Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality in Early Childhood

by

Brenna Zatto

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of

Master of Science

Department of Psychology

University of Alberta

ABSTRACT

Internalizing symptoms, including depression, anxiety, and somatization, are among the most common mental health concerns of young children. Yet the different patterns of change in depressive, anxious, and somatic symptoms across early childhood remain underexamined. While children who experience more frequent internalizing symptoms tend to also experience more negative relationships with their teachers, how children's depressive, anxious, and somatic symptoms are associated with dimensions of teacher-child relationship quality (closeness, dependency, conflict) in early childhood has received limited attention. The current study examined patterns of change in children's depressive, anxious, and somatic symptoms and in dimensions of teacher-child relationship quality (closeness, dependency, conflict) across preschool and kindergarten. The current study further investigated four conceptual models of the concurrent and prospective associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality: concurrent, child-driven, relationship-driven, and transactional models. Participants were 443 ethnically diverse children (47.9% girls; M_{age} = 4.08 years, *SD* = .34 years) who were assessed four times, in the fall and spring of preschool and kindergarten. Children's depressive, anxious, and somatic symptoms and teacher-child relationship quality were assessed by teacher reports. Results indicated that children's depressive, anxious, and somatic symptoms were primarily related to the concurrent, but not prospective, quality of teacher-child relationships, in support of the concurrent model. Children who showed more frequent symptoms of depression and anxiety experienced less closeness and more dependency and conflict in their relationship with teachers across preschool and kindergarten. Findings suggest that teachers may respond negatively to children's depressive,

anxious, and somatic symptoms while children may become more sad or anxious when teachers perceive them to be overly dependent, needy, or difficult to work with.

Keywords: internalizing symptoms, teacher-child relationship quality, preschool, kindergarten

PREFACE

This thesis is an original work by Brenna Zatto. The research project of which this thesis is a part received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Early Experiences Project”, No. 00051399, September 9, 2014.

ACKNOWLEDGEMENT

First, I would like to thank my supervisor, Dr. Wendy Hoglund, for her support and guidance throughout the development of my thesis and allowing me the opportunity to explore topics I truly care about. The growth I have experienced over the past two years under her mentorship, academically, professionally, and otherwise, has been rewarding. I also would like to thank my committee members for their feedback and guidance in the development of my thesis.

I would like to thank my fellow PEERS Lab graduate students, Saira and Kenda. Their support throughout the development of my thesis has been helpful and very appreciated. Their friendship has been incredibly welcoming and gracious. I would also like to thank the PEERS Lab members, who awarded me the opportunities to both mentor and learn from them.

Finally, I would like to thank my husband, Brenden, for his unwavering love and support. From immigrating to Canada so I can attend graduate school to planning a wedding while I'm completing my master's degree, you are nothing short of selfless and amazing. I also would like to thank my family, who always supports me no matter how crazy my dreams or how far they take me.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality in Early Childhood

Early childhood is an important developmental period for understanding the emergence and developmental course of children's internalizing symptoms. Internalizing symptoms often include three dimensions: symptoms of depression (e.g., feelings of sadness, worthlessness), anxiety (e.g., fearfulness, worries), and somatization (e.g., headaches, stomachaches; Jellesma, Zee, & Koomen, 2015). Internalizing symptoms are some of the most common mental health concerns of young children. Around 4% of children aged 2 to 5 years experience internalizing symptoms that warrant clinical attention (Lavigne et al., 1996). The three dimensions of internalizing symptoms are commonly found to co-occur and are often modeled together as a manifest or latent internalizing construct (Carter et al., 2010; Parkes, Sweeting, & Wight, 2016; Sterba, Prinstein, & Cox, 2007). Yet, the frequency and developmental course of depressive, anxious, and somatic symptoms may unfold differently in early childhood (Carter et al., 2010). For instance, a meta-analysis of five studies revealed that the highest reported 3-month community prevalence of depressive symptoms was 2.1% in preschool-age children (about age 3 to 4 years) while the 3-month prevalence of anxious symptoms was 6.5% (Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009). Investigating internalizing symptoms as a manifest or latent construct may not capture differences in the frequencies and developmental course of depressive, anxious, and somatic symptoms across early childhood (Carter et al., 2010). For instance, it may be that the frequency of depressive symptoms remains stable across early childhood while the frequency of anxious symptoms increases during this period (Carter et al., 2010; Lavigne,

Hopkins, Gouze, & Bryant, 2015; Luby, Si, Belden, Tandon, & Spitznagel, 2009; Whalen, Sylvester, & Luby, 2017).

Entry into preschool can be particularly important for children as they gain independence from their caregivers and learn to navigate a new environment. It may be a time when symptoms of depression, anxiety, or somatization emerge or increase in frequency (Luby & Belden, 2012; Whalen et al., 2017). Preschool is also often the first time that children experience an ongoing relationship with a teacher, and the quality of this relationship can be important for how well children adjust to the preschool context. Teacher-child relationship quality reflects the affective nature of a child's relationship with her or his teacher (Baker, Grant, & Morlock, 2008). These relationships can be positive in quality, characterized by closeness between children and teachers. Teacher-child relationships can also be negative in quality, characterized by conflict between the child and teacher or dependency of the child on the teacher for support (Curby, Downer, & Booren, 2014; Pianta, 2001). Birch and Ladd (1997) found that teacher-child relationship quality accounted for a significant portion of variance in kindergarten children's reports of loneliness (3%) and teacher reports of children's school liking (25%) and school avoidance (12%). Given the importance of the teacher-child relationship in children's early school adjustment, the quality of this relationship may relate to young children's experiences of depressive, anxious, and somatic symptoms (Mejia & Hoglund, 2016; Zatto & Hoglund, 2018). Yet little research has investigated how change in teacher-child relationship quality across preschool and kindergarten relates to change in children's symptoms of depression, anxiety, and somatization (Hartz, Williford, & Koomen, 2017).

Children who experience more frequent internalizing symptoms, including depressive, anxious, and somatic symptoms, in early childhood tend to also experience more negative

relationships with their teachers (Henricsson & Rydell, 2004; Hughes, Bullock, & Coplan, 2014; Mejia & Hoglund, 2016; Rudasill & Rimm-Kaufman, 2009; Sette, Spinrad, & Baumgartner, 2013; Torsheim & Wold, 2001; Zatto & Hoglund, 2018; Zhang, 2015). Yet the direction of this association in unclear. Most studies suggest that the quality of the teacher-child relationship predicts children's later internalizing symptoms (Arbeau, Coplan, & Weeks, 2010; Baker, Grant, & Morlock, 2008; Buyse, Verschueren, Verachtert, & Van Damme, 2009; Pianta, Steinberg, & Rollins, 1995). However, this research has not commonly investigated the possible role of children's internalizing symptoms on prospective teacher-child relationship quality. Some research indicates that children's internalizing symptoms at entry to school predict later teacher-child relationship quality (Mejia & Hoglund, 2016; Roorda, Verschueren, Vancraeyveldt, Van Craeyevelt, & Colpin, 2014; Zatto & Hoglund, 2018). Research has also suggested that children's internalizing symptoms and teacher-child relationship quality may be reciprocally related (Jellesma et al., 2015; Roorda, Koomen, Split, Thijs, & Oort, 2013; Roorda et al., 2014). These mixed findings suggest we need further study of the ways in which children's depressive, anxious, and somatic symptoms relate to dimensions of teacher-child relationship quality concurrently and over time.

The first goal of the current study is to examine change in the frequency of children's depressive, anxious, and somatic symptoms from fall of preschool to spring of kindergarten. The second goal is to examine change in teacher-child relationship quality across preschool and kindergarten. The third goal of this study is to test four conceptual models of the concurrent and prospective associations between children's depressive, anxious, and somatic symptoms and dimensions of teacher-child relationship quality (closeness, dependency, conflict) from fall of preschool to spring of kindergarten: concurrent, child-driven, relationship-driven, and

transactional models (see Figure 1). The concurrent model tests the proposition that children's depressive, anxious, and somatic symptoms and teacher-child relationship quality are related primarily within time but do not have direct lingering effects on each other. The child-driven model tests the idea that children's depressive, anxious, and somatic symptoms directly predict prospective teacher-child relationship quality. The relationship-driven model tests the proposition that teacher-child relationship quality directly predicts children's later depressive, anxious, and somatic symptoms. The transactional model tests the hypothesis that children's depressive, anxious, and somatic symptoms and teacher-child relationship quality mutually predict each other across preschool and kindergarten.

Theoretical Framework

Developmental systems theory guides the overall focus of the current study in the investigation of the concurrent and prospective associations between children's depressive, anxious, and somatic symptoms and dimensions of teacher-child relationship quality (Sameroff, 2000). Developmental systems theory emphasizes the linkage between a child's social context (such as the quality of the teacher-child relationship) and behaviors (such as the expression of worrying or sadness) as a key source of influence on developmental outcomes (such as outcomes of anxiety or depression). Contextual factors are suggested to influence a child's ability to adapt and organize experience and they interact with the child's behavioral characteristics. How an individual child and her or his context work together produce patterns of adaptive or maladaptive functioning. When contextual adversity (such as a dependent or conflictual teacher-child relationship) combines with the atypical needs of the child (such as frequent feelings of sadness or worry), maladjustment may form (such as symptoms of depression or anxiety). Drawing from

this theory, it is expected that children's experiences and displays of depressive, anxious, and somatic symptoms will relate to the quality of their teacher-child relationship.

It may be that children's depressive, anxious, and somatic symptoms and quality of the teacher-child relationship are mutually influential, with both children and teachers adapting their behaviors in response to the other across preschool and kindergarten (Sameroff, 2000). This mutual influence may occur within time, supporting the proposed concurrent model, or this mutual influence may linger over time, supporting the proposed transactional model (Sameroff, 2000; Sameroff & MacKenzie, 2003; see Figure 1). It could also be that children's early depressive, anxious, and somatic symptoms influence their contexts and predict the subsequent quality of the teacher-child relationship, supporting the idea of the child-driven model (Grusec & Davidov, 2010). Alternatively, the quality of early teacher-child relationships may predict children's later depressive, anxious, and somatic symptoms, supporting the idea of a relationship-driven model (Sherman, Rice, & Cassidy, 2015; Sroufe, Carlson, Levy, & Egeland, 1999). Along with developmental systems theory, the child-driven model is informed by socialization theory which suggests that children's behaviors are most important for their developmental outcomes (Grusec & Davidov, 2010). The relationship-driven model is also further informed by attachment theory which suggests that caregiver-child relationships are most important for developmental outcomes (Sherman et al., 2015; Sroufe et al., 1999). Patterns of change in children's depressive, anxious, and somatic symptoms and teacher-child relationship quality must first be examined to determine the association between these constructs.

Patterns of Change for Depressive, Anxious, and Somatic Symptoms

Research suggests that children's depressive, anxious, and somatic symptoms may have different patterns of change in early childhood, with differences also present between clinical and

community samples of children (Lavigne et al., 1996; Lavigne et al., 2009). Clinically depressive symptomatology has been found to emerge as early as 2 years (Luby & Belden, 2012). With a community sample of children aged 3 to 6 years oversampled for symptoms of depression, Luby et al. (2009) found that children who experienced more frequent depressive symptoms in preschool continued to experience more frequent depressive symptoms up to 2 years later, as reported by parents. Still, most research indicates that, on average, depressive symptoms among community samples are consistently low in frequency across early childhood. For example, in a 2-year longitudinal study with a community sample, parents reported children's depressive symptoms across ages 1 to 3 years to be consistently low in frequency (Carter et al., 2010). Lavigne et al. (2015) found similar results with a community sample in a 2-year longitudinal study in which children's depressive symptoms were low on average and predictive of later depressive symptoms across ages 4 to 6 years, as reported by parents. The prevalence of children's major depressive symptoms ranged from 3.1% at age 4 to 4.1% at age 6, while the prevalence of children's dysthymic symptoms ranged from 1.4% at age 4 to 2.1% at age 6 (Lavigne et al., 2015).

Anxious symptomatology also shows an early age of onset, with anxiety disorders recognized as the most prevalent class of psychopathology during the preschool period, as well as across the lifespan (Whalen et al., 2017). In a review of research investigating anxious symptoms among preschool children, Whalen et al. (2017) found that anxious symptoms tend to emerge around the preschool period, with a median age of onset at 6 years. A population-based study reflects this emergence, in which anxiety disorders were found to have a one-time prevalence rate of 22% in children aged 4 to 7 years (Paulus, Backes, Sander, Weber, & von Gontard, 2015). Lavigne et al.'s (2015) 2-year longitudinal study also found that the prevalence

of children's generalized anxiety symptoms, as reported by parents, ranged from 15% at age 4 to 10% at age 6 (Lavigne et al., 2015). The prevalence of separation anxiety symptoms ranged from 6% at age 4 to 3% at age 6 (Lavigne et al., 2015). Even with the modest decline in prevalence of anxious symptoms across ages 4 to 6 years, Lavigne et al. (2015) found that children's anxious symptoms were low to moderate on average and predictive of later anxious symptoms. Overall, these findings suggest that anxious symptoms may be the most prevalent internalizing symptom for young children, with some children displaying an increase in anxious symptoms during the early childhood period.

The developmental course of children's somatic symptoms is less clear. In a longitudinal study with a community sample of children aged 10 years, Jellesma, Rieffe, Terwogt, and Westenberg (2011) found that children's self-reported somatic complaints increased over two years. Another longitudinal study with a community sample found that children who reported experiencing frequent somatic complaints at age 13 also tended to report the same heightened frequency of complaints at ages 16 and 20 (Steinhausen & Metzke, 2007). These findings suggest that somatic symptoms may increase by middle childhood, though the pattern of change of somatic symptoms across early childhood has not been investigated.

While children's depressive, anxious, and somatic symptoms may co-occur (Brady & Kendall, 1992; Kristensen, Oerbeck, Torgersen, Hansen, & Wyller, 2014; Lavigne et al., 2015; Muris & Meesters, 2004; Vulic-Prtoric et al., 2007), research suggests these symptoms may be less interrelated in early childhood as compared to middle childhood and adolescence. For instance, Brady and Kendall (1992) found in a meta-analysis that 16% to 62% of children aged 5 to 17 years who were identified as depressed or anxious experienced co-occurring depressive and anxious symptoms. Yet this co-occurrence was higher among older (aged 12 to 17 years) than

younger (aged 5 to 11 years) children. Younger children experienced more frequent anxious symptoms compared to depressive symptoms or the co-occurrence of these symptoms (Brady & Kendall, 1992). It may be that children's depressive, anxious, and somatic symptoms unfold differently in early childhood. Children's depressive symptoms may increase later in childhood while children's anxious and somatic symptoms emerge earlier. It could also be that children's depressive, anxious, or somatic symptoms are related differently to contextual factors. One such contextual factor is the quality of the relationship a child shares with her or his teacher.

Patterns of Change for Teacher-Child Relationship Quality

The relationships children share with their teachers are important for children's adjustment and development and may relate to children's experiences of depressive, anxious, and somatic symptoms (Hamilton & Howes, 1992; Pianta, 1999). Teacher-child relationship quality has typically been assessed via teacher ratings along three dimensions: closeness (e.g., openness with teacher, warmth and affection), dependency (e.g., difficulty with separation, reliance on teacher to initiate interactions), and conflict (e.g., difficulty with compliance, frequent elicitation of teacher's attention; Baker et al., 2008; Pianta, 2001; Pianta et al., 1995). Change in levels of teacher-child closeness, dependency, and conflict can reflect how children and teachers adapt their relationships across preschool and kindergarten. For instance, Fumoto (2011) demonstrated that teacher-child interactions in preschool are largely teacher-directed, with teachers demonstrating authority and offering security and help to children when needed. As children move into kindergarten, teacher-child interactions are teacher- and child-directed, with teachers encouraging children's independence and perseverance (Fumoto, 2011). The quality of teacher-child relationships, such as closeness or dependency, may also change as children and teachers become more familiar with each other and children gain more independence in the classroom.

Teachers generally perceive their relationships with children to be positive. For example, Howes (2000) found that on average teachers reported their relationships with children as low in conflict and high in closeness in preschool and grade 2. Research findings on change in levels of teacher-child closeness are mixed. Jerome, Hamre, and Pianta (2009) found in their longitudinal study that teachers' annual reports of teacher-child closeness were consistent across kindergarten to grade 1, even with change in teacher. However, Jerome et al. (2009) found that after grade 1, teachers' reports of teacher-child closeness decreased exponentially every year through grade 5. In a longitudinal study, teachers' reports of teacher-child closeness were found to increase from entry to preschool to the end of the preschool year (Hartz et al., 2017). Yet another finding comes from a 2-year longitudinal study in which grade 3 teachers reported less teacher-child closeness as compared to grade 1 teachers, suggesting a decrease in closeness across this period (Mason, Hajovsky, McCune, & Turek, 2017). Overall, the pattern of change in teacher-child closeness across early childhood remains unclear.

Findings for change in teacher-child conflict are generally consistent across studies. Jerome et al. (2009) found that teacher-reported teacher-child conflict increased each year across kindergarten to grade 5, with greater increases in teacher-child conflict reported by teachers for younger children (kindergarten to grade 1) than older children (grades 2 to 5). Mason et al. (2017) also found that grade 1 teachers reported less teacher-child conflict compared to grade 3 teachers, suggesting an increase in teacher-child conflict across this period. Together these studies suggest that teacher-child conflict may increase across preschool and kindergarten.

Research has focused on change in levels of closeness or conflict in teacher-child relationships, but not in teacher-child dependency. The current study is thus the first to investigate the pattern of change in teacher-child dependency across early childhood. On

average, teacher-child dependency may show modest decreases across preschool to kindergarten as teacher-child interactions begin to become more child-directed (Fumoto, 2011). Overall, the quality of children's relationships with teachers and increases or decreases in relationship quality may be important for young children's ability to manage experiences of depressive, anxious, or somatic symptoms as they transition through these early school years.

Concurrent and Prospective Associations between Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality

Given the early emergence of internalizing symptomatology and the importance of the teacher-child relationship during the early school years, the ways in which children's depressive, anxious, and somatic symptoms relate to dimensions of teacher-child relationship quality concurrently and over time warrant investigation. It may be that children's internalizing symptoms and teacher-child relationship quality are related within time during early childhood without a lingering association between these constructs across time, supporting the idea of the concurrent model. Most research has investigated how teacher-child relationship quality predicts children's later internalizing symptoms, providing support for the idea of the relationship-driven model (Arbeau et al., 2010; Baker et al., 2008; Buyse et al., 2009; Pianta et al., 1995). Research that has investigated how children's internalizing symptoms predict prospective teacher-child relationship quality has also found support for the child-driven and transactional models (Mejia & Hoglund, 2016; Roorda et al., 2014; Zatto & Hoglund, 2018; Zhang, 2015).

Concurrent model. The concurrent model is broadly informed by developmental systems theory, which proposes there is a bidirectional association between a child's behaviors and her or his social context (Sameroff, 2000). According to this theory, the dynamic interrelation between a child's behavior and social context may occur across different time

scales, such as moment-by-moment, week-by-week, or over a longer duration of time. Over a period of time, the synchrony between a child's behaviors and social context is proposed to become consolidated. It may be that the interrelation between a child's behavior and social context first emerges as a contemporary relation and is captured by concurrent assessments. In line with this idea, it may be that children's depressive, anxious, and somatic symptoms and teacher-child relationship quality are primarily related within time. For instance, on occasions when children seem more sad or anxious, teachers may also concurrently perceive less closeness and more dependency or conflict with these children. In this case, the concurrent model suggests that the moment-to-moment or day-to-day expressions of children's experiences of depressive, anxious, and somatic symptoms are concurrently related to teacher-child relationship quality. It may be that across time periods, this concurrent interrelation becomes stronger to reflect the increasing synchrony between a child's behavior and social context.

Cross-sectional studies that have investigated the association between children's internalizing symptoms and teacher-child relationship quality provide support for the concurrent model. For instance, Roorda et al. (2013) found that children aged 3 to 5 years who experienced more frequent internalizing symptoms, as reported by teachers, were also observed to share fewer positive interactions with their teachers. With a cross-sectional sample of children in grades 3 to 6, Jellesma et al. (2015) similarly found that when teachers reported more conflict with children, children reported more symptoms of anxiety. Children who reported more negative interactions with their teachers also reported experiencing more depressive symptoms (Jellesma et al., 2015).

Evidence in support of the concurrent model has also been demonstrated in longitudinal research. With a sample of preschool children, Zatto and Hoglund (2018) found that teachers'

reports of children's internalizing symptoms (depressive, anxious, somatic symptoms) were concurrently related to teachers' reports of teacher-child dependency and conflict at the beginning and end of the preschool year. With a sample of children in kindergarten to grade 3, Mejia and Hoglund (2016) found that children's internalizing symptoms (depressive and anxious symptoms) were concurrently related with teacher-reported teacher-child dependency and conflict at each of the three waves of data collection over one school term. These studies suggest that children's depressive, anxious, and somatic symptoms and teacher-child relationship quality may be primarily interrelated within time. However, the studies by Zatto and Hoglund (2018) and Mejia and Hoglund (2016) also found a long-term association of children's internalizing symptoms with prospective teacher-child dependency, providing support for the child-driven model.

Child-driven model. The child-driven model is guided by both developmental systems and socialization theories (Grusec & Davidov, 2010; Sameroff, 2000). According to socialization theory, children are not passive recipients of caregivers' behaviors. Rather, children's own behaviors and feelings may shape the way that caregivers interact with them. Grusec and Davidov (2010) argued that children can influence their caregivers' responses and interactions, thereby contributing to their own development through the socialization given by caregivers.

Drawing from socialization theory, the child-driven model proposes that the frequency of children's depressive, anxious, and somatic symptoms may predict the quality of relationships children share with their teachers across preschool and kindergarten (Grusec & Davidov, 2010). Teachers may interact differently with children who experience a high frequency of depressive, anxious, and somatic symptoms over time compared to children with infrequent symptoms. When children are overly anxious or sad, they may be unlikely to seek their teachers' comfort

and engage less positively with their teachers. Teachers may subsequently perceive less close relationships with these children across the school year. Teachers may also report more dependency or conflict in their relationships with children who experience frequent depressive, anxious, and somatic symptoms, as teachers may need to attend more to these children to help them positively engage in the classroom.

Evidence in support of the child-driven model was demonstrated in a longitudinal study that followed a sample of children across the preschool year (Zatto & Hoglund, 2018). After controlling for the concurrent associations and children's aggressive behaviors at the start of preschool, children who experienced more frequent internalizing symptoms (depressive, anxious, somatic symptoms) at entry to preschool (as reported by teachers) showed greater teacher-reported dependency and less positive relations with their teachers (as reported by teachers and observers) by the end of the school year (Zatto & Hoglund, 2018). Mejia and Hoglund (2016) found similar support for the child-driven model in their research with a sample of children in kindergarten to grade 3 who were followed over one school term. Using teacher reports, children's internalizing symptoms (depressive and anxious symptoms) at the start of winter term predicted more teacher-child dependency at the end of the school year after controlling for the concurrent associations between these constructs and children's aggressive behaviors.

