., 2011; Wentzel, Battle, Russell, & Looney, 2010). This model not only captures the two major influential forces within classrooms (teachers and peers), but also allows for the examination of an interactive influence of teachers and peers on individual student behaviors (Bierman, 2011; Farmer et al., 2011; Hughes & Chen, 2011; Neal & Neal, 2013). Thus, the first primary aim of this study was to investigate the partial mediation model of class peer norms on the association between teacher support and individual student behaviors.

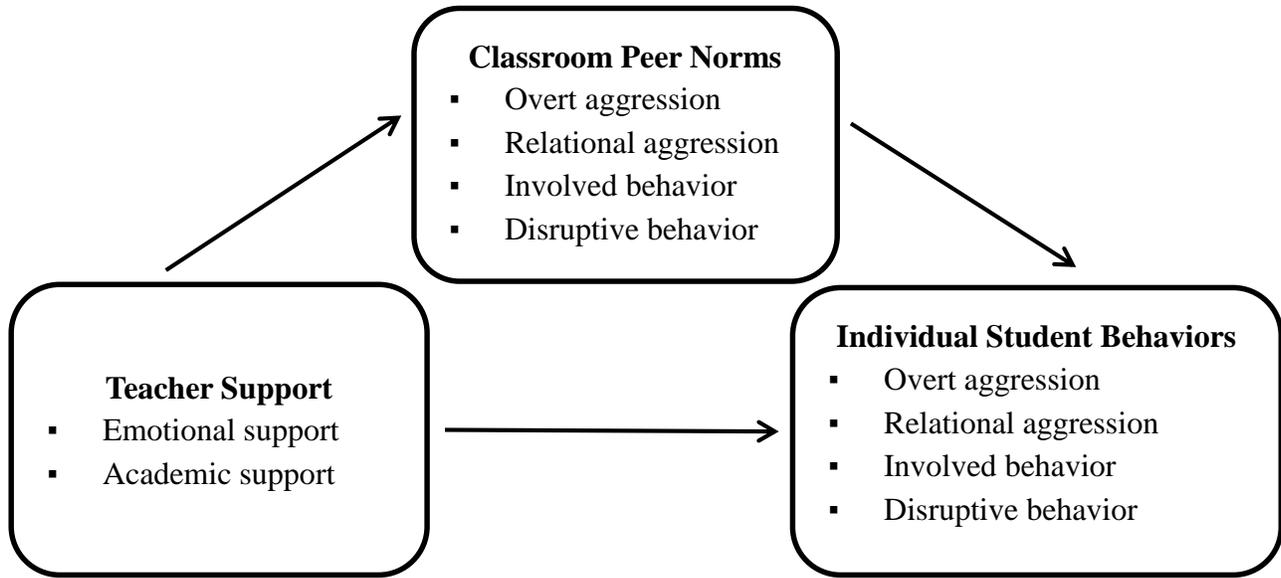


Figure 1. Partial mediation model of class peer norms on the association between teacher support and individual student behaviors.

Moderation effect of class peer norms. The second primary aim of the study was to investigate the potential moderation effect of class peer norms on the association between teacher support and individual student behaviors (overt and relational aggression, involved and disruptive behavior). Research indicates teachers have a stronger influence on individual student behaviors in classroom or school environments characterized by lower levels of aggression (Conduct Problems Prevention Research Group [CPPRG], 2010; Guerra, Boxer, & Cook, 2006; Hughes, Cavell, Meehan, Zhang, & Collie, 2005). For example, in a longitudinal randomized controlled trial involving 86 second and third grade students, Hughes and colleagues (2005) found an intervention program, the major component of which was providing emotional support to students by mentors (undergraduate students) during lunch time, was more effective in improving academic achievement and reducing aggression for students in less adverse school

environments. In other words, low levels of school adversity (adversity was defined as high levels of aggression and mobility, low levels of socioeconomic status) amplified the effectiveness of emotional support (i.e., moderation effect).

Similar results were reported in another longitudinal randomized controlled trial (CPPRG, 2010) involving 2,937 children in their first through third grades, which found school environments moderated intervention effectiveness with stronger effects reducing aggression in less disadvantaged school environments. Guerra and colleagues (2006) also reported interventions aimed at reducing aggression among elementary school children were more effective in schools with lower levels of aggression. In summary, research indicates teacher influence on individual student behaviors may vary by classroom/school contexts and positive teacher influences are likely to be amplified in advantaged contexts. However, most research examining the moderation effects of classroom/school contexts have been conducted among elementary schools, and limited evidence is available among middle schools. Considering the differences between middle and elementary school classrooms as well as differences in social and academic norms between elementary and middle school students (Galvan et al., 2011), it is warranted to examine whether such moderation effects also apply to middle school classrooms.

This moderation effect of class peer norms on the association between teacher support and individual student behaviors may be accounted for by several factors. First, individual student behaviors (i.e., aggression and/or engagement problems) are more likely to be modeled and reinforced by peers in classrooms where there are high levels of class peer norms, so that

behaviors align with peer norms in the classroom (Dishion & Tipsord, 2011; Guerra et al., 2006; Hughes et al., 2005). Second, it is less likely for teachers to provide high levels of support to students in classrooms with high levels of aggression peer norms, as the teacher-student relationship is often conflictual (Stipek & Miles, 2008; Thomas et al., 2011). This mechanism may apply to academic engagement problems as well. Third, the strategies teachers use to manage classrooms are less likely to be successful in classrooms with high average levels of aggression or engagement problems, as teacher attention/supervision is diluted by the high incidence of aggression or engagement problems (Hughes et al., 2005; Stipek & Miles, 2008; Thomas & Bierman, 2006).

Theoretical framework. Three theories were used to inform the current study: ecological model, person-group similarity/dissimilarity model, and the behavioral model. The ecological model emphasizes the importance of examining various sources of influence on individuals' behaviors within a specific environment and the potential interactions between these different sources (Bronfenbrenner, 1970; Neal & Neal, 2013). Thus, within a classroom it is critical to investigate both teacher and peer influences on individual student behaviors (Doll & Brehm, 2014), as both are salient and influential sources. The person-group similarity/dissimilarity model proposes that the congruence (or incongruence) between an individual's behaviors and his/her group norms contributes to the social status an individual can achieve within a group, and shapes his/her behaviors accordingly (Stormshak et al., 1999). In other words, it indicates the importance of examining the influence of class peer norms. The

behavioral model proposes that individuals behave in certain ways because of the modeling and reinforcement offered in the environment (Cooper, Heron, & Heward, 2007), which can help us to understand student behaviors in a classroom, especially aggressive behavior (Dishion & Tipsord, 2011).

Ecological model. Social contexts have significant influences on individuals' behaviors and development (Bronfenbrenner, 1970; Neal & Neal, 2013), especially proximal environments such as the classroom (Barth et al., 2004; Chang, 2004; Doll & Brehm, 2014). There are two distinct processes within a classroom that influence students' interpersonal exchanges: the rules and expectations set by teachers and the values constructed by students themselves (Cairns & Cairns, 1994; Farmer et al., 2007; Farmer et al., 2011). These two processes are directly tied to the two key constructs in this study, teacher support and class peer norms. These two processes do not operate separately, but instead they may jointly shape individual student behaviors, as early adolescents assimilate influences from both teachers and classmates (Bierman, 2011; Farmer et al., 2011; Neal & Neal, 2013).

Students who receive high levels of support from teachers are more likely to have less aggressive behaviors (Luckner & Pianta, 2011; Murray-Harvey & Slee, 2010; Stipek & Miles, 2008) and be academically engaged (Hamre & Pianta, 2005; Patrick et al., 2007; Roorda et al., 2011). Class peer norms (i.e., the class average of certain behaviors) are also closely tied to individual student's aggression and academic engagement (Farmer et al., 2011). Students placed in classrooms with high average levels of aggression tend to become more aggressive over time

(Barth et al., 2004; Kellam et al., 1998; Mercer et al., 2009; Thomas & Bierman, 2006) and students in classrooms with high average levels of academic engagement tend to be more engaged (Barth et al., 2004). Therefore, it is important to investigate the influence of teacher support and class peer norms on students' adjustment simultaneously. In order to examine the unique and interactive influence of these sources on individual student's adjustment, prior adjustment level of student behaviors (aggression and engagement) were controlled in the study.

Person-group similarity/dissimilarity model. The person-group similarity/dissimilarity model indicates that the composition of a group (such as a classroom) influences how a student's behaviors are interpreted by the group and shapes his/her subsequent behaviors. The person-group similarity model proposes that individuals tend to engage in behaviors consistent with the peer norms of the group. An individual is more likely to be accepted or positively evaluated when his/her behaviors are congruent with peer norms, but is more likely to be rejected or negatively evaluated when his/her behaviors deviate from peer norms (Bellmore et al., 2011; Chang, 2004; Stormshak et al., 1999; Wright, Giammarino, & Parad, 1986). Research indicates susceptibility to peer influence peaks during early adolescence (LaFontana & Cillessen, 2010), especially influences from peers in the proximal environment (e.g., classroom; Barth et al., 2004; Chang, 2004). For many behaviors, early adolescents tend to act in a way that is consistent with peer norms, including aggression, academic engagement, and achievement (Bellmore et al., 2011; Jonkman et al., 2009).

Congruence between an individual's behaviors and his/her group norms may vary across

contexts and determine the peer status that an individual can gain within a group (Chang, 2004; Jonkmann et al., 2009; Stormshak et al., 1999; Wright et al., 1986). For example, students who engage in aggressive behavior are more likely to be negatively evaluated in a classroom with low average levels of aggressive behaviors, but accepted or positively evaluated in a classroom with high average levels of aggressive behaviors (Bellmore et al., 2011; Chang, 2004; Stormshak et al., 1999; Wright et al., 1986). Students with high academic achievement may obtain high peer status within a high-achieving classroom, but may not gain such high status within a low-achieving classroom (Jonkmann et al., 2009).

In contrast, the person-group dissimilarity model proposes that the incongruence between an individual's behaviors and his/her group norms contributes to the social status an individual can achieve within the group, such as disruptive behavior (Jonkmann et al., 2009; Stormshak et al., 1999). This may happen due to the fact that disruptive behavior may help students gain more visibility in a classroom with low average levels of disruptive behavior. However, this model has been utilized less frequently in the literature compared to the similarity model, and much less is known regarding potential associations. In summary, the influence of classroom composition on individual student's behaviors may follow different tracks (i.e., similarity or dissimilarity model). In this study, it was anticipated overt and relational aggression and involved behavior would follow the similarity model, and it explored whether disruptive behavior would follow the dissimilarity model through the multilevel mediation analyses.

Behavioral model. From a behavioral theory perspective, an individual behaves in certain

ways as a result of being reinforced by the environment (Cooper et al., 2007). This model proposes that aggressive children and adolescents, when grouped together, are likely to encourage, model, and reinforce aggression (Dishion & Tipsord, 2011; Thomas & Bierman, 2006). There are some strategies teachers can utilize to reduce the negative effects of these deviancy trainings, such as increasing supervision and classroom structure (Dishion & Tipsord, 2011). However, these strategies are less likely to be successful in classrooms with high levels of aggression peer norms, as teacher attention is diluted by the high incidence of aggression and it is harder for teachers to provide high levels of support and manage student behavior in such environments (Stipek & Miles, 2008; Thomas & Bierman, 2006).

Purpose of the Current Study

The first primary aim of this study was to test a partial mediation model on the association between teacher support and individual student behaviors (overt and relational aggression, involved and disruptive behavior): the direct influence of teacher support on student behaviors and the indirect influence via class peer norms (Bierman, 2011; Farmer et al., 2011).

The second primary aim was to examine class peer norms as moderators on the association between teacher support and student behaviors. The current study explored existing data from Dr. Kiefer's Adolescent Motivation and Development Study to answer the following questions:

1. Were spring student behaviors (overt and relational aggression, involved and disruptive behavior) *directly* influenced by fall teacher support?
2. Was there an *indirect* influence of fall teacher support on spring student behaviors via

classroom peer norms?

- a) Did fall teacher support have significant influence on fall classroom peer norms?
 - b) Did fall classroom peer norms have significant effect on spring student behaviors?
3. Was there a significant moderation effect of fall classroom peer norms on the association between fall teacher support and each student behavior (overt and relational aggression, involved and disruptive behavior) in the spring?

Multilevel modeling was utilized to investigate classroom peer norms as moderators and partial mediators on associations between teacher support and individual student behaviors, given the nested nature of the data.

Hypotheses

Based on the evidence reviewed above and further discussed in Chapter 2, the following hypotheses were made:

1. It was expected fall teacher support would have a *direct* negative association with aggression (overt and relational) and disruptive behavior and a positive association with involved behavior in the spring.
2. It was expected fall teacher support would have an *indirect* association with spring individual student behaviors via classroom peer norms (CPN).

2.1 Fall teacher support was expected to be negatively associated with aggression (overt and relational) and disruptive behavior CPN, and positively associated with involved behavior CPN in the fall.

2.2 Fall overt aggression CPN was expected to be positively associated with spring student overt aggression.

2.3 Fall relational aggression CPN was expected to be positively associated with spring student relational aggression.

2.4 Fall involved behavior CPN was expected to be positively associated with spring student involved behavior.

2.5 The influence of fall disruptive CPN on spring student disruptive behavior was exploratory. According to the person-group dissimilarity model, students in classrooms with lower disruptive behavior CPN may be more likely to increase disruptive behavior over time, as disruptive behavior helps them gain visibility and status. However, according to the behavioral model, students may not display more disruptive behavior in such classrooms as they would not receive much modeling or reinforcement.

3. It was expected classroom peer norms would moderate the associations between fall teacher support and spring student behaviors.

3.1 For overt aggression, the influence of high levels of teacher support was expected to be diminished in classes with high overt aggression CPN.

3.2 For relational aggression, the influence of high levels of teacher support was expected to be diminished in classes with high relational aggression CPN.

3.3 For involved behavior, the influence of high levels of teacher support was expected to be amplified in classes with high involved behavior CPN.

3.4 For disruptive behavior, the influence of high levels of teacher support was expected to be diminished in classes with high disruptive behavior CPN.

Definitions of Key Terms

Aggression. This study examined two forms of aggression: overt and relational aggression (Crick, 1996; Little, Henrich, Jones, & Hawley, 2003), which are distinct yet closely related constructs. Overt aggression refers to the direct physical or verbal aggressive behaviors, for example, kicking, fighting, hitting, and insulting (Little et al., 2003). Relational aggression is more indirect and aimed at harming people's relationships, such as spreading rumors and excluding someone from a group (Little et al., 2003). Peer-nominated overt and relational aggression was used in this study. Students were asked to nominate up to three students who displayed overt and relational aggression, and the nominations each participant received was standardized within each school by dividing the number of the nominators, consistent with prior research utilizing peer nominations (Crick & Grotpeter, 1995).

Academic engagement. Academic engagement is a multifaceted construct including behavioral, emotional, and cognitive engagement (Fredricks et al., 2004). This study specifically examined behavioral engagement, which included involved (on-task) and disruptive (not following classroom rules) behaviors. Self-report measures were used to assess both facets of academic behavioral engagement.

Class peer norms. Peer norms are often defined in two ways, descriptive or injunctive norms, which are related yet distinct constructs. Injunctive norms refer to people's attitudes

(approval or disapproval) of certain behaviors, whereas descriptive norms refer to the occurrence of certain behaviors (Cialdini, Reno, & Kallgren, 1990). The current study used descriptive norms, as it has shown validity in studying early adolescents' classroom behaviors beyond injunctive norms (Scholte, Sentse, & Granic, 2010). Descriptive class peer norms are often calculated as a class average of a certain behavior, including (Ryan, 2001; Thomas et al., 2011) or excluding (Barth et al., 2004) the target student.

Teacher support. Teacher support was defined as students' perceptions of emotional and academic support they received from their teachers in this study (Johnson & Johnson, 1983; Johnson et al., 1983).

Contributions to the Literature

As discussed in this chapter, early adolescence is a critical developmental period with many changes occurring, including a peak in aggression, decreased academic engagement, increased peer influence, and decreased teacher support. The first year of middle school may be particularly challenging as students acclimate to a new school context in terms of navigating a larger peer system, having more teachers, and receiving less teacher support (Eccles & Roeser, 2011). Also, the curriculum often does not match the development of students' cognitive abilities compared to that in elementary school (Eccles et al., 1993). Despite these various challenges, teachers often serve as a powerful yet "invisible hand" (Farmer et al., 2011). High levels of teacher support can exert a direct influence on individual student's behaviors and/or an indirect influence via class peer norms (Bierman, 2011). However, research has rarely examined both

direct and indirect teacher influences simultaneously. This study was designed to better understand the underlying mechanisms involved in how teacher support influences individual student behaviors (i.e., aggression and engagement) by examining a partial mediation model including both routes. This design also provided insight regarding the less well known effect of teacher influences on class peer norms. Examination of the potential moderation effects of class peer norms on the association between teacher support and student behaviors helped to identify conditions that amplify or lessen the positive effects of high levels of teacher support. By examining both aggression and engagement as outcome variables, this study aimed to provide a comprehensive understanding of students' social and academic behaviors during the first year of middle school, a time when behaviors have increasingly long-term consequences (Balfanz et al., 2007).

Findings might also have practical implications and inform school-based interventions aimed to reduce aggression and increase engagement during the first year of middle school. For example, if the partial mediation model was confirmed, it would indicate that interventions need to target both class peer norms and teacher support in order to maximize desired effects (Hamm et al., 2014; Hamm, Farmer, et al., 2011). Findings on the potential moderation effects of class peer norms might inform practice as well in that it might provide hints how educational professionals (e.g., teachers and school psychologists) could modify classroom contexts in order to maximize teacher influence (Stipek & Miles, 2008; Thomas et al., 2011). For example, if high aggression class peers norms hindered the positive influences of teachers, schools would want to

disperse highly aggressive students into different classrooms in order to prevent class peer norms favoring high levels of aggression. Findings highlighting the influence of teacher support on promoting positive student behavior might also have implications for educational professionals, including school psychologists, as well as educational policy makers, calling for increased attention to teacher support for students, especially during the first year of middle school.

Chapter Two: Review of the Literature

This chapter summarizes (1) the prevalence and developmental trends of aggression and engagement during early adolescence, (2) the consequences of early adolescent aggression and engagement, (3) the influence of class peer norms on individual student's aggression and engagement, and (4) the influence of teacher support on class peer norms and individual student's aggression and engagement. In addition, gaps in the current literature are identified and discussed.

Aggression

Although aggression occurs at an early age and is common throughout the lifespan, it reaches a peak during early adolescence (Moffit, 1993; Nansel et al., 2001; Pellegrini & Long, 2002). Aggression not only affects youth who are engaged in aggressive behaviors, but also affects youth who are the target of such aggressive behaviors. There is a significant portion of students involved in sustained aggression, including both bullies and victims (Craig et al., 2009; Juvonen et al., 2003; Musil, Tement, Vukman, & Sostaric, 2014; Nansel et al., 2001). In a US national survey, Nansel and colleagues (2001) reported 29.9% of adolescents experienced sustained aggression sometimes or weekly (13.0% bullies, 10.6% victims, and 6.3% bully-victims). Juvonen and colleagues (2003) reported a prevalence of 22% for sustained aggression (7% bullies, 9% victims, and 6% bully-victims) using a peer-nomination method in a sample of

1,985 sixth-grade students, most of whom were Latino and African American. Craig and colleagues (2009) reported an average prevalence of 26% for sustained aggression in an international study involving 202,056 adolescents from 40 countries (US sample included). Musil and colleagues (2014) reported a similar rate of sustained aggression among 204 adolescent students with special needs from six European countries, in that 24.2% of the students were involved in aggression (1.9% bully, 15.5% victim, and 6.8% bully-victim). Together, this line of research indicates that sustained aggression is a universal phenomenon, despite the prevalence varying across countries and student populations (i.e., in general or special education). Although not all aggression is sustained, research provides an estimate of how frequent aggression occurs and how many students are influenced by such behavior.

Aggression can be classified into overt and relational aggression based on its form (Crick, 1996; Little et al., 2003; Marsee et al., 2014), or proactive and reactive aggression according to its function (Crick & Dodge, 1996; Little et al., 2003; Marsee et al., 2014; Poulin & Boivin, 2000). Overt and relational aggression are distinct yet closely related constructs (Crick, 1996; Little et al., 2003). Overt aggression refers to the direct physical or verbal aggressive behaviors, such as kicking, fighting, hitting, and insulting (Little et al., 2003). Relational aggression is more indirect and aimed at harming people's relationships, such as spreading rumors, excluding someone from a group, and purposefully ending a relationship (Little et al., 2003). Proactive aggression refers to deliberate aggressive behaviors which are the products of certain anticipated outcomes, whereas reactive aggression means the defensive aggressive behaviors which are often in response to perceived provocation (Crick & Dodge, 1996; Little et al., 2003). In this study,

aggression was classified into overt and relational aggression according to its form.

