Heterogeneity of Depressive and Anxious Symptoms in Early Childhood: Influence by Self-Regulation and Classroom Climate

by

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ABSTRACT

Depressive and anxious symptoms can emerge as early as preschool, though heterogeneity in these early symptoms is unclear. Examination of whether variation in the patterns of change in depressive symptoms diverge from those of anxious symptoms can help to better identify concerning symptom experiences. Examination of heterogeneity can also aid in identifying developmental tasks and contextual experiences that differentiate between symptom experiences, including self-regulation and classroom climate. Self-regulation allows for management of emotion, cognition, and behavior, though young children may vary in these abilities. Such variability in self-regulation may differentiate between depressive and anxious symptom experiences. Climate of the preschool classroom, including interactional and organizational quality, may also differentiate between symptom experiences, as preschool is a prominent context for development. To examine heterogeneity in depressive and anxious symptoms, growth mixture modeling was first used. Second, latent profile analysis was used to determine profiles of self-regulation. Third, multinomial logistic regression was used to examine whether the self-regulation profiles and classroom climate domains (emotional support, organization, instructional support) discriminate between depressive and anxious symptoms trajectories. Participants were 443 children (47.9% girls, M_{age} = 4.08 years, SD = 0.35) assessed in the fall and spring of preschool and kindergarten. Depressive and anxious symptoms were assessed by teachers at each wave. In the fall of preschool, self-regulation was assessed by teachers, caregivers, trained observers, and behavioral assessment and classroom climate was assessed by trained observers. Multiple trajectories were identified for depressive (*low with decelerated growth*, 92.81%; *moderate with accelerated growth*, 7.19%) and anxious symptoms (*low and stable*, 84.40%; *moderate and decreasing*, 8.66%; *low and increasing*, 6.94%).

Multiple self-regulation profiles were also identified (*typically-regulated*, 69.65%; *behaviorally-overregulated*, 20.84%; *emotionally-dysregulated*, 9.50%). Children in the *emotionally-dysregulated* and *behaviorally-overregulated* profiles were more likely to follow the *moderate with accelerated growth* depressive symptoms trajectory. Children in the *emotionally-dysregulated* profile and in more emotionally supportive and organized classrooms were more likely to follow the *moderate and decreasing* anxious symptoms trajectory. Children vulnerable to elevated depressive symptoms may benefit from prevention and intervention efforts related to emotional and behavioral aspects of self-regulation. Children experiencing elevated anxious symptoms at the start of preschool may benefit from efforts related to emotional self-regulation and emotional and organizational qualities of the classroom.

Keywords: depression, anxiety, self-regulation, classroom climate, preschool, kindergarten

PREFACE

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CHAPTER I

Introduction

Internalizing symptoms, including symptoms of depression (e.g., excessive sadness, feelings of helplessness) and anxiety (e.g., excessive fearfulness and worries), were once thought to be too complex for young children to experience (Beesdo et al., 2009; Egger & Angold, 2006; Henkel et al., 2002; Luby, 2010). Research highlights that symptom experience can begin as early as preschool, however, making early childhood a salient period for exploring the experience and patterns of internalizing symptoms (Carter et al., 2010; Egger & Angold, 2006; Lavigne et al., 1996; Whalen et al., 2017). Identification of heterogeneity in the magnitude and pattern of change in depressive and anxious symptoms in early childhood will help elucidate how psychopathology may begin to form. Investigating heterogeneity in symptom experience is also needed to identify key risk and promotive factors of young children who may be vulnerable to elevated and prolonged symptomology (Whalen et al., 2017).

Both individual and contextual factors can provide risk for the experience of depressive and anxious symptoms or promote limited symptom experience. In early childhood, children are building the foundation of their self-regulation abilities, which includes the management of emotional, cognitive, and behavioral arousal (Shonkoff & Phillips, 2000; Ziv et al., 2017). Self-regulation has been implicated as an influential factor for the experience of depressive and anxious symptoms, with more advanced self-regulatory abilities generally related to less frequent symptom experience (Nigg, 2017; Robson et al., 2020; Ziv et al., 2017). Yet how self-regulatory abilities vary across emotional, cognitive, and behavioral domains among young children remains unclear.