Roorda et al. (2014) also tested the association between internalizing symptoms (depressive, anxious, somatic symptoms) and teacher-child relationship quality across preschool with a sample of boys at risk for developing externalizing symptoms. After controlling for the concurrent associations, internalizing symptoms at the beginning of the school year negatively predicted teacher-child closeness by the end of the school year, as reported by teachers (Roorda et al., 2014). The child-driven model has also been supported in research investigating the

association between children's anxious symptoms and teacher-child relationship quality in children aged 2 to 5 years (Zhang, 2015). Zhang (2015) found that children who experienced frequent anxious symptoms at entry to preschool were reported by teachers to have more dependent teacher-child relationships at the end of the school year. Together, these findings illustrate that children's internalizing symptoms may predict how teachers perceive the quality of their relationships with these children. Still, other research has suggested that teacher-child relationships may have lingering effects on children's experiences of depressive, anxious, and somatic symptoms.

Relationship-driven model. The relationship-driven model is guided by both developmental systems and attachment theories (Sameroff, 2000; Sherman, Rice, & Cassidy, 2015; Sroufe, Levy, & Egeland, 1999). Attachment theory proposes that children form attachment patterns, or organized behavior in a relationship, with their caregivers (Sroufe et al., 1999). Based on these attachment patterns, children are believed to develop mental representations, or internal working models, of caregivers' expected behaviors (Sherman et al., 2015; Sroufe et al., 1999). Internal working models have been operationalized as the proximity a child seeks with a caregiver in times of stress to maintain her or his safety (Sherman et al., 2015). According to attachment theory, children also form complementary mental representations of themselves based on their attachment relationships (Sherman et al., 2015). Subsequently, relationships between children and their caregivers, including teachers, can figure prominently in children's developmental pathways toward adjustment or maladjustment (Hamilton & Howes, 1992; Pianta, 1999).

Drawing from attachment theory, it is proposed that the quality of relationships children form with their teachers may predict the frequency of children's depressive, anxious, and

somatic symptoms across preschool and kindergarten (Sherman et al., 2015; Sroufe et al., 1999). Children who experience a close, supportive relationship with their teachers may develop working models of teachers as a source of support and feel secure in the classroom (Sherman et al., 2015). These children may subsequently show fewer depressive, anxious, and somatic symptoms over time. On the other hand, children who experience dependency in their teacher-child relationship may develop an internal working model that the teacher is needed for security but is not always available or receptive, increasing their risks for these symptoms. Children who experience conflict in their teacher-child relationship may develop a working model of their teachers as hostile and unsupportive, also increasing their risks for depressive, anxious, and somatic symptoms (Pianta, 1999).

Most research on the association between internalizing symptoms and teacher-child relationship quality has focused on the relationship-driven model (Buyse et al., 2009; Hamre & Pianta, 2001; Pianta et al., 1995). Using teacher reports, Pianta et al. (1995) found that children who had more positive teacher-child relationships at the end of the kindergarten year also demonstrated better adjustment to school in the middle of grade 1. Rucinski, Brown, and Downer (2017) also tested the relationship-driven model in their longitudinal study across one school year with children in grades 3 to 5. When children and teachers reported more dependent and conflictual teacher-child relationships at entry to school, children also reported experiencing more frequent depressive symptoms by the end of the school year, after controlling for depressive symptoms at the start of school (Rucinski et al., 2017). A 2-year longitudinal study also found that children who were perceived by teachers to have more conflict in their teacher-child relationships in grade 4, reported experiencing more depressive symptoms in grade 6 (Rudasill, Possel, Black, & Niehaus, 2014). On the other hand, children who shared closer

relationships with their teachers in grade 4 reported fewer depressive symptoms in grade 6 (Rudasill et al., 2014).

While numerous studies support the relationship-driven model, these studies generally have not tested alternative theoretical models. Specifically, these studies did not test the possible role of children's internalizing symptoms on prospective teacher-child relationship quality (Arbeau et al., 2010; Baker et al., 2008; Buyse et al., 2009; Pianta et al., 1995). It could be that both children's internalizing symptoms and teacher-child relationship quality have lingering effects on each other and that this interrelation emerges over time, providing support for the transactional model.

Transactional model. The transactional model is informed by developmental systems theory, which proposes that possible reciprocal associations between a child's behavior and her or his context can influence the child's ongoing development (Sameroff, 2000; Sameroff & MacKenzie, 2003). Drawing from research that supports the child-driven and relationship-driven models, it is possible that children's depressive, anxious, and somatic symptoms both predict and are predicted by the quality of their relationships with teachers over time. In this case, the transactional model suggests that the interrelations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality emerge over time and that these constructs mutually influence each other across preschool and kindergarten.

Few studies have assessed reciprocal associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality over time. Using teacher reports, Roorda et al. (2014) found that teacher-child dependency and conflict were positively and reciprocally associated with children's internalizing symptoms (depressive, anxious, somatic symptoms) across the first term of preschool, after controlling for the concurrent associations.

While this finding suggests a reciprocal association between children's internalizing symptoms and teacher-child dependency and conflict that emerges over time, Roorda et al. (2014) also found evidence in support of the child-driven model, with children's internalizing symptoms predicting later teacher-child closeness. Studies by Mejia and Hoglund (2016) across one school term with children in kindergarten to grade 3 and by Zatto and Hoglund (2018) across one preschool year also tested but did not find support for the transactional model. Research that examines how the interrelation between children's internalizing symptoms and teacher-child relationship quality emerges across early childhood is needed to bridge studies testing different theoretical models of association between these constructs.

Current Study

The current study examined patterns of change of children's depressive, anxious, and somatic symptoms and three dimensions of teacher-child relationship quality (closeness, dependency, conflict) across preschool and kindergarten. This study further investigated four conceptual models of the concurrent and prospective associations between children's depressive, anxious, and somatic symptoms and dimensions of teacher-child relationship quality. The following research questions are investigated: 1) How do the frequencies of children's depressive, anxious, and somatic symptoms change across preschool and kindergarten? 2) How do dimensions of teacher-child relationship quality change across preschool and kindergarten? and 3) Are children's depressive, anxious, and somatic symptoms associated with teacher-child relationship quality across preschool and kindergarten? Are these associations best represented by the concurrent, child-driven, relationship-driven, or transactional model of association?

It is hypothesized that the frequency of children's depressive symptoms will be consistently low across preschool and kindergarten (Carter et al., 2010; Lavigne et al., 2015), the

frequency of children's anxious symptoms will be low at entry to preschool and increase across preschool and kindergarten (Brady & Kendall, 1992; Lavigne et al., 2015; Whalen et al., 2017), and the frequency and change of somatic symptoms will be similar to that of depressive or anxious symptoms. It is hypothesized that levels of teacher-child closeness will be consistently high across preschool and kindergarten, levels of teacher-child dependency will be moderate at entry to preschool and decreases by fall of kindergarten, and levels of teacher-child conflict will be low at entry to preschool and increase by fall of kindergarten (Fumoto, 2011; Jerome et al., 2009; Mason et al., 2017).

It is further hypothesized that children's depressive, anxious, and somatic symptoms will negatively predict prospective teacher-child closeness and positively predict prospective teacher-child dependency across preschool and kindergarten, in support of the child-driven model and aligning with socialization theory (Grusec & Davidov, 2010; Mejia & Hoglund, 2016; Zatto & Hoglund, 2018; Zhang, 2015). These associations are hypothesized to be strongest for children's anxious symptoms (Brady & Kendall, 1992; Lavigne et al., 2015; Whalen et al., 2017; Zhang, 2015). It is also hypothesized that children's depressive, anxious, and somatic symptoms will be concurrently associated with teacher-child conflict across preschool and kindergarten but not related over time, in support of the concurrent model (Jellesma et al., 2015; Mejia & Hoglund, 2016; Zatto & Hoglund, 2018). Although there is evidence of teacher-child relationships predicting children's internalizing symptoms, these studies have often not examined whether children's internalizing symptoms predict the quality of teacher-child relationships (Arbeau et al., 2010; Baker et al., 2008; Buyse et al., 2009; Pianta et al., 1995). The few studies that have examined different directional associations between these constructs have generally found that children's internalizing symptoms predict later teacher-child relationship quality (Mejia &

Hoglund, 2016; Zatto & Hoglund, 2018; Zhang, 2015). This suggests that children's adjustment to school may predict the nature of the relationships they share with their teachers across the school year.

Previous research in this area generally has not accounted for the influence of children's aggressive behaviors on the associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality. Children who enact aggressive behaviors tend to show greater risks for depressive, anxious, and somatic symptoms (Cunningham & Boyle, 2002; Hughes et al., 2014; Leadbeater & Hoglund, 2009; Mejia & Hoglund, 2016) and often have more conflictual teacher-child relationships (Henricsson & Rydell, 2004; Hughes et al., 2014; Keenan, Shaw, Delliquadri, Giovanelli, & Walsh, 1998; Justice, Cottone, Mashburn, & Rimm-Kaufman, 2008; Mejia & Hoglund, 2016; Sette et al., 2013). Not accounting for children's aggressive behaviors may lead to misunderstanding of how children's depressive, anxious, and somatic symptoms are associated with teacher-child relationship quality. For this reason, the current study controls for the frequency of children's aggressive behaviors at the start of preschool in the investigation of the associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality (Mejia & Hoglund, 2016; Zatto & Hoglund, 2018).

CHAPTER II

Method

Participants

In the current study, two cohorts of preschool children were recruited from two half-day preschool programs (program A and program B) that work with low-income families. Preschool program A is a charity-funded program that offers classroom-based education and care, with

eligibility for low-income families to receive free services and programming. Preschool program A offers multidisciplinary support for families and children that includes teaching staff, social workers, and speech and language pathologists. Preschool program B is a government-funded, faith-based program that offers classroom-based education and care, also with eligibility for low-income families to receive free services and programming. Preschool program B also offers multidisciplinary support for families and children similar to preschool program A, although there are fewer services offered. Both programs use comparable activities to support children's social, emotional, and cognitive learning.

Within the two preschool programs, children were recruited from 23 classrooms in 9 early learning sites in fall 2014 (cohort 1) and from 21 classrooms in 9 sites in fall 2015 (cohort 2) to participate in a 2-year long longitudinal study of social and emotional development in early childhood. In total, participants included 443 preschool children; 47.9% girls, M_{age} = 4.08 years, *SD* = .34 years, range = 3 to 5.25 years (cohort 1, *n* = 232, 50.4% girls, M_{age} = 4.11 years, *SD* = .35 years; cohort 2, *n* = 211, 45% girls, M_{age} = 4.05 years, *SD* = 0.33 years). According to parent-reported data, the sample of children was ethnically diverse: 33% Caucasian/Canadian (cohort 1, 42.3%; cohort 2, 20%), 18.4% South Asian (cohort 1, 14.3%; cohort 2, 15%), 10.1% Arab/West Asian (cohort 1, 6.5%; cohort 2, 15%), 7.6% Black/African Canadian (cohort 1, 5.4%; cohort 2, 10.8%), 7.3% South East Asian (cohort 1, 4.8%; cohort 2, 10%), 5.2% East Asian (cohort 1, 4.8%; cohort 2, 5.8%), 3.8% Aboriginal (cohort 1, 3%; cohort 2, 5%), 3.5% Latin American (cohort 1, 4.2%; cohort 2, 2.5%), and 11.1% reported multiple ethnicities (cohort 1, 14.3%; cohort 2, 6.7%).

According to parent-reported data, 67.1% of children were from immigrant families (cohort 1, 63.2%; cohort 2, 71.8%); 49.5% of children from immigrant families were not born in

Canada (cohort 1, 51.8%; cohort 2, 46.1%) and 50.5% of children from immigrant families were born in Canada (cohort 1, 48.2%; cohort 2, 53.9%). English was the primary language spoken in 12.4% of households (cohort 1, 19.9%; cohort 2, 0%). Other languages that were most commonly spoken included: South Asian languages (25.2%; e.g., Punjabi, Hindi; cohort 1, 23.9%; cohort 2, 27.4%), Southeast Asian languages (12.4%; e.g., Vietnamese, Tagalog; cohort 1, 11.4%; cohort 2, 14.2%), East Asian languages (3.5%; e.g., Mandarin, Japanese; cohort 1, 5.7%; cohort 2, 0%), West Asian languages (12.1%; e.g., Turkish, Arabic; cohort 1, 10.2%; cohort 2, 15.1%), Latin languages (3.5%; e.g., Spanish, Portuguese; cohort 1, 2.8%; cohort 2, 4.7%), African/Caribbean languages (3.5%; e.g., Dinka, Amharic; cohort 1, 5.7%; cohort 2, 0%), French (3.2%; cohort 1, 2.8%; cohort 2, 3.8%), Aboriginal languages (2.5%; e.g., Cree, Blackfoot; cohort 1, 3.4%; cohort 2, 0.9%), other European languages (17.7%; e.g., Polish, Ukrainian; cohort 1, 8.5%; cohort 2, 33%), and multiple languages (3.9%; cohort 1, 5.7%; cohort 2, 0.9%).

Parent-reported data also indicated that 14.7% of mothers (cohort 1, 12.9%; cohort 2, 17%) and 20.7% of fathers (cohort 1, 17.7%; cohort 2, 24.6%) did not complete high school, 46.2% of mothers (cohort 1, 46.0%; cohort 2, 46.4%) and 25.4% of fathers (cohort 1, 29.9%; cohort 2, 21.0%) were unemployed, and 18.4% of children lived in a single parent household (cohort 1, 16.0%; cohort 2, 21.4%). Based on parent-reported income data, all children from both cohorts lived in households that were below Statistics Canada low-income threshold.

In total, 173 teachers (cohort 1, $n = 84$; cohort 2, $n = 89$) participated in the current study; 22 were preschool teachers (cohort 1, $n = 12$; cohort 2, $n = 10$) and 151 were kindergarten teachers (cohort 1, $n = 72$; cohort 2, $n = 79$). Of these teachers, 32 participated in both years of the study; 8 of 22 preschool teachers taught both cohort 1 and cohort 2 children in preschool and

24 of 151 kindergarten teachers taught both cohort 1 and cohort 2 children in kindergarten. Preschool and kindergarten teachers were similar in age: preschool teachers, M_{age} = 38.71 years, *SD* = 10.75, range = 23.6 to 61.5; cohort 1, M_{age} = 35.9 years, *SD* = 10.3; cohort 2, M_{age} = 42.1 years, *SD* = 10.8; kindergarten teachers, M_{age} = 40.1 years, *SD* = 10.52, range = 23.2 to 64; cohort 1, M_{age} = 41.9 years, *SD* = 10.1; cohort 2, M_{age} = 38.5 years, *SD* = 10.7). All preschool teachers were female and 98.6% of kindergarten teachers were female (cohort 1, 98.6%; cohort 2, 98.7%). The majority of preschool teachers were Caucasian/Canadian (75%; cohort 1, 81.8%; cohort 2, 66.7%) The majority of kindergarten teachers were also Caucasian/Canadian (67.7%; cohort 1, 74.4%; cohort 2, 62.3%).

Teacher-report data indicated that preschool and kindergarten teachers had been teaching for a similar number of years: preschool teachers, *M* = 11 years, *SD* = 10.1; cohort 1, *M* = 8.6 years; cohort 2, *M* = 14 years; kindergarten teachers, *M* = 14.1 years, *SD* = 9.5; cohort 1, *M* = 14.9 years; cohort 2, *M* = 13.4 years. On average, preschool teachers had a higher percentage of Bachelor's degrees (81.8%; cohort 1, 83.3%; cohort 2, 80%) compared to kindergarten teachers (69.5%; cohort 1, 75.5%; cohort 2, 64.3%). Preschool teachers also had a higher percentage of Master's degrees (9.1%; cohort 1, 8.3%; cohort 2, 10%) compared to kindergarten teachers (1.0%; cohort 1, 0%; cohort 2, 1.8%). Kindergarten teachers were more likely to have a two-year after-degree (29.5%; cohort 1, 24.5%; cohort 2, 33.9%) than preschool teachers (9.1%; cohort 1, 8.3%; cohort 2, 10%). A two-year after-degree program is equivalent to a M.Ed. and is completed following a Bachelor's degree.

Procedure

Following University Research Ethics and School Board approval, consent packages were sent home to all parents of the children in the participating preschool classrooms informing

them of the study and seeking consent for their children to participate. The researchers also attended parent sessions offered by the preschool programs in the fall to inform parents of the purpose of the research and to answer any questions. Consent packages were provided in the predominate language spoken by families (e.g., English, Arabic, Punjabi). At Wave 2, consent was also requested for children new to the school and for children who had not previously returned their consent forms. Parents were asked to return their consent forms regardless of whether they granted consent. The overall return rate of consent forms was 68.5% (cohort 1, 72%; cohort 2, 65%; range = 28% - 94% across classrooms). Of the consent forms that were returned, 91% of parents consented for their child to participate (cohort 1, 87%; cohort 2, 95%; range = 60% - 100% across classrooms). Of all eligible children, 59.3% of parents consented for their child to participate in this two-year study (cohort 1, 60.5%; cohort 2, 58%).

Data were collected on four occasions. Baseline data were collected in the fall to early winter of preschool (W1). Follow-up data were collected in the spring of preschool (W2), fall to early winter of kindergarten (W3), and spring of kindergarten (W4). Each data collection period lasted about three months, with approximately four months between each wave of assessment. Data collection visits were rescheduled within two weeks for absent children. For each child in their classroom with consent to participate, teachers completed surveys on the child's internalizing symptoms and on their relationship quality with the child at each wave, as well as on the child's aggressive behaviors at W1. Parents also completed a demographic survey about their household at W1.

In total, 433 children (cohort 1, n = 222; cohort 2, n = 211) participated at W1; 437 children (cohort 1, n = 229; cohort 2, n = 208) participated at W2; 410 children (cohort 1, n = 212; cohort 2, n = 198) participated at W3; and 397 children (cohort 1, n = 209; cohort 2, n =

188) participated at W4. There was a 98.6% retention rate from W1 to W2 (cohort 1, 98.6%; cohort 2, 98.6%); a 93.8% retention rate from W2 to W3 (cohort 1, 92.6%; cohort 2, 95.2%); and a 96.8% retention rate from W3 to W4 (cohort 1, 98.6%; cohort 2, 94.9. Overall, there was a 91.7% retention rate from W1 to W4 (cohort 1, 94.1%; cohort 2, 89.1%).

Measures

Depressive, anxious, and somatic symptoms were assessed from teacher reports on three dimensions of the Behavior Assessment System for Children II at each wave (BASC-II; Reynolds & Kamphaus, 2004). Teachers rated how often in the past month children showed symptoms of *depression* (e.g., "seems lonely", "is easily upset"; 9 items), *anxiety* (e.g., "is nervous", "worries what other kids might think"; 9 items), and *somatization* (e.g., "complains of health", "has stomach problems"; 10 items). Teachers rated these items on a 4-point scale: 0 (*Never*), 1 (*Sometimes*), 2 (*Often*), and 3 (*Always*). Items were averaged within each subscale. Previously, the BASC-II has shown high internal consistency (a = .81 to .88) and strong predictive, concurrent, and construct validity (Reynolds & Kamphaus, 2004). Currently, the BASC-II item scores showed moderate to high internal consistency at each wave: depression, α = .85 to .88; anxiety, α = .76 to .83; and somatization, α = .80 to .81 (see Table 1).

Teacher-child relationship quality was assessed from teacher reports using the Student-Teacher Relationship Scale (STRS; Pianta, 2001). Teachers rated the quality of their relationships on three dimensions at each wave: *closeness* (e.g., "I share an affectionate, warm relationship with this child", "if upset, this child will seek comfort from me"; 8 items), *dependency* (e.g., "this child reacts strongly to separation from me", "this child asks for my help when he/she does not really need help"; 5 items), and *conflict* (e.g., "this child and I always seem to be struggling with each other", "this child easily becomes angry with me"; 7 items). Teachers

rated these items on a 5-point scale: 0 (*Definitely does not apply*) to 4 (*Definitely applies*). The STRS has previously shown moderate to high internal consistency (a = .68 to .93; Pianta, 2001). The STRS has also shown strong predictive, concurrent, and construct validity (Birch & Ladd, 1997, 1998; Hamre & Pianta, 2001; Henricsson & Rydell, 2004; Pianta, 2001; Rudasill & Rimm-Kaufman, 2009). Currently, the STRS item scores showed moderate to high internal consistency at each wave: closeness, α = .69 to .80; dependency, α = .62 to .78; and conflict, α = .89 to .92 (see Table 1).

Baseline covariates included child age in years, child gender (0 = boys, 1 = girls), and child aggression at W1. Teachers reported how often in the past month they observed a participating child displaying *physical aggression* toward their peers (e.g., "kicks or hits other children", "verbally threatens to hit or beat up other children"; 6 items) on a 4-point scale on the Preschool Social Behaviour Scale – Teacher Form (Crick, Casas, & Mosher, 1997): 0 (*Never*), 1 (*Sometimes*), 2 (*Often*), 3 (*Always*). On average, children's physical aggression was low in frequency (M = .15, SD = .30, range = .00 – 1.67). Internal consistency of the item scores was high at W1 (α = .80).

Data Analysis Strategy

Data analyses are presented in three sections. First, descriptive statistics of the constructs and bivariate correlations among the constructs are examined. Second, latent growth curve models (LGCM) are used to assess change in the frequency of children's depressive, anxious, and somatic symptoms and teacher-child relationship quality (closeness, dependency, conflict) across preschool and kindergarten. Third, autoregressive latent trajectory models with structured residuals (ALT-SR) are used to test the four conceptual models of the associations (concurrent, child-driven, relationship-driven, transactional) between children's depressive, anxious, and

somatic symptoms and teacher-child relationship quality (see Figure 1). The LGCMs and ALT-SRs are tested using Mplus 7.3 (Muthén & Muthén, 2011). The models are clustered by preschool classroom to account for any dependencies in the data.

Previous research on the concurrent and prospective associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality has typically used autoregressive cross-lagged panel models to estimate these associations (Mejia & Hoglund, 2016; Roorda et al., 2014; Rudasill et al., 2014; Zatto & Hoglund, 2018; Zhang, 2015). Recent examination of autoregressive cross-lagged panel models suggests this approach does not disaggregate between- and within-person associations (Berry & Willoughby, 2017). The current study uses an ALT-SR to disaggregate the between-person variation between growth parameters from the within-person variation in the concurrent and cross-lagged associations over time (Berry & Willoughby, 2017). The structured residuals of the ALT-SR account for the residual variation in the constructs at each wave and enable examination of within-person variability (Berry & Willoughby, 2017). The ALT-SR thus enables a more accurate estimation of the between- and within-person variation in how children's depressive, anxious, and somatic symptoms are interrelated with teacher-child relationship quality.

Model fit of the LGCMs and ALT-SRs are assessed via the chi-square statistic (χ^2), comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and standardized root-mean-square residual (SRMR; Kline, 2015). The χ^2 statistic assesses the difference between the hypothesized models and the null model with sensitivity to sample size. The CFI statistic calculates the observed versus hypothesized covariance matrix that is independent of sample size. CFI values of .95 or greater indicate excellent model fit and values of .90-.94 indicate adequate fit. The RMSEA statistic is an absolute measure of model fit that

assesses differences in the hypothesized models and the null model based on non-centrality parameters. The RMSEA statistic assesses the standardized differences in correlations between the observed and hypothesized covariance matrix that accounts for the degrees of freedom and complexity of the models. The SRMR is an index of average standardized differences between the observed and hypothesized models. RMSEA and SRMR values of .05 or lower indicate excellent model fit and values of .06-.08 indicate adequate model fit (Kline, 2015).