Associated outcomes of aggression. Childhood and adolescent aggression is associated with various negative outcomes, such as peer rejection (Crick, 1996), impaired relationships with teachers (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Stipek & Miles, 2008; Thomas et al., 2011), and academic failure (Nansel et al., 2001; Stipek & Miles, 2008; Xie, Cairns, & Cairns, 2002). For example, Crick (1996) reported in a longitudinal study among 245 third- through sixth-grade students that both overt and relational aggression had unique contributions to later peer rejection. Stipek and Miles (2008) followed 403 students from kindergarten or first grade through fifth grade and examined teacher-student relationships and academic engagement as mediating the association between aggression and academic achievement. Aggressive students were more likely to develop a conflictual relationship with their teachers, which led to decreased academic engagement, and then to decreased achievement (Stipek & Miles, 2008). In addition to this path, aggression directly led to decreased academic achievement (Stipek & Miles, 2008) among fifth-grade students. The negative influence of aggression is not limited to students who exert aggressive behaviors but also affects students who are the target of aggressive behaviors. These students are more likely to experience negative consequences such as health problems, feelings of loneliness, and difficulty to make friends (Juvonen et al., 2003; Nansel et al., 2001).

However, aggression may be associated with positive consequences under certain conditions, especially during early adolescence (Bellmore et al., 2011; Hoff, Reese-Weber, Schneider, & Stagg, 2009; Juvonen et al., 2013; LaFontana & Cillessen, 2002). For example,

Bellmore and colleagues (2011) reported among 1,985 sixth-grade students that aggression (verbal, physical, and relational aggression) was associated with high peer status across the school year. Using peer nominations, Hoff and colleagues (2009) reported among 417 sixth-grade students that both overt and relational aggression were associated with high peer status, particularly relational aggression. LaFontana and Cillessen's (2002) four-year longitudinal study found among 442 fourth- through eighth-grade students that physical and relational aggression were increasingly associated with perceived popularity in sixth grade compared to the other grades. Juvonen and colleagues (2013) found among 1,895 ethnically diverse youth (from spring of seventh through spring of eighth grade) that both physical and relational aggression aided in the establishment and/or maintenance of high peer status.

Measurement of aggression. Aggression is often measured through the following methods: self-report, teacher-rating, peer-report, and observation (Voulgaridou & Kokkinos, 2015). Self-report measures are widely used, especially for large-scale studies (Craig et al., 2009; Little et al., 2003; Nansel et al., 2001), and are useful in understanding the individual perspectives of youth who engage in aggression or who are the targets of aggression (Musil et al., 2014). However, one limitation of self-report methods is that students may underreport their aggressive behaviors, especially relational aggression, and self-reported data are often not congruent with peer or teacher reported data (Xie et al., 2002). Teacher-rating is one of the most reliable methods to measure students' social behaviors, including overt aggression, as it is often based on observations of target behaviors in multiple contexts over a period of time (Merrell, Buchanan, & Tran, 2006; Xie, Cairns, & Cairns, 2005; Xie, Mahoney, & Cairns, 1999). Potential

limitations of teacher-rating include stereotypes that boys typically engage in overt aggression and girls typically engage in relational aggression, as well as biases regarding student reputation and insensitivity to covert manifestations of aggression, such as some subtle forms of relational aggression (Merrell et al., 2006; Xie et al., 2005).

The peer report method, including peer rating (e.g., rate each classmate on aggression) and nomination (e.g., nominate up to three students who are aggressive), is one of the most popular methods to measure both overt and relational aggression. One strength of peer reports is that it allows researchers to synthesize information from multiple informants who regularly observe and/or socially interact with the target student (Merrell et al., 2006; Tackett, Waldman, & Lahey, 2009; Xie et al., 2005). However, one potential limitation is the character defamation effect that a student receives high peer ratings or nominations on a form of aggression due to gossip or rumors (Xie et al., 2005).

Researchers can use laboratory and naturalistic observations to provide relatively objective data that is free of the biases or relationships between the observer and the target child being observed (Merrell et al., 2006; Xie et al., 2005). However, it can be time and labor consuming and subject to the observer effect that children may behave differently when there is an observer(s). Also, the use of direct observation methods are viewed as somewhat controversial for examining relational aggression, given the indirect and relational nature of this form of aggression (Voulgaridou & Kokkinos, 2015).

It should be noted that methods to assess aggression (self- report, teacher-rating, peer-report and observation) are not exclusive to each other, but can be used in combination (Little et

al., 2003; Pellegrini & Long, 2002). Researchers, aware of the strengths and limitations of each approach, may choose the method(s) most relevant according to their research purposes, design, and feasibility. For example, if the purpose is to compare the perspectives of youth who engage in aggression and who are the target of aggression, it is more effective to use the self-report method (Musil et al., 2014). However, if the purpose is to understand the consensus within a peer context (e.g., to understand the peer norms), it is more effective to use the peer-report method (Bellmore et al., 2011). This study used peer nominations, as it enables to obtain information from multiple informants and aligns with one of the general purposes of the study: to understand peer dynamics in the classroom.

Academic Engagement

Academic engagement is a multifaceted construct (behavioral, emotional, cognitive engagement) and is considered as a precursor to academic achievement (Fredricks et al., 2004; Wang & Eccles, 2012; Wigfield et al., 2015). Behavioral engagement includes both on-task behaviors such as attention to teacher instruction and the absence of disruptive behavior such as getting into trouble in classes (Fredricks et al., 2004; Wang & Eccles, 2012). Emotional engagement refers to the emotional bonds/attitudes students form with school (e.g., like school/teachers), school connectedness, and valuing of school (Fredricks et al., 2004; Wang & Eccles, 2012). Cognitive engagement refers to the motivation, self-regulated strategies applied and the investment made in learning (Fredricks et al., 2004; Wang & Eccles, 2012). Mounting evidence indicates these three facets of engagement are distinct yet closely related; scholars propose to define engagement including all three aspects (Fredricks et al., 2004; Fredrick, 2014).

Preliminary studies suggest a fourth potential component, agentic engagement, which refers to “students’ constructive contribution into the flow of the instruction” (Reeve & Tseng, 2011, p. 257). Although a general definition of engagement is often welcomed by policy makers, it is not helpful for conducting research and designing interventions; instead, a specific definition helps us to understand what outcomes engagement can bring to students and what factors influence engagement (Eccles & Wang, 2012). Given that behavioral engagement is the most relevant facet of engagement for the purpose of the study and is a precursor of academic achievement (Fredricks et al., 2004), academic engagement in this study was defined specifically in terms of behavioral engagement (involved behavior and disruptive behavior).

Associated outcomes of engagement. Engagement largely influences students’ school success. Engaged students are more likely to gain better academic achievement (Ladd et al., 2009; Wang & Eccles, 2012) and complete high school (Finn & Rock, 1997; Lamote et al., 2013; Reschly & Christenson, 2006). For example, Finn and Rock (1997) found among 1,803 ethnically diverse youth from low-income families that behavioral engagement differentiated students who graduated high school from students who dropped out. Reschly and Christenson (2006) reported high academic engagement (including behavioral engagement) in eighth grade predicted students’ likelihood of graduating high school, and low academic engagement in eighth grade predicted the likelihood of dropping out. Research also indicates that behavioral engagement mediates the relations between a supportive classroom learning environment and achievement improvement among early adolescents (Dotterer & Lowe, 2011; Reyes et al., 2012).

Beyond the well-known implications for academic adjustment, recent evidence suggests

engagement may have implications for students' well-being in other domains such as mental health and problem behaviors (Li & Lerner, 2011; Wang & Fredricks, 2014; Wang & Peck, 2013). For example, Li and Lerner (2011) followed 1,977 adolescents from fifth through eighth grades and found students with adaptive engagement profiles (behavior or emotional engagement) experienced less depression, delinquency, and substance use problems.

Despite the various positive effects of engagement, students are not engaged as much as we might expect. First, students often do not have enough opportunities to engage in learning activities due to school structure factors, namely losing time to non-learning activities such as lunch, recess, transitions, and waiting to get teacher help (Gettinger & Walter, 2012). During the limited time students have an opportunity to learn, they may not be engaged due to boredom from a lack of challenging, relevant, and learner-centered curriculum, despite that such curriculum promotes engagement (Meece, Herman, & McCombs, 2003). This is especially salient during the middle school years when there is often a mismatch between curriculum and students' developmental needs (stage-environment fit theory; Eccles et al., 1993; Eccles & Roeser, 2011; Larson, 2000).

Many studies have documented such a decline of engagement after the middle school transition (Hughes, Im, Kwok, Cham, & West, 2014; Lamote et al., 2013; Li & Lerner, 2011). Following 4,604 students from Grades 7 through 12 in Belgium (Grade 7 was the beginning of middle school in the study), Lamote and colleagues (2013) found a significant decline of engagement after the transition to middle school that 13% of the participants had high initial self-reported behavioral engagement (i.e., at Grade 7) but it decreased significantly through Grade

12, and another 66% of the participants showed some decrease through Grade 12 (Lamote et al., 2013). This overall declining pattern of behavioral engagement during middle school was also reported in Hughes and colleagues' (2014) longitudinal study, which followed 204 Latino students from first through ninth grade who were at risk for academic failure, although behavioral engagement remained stable throughout elementary school. Additionally, Hughes and colleagues (2014) documented a drop of behavioral engagement immediately after transitioning to middle school. In another longitudinal study tracking 1,977 students from fifth through eighth grade, Li and Lerner (2011) found 19.5% of the students experienced decreases in behavioral engagement during the middle school transition (i.e., sixth grade), with 4.4% experienced a decline from grades 6 – 8 and 15.1% experienced a decline just in sixth grade. In summary, a significant portion of students encounter a risk of decreasing engagement immediately after transitioning to middle school.

Thus, it is important to investigate what factors may contribute to such declines, particularly during sixth grade when the decline starts, so that appropriate early prevention and intervention strategies can be applied. Additionally, engagement during sixth grade has significant long term implications for student academic success (Balfanz et al., 2007). Balfanz and colleagues (2007) followed 13,000 students from middle through high school and found school disengagement in sixth grade predicted 60% of the students who failed to graduate high school. On the other hand, student engagement is a malleable factor in that it can be increased through appropriate interventions (Balfanz et al., 2007). Thus, student engagement during sixth grade deserves further investigation.

Measurement of engagement. Behavioral engagement is often assessed through the following methods: self- and teacher-reports, observations, and early warning signals (Fredricks, 2014). Self-report questionnaires are widely employed due to their convenience. Despite that students do not always provide the most accurate reports of their own behavior (Fredricks, 2014), validity has been documented for self-report measures. For example, students who received more office discipline referrals tended to self-report more disruptive behaviors ($r = .44, p < .01$; Kaplan & Maehr, 1999), one type of engagement measured in the current study. Behavioral engagement is often measured as part of a larger survey that includes multiple forms of engagement (e.g., behavioral, emotional and cognitive engagement). These measures may differ in conceptualization of disengagement, with some measures including scales specifically assessing disengagement while others simply considering disengagement as low levels of engagement (Fredricks & McColskey, 2012). The current study considered involved and disruptive behavior as two distinct yet inversely related aspects of engagement. Additionally, some measures target engagement in a specific environment (e.g., math class), whereas others measure general engagement (Fredricks & McColskey, 2012).

Teacher-rating measures may be particularly useful for younger students or students with limited literacy, but may be used with older students as well. For example, the teacher rating scale developed by Skinner, Kindermann, and Furrer (2009) was originally designed for students in upper elementary schools, but it has been used for older students as well. Observation of behavioral engagement often uses time sampling procedures or event counts (Fredricks, 2014).

Observations provide an objective measurement of students' engagement levels, but can be time

and labor consuming. Engagement can also be assessed via early warning signs for which schools often already have the data, such as tardiness, referrals, and suspensions (Fredricks, 2014). Student self-report questionnaires were applied in this study, considering the large number of students involved and the adequate cognitive abilities of the participants, and the items assessed general engagement (i.e., involved behavior) and disengagement (i.e., disruptive behavior).

Class Peer Norms

As discussed in Chapter 1, students are influenced by both their peers and teachers in the classroom. Classroom peers are in a unique influential position because of the proximity and the structured time they spend together on a daily basis (Ladd et al., 2009). Research indicates class peer norms have significant implications for students' adjustment, as they serve as important resources from which students infer what behaviors are desired and they may act to conform to these perceived desirable behaviors (Chang, 2004; Henry, 2008; Lapinski & Rimal, 2005). Class peer norms have been shown to be associated with students' aggression and academic engagement (Farmer et al., 2011). They can be influential at an early age, have an enduring influence (Kellam et al., 1998; Thomas et al., 2011), and may become increasingly influential during early adolescence, given the general increased salience of peer influence during this period (Larson & Richards, 1991; Lynch, Lerner, & Leventhal, 2013; Masten, Juvonen, & Spatzier, 2009) and a peak in youth's concerns with their peer status (Cillessen, Schwartz, & Mayeux, 2011; LaFontana & Cillessen, 2010).

However, class peer norms tend to develop a negative trend during early adolescence. In

a study involving students from fourth through eighth grade, Galvn and colleagues (2011) found that early adolescents' perception of classmates displaying aggression increased and academic engagement decreased. Kiefer and Ryan (2011) found early adolescents' (sixth- and seventh-grade students; seventh grade was the first year in middle school) attribution of social success among peers in school to sincere and responsible behaviors decreased and attribution to dominant and disingenuous behaviors increased across middle school transition. Students often view aligning with these changing peer norms as important in order to establish and maintain high peer status in middle school (Bellmore et al., 2011; Galvn et al., 2011). For example, Bellmore and colleagues (2011) found that gaining or maintaining a high peer status across the sixth grade (the first year of middle school) was associated with increased levels of physical, verbal, and relational aggression. Early adolescents' perceptions of their peer norms have important implications for their own behaviors, as they tend to behave in a way that is consistent with their perceived peer norms even when the perceptions are not accurate (Helms et al., 2014).

Measurement of class peer norms. Norms are often defined in two ways, descriptive or injunctive norms. Descriptive norms refer to the occurrence or prevalence of a certain behavior, such as the frequency of aggression (Bellmore et al., 2011; Cialdini et al., 1990; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Injunctive norms refer to the attitudes, beliefs, and values toward a certain behavior, such as the importance of academic engagement (Cialdini et al., 1990; Hamm, Schmid, Farmer, & Locke, 2011; Schultz et al., 2007). Descriptive and injunctive norms are related yet distinct concepts (Cialdini et al., 1990), both of which have significant implication for adolescents' adjustment (Hamm, Schmid et al., 2011; Henry, 2008).

Descriptive norms were used in this study, as it is often used in studies investigating early adolescents' behaviors (Bellmore et al., 2011; Masten et al., 2009; Ryan, 2001). Further, research suggests descriptive norms influence youth's behaviors beyond injunctive norms (Scholte et al., 2010), although a consensus has not been reached yet (Hamm, Schmid et al., 2011).

Norms can also be defined at different levels, such as peer groups and classrooms. Peer groups norms refer to behaviors or values of the few fellow students with whom a target student often hangs out (Hamm, Schmid et al., 2011; Hamm et al., 2014; Rulison, Gest, Loken, & Welsh, 2010; Ryan, 2001). Class peer norms refer to the behaviors or values of all students within a classroom (Barth et al., 2004; Bellmore et al., 2011; Chang, 2004). Norms both at the peer group and classroom levels have been demonstrated as having significant implications for student adjustment (Barth et al., 2004; Bellmore et al., 2011; Rulison et al., 2010; Ryan, 2001). This study defined norms at the classroom level, considering the significance of the classroom ecology on student behaviors (Bellmore et al., 2011; Chang, 2004; Doll & Brehm, 2014; Patrick et al., 2007); one of the general purposes of the study was to understand peer dynamics at the classroom level. In summary, this study utilized descriptive class peer norms, which are often calculated as a class average including (Thomas et al., 2011; Ryan, 2001) or excluding (Barth et al., 2004) the target student's behavior. In this study, a class average including the target student was calculated for each classroom, given that each student is an integral part of the classroom dynamic (Thomas et al., 2011); there is no strong evidence that one way surpasses the other (both are viable methods).

Influence on aggression. Class peer norms of aggression have significant implications

for individual student's development of aggressive behaviors. This is especially true for students who are at risk of aggression (e.g., high initial levels of aggression; Barth et al., 2004; Bellmore et al., 2011), as aggressive peers tend to model and reinforce aggressive behaviors (Dishion & Tipsord, 2011; Stormshak et al., 1999). The influence of class peer norms of aggression is not limited to early adolescence, but can occur at an early age and may last for many years. For example, Kellam and colleagues (1998) measured classroom aggression levels via teacher report (peer nominations and observations were used to validate teacher report data) in 40 first-grade classrooms involving 1,084 children (49% boys) in 18 schools, and assessed individual student's aggression when they were in sixth grade (data were available for 682 students). Results indicated higher levels of classroom aggression (overt and relational aggression combined) in first grade put boys at a higher risk to develop aggressive behavior in sixth grade after controlling for individual levels of aggressive and disruptive behavior in first grade (Kellam et al., 1998). Such early impact of aggression class peer norms is reported in other studies as well, including kindergarten through second grade (Thomas et al., 2011) and first through third grade (Thomas & Bierman, 2006).

The influence of aggression class peer norms on individual student's aggressive behavior is also found at the upper elementary and middle school levels. Following 948 students from third through fifth grade, Mercer and colleagues (2009) found students from third-grade classrooms with higher average levels of teacher-reported aggression (overt and relational aggression combined) displayed greater increases in self-reported aggression through the school year. Barth and colleagues (2004) followed 589 students in 65 classrooms from fourth through

fifth grade. They found that teacher-rated individual student aggression (overt and relational aggression combined) was positively associated with aggressive class peer norms, and students with aggressive behaviors in fourth grade showed greater increases in aggression when placed in fifth-grade classrooms with a higher class average of aggression. In other words, high class peer norms amplified the risk for aggressive students to become more aggressive. Bellmore and colleagues (2011) found similar results in sixth grade that high status students located in classrooms with high average levels of verbal aggression demonstrated a greater increase in verbal aggression than students in classrooms with low average aggression across the sixth grade school year. In summary, aggression class peer norms have significant implication for individual student's development of aggression. However, more research is needed to differentiate between the different forms of aggression (i.e., overt and relational aggression). It was expected that individual student's aggression (overt and relational) in the spring would be positively associated with aggression (overt and relational, respectively) class peer norms in the fall.

Influence on engagement. Although the influence of class peer norms on academic adjustment is understudied compared to social behaviors such as aggression (Farmer et al., 2011), research indicates that classroom is a meaningful and important context that influences students' academic behaviors, including engagement (Crosnoe & Benner, 2015; Doll & Brehm, 2014; Reyes et al., 2012; Skinner & Pitzer, 2012; Wigfield et al., 2015). Class peer norms of engagement are positively associated with individual student's academic engagement (Barth et al., 2004; Farmer et al., 2011). Barth and colleagues (2004) found among 589 fourth- and fifth-grade students that individual student's engagement (teacher-reported) was positively associated

with the engagement class peer norms, and students with academic problems (e.g., “does not complete assignments”) were more likely to increase in off-task behavior when placed in classrooms with high average levels of academic problems (i.e., low average levels of engagement).

Gaining or maintaining peer status is a salient motivator for adolescent behaviors, including academic engagement (Galvn et al., 2011; Jonkmann et al., 2009). Although perceived academic engagement was positively and significantly correlated with high peer status in fourth and fifth grades, the correlation became insignificant in the fall of sixth grade, and negative in the spring of sixth grade (Galvn et al., 2011). Instead, perceived academic disengagement became positively and significantly correlated with high peer status in sixth grade (Galvn et al., 2011). Interestingly, Jonkmann and colleagues (2009) found slightly different results. In their study involving 5,468 seventh-grade students from 266 classrooms in Germany, they found that academic achievement (i.e., grade point average) was more strongly related to high social status (conceptualized as dominance) in high and average achieving classrooms but not in low achieving classrooms. Although academic achievement differs from engagement and such an association was not found in low achieving classrooms, this finding indicates that positive academic adjustment is still valued among high achieving students in seventh grade, which is in contrast to Galvn and colleagues’ (2011) finding that positive academic adjustment no longer contributes to high social status when students proceed to sixth grade or seventh grade. However, Jonkmann and colleagues’ (2009) finding on disruptive behavior (a type of disengagement) is more similar to Galvn and colleagues’ findings (2011) on disengagement that

disruptive behavior is associated with high social status among low and average disruptive seventh-grade classrooms, although not in high disruptive classrooms. Based on this research, the current study further examined the association between engagement class peer norms and individuals' engagement among sixth-grade students.