All model comparisons were assessed using the Satorra-Bentler scaled chi-square (χ^2) likelihood ratio difference test to assess differences in model fit of clustered models that are nested (e.g., child-driven vs. transactional). The Bayesian Information Criteria (BIC) was used to assess difference in model fit of non-nested models (e.g., child-driven vs. relationship-driven).

Missing data

Missing depression, anxiety, somatization, and teacher-child relationship quality data are estimated with full information likelihood (FIML) estimation with robust standard errors (Allison, 2002). Overall, 49% of children had teacher-reported data at all waves, 16.7% had teacher-reported data at three waves only, 22.6% had teacher-reported data at two waves only, 8.4% had teacher-reported data at one wave only, and 3.4% had no teacher-reported data at any wave. Children missing teacher-reported data at any wave were compared to children with no missing teacher-reported data on: (1) demographics (cohort, preschool program) and baseline covariates (child gender, age, aggression at W1), (2) baseline internalizing symptoms (depression, anxiety, somatization), and (3) baseline teacher-child relationship quality (closeness, dependency, conflict). Children missing teacher-reported data at any wave were more likely to be younger (M_{age} = 4.04 years, SD = .32) compared to children with no missing data (M_{age} = 4.12, SD = .35), F = 6.08, $p < .05$. Children missing teacher-reported data at any wave were also

more likely to be from preschool program A (55%) compared to children with no missing teacher-reported data (41%), t (437) = 2.72, $p < .01$. There were no differences by child gender, child aggression at W1, depressive, anxious, and somatic symptoms at W1, or teacher-child relationship quality at W1 between children with teacher-reported data at all waves and children missing teacher-reported data at any wave.

CHAPTER III

Results

Descriptive Statistics

Descriptive statistics for the constructs are presented in Table 1. On average, children showed a low frequency of depressive, anxious, and somatic symptoms at each wave. Teachers also reported a low degree of teacher-child dependency and conflict and a moderate to high degree of teacher-child closeness at each wave.

Bivariate correlations between children's depressive, anxious, and somatic symptoms are presented in Table 2. Children's depressive symptoms showed moderate rank-order stability across waves, rs = .43 to .67, $p < .01$. Symptoms of anxiety and somatization showed low to moderate rank-order stability across waves: anxiety, rs = .23 to .63, $p < .01$, and somatization, rs = .15 to .50, $p < .05$. These constructs were also moderately to highly correlated with each other within each wave, rs = .35 to .68, $p < .01$.

Bivariate correlations between teacher-child closeness, dependency, and conflict are presented in Table 3. Teacher-child closeness and conflict showed moderate rank-order stability across waves: closeness, rs = .42 – .58, $p < .01$ and conflict, rs = .53 – .60, $p < .01$. Teacher-child dependency showed low to moderate rank-order stability, rs = .17 – .55, $p < .01$. Teacher-child closeness was negatively and weakly correlated with teacher-child dependency at W2 and W3

(*r*s = -.13 and -.16, $p < .01$, respectively) and moderately correlated with teacher-child conflict within each wave (*r*s = -.26 to -.41, $p < .01$). Teacher-child conflict was positively and moderately to strongly correlated with teacher-child dependency within each wave (*r*s = .39 to .58, $p < .01$).

Bivariate correlations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality are presented in Table 4. Children's depressive and anxious symptoms were negatively and weakly correlated with teacher-child closeness at each wave (*r*s = -.12 to -.25, $p < .05$), with the exception of anxiety with teacher-child closeness at W4. Children's depressive, anxious, and somatic symptoms were positively and weakly to strongly correlated with teacher-child dependency and conflict at each wave (*r*s = .16 to .66, $p < .05$), with the exception of somatization with teacher-child conflict at W1 and W3.

Patterns of Change for Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality

A series of LGCMs were examined next to assess patterns of change in children's depressive, anxious, and somatic symptoms across preschool and kindergarten. For each LGCM, the error terms of the indicators were estimated to be correlated within school year (i.e., W1 with W2, W3 with W4) with the assumption that measurement error would be related within school year and reporter. The indicator variances were also constrained to be equal across waves.

A series of unconditional LGCMs were estimated for each construct to determine the best-fitting model of change (Kline, 2015). First, a fixed intercept model was tested where the variance of the construct at W1 was constrained to 0 and all indicator variables were constrained to 1. Second, a random intercept model was tested where the variance of the construct at W1 was free to vary, with all indicator variables constrained to 1. Third, a fixed linear slope model was

tested where the variance of the linear change in the construct was constrained to 0 and each indicator variable was constrained successively at 0, 1, 2, and 3 to represent linear change across equidistant data collection points. Fourth, a random linear slope model was tested where the variance of the linear change in the construct was free to vary. Fifth, a fixed quadratic model was tested where the variance of the quadratic change in the construct was constrained to 0 and each indicator variable was constrained at 0, 1, 4, and 9 to represent quadratic change. Sixth, a random quadratic model was tested where the variance of the quadratic change in the construct was free to vary.

Best-fitting LGCMs were determined by comparing the model fit of each nested model (e.g., fixed intercept vs. random intercept model; intercept model vs. fixed linear slope model). All model fit comparisons were tested using the Satorra-Bentler chi-square difference test, whereby the model with the significantly lowest chi-square value demonstrated the best fit to the data. Last, conditional best-fitting LGCMs were estimated for each construct where each of the growth parameters were regressed on the baseline covariates (child age, child sex, child aggression) and clustered by preschool classroom to account for any dependencies in the data.

Depressive symptoms. Comparison of the unconditional LGCMs for depressive symptoms indicated that the fixed quadratic slope model fit the data best. Upon examination of the growth parameters, it was found that the intercept and variance coefficients of the linear slope parameter were no longer significant with the inclusion of the fixed quadratic slope. Removal of the quadratic slope parameter resulted in significant intercept and variance coefficients for the linear slope parameter without the additional constraints. Thus, it was determined that the best-fitting LGCM was the random linear slope model, with this model providing good fit to the data (see Table 5). The conditional LGCM indicated that depressive

symptoms were low in frequency at fall of preschool and increased significantly and linearly by spring of kindergarten (see Figure 2). The intercept and linear slope parameters demonstrated variability and were not significantly correlated. The conditional LGCM accounted for 51% of the variance in the intercept and 46% of the variance in the linear slope of depressive symptoms.

Anxious symptoms. Comparisons of the unconditional LGCMs for anxious symptoms designated the random linear slope model fit the data best, with the indicator variance for anxious symptoms at W4 free to vary from the variances at W1 to W3. This model provided a good fit to the data (see Table 5). The conditional LGCM indicated that anxious symptoms were low in frequency at fall of preschool and increased linearly by spring of kindergarten (see Figure 3). The intercept and linear slope parameters demonstrated variability and were not significantly correlated. The conditional LGCM accounted for 23% of the variance in the intercept and 13% of the variance in the linear slope of anxious symptoms.

Somatic symptoms. The random linear slope model fit the data in the comparisons of the unconditional LGCMS for somatic symptoms, with the intercept variance constrained to 0 (see Table 5). The conditional LGCM indicated that somatic symptoms were low in frequency at fall of preschool and increased linearly by the spring of kindergarten (see Figure 4). The linear slope parameter demonstrated variability (the variance of the intercept was constrained to 0). The conditional LGCM accounted for 15% of the variance in the linear slope of somatic symptoms. See Figure 5 for an illustration of the average patterns of change of symptoms of depression, anxiety, and somatization from fall of preschool to spring of kindergarten.

Teacher-child closeness. Comparisons of the unconditional LGCMs for teacher-child closeness indicated that the fixed quadratic slope model fit the data best (see Table 5). The conditional LGCM indicated that teacher-child closeness was moderate at fall of preschool,

increased linearly across preschool, and then accelerated in that rate of change by the spring of kindergarten (see Figure 6). The intercept and linear slope parameters demonstrated variability and were not significantly correlated. The conditional LGCM accounted for 19% of the variance in the intercept and 44% of the variance in the linear slope of teacher-child closeness (the variance of the quadratic slope was constrained to 0).

Teacher-child dependency. The fixed linear slope model fit the data best in the comparisons of the unconditional LGCMs for teacher-child dependency (see Table 5). The conditional LGCM indicated that teacher-child dependency was moderate at fall of preschool and decreased linearly by spring of kindergarten (see Figure 7). There was variability around the intercept parameter. The conditional LGCM accounted for 44% of the variance in the intercept of teacher-child dependency (the variance of the linear slope was constrained to 0).

Teacher-child conflict. Comparison of the unconditional LGCMs for teacher-child conflict indicated that the random linear slope model provided the best fit to the data (see Table 5). The conditional LGCM indicated that teacher-child conflict was moderate at fall of preschool and decreased linearly by spring of kindergarten (see Figure 8). The intercept and linear slope parameters demonstrated variability and were not significantly correlated. The conditional LGCM accounted for 67% of the variance in the intercept and 40% of the variance in the linear slope. See Figure 9 for an illustration of the average patterns of change of teacher-child closeness, dependency, and conflict from fall of preschool to spring of kindergarten.

Concurrent and Prospective Associations between Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality

Last, a series of ALT-SRs were examined to assess the concurrent and prospective associations between children's internalizing symptoms and teacher-child relationship quality

across preschool and kindergarten. The growth parameters in the ALT-SRs were each regressed on the baseline covariates, including child age, sex, and aggression at W1. The conditional, clustered LGCMs presented above were used to build the ALT-SRs. Structured residuals (SR) were created by constraining the variance of the indicators for internalizing symptoms and teacher-child relationship quality constructs to 1 and creating phantom variables out of the constrained variances. The SRs were then used to examine the autoregressive and cross-lagged relations as well as the within-time covariances between children's internalizing symptoms and teacher-child relationship quality constructs. The between-person associations were represented in the covariances between the growth parameters. The within-person associations were represented in the covariances, autoregressive paths, and cross-lagged paths between the SRs.

First, a concurrent model with the autoregressive paths for each construct (e.g., W2 depressive symptoms regressed on W1 depressive symptoms) and within-time covariances between each construct (e.g., W1 depressive symptoms with W1 teacher-child closeness) was tested to assess whether children's internalizing symptoms and teacher-child relationship quality were just correlated within time. Second, the child-driven model added directional paths from children's depressive, anxious, or somatic symptoms to lagged teacher-child relationship quality (e.g., W2 teacher-child closeness regressed on W1 depressive symptoms) to assess whether children's internalizing symptoms predicted later teacher-child relationship quality. Third, the relationship-driven model added directional paths from teacher-child relationship quality to lagged depressive, anxious, or somatic symptoms (e.g., W2 depressive symptoms regressed on W1 teacher-child closeness) to assess whether teacher-child relationship quality predicted children's later internalizing symptoms. Last, the transactional model added bidirectional paths between children's depressive, anxious, or somatic symptoms and teacher-child relationship

quality (e.g., W2 depressive symptoms regressed on W1 teacher-child closeness, and W2 teacher-child closeness regressed on W1 depressive symptoms) to assess if children's internalizing symptoms and teacher-child relationship quality reciprocally predicted each other.

Depressive symptoms and teacher-child relationship quality. The concurrent model was identified as the best-fitting ALT-SR for the association between children's depressive symptoms and teacher-child closeness (see Table 6 and Figure 10). The autoregressive paths for depressive symptoms and teacher-child closeness were significant, indicating moderate mean-level stability in these constructs over time. Children's depressive symptoms were negatively and weakly associated with concurrent teacher-child closeness across W2 to W4, indicating modest within-person covariation. The depressive symptoms intercept was not significantly correlated with the linear slope parameter. This model accounted for 45% of the variance in the intercept and 39% of the variance in the linear slope of depressive symptoms. The variances of all teacher-child closeness growth parameters were constrained to 0.

The child-driven model was identified as the best-fitting ALT-SR for the association between children's depressive symptoms and teacher-child dependency (see Table 6 and Figure 11). The autoregressive paths for depressive symptoms and teacher-child dependency were significant, indicating moderate mean-level stability in these constructs over time. Children's depressive symptoms were positively and weakly associated with concurrent teacher-child dependency at each wave, indicating modest within-person covariation in these constructs within time. Children's depressive symptoms also positively and moderately predicted prospective teacher-child dependency across each lagged association. No between-person variance was estimated due to the growth parameters being constrained to 0. This model accounted for 77% of

the variance in the intercept of depressive symptoms. The variances of the depressive symptoms slope and teacher-child dependency parameters were constrained to 0.

The transactional model was identified as the best-fitting ALT-SR for children's depressive symptoms and teacher-child conflict (see Table 6 and Figure 12). The autoregressive paths for children's depressive symptoms and teacher-child conflict were significant, indicating moderate mean-level stability in these constructs over time. Children's depressive symptoms were positively and weakly associated with concurrent teacher-child conflict at each wave, indicating moderate within-person covariation within time. Children's depressive symptoms positively and weakly predicted prospective teacher-child conflict across each lagged association. Reciprocally, teacher-child conflict positively and moderately predicted prospective depressive symptoms across the transition from preschool to kindergarten and the kindergarten year. No between-person variance was estimated as the growth parameters were constrained to 0. This model accounted for 68% of the variance in the intercept of depressive symptoms. The variances of the depressive symptoms slope and teacher-child conflict parameters were constrained to 0.

Anxious symptoms and teacher-child relationship quality. The concurrent model was identified as the best-fitting ALT-SR for the associations between children's anxious symptoms and teacher-child closeness, dependency, and conflict (see Table 6 and Figures 13, 14, and 15). The autoregressive paths for anxious symptoms and teacher-child closeness, dependency, and conflict were significant, indicating modest mean-level stability in these constructs over time. Children's anxious symptoms were negatively and weakly associated with concurrent teacher-child closeness at W1 and positively and moderately associated with concurrent teacher-child dependency and conflict at W2, W3, and W4. This indicates modest within-person covariation

between anxious symptoms and teacher-child closeness at entry to preschool, and moderate within-person covariation between anxious symptoms and teacher-child dependency and conflict at the end of preschool and in the kindergarten year. The anxious symptoms intercept was significantly and negatively correlated with the anxious symptoms linear slope in each ALT-SR. The anxious symptoms intercept was significantly and positively correlated with the teacher-child dependency intercept. The anxious symptoms linear slope was significantly and positively correlated with the teacher-child conflict intercept. The models accounted for 17% of the variance in the intercept and 8% in the linear slope of anxious symptoms, 17% of the variance in the intercept for teacher-child closeness, 39% of the variance in the intercept for teacher-child dependency, and 64% of the variance in the intercept for teacher-child conflict. The variances of the linear and quadratic slopes of teacher-child closeness, linear slope of teacher-child dependency, and linear slope of teacher-child conflict were constrained to 0.

Somatic symptoms and teacher-child relationship quality. The concurrent model was identified as the best-fitting ALT-SR for the associations between children's somatic symptoms and teacher-child closeness, dependency, and conflict (see Table 6 and Figures 16, 17, and 18). The autoregressive paths were significant for somatic symptoms and teacher-child closeness and dependency, indicating modest mean-level stability in these constructs over time. The autoregressive paths for teacher-child conflict were not significant. Children's somatic symptoms were positively and modestly associated with concurrent teacher-child dependency at each wave, indicating modest within-person covariation between somatic symptoms and teacher-child dependency within time in preschool and kindergarten. The teacher-child dependency intercept was significantly and positively correlated with the somatic symptoms linear slope. No significant associations were found between somatic symptoms and teacher-child closeness or

conflict. The models accounted for 16% of the variance in the somatic symptoms linear slope, 17% of the variance in the intercept and 32% of the variance in the linear slope of teacher-child closeness, 39% of the variance in the intercept of teacher-child dependency, and 54% of the variance in the intercept and 37% of the variance in the linear slope of teacher-child conflict. The variances of the intercept of somatic symptoms, quadratic slope of teacher-child closeness, and linear slope of teacher-child dependency were constrained to 0.

Baseline Covariates

Differences in the patterns of change in children's depressive, anxious, and somatic symptoms and dimensions of teacher-child relationship quality by the baseline covariates are presented in Table 7. Compared to younger children, older children experienced more teacher-child closeness and less teacher-child conflict at entry to preschool. Compared to boys, girls experienced more teacher-child closeness and less teacher-child conflict at entry to preschool. Children who were reported to have more aggressive behaviors at W1 experienced more depressive, anxious, and somatic symptoms, more teacher-child dependency and conflict, and less teacher-child closeness at entry to preschool, as well as fewer increases in depressive and anxious symptoms and fewer decreases in teacher-child conflict across preschool and kindergarten compared to less aggressive children.

CHAPTER IV

Discussion

The current study investigated the patterns of change in children's depressive, anxious, and somatic symptoms and in children's relationship quality with their teachers, as well as the associations between these constructs across early childhood. Guided by developmental systems theory, where both a child's behaviors and her or his social context are proposed to be key

sources of influence on developmental outcomes (Sameroff, 2000), four directional models of how children's depressive, anxious, and somatic symptoms related to teacher-child relationship quality across preschool and kindergarten were examined: concurrent, child-driven, relationship-driven, and transactional models. The results most consistently supported the concurrent model with two exceptions for depressive symptoms: the association with teacher-child dependency supported the child-driven model and the association with teacher-child conflict supported the transactional model. Overall, the findings indicate some differences in how children's depressive, anxious, and somatic symptoms relate to different dimensions of teacher-child relationship quality in early childhood.

Patterns of Change for Depressive, Anxious, and Somatic Symptoms

There were similar patterns of change in children's depressive, anxious, and somatic symptoms across early childhood, as evidenced by the best-fitting LGCMs (see Figure 5). Children's depressive, anxious, and somatic symptoms were low in frequency at entry to preschool and increased linearly across preschool and kindergarten. Moreover, children tended to enter preschool experiencing various frequencies of depressive and anxious symptoms while children tended to experience a similar frequency of somatic symptoms at entry to preschool. Variability was also demonstrated in the linear increases of children's depressive, anxious, and somatic symptoms, though the average patterns of change in these symptoms were similar across preschool and kindergarten. These findings do not support previous research findings that children's depressive symptoms would remain consistently low in frequency across preschool and kindergarten but do converge with other findings that children's anxious symptoms would be low in frequency and increase across preschool and kindergarten (Carter et al., 2010; Lavigne et

al., 2015; Whalen et al., 2017). Findings here indicate that children's depressive, anxious, and somatic symptoms emerge similarly and are likely related during early childhood.

Consistent with the current findings, research has found that children's depressive and anxious symptoms emerge around the preschool period (Luby & Belden, 2012; Whalen et al., 2017). Research also suggests there is a co-occurrence between depressive, anxious, and somatic symptoms, though this association is less supported in early childhood. For instance, Brady and Kendall (1992) found in a meta-analysis that younger children (aged 5 – 11 years) experienced more frequent anxious symptoms while older children (age 12-17 years) more often experienced the co-occurrence of depressive and anxious symptoms. Brady and Kendall (1992) suggested that a temporal relationship was evident between the onset of anxious and depressive symptoms, with anxious symptoms more often predating depressive symptoms. Findings here did not test the temporal associations between children's depressive, anxious, and somatic symptoms but suggest that these symptoms show similar developmental patterns.

Community samples of young children may experience more mild symptomatology that is common among depression, anxiety, and somatization as compared to clinical samples. For instance, research that suggested anxious symptoms emerge before depressive symptoms were often demonstrated with a clinical sample of children (Brady & Kendall, 1992; Whalen et al., 2017). It may be that in community samples, children's anxious symptoms emerge similarly with depressive and somatic symptoms (Luby & Belden, 2012). Alternatively, it may be that internalizing symptoms are harder to differentiate in community samples of children, leading teachers to report similar frequencies of depressive, anxious, and somatic symptoms (Watson & Clark, 1989).

Patterns of Change for Teacher-Child Relationship Quality

Based on the best-fitting LGCM, teacher-child closeness was moderate at entry to preschool and increased across preschool and kindergarten, with this increase accelerating by spring of kindergarten (see Figure 9). Experiences of teacher-child closeness were variable at entry to preschool and varied in their linear change across preschool and kindergarten, while children similarly experienced a quadratic increase in teacher-child closeness by spring of kindergarten. There are mixed findings on the pattern of change in teacher-child closeness across early childhood (Hartz et al., 2017; Jerome et al., 2009; Mason et al., 2017). The current finding replicates a 1-year longitudinal study that found teacher-child closeness increased from entry to preschool to the end of the school year (Hartz et al., 2017). Teacher-child dependency and conflict demonstrated similar patterns of change across early childhood in the best-fitting LGCMs (see Figure 9). Dependency and conflict between children and teachers was moderate at entry to preschool and decreased across preschool and kindergarten. Children tended to differ in their experiences of teacher-child conflict at entry to preschool, but had similar experiences of teacher-child dependency. Children also experienced variability in the linear decrease in teacher-child dependency and conflict across preschool and kindergarten. This finding is contrary to research that demonstrated teacher-child conflict increased across elementary school (Jerome et al., 2009; Mason et al., 2017). For example, longitudinal studies with elementary school children showed an increase in teacher-child conflict across kindergarten to grade 5 (Jerome et al., 2009) and across grade 1 to grade 3 (Mason et al., 2017).

It may be that children's relationships with their teachers in the early school years (such as in preschool and kindergarten) are more positive in quality than relationships between teachers and children in the later elementary years. Young children may need more direction and attention from their teachers at the beginning of preschool as they adjust to the new context

(Birch & Ladd, 1997). As children progress through preschool and kindergarten, they may feel more comfortable engaging independently and adhering to the rules and structure of the classroom. Teachers may also perceive more dependency or conflict from children at entry to preschool as they attempt to enact rules and form the structure of the classroom (Fumoto, 2011). As children get accustomed to the classroom context, teachers may perceive children to be more independent and rule-abiding and engage more positively with them (Fumoto, 2011). Research has also found that teachers' reports of relationship quality with their students do not always converge with reports by children and observers (Murray, Murray, & Waas, 2008; Murray, Waas, & Murray, 2008; White, 2016). It may be that teachers are biased to perceive or report their relationships with children as positive (Howes, 2000). While teacher-child relationships generally improved over time, the quality of these relationships were also associated with children's experiences of depressive, anxious, and somatic symptoms across early childhood.

Associations between Children's Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality

Overall, the most consistent support was found for the concurrent model of association between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality. This result replicates other research suggesting children's internalizing symptoms are associated with concurrent teacher-child conflict (Jellesma et al., 2015; Mejia & Hoglund, 2016; Zatto & Hoglund, 2018) but is in contrast to research suggesting that children's internalizing symptoms would predict prospective teacher-child closeness and dependency, in support of the child-driven model (Mejia & Hoglund, 2016; Zatto & Hoglund, 2018; Zhang, 2015). These findings indicate that children's experiences of depressive, anxious, and somatic symptoms are related within time to teacher-child relationship quality but generally do not show direct

lingering effects over time once the between- and within-person variability was disentangled in these associations. This finding suggests that both teachers and children adapt proactively or reactively to each other on a momentary or daily basis rather than prospectively over the lagged time period assessed here. Still, children's depressive, anxious, and somatic symptoms were differently associated with the dimensions of teacher-child relationship quality.