Teacher Support

Teachers are an important socializing agent for students' development and educational success (Crosnoe & Benner, 2015). High levels of teacher support are a developmental asset that protects students from experiencing academic and behavior problems (Farmer et al., 2011; Hamre & Pianta, 2001; McGrath & Van Bergen, 2015; O'Connor et al., 2011; Roodra et al., 2011; Sabol & Pianta, 2012), especially for students at risk (Baker, 2006). The interactions between teachers and students are transactive in nature, in that teacher support influences student behaviors and, in turn, student behaviors have a significant influence on teacher support. For example, aggressive students are more likely to have a conflictual relationship with their teachers and receive less support from them (Stipek & Miles, 2008), and well-behaved students tend to receive more support from teachers (O'Connor, 2010). This study focused on the influence from teachers to students, as teachers are naturally in a powerful position to set the tone and structure for student behaviors (Farmer et al., 2011; Gest, Madill, Zadzora, Miller, & Rodkin, 2014; Troop-Gordon, 2015).

The influence of teacher support is not limited to individual student's behaviors, but may affect the behaviors of students within the entire classroom (i.e., class peer norms; Bierman, 2011; Farmer et al., 2011). Perceptions of teacher support vary across students and teachers

(O'Connor, 2010), and these perceptions are also influenced by interventions aimed to improve it (O'Connor et al., 2011; Sabol & Pianta, 2012). This has important practical implications, in that interventions can be designed to change the levels of teacher support in order to achieve desired outcomes (Murray & Malmgren, 2005). Teacher support often decreases when students move to higher grades (O'Connor, 2010), despite its stronger influences on adolescents than children (Roodra et al., 2011). Also, middle school teachers reported less competence in managing social interactions within a classroom (Ryan et al., 2015) than elementary school teachers and one third of the middle school teachers are not sure or do not believe in the importance of supportive teacher-student relationships (Davis, 2006). Thus, it is important to study the implications of teacher support on student adjustment following the transition to middle school, as it may help us understand teacher support during this critical developmental stage and motivate teachers to provide more support to students. Additionally, the majority of current research uses teacher reports to measure teacher support and its influence on student outcomes (Sabol & Pianta, 2012). Thus, it is important to examine if such influence exists when using multiple informants for teacher support and student outcomes (Sabol & Pianta, 2012), especially considering the discrepancy of teacher-rating and student-rating of the levels of teacher support (Koepke & Harkins, 2008).

Measurement of teacher support. Teacher-student interactions are embedded in and interact with other systems, such as the classroom peer context and school context, which also influence student adjustment (Neal & Neal, 2013; Sabol & Pianta, 2012). Although there are connections among these different systems, teacher support is conceptually distinct (Thomas et

al., 2011). Teacher support may be defined slightly different across studies (e.g., emotional support, instructional support, academic support, and organizational support; Luckner & Pianta, 2011; Patrick et al., 2007). It can be assessed via different methods, such as questionnaires, interviews, and observations (Pianta, 1999), and multiple informants can be assessed, including teachers and students. In the current study, teacher support was defined as students' perception of the emotional and academic support they receive from teachers (Johnson et al., 1983; Johnson & Johnson, 1983). Evidence shows that student perceptions of teacher emotional and academic support have significant implications on early adolescents' adjustment (Johnson et al., 1983; Patrick et al., 2007). Although these two aspects of teacher support (emotional and academic) are different as evidenced by factor analysis (Johnson et al., 1983) and observational studies (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001), they are highly correlated and have been combined in previous studies (Patrick et al., 2007; Wentzel, 1997).

Influence on individual student behaviors.

Influence on aggression. Various studies have demonstrated significant associations between teacher support and individual student's aggressive behaviors. In a longitudinal study, Thomas and colleagues (2011) reported among 4,179 students that the level of teacher support at the end of first grade was negatively associated with students' overt aggressive behaviors in second grade. In another longitudinal study following students from first through fifth grade, O'Connor and colleagues (2011) found high quality teacher-student relationships (more emotional support and less conflict) predicted fewer parent-rated externalizing behavior problems (including aggression) after controlling for family and school-level factors (e.g., SES).

Such associations between teacher support and student aggression are documented in other studies involving children (Buyse et al., 2008; Buyse, Verschueren, Verachtert, & Van Damme, 2009).

Although less investigation has been made among adolescents, research demonstrates significant associations between teacher support and student aggressive behavior. Luckner and Pianta (2011) found among 894 fifth-grade students and their 894 teachers (i.e., one student was selected from one classroom) that higher levels of teacher emotional support was related to lower levels of student relational aggression. Murray-Harvey and Slee (2010) found among 888 Australian students from 58 fifth- through ninth-grade classrooms (mean age = 12.85 years) a significant negative correlation between supportive teacher-student relationship (e.g., “If I express my troubles/problems I am listened to by my teachers”) and student aggression levels ($r = -.31$; overt and relational aggression combined). In summary, research indicates teacher support has a significant influence on individual student’s aggressive behaviors. However, most research has measured aggression in general instead of separating it to different forms (see Thomas et al., 2011 as an exception that focused specifically on overt aggression). Thus, there is a need to examine such influence on separate forms of aggression (overt and relational aggression). In the current study, it was expected that high levels of teacher support in the fall of sixth grade would be positively associated with lower levels of student aggression (overt and relational) in the spring.

Influence on academic engagement. Students’ academic adjustment, including motivation and engagement, is significantly enhanced when they receive more support from

teachers (Crosnoe & Benner, 2015; Farmer et al., 2011; Skinner & Pitzer, 2012; Wentzel, 2002).

The impact of teacher support on academic engagement occurs at an early age and can be enduring (Hamre & Pianta, 2001). For example, first-grade students who are at risk of academic adjustment (achievement) can reach the typical achievement level of their regular peers after being placed in classrooms with teachers who provide high emotional and instructional support (similar to academic support), while the gap between their counterparts in classrooms with less emotional and instructional teacher support and regular peers remains (Hamre & Pianta, 2005). O'Connor and McCartney (2007) reported positive associations between high quality teacher-student relationships (high emotional support and low conflict) and students' classroom engagement among third-grade students, which further led to improved academic achievement. Further, teacher support (emotional and academic support combined) was found to have significant positive associations with student classroom engagement among fifth-grade students (Patrick et al., 2007).

The impact of teacher support on students' engagement is significant among secondary school students as well, although more investigation has been conducted at the elementary school level (Roorda et al., 2011). In a meta-analysis including 99 studies (63 primary school studies, 31 secondary studies, and 5 combined) from elementary to secondary schools investigating the association between affective teacher-student relationship (i.e., emotional teacher support) and student engagement, medium to large effect sizes were found for this association (Roorda et al., 2011). Importantly, it was found that the effect was stronger in secondary schools than that in elementary schools (Roorda et al., 2011), which provides a strong rationale to investigate teacher

support in terms of its influence on engagement during the first year of middle school.

Guided by ecological (Bronfenbrenner, 1970) or stage-environment fit theories (Eccles et al., 1993), several studies have investigated the contributions of teacher support to engagement at the middle and high school level using structural equation modeling (SEM). Murray (2009) compared the relative influences of teacher-child and parent-child relations on engagement levels among 129 middle school students (91% Latino) and found closeness with teachers (similar to emotional support) had a significant contribution to engagement beyond parent-child relations. Woolley, Kol, and Bowen (2009) investigated the influence of support from teachers, parents, and friends on Latino middle school students' ($N = 848$) academic adjustment and reported a unique contribution of teacher support to students' engagement (i.e., homework time). Garcia-Reid and colleagues (2005) investigated four types of social support (i.e., teacher, friend, parent, and neighbor) among 226 Latino middle school students and found teacher support had the most significant direct influence on student engagement, followed by friend and parent support. Therefore, it was expected that high levels of teacher support in the fall of sixth grade would be positively associated with lower levels of disruptive behavior and higher levels of involved behavior in the spring.

The positive influence of teacher support is further indicated in intervention studies. For example, Murray and Malmgren (2005) found that a program aimed at increasing teacher involvement and support was beneficial for high school students with emotional and behavioral difficulties in improving their academic engagement and achievement. However, it should be noted that improvement of engagement did not reach significance, although there was significant

achievement improvement. More intervention studies are needed to delineate the influence of teacher support on academic engagement for students of different populations.

Influences on class peer norms. In comparison to teacher influences on individual student's behaviors, much less is known about teacher influences on class peer norms (Bierman, 2011). According to the ecological model, there are reciprocated interactions between the system of teacher-student interactions and the system of peer-student interactions within a classroom ecology (Hughes & Chen, 2011; Neal & Neal, 2013). Teachers are in a unique, powerful position to set the structure and tone for the social interactions within a classroom (Farmer et al., 2011; Gest et al., 2014; McGrath & Van Bergen, 2015; Troop-Gordon, 2015). Teachers have the capacity to provide support and shape the context even in classrooms with adverse conditions, such as high average levels of aggression, which presents challenges for teachers (Thomas et al., 2011). When students feel well supported emotionally and academically by their teachers, they are more likely to engage in learning activities (Wigfield et al., 2015). In line with this, it is likely that the class average level of engagement may be promoted when students perceive high levels of teacher support.

Recent school-based research and interventions indicate teachers can shape peer norms (Hamm et al., 2014; Hamm, Farmer, et al., 2011). For instance, in a randomized control trial, Hamm, Farmer, and colleagues (2011) found among 225 sixth-grade students that peer norms became less supportive of bullying when teachers improved their knowledge regarding the membership of the peer groups within a classroom (i.e., which students belong to which groups).

In another randomized control trial involving 2,453 sixth-grade students and their 188 teachers in

36 rural schools, Hamm and colleagues (2014) found students' perceptions of peer groups' acceptance and expectations for academic effort and achievement were more favorable in intervention schools than control schools. Teachers in intervention schools received training to build supportive classroom learning environments for students, such as become aware of the social interactions within a classroom and provide constructive feedback to students' learning, which is consistent with the features of high levels of teacher support. It should be noted that peer norms in these two studies were defined at the peer group level and from the perspective of injunctive norms, which are different from the descriptive class peer norms in the current study. However, it provides hints that teacher influence is not limited to the level of individual student, but can reach a higher level, such as peer group norms and possibly class peer norms. Therefore, it was expected that teacher support in the fall would be negatively associated with class peer norms of aggression (overt and relational) and disruptive behavior in the fall, and positively associated with class peer norms of involved behavior in the fall.

Summary and Gaps in the Literature

Peer influence becomes increasingly salient during early adolescence (LaFontana & Cillessen, 2010), and classroom peers are in a unique influential position due to the proximity and the structured time they spend together (Ladd et al., 2009). Class peer norms, which are calculated as the class average level of a certain behavior, are important resources from which students infer criteria for desirable behaviors and adjust their own behavior accordingly (Chang, 2004; Farmer et al., 2011; Henry, 2008). However, these norms generally develop in a negative trend during early adolescence: aggression becomes more valued and prevalent and academic

engagement becomes less valued (Galvn et al., 2011). High aggression class peer norms may put students at a heightened risk for increased aggression, especially for students with an initial risk for aggression (e.g., high status students or initially aggressive students), as students tend to model and reinforce aggressive behaviors in such classroom environments (Dishion & Tipsord, 2011). Aggression is linked to negative consequences for both the agent (students who display aggression) and the target (students whom the aggressive behaviors is directed towards) under most situations (Crick, 1996; Juvonen et al., 2003; Stipek & Miles, 2008), despite the positive consequence (e.g., gaining high social status) under some circumstances (LaFontana & Cillessen, 2002; Juvonen et al., 2013). Additionally, the occurrence of aggression reaches a peak during early adolescence (Moffit, 1993; Pellegrini & Long, 2002). Thus, it is important to examine the influence of class peer norms on individual student’s aggression.

Class peer norms also have implications for students’ academic adjustment, although less is studied compared to the aggression class peer norms. Students’ engagement problems often worsen in classrooms with low engagement norms (i.e., low class average engagement) and are mitigated in classrooms with high engagement norms (Barth et al., 2004). Despite the general decline in the values and prevalence of academic engagement during early adolescence, academic adjustment can still contribute to high social status in high-achieving classrooms (Jonkman et al., 2009). Additionally, students are not as engaged as we might expect during middle school, but engagement during this period has significant implications for students’ long-term academic success (e.g., high school graduation rates; Balfanz et al., 2007). This highlights the importance to study the role of class peer norms in influencing students’ engagement.

Teachers can be a critical developmental asset that protects early adolescents from academic and behavioral problems and promotes social and academic success, due to their position to set the tone and structure classroom interactions (Crosnoe & Benner, 2015). However, it is concerning that teacher support decreases during early adolescence, despite its stronger influence on students' adjustment compared to younger students, and one third of middle school teachers are not sure or do not know the impact of teacher support (Davis, 2006). Much work has been done regarding the influence of teacher support on individual student's adjustment. However, little is known regarding the influence of teacher support on the classroom as a whole or class peer norms, in addition to the preliminary evidence that suggests a promising role for teachers to shape class peer norms (Bierman, 2011). It is critical to examine teacher support and class peer norms simultaneously, as both are salient and influential sources for students' behaviors. Examining both sources may reveal the interactive dynamic between the two in terms of how students' behaviors are shaped during middle school.

Although the current literature is informative regarding the influence of class peer norms and teacher support on individual student's aggression and academic engagement, there are several gaps. First, teacher influence on the classroom as a whole (i.e., class peer norms) is relatively understudied compared to teachers' influence on individual student's behavior. It is important to investigate this considering the interactive nature between the teacher-student and peer-student subsystems within a classroom ecology (e.g., positive teacher influence might be counteracted by negative peer influence; Neal & Neal, 2013). Additionally, it will be more feasible and cost-efficient if such investigation can provide recommendations for teachers

regarding how they can intervene with the class as a whole instead of at the level of an individual student.

Second, teacher influence and peer influence on individual student's adjustment have rarely been examined simultaneously. Thomas and colleagues' (2011) work is the first investigation of both influences on student adjustment (i.e., aggressive and disruptive behavior). It highlights the importance to examine both factors, however, the study was conducted among lower elementary school students. No such investigation is found at the upper elementary or middle school level. Considering early adolescence is a critical developmental period with many individual and school contextual changes occurring, it is necessary to replicate Thomas' and colleagues' work in middle school.

Third, current investigation of the influence of teacher support on student adjustment largely employs teacher-reported data for both teacher support and student outcomes. It is important to validate such findings using multiple informant methods, especially considering the discrepancy between teacher-perceived and student-perceived teacher support. Fourth, aggression and engagement have rarely been examined simultaneously in relation to teacher support and/or class peer norms (see Barth et al., 2004 as an exception) and academic adjustment is less studied compared to aggression. It is important to investigate both aggression and engagement in order to gain a more comprehensive picture of early adolescents' school adjustment. Fifth, aggression have been examined in general but rarely separated into different forms (i.e., overt and relational aggression) in terms of how it might be influenced by teacher support and class peer norms.

Chapter Three: Method

This short-term longitudinal study was aimed to address the following research questions:

1. Were spring student behaviors (overt and relational aggression, involved and disruptive behavior) *directly* influenced by fall teacher support?
2. Was there an *indirect* influence of fall teacher support on spring student behaviors via class peer norms?
 - a) Did fall teacher support have significant influence on fall class peer norms?
 - b) Did fall class peer norms have significant effect on spring student behaviors?
3. Was there a significant moderation effect of fall class peer norms on the association between fall teacher support and each student behavior (overt and relational aggression, involved and disruptive behavior) in the spring?

This chapter details the methods utilized in the current study. First, information on the study participants is provided, followed by the procedures used for recruiting participants and collecting data. Then a description of the measures used for data collection is provided. Next, the analysis plan used to address the research questions is explained. Finally, ethical considerations of the study are addressed.

Participants

Participants in this study were sixth-grade students from a larger study: Adolescent

Motivation and Development Study (AMDS), which was directed by Dr. Kiefer, the principal investigator. Students were recruited to participate in the AMDS from three elementary (School I, II, and III) and three middle schools (School A, B, and C), which serve a large, ethnically diverse, urban community in the southeastern United States. The three elementary schools were selected based on student diversity and convenience sampling. The three middle schools were chosen based on the student diversity and the feeder patterns between middle and elementary schools in the school district, so that students could be followed longitudinally, which was aligned with the aim of the AMDS, to examine motivation and peer relations across the middle school transition. Students from elementary School I attended middle School C, students from School II went to School B, and students from School III fed into School A and B (see Figure 2).

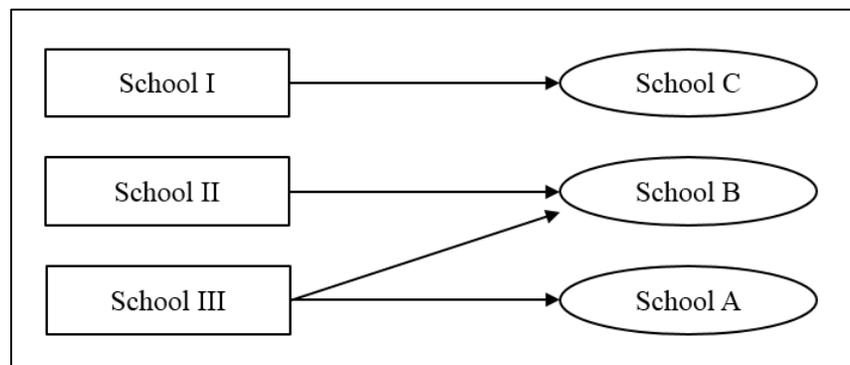


Figure 2. Elementary to middle school feeder pattern.

Among the three middle schools, the average rate of students eligible for free or reduced fee lunch was 32% (30% for School A, 52% for School B, and 13% for School C), and the average annual mobility rate was 20% including both students who transferred in and out.

During the fall of sixth grade (Time 1), 421 students from 42 classrooms in the three schools

participated. In the spring of sixth grade (Time 2), there were some participants who dropped out from the study and some new participants who had not participated in the fall. In total, there were 406 students from 38 classrooms in the three schools who participated in the spring. Among them, 346 students participated at both time points. Computation of peer nomination scores on overt and relational aggression was based on all students who participated at each time point (i.e., the information from all 421 students was used to calculate Time 1 aggression scores and information from all 406 students in the spring was used for Time 2 aggression scores; Cillessen & Mayeux, 2004). All other analyses were based on data from students who participated at both time points.

Among the 346 students who participated at both time points, 337 of them from 37 classrooms remained in the same classroom across the two time points. Students from classrooms with fewer than five participants were excluded from the sample, as evidence shows that the average size of peer groups during the first year of middle school is around 5 (Ryan, 2001) and class size should be equal to or larger than that. Also, the majority of the classes had five or more participants, and only four of the 37 classes did not meet this criterion (one classroom with two students, and three classrooms with three participants were omitted). This led to a sample of 326 students from 33 classes. Five more participants were excluded from the sample because they did not report either teacher academic support or teacher emotional support, which were used to compute teacher support scores. All nine participants in one of the 33 classes were also excluded, as eight of the nine students did not have data on teacher support, which was a key variable in the current study. Therefore, the final sample for analyses included 312

participants in 32 classrooms (49.4% female; 55.4% White, 21.1% Latino, 10.6% multi-racial, 6.4% Asian, 4.8% African American, and 1.6% classified as others). Demographic information of participants in each school is reported in Table 1. The number of participants in each classroom ranged from 5 to 18, with an average class size of 9.75.

Table 1

Demographic Characteristics of Participants in both Fall and Spring of Sixth Grade

Demographic Variable	School A (N = 62) 20%	School B (N = 94) 30%	School C (N = 156) 50%	Total Sample (N = 312) 100%
Gender				
Male	31 (50%)	49 (52.1%)	78 (50%)	158 (50.6%)
Female	31 (50%)	45 (47.9%)	78 (50%)	154 (49.4%)
Ethnicity				
White	38 (61.3%)	33 (35.1%)	102 (65.4%)	173 (55.4%)
Latino	12 (19.4%)	38 (40.4%)	16 (10.3%)	66 (21.2%)
Multi-Racial	5 (8.1%)	11 (11.7%)	17 (10.9%)	33 (10.6%)
Asian	4 (6.5%)	4 (4.3%)	12 (7.7%)	20 (6.4%)
African American	3 (4.8%)	7 (7.4)	5 (3.2%)	15 (4.8%)
Others	-	1 (1.1%)	4 (2.6%)	5 (1.6%)
Free or Reduced-Fee Lunch	30%	52%	13%	32%

Note. N = 312.

Among the 32 classrooms, teacher information was available for 25 of them (one teacher for one classroom; 84% female) during the fall. Twenty of the 25 teachers (i.e., 80%) were European American, three of them (i.e., 12%) were Hispanic, one was African American (i.e., 4%), and one was Asian American (i.e., 4%). Teachers' average age was 43 years with a standard deviation of 11 years.

Procedure

Students were recruited from social studies classes in these schools. A convenience sampling method was used. The research team requested one subject area to be recruited from, and the principals at the participation schools selected social studies class due to practicality issues with spring testing. Data used in this study were collected in fall 2009 (fall of sixth grade) and spring 2010 (spring of sixth grade), with approximately six months interval in between the two time points. Active parent consent forms and student assent forms were obtained prior to data collection. All sixth-grade students were invited to participate in the study. To encourage participation, every student who returned the parent consent form, no matter if the parent allowed him/her to participate in the study or not, was given a raffle ticket for a gift certificate to a local movie theater. At each school, there were three students who received a certificate. Fifty-seven percent of the students returned parental consent forms and provided assent, allowing them to participate in the study. Participants were representative of the overall demographics among the three schools.

Surveys were administered during the school day by two or more researchers in the media center or cafeteria at each school, with students from multiple social studies classes in attendance. One researcher read the instructions and questions aloud to students and the other researcher(s) walked around to make sure students filled in the survey properly and answered any questions. All students who completed the survey were given a mini dual pen or highlighter as incentive. Before completing the survey, students were informed of the survey purpose (i.e., to learn about their motivation and success in school). Students were also informed that

participation was voluntary, they could withdraw at any time, and that the information provided would be kept confidential. Surveys were administered on another school day for students who were absent during the first survey administration.

Measures

The demographics form was developed by the research team for the Adolescent Motivation and Development Study (see Appendix A). All measures were administered in the fall (Time 1 or T1) and spring (Time 2 or T2) of sixth grade. All self-report measures used a 5-point scale (*1 = not at all true, 3 = somewhat true, 5 = very true*).

Peer nominated aggression. Two forms of aggression (i.e., overt and relational aggression) were assessed by peer nominations. Students were asked the following two questions: “Which students in your grade get into physical fights, threaten to beat up or bully other students (overt aggression)?”, and “Which students in your grade spread rumors, gossip, or exclude friends when mad at them (relational aggression)?” (Crick & Grotpeter, 1995). These questions are also listed in Appendix B. Students could nominate up to three peers, either same- or cross-gender, in their grade for each question. Nominations were summed for each participant and standardized within each school via dividing it by the number of nominators. More specifically, during the fall semester, nominations were divided by 85 for participants from School A, by 149 for School B, and by 187 for School C. For example, a participant from School A would receive a standardized score of $1/85$ (or 0.0118) for one nomination, a participant from School B would receive a standardized score of $1/149$ (or 0.0067), and a participant from School C would receive $1/187$ (0.0053). During spring, nominations were divided by 95 for participants

from School A, by 125 for School B, and by 186 for School C. These standardized scores were further transformed to z scores, which were the final peer nomination scores for each participant, and utilized in further correlation, mediation, and moderation analyses. Higher peer nomination scores suggested higher levels of overt and relational aggression.

Academic engagement. Two facets of academic engagement (i.e., involved and disruptive behavior) were assessed by self-report measures (see Appendix C for all items). Students were verbally reminded to think about their classes in general when responding to these measures. Items measuring involved behavior were from the Rochester Assessment of Intellectual and Social Engagement (Miserandino, 1996; Skinner & Belmont, 1993). Involved behavior focused on students' self-perception of the extent to which they were behaviorally engaged in academic activities (e.g., "I listen carefully in class"; four items). Items measuring disruptive behavior were from a measure developed by Kaplan and Maehr (1999). Disruptive behavior focused on students' self-perception of the extent to which they were behaviorally disruptive and did not follow classroom rules/instructions (e.g., "I always follow the classroom rules" [reverse coded] and "I sometimes don't follow the teacher's instructions"; four items). Both scales demonstrated good reliabilities: Cronbach alpha of .76 to .84 for the Involved Behavior scale (Kiefer, Alley, & Ellerbrock, 2015; Kiefer & Ryan, 2008; Miserandino, 1996) and .83 to .89 for the Disruptive Behavior scale (Kaplan & Maehr, 1999; Midgley et al., 2000). Construct validity (i.e., correlations with motivational and behavioral constructs) have also been documented for these two scales (Kaplan & Maehr, 1999; Skinner & Belmont, 1993). Higher scores on these two scales indicated a higher level of involved or disruptive behavior.

Class peer norms. As discussed in Chapter 2, class peer norms can be computed via two ways: class average including the target student (Kellam et al., 1998; Thomas et al., 2011) or excluding the target student (Barth et al., 2004). These are two viable methods, and there is no solid evidence that one method is better than the other. In this study, class peer norms of aggression and academic engagement were computed as averages for each class including the target student, as he/she contributed to and was part of the classroom peer culture (Kellam et al., 1998). Class peer norms of overt and relational aggression were calculated as the average of students' peer nomination scores for overt and relational aggression in each classroom respectively. For example, seven students in one class participated in the study and their data met the criteria to be included in the final analysis sample. Their peer nominated overt aggression scores were -0.2425, -0.2425, -0.2425, -0.2425, 0.7687, 1.7799, and 2.7911 respectively in the fall. The average of these numbers, 0.6242, was considered as the overt aggression class peer norm for this class in the fall. Similarly, class peer norms of involved and disruptive behavior were calculated as the average self-reported involved and disruptive behavior within each classroom respectively. Thus, four norms were computed: overt aggression, relational aggression, involved behavior, and disruptive behavior class peer norms.

Teacher support. Teacher support was conceptualized as students' perceptions of the emotional and academic support they received from their teacher in the social studies classroom and computed as a composite of two measures: teacher emotional support and teacher academic support (see Appendix D for all items). Students were verbally reminded to think about their social studies class when responding to these two measures. Teacher emotional support was

measured with a four-item scale adapted slightly from the measure developed by Moos (Johnson et al., 1983; Johnson & Johnson, 1983; Patrick et al., 2007), for example, “In this class my teacher really understands how I feel about things”. Teacher academic support was also measured with a four-item scale adapted slightly from the measure developed by Moos (Johnson et al., 1983), for example, “In this class my teacher likes to help me learn”. Both scales were demonstrated as having good reliabilities (Cronbach alpha was .80 and .78 for the emotional and academic support respectively; Johnson et al., 1983) and validities (Patrick et al., 2007). These two constructs were distinct yet highly correlated in prior research and had implications for students’ academic and social adjustment (Johnson et al., 1983; Patrick et al., 2001; Patrick et al., 2007). Higher scores suggested students perceived receiving more emotional and academic support from their teacher.

Analysis Plan

Data integrity. After data collection, surveys were de-identified and scanned into a computer program called Remark. A graduate assistant reviewed each survey before scanning, so that erratic errors or patterns were excluded. If a participant selected two answers for a multiple choice question, with each answer on opposite ends of the scale, that answer was considered invalid and treated as missing data. If two answers were selected and they were next to each other, the answer closest to the middle of the scale was deemed as the response. If they were only one space apart, the in-between item was deemed as the response. Data were checked through a feature in Remark, as well as through graduate assistant review. Additionally, data accuracy were checked via frequency and other descriptive analysis on IBM Statistical Package for the Social

Sciences (SPSS) Version 21.

Missing data. Mean imputation was conducted for the scales which had only one missing item per scale (Byrne, 2001). Listwise deletion was not adopted, as it deletes all data for one participant if there is any missing information, which would lead to a loss of large amount of data, as well as a reduced sample size and statistical power of the study (Byrne, 2001).

Attrition analyses. Independent sample t-tests and chi-square tests were conducted to determine if the data reported in the fall (T1) differed significantly between students who did not participate in the spring (T2) and students who remained in the study in the spring. The significance level was defined as $p < .05$. Additionally, z-tests were conducted to determine if there was significant difference between the initial longitudinal sample ($N = 346$) and the final analysis sample ($N = 312$).

Preliminary analyses. Reliabilities of the self-report measures (involved and disruptive behavior, teacher emotional and academic support) were calculated using SPSS Version 21. Teacher emotional and academic support would be merged into one scale if the correlation between them was 0.7 or above. Descriptive analyses were conducted using SPSS Version 21, including means, standard deviations, normality (i.e., skewness and kurtosis), correlations among the variables of interest (i.e., overt and relational aggression, involved and disruptive behavior, four class peer norms, and teacher support), as well as differences across the three schools.

Multilevel mediation. Hierarchical Linear and Nonlinear Modeling (HLM) student edition 7.01 was employed for the multilevel analyses. The only exception was Step 2 of the mediation analyses, which was completed in SPSS 21 (see the following paragraph for more

details). First, intraclass correlation coefficients (*ICCs*) were estimated for teacher support, overt and relational aggression, and involved and disruptive behavior to determine their variability between classrooms versus within classrooms. Next, teacher support in the fall was split into two levels: class average teacher support (Level 2 construct; variability between classes) and group-mean centered teacher support (Level 1 construct; variability within a class). The four student behaviors (overt and relational aggression, and involved and disruptive behavior) in the fall were also group-mean centered. Finally, a mediation model was examined for each of the four student behaviors with fall class peer norm as a mediator, fall Level 2 teacher support as the independent variable (IV) and spring student behavior as the dependent variable (DV; see Figure 3 using overt aggression as an example).

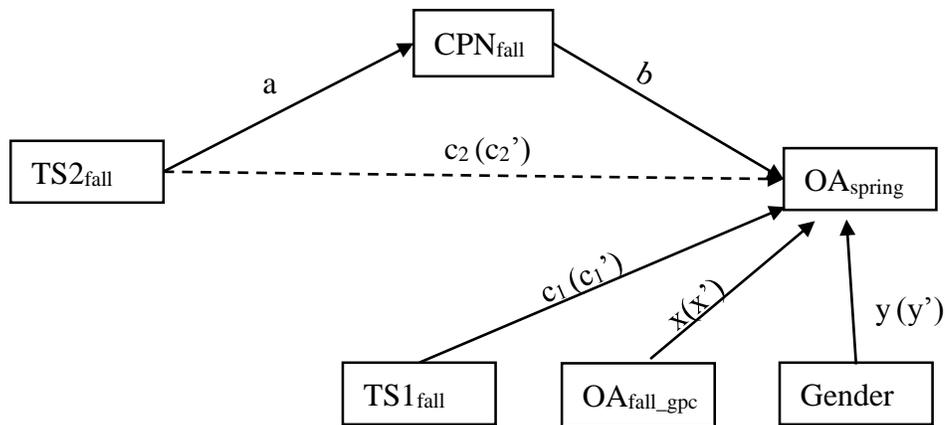


Figure 3. Mediation model illustration.*

*1 = Level 1, 2 = Level 2, TS = teacher support, CPN = class peer norm, OA = overt aggression, gpc = group-mean centered.

Each mediation analysis included three steps. In Step 1, the direct effect of fall Level 2 teacher support (IV) on spring student behavior (DV) was investigated in HLM, which was

denoted by c_2 . The effects of Level 1 covariates (i.e., Level 1 teacher support, group-mean centered fall behavior and gender) were denoted by c_1 , x and y respectively. The equations entered into HLM were as following (Reyes et al., 2012):

$$\text{Level 1: Behavior}_{\text{spring}} = \beta_{0j} + \beta_{1j}\text{TS1}_{\text{fall_ij}} + \beta_{2j}\text{Behavior}_{\text{fall_gpc_ij}} + \beta_{3j}\text{Gender}_{ij} + \gamma_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}\text{TS2}_{\text{fall_j}} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

In Step 2, the influence of fall Level 2 teacher support (IV) on class peer norm (mediator) was investigated in SPSS, which was denoted by a . The equation used in SPSS was as below:

$$\text{CPN}_{\text{fall}} = \beta_0 + \beta_1\text{TS2} + \varepsilon$$

In Step 3, the effect of fall class peer norm on spring student behavior was explored, controlling for Level 2 teacher support (IV) and Level 1 covariates. The effect of fall class peer norm on spring student behavior was represented by b , the effect of fall Level 2 teacher support was denoted by c_2' , and the influence of Level 1 covariates (Level 1 teacher support, group-mean centered fall behavior and gender) was denoted by c_1' , x' and y' respectively. The equations entered into HLM were as following (Reyes et al., 2012):

$$\text{Level 1: Behavior}_{\text{spring}} = \beta_{0j} + \beta_{1j}\text{TS1}_{\text{fall_ij}} + \beta_{2j}\text{Behavior}_{\text{fall_gpc_ij}} + \beta_{3j}\text{Gender}_{ij} + \gamma_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}\text{TS2}_{\text{fall_j}} + \gamma_{02}\text{CPN}_{\text{fall_j}} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

In summary, the direct influence of fall Level 2 teacher support on spring student behavior was represented by c_2 , and the indirect effect (or mediation effect) was represented by the product of a and b (i.e., ab). If c_2 was significant, teacher support had significant direct influence on the student behavior (i.e., overt and relational aggression, involved and disruptive behavior); otherwise, the direct influence of teacher support on the student behavior was non-significant. The indirect effect (or mediation effect) of Level 2 teacher support on student behavior via class peer norm could be significant only if both a and b were significant (i.e., if only a or b was significant or neither of them was significant, then no significant mediation effect was detected). If both a and b were significant and the direct influence of fall Level 2 teacher support (c_2) was reduced (c_2') when considering the mediation effect (ab) yet significantly different from zero ($c_2' < c_2$, $c_2' \neq 0$), then it was a partial mediation model. If both a and b were significant but the direct influence of teacher support on student behavior (c_2) was not significantly different from zero per se ($c_2 = 0$) or it was no longer significantly different from zero after adding the mediator ($c_2' = 0$), then it was a full mediation model.

Given the sample size (312 students from 32 classrooms), the effects of Level 1 covariates were estimated as fixed effects rather than random effects in Steps 1 and 3 to prevent the model becoming too complicated. Two plans of multilevel mediation analyses were conducted. In Plan A, group-mean centered fall behavior was controlled in Steps 1 and 3 of the analyses (see Figure 3 above); whereas in Plan B, it was not controlled. Given the correlation between group-mean centered fall student behaviors with other Level 1 covariates (i.e., gender

and teacher support in the fall), fall behaviors were included in the equations (Plan A) as a conservative approach to analyze the data. The contribution of Level 1 fall teacher support and gender on spring behaviors was likely to be underestimated. However, this approach (i.e., controlling fall behaviors) could help to explain potential influences that were inherent to participants (i.e., more variance explained or a better model fit). Therefore, results of Plan A are reported and interpreted in Chapter 4. Results of Plan B are provided in Appendix E.

Multilevel moderation. The multilevel moderation analyses were conducted in HLM student edition 7.01. Similar to the mediation analyses, two plans of analyses were conducted to examine the potential moderation effect. In Plan A, group-mean centered fall behavior was controlled; whereas in Plan B, it was not controlled. Results of Plan A are reported and interpreted in Chapter 4. Results of Plan B are provided in Appendix E. The equations entered into HLM for Plan A were reported below:

$$\text{Level1: Behavior}_{\text{spring}} = \beta_{0j} + \beta_{1j}\text{TS1}_{\text{fall_ij}} + \beta_{2j}\text{Behavior}_{\text{fall_gpc_ij}} + \beta_{3j}\text{Gender}_{ij} + \gamma_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}\text{TS2}_{\text{fall_j}} + \gamma_{02}\text{CPN}_{\text{fall_j}} + \gamma_{03} \text{TS2}_{\text{fall_j}} \text{PN}_{\text{fall_j}} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}\text{CPN}_{\text{fall_j}} + u_{1j}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

A simple slope test was conducted for the significant moderation effect using the online tool provided by Preacher and colleagues (<http://www.quantpsy.org/interact/hlm2.htm>; Preacher, Curran, & Bauer, 2006) to assist interpretation of the moderation effect (i.e., to decompose the interaction and pinpoint areas of significance). The significant moderation effect was also plotted

using +1 and -1 standard deviation.

Ethical Considerations

This study used archival data from the Adolescent Motivation and Development Study, a larger longitudinal study examining student motivation and peer relations across the middle school transition. The procedures for data collection, storage, analysis, consent, and assent were approved by the University of South Florida Institutional Review Board (IRB) and the Department of Assessment and Accountability of the collaborating school district. All data were de-identified and stored in a secure place. Therefore, conducting the study involved minimal risk for participants. More details about the consent and assent procedures are provided below.

Parental consent forms were provided in English and Spanish to classroom teachers, who helped to distribute the forms to students and collect the forms when students returned signed documents. All students received two copies of the consent form, one to sign and return and the other for them to keep for their records. Only students who returned consent forms that allowed them to participate were included in the study and they were informed of the study purpose and the voluntary nature of their participation prior to data collection. Survey administrators were trained by Dr. Kiefer, the Principal Investigator, and had current IRB certification. More information about the study procedure and data integrity refer to the Procedure, Data Integrity, and Missing Data sections.

Chapter Four: Results

This chapter first presents the results of attrition analyses. Next, descriptive analyses results are provided, including reliabilities of self-report measures, mean, standard deviation, normality of the key variables, correlations among variables, and differences across the three schools. Finally, results of multilevel mediation and moderation analyses are delineated.

Attrition Analyses

Independent samples *t* tests were conducted to determine if there was significant difference between students who participated in both fall (Time 1) and spring (Time 2; $N = 346$) semesters and students who participated in the fall only ($N = 75$). Results show that students who only participated at Time 1 displayed significantly higher level disruptive behavior (mean = 2.45) compared to students who participated at both time points (mean = 2.15; $t = -2.363$, $p = .019$), which is consistent with prior research (Jamison, Wilson, & Ryan, 2015). However, these two groups of students did not show significant differences in terms of overt aggression, relational aggression, involved behavior or teacher support. Chi-square test revealed no significant difference between these two groups in terms of gender, but differences in ethnicity ($\chi^2 = 24.559$, $df = 4$, $p = .000$) in that more percentages of African American and Latino students withdrew in the spring than expected (see Table 2). To further determine if there was significant difference between the initial longitudinal sample ($N = 346$) and the final analysis sample ($N = 312$), chi-

square tests and z tests were conducted. Consistently, there were no significant differences across the two samples, in terms of gender, ethnicity, teacher support, overt aggression, relational aggression, involved behavior, and disruptive behavior in the fall and spring respectively.

Table 2

Ethnicity of Students who Participated in both Waves and who Withdrew in Spring.

	Both Fall and Spring ($N = 346$)		Fall Only ($N = 75$)	
	Number	Percentage	Number	Percentage
Asian	23	6.6%	0	0
African American	16	4.6%	9	12%
Latino	72	20.8%	29	38.7%
White	192	55.5%	26	34.7%
Multi-racial	38	11.0%	10	13.3%
Other	5	1.4%	1	1.3%
Total	346	100%	75	100%

Descriptive Analyses

Reliabilities of the self-report measures are summarized in Table 3. As expected, both the Teacher Academic Support (TAS) and Teacher Emotional Support (TES) scales showed good reliabilities ($\alpha = .777$ and $.885$ for TAS in the fall and spring respectively; $\alpha = .841$ and $.872$ for TES in the fall and spring respectively), which are consistent with prior research (Johnson et al., 1983). Teacher Support, which was a combination of the TAS and TES scales, also showed good reliabilities ($\alpha = .876$ and $.927$ in the fall and spring respectively). Reliabilities of the Involved Behavior scale ($\alpha = .857$ and $.888$ in the fall and spring respectively) and Disruptive Behavior scale ($\alpha = .786$ and $.841$ in the fall and spring respectively) are also consistent with prior

research (Kaplan & Maehr, 1999; Midgley et al., 2000; Skinner & Belmont, 1993).

Table 3

Reliabilities of the Self-Report Measures in the Fall and Spring.

	Fall 2009	Spring 2010
Teacher Academic Support	.777	.885
Teacher Emotional Support	.841	.872
Teacher Support	.876	.927
Involved Behavior	.857	.888
Disruptive Behavior	.786	.841

Note. $N = 312$.

Distributions of the peer-nominated overt and relational aggression (i.e., percentages of nominations from participants attending a different social studies class, the same social studies class, or both) of the final analysis sample ($N = 312$) were calculated (see Appendix F for nominations by class). In the fall, 37 of the 312 participants were nominated as displaying overt aggression. There were 28 participants nominated by participants attending different classes (75.7%), five (13.5%) by participants in the same class, and four (10.8%) by participants from both inside and outside their classes; 27 of the 37 nominees (73.0%) were boys and 10 (27.0%) were girls. There 84 participants nominated for relational aggression in the fall, 56 of whom (66.7%) were nominated by participants from different classes, 12 (14.3%) by participants in the same class, and 16 (19.0%) by participants from both inside and outside classes; 56 of the 84 nominees (66.7%) were girls and 28 (33.3%) were boys.

In the spring, 51 of the 312 participants were nominated for overt aggression. There were 37 participants nominated by participants attending different classes (72.5%), six (11.8%) by

participants in the same class, and eight by participants from both inside and outside their classes; 39 of the 51 nominees (76.5%) were boys and 12 (23.5%) were girls. There were 92 participants nominated as displaying relational aggression in the spring, 55 of whom (59.2%) were nominated by participants from different classes, 11 by participants in the same class, and 26 by participants from both inside and outside classes; 66 of the nominees (71.7%) were girls and 26 (28.3%) were boys.