Depressive, anxious, and somatic symptoms and teacher-child dependency. Children who experienced more depressive, anxious, and somatic symptoms tended to also experience more concurrent teacher-child dependency, converging with previous research (Mejia & Hoglund, 2016; Zatto & Hoglund, 2018). Children who experience more frequent depressive, anxious, or somatic symptoms may be overly reliant on their teachers to minimize negative feelings and engage in the classroom, with teachers subsequently perceiving more dependency from these children (Birch & Ladd, 1998; Mejia & Hoglund, 2016). Teachers may also attend more often to children vulnerable to depressive, anxious, or somatic symptoms in a way that is not necessarily supportive or engaging, with children simultaneously experiencing more sadness or anxiety (Birch & Ladd, 1998; Olson & Rosenblum, 1998). The associations between children's anxious and somatic symptoms and teacher-child dependency also demonstrated partial disaggregation of between- and within-person variation. Children who experienced more teacher child dependency at entry to preschool tended to also experience more anxious symptoms in fall of preschool and a greater increase in somatic symptoms across preschool and kindergarten. These findings suggest that variation in individual children's own anxious and somatic symptoms in relation to their average symptoms and those of their peers may be important for experiences of dependency in their relationships with teachers.

Children's depressive symptoms were also prospectively related to teacher-child dependency, in support of the child-driven model. Children who experienced more frequent depressive symptoms tended to also experience more concurrent and prospective dependency with their teachers across preschool and kindergarten. This finding aligns with research that has examined these directional associations with a latent internalizing symptoms construct (Mejia & Hoglund, 2016; Zatto & Hoglund, 2018), but suggests that children's depressive symptoms may drive this prospective association. It may be that teachers attempt to support and engage with children who are overly sad to sensitively respond to their behaviors and emotions (Birch & Ladd, 1998; Olson & Rosenblum, 1998). These children may then become overly reliant on their teachers to minimize their feelings of sadness, subsequently leading teachers to perceive these children as needy and overly dependent across the school year.

Depressive and anxious symptoms and teacher-child conflict. Children's depressive and anxious symptoms, but not somatic symptoms, were associated with teacher-child conflict. Children who experienced more depressive or anxious symptoms tended to also experience more concurrent teacher-child conflict. This finding is consistent with previous research that examined these directional associations between a latent internalizing symptoms construct and teacher-child conflict across preschool (Zatto & Hoglund, 2018) and middle childhood (Mejia & Hoglund, 2016). It may be that depressive and anxious symptoms are more overt than somatic symptoms in early childhood and thus more important for their experiences of conflict with teachers. A study by Jellesma et al. (2015) supports this idea, where children's depressive and anxious symptoms, but not somatic symptoms, were found to be associated with concurrent teacher-child conflict in grades 3 to 6. This suggests that teachers who perceive children to be distracting or noncompliant may also concurrently perceive these children as overly sad and

anxious. These children may elicit teachers' attention as a way to help them manage their emotions and to engage positively in the classroom. The association between children's anxious symptoms and teacher-child conflict also demonstrated partial disaggregation of between- and within-person variation. This suggests that children who experienced more teacher-child conflict at entry to preschool relative to other children also tended to experience a greater increase in anxious symptoms by spring of kindergarten. This suggests that variation in children's anxious symptoms in relation to their average experiences of anxiety and that of their peers may be important for their experiences of conflict with their teachers.

Depressive symptoms were also reciprocally related to teacher-child conflict, in support of the transactional model and consistent with previous research (Roorda et al., 2014). It may be that teachers who perceive children as difficult to work with attend less sensitively to them, subsequently increasing vulnerable children's likelihood of experiencing more feelings of sadness across early childhood. At the same time, children who are overly sad may elicit teachers' attention to minimize their negative feelings, increasing the odds that teachers perceive these children as difficult and demanding across the school year.

The strong correlation of aggressive behaviors with depressive symptoms and teacher-child conflict may also explain the finding that these constructs were reciprocally associated over time. A longitudinal study by Doumen et al. (2008) found that children's physical aggression and teacher-child conflict were reciprocally related across the kindergarten year. Another study by Hamre, Pianta, Downer, and Mashburn (2008) found that over half of the variance in teachers' reports of conflict with children in preschool was explained by their reports of children's problem behaviors. It may be that the strong correlation of aggressive behaviors with depressive symptoms and teacher-child conflict influenced the reciprocal association found here.

Depressive symptoms and teacher-child closeness. Depressive symptoms were concurrently associated with teacher-child closeness, indicating that when children experienced more depressive symptoms they also experienced less concurrent closeness with their teachers. This finding converges with a study by Zatto and Hoglund (2018) that found a concurrent association between a latent internalizing symptoms construct and a positive teacher-child relationship quality construct (closeness, positive engagement, communication) across the preschool year. The current finding suggests that depressive symptoms may drive this association with teacher-child closeness. The pervasiveness of negative emotions (such as sadness or guilt) typically displayed by children experiencing depressive symptoms, but not necessarily anxious or somatic symptoms, may be most important for teacher-child closeness (Brady & Kendall, 1992; Stavrakaki, Vargo, Boodoosingh, & Roberts, 1987). Teachers may feel less close to children who display more sadness while children may simultaneously display more sadness when they feel less close to their teachers (Brady & Kendall, 1992; Finch, Lipovsky, & Casat, 1989; Roorda et al., 2013). Overall, the associations between children's depressive, anxious, and somatic symptoms and dimensions of teacher-child relationship quality have implications for prevention and intervention of these symptoms and negative teacher-child relationships.

Implications

This study contributes to the body of research on how young children's depressive, anxious, and somatic symptoms relate to the quality of teacher-child relationships by focusing on this association across preschool and kindergarten, generally children's first formal relationships with teachers. This study examined the patterns of change in children's depressive, anxious, and somatic symptoms and in teacher-child closeness, dependency, and conflict. This study also

assessed the concurrent and prospective associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality. The between- and within-person variation in these associations were disaggregated, which has often been overlooked in this line of research (Arbeau et al., 2010; Baker et al., 2008; Berry & Willoughby, 2017; Buyse et al., 2009; Mejia & Hoglund, 2016; Pianta et al., 1995; Zatto & Hoglund, 2018). Findings suggest that children's symptoms of depression, anxiety, and somatization are generally associated with dimensions of teacher-child relationship quality within time but not necessarily across time.

Children's depressive, anxious, and somatic symptoms may similarly emerge in early childhood, but show some modest differences in how they relate to dimensions of teacher-child relationship quality. For instance, only children's depressive symptoms were associated with concurrent teacher-child closeness and showed lingering effects on teacher-child dependency and conflict across preschool and kindergarten. Variation in children's experiences of depressive, anxious, and somatic symptoms in relation to their own average experiences and that of their peers are also important for their relationships with teachers within time and across preschool and kindergarten.

Findings here suggest that teachers may need to provide different forms of support to children who are overly sad or anxious to foster children's positive experiences in the classroom (Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010). Providing structured opportunities for children experiencing depressive, anxious, and somatic symptoms to work independently and also supportively with peers may benefit children who are vulnerable to depressive, anxious, and somatic symptoms and children who experience negative teacher-child relationships. The use of supportive, proactive strategies to help children engage positively with peers in the classroom,

such as through role plays, may help instill a sense of confidence and comfort in these children about their own abilities.

Professional development opportunities related to children's mental health may also benefit teachers. Evidence-based mental health strategies that provide ongoing support and feedback to teachers have the potential to assist teachers in identifying and supporting children who are experiencing depressive, anxious, or somatic symptoms as well as fostering closer and less dependent and conflictual teacher-child relationships. My Teaching Partner is one intervention strategy that has shown promise in supporting teachers to improve their emotional support and teacher-child relationships in preschool and kindergarten classrooms (Early, Maxwell, Ponder, & Pan, 2017; Pianta, Mashburn, Downer, Hamre, & Justice, 2008). My Teaching Partner involves teachers recording observations of their teaching to receive constructive feedback from a coach about the instructional quality in the classroom, including emotional support, organizational structure, and instructional support (Early et al., 2017). Teachers who can identify children's depressive, anxious, and somatic symptoms and provide proactive support to children vulnerable to these symptoms may help to foster positive teacher-child relationships across the preschool and kindergarten years.

Limitations and Future Research

While there are several strengths of the current study, there are also some notable limitations. One limitation of the current study is the low response rate of parents regarding consent for their children to participate. Parents were provided consent forms and encouraged to return the forms regardless of whether or not consent was granted. Still, only 68.5% of parents returned the consent forms. This study targeted a population of children from ethnically diverse and low-income backgrounds, which may explain the low response rate. Research has shown

that consent forms are less likely to be returned from parents with lower educational attainment and parents from ethnic minority backgrounds (Esbensen, Melde, Taylor, & Peterson, 2008). The current low response rate thus suggests that the sample may not be representative of the targeted population of children. It could be that more vulnerable families did not feel comfortable granting consent for the study or were less able to return consent forms. In this way, the current study may not capture the full range of vulnerability present in the targeted population. While the researchers attended parent information sessions held by the preschool programs to help parents learn about the study, this may not have been sufficient to help parents feel comfortable participating in this research. Future research could implement additional strategies for parents to learn about the study, such as through community events and printed and online materials, as well as provide multiple ways in which to consent to the research, such as through written or oral consent (Esbensen et al., 2008).

Only 49% of children had teacher-reported data at all waves of assessment, another limitation of the current study. Missing data were due, in part, to children moving away, difficulties in locating children after transitioning into a new school for kindergarten, and kindergarten teachers not consenting to participate. While children who were missing data at any wave only differed by age and program compared to children without missing data, the amount of missing data may have influenced findings. The current study estimated missing data with FIML with robust standard errors, a technique recommended for longitudinal research (Allison, 2002). Still, descriptive statistics of children's depressive, anxious, and somatic symptoms suggest a decrease in the average frequency of these symptoms, while the patterns of change found in the LGCMs indicate an increase in these symptoms across preschool and kindergarten. It may be that using FIML with robust errors to estimate patterns of change resulted in the

difference between these descriptive statistics and the longitudinal patterns of change modeled in children's depressive, anxious, and somatic symptoms. While the researchers collected information from parents about their children's future school and also additional contact information, future research could implement other proactive strategies to help maintain contact with families should they move and to inform future teachers of the study.

A limitation of the current study is the reliance on teachers to rate both children's depressive, anxious, and somatic symptoms and teacher-child relationship quality. Previous research has also predominantly relied on teachers to rate the quality of their relationships with students (e.g., Mejia & Hoglund, 2016; Murray, Murray, et al., 2008). However, reports of teacher-child relationship quality by teachers do not always converge with reports by children and observers (Murray, Murray, et al., 2008; Murray, Waas, et al., 2008; White, 2016). The change in teacher, and thus reporter, from preschool to kindergarten potentially affected reports of children's depressive, anxious, and somatic symptoms and teacher-child relationship quality. For instance, the mean levels of these constructs tended to be similar within grade but dissimilar when compared between preschool and kindergarten. Future research could incorporate child and observer reports of the teacher-child relationship as well as children's depressive, anxious, and somatic symptoms to account for any potential bias.

Previous research has rarely accounted for the influence of aggressive behaviors on the associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality. Children with more frequent aggressive behaviors often show greater risk for experiencing internalizing symptoms and often have more conflictual teacher-child relationships (Cunningham & Boyle, 2002; Henricsson & Rydell, 2004; Hughes et al., 2014; Justice et al., 2008; Keenan et al., 1998; Leadbeater & Hoglund, 2009; Mejia & Hoglund, 2016;

Sette et al., 2013) The current study controlled for the frequency of children's aggressive behaviors toward their peers to better estimate the associations between children's depressive, anxious, and somatic symptoms and teacher-child relationship quality (Mejia & Hoglund, 2016; Zatto & Hoglund, 2018). However, children's aggressive behaviors were strongly correlated with children's depressive symptoms and teacher-child conflict. Additional constraints on the variances of growth parameters were required in the concurrent and prospective associations to account for this strong correlation. These constraints removed associations between growth parameters that could have potentially presented between-person variation among children's depressive symptoms with teacher-child relationship quality, leaving the variation in these associations unclear. When disentangled, the associations between children's depressive symptoms and teacher-child relationship quality may demonstrate similar associations with anxious and somatic symptoms across early childhood.

Future research could examine the association between children's aggressive behaviors and their experiences of depressive symptoms. Research has found that children with clinical symptoms of depression and anxiety in preschool were more likely to display and be victim to aggressive behaviors in elementary school (Belden, Gaffrey, & Luby, 2012). However, relational aggression has more often been associated with children's internalizing symptoms compared to physical aggression in middle childhood and adolescence (Card, Stucky, Sawalani, & Little, 2008; Perry & Ostrov, 2018). For instance, a meta-analysis of 148 studies on physical and relational aggression across childhood and adolescence indicated that relational aggression, but not physical aggression, was related to internalizing symptoms (Card et al., 2008). Perry and Ostrov (2018) also found that externalizing symptoms characterized by relational aggression as opposed to physical aggression were related to internalizing symptoms in children aged 4 years.

The unique finding here that young children's physical aggression is strongly related to depressive symptoms warrants further investigation in early childhood.

Future research on children's depressive, anxious, and somatic symptoms and teacher-child relationship quality may also benefit from considering classroom or child characteristics. For example, the degree of classroom emotional support (e.g., teacher sensitivity, regard for student perspectives) may be important for how children feel and for their dyadic relationships with teachers and peers in this setting. Curby et al. (2014) found that classroom emotional support predicted preschool children's positive engagement with peers and was reciprocally related to positive engagement with teachers. Children's temperament (e.g., inhibition/shyness, anger) has also been linked to children's internalizing symptoms and teacher-child relationship quality. For instance, children who displayed greater behavioral inhibition in preschool tended to display more internalizing symptoms at age 6 (Bufferd et al., 2014) and 8 years (Hastings et al., 2015). Shyness has also been found to be a negative predictor of teacher-child closeness in preschool and grade 1 (Justice et al., 2008; Rudasill & Rimm-Kaufman, 2009). Future research examining the influence of these classroom and child characteristics may enhance understanding of how children's depressive, anxious, and somatic symptoms relate to the quality of the teacher-child relationship.

Conclusion

The current study highlights young children's experiences of depressive, anxious, and somatic symptoms and the different associations these symptoms share with the quality of teacher-child relationships. Patterns of change in children's depressive, anxious, and somatic symptoms were uniquely related to teacher-child relationship quality, suggesting that individual examination of internalizing symptoms is warranted in early childhood. Professional

development that supports teachers in their efforts to identify and support children experiencing depressive, anxious, or somatic symptoms, such as My Teaching Partner, may help to lessen these symptoms and improve the teacher-child relationship (Early et al., 2017; Pianta et al., 2008). School-based mental health strategies that support children who are experiencing depressive, anxious, or somatic symptoms would also likely benefit children's developmental outcomes and relationships with teachers.

REFERENCES

Allison, P. D. (2002). *Missing data: Quantitative application in the social sciences*. Thousand Oaks, CA, US: Sage Publications.

Arbeau, K. A., Coplan, R. J., & Weeks, M. (2010). Shyness, teacher-child relationships, and socio-emotional adjustment in grade 1. *International Journal of Behavioral Development*, *34*(3), 259-269. doi:10.1177/0165025409350959

Baker, J.A., Grant, S., & Morlock, L. (2008) The teacher-student relationship as a developmental context for children with internalizing or externalizing behavior problems. *School Psychology Quarterly*, *23*(1), 3-15. doi:10.1037/1045-3830.23.1.3

Belden, A.C., Gaffrey, M. S., & Luby, J. L. (2012). Relational aggression in children with preschool-onset psychiatric disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, *51*(9), 889-901. doi:10.1016/j.jaac.2012.06.018

Berry, D. & Willoughby, M. T. (2017). On the practical interpretability of cross-lagged panel models: Rethinking a developmental workhorse. *Child Development*, *88*(4), 1186-1206. doi:10.1111/cdev.12660

Birch, S. & Ladd, G. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology*, *35(1)*, 61-79. doi:10.1016/S0022-4405(96)00029-5

Birch, S. & Ladd, G. (1998). Children's interpersonal behaviors and the teacher-child relationship. *Developmental Psychology*, *34*, 934-946. doi:10.1037/00121649.34.5.934

Brady, E.U. & Kendall, P.C. (1992). Comorbidity of anxiety and depression in children and adolescents. *Psychological Bulletin*, *111*(2), 244-255. doi:10.1037/0033-2909.111.2.244

Bufferd, S. J., Dougherty, L., R., Olino, T. M., Dyson, M. W., Laptook, R. S., Carlson, G. A., & Klein, D. N. (2014). Predictors of the onset of depression in young children: A multi-method, multi-informant longitudinal study from ages 3 to 6. *Journal of Child Psychology and Psychiatry*, *55*(11), 1279-1287. doi:10.1111/jcpp.12252

Buyse, E., Verschueren, K., Verachtert, P., & Van Damme, J. (2009). Predicting school adjustment in early elementary school: Impact of teacher-child relationship quality and relational classroom climate. *The Elementary School Journal*, *110*(2), 119-141. doi:10.1086/605768

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, 79(5), 1185-1229. doi:10.1111/j.1467-8624.2008.01184.x

Carter, A.S., Godoy, L., Wagmiller, R.L., Veliz, P., Marakovitz, S., & Briggs-Gowan, M.J. (2010). Internalizing trajectories in young boys and girls: The while is not a simple sum of its parts. *Journal of Abnormal Child Psychology*, *38*, 19-31. doi:10.1007/s10802-009-9342-0

Crick, N. R., Casas, J. F., & Mosher, M. (1997). Relational and overt aggression in preschool. *Developmental Psychology*, *33*(4), 579-588. doi:10.1037/0012-1649.33.4.579

Cunningham, C. E. & Boyle, M. H. (2002). Preschoolers at risk for Attention-Deficit Hyperactivity Disorder and Oppositional Defiant Disorder: Family, parenting, and behavioral correlates. *Journal of Abnormal Child Psychology*, *30*(6), 555-569. doi:10.1023/A:1020855429085

Curby, T.W., Downer, J.T., & Booren, L.M. (2014). Behavioral exchanges between teachers and children over the course of a typical preschool day: Testing bidirectional associations. *Early Childhood Research Quarterly*, *29*, 193-204. doi:10.1016/j.ecresq.2014.01.002

Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., Luyckx, K., & Soenens, B. (2008). Reciprocal relations between teacher-child conflict and aggressive behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology*, *37*(3), 588-599. doi:10.1080/15374410802148079

Early, D. M., Maxwell, K. L., Ponder, B. D., & Pan, Y. (2017). Improving teacher-child interactions: A randomized controlled trial of Making the Most of Classroom Interactions and My Teaching Partner profession development models. *Early Childhood Research Quarterly*, *38*, 57-70. doi:10.1016/j.ecresq.2016.08.005

Esbensen, F., Melde, C., Taylor, T. J., & Peterson, D. (2008). Active parental consent in school-based research: How much is enough and how do we get it? *Evaluation Review*, *32*(4), 335-362. doi:10.1177/0193841X08315175

Finch, A. J., Lipovsky, J. A., & Casat, C. D. (1989). Anxiety and depression in children and adolescents: Negative affectivity or separate constructs? In P. Kendall, & D. Watson (Eds.), *Anxiety and depression: Distinctive and overlapping features* (pp. 171-202). San Diego, CA, US: Academic Press.

Fumoto, H. (2011). Teacher-child relationships and early childhood practice. *Early Years*, *31*(1), 19-30. doi:10.1080/09575146.2010.535790

Grusec, J.E. & Davidov, M. (2010). Integrating different perspectives on socialization theory and research: A domain-specific approach. *Child Development*, *81*(3), 687-709. doi:10.1111/j.14678624.2010.01426.x

Hamilton, C. E. & Howes, C. (1992). A comparison of young children's relationships with mothers and teachers. *New Directions for Child and Adolescent Development*, *37*, 41-59, doi:10.1111/1467-8624.00301

Hamre, B.K. & Pianta, R.C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, *72*(2), 625-638. doi:10.1111/1467-8624.00301

Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development*, *17*(1), 115-136. doi:10.1111/j.1467-9507.2007.00418.x

Hartz, K., Williford, A. P., & Koomen, H. M. Y. (2017). Teachers' perceptions of teacher-child relationships: Links with children's observed interactions. *Early Education and Development*, *28*(4), 441-456.

Hastings, P.D., Helm, J., Mills, R.S.L., Serbin, L.A., Stack, D.M., & Schwartzman, A.E. (2015). Dispositional and environmental predictors of the development of internalizing problems in childhood: Testing a multilevel model. *Journal of Abnormal Child Psychology*, *43*, 831-845. doi:10.1007/s10802-014-9951-0

Henricsson, L. & Rydell, A. (2004). Elementary school children with behavior problems: Teacher-child relations and self-perception. A prospective study. *Merrill-Palmer Quarterly*, *50*(2), 111-138. doi:10.1353/mpq.2004.0012

Howes, C. (2000). Social-emotional classroom climate in child care, child-teacher relationships and children's second grade peer relations. *Social Development*, *9*(2), 191-204. doi:10.1111/1467-9507.00119

Hughes, K., Bullock, A., & Coplan, R.J. (2014). A person-centered analysis of teacher-child relationships in early childhood. *British Journal of Educational Psychology*, *84*(2), 253-267. doi:10.1111/bjep.12029

Jellesma, F. C., Rieffe, C., Terwogt, M. M., & Westenberg, P. M. (2011). Children's sense of coherence and trait emotional intelligence: A longitudinal study exploring the development of somatic complaints. *Psychology and Health*, *26*(3), 307-320. doi:10.1080/08870440903411021

Jellesma, F.C., Zee, M., & Koomen, H.M.Y. (2015). Children's perceptions of the relationship with the teacher: Associations with appraisals and internalizing problems in middle childhood. *Journal of Applied Developmental Psychology*, *36*, 30-38. doi:10.1016/j.appdev.2014.09.002

Jerome, E.M., Hamre, B.K., & Pianta, R.C. (2009). Teacher-child relationships from kindergarten to sixth grade: Early childhood predictors of teacher-perceived conflict and closeness. *Social Development*, *18*(4). 915-945. doi:10.1111/j.1467-9507.2008.00508.x

Justice, L. M., Cottone, E. A., Mashburn, A, & Rimm-Kaufman, S. E. (2008). Relationships between teachers and preschoolers who are at risk: Contribution of children's language skills, temperamentally based attributes, and gender. *Early Education and Development*, *19(4)*, 600-621. doi:10.1080/10409280802231021

Keenan, K., Shaw, D., Delliquadri, E., Giovanelli, J., & Walsh, B. (1998). Evidence for the continuity of early problem behaviors: Application of a developmental model. *Journal of Abnormal Child Psychology*, *26*(6), 441-454. doi:10.1023/A:1022647717926

Kline, R. (2015). *Principles and practice of structural equation modeling* (4th ed.). New York, NY: Guilford.

Kristensen, H., Oerbeck, B., Torgersen, H. S., Hansen, B. H., & Wyller, V. B. (2014). Somatic symptoms in children with anxiety disorders: An exploratory cross-sectional study of the relationship between subjective and objective measures. *European Child and Adolescent Psychiatry*, *23*, 795-803. doi:10.1007/s00787-013-0512-9

Lavigne, J. V., Gibbons, R. D., Christoffel, K. K., Arend, R., Rosenbaum, D., Binns, H., Dawson, N., Sobel, H., & Isaacs, C. (1996). Prevalence rates and correlates of psychiatric disorders among preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry*, *35*(2), 204-214. doi:10.1097/00004583-199602000-00014

Lavigne, J.V., Hopkins, J., Gouze, K.R., & Bryant, F.B. (2015). Bidirectional influences of anxiety and depression in young children. *Journal of Abnormal Child Psychology*, *43*, 163-176. doi:10.1007/s10802-014-9884-7

Lavigne, J.V., LeBailly, S.A., Hopkins, J., Gouze, K.R., & Binns, H.J. (2009). The prevalence of ADHD, ODD, depression, and anxiety in community sample of 4-year-olds. *Journal of Clinical Child & Adolescent Psychology*, *38*(3), 315-328. doi:10.1080/15374410902851382

Leadbeater, B. J. & Hoglund, W. L. G. (2009). The effects of peer victimization and physical aggression on changes in internalizing from first to third grade. *Child Development*, *80*(3), 843-859. doi:10.1111/j.1467-8624.2009.01301.x

Luby, J. L. & Belden, A. C. (2012). Depressive-symptom onset during toddlerhood in a sample of depressed preschoolers: Implications for future investigations of major depressive disorder in toddlers. *Infant Mental Health Journal*, *33*(2), 139-147. doi:10.1002/imhj.21314

Luby, J. L., Si, X., Belden, A. C., Tandon, M., & Spitznagel, E. (2009). Preschool depression: Homotypic continuity and course over 24 months. *Archives of General Psychiatry*, *66*(8), 897-905. doi:10.1001/archgenpsychiatry.2009.97

Mason, B. A., Hajovsky, D. B., McCune, L. A., & Turek, J. L. (2017). Conflict, closeness, and academic skills: A longitudinal examination of the teacher-student relationship. *School Psychology Review*, *46*(2), 177-189. doi:10.17105/SPR-2017-0020.V46-2

Mejia, T.M. & Hoglund, W.L.G. (2016). Do children's problems contribute to teacher-child relationship quality? Support for a child-driven model. *Early Childhood Research Quarterly*, *34*, 13-26. doi:10.1016/j.ecresq.2015.08.003

Muris, P. & Meesters, C. (2004). Children's somatization symptoms: Correlations with trait anxiety, anxiety sensitivity, and learning experiences. *Psychological Reports*, *94*, 1269-1275. doi:10.2466/PR0.94.3.1269-1275

Murray, C., Murray, K. M., & Waas, G. A. (2008). Child and teacher reports of teacher-student relationships: Concordance of perspectives and associations with school adjustment in urban kindergarten classrooms. *Journal of Applied Developmental Psychology*, *29*, 49-61. doi:10.1016/j.appdev.2007.10.006

Murray, C., Waas, G.A., & Murray, K.M. (2008). Child race and gender as moderators of the association between teacher-child relationships and school adjustment. *Psychology in the Schools*, *45*(6), 562-578. doi:10.1002/pits.20324

Muthén, L.K. & Muthén, B.O. (2011). *Mplus user's guide* (3rd ed.). Los Angeles, CA, US: Muthén & Muthén.

Olson, S.L. & Rosenblum, K. (1998). Preschool antecedents of internalizing problems in children beginning school: The role of social maladaptation. *Early Education and*

Development, *9*(2), 117-129. doi:10.1207/s15566935eed0902_1

Parkes, A., Sweeting, H., & Wight, D. (2016). Early childhood precursors and school age correlates of different internalizing problem trajectories among young children. *Journal of Abnormal Child Psychology*, *44*, 1333-1346. doi:10.1007/s10802-015-0116-6

Paulus, F.W., Backes, A., Sander, C.S., Weber, M., & von Gontard, A. (2015). Anxiety disorders and behavioral inhibition in preschool children: A population-based study. *Child Psychiatry and Human Development*, *46*, 150-157. doi:10.1007/s10578-014-0460-8

Perry, K. J. & Ostrov, J. M. (2018). Testing a higher order model of internalizing and externalizing behavior: The role of aggression subtypes. *Child Psychiatry and Human Development*, 49, 20-32. doi:10.1007/s10578-017-0725-0

Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington DC: American Psychological Association.

Pianta, R.C. (2001). *Student-Teacher Relationship Scale*. Odessa, FL: PAR, Inc.

Pianta, R. C., Mashburn, A. J., Downer, J. T., Hamre, B. K., & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, *23*, 431-451. doi:10.1016/j.ecresq.2008.02.001

Pianta, R.C., Steinberg, M.S, & Rollins, K.B. (1995). The first two years of school: Teacher-child relationships and directions in children's classroom adjustment. *Development and Psychopathology*, *7*(2), 295-312. doi:10.1017/S0954579400006519

Reynolds, C.R. & Kamphaus, R.W. (2004). *Behavioral Assessment System for Children* (2nd ed.). Circle Pines, MN: American Guidance Service Inc.

Roorda, D. L., Koomen, H. M. Y., Split, J. L., Thijs, J. T., & Oort, F. J. (2013). Interpersonal behaviors and complementarity in interactions between teachers and kindergarteners with a variety of externalizing and internalizing behaviors. *Journal of School Psychology*, *51*, 143-158. doi:10.1016/j.jsp.2012.12.001

Roorda D. L., Verschueren, K., Vancraeyveldt, C. Van Craeyevelt, S., & Colpin, H. (2014). Teacher-child relationships and behavioral adjustment: Transactional links for preschool boys at risk. *Journal of School Psychology*, *52*, 495-510. doi:10.1016.j.jsp.2014.006.004

Rucinski, C. L., Brown, J. L., & Downer, J. T. (2017). Teacher-child relationships, classroom climate, and children's social-emotional and academic development. *Journal of Educational Psychology*, *109*(9), 1-13. doi:10.1037/edu0000240

Rudasill, K.M., Possel, P., Black, S.W., & Niehaus, K. (2014). Teacher support mediates concurrent and longitudinal associations between temperament and mild depressive symptoms in sixth grade. *Early Child Development and Care*, *184*(6), 803-818. doi:10.1080/03004430.2013.821610

Rudasill, K. M. & Rimm-Kaufman, S.E. (2009). Teacher-child relationship quality: The roles of child temperament and teacher-child interactions. *Early Childhood Research Quarterly*, *24*, 107-120. doi:10.1016/j.ecresq.2008.12.003

Sameroff, A. J. (2000). Developmental systems and psychopathology. *Development and Psychopathology*, *12*, 297-312. doi:10.1017/S0954579400003035

Sameroff, A. J. & MacKenzie, M. J. (2003). Research strategies for capturing transactional models of development: The limits of the possible. *Development and Psychopathology*, *15*, 613-640. doi:10.1017.S0954579403000312

Sette, S., Spinrad, T.L., & Baumgartner, E. (2013). Links among Italian preschoolers' socioemotional competence, teacher-child relationship quality, and peer acceptance. *Early Education and Development, 24*(6), 851-864. doi:10.1080/10409289.2013.744684

Sherman, L. J., Rice, K., & Cassidy, J. (2015). Infant capacities related to building internal working models of attachment figures: A theoretical and empirical review. *Developmental Review*, *37*, 109-141. doi:10.1016/j.dr.2015.06.001

Sroufe, L. A., Carlson, E. A., Levy, A. K., & Egeland, B. (1999). Implications of attachment theory for developmental psychopathology. *Development and Psychopathology*, 11, 1-13.

Stavrakaki, C., Vargo, B., Boodoosingh, L., & Roberts, N. (1987). The relationship between anxiety and depression in children: rating scales and clinical variables. *The Canadian Journal of Psychiatry*, *32*(6), 433-439.

Steinhausen, H. C. & Metzke, C. W. (2007). Continuity of functional-somatic symptoms from late childhood to young adulthood in a community sample. *Journal of Child Psychology and Psychiatry*, *48*(5), 508-513. doi:10.1111/j.1469-7610.2006.01721.x

Sterba, S.K., Prinstein, M.J., & Cox, M.J. (2007). Trajectories of internalizing problems across childhood: Heterogeneity, external validity, and gender differences. *Development and Psychopathology*, *19*, 345-366. doi:10.1017/S0954579407070174

Torsheim, T. & Wold, B. (2001). School-related stress, school support, and somatic complaints: A general population study. *Journal of Adolescent Research*, *16*(3), 293-303. doi:10.1177/0743558401163003

Tsouloupas, C. N., Carson, R. L., Matthews, R., Grawitch, M. J., & Barber, L. K. (2010). Exploring the association between teachers' perceived student misbehavior and

emotional exhaustion: The importance of teacher efficacy beliefs and emotion regulation. *Educational Psychology*, *30*(2), 173-189. doi:10.1080/01443410903494460

Vulic-Prtoric, A., Galic, S., Coha, R., Grubic, M., Lopizic, J., & Padelin, P. (2007). Anxiety in children with headaches. *Psychological Topics*, *16*(2), 201-224.

Watson, D. & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, *96*, 465-490.

Whalen, D.J., Sylvester, C.M., & Luby, J.L. (2017). Depression and anxiety in preschoolers: A review of the past 7 years. *Child and Adolescent Psychiatric Clinics of North America*, *26*(3), 503-522. doi:10.1016/j.chc.2017.02.006.

White, K.M. (2016). "My teacher helps me": Assessing teacher-child relationships from the child's perspective. *Journal of Research in Childhood Education*, *30*(1), 29-41. doi:10.1080/02568543.2015.1105333

Zatto, B. & Hoglund, W. L. G. (2018). *Children's internalizing problems and teacher-child relationship quality across preschool*. Revised and resubmitted.

Zhang, X. (2015). The differential role of symptoms of anxiety and social withdrawal in Chinese children's dependency on their teachers during the transition to nursery care. *Early Education and Development*, *26*(7), 956-969. doi:10.1080/10409289.2014.915675

Table 1
Descriptive Statistics of Symptoms of Depression, Anxiety, and Somatization and Teacher-Child Relationship Quality

Variables	α	*N*	Mean	*SD*	Range
Depression					
W1	0.88	387	0.40	0.44	0.00-2.13
W2	0.86	393	0.45	0.43	0.00-2.56
W3	0.85	270	0.37	0.43	0.00-2.33
W4	0.87	275	0.34	0.42	0.00-2.11
Anxiety					
W1	0.83	383	0.45	0.41	0.00-2.43
W2	0.81	394	0.47	0.36	0.00-2.60
W3	0.81	270	0.38	0.36	0.00-2.30
W4	0.76	276	0.36	0.31	0.00-1.60
Somatization					
W1	0.81	365	0.20	0.24	0.00-1.56
W2	0.80	365	0.24	0.25	0.00-1.20
W3	0.80	268	0.17	0.24	0.00-1.50
W4	0.80	275	0.17	0.24	0.00-1.30
Closeness					
W1	0.69	386	2.93	0.61	0.75-4.00
W2	0.73	393	3.19	0.63	0.88-4.00
W3	0.74	270	3.05	0.70	0.75-4.00
W4	0.80	275	3.21	0.73	0.25-4.00
Dependency					
W1	0.78	386	0.95	0.80	0.00-3.60
W2	0.70	393	0.95	0.72	0.00-3.60
W3	0.62	270	0.60	0.63	0.00-3.20
W4	0.66	275	0.60	0.65	0.00-3.40
Conflict					
W1	0.92	386	0.74	0.91	0.00-3.43
W2	0.91	393	0.73	0.90	0.00-3.57
W3	0.89	270	0.51	0.77	0.00-3.57
W4	0.89	275	0.50	0.76	0.00-3.43

Notes. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4.

Table 2
Bivariate Correlations between Symptoms of Depression, Anxiety, and Somatization

Variables	1	2	3	4	5	6	7	8	9	10	11
Depression											
1. W1	---										
2. W2	**.67****	---									
3. W3	**.39****	**.43****	---								
4. W4	**.30****	**.43****	**.67****	---							
Anxiety											
5. W1	.65**	.43**	.11	.07	---						
6. W2	.46**	.65**	.16**	.17**	**.58****	---					
7. W3	.17**	.24**	.68**	.52**	**.10**	**.23****	---				
8. W4	.11	.19**	.45**	.68**	**.07**	**.18****	**.63****	---			
Somatization											
9. W1	.35**	.14**	.04	.02	.43**	.16**	.00	-.03	---		
10. W2	.23**	.35**	.12	.23**	.27**	.42**	.09	.19**	**.29****	---	
11. W3	.07	.13*	.35**	.30**	.06	.07	.36**	.21**	**.05**	**.15***	---
12. W4	.08	.12	.26**	.37**	.13*	.15*	.28**	.37**	**-.01**	**.18****	**.50****

Notes. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4. Stability coefficients shown in boldface. *$p < .05$. **$p < .01$.

Table 3

Bivariate Correlations between Dimensions of Teacher-Child Relationship Quality

Variables	1	2	3	4	5	6	7	8	9	10	11
Closeness											
1. W1	---										
2. W2	**.58****	---									
3. W3	**.26****	**.42****	---								
4. W4	**.27****	**.36****	**.56****	---							
Dependency											
5. W1	-.02	-.11*	-.02	.07	---						
6. W2	-.03	-.13**	.03	-.02	**.47****	---					
7. W3	-.14*	-.11	-.16**	-.08	**.19****	**.17****	---				
8. W4	.00	-.01	-.07	.01	**.18****	**.14***	**.55****	---			
Conflict											
9. W1	-.26**	-.28**	-.15*	.02	.58**	.30**	.26**	.17**	---		
10. W2	-.23**	-.41**	-.12	-.06	.28**	.52**	.30**	.24**	**.60****	---	
11. W3	-.10	-.19**	-.29**	-.12	.14*	.22**	.54**	.29**	**.44****	**.53****	---
12. W4	-.11	-.17**	-.15*	-.33**	.17**	.27**	.27**	.39**	**.30****	**.46****	**.57****

Notes. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4. Stability coefficients shown in boldface. *$p < .05$. **$p < .01$.

Table 4

Bivariate Correlations of Symptoms of Depression, Anxiety, and Somatization with Teacher-Child Relationship Quality

	Depression				**Anxiety**				**Somatization**			
	W1	**W2**	**W3**	**W4**	**W1**	**W2**	**W3**	**W4**	**W1**	**W2**	**W3**	**W4**
Closeness												
W1	**-.12***	-.11*	-.10	-.10	**-.18****	-.13*	-.11	-.16*	**.02**	.06	.04	-.14*
W2	-.10	**-.17****	-.17**	-.18**	-.09	**-.25****	-.19**	-.22**	.09	**-.01**	-.08	-.12*
W3	.07	-.03	**-.17****	-.14*	.01	-.11	**-.16***	-.16*	.10	-.04	**.01**	-.01
W4	.10	-.07	-.06	**-.16****	.02	-.13*	-.11	**-.11**	.13*	.00	.04	**.01**
Dependency												
W1	**.45****	.29**	.21**	.23**	**.33****	.28**	.17**	.22**	**.16****	.21**	.12	.13*
W2	.41**	**.43****	.26**	.24**	.30**	**.43****	.12	.12	-.04	**.19****	.04	.03
W3	.15*	.19**	**.49****	.37**	.04	.09	**.48****	.37**	.02	.08	**.25****	.23**
W4	.12	.21**	.31**	**.46****	.00	.09	.30**	**.43****	.01	.16**	.16*	**.26****
Conflict												
W1	**.53****	.39**	.34**	.28**	**.25****	.16**	.13*	.16**	**.09**	.05	.03	.08
W2	.43**	**.57****	.45**	.44**	.17**	**.36****	.27**	.25**	.00	**.20****	.11	.13*
W3	.24**	.37**	**.66****	.53**	.01	.09	**.45****	.32**	-.03	.08	**.11**	.13*
W4	.22**	.39**	.55**	**.66****	.02	.12*	.33**	**.36****	-.02	.19**	.19**	**.18****

Notes. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4. Within-time correlations shown in boldface. *$p < .05$. **$p < .01$.

Table 5

Latent Growth Curve Models for Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Depression						
1. Fixed Intercept	99.67(10), p<.01	.79	.15 (.12-.17)	.23	1193.74	
2. Random Intercept	29.92(9), p<.01	.95	.07 (.05-.10)	.06	1130.04	vs. Fixed Intercept: $\Delta\chi^2$=69.75(1), p<.01
3. Fixed Linear Slope	28.24(8), p<.01	.95	.08 (.05-.11)	.05	1134.42	vs. Random Intercept: $\Delta\chi^2$=1.68(1), *ns*
4. Random Linear Slope	22.87(6), p<.01	.96	.08 (.05-.12)	.04	1141.16	vs. Random Intercept: $\Delta\chi^2$=7.05(3), ns
5. Fixed Quadratic Slope	14.52(5), p<.05	.98	.07 (.03-.11)	.04	1138.87	vs. Random Linear Slope: $\Delta\chi^2$=8.35(1), p<.01
6. Random Quadratic Slope	Not positive definite.					
7. Conditional Random Linear Slope	**25.98(12), *p*<.05**	**.97**	**.06 (.03-.08)**	**.04**	**933.89**	
Anxiety						
1. Fixed Intercept	43.70(9), p<.01	.88	.10 (.07-.12)	.13	873.01	
2. Random Intercept	38.51(8), p<.01	.89	.09 (.07-.13)	.10	873.88	vs. Fixed Intercept: $\Delta\chi^2$=5.19(1), p<.05
3. Fixed Linear Slope	30.36(7), p<.01	.92	.09 (.06-.12)	.09	871.79	vs. Random Intercept: $\Delta\chi^2$=8.15(1), p<.01
4. Random Linear Slope	17.93(5), p<.01	.95	.08 (.04-.12)	.05	871.48	vs. Fixed Linear Slope: $\Delta\chi^2$=12.43(2), p<.01
5. Fixed Quadratic Slope	16.06(4), p<.01	.96	.08 (.04-.13)	.05	875.67	vs. Random Linear Slope: $\Delta\chi^2$=1.87(1), ns
6. Random Quadratic Slope	10.64(1), p<.01	.97	.15 (.08-.24)	.04	888.42	vs. Random Linear Slope: $\Delta\chi^2$=7.29(4), ns
7. Conditional Random Linear Slope	**16.47(11), *ns***	**.98**	**.04 (.00-.07)**	**.04**	**822.70**	
Somatization						
1. Fixed Intercept	27.88(9), p<.01	.82	.07 (.04-.10)	.09	-66.06	
2. Random Intercept	24.69(8), p<.01	.84	.07 (.04-.10)	.08	-63.22	vs. Fixed Intercept: $\Delta\chi^2$=3.19(1), *ns*
3. Fixed Linear Slope	24.34(8), p<.01	.84	.07 (.04-.10)	.08	-63.57	vs. Fixed Intercept: $\Delta\chi^2$=3.54(1), *ns*
4. Random Linear Slope	20.30(7), p<.01	.87	.07 (.03-.10)	.07	-61.57	vs. Fixed Intercept: $\Delta\chi^2$=7.58(2), p<.05
5. Fixed Quadratic Slope	19.21(6), p<.01	.87	.07 (.04-.11)	.07	-56.62	vs. Random Linear Slope: $\Delta\chi^2$=1.09(1), *ns*
6. Random Quadratic Slope	Not positive definite.					
7. Conditional Random Linear Slope	**22.02(13), *ns***	**.90**	**.04 (.00-.07)**	**.06**	**-46.68**	

Table 5 continued on next page.

Table 5 continued

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Closeness						
1. Fixed Intercept	154.13(10), p<.01	.51	.18 (.16-.21)	.26	2514.39	
2. Random Intercept	101.70(9), p<.01	.68	.16 (.13-.18)	.18	2468.02	vs. Fixed Intercept: $\Delta\chi^2$=52.43(1), p<.01
3. Fixed Linear Slope	57.05(8), p<.01	.83	.12 (.09-.15)	.25	2429.42	vs. Random Intercept: $\Delta\chi^2$=44.65(1), p<.01
4. Random Linear Slope	41.75(6), p<.01	.88	.12 (.09-.15)	.10	2426.25	vs. Fixed Linear Slope: $\Delta\chi^2$=15.30(2), p<.01
5. Fixed Quadratic Slope	28.11(5), p<.01	.92	.10 (.07-.14)	.10	2418.67	vs. Random Linear Slope: $\Delta\chi^2$=13.64(1), p<.01
6. Random Quadratic Slope	24.99(2), p<.01	.92	.16 (.11-.22)	.09	2433.72	vs. Fixed Quadratic Slope: $\Delta\chi^2$=3.12(3), *ns*
7. Conditional Fixed Quadratic Slope	**24.69(8), *p*<.01**	**.94**	**.07 (.04-.11)**	**.05**	**2252.16**	
Dependency						
1. Fixed Intercept	75.12(9), p<.001	.65	.13 (.11-.16)	.18	2746.45	
2. Random Intercept	70.18(8), p<.01	.67	.14 (.11-.17)	.15	2747.57	vs. Fixed Intercept: $\Delta\chi^2$=4.94(1), p<.05
3. Fixed Linear Slope	31.52(7), p<.01	.87	.09 (.06-.12)	.09	2714.97	vs. Random Intercept: $\Delta\chi^2$=38.66(1), p<.01
4. Random Linear Slope	28.76(5), p<.01	.87	.11 (.07-.14)	.08	2724.32	vs. Fixed Linear Slope: $\Delta\chi^2$=2.76(2), *ns*
5. Fixed Quadratic Slope	31.50(6), p<.01	.86	.10 (.07-.14)	.09	2721.01	vs. Fixed Linear Slope: $\Delta\chi^2$=0.02(1), *ns*
6. Random Quadratic Slope	31.20(4), p<.01	.85	.13 (.09-.17)	.09	2732.82	vs. Fixed Linear Slope: $\Delta\chi^2$=0.32(3), *ns*
7. Conditional Fixed Linear Slope	**31.93(13), *p*<.01**	**.87**	**.06 (.04-.09)**	**.06**	**2524.93**	
Conflict						
1. Fixed Intercept	126.72(9), p<.01	.67	.18 (.15-.20)	.25	3096.72	
2. Random Intercept	48.67(8), p<.01	.89	.11 (.08-.14)	.09	3024.73	vs. Fixed Intercept: $\Delta\chi^2$=78.05(1), p<.01
3. Fixed Linear Slope	25.41(7), p<.01	.95	.08 (.05-.11)	.06	3007.53	vs. Random Intercept: $\Delta\chi^2$=23.26(1), p<.01
4. Random Linear Slope	17.15(5), p<.01	.97	.08 (.04-.12)	.05	3011.38	vs. Fixed Linear Slope: $\Delta\chi^2$=8.26(2), p<.05
5. Fixed Quadratic Slope	17.14(4), p<.01	.96	.09 (.05-.13)	.05	3017.43	vs. Random Linear Slope: $\Delta\chi^2$=0.01(1), *ns*
6. Random Quadratic Slope	Not positive definite.					
7. Conditional Random Linear Slope	**16.86(11), *ns***	**.98**	**.04 (.00-.07)**	**.04**	**2640.87**	

Notes. Best-fitting models shown in boldface. For each construct, models 1 to 6 are unconditional. Conditional models include baseline covariates (child age, child sex, child aggression at W1) regressed on growth parameters and are clustered by preschool classroom. *ns* = not significant.