Means (*M*), standard deviations (*SD*), skewness and kurtosis, and correlations among variables are reported in Table 4. Z-scores (rather than raw scores) were used for peer nominated overt and relational aggression (Cillessen, 2009). All variables were continuous variables, except gender, which was a categorical variable (0 = boys, 1 = girls). Distributions of involved behavior, disruptive behavior, the four class peer norms, and teacher support did not significantly violate the normality assumption. The distributions of overt and relational aggression were not normal. However, this is typical with limited choice peer nomination data (e.g., nomination was limited to three peers in the sixth grade in this study; Terry, 2000).

Correlations among variables were generally consistent with the current literature (e.g., Barth et al., 2004; Luckner & Pianta; 2011; Roorda et al., 2011) and hypotheses of the study, with some exceptions. As expected, fall class peer norms were significantly correlated with their relevant spring individual student behaviors for relational aggression ($r = .150, p < .01$) and disruptive behavior ($r = .158, p < .05$). The correlations between fall class peer norms and spring student behaviors were not statistically significant for overt aggression and involved behavior.

However, when concurrent data were examined, fall class peer norms were significantly

correlated with relevant fall student behaviors for all four outcomes ($r = .289, p < .01$ for overt aggression; $r = .311, p < .01$ relational aggression; $r = .384, p < .01$ for involved behavior; and $r = .334, p < .01$ for disruptive behavior).

Correlation between fall teacher academic support and emotional support was significant ($r = .673, p < .01$) and close to the expected level of .07. Thus, they were combined as teacher support. Fall teacher support was found having significant correlations with spring student relational aggression ($r = -.116, p < .05$), involved behavior ($r = .321, p < .001$), and disruptive behavior ($r = -.181, p < .01$), but non-significant correlation with spring overt aggression ($r = -.004, p = .95$). Teacher support was further split into two levels: Level 1 (variability within a class) and Level 2 (variability between classes) to understand its association with spring student behaviors and fall class peer norms. Fall Level 1 teacher support had a significant positive correlation with spring involved behavior ($r = .299, p < .01$) and a negative correlation with spring disruptive behavior ($r = -.161, p < .01$). However, the correlations of fall Level 1 teacher support with spring overt and relational aggression were not statically significant. Fall Level 2 teacher support was negatively correlated with spring relational aggression ($r = -.116, p < .05$) and positively correlated with spring involved behavior ($r = .132; p < .05$). However, fall Level 2 teacher support was not significantly correlated with spring overt aggression or disruptive behavior. The correlations between fall Level 2 teacher support and class peer norms (CPN) were significant for all four outcomes ($r = -.121, p < .05$ for overt aggression CPN; $r = -.312, p < .01$ for relational aggression CPN; $r = .365, p < .01$ for involved behavior CPN; and $r = -.398, p < .01$ for disruptive behavior CPN).

Table 4

Results of Descriptive Analyses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender	-														
2. T1 TS_gpc	.136*	-													
3. T1 TS_Level 2	-.061	.000	-												
4. T1 CPN_OA	-.042	.000	-.121*	-											
5. T1 CPN_RA	.122*	.000	-.312**	.074	-										
6. T1 CPN_Inv	-.007	.000	.365**	-.294**	-.460**	-									
7. T1 CPN_Disr	-.017	.000	-.398**	.412**	.273**	-.592**	-								
8. T1 OA_gpc	-.140*	-.119*	.000	.000	.000	.000	.000	-							
9. T1 RA_gpc	.194**	-.088	.000	.000	.000	.000	.000	.194**	-						
10. T1 Inv_gpc	.149**	.377**	-.001	-.001	.002	-.001	.000	-.208**	-.185**	-					
11. T1 Disr_gpc	-.156**	-.218**	.000	.001	.000	-.001	.001	.231**	.185**	-.595**	-				
12. T2 OA	-.190**	-.022	.043	.093	-.001	-.024	.064	.547**	.175**	-.242**	.250**	-			
13. T2 RA	.220**	-.077	-.116*	-.048	.150**	-.078	-.041	.059	.590**	-.154**	.111	.174**	-		
14. T2 Inv	.007	.299**	.132*	-.086	-.158**	.109	-.143*	-.208**	-.064	.504**	-.421**	-.208*	-.174**	-	
15. T2 Disr	-.116*	-.161**	-.095	.080	.061	-.115*	.158*	.118*	.115*	-.407**	.580**	.193**	.139*	-.584**	-
<i>M</i>	.490	-.001	4.105	-.023	.002	4.175	2.127	.000	.000	.000	.000	.000	-.010	3.920	2.360
<i>SD</i>	.501	.737	.271	.270	.299	.320	.324	.897	.917	.770	.906	.998	.995	.992	1.107
Skewness	.026	-.771	-.495	1.715	.794	-.376	-.036	7.844	3.633	-.800	.660	7.972	6.896	-.980	.640
Kurtosis	-2.012	.349	-.557	2.570	.442	.218	-.607	88.927	19.427	.593	.084	84.732	57.207	.547	-.375

Note. *N* = 312. T1 = Time 1 (fall of sixth grade); T2 = Time 2 (spring of sixth grade); TS = Teacher Support; gpc = group-mean centered; CPN = class peer norm; OA = Overt Aggression; RA = Relational Aggression; Inv = Involved Behavior; Disr = Disruptive Behavior; *M* = mean; *SD* = standard deviation. * $p < .05$. ** $p < .01$.

To determine if the key variables of the current study differed across the three schools, one-way ANOVA tests were conducted. In the fall of sixth grade, no significant differences were found for teacher support, relational aggression, involved behavior, and disruptive behavior. However, the three schools differed significantly in overt aggression [$F(2, 306) = 4.708, p = .01$]. Further Tukey HSD test indicated School B had significantly higher levels of overt aggression ($M = 0.214, SD = 1.560$) than both School A ($M = -0.213, SD = 0.227$) and School C ($M = -0.087, SD = 0.478$). In the spring of the sixth grade, no significant differences were found across the three schools in terms of overt aggression, involved behavior and disruptive behaviors. However, the three schools differed significantly in terms of relational aggression [$F(2, 306) = 3.612, p = .028$]. Further Tukey HSD tests indicated School A had significant higher levels of relational aggression ($M = 0.291, SD = 1.746$) than both School B ($M = -0.091, SD = 0.504$) and School C ($M = -0.083, SD = 0.760$).

Multilevel Analyses

Assumption check. As mentioned above, no significant violations of the normality assumption of the continuous variables were found, except peer nominated overt and relational aggression. The distribution of residuals were further examined, including normality (see Table 5) and homoscedasticity (see Figure 4). Similarly, no significant violations of the normality assumption were found for the residuals of involved or disruptive behavior at either Level 1 or Level 2. However, significant violations of normality assumption were found for the residuals of peer nominated overt and relational aggression, particularly residuals at Level 1. However, this is typical with limited choice peer nomination data (Terry, 2000). In terms of the homoscedasticity

assumption, violations were found for peer-nominated overt and relational aggression, but not for involved or disruptive behavior.

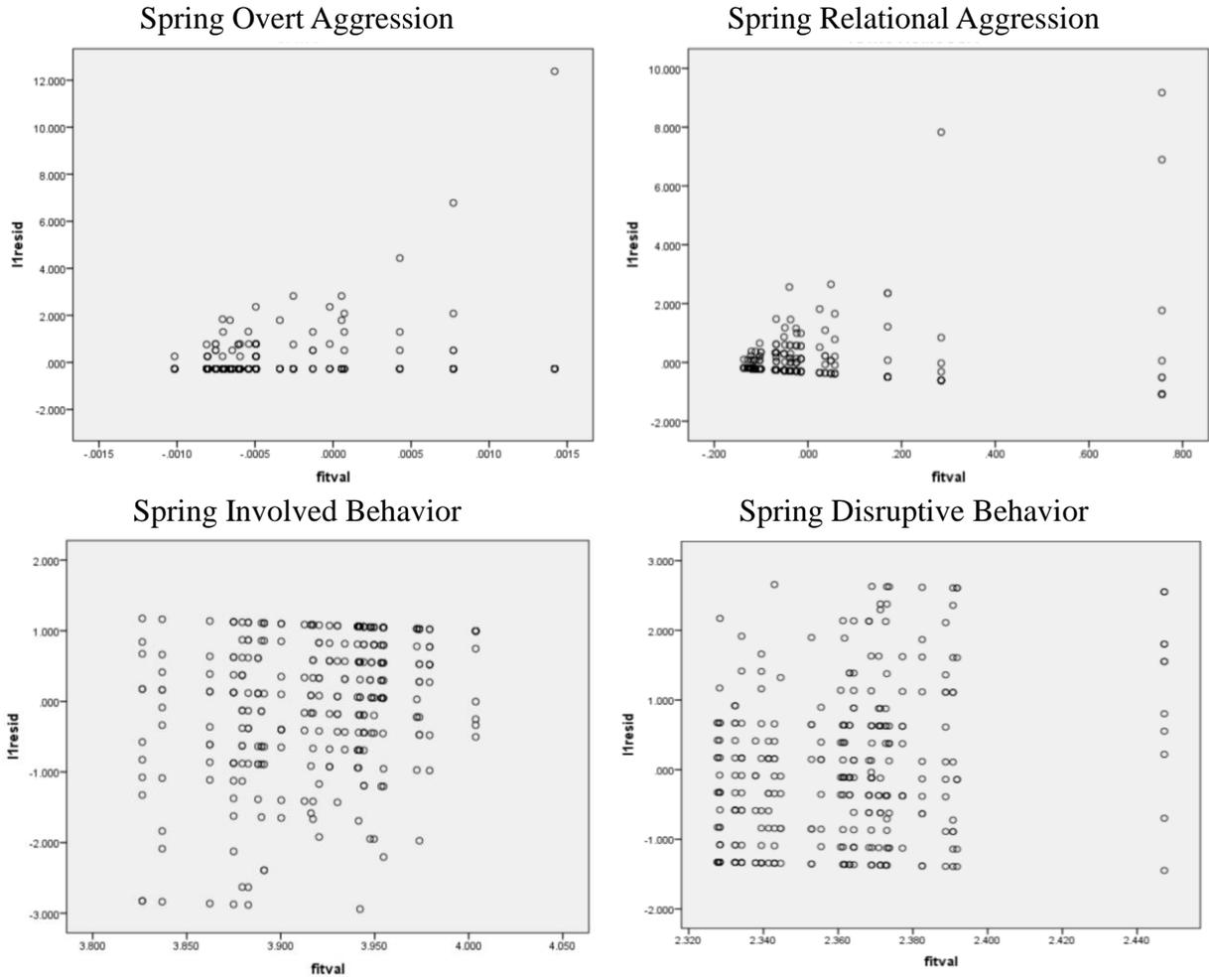


Figure 4. Scatterplot for homoscedasticity of level 1 residuals.

Table 5

Normality of Level 1 and Level 2 Residuals

	Level 1 Residuals		Level 2 Residuals	
	Skewness	Kurtosis	Skewness	Kurtosis
T2 Overt Aggression	7.971	84.727	2.087	4.841
T2 Relational Aggression	6.560	53.642	3.564	15.064
T2 Involved Behavior	-.976	.526	-.380	-.207
T2 Disruptive Behavior	.631	.140	1.161	3.170

Note. $N = 312$. T2 = Time 2 (spring of sixth grade).

Unconditional models. Unconditional models were examined to determine the intraclass correlation coefficients (*ICCs*) for the key variables (see Table 6), which reflect the percentage of variability at the between level (i.e., $ICC = \text{variability at the between level} / \text{total variability}$). Results show that *ICC* was significant for fall involved behavior ($ICC = 5.37\%$, $p < .05$) and spring teacher support ($ICC = 7.72\%$, $p < .01$) and relational aggression ($ICC = 6.94\%$, $p < .05$). This indicates 5.37% of the variance in fall involved behavior, 7.72% of the variance in spring teacher support, and 6.94% of the variance in spring relational aggression was explained at the between classroom level. *ICCs* were small and non-significant for the other variables, suggesting variance in those variables were largely explained at the within classroom level.

Table 6

Intraclass Correlation Coefficients (ICCs) for Key Variables

	Teacher Support	Overt Aggression	Relational Aggression	Involved Behavior	Disruptive Behavior
Fall	1.52%	0.13%	0.05%	5.37%*	1.03%
Spring	7.72%**	0.02%	6.94%*	1.45%	0.76%

Note. $N = 312$. * $p < .05$, ** $p < .01$.

Multilevel mediation. As discussed in Chapter 3, multilevel mediation analyses were conducted using two different approaches, Plan A (with fall group-mean centered behavior controlled) and Plan B (without controlling fall behavior). The overall pattern (i.e., if there is a mediation effect of CPN on the association between fall teacher support and spring student behavior; if it is a full or partial mediation) of the results was similar between the two plans, with some differences: (1) the influence of gender and fall teacher support on spring behavior tended to be underestimated in Plan A; (2) Plan A had better model fit for all four outcomes; and (3) a marginal full mediation model was established for overt aggression (teacher support → CPN → overt aggression) in Plan A but not in Plan B. Results of Plan A are delineated below, as this approach could help to explain potential influences that were inherent to participants (i.e., more variance explained or a better model fit). Results of Plan B are reported in Appendix E.

In Plan A, CPN was found to have a significant full mediation effect on the association of fall teacher support (Level 2) with spring disruptive behavior, a marginally significant full mediation effect on spring overt and relational aggression, but no significant mediation effect on involved behavior. Level 1 teacher support (i.e., within classroom variation, or variation from the class average) had a significant positive association with involved behavior, but no significant relations with any of the other three student behaviors. Gender had a significant negative association with overt aggression, but no significant relations with any of the three other student behaviors. Fall behavior remained a significant predictor of spring behavior for all four student behaviors. The models for each student behavior are reported below, with results from the three steps of mediation analyses reported first and effects of Level 1 covariates described afterwards.

Overt aggression. Results of the mediation analyses for overt aggression are summarized in Table 7 and Figure 5. The mediation effect of overt aggression CPN on the association between fall Level 2 teacher support and spring student overt aggression was marginally significant and it was a full mediation model (rather than the partial mediation model proposed). In Step 1, the direct effect of fall Level 2 teacher support (independent variable or IV) on spring student overt aggression (dependent variable or DV) was examined. This association was non-significant ($\gamma = 0.161, p \geq .10, SE = 0.189$). In Step 2, the effect of fall Level 2 teacher support (i.e., IV) on fall overt aggression CPN (i.e., mediator) was examined, and teacher support had a significant negative effect on this CPN ($\gamma = -0.121, p < .05, SE = 0.056$). This indicates that overt aggression CPN tended to be lower when the average perceived teacher support (i.e., Level 2 teacher support) was high in a class. In Step 3, the association between fall overt aggression CPN (i.e., mediator) and spring student overt aggression (i.e., DV) was investigated while controlling for teacher support (i.e., IV). Fall overt aggression CPN had a marginally significant positive effect on individual student overt aggression in the spring ($\gamma = 0.323, p < .10, SE = 0.184$). This indicates that students whose class had high overt aggression CPN in the fall tended to receive higher peer-nominated overt aggression scores in the spring. The effect of fall Level 2 teacher support on spring individual student overt aggression remained non-significant in this step ($\gamma = 0.198, p \geq .10, SE = 0.185$). Model fit of Step 3 improved than that of Step 1 (i.e., deviance decreased from 753.99 in Step 1 to 750.68 in Step 3, while the number of parameters estimated remained the same). In summary, fall Level 2 teacher support did not have a significant direct influence on spring student overt aggression, but it had a significant negative effect on class peer

norm, which further had marginally significant effect (i.e., $p < .10$) on over aggression. Thus, a marginally significant full mediation model was established for overt aggression.

In terms of the effect of Level 1 covariates, gender had a significant negative effect on student overt aggression ($\gamma = -0.248, p < .05, SE = 0.100$ in Step 1; $\gamma = -0.237, p < .05, SE = 0.100$ in Step 3), which indicates girls tended to receive lower peer-nominated overt aggression scores. Overt aggression in the fall had significant positive effect on peer-nominated overt aggression in the spring ($\gamma = -0.598, p < .001, SE = 0.054$ for both Step 1 and 3), suggesting students who had high levels of peer nominated overt aggression in the fall tended to receive higher peer-nominated overt aggression scores in the spring. Level 1 fall teacher support (i.e., deviation of student's perception of teacher support from his/her class average perception of teacher support) did not have a significant influence on individual student overt aggression in the spring.

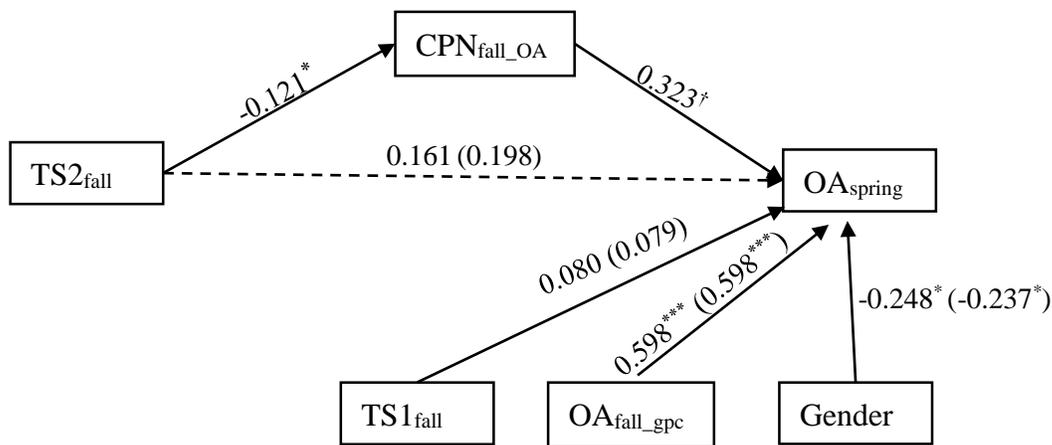


Figure 5. Mediation model for overt aggression: Unstandardized parameter estimates. *

*TS1 = level 1 teacher support, TS2 = level 2 teacher support, CPN = class peer norm, OA = overt aggression, gpc = group-mean centered.

Table 7

Multilevel Mediation Analyses Results for Spring Overt Aggression (Plan A)

	Step 1		Step 2		Step 3	
	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>
Intercept	-0.532	0.779	0.473*	0.231	-0.685	0.763
Level 1						
Teacher Support _{fall}	0.080	0.067	-	-	0.079	0.067
Gender	-0.248*	0.100	-	-	-0.237*	0.100
OA _{fall_gpc}	0.598***	0.054	-	-	0.598***	0.054
Level 2						
Teacher Support _{fall}	0.161	0.189	-0.121*	0.056	0.198	0.185
Peer Norm _{fall_OA}	-	-	-	-	0.323 [†]	0.184
Fit Statistics						
Deviance (or R^2)	753.99 ^a		.015 ^b		750.68 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. OA = Overt Aggression, gpc = group-mean centered, *SE* = Standard Error.

[†] $p < .10$. * $p < .05$. *** $p < .001$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index.

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

Relational aggression. Results of the mediation analyses for relational aggression are summarized in Table 8 and Figure 6. The mediation effect of CPN on the association between fall Level 2 teacher support and spring student relational aggression was marginally significant and it was full mediation effect (rather than the partial mediation model proposed). In Step 1, the direct effect of fall Level 2 teacher support (independent variable or IV) on spring student relational aggression (dependent variable or DV) was examined. Teacher support had a marginally significant negative influence on individual student relational aggression ($\gamma = -0.463$, $p < .10$, $SE = 0.251$). This indicates students whose class had a high average perception of teacher support in the fall tended to receive lower peer-nominated relational aggression scores in

the spring, compared to student whose class had low levels of average perceived teacher support. In Step 2, the effect of fall Level 2 teacher support (i.e., IV) on fall relational aggression CPN (i.e., mediator) was examined, and teacher support had a significant negative association with the class peer norm ($\gamma = -0.344, p < .001, SE = 0.059$). This indicates relational aggression CPN tended to be lower in classes where the average perceived teacher support was high. In Step 3, the association between the fall relational aggression CPN (i.e., mediator) and spring student relational aggression (i.e., DV) was investigated while controlling for teacher support (i.e., IV). Fall relational aggression CPN had a marginally significant positive effect on peer-nominated relational aggression in the spring ($\gamma = 0.426, p < .10, SE = 0.223$). This indicates students whose class had high relational aggression CPN in the fall tended to receive higher peer-nominated relational aggression scores in the spring. The effect of fall Level 2 teacher support on spring student relational aggression in this step decreased when compared to that in Step 1 and became non-significant ($\gamma = -0.324, p \geq .10, SE = 0.253$). This suggests that teacher support did not have a significant influence on student relational aggression when CPN was taken into consideration. Model fit of Step 3 improved than that of the Step 1 (i.e., deviance decreased from 697.02 in Step 1 to 692.80 in Step 3, while the number of parameters estimated remained the same). In summary, the marginally significant direct influence of fall Level 2 teacher support on spring student relational aggression decreased to a non-significant level after adding relational aggression CPN into the model. However, teacher support had a significant influence on relational aggression CPN, which further had a marginally significant effect (i.e., $p < .10$) on student relational aggression. Thus, a marginally significant full mediation model was

established for relational aggression.