Table 6
Autoregressive Latent Trajectory Models of the Concurrent and Prospective Models of Association

Model	χ^2 (df)	SCF	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Depression X Closeness							
1. Concurrent	**121.01(39), *p*<.01**	**1.26**	**.89**	**.07 (.06-.09)**	**.08**	**3221.79**	
2. Child-Driven	119.10(37), *p*<.01	1.27	.89	.08 (.06-.09)	.08	3232.42	vs. Concurrent: $\Delta\chi^2$=1.13(2), *ns*
3. Relationship-Driven	118.46(37), *p*<.01	1.26	.89	.08 (.06-.09)	.07	3230.57	vs. Concurrent: $\Delta\chi^2$=2.55(2), *ns*
4. Transactional	117.70(36), *p*<.01	1.26	.89	.08 (.06-.09)	.07	3236.18	vs. Concurrent: $\Delta\chi^2$=3.31(3), *ns* vs. Child-Driven: $\Delta\chi^2$=1.81(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=0.76(1), *ns*
Depression X Dependency							
1. Concurrent	151.19(44), *p*<.01	1.34	.84	.08 (.07-.09)	.09	3360.31	
2. Child-Driven	**135.96(42), *p*<.01**	**1.35**	**.86**	**.08 (.06-.09)**	**.08**	**3352.48**	**vs. Concurrent: $\Delta\chi^2$=16.86(2), *p*<.01**
3. Relationship-Driven	142.96(42), *p*<.01	1.34	.85	.08 (.07-.09)	.08	3360.36	vs. Concurrent: $\Delta\chi^2$=8.23(2), *p*<.05
4. Transactional	132.55(41), *p*<.01	1.34	.86	.08 (.06-.09)	.08	3352.91	vs. Concurrent: $\Delta\chi^2$=18.64(3), *p*<.01 vs. Child-Driven: $\Delta\chi^2$=3.37(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=10.41(1), *p*<.01
Depression X Conflict							
1. Concurrent	135.58(44), *p*<.01	1.48	.89	.07 (.06-.09)	.09	3353.81	
2. Child-Driven	113.75(42), *p*<.01	1.49	.92	.07 (.05-.08)	.08	3334.88	vs. Concurrent: $\Delta\chi^2$=24.54(2), *p*<.01
3. Relationship-Driven	109.56(42), *p*<.01	1.48	.92	.07 (.05-.08)	.07	3327.41	vs. Concurrent: $\Delta\chi^2$=26.02(2), *p*<.01
4. Transactional	**95.52(41), *p*<.01**	**1.48**	**.94**	**.06 (.04-.07)**	**.06**	**3312.64**	**vs. Concurrent: $\Delta\chi^2$=40.06(3), *p*<.01** **vs. Child-Driven: $\Delta\chi^2$=14.80(1), *p*<.01** **vs. Relationship-Driven: $\Delta\chi^2$=14.04(1), *p*<.01**
Anxiety X Closeness							
1. Concurrent	**91.44(35), *p*<.01**	**1.33**	**.90**	**.07 (.05-.08)**	**.08**	**3091.15**	
2. Child-Driven	90.95(33), *p*<.01	1.33	.90	.07 (.05-.08)	.08	3102.81	vs. Concurrent: $\Delta\chi^2$=0.49(2), *ns*
3. Relationship-Driven	90.96(33), *p*<.01	1.33	.90	.07 (.05-.08)	.08	3102.12	vs. Concurrent: $\Delta\chi^2$=0.48(2), *ns*
4. Transactional	90.82(32), *p*<.01	1.33	.90	.07 (.05-.09)	.08	3107.99	vs. Concurrent: $\Delta\chi^2$=0.62(3), *ns* vs. Child-Driven: $\Delta\chi^2$=0.13(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=0.14(1), *ns*

Table 6 continued on next page.

Table 6 continued

Model	χ^2 (df)	SCF	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Anxiety X Dependency							
1. Concurrent	**104.18(38), *p*<.01**	**1.37**	**.88**	**.07 (.05-.08)**	**.08**	**3232.65**	
2. Child-Driven	101.64(36), *p*<.01	1.37	.88	.07 (.05-.09)	.08	3241.13	vs. Concurrent: $\Delta\chi^2$=2.54(2), *ns*
3. Relationship-Driven	104.55(36), *p*<.01	1.36	.87	.07 (.06-.09)	.08	3243.61	vs. Concurrent: $\Delta\chi^2$=0.35(2), *ns*
4. Transactional	100.89(35), *p*<.01	1.36	.88	.07 (.05-.09)	.08	3245.39	vs. Concurrent: $\Delta\chi^2$=3.71(3), *ns* vs. Child-Driven: $\Delta\chi^2$=1.18(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=3.66(1), *ns*
Anxiety X Conflict							
1. Concurrent	**69.56(38), *p*<.01**	**1.41**	**.95**	**.05 (.03-.06)**	**.05**	**3375.55**	
2. Child-Driven	65.64(36), *p*<.01	1.44	.96	.05 (.03-.06)	.05	3384.07	vs. Concurrent: $\Delta\chi^2$=4.09(2), *ns*
3. Relationship-Driven	70.14(36), *p*<.01	1.37	.95	.05 (.03-.07)	.05	3385.91	vs. Concurrent: $\Delta\chi^2$=0.93(2), *ns*
4. Transactional	67.78(35), *p*<.01	1.39	.95	.05 (.03-.07)	.05	3389.84	vs. Concurrent: $\Delta\chi^2$=2.35(3), *ns* vs. Child-Driven: $\Delta\chi^2$=0.10(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=2.80(1), *ns*
Somatization X Closeness							
1. Concurrent	**74.99(35), *p*<.01**	**1.42**	**.89**	**.05 (.04-.07)**	**.06**	**2235.00**	
2. Child-Driven	74.49(33), *p*<.01	1.43	.88	.06 (.04-.07)	.06	2246.71	vs. Concurrent: $\Delta\chi^2$=2.68(2), *ns*
3. Relationship-Driven	71.49(33), *p*<.01	1.42	.89	.06 (.04-.07)	.06	2241.85	vs. Concurrent: $\Delta\chi^2$=2.80(2), *ns*
4. Transactional	70.81(32), *p*<.01	1.43	.89	.06 (.04-.07)	.06	2247.63	vs. Concurrent: $\Delta\chi^2$=3.22(2), *ns* vs. Child-Driven: $\Delta\chi^2$=0.36(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=0.44(1), *ns*
Somatization X Dependency							
1. Concurrent	**94.69(41), *p*<.01**	**1.44**	**.80**	**.06 (.04-.07)**	**.07**	**2487.97**	
2. Child-Driven	91.15(39), *p*<.01	1.44	.80	.06 (.04-.08)	.07	2494.90	vs. Concurrent: $\Delta\chi^2$=3.54(2), *ns*
3. Relationship-Driven	92.46(39), *p*<.01	1.45	.80	.06 (.04-.08)	.07	2498.00	vs. Concurrent: $\Delta\chi^2$=1.84(2), *ns*
4. Transactional	91.48(38), *p*<.01	1.44	.80	.06 (.05-.08)	.07	2501.53	vs. Concurrent: $\Delta\chi^2$=3.21(3), *ns* vs. Child-Driven: $\Delta\chi^2$=0.33(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=1.28(1), *ns*

Table 6 continued on next page.

Table 6 continued

Model	χ^2 (df)	SCF	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Somatization X Conflict							
1. Concurrent	**60.57(38), p<.05**	**1.49**	**.95**	**.04 (.02-.06)**	**.05**	**2600.74**	
2. Child-Driven	59.04(36), p<.01	1.51	.95	.04 (.02-.06)	.05	2611.14	vs. Concurrent: $\Delta\chi^2$=0.97(2), *ns*
3. Relationship-Driven	56.91(36), p<.01	1.52	.95	.04 (.02-.06)	.05	2608.56	vs. Concurrent: $\Delta\chi^2$=3.94(2), *ns*
4. Transactional	56.04(35), p<.05	1.52	.95	.04 (.02-.06)	.05	2613.28	vs. Concurrent: $\Delta\chi^2$=4.45(3), *ns* vs. Child-Driven: $\Delta\chi^2$=3.42(1), *ns* vs. Relationship-Driven: $\Delta\chi^2$=0.87(1), *ns*

Notes. Best-fitting models shown in boldface. All models include baseline covariates (child age, child sex, child aggression at W1) regressed on growth parameters and are clustered by preschool classroom. SCF = Scaling correction factor, used for Satorra-Bentler chi-square difference tests with clustered models. *ns* = not significant.

Table 7

Differences in Depressive, Anxious, and Somatic Symptoms and Teacher-Child Relationship Quality by Baseline Covariates

Baseline Covariates	**Depression**					
	Intercept		**Linear Slope**		**Quadratic Slope**	
	β	**(*SE*)**	**β**	**(*SE*)**	**β**	**(*SE*)**
Child Age	.04	(.05)	-.02	(.03)	*na*	*na*
Child Sex	-.02	(.04)	.00	(.02)	*na*	*na*
Child Aggression	.73**	(.06)	-.15**	(.04)	*na*	*na*
	Anxiety					
	Intercept		**Linear Slope**		**Quadratic Slope**	
	β	**(*SE*)**	**β**	**(*SE*)**	**β**	**(*SE*)**
Child Age	.07	(.07)	-.02	(.03)	*na*	*na*
Child Sex	.03	(.04)	.00	(.02)	*na*	*na*
Child Aggression	.40**	(.08)	-.11**	(.04)	*na*	*na*
	Somatization					
	Intercept		**Linear Slope**		**Quadratic Slope**	
	β	**(*SE*)**	**β**	**(*SE*)**	**β**	**(*SE*)**
Child Age	.03	(.03)	-.03	(.02)	*na*	*na*
Child Sex	.02	(.02)	.01	(.01)	*na*	*na*
Child Aggression	.14**	(.05)	-.04	(.03)	*na*	*na*
	Closeness					
	Intercept		**Linear Slope**		**Quadratic Slope**	
	β	**(*SE*)**	**β**	**(*SE*)**	**β**	**(*SE*)**
Child Age	.23**	(.08)	-.01	(.13)	-.01	(.04)
Child Sex	.12*	(.05)	.16	(.09)	-.04	(.03)
Child Aggression	-.23*	(.09)	.08	(.13)	.03	(.04)
	Dependency					
	Intercept		**Linear Slope**		**Quadratic Slope**	
	β	**(*SE*)**	**β**	**(*SE*)**	**β**	**(*SE*)**
Child Age	-.13	(.10)	.03	(.05)	*na*	*na*
Child Sex	-.07	(.09)	.05	(.04)	*na*	*na*
Child Aggression	.67**	(.17)	-.12	(.08)	*na*	*na*
	Conflict					
	Intercept		**Linear Slope**		**Quadratic Slope**	
	β	**(*SE*)**	**β**	**(*SE*)**	**β**	**(*SE*)**
Child Age	-.20*	(.10)	.08	(.06)	*na*	*na*
Child Sex	-.21*	(.09)	.05	(.04)	*na*	*na*
Child Aggression	1.66**	(.16)	-.35**	(.07)	*na*	*na*

Notes. Child sex: boys = 0, girls = 1. *na* = Not applicable. *$p < .05$, **$p < .01$.

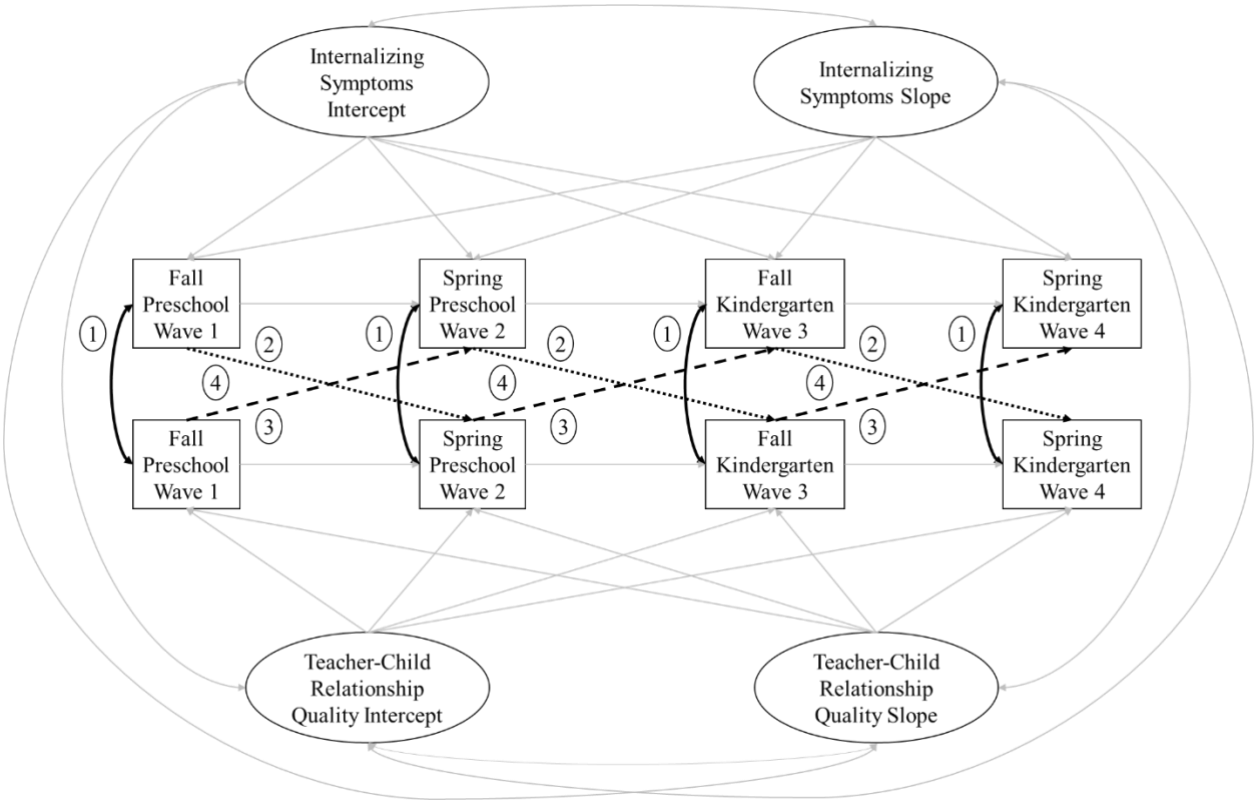

Figure 1. Heuristic of the proposed directional models of association. *Notes*. Solid bold lines (1) indicate paths included in concurrent model as well as in the other directional models. Dotted lines (2) indicate paths included in the child-driven model. Dashed lines (3) indicate paths included in the relationship-driven model. All paths were included in the transactional model (4).

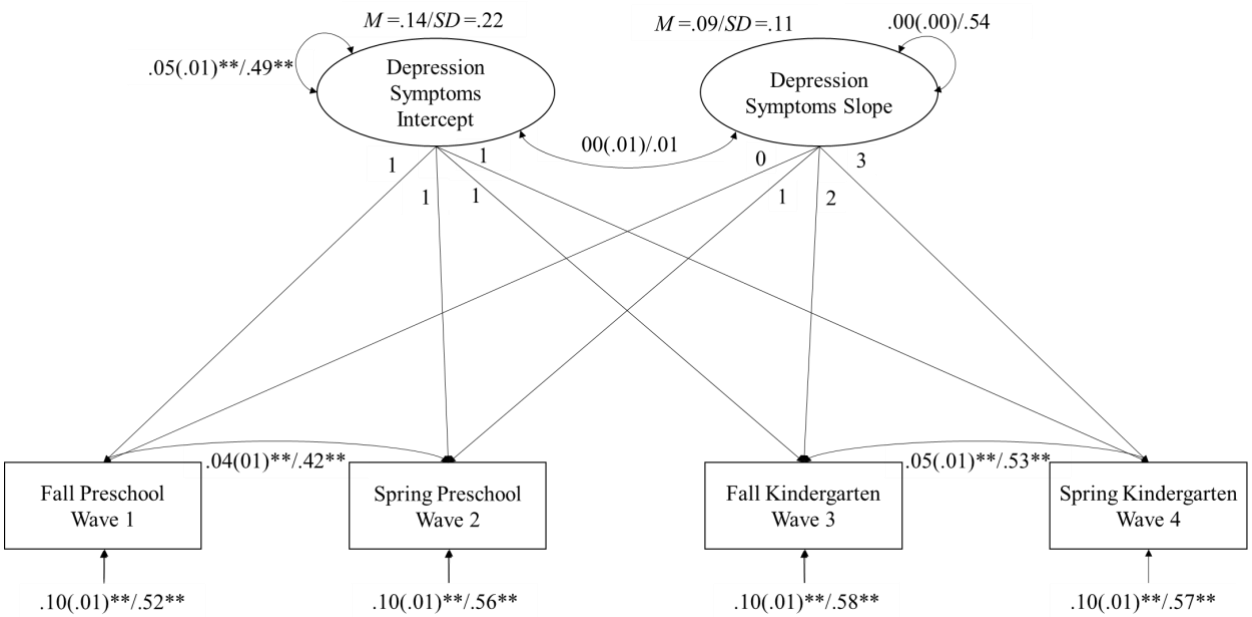

Figure 2. Latent growth curve model of children's depressive symptoms across preschool and kindergarten. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. *$p < .05$, **$p < .01$.

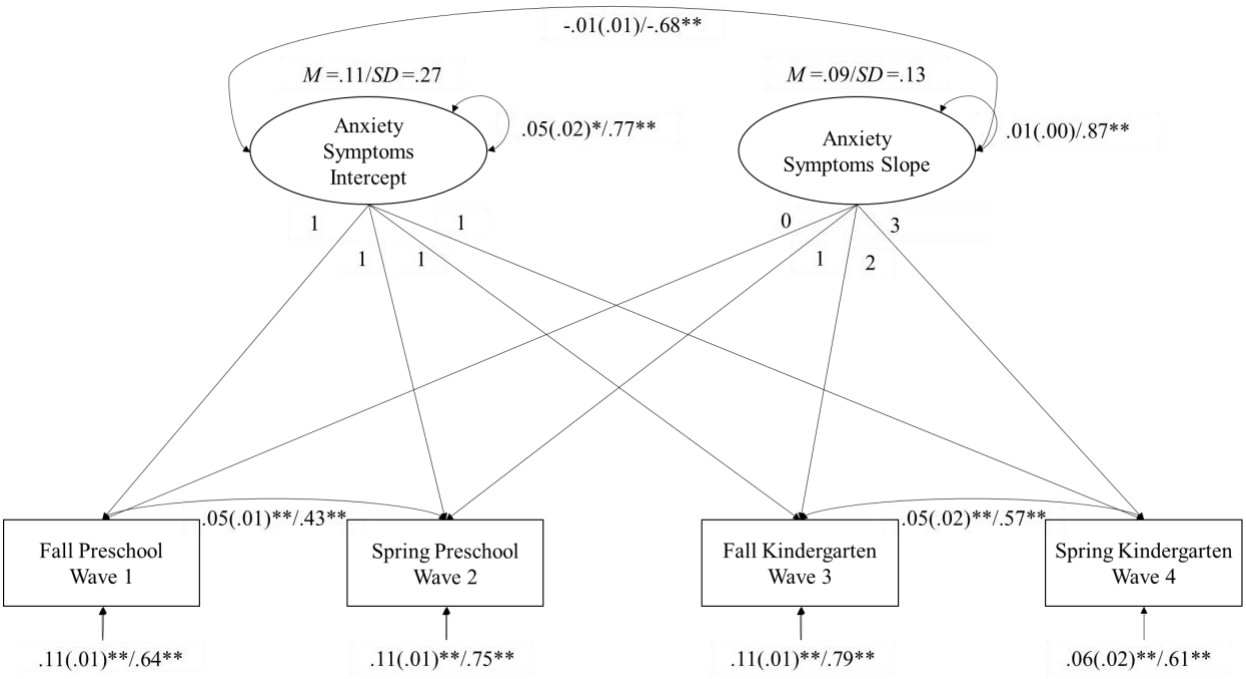

Figure 3. Latent growth curve model of children's anxious symptoms across preschool and kindergarten. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. *$p < .05$, **$p < .01$.

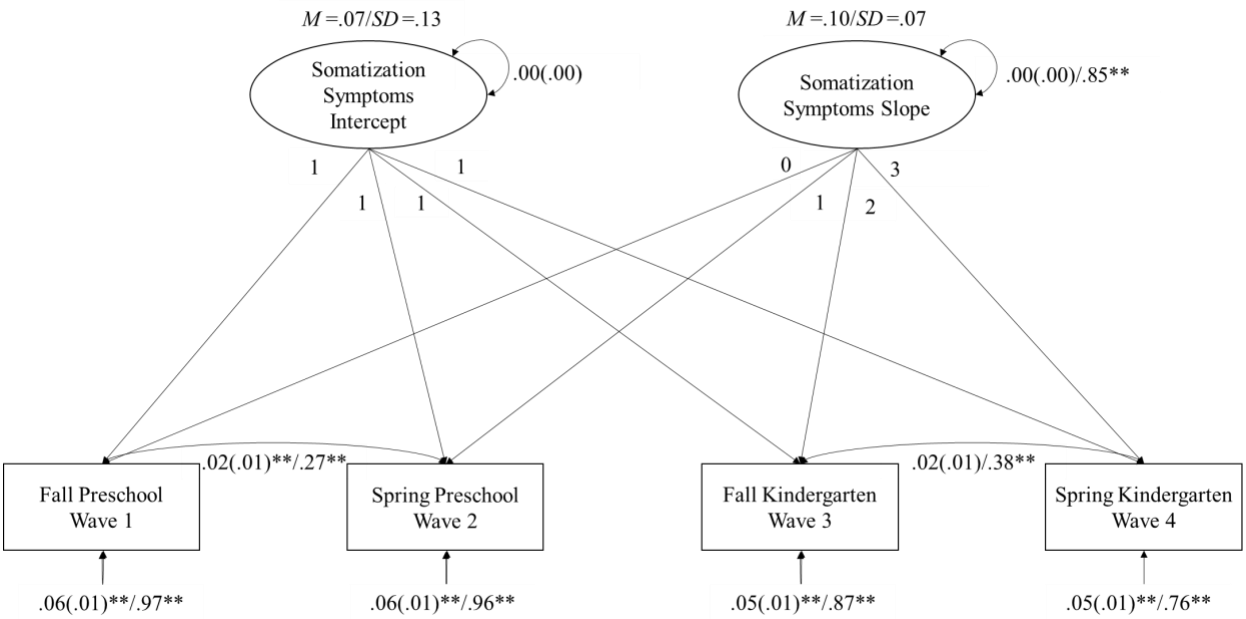

Figure 4. Latent growth curve model of children's somatic symptoms across preschool and kindergarten. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. *$p < .05$, **$p < .01$.

Patterns of Change in Symptoms of Depression, Anxiety, and Somatization

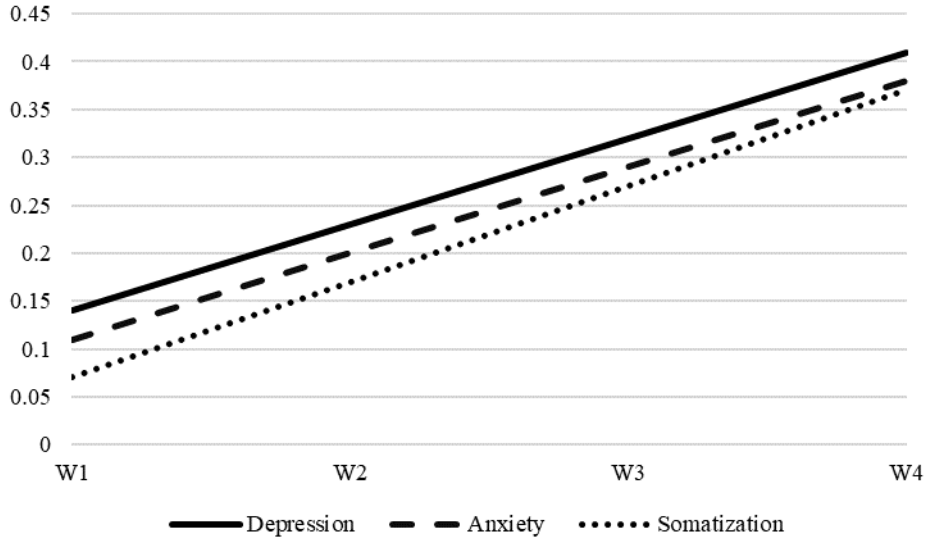

Figure 5. Patterns of change in symptoms of depression, anxiety, and somatization across preschool and kindergarten. *Notes*. W1 = Wave 1 (fall of preschool). W2 = Wave 2 (spring of preschool). W3 = Wave 3 (fall of kindergarten). W4 = Wave 4 (spring of kindergarten).