In terms of the effect of Level 1 covariates, student's relational aggression in the fall had significant positive influence on peer nominated relational aggression in the spring ($\gamma = 0.630$, $p < .001$, $SE = 0.047$ for Step 1; $\gamma = 0.632$, $p < .001$, $SE = 0.047$ for Step 3). This indicates students who had high levels of peer nominated relational aggression in the fall tended to receive higher peer-nominated relational aggression scores in the spring. No significant effects on spring relational aggression were found for fall Level 1 teacher support or gender.

Table 8

Multilevel Mediation Analyses Results for Spring Relational Aggression (Plan A)

	Step 1		Step 2		Step 3	
	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>
Intercept	1.802 [†]	1.031	1.416 ^{***}	0.245	1.239	1.038
Level 1						
Teacher Support _{fall}	-0.046	0.058	-	-	-0.045	0.058
Gender	0.123	0.092	-	-	0.112	0.092
RA _{fall_gpc}	0.630 ^{***}	0.047	-	-	0.632 ^{***}	0.047
Level 2						
Teacher Support _{fall}	-0.463 [†]	0.251	-0.344 ^{***}	0.059	-0.324	0.253
Peer Norm _{fall_RA}	-	-	-	-	0.426 [†]	0.223
Fit Statistics						
Deviance (or R^2)	697.02 ^a		.098 ^b		692.80 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. RA = Relational Aggression, gpc = group-mean centered, SE = Standard Error.

[†] $p < .10$. ^{***} $p < .001$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index.

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

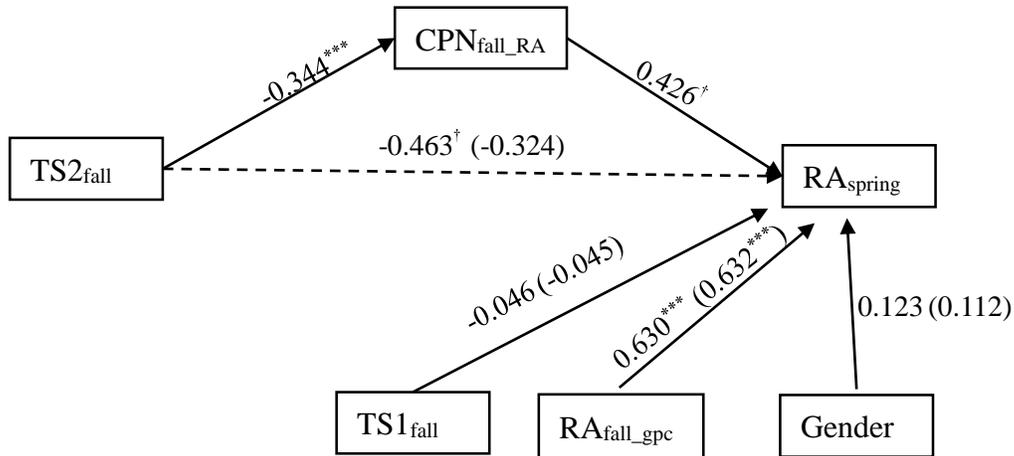


Figure 6. Mediation model for relational aggression: Unstandardized parameter estimates.*

*TS1 = level 1 teacher support, TS2 = level 2 teacher support, CPN = class peer norm, RA = relational aggression, gpc = group-mean centered.

Involved behavior. Results of the mediation analyses for involved behavior are summarized in Table 9 and Figure 7. No significant mediation effect was found for involved behavior CPN on the association between fall Level 2 teacher support and spring student involved behavior. In Step 1, the direct effect of fall Level 2 teacher support (i.e., independent variable or IV) on spring student involved behavior (i.e., dependent variable or DV) was examined. This relation was marginally significant ($\gamma = 0.385, p < .10, SE = 0.211$). This suggests that students whose class had high average perception of teacher support in the fall tended to self-report higher levels of involved behavior in the spring, compared to students whose class had low average perception of teacher support in the fall. In Step 2, the effect of fall Level 2 teacher support (i.e., IV) on the fall involved behavior CPN (i.e., mediator) was examined, and teacher support had significant positive influence on this class peer norm ($\gamma = 0.431, p < .001, SE = 0.062$). This indicates that involved behavior CPN tended to be higher

when the average perceived teacher support was high in a class. In Step 3, the association between fall involved behavior CPN (i.e., mediator) and spring student involved behavior (i.e., DV) was investigated while controlling for teacher support (i.e., IV). Fall involved behavior CPN did not have significant influence on student involved behavior in the spring ($\gamma = 0.240, p \geq .10, SE = 0.189$). However, the influence of teacher support on student involved behavior decreased when compared to that in Step 1 and became non-significant ($\gamma = 0.281, p \geq .10, SE = 0.225$). Model fit of Step 3 did not improve than that of Step 1 (i.e., deviance increased from 733.28 in Step 1 to 735.01 in Step 3 while the number of parameters estimated remained the same). In summary, the marginally significant (i.e., $p < .10$) direct influence of fall Level 2 teacher support on spring student involved behavior decreased to a non-significant level after adding CPN into the model. Fall teacher support had significant positive effect on involved behavior CPN. However, CPN did not have significant influence on student involved behavior. Thus, no mediation effect was found for CPN on the association between fall Level 2 teacher support and spring student involved behavior.

In terms of the effect of Level 1 covariates, fall Level 1 teacher support (i.e., deviation of student's perception of teacher support from his/her class average) had significant positive influence on student involved behavior in the spring ($\gamma = 0.160, p < .05, SE = 0.073$ for Step 1; $\gamma = 0.158, p < .05, SE = 0.073$ for Step 3), which indicates student who perceived more teacher support (relative to his/her classmates) in the fall tended to report higher levels of involved behavior in the spring, regardless of the class average levels of perceived teacher support.

Student's self-reported involved behavior in the fall also had significant positive influence on

his/her involved behavior in the spring ($\gamma = 0.615, p < .001, SE = 0.069$ for Step 1; $\gamma = 0.617, p < .001, SE = 0.069$ for Step 3). This indicates student who reported high levels of involved behavior in the fall tended to self-report more involved behavior in the spring. No significant influence was found for gender on student involved behavior.

Table 9

Multilevel Mediation Analyses Results for Spring Involved Behavior (Plan A)

	Step 1		Step 2		Step 3	
	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>
Intercept	2.416*	0.872	2.407***	0.257	1.841 [†]	0.976
Level 1						
Teacher Support _{fall}	0.160*	0.073	-	-	0.158*	0.073
Gender	-0.128	0.101	-	-	-0.132	0.101
Inv _{fall_gpc}	0.615***	0.069	-	-	0.617***	0.069
Level 2						
Teacher Support _{fall}	0.385 [†]	0.211	0.431***	0.062	0.281	0.225
Peer Norm _{fall_Inv}	-	-	-	-	0.240	0.189
Fit Statistics						
Deviance (or R^2)	733.28 ^a		.133 ^b		735.01 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. Inv = Involved Behavior, gpc = group-mean centered, *SE* = Standard Error.

[†] $p < .10$. * $p < .05$. *** $p < .001$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index;

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

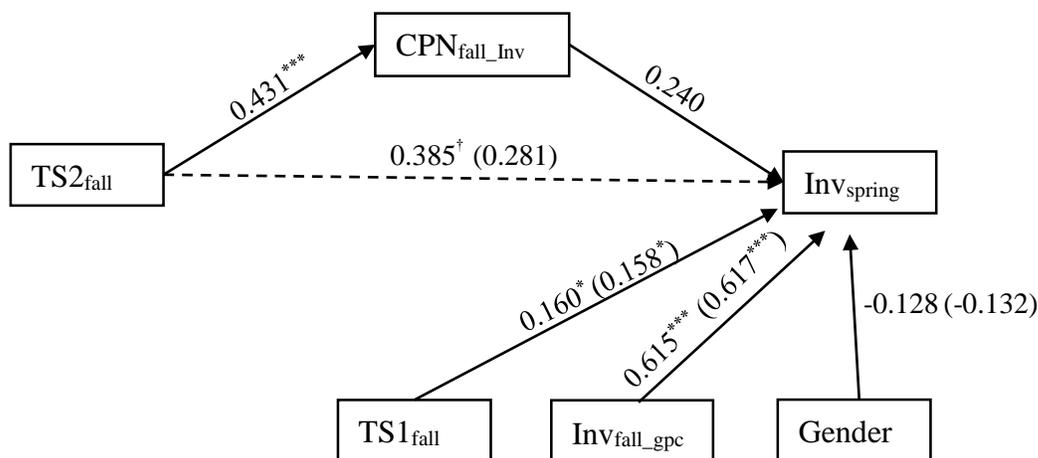


Figure 7. Mediation model for involved behavior: Unstandardized parameter estimates.*

*TS1 = level 1 teacher support, TS2 = level 2 teacher support, CPN = class peer norms, Inv = involved behavior, gpc = group-mean centered.

Disruptive behavior. Results of the mediation analyses for disruptive behavior are summarized in Figure 8 and Table 10. The mediation effect of class peer norm on the association between fall Level 2 teacher support and spring student disruptive behavior was significant and it was a full mediation effect (rather than the partial mediation model proposed). In Step 1, the direct effect of fall Level 2 teacher support (independent variable or IV) on spring student disruptive behavior (dependent variable or DV) was examined. Teacher support had a marginally significant negative effect on student disruptive behavior ($\gamma = -0.421, p < .10, SE = 0.243$). This indicates student whose class had a high average perception of teacher support in the fall tended to self-report lower levels of disruptive behavior in the spring, when compared to student whose class had low overall perception of teacher support in the fall. In Step 2, the effect of fall Level 2 teacher support (i.e., IV) on fall disruptive behavior CPN (i.e., mediator) was examined, and teacher support had significant negative effect on this CPN ($\gamma = -0.475, p < .001, SE = 0.062$).

This suggests disruptive behavior CPN tended to be lower when the average perception of teacher support was high in a class. In Step 3, the association between fall disruptive behavior CPN (i.e., mediator) and spring student disruptive behavior (i.e., DV) was investigated while controlling teacher support (i.e., IV). Fall disruptive behavior CPN had significant positive effect on individual student disruptive behavior in the spring ($\gamma = 0.567, p < .01, SE = 0.199$). This suggests student whose class had high levels of disruptive behavior CPN in the fall tended to self-report more disruptive behavior in the spring. In the meantime, the influence of teacher support on spring student disruptive behavior decreased and become non-significant ($\gamma = -0.157, p \geq .10, SE = 0.235$) when compared to that in Step 1. Model fit of the last step improved than that of Step 1 (deviance decreased from 759.72 in Step 1 to 752.26 in Step 3, while the number of parameters estimated remained the same). In summary, the marginally significant (i.e., $p < .10$) direct influence of fall Level 2 teacher support on spring student disruptive behavior decreased and become non-significant once CPN was added in the model. However, teacher support had significant influence on disruptive behavior CPN, which further had significant effect on student disruptive behavior. Thus, teacher support had a significant indirect influence on student disruptive behavior via disruptive behavior CPN (i.e., full mediation model).

In terms of the effect of Level 1 covariates, disruptive behavior in the fall had significant positive effect on students' levels of disruptive behavior in the spring ($\gamma = 0.722, p < .001, SE = 0.060$ in both Step 1 and 3). This indicates students who self-reported high levels of disruptive behavior in the fall tended to report more disruptive behavior in the spring. No significant influence on spring disruptive behavior was found for fall Level 1 teacher support or gender.

Table 10

Multilevel Mediation Analyses Results for Spring Disruptive Behavior (Plan A)

	Step 1		Step 2		Step 3	
	γ	SE	γ	SE	γ	SE
Intercept	4.138***	1.001	4.077***	0.256	1.841	1.204
Level 1						
Teacher Support _{fall}	-0.033	0.072	-	-	-0.031	0.073
Gender	-0.110	0.108	-	-	-0.109	0.106
Disr _{fall_gpc}	0.722***	0.060	-	-	0.722***	0.060
Level 2						
Teacher Support _{fall}	-0.421 [†]	0.243	-0.475***	0.062	-0.157	0.235
Peer Norm _{fall_Disr}	-	-	-	-	0.567**	0.199
Fit Statistics						
Deviance (or R ²)	759.72 ^a		.159 ^b		752.26 ^a	
No. of Parameters Estimated	2		-		2	

Note. N = 312. Disr = Disruptive Behavior, gpc = group-mean centered, SE = Standard Error.

[†] p < .10. ** p < .01. *** p < .001.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index;

^b Step 2 was analyzed in SPSS and R² was reported as its fit index.

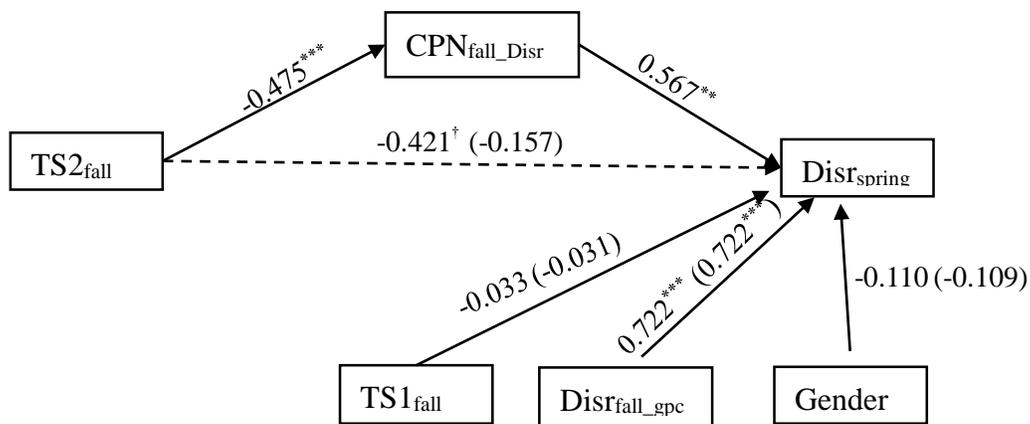


Figure 8. Mediation model for disruptive behavior: Unstandardized parameter estimates.*

*TS1 = level 1 teacher support, TS2 = level 2 teacher support, CPN = class peer norms, Disr = disruptive behavior, gpc = group-mean centered.

Multilevel moderation. Similar to the mediation analyses, two plans of analyses were conducted to examine the potential moderation effect of class peer norms on the association between teacher support and individual student behaviors. In Plan A, group-mean centered fall behavior was controlled, whereas in Plan B it was not controlled. Results of Plan A are delineated in the text and results of Plan B are reported in Appendix E. As reported in Table 11, only one significant moderation effect was found that class peer norm moderated the relation between fall Level 1 teacher support and spring student involved behavior ($\gamma = 0.407, p < .05, SE = 0.198$). This finding indicates that students who reported relatively high levels of teacher support in the fall (compared to other students in the same class) tended to report higher levels of involved behavior in the spring when the fall involved behavior CPN was also high. Simple slope analyses indicated there was a significant positive relation between Level 1 teacher support and involved behavior for students whose class had high levels of involved behavior CPN ($\beta = 0.434, t = 3.223, p < .01$), but not for students whose class had low levels of involved behavior CPN ($\beta = -0.086, t = 0.678, p = .503$; see Figure 9).

Table 11

Moderation Analyses Results for Spring Behaviors (Plan A)

	Overt Aggression		Relational Aggression		Involved Behavior		Disruptive Behavior	
	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>
Intercept	-0.834	0.848	0.651	0.953	6.125	12.995	2.232	6.487
Level 1								
TS1 _{fall}	0.084	0.076	-0.026	0.072	-1.527 [†]	0.823	-0.850	0.552
Behavior _{fall_gpc}	0.597***	0.055	0.623***	0.046	0.629***	0.069	0.719***	0.060
Gender	-0.240*	0.099	0.047	0.090	-0.158	0.102	-0.124	0.106
Cross level interaction								
TS1 _{fall} *PN _{fall}	-0.019	0.281	-0.222	0.237	0.407*	0.198	0.370	0.248
Level 2								
TS2 _{fall}	0.236	0.206	-0.178	0.231	-0.771	3.185	-0.248	1.535
Peer Norm _{fall}	-2.694	3.843	4.377	3.096	-0.779	3.128	0.406	2.894
TS2 _{fall} * PN _{fall}	0.734	0.938	-0.964	0.758	0.251	0.764	0.038	0.689
Fit Statistics								
Deviance	746.28		676.95		730.78		749.18	
No. of Parameters Estimated	4		4		4		4	

Note. $N = 312$. Gpc = group-mean centered, TS1 = Level 1 Teacher Support, TS2 = Level 2 Teacher Support, *SE* = Standard Error. [†] $p < .10$. * $p < .05$. *** $p < .001$.

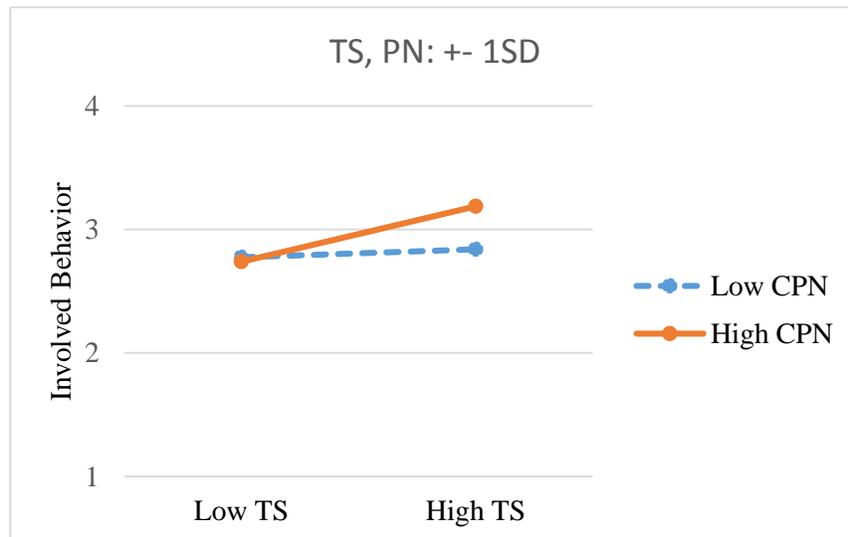


Figure 9. Level 1 teacher support and class peer norm, interaction for involved behavior.

Chapter Five: Discussion

The current study examined the partial mediation and moderation effects of class peer norms (CPN) on the association of teacher support with student behaviors (overt and relational aggression, involved and disruptive behavior) during the first year of middle school, using multilevel modeling. As presented in Chapter 4, findings were largely consistent with the hypotheses, despite some nuances (e.g., disruptive behavior did not follow the person-group dissimilarity model). This chapter summarizes the key findings from mediation and moderation analyses, relates the findings to existing literature, and discusses theoretical as well as practical implications. Lastly, limitations of the study and how future studies can address these limitations and forward research on this topic are addressed.

The three research questions addressed in the current study were:

1. Were spring student behaviors (overt and relational aggression, involved and disruptive behavior) *directly* influenced by fall teacher support?
2. Was there an *indirect* influence of fall teacher support on spring student behaviors via class peer norms?
 - a) Did fall teacher support have significant influence on fall class peer norms?
 - b) Did fall class peer norms have significant effect on spring student behaviors?

3. Was there a significant moderation effect of fall class peer norms on the association between fall teacher support and each student behavior (overt and relational aggression, involved and disruptive behavior) in the spring?

Direct and Indirect Influence of Teacher Support

Recent research indicates teachers can be an important ‘invisible hand’ (Farmer et al., 2011) that impacts student behaviors directly and indirectly via class peer norms (CPN). However, these two routes have rarely been examined simultaneously in middle school classrooms. It is critical to investigate these two routes together, as both teachers and classroom peers have salient influence during early adolescence when students strive to construct their own values (Cairns & Cairns, 1994; Farmer et al., 2007; Wentzel et al., 2010) and students are exposed to these two sources of influence simultaneously within a classroom (Neal & Neal, 2013; Thomas et al., 2011). Examination of these two routes together not only provide a deeper understanding of the unique influence teachers and classroom peers have on student behaviors, but also provide insight into the interactive nature between these two sources of influence in terms of shaping student behaviors. The following paragraphs detail the findings of the direct and indirect influence (via CPN) of teacher support on each of the four student behaviors (overt and relational aggression, involved and disruptive behavior).

Overt aggression. Unexpectedly, neither Level 1 (variation from the class mean) nor Level 2 (class mean) fall teacher support had significant direct influence on individual student’s overt aggression in the spring. There are several reasons that may explain this discrepancy. First,

more evidence is available among elementary (Buyse et al., 2009; O'Connor et al., 2011; Thomas et al., 2011) than middle school students (Murray-Harvey & Slee, 2010) on the direct link between teacher support and student aggression. It is more challenging to examine teacher support in relation to student aggression in middle schools, as students have multiple teachers whereas they usually spend most of school time with one teacher in elementary school. How can a middle school student's experience of emotional and academic support from multiple teachers be accurately gauged? Asking students to report the support they receive from one specific teacher (e.g., social studies teacher in this study) in middle school may not capture the overall support a student receives from multiple teachers. Thus, it is plausible that the current study was conservative by examining the direct influence of student's perceptions of one specific teacher's support on their subsequent overt aggression. It is possible that by examining students' overall perception of the emotional and academic support they receive from multiple teachers or the support they receive from their favorite teacher may help us understand better the direct link between teacher support and student subsequent overt aggression.

Another explanation is that most current research investigating the relation between teacher support and student aggression does not separate aggression into its different forms, such as overt and relational aggression (Buyse et al., 2009; Murray-Harvey & Slee, 2010; O'Connor et al., 2011). For example, in a study among middle school students in which a significant association was found between teacher support and student aggression (Murray-Harvey & Slee, 2010), aggression was examined as a combination of overt and relational aggression, despite that

the study also employed a domain general approach (i.e., asking students to rate teacher support generally rather than a specific teacher). This line of research provides initial evidence on the potential relation between teacher support and student overt aggression. However, more research specifically targeting overt aggression (see Thomas et al., 2011 as an example) is warranted in order to understand the relation between teacher support and student overt aggression.

As expected, fall Level 2 teacher support had an indirect influence on student overt aggression in the spring via overt aggression CPN (i.e., fall teacher support was negatively associated with fall overt aggression CPN, which was further positively associated with student overt aggression in the spring). The negative association between teacher support and overt aggression CPN indicates social studies classes with a teacher whose students reported him/her as providing high levels of support on average tended to have lower overt aggression CPN, compared to classes with a teacher rated low. Current research suggests teachers not only influence individual student's behaviors but also shape peer culture (e.g., peer group norms; Hamm et al., 2014; Hamm, Farmer et al., 2011), which serves as an important context for students to construct values and develop behaviors. However, no research has examined the influence of teachers on the peer culture at the classroom level (i.e., class peer norm) for middle school students yet (see Thomas et al., 2011 as an example of investigating this relation at the elementary level). Thus, the finding from the current study that classroom average teacher support had a negative association with overt aggression CPN extends prior research investigating the influence of teachers on the classroom peer dynamic among middle school

students.

The positive association between fall overt aggression CPN and spring student overt aggression suggests that students whose social studies classrooms had high CPN (i.e., average level of overt aggression) in the fall tended to be reported by their sixth-grade peers as having more overt aggression in the spring. Experience of peer culture in just one class had influence on students' subsequent overt aggression, which highlights the critical role of classroom peers in shaping students' overt aggression during the first year of middle school. The finding is consistent with theoretical assumptions (i.e., behavioral theory and person-group similarity model) and empirical findings (Barth et al., 2004; Bellmore et al., 2011; Kellam et al., 1998; Thomas et al., 2011). In these classrooms, students are more likely to observe the modeling of overt aggression and receive reinforcement (e.g., peer approval and gain and/or maintain high peer status) for displaying overt aggression (Bellmore et al., 2011; Dishion & Tipsord, 2011), as that is congruent with the norm in their class (Stormshak et al., 1999). This finding fills in the gap of examining the influence of CPN on separate forms of aggression, as many of these studies defined aggression generally (e.g., combined overt and relational aggression; Barth et al., 2004; Kellam et al., 1998; Mercer et al., 2009). It also extends the finding of CPN on overt aggression among students in elementary school to those in the first year of middle school.

In summary, CPN had a direct positive influence on student overt aggression (i.e., high overt aggression CPN was associated with more subsequent student over aggression) and teacher support had a negative indirect influence on subsequent student aggression (i.e., teacher support

was negatively associated with student relational aggression) via CPN across the sixth grade. It is noted that the significance of the association between overt aggression CPN and student overt aggression was marginal (i.e., $p < .10$). Additionally, the magnitude of the indirect effect of teacher support on student overt aggression was very small compared to the influence of CPN or student characteristics in the model (i.e., gender and student overt aggression in the fall). Thus, more research is needed to verify and further understand the relation among teacher support, CPN and student overt aggression.

Relational aggression. As expected, fall teacher support (Level 2) had a negative direct influence on student relational aggression in the spring, meaning that students whose social studies classrooms had a high average perception of teacher support were reported by their sixth-grade peers as displaying less relational aggression in the spring. This finding is consistent with research among upper elementary school students (Luckner & Pianta, 2011) and findings from middle school students using a domain general approach (Murray-Harvey & Slee, 2010), despite aggression being defined as a combination of overt and relational aggression in Murray-Harvey and Slee's study. It highlights the critical role of teacher support in shaping student relational aggression during the first year of middle school, as perceiving high levels of teacher support in just one class was associated with lower levels of grade-wide peer-nominated relational aggression. Level 1 fall teacher support (i.e., variation of a student's perception of teacher support from the class average) did not have a significant influence on student relational aggression in the spring. Thus, it is the between classrooms (or between teachers) difference in

perceptions of teacher support that influences subsequent student relational aggression, rather than the within classroom variation of perceived teacher support.

As expected, fall teacher support (Level 2) also had a significant indirect influence on student relational aggression in the spring via CPN (i.e., fall teacher support was negatively associated with fall relational aggression CPN, which was further positively associated with student relational aggression in the spring). The direct impact of teacher support became non-significant when this indirect route was added into the model. Thus, the influence of teacher support on student relational aggression was exclusively through CPN. The negative association between teacher support and relational aggression CPN indicates that social studies classes with a teacher whose students perceived him/her as providing high levels of support had lower average levels of peer-nominated relational aggression, compared to classes with low perceived levels of teacher support. As discussed earlier, research regarding the influence of teacher support on classroom peer culture among middle school students is limited although promising (Farmer et al., 2011; Hamm et al., 2014; Thomas et al., 2011). The finding extends this line of research and highlights the role of teachers in shaping the classroom dynamic in terms of specific forms of aggression (Bierman, 2011; Farmer et al., 2011).

The positive association between fall relational aggression CPN and spring student relational aggression indicates that students whose social studies classrooms had high average level of relational aggression (i.e., high CPN) in the fall had higher levels of peer-nominated relational aggression in the spring. Similar to the finding on overt aggression, this finding

highlights the critical role of classroom peers in shaping student relational aggression in the first year of middle school. Students in classes with high relational aggression CPN may be more likely to observe the modeling of and receive reinforcement for displaying relational aggression (Dishion & Tipsord, 2011), as this is congruent with classroom norms (Stormshak et al., 1999). This finding is consistent with and extends previous research conducted in elementary schools that used a general definition of aggression (i.e., combined overt and relational aggression; Barth et al., 2004; Kellam et al., 1998; Mercer et al., 2009).

In summary, during the first year in middle school, the significant direct influence of teacher support (Level 2) on student relational aggression became non-significant when CPN was added into the model. However, Level 2 teacher support had a negative indirect influence (i.e., teacher support was negatively associated with student relational aggression) on student relational aggression via CPN. In other words, teacher influence on student relational aggression was exclusively mediated via CPN. This highlights the “invisible hand” of teachers in shaping students’ peer context (Farmer et al., 2011) and the importance of considering both teacher and peer influence on student relational aggression within a middle school classroom. However, it is noted that the significance of the association between CPN and student relational aggression was marginal (i.e., $p < .10$). Thus, additional research is needed to further verify and understand this relation among middle school students.

Involved behavior. As expected, fall Level 2 teacher support had a significant direct positive impact on student involved behavior in the spring, which suggests that students whose

social studies classrooms had high average perceptions of teacher support had higher subsequent levels of self-reported involved behavior, compared to students whose social studies classrooms had low average perceptions of teacher support. Similarly, Level 1 teacher support also had a significant direct positive influence on student involved behavior in the spring. This indicates that among students of the same social studies teacher, those who had relatively higher perceptions of teacher support tended to self-report higher levels of involved behavior in the spring, regardless of the average rating of teacher support in that class. Thus, not only the between classrooms (or between teachers) differences in student perceptions of teacher support matters, but also the within class differences in perceptions of teacher support, in terms of impacting student involved behavior. These findings are aligned with prior research revealing the positive influence of teacher support on academic engagement among middle school students (Garcia-Reid et al., 2006; Murray, 2009; Woolley et al., 2009). However, the findings extend prior research that typically investigated teacher support as a single level construct in that it revealed not only between-class but also within-class differences in perceptions of teacher support shape students' involved behavior. The findings also highlight the critical role of perceived teacher support in that having one supportive teacher (i.e., social studies teacher in this study) can positively influence student involved behavior in middle school.

Fall Level 2 teacher support also had a significant positive relation with involved behavior CPN, which indicates social studies classes with a teacher whose students reported him/her as providing high levels of support on average tended to have high average levels of

involved behavior. This has important implications, given that when a teacher is viewed as highly supportive emotionally and academically, students' perception of the expectations and acceptance of academic effort in the class are often improved (Hughes & Chen, 2011), and the involved behavior in the whole class may be enhanced (i.e., a higher involved behavior CPN). This finding extends previous research that reveals the contribution of teachers in shaping peer group culture regarding academic effort (Hamm et al., 2014) and indicates roles of teachers in shaping peer culture regarding academic engagement at the classroom level among middle school students.

Unexpectedly, the association between fall involved behavior CPN and spring student involved behavior was non-significant, despite in the preliminary analysis a marginally significant correlation was detected ($r = .109$, $p = .058$). It is possible that there is significant association between these two constructs, but the current study did not have sufficient power to discover it. According to the behavior theory, students are more likely to see modeling of involved behavior and receive peer reinforcement for displaying involved behavior in classes with high involved behavior CPN (i.e., high average levels of involved behavior; Cooper et al., 2007; Dishion & Tipsord, 2011), thus display more involved behavior themselves. Such association was found in empirical studies among upper elementary school students (Barth et al., 2004).

One plausible explanation for the discrepancy between the hypothesis and finding is that students spend most of their school time with one group of classmates in elementary school,

whereas students switch among classes and have several groups of classmates in middle school. Measuring CPN in one class (e.g., social studies class in this study) may not capture the overall influence of classroom peers in middle school. Another explanation is that early adolescents are preoccupied with achieving high peer status, which is a motivation for many of their behaviors, including academic engagement. The contribution of academic engagement to peer status decreases during the first year of middle school (Galvan et al., 2011). Galvan and colleagues (2011) reported the positive association between engagement and high peer status in fifth grade became insignificant in the fall of sixth grade and negative in the spring of sixth grade. Thus, it is possible that despite that the involved behavior CPN (i.e., average level of involved behavior) was high in a class, students did not want to have (or self-report) high involved behavior due to its incompatibility with high peer status.

In summary, no significant indirect effect of teacher support on student involved behavior was detected. Additionally, the direct impact of Level 2 teacher support on spring student involved behavior became smaller and non-significant when CPN was added into the model. However, Level 1 teacher support remained significant, regardless if peer influence was considered or not. Therefore, when considering the classroom influence as a whole (both teacher and peer influence) on student involved behavior during the first year of middle school, only Level 1 fall teacher support (i.e., a student’s perception of teacher support relative to his/her classmates) remained a significant predictor.

Disruptive behavior. As expected, fall teacher support (Level 2) had a significant

negative direct influence on student disruptive behavior in the spring, which suggests that students whose social studies classrooms had high average perceptions of teacher support in the fall self-reported lower levels of disruptive behavior in the spring, compared to students whose social studies class had low average perceptions of teacher support. Disruptive behavior was defined as not following classroom rules/instructions (i.e., off-task behaviors or disengagement). When teachers are viewed as supportive, students may become more engaged in learning activities (Murray, 2009; Roorda et al., 2011), thus report low levels of subsequent disruptive behavior. However, Level 1 fall teacher support (i.e., variation from the class average perception of teacher support) did not have a significant influence on student disruptive behavior in the spring. Together, these findings suggest it was the between classrooms (or between teachers) difference in student perceptions of teacher support rather than within class differences that matters, in terms of shaping student disruptive behavior. The findings are consistent with previous research supporting the positive impact of teacher support in facilitating student engagement (Garcia-Reid et al., 2006; Murray, 2009; Roorda et al., 2011; Woolley et al., 2009). The current study also extends this line of research as it investigated teacher support at both the between- and within-class levels, rather than considering it as a single level of construct. The findings also highlight the critical role of teachers in shaping students' disruptive behavior in that perceiving one teacher as emotionally and academically supportive was associated with less subsequent disruptive behavior.

Fall teacher support (Level 2) also had a significant indirect effect on student disruptive

behavior in the spring via CPN (i.e., fall teacher support was negatively associated with fall disruptive behavior CPN, which was further positively associated with student disruptive behavior in the spring). The direct effect of teacher support became non-significant when this indirect effect was taken into account. The significant negative association between teacher support and disruptive behavior CPN indicates that social studies classes with a teacher whose students perceived him/her as providing high levels of support had lower average levels of disruptive behavior, compared to classes with low perceived levels of teacher support. This aligns with research documenting the important role of teachers in shaping classroom peer culture among elementary school students (Thomas et al., 2011) and provides additional evidence that teachers shape classroom peer culture among middle school students (Hamm et al., 2014).

The positive association between fall disruptive behavior CPN and spring student disruptive behavior indicates that students whose social studies class had high disruptive behavior CPN (i.e., high average level of disruptive behavior) in the fall tended to self-report higher levels of disruptive behavior in the spring. This finding highlights the critical role of classroom peers in shaping student disruptive behavior, as peer culture in one class had a significant effect on subsequent self-reported disruptive behavior. This finding is consistent with the behavioral theory in that students are more likely to observe modeling of disruptive behaviors and receive reinforcement for displaying disruptive behaviors themselves in classrooms where there is high disruptive behavior CPN (Dishion & Tipsord, 2011), and consequently engage in

disruptive behaviors more frequently themselves. However, the finding is in contrast to the person-group dissimilarity model that disruptive behavior was beneficial for students to gain visibility thus high peer status in classrooms with low levels of disruptive behaviors (Jonkmann et al., 2009; Stormshak et al., 1999). One possible reason is that despite the increase of disruptive behavior in the first year of middle school, it was still a low incidence behavior compared to other behaviors, such as involved behavior. Thus, even in classes with higher disruptive behavior CPN, students were still able to gain visibility and peer status, thus they may have motivation to engage in this behavior.

In summary, the direct influence of teacher support on student disruptive behavior became non-significant when CPN was taken into account during the first year of middle school. However, teacher support had a negative indirect effect on student disruptive behavior (i.e., teacher support was negatively associated with student disruptive behavior) via CPN. In other words, teacher influence on student disruptive behavior was mediated exclusively via CPN. This highlights the “invisible hand” of teachers in shaping students’ peer context (Farmer et al., 2011) and the importance to consider both teacher and peer influence in understanding student disruptive behavior during the first year of middle school.

Moderation Effects

As reported in Chapter 4, only one significant moderation effect was found. CPN moderated the association between fall Level 1 teacher support and spring student involved behavior, in that students who perceived relatively high levels of teacher support in their social

studies class tended to report high levels of involved behavior only if the involved behavior CPN was also high in the class. Research indicates high levels of teacher support (Murray, 2009; Roorda et al., 2011) and academic engagement CPN (Barth et al., 2004; Jonkman et al., 2009) are enablers for student engagement. It is possible that there is a synergic effect in facilitating student engagement when both teacher support and involved behavior CPN are high in a class. On the other hand, if either of teacher support or CPN is low, students may perceive conflictual messages regarding academic engagement from their teachers and peers, thus may not engage in learning activities as much as they can. It should be noted that involved behavior CPN moderated the relation of Level 1 teacher support with student involved behavior, but not the Level 2 teacher support. This means that only the effect of student's perception of teacher support that is relative to his/her classmates depends on the level of CPN, but not the effect of the average teacher support in a class. In other words, when the involved behavior CPN is high, students who perceived higher levels of teacher support relative to their classmates - *regardless of the average level of teacher support in the class* - self-reported high levels of subsequent involved behaviors.

Unexpectedly, no significant moderation effect was found for overt aggression, relational aggression, and disruptive behavior. Research has suggested teachers have a stronger influence on student behaviors in elementary classrooms/schools where the overall level of aggression is low, as teacher-student relationships tend to be less conflictual and teacher attention/supervision is less likely to be diluted (CPPRG, 2010; Guerra et al., 2006; Hughes et al., 2005; Stipek & Miles, 2008). Also, students are less likely to receive conflictual messages from teachers and

classmates regarding aggression and/or disruptive behaviors (Hughes et al., 2005), as the values, modeling, and reinforcement from peers on behaviors are more likely to be consistent with those from teachers (i.e., low levels of aggression and disruptive behaviors). One explanation for these non-significant moderation effects is that teacher support and CPN were measured at a specific classroom in this study (i.e., social studies class), whereas student aggression and disruptive behavior were measured generally (or across classes). In contrast, research detecting moderation effects of classroom/school context on teacher influence was conducted in elementary schools (see CPPRG, 2010 as an example), where students spent most of their school time with one teacher and one group of specific students. In the current study, it is possible that teacher support and CPN varied among the different classes. Thus, measuring teacher support and CPN in one class may not allow us to detect the overall moderation effect of classroom peer context on teacher support in middle school.

Another explanation is that the current study might not have sufficient power to detect potential moderation effects of CPN. Teacher support in this study was split into two levels instead of being examined as a single level construct as in most of the current research, which facilitated better understanding of the influence of teacher support. However, it requires a larger sample size, particularly the sample size at Level 2. Thus, additional studies, particularly studies with an adequate Level 2 sample size, are warranted to disentangle the potential moderation effects of CPN on the associations of teacher support with student behaviors.

Theoretical and Practical Implications

The findings of the current study have both theoretical and practical implications. Guided by the ecological theory, this study investigated the unique and joint influence of fall teacher support and CPN on spring student behaviors (overt and relational aggression, involved and disruptive behavior) during the first year of middle school. Both teachers and classroom peers are salient sources of influence on student behavior (Doll & Brehm, 2014), although they are rarely examined simultaneously in terms of how they shape student behavior, particularly among middle school students (Bierman, 2011; Farmer et al., 2011). Examination of the partial mediation effect of CPN on the association between teacher support (Level 2) and student behaviors indicated that all significant direct influence of Level 2 teacher support on subsequent student behaviors (relational aggression, involved and disruptive behavior) became non-significant when CPN was considered. However, teacher support (Level 2) had an indirect effect on three (overt and relational aggression, disruptive behavior) of the four student behaviors investigated via CPN. These findings highlight the importance to consider the joint influence of teachers and peers on student behaviors during the first year of middle school. It supports the ecological model that social context has implications for individuals' behaviors and development, particularly proximal environments (e.g., classrooms). The findings from the current study also highlight the importance of considering the joint influence of various sources of influence within a context (Bronfenbrenner, 1970; Neal & Neal, 2013).

The finding of significant association between teacher support and CPN across all four

student behaviors extends research investigating teacher influence on classroom peer culture among elementary (Thomas et al., 2011) to middle schools. Evidence of teacher influence on classroom peer culture in middle school is promising, yet limited. For example, Hamm and colleagues (2014) found teachers can shape peer norms at the peer group level, which suggests teacher influence can go beyond individual student. However, peer group is a unit (or context) smaller than classroom. Thus, the finding of the current study highlights the “invisible hand” of teachers in shaping classroom peer culture (Farmer et al., 2011), which is a critical developmental context for middle school students to construct values and develop behaviors (Cairns & Cairns, 1984; Chang, 2004; Wentzel et al., 2010). This has important implications for middle school teachers, particularly considering many of them report not competent managing classroom dynamics compared to their elementary counterparts (Ryan et al., 2015) and do not believe (or are not aware of) the importance of a supportive teacher-student relationship (Davis, 2006).

The finding of positive associations of CPN with overt aggression, relational aggression, and disruptive behavior extends evidence of CPN influence on student behaviors from elementary (Barth et al., 2004; Kellam et al., 1998; Mercer et al., 2009) to middle school (Bellmore et al., 2011). It is consistent with the behavior theory (Cooper et al., 2007; Dishion & Tipsord, 2011) in that students are more likely to observe modeling of and receive reinforcement for certain behavior in classrooms with high CPN on that behavior (e.g., overt aggression), and subsequently engage in that behavior more frequently him/herself. It also supports the person-

group similarity model (Stormshak et al., 1999; Wright et al., 1986) as middle school students tend to behave in a way that is consistent with the norms in a context so that they can fit into it (Bellmore et al., 2011; Chang, 2004; Jonkmann et al., 2009).