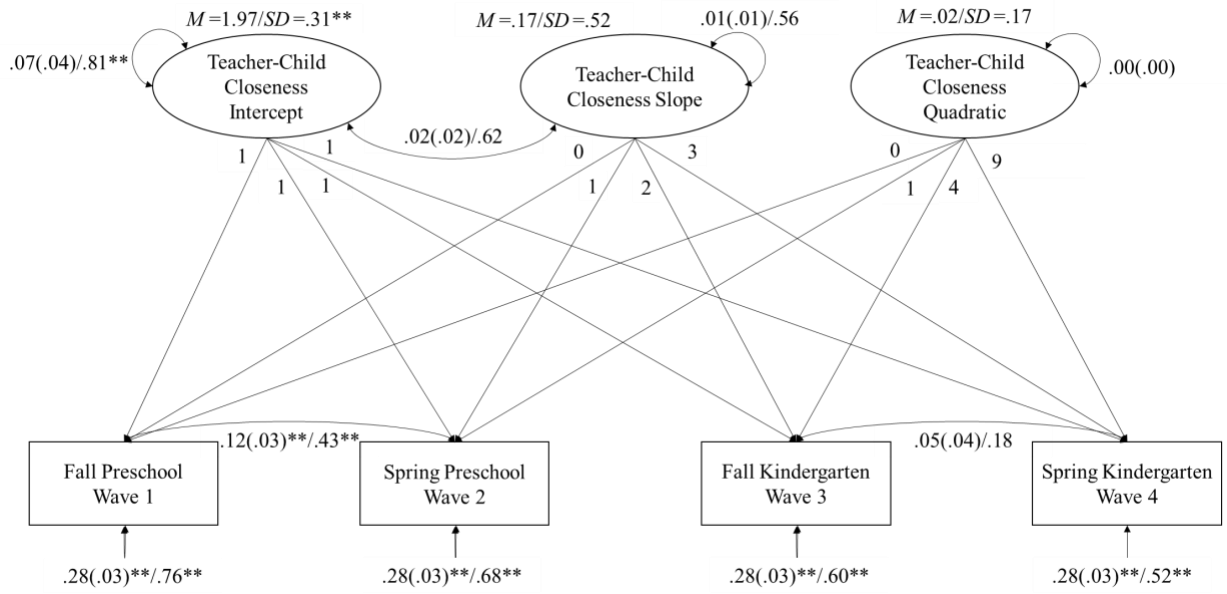

Figure 6. Latent growth curve model of teacher-child closeness across preschool and kindergarten. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. *$p < .05$, **$p < .01$.

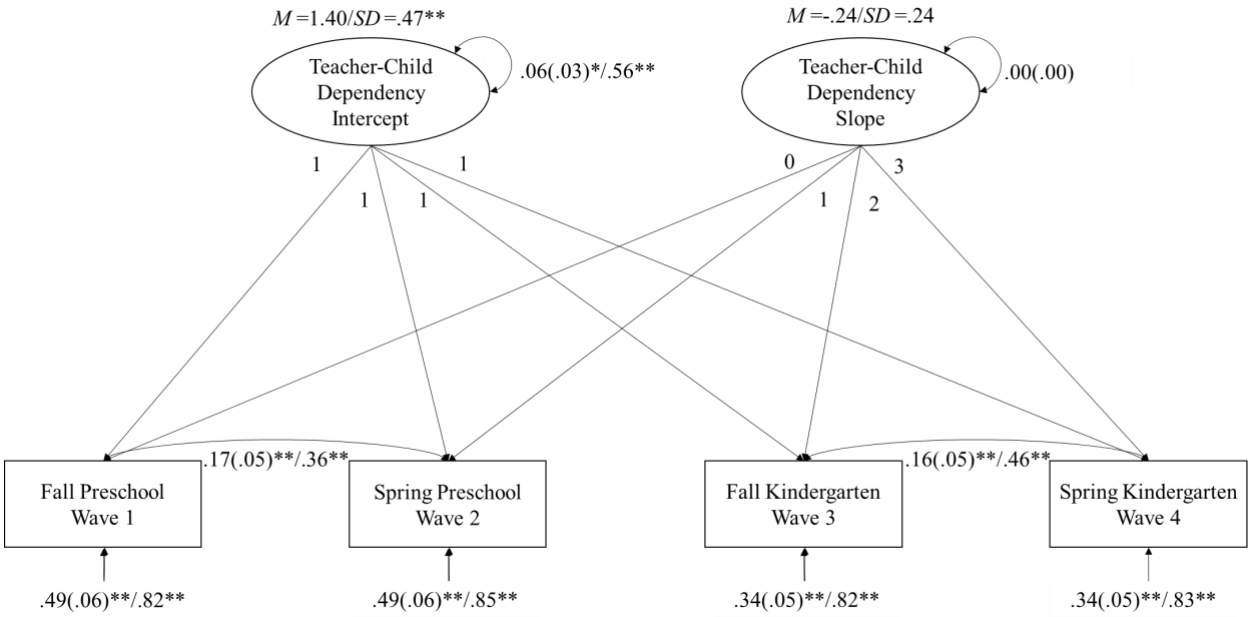

Figure 7. Latent growth curve model of teacher-child dependency across preschool and kindergarten. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. *$p < .05$, **$p < .01$.

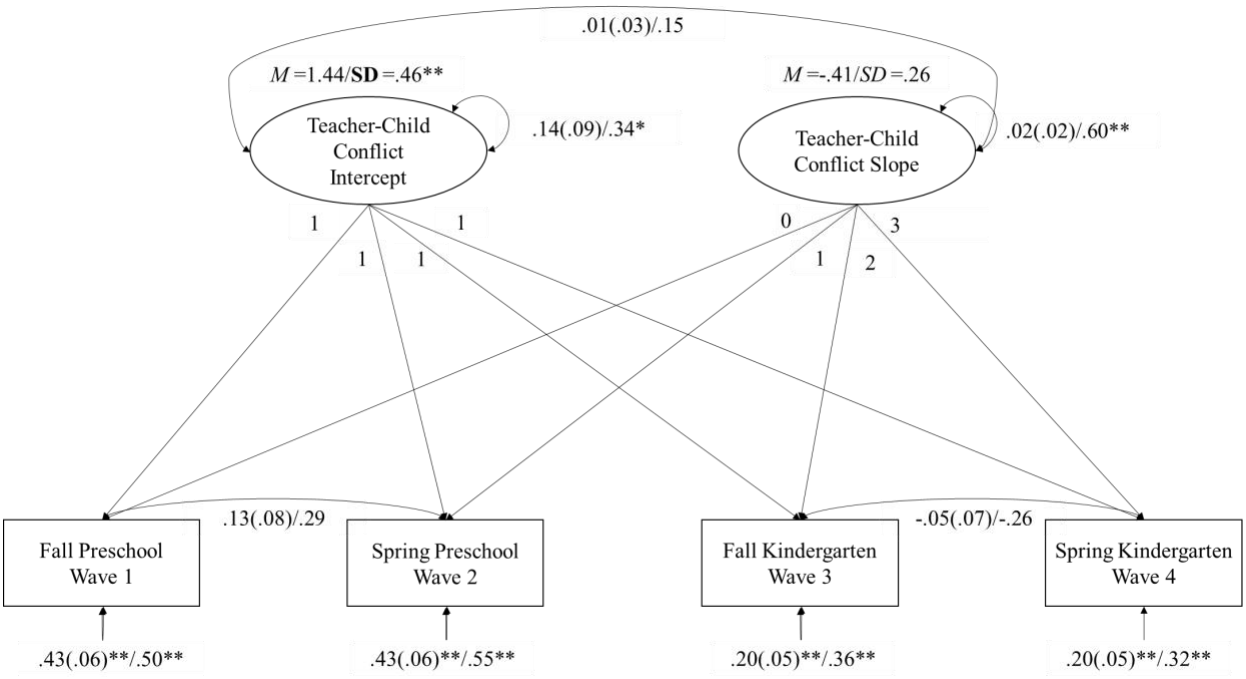

Figure 8. Latent growth curve model of teacher-child dependency across preschool and kindergarten. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. *$p < .05$, **$p < .01$.

Patterns of Change in Teacher-Child Closeness, Dependency, and Conflict

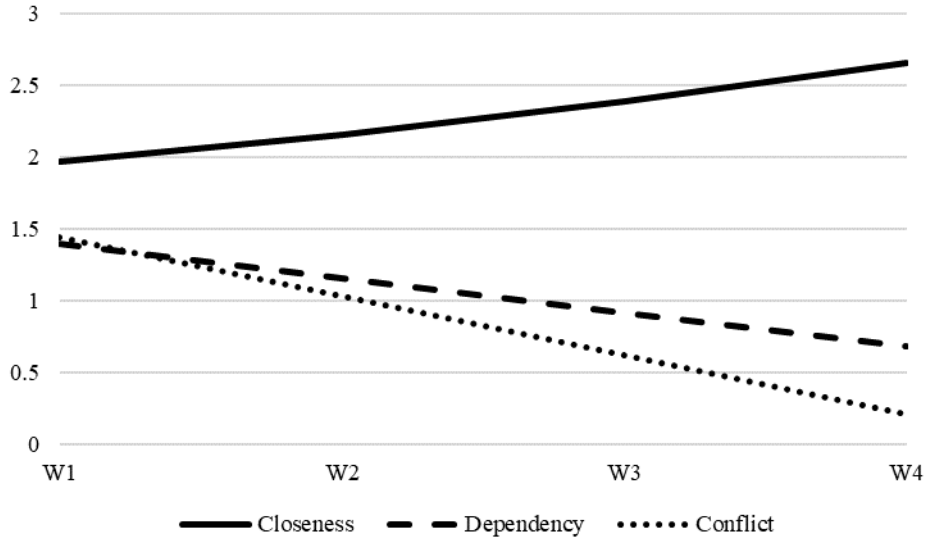

Figure 9. Patterns of change in teacher-child closeness, dependency, and conflict across preschool and kindergarten. *Notes*. W1 = Wave 1 (fall of preschool). W2 = Wave 2 (spring of preschool). W3 = Wave 3 (fall of kindergarten). W4 = Wave 4 (spring of kindergarten).

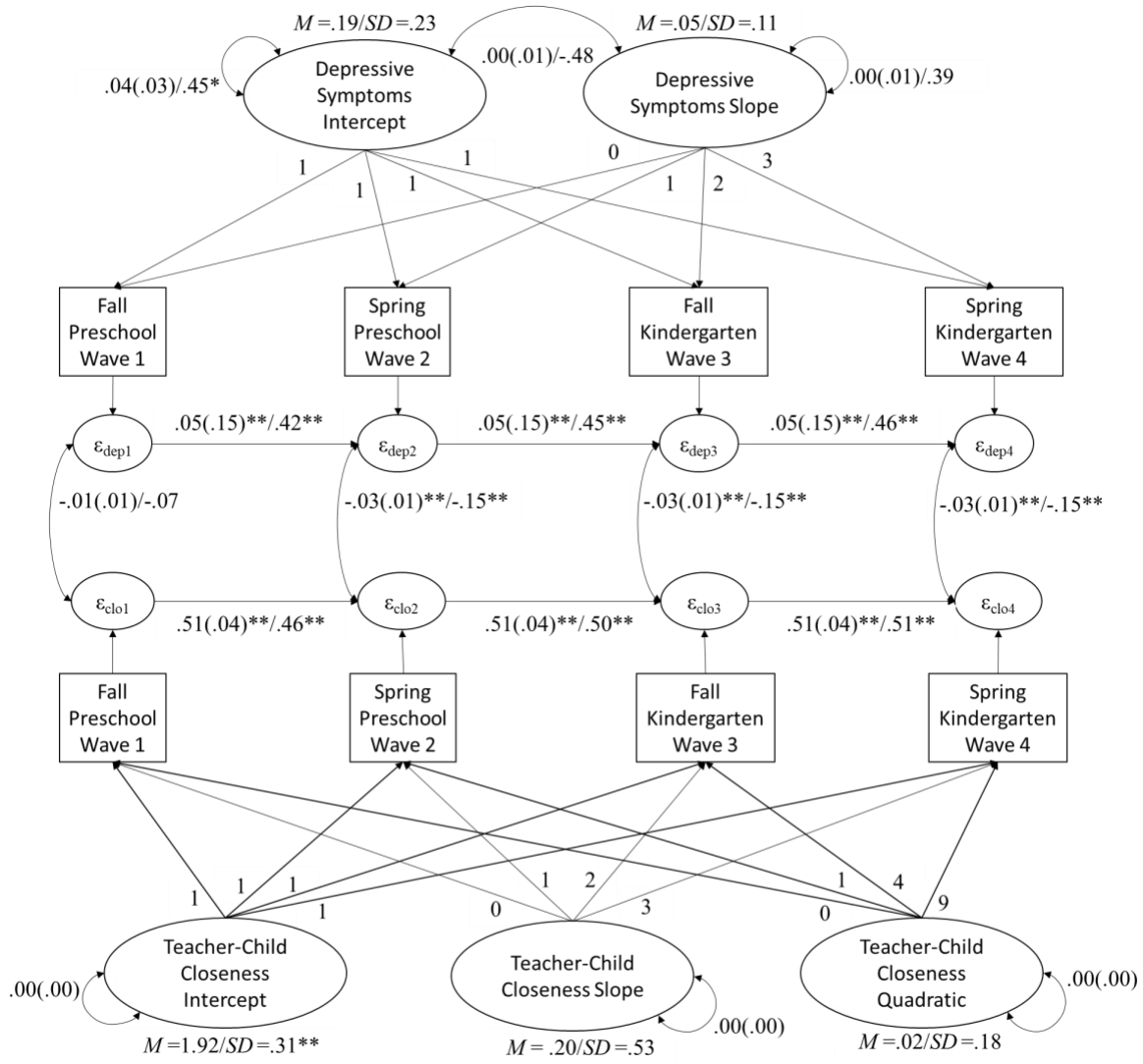

Figure 10. Concurrent model: best-fitting model of association between children's depressive symptoms and teacher-child closeness. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{dep} = structured residual for children's depressive symptoms. ε_{clo} = structured residual for teacher-child closeness. **p* < .05, ***p* < .01.

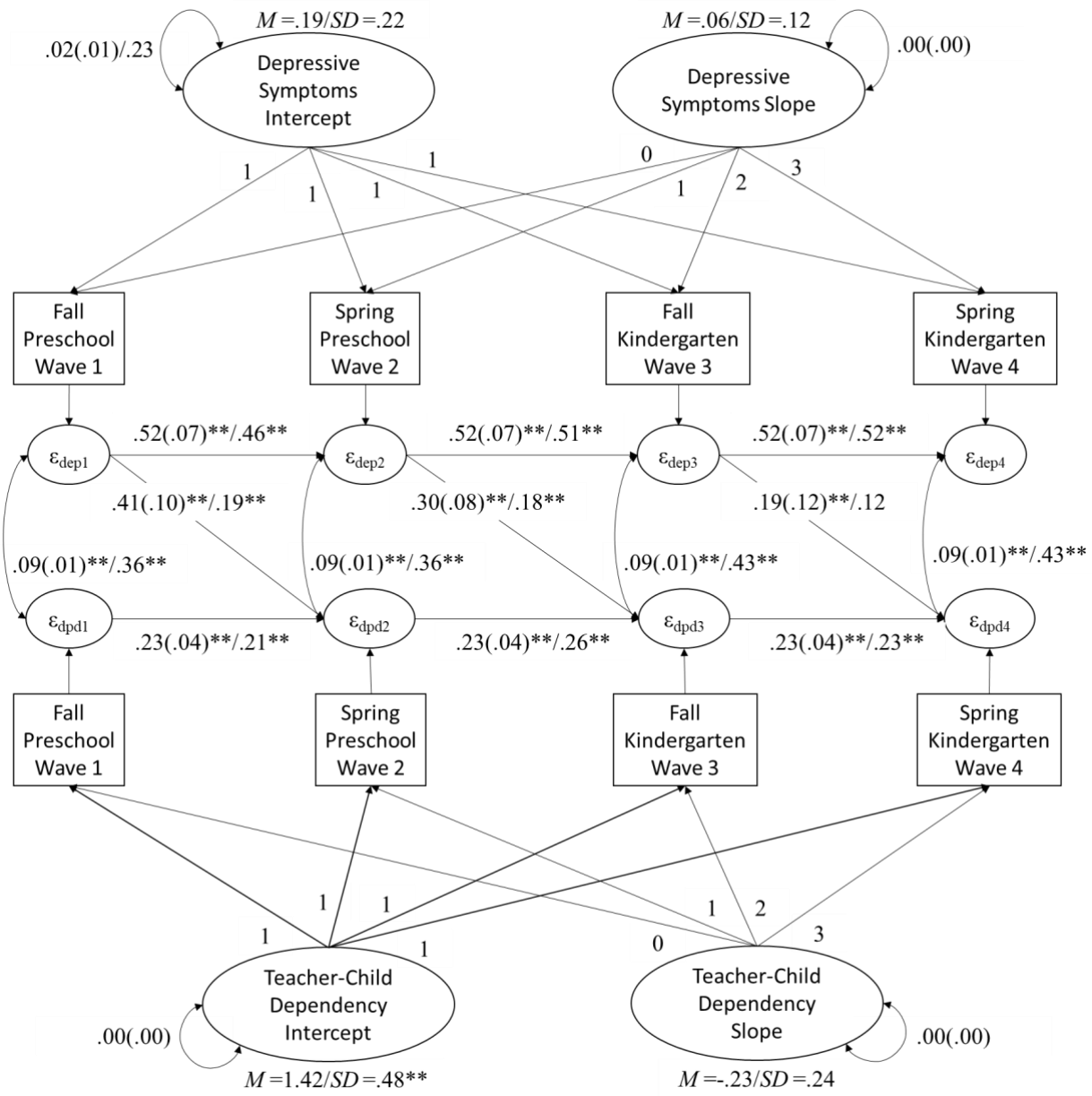

Figure 11. Child-driven model: best-fitting model of association between children's depressive symptoms and teacher-child dependency. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{dep} = structured residual for children's depressive symptoms. ε_{dpd} = structured residual for teacher-child dependency. **p* < .05, ***p* < .01.

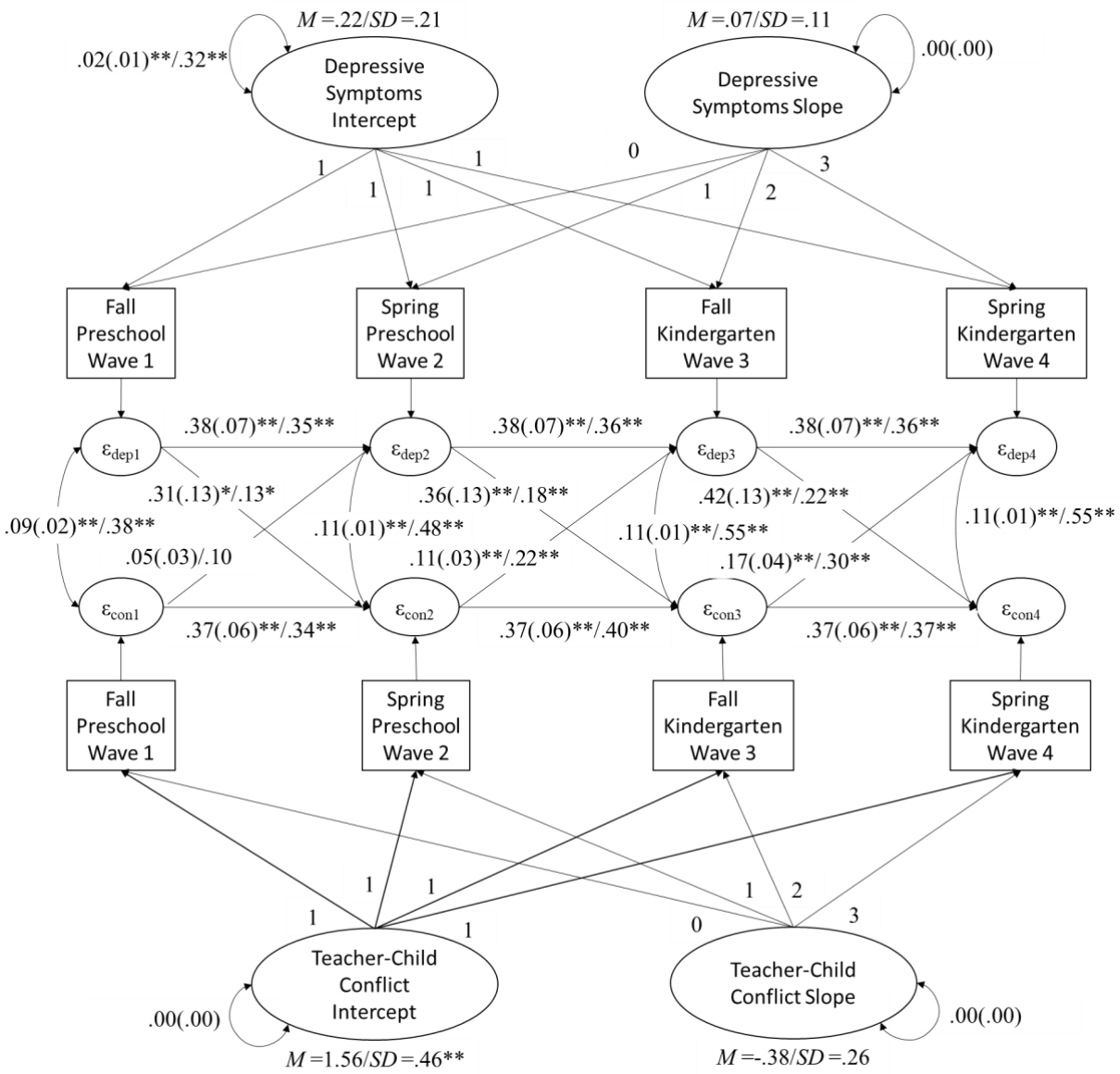

Figure 12. Transactional model: best-fitting model of association between children's depressive symptoms and teacher-child conflict. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{dep} = structured residual for children's depressive symptoms. ε_{con} = structured residual for teacher-child conflict. *$p < .05$, **$p < .01$.