Although the overall pattern of the CPN influence on student behavior among middle school students was similar to that of their elementary counterparts (i.e., high CPN in the fall was associated with high student behavior in the spring), there was some nuance. CPN did not have significant impact on student involved behavior (one type of engagement), which was likely due to the unique characteristic of the first year in middle school (Galvn et al., 2011). However, the finding of the influence of CPN on student behaviors was very salient overall, particularly considering CPN was measured at just one class in this study (i.e., social studies class), while student behaviors were measured more generally.

The finding of positive association between CPN and student disruptive behavior has theoretical implications as it is consistent with behavioral theory but inconsistent with the person-group dissimilarity model. The person-group dissimilarity theory suggests disruptive behavior is beneficial for students to gain visibility and high peer status in classrooms with low levels of disruptive behaviors overall (Jonkmann et al., 2009; Stormshak et al., 1999), thus students may become more disruptive in those classrooms. Aligned with prior research, disruptive behavior was a low incidence behavior overall during the first year of middle school (Kaplan & Maehr, 1999), despite its increasing trend. The findings in the current study indicate that in classrooms with relatively higher levels of disruptive behavior, students may still be able

to gain visibility and peer status for displaying disruptive behaviors, because overall the incidence of disruptive behavior is low. This finding highlights the importance of considering contextual factors (e.g., the context of middle school) when applying theories to guide research or practice.

In addition to the mediation effect discussed above, CPN was found having moderation effect that it moderates the association between fall Level 1 teacher support and spring student involved behavior. It revealed condition that can amplify the positive effect of teacher support (i.e., high involved behavior CPN) and condition that can impede the positive effect of teacher support (i.e., low involved behavior CPN). This finding expands our understanding of the mechanisms how teacher support and CPN may work together in shaping student behaviors beyond the mediation effect discussed above. It also indicates the complexity of the mechanisms how teacher and peer influence may interact with each other in terms of shaping student behavior.

This study provided us a comprehensive understanding of students' adjustment during the first year of middle school, as it targeted both social and academic domains of school life. Additionally, the findings contribute to the literature in that it investigated aggression in its separate forms (i.e., overt and relational aggression) in relation to teacher support and CPN, whereas current research often investigates aggression generally (Barth et al., 2004; Kellam et al., 1998; Mercer et al., 2009; Murray-Harvey & Slee, 2010). This helps to provide a more accurate understanding of relations of teacher support and CPN with student aggression, as overt

and relational aggression can have very different meanings for adolescents (Little et al., 2003).

Taken together, these findings highlight the importance of teacher and classroom peer influence in shaping student behaviors during the first year of middle school, particularly considering that teacher support and CPN were measured in just one class (i.e., social studies class) whereas student behaviors were measured across classes. In other words, having one supportive teacher is a salient protective factor for students' academic and behavioral well-being. This finding is consistent with and extends the resilience literature among youth that having close and supportive relationship with one adult at school is a big protective factor for adolescents' emotional well-being (Masten, 2015).

The findings of this study (mediation and moderation effects of CPN) have practical implications as well. The finding of moderation effect of CPN on the association between teacher support and student involved behavior indicates that schools may consider dispersing students who have low academic engagement into different classes at the beginning of sixth grade, so that the positive effect of teacher support can be amplified. One possible way middle schools can achieve this is to use archival data such as grades and early warning system data from fifth grade. School psychologists, being well trained in interpreting system level data (e.g., early warning system), can take a lead in this line of intervention. Further, findings of the full mediation effects of CPN on the association of teacher support with overt aggression, relational aggression and disruptive behavior suggest it is important to target both teacher and peer influence if schools would like to create a supportive environment to facilitate students' healthy social and academic

development during the first year of middle school. This has implications for school psychologists who often provide multitier interventions (universal, supplemental and intensive) to prevent and/or reduce aggression and foster engagement among students – universal interventions targeting classroom ecology have to be in place before providing supplemental and/or intensive interventions.

Limitations

Although the current study contributes to the literature in several ways, it is not without limitations. The first limitation is that data were limited to two time points (approximately six months apart). This short-term longitudinal design allows for the evaluation of whether contextual factors (i.e., teacher and peer influence) are related to changes in student outcomes (while controlling for prior levels), thus providing information on these links in development during the first year of middle school. However, three or more assessment points would allow better examination of the mediation pathways in development (Reichardt, 2011), with independent variable (i.e., teacher support) at Time 1, mediator (i.e., class peer norm) at Time 2 and dependent variable (i.e., student behavior) at Time 3. This condition would allow time for teacher support to influence class peer norms.

The second limitation is that teacher support and class peer norms were measured in one specific class (i.e., social studies) in this study. Despite this being a relatively conservative measure of teacher support and peer norms, it is promising that the findings indicated student experience with teacher and peers in one class had a significant influence on subsequent student

behavior. This is consistent with the resilience literature that a high-quality relationship with one caring adult in school is a critical protective factor for adolescents' mental health (Masten, 2015). However, it should be noted that the magnitude for some links in the mediation models was small. Additionally, the significance level of several links in the mediation models was marginal, and some links were non-significant (e.g., the direct influence of fall teacher support on spring student overt aggression). One explanation is that teacher support and CPN were measured in just one class. In contrast to elementary school where students spend most of their school time with one teacher in one classroom (Thomas et al., 2011), students have several teachers and different groups of classmates during middle school. Thus, measuring teacher support and CPN in one class may not fully capture the influence of teachers and classroom peers a middle school student experiences.

The third limitation of the current study is the conceptualization and measurement of CPN. It used the class average of a certain individual behavior (e.g., overt aggression) as the class peer norm for that behavior. This method has been widely used in the literature and shows validity in understanding the influence of classroom dynamic on student adjustment (Barth et al., 2004; Ryan, 2001; Thomas et al., 2011). However, other researchers (e.g., Preacher, Zyphur, & Zhang, 2010) argue group-level (e.g., classroom in this study) constructs should be measured at the group level, rather than using an aggregation of individual construct data. For example, in the context of the current study, students would be asked questions regarding the entire class (e.g., "what do you think is the overall level of involved behavior in this class") rather than asked

questions regarding their own behavior (e.g., “I listen carefully in class”) and then average student responses. Future researchers may want to compare these two approaches and investigate whether one is better or if they are complementary in terms of understanding the influence of classroom peer culture on student adjustment.

The fourth limitation is the sample size used in the current study. Although the sample size (312 students in 32 classrooms) meets the minimum requirement of multilevel modeling (i.e., 30 or more Level 2 units), it is relatively small compared to other studies investigating the influence of classroom dynamic (teachers and peers) on student behaviors. Some studies had similar number of Level 1 units (i.e., students) but a larger Level 2 size. For example, there were 378 students from 65 classrooms in Barth and colleagues’ (2004) study. Other studies had both larger Level 1 and 2 sizes. For example, there were 4,179 children from 214 classrooms in Thomas and colleagues’ (2011) study, and 5,468 students from 266 classrooms in Jonkmann and colleagues’ (2009) study. Sample size, particularly the size at Level 2, determines the power in detecting significant associations (Raudenbush & Bryk, 2002). The relatively small sample size of the study (especially at Level 2) may explain some of the non-significant and marginal significant findings.

Future Directions

The findings in this study (mediation and moderation effects of CPN on the association of teacher support with student behaviors) extend previous research on teacher and peer influence on student behaviors and highlight the complex mechanisms how these two sources of influence

may interact with each other. However, teachers and peers have rarely been examined simultaneously in terms of their influence on student behaviors (Bierman, 2011; Farmer et al., 2011). Additionally, the significance level for some links was marginal and other links was non-significant. Thus, replication of the findings using a larger sample size (particularly a larger Level 2 sample size) is warranted, so that it can be determined if the non-significant and marginally-significant findings were due to the relatively small sample size (and consequently under power).

Future studies may want to collect data at three or more time points in order to test the mediation models (i.e., teacher support at Time 1, CPN at Time 2, and student behavior at Time 3), so that there will be time for teacher support to influence CPN and time for CPN to influence student behavior. A different conceptualization of CPN may be adopted (i.e., average individual's perception of CPN rather than average individual's actual behaviors). Students may be asked to rate their perception of teacher support and CPN overall, so that their experience of teacher support and CPN can be more accurately captured. Alternatively, future research may want to continue investigating the influence of teacher support and CPN on student behavior in one specific class, as the finding that experience of teacher and peer influence in one class has significant influence on student's overall behaviors is very powerful. However, they may want to investigate this topic among classes other than social studies, or ask students to rate their most and least favorite teachers and classes, so that we can learn the similarities and differences across various classes in middle school in terms of how teachers and classroom peers shape student

behaviors.

This study focused on the unidirectional influence of teacher support on student behaviors and CPN, as teachers are naturally in a powerful position in shaping classroom dynamic and student behaviors (Farmer et al., 2011; Troop-Gordon, 2015). However, research indicates that student behaviors and CPN can influence teacher support as well (Stipek & Miles, 2008). Similarly, individual student's behavior may influence the CPN (particularly students who are at the top of their peer hierarchy; Helms et al., 2014), despite this study focused on the influence of CPN on student behavior. Thus, future studies may consider investigating the reciprocal or bidirectional relations among teacher support, CPN and student behaviors.

This study included one relevant CPN in each of the partial mediation models (e.g., only overt aggression CPN was included when examining the model of teacher support → CPN → student overt aggression). Future studies may want to consider including multiple CPNs in each partial mediation model (e.g., include both overt and relational aggression CPNs when examining the model of teacher support → CPN → student overt aggression), as students are exposed to the influence of these multiple norms simultaneously. Including multiple CPNs in the mediation models may help to capture more accurately the experience of classroom peer culture in a middle school classroom.

Both mediation and moderation effects of CPN on the association of teacher support with student behaviors were examined in the current study. This is a meaningful contribution to the literature as no such models have been examined previously among middle school students.

However, the two effects (mediation and moderation) were examined separately. Future studies can further this research by investigating these two mechanisms simultaneously (e.g., examining mediated moderation models; Muller, Judd, & Yzerbyt, 2005; Preacher, Rucker, & Hayes, 2007), which may help to disentangle the mechanisms how the different sources of influence within a classroom context interact with each other in shaping student behaviors (Neal & Neal, 2013). Also, future studies may want to consider additional relevant teacher variables when examining the mediation and moderation models, such as teacher self-efficacy, so that all the potential factors can be included in the model.

Lastly, future studies may consider using three-level multilevel modeling (students as Level 1 units, classrooms as Level 2 units, and schools as Level 3 units), so that not only the influence of teachers and peers in classrooms can be captured, but also teacher and peer influence at the school level will be included. This would allow understanding of student behaviors from the multi-contexts where they are embedded (Bronfenbrenner, 1970; Neal & Neal, 2013).

Conclusions

In conclusion, this study contributes to the literature by providing empirical evidence that teacher support and class peer norms have significant implications for student behaviors across the first year of middle school. Teacher support (Level 2) had significant direct influences on student behaviors (relational aggression, involved and disruptive behavior), all of which became non-significant when class peer norms were taken into account. However, teacher support (Level

2) had indirect effect on student behaviors (overt and relational aggression, disruptive behavior) via class peer norms. Level 1 teacher support (variation from class mean) had significant positive influence on subsequent student involved behavior, which was moderated by class peer norm. Overall, these findings are consistent with existing theory and research, despite some nuances. Considering the complexity of teacher and classroom peer influence on subsequent student behaviors, additional investigation is warranted, including research utilizing three or more time points longitudinal data, a larger sample size, as well as a more comprehensive examination of domain general and domain specific measures of teacher support and class peer norms in middle school.

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Appendices

Appendix A: Demographics Form

The Adolescent Motivation
and Development Study:
Student Questionnaire



Middle School
Fall, 2009

Print Name: _____

Middle School Name: _____

Class ID: __

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Student ID: _____

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Appendix A: Demographics Form (Continued)

Student Demographics

Gender:

- Boy
- Girl

Race (choose one):

- Asian American or Pacific Islander
- Black or African American
- Hispanic or Latino/a
 - ▶ White or European American
 - ▲ Multi-Racial
 - ▼ Other: _____



Stop!!! Do not continue until told to do so.

Appendix B: Peer Nominated Aggression

All students act differently at school. Please nominate up to 3 students for each question.

Which students in your grade get into physical fights, threaten to beat up or bully other students?

Which students in your grade spread rumors, gossip, or exclude friends when mad at them?

Appendix C: Academic Engagement Measure

5 Point Likert Scale (*1 = not at all true of me, 3 = somewhat true for me, 5 = very true of me*)

Involved Behavior

I listen carefully in class.

I try very hard in school.

The first time my teacher talks about a new topic I listen very carefully.

I pay attention in my classes.

Disruptive Behavior

I sometimes get into trouble in my classes.

I always follow the classroom rules. (Reverse Coded).

I sometimes behave in a way that annoys my teachers.

I sometimes don't follow the teacher's instructions.

Note. Students were verbally reminded to think about their classes in general when responding to this measure.

Appendix D: Teacher Support

5 Point Likert Scale (*1 = not at all true, 3 = somewhat true, 5 = very true*)

Teacher Emotional Support

In this class my teacher...

Respects my opinion.

Really understands how I feel about things.

Tries to help me when I am sad or upset.

I can count on my teacher for help when you need it.

Teacher Academic Support

In this class my teacher...

Likes to see my work.

Cares about how much they help me learn.

Wants me to do my best in school.

Likes to help me learn.

Note. Students were verbally reminded to think about their social studies class when responding to this measure.

Appendix E: Multilevel Mediation and Moderation Analyses Results of Plan B

Multilevel Mediation Analysis Results for Spring Overt Aggression (Plan B)

	Step 1		Step 2		Step 3	
	γ	SE	γ	SE	γ	SE
Intercept	-0.408	0.894	0.473*	0.231	-0.564	0.897
Level 1						
Teacher Support _{fall}	0.005	0.079	-	-	0.004	0.079
Gender	-0.383**	0.117	-	-	-0.372**	0.117
Level 2						
Teacher Support _{fall}	0.147	0.217	-0.121*	0.056	0.186	0.217
Peer Norm _{fall_OA}	-	-	-	-	0.338	0.217
Fit Statistics						
Deviance (or R^2)	852.72 ^a		.015 ^b		849.68 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. $SE =$ Standard Error. * $p < .05$. ** $p < .01$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index;

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

Multilevel Mediation Analysis Results for Spring Relational Aggression (Plan B)

	Step 1		Step 2		Step 3	
	γ	SE	γ	SE	γ	SE
Intercept	1.370	0.987	1.416***	0.245	0.894	1.006
Level 1						
Teacher Support _{fall}	-0.143 [†]	0.076	-	-	-0.141 [†]	0.076
Gender	0.412***	0.114	-	-	0.394**	0.114
Level 2						
Teacher Support _{fall}	-0.390	0.239	-0.344***	0.059	-0.272	0.244
Peer Norm _{fall_RA}	-	-	-	-	0.372 [†]	0.218
Fit Statistics						
Deviance (or R^2)	832.78 ^a		.098 ^b		829.28 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. $SE =$ Standard Error. [†] $p < .10$. ** $p < .01$. *** $p < .001$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index;

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

Appendix E: Multilevel Mediation and Moderation Analyses Results of Plan B (Continued)

Multilevel Mediation Analysis Results for Spring Involved Behavior (Plan B)

	Step 1		Step 2		Step 3	
	γ	SE	γ	SE	γ	SE
Intercept	2.244*	0.864	2.407***	0.257	1.762 [†]	0.972
Level 1						
Teacher Support _{fall}	0.413***	0.076	-	-	0.412***	0.076
Gender	-0.044	0.112	-	-	-0.048	0.112
Level 2						
Teacher Support _{fall}	0.412 [†]	0.209	0.431***	0.062	0.323	0.224
Peer Norm _{fall_Inv}	-	-	-	-	0.203	0.188
Fit Statistics						
Deviance (or R^2)	803.96 ^a		.133 ^b		802.46 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. SE = Standard Error. [†] $p < .10$. * $p < .05$. *** $p < .001$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index;

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

Multilevel Mediation Analysis Results for Spring Disruptive Behavior (Plan B)

	Step 1		Step 2		Step 3	
	γ	SE	γ	SE	γ	SE
Intercept	4.081***	0.987	4.077***	0.256	2.076	1.318
Level 1						
Teacher Support _{fall}	-0.227*	0.088	-	-	-0.225*	0.088
Gender	-0.245 [†]	0.129	-	-	-0.232 [†]	0.128
Level 2						
Teacher Support _{fall}	-0.387	0.239	-0.475***	0.062	-0.153	0.257
Peer Norm _{fall_Disr}	-	-	-	-	0.487*	0.216
Fit Statistics						
Deviance (or R^2)	886.17 ^a		.159 ^b		880.49 ^a	
No. of Parameters Estimated	2		-		2	

Note. $N = 312$. SE = Standard Error. [†] $p < .10$. * $p < .05$. *** $p < .001$.

^a Steps 1 and 3 were analyzed in HLM and deviance was reported for each step as fit index;

^b Step 2 was analyzed in SPSS and R^2 was reported as its fit index.

Appendix E: Multilevel Mediation and Moderation Analyses Results of Plan B (Continued)

Moderation Analyses Results for Spring Behaviors (Plan B)

	Overt Aggression		Relational Aggression		Involved Behavior		Disruptive Behavior	
	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>	γ	<i>SE</i>
Intercept	-0.743	0.968	0.618	0.990	6.634	13.102	3.058	6.941
Level 1								
TS1 _{fall}	0.011	0.086	-0.107	0.095	-0.698	0.935	-1.292 [†]	0.656
Gender	-0.368**	0.117	0.282*	0.112	-0.067	0.113	-0.238 [†]	0.128
Cross level interaction								
TS1 _{fall} *PN _{fall}	-0.501	0.316	-0.466	0.310	0.269	0.226	0.484	0.296
Level 2								
TS2 _{fall}	0.231	0.235	-0.195	0.240	-0.871	3.209	-0.386	1.641
Peer Norm _{fall}	-2.739	4.386	3.047	3.214	-0.965	3.152	0.043	3.112
TS2 _{fall} * PN _{fall}	0.752	1.070	-0.654	0.786	0.286	0.770	0.106	0.741
Fit Statistics								
Deviance	844.18		813.45		800.75		876.72	
No. of Parameters Estimated	4		4		4		4	

Note. $N = 312$. TS1 = Level 1 Teacher Support, TS2 = Level 2 Teacher Support, *SE* = Standard Error.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

Appendix F: Distribution of Nominations by Class

Class Number	Fall		Spring	
	Overt Aggression	Relational Aggression	Overt Aggression	Relational Aggression
1	0	1	1	6
2	0	2	2	4
3	0	0	2	4
4	0	0	2	2
5	1	0	1	0
6	0	3	1	1
7	0	2	1	2
8	3	4	1	2
9	1	3	3	3
10	2	3	1	2
11	1	1	0	0
12	0	3	0	0
13	3	1	1	1
14	2	2	3	2
15	2	6	4	9
16	2	2	3	4
17	1	2	1	2
18	1	0	0	1
19	0	1	1	1
20	1	3	3	5
21	0	2	1	1
22	1	2	1	1
23	1	5	1	5
24	2	8	3	3
25	1	4	1	4
26	1	2	1	2
27	1	4	2	6
28	4	3	3	2
29	2	2	2	4
30	2	4	1	4
31	2	4	2	5
31	0	5	2	4
Total	37	84	51	92

Note. The number of participants in each classroom ranged from 5 to 18, with an average class size of 9.75.

Appendix G: IRB Certificate



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Activity Details (Personnel Change Approved)

Author: Jamie Reddish (Research Integrity & Compliance)

Logged For (Amendment): Amendment 2 for IRB Study #107783

Activity Date: 9/6/2016 1:47 PM

[Activity Form](#) [Property Changes](#) [Documents](#) [Notifications](#)

Instructions:

- Review the Personnel Change request's description and ensure that no ancillary reviews are pending.
- Upon completion of this activity this amendment will be approved as an Expedited Amendment and reported to the board meeting selected. The Parent Study was approved by .
- The Study Team will be notified of this approval

Personnel Change Description:

Key Personnel removed: Keri Stewart

Key Personnel added: Huanhuan Wang, Casey Schick

Pending Ancillaries:

No Pending Ancillary Approvals

Select the meeting for which this item should appear on the agenda:

	Date	Location	Name
<input type="radio"/>	9/12/2016	RJC Conference Room	IRB - 01A meeting on Mon, 12 Sep 2016
<input type="radio"/>	9/16/2016	RJC Conference Room	IRB - 02 meeting on Fri, 16 Sep 2016
<input type="radio"/>	9/20/2016	RJC Conference Room	IRB - 01B meeting on Tue, 20 Sep 2016
<input type="radio"/>	9/25/2016	RJC Conference Room	IRB - 01C meeting on Mon, 26 Sep 2016
<input type="radio"/>	10/3/2016	RJC Conference Room	IRB - 01A meeting on Mon, 3 Oct 2016
<input type="radio"/>	10/18/2016	RJC Conference Room	IRB - 01B meeting on Tue, 18 Oct 2016