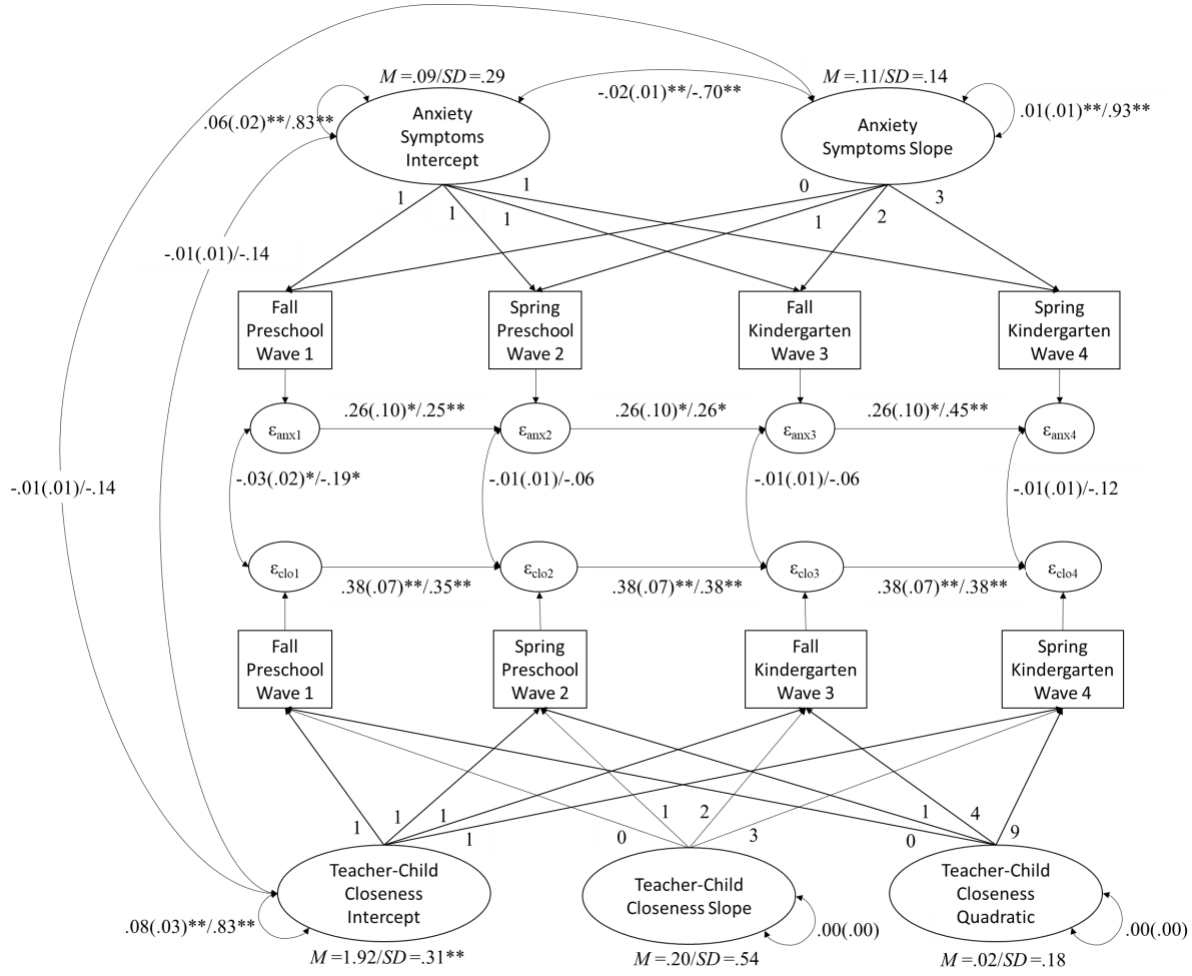

Figure 13. Concurrent model: best-fitting model of association between children's anxious symptoms and teacher-child closeness. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{anx} = structured residual for children's anxious symptoms. ε_{clo} = structured residual for teacher-child closeness. **p* < .05, ***p* < .01.

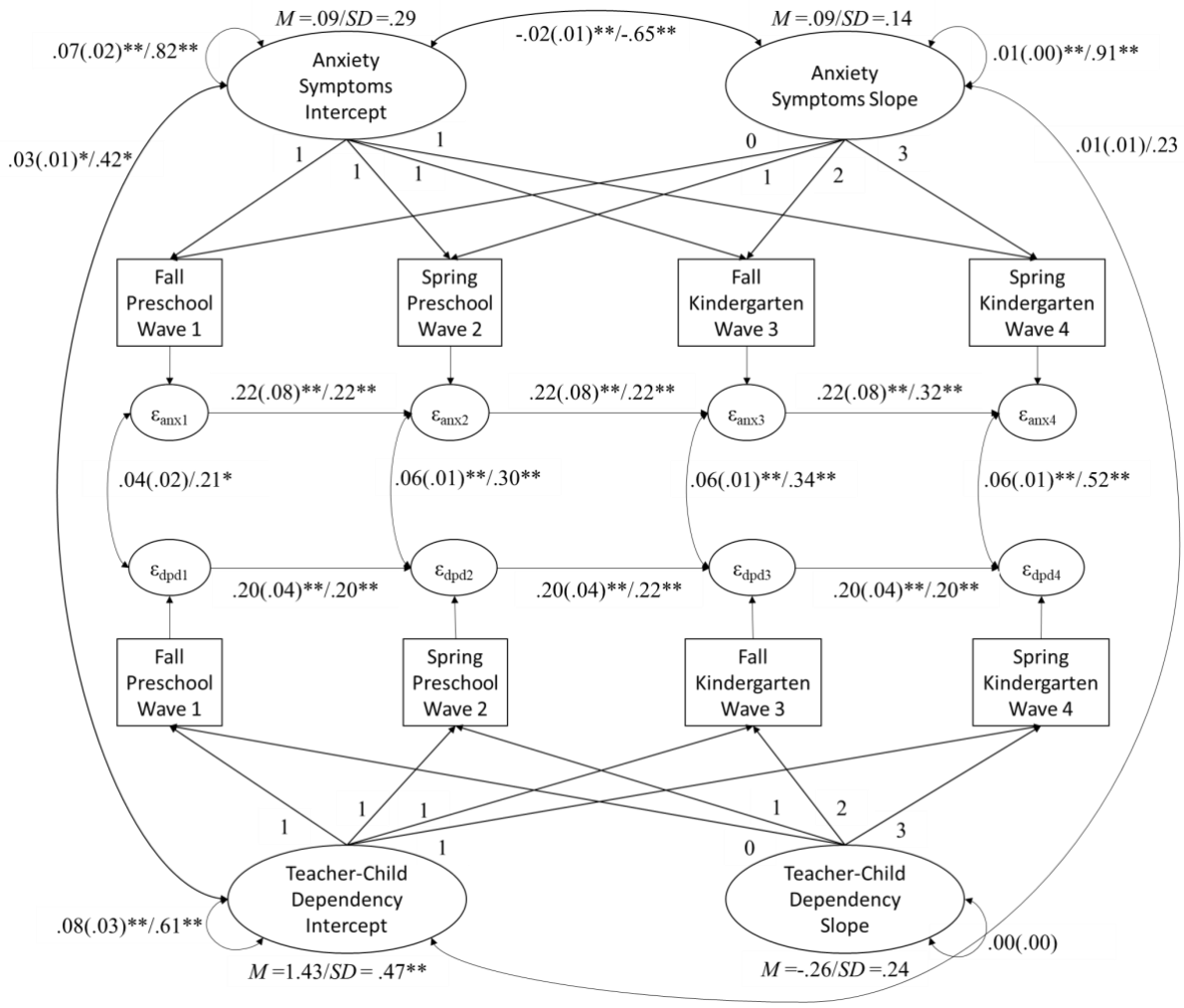

Figure 14. Concurrent model: best-fitting model of association between children's anxious symptoms and teacher-child dependency. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{anx} = structured residual for children's anxious symptoms. ε_{dpd} = structured residual for teacher-child dependency. *$p < .05$, **$p < .01$.

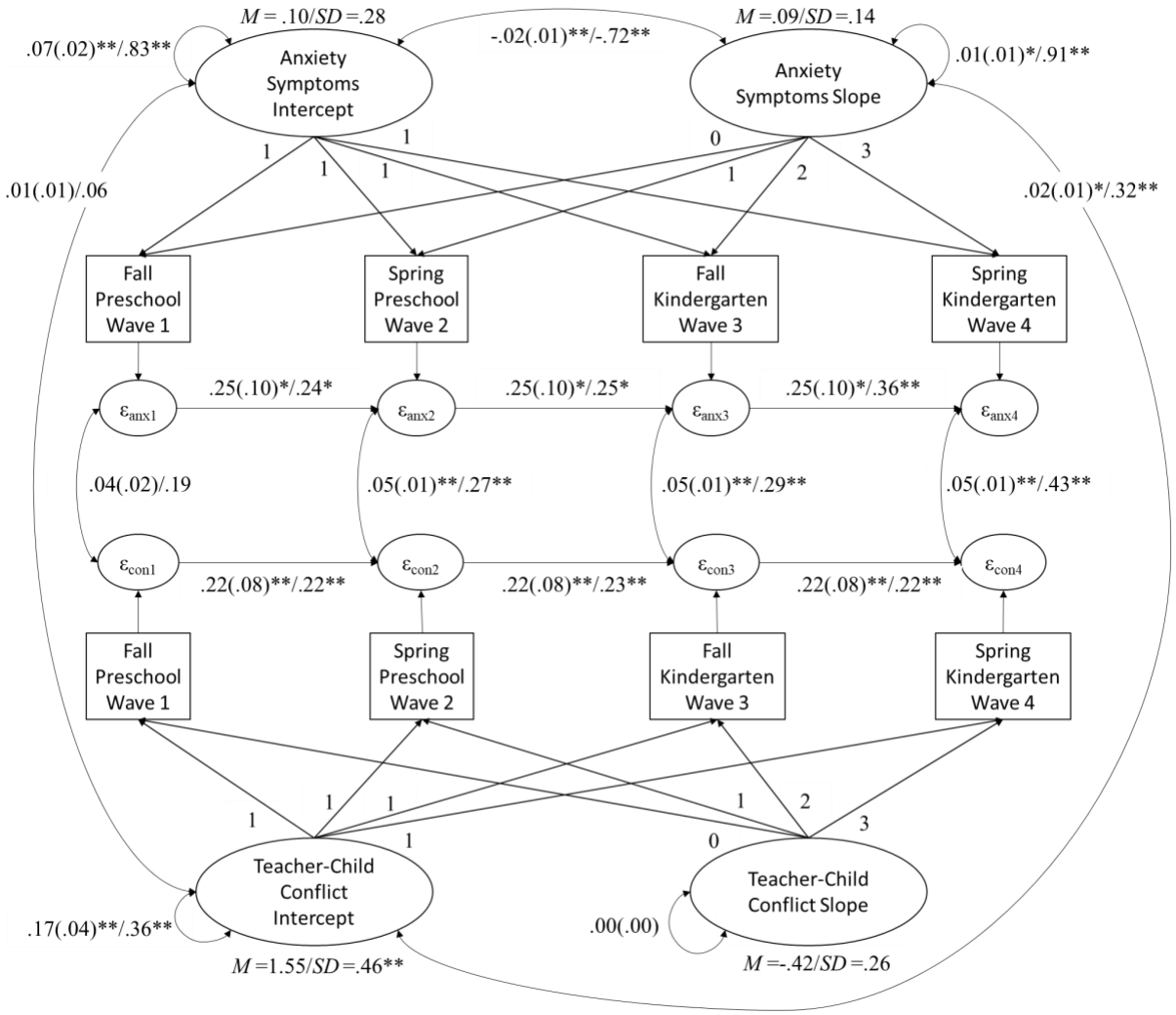

Figure 15. Concurrent model: best-fitting model of association between children's anxious symptoms and teacher-child conflict. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{anx} = structured residual for children's anxious symptoms. ε_{con} = structured residual for teacher-child conflict. *$p < .05$, **$p < .01$.

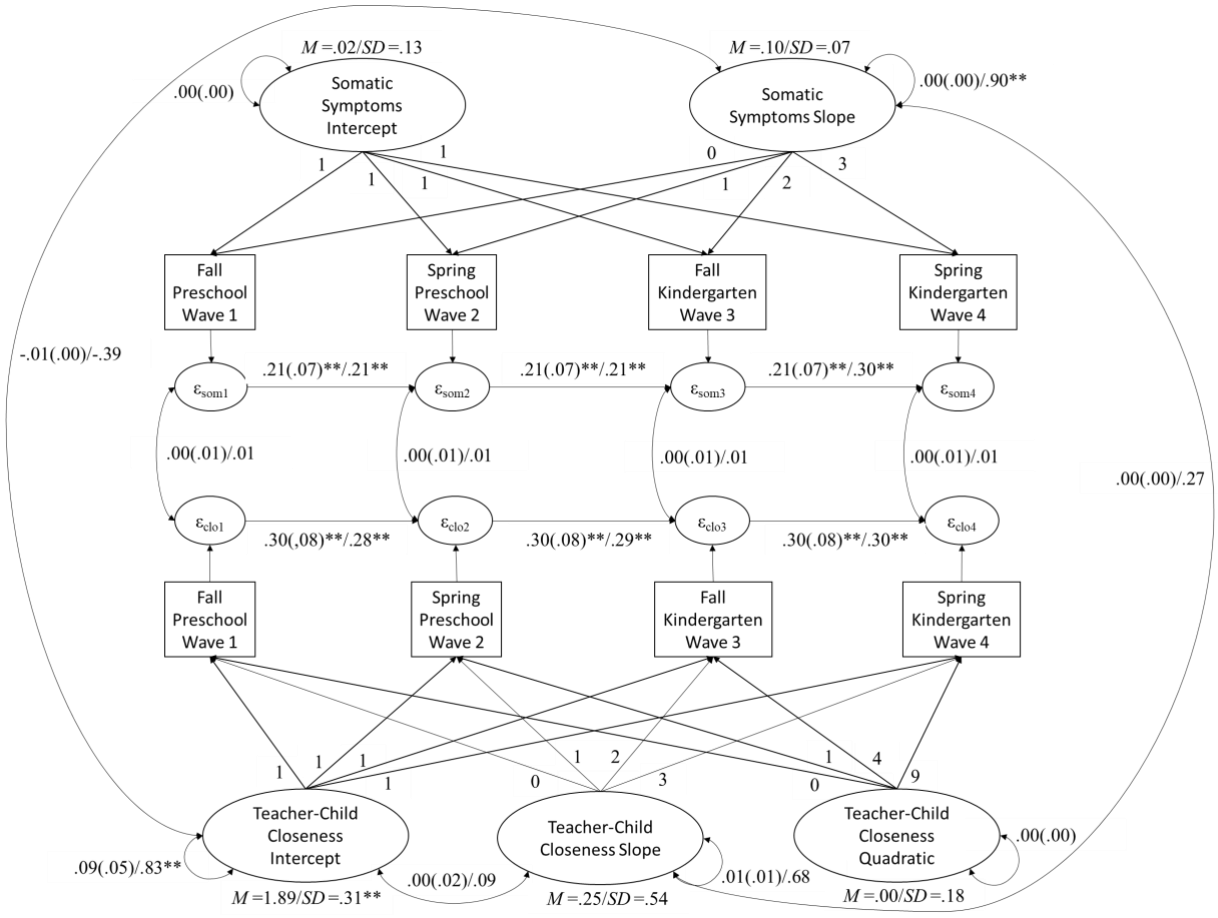

Figure 16. Concurrent model: best-fitting model of association between children's somatic symptoms and teacher-child closeness. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{som} = structured residual for children's somatic symptoms. ε_{clo} = structured residual for teacher-child closeness. **p* < .05, ***p* < .01.

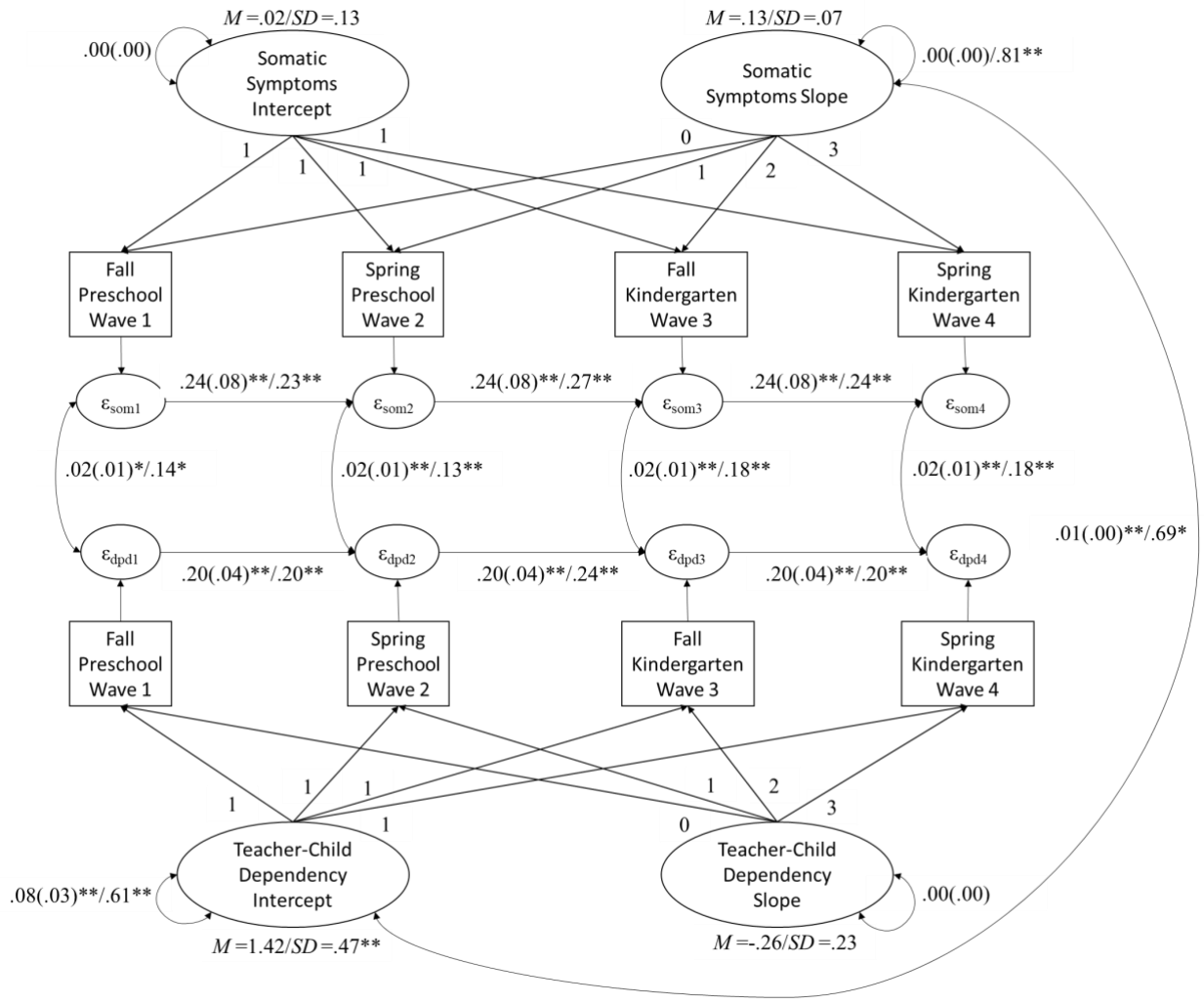

Figure 17. Concurrent model: best-fitting model of association between children's somatic symptoms and teacher-child dependency. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{som} = structured residual for children's somatic symptoms. ε_{dpd} = structured residual for teacher-child dependency. *$p < .05$, **$p < .01$.

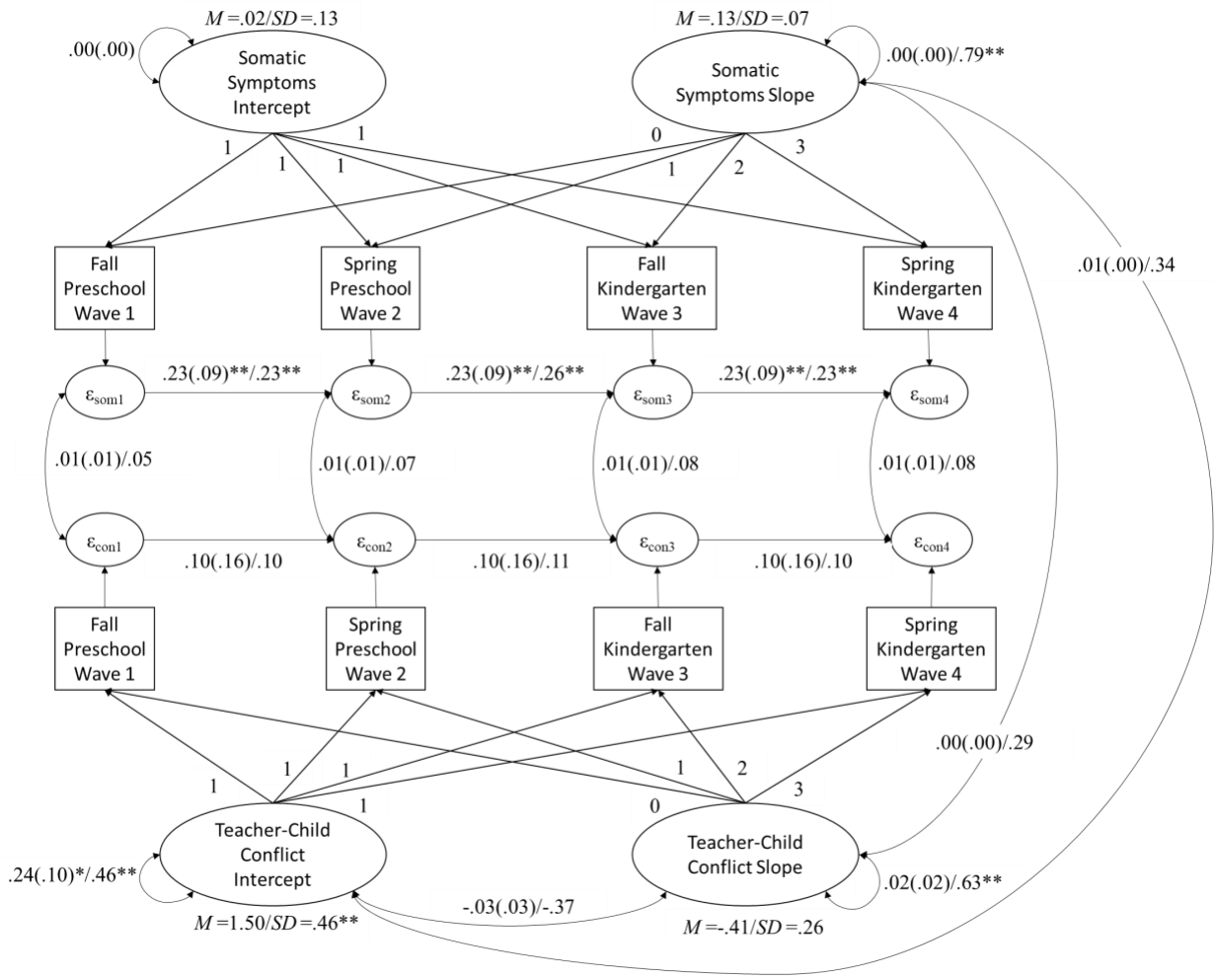

Figure 18. Concurrent model: best-fitting model of association between children's somatic symptoms and teacher-child conflict. *Notes*. Unstandardized (standard errors) / standardized estimates presented. The model was clustered by preschool classroom. All latent growth parameters were regressed on child age, sex, and aggression at W1. ε_{som} = structured residual for children's somatic symptoms. ε_{con} = structured residual for teacher-child conflict. *$p < .05$, **$p < .01$.