Self-regulation abilities across emotion, cognition, and behavior can demonstrate both integration and differentiation (Bridgett et al., 2013; Nigg, 2017). Some children may demonstrate similar self-regulatory abilities during emotional, cognitive, and behavioral arousal. For example, children may show more difficulty or excel with emotional (e.g., managing negative emotion), cognitive (e.g., concentrating), and behavioral (e.g., following directions) self-regulation. Other children may be more or less adept with self-regulatory abilities in some domains than others (McClelland et al., 2015; Nigg, 2017). For example, a child may be able to generally concentrate and follow directions except when in an emotionally-arousing situation, during which they struggle to manage their sadness. The possibility of integration and differentiation suggests that young children likely demonstrate variability in their self-regulation of emotional, cognitive, and behavioral arousal, which may manifest as distinct profiles of self-regulatory abilities. Such profiles could be characterized by competence or difficulty across emotional, cognitive, and behavioural arousal, with others characterized by difficulty in one or two domains and competence in the others. These profiles of self-regulation in early childhood may have implications for how self-regulation relates to the experience of depressive and anxious symptoms, including heterogeneity in symptom trajectories. Identification of distinct profiles of self-regulation and their association with trajectories of depressive and anxious symptoms will inform both knowledge and practice of how self-regulation profiles may forecast elevated and prolonged symptomology and be targets for early childhood mental health.

Children's experiences of depressive and anxious symptoms may also be accentuated or attenuated based on the quality of instructional practices and relationships in the classroom context. The classroom is an important context for young children, as they begin to navigate the classroom independent of caregivers and engage and interact with peers and teachers in this

context (Eccles & Roser, 2011; Pianta, 2016). Preschool is often children's first experience in a classroom, and the climate of the preschool classroom may figure prominently in their experiences of depressive and anxious symptoms. Classroom climate represents the interactive and interpersonal dynamics in a classroom, characterized by the degree of emotional support (e.g., warmth of teacher and peer interactions), instructional support (e.g., provision of quality feedback from teachers), and organization (e.g., consistent rules and structure) within a classroom (Pianta, La Paro, et al., 2008; Wang et al., 2020). On the one hand, children's well-being may be fostered in classrooms that are well organized with few disruptions and that are characterized by supportive interactions between children and teachers and between peers (Griggs et al., 2016; Wang et al., 2020). On the other hand, children's well-being may be hindered in more disorganized and less supportive classrooms, with children experiencing more frequent symptoms of depression and anxiety (Somersalo et al., 2002; Wang et al., 2020). Yet classroom climate has seldom been examined in early childhood or in relation to children's experiences of depressive and anxious symptoms, leaving the influence of classroom climate unclear (Griggs et al., 2016; Pianta, 2016; Somersalo et al., 2002; Wang et al., 2020). Investigation of how classroom climate may relate to heterogeneity in the trajectories of depressive and anxious symptoms in early childhood will inform both knowledge and practice of how the quality of interactions in the classroom context may support or undermine young children's mental health.

The overarching aim of this dissertation is to characterize and explain variability in trajectories of depressive and anxious symptoms in early childhood. A set of four research objectives address this overarching aim: (1) To investigate heterogeneity in the trajectories of depressive and anxious symptoms across early childhood; (2) To investigate heterogeneity in the

profiles of self-regulation; (3) To investigate whether the self-regulation profiles discriminate between the trajectories of depressive and anxious symptoms; and (4) To investigate whether preschool classroom climate discriminates between the trajectories of depressive and anxious symptoms. Addressing these four objectives will help to characterize children's experiences of depressive and anxious symptoms and identify key individual and contextual risk and promotive factors of symptom experience in the early childhood period.

Theoretical Framework

A developmental psychopathology perspective guides the overarching aim of this dissertation in its investigation to characterize and explain variability in trajectories of depressive and anxious symptoms in early childhood (Cicchetti, 2020; Masten, 2004, 2006). Developmental psychopathology is an integrative approach to understanding maladaptation in relation to human development, with a focus on variation in adaptation and maladaptation, processes that account for this variation, and how developmental patterns of maladaptation may be prevented, redirected, or treated. The longitudinal principle of developmental psychopathology presented by Masten (2006) states that longitudinal observation is integral in understanding pathways and processes of change over development. To align with the longitudinal principle, trajectories of depressive and anxious symptoms across early childhood will be examined. The mutually informative principle further suggests that the study of both normative and non-normative behavior is integral in understanding development toward competence and psychopathology (Masten, 2006). The current research draws from the mutually informative principle to expect that qualitatively distinct trajectories of depressive and anxious symptoms will be identified as well as qualitatively distinct profiles of children's self-regulation abilities. Identification of such heterogeneity in the developmental trends of depressive and anxious symptoms and profiles of

self-regulation will inform knowledge of patterns of change and ability related to adaptive and maladaptive development. The systems principle also suggests that competence and psychopathology are influenced by interactions among systems within an individual (e.g., children's emotional self-regulation and depressive symptoms; Masten, 2006). In this way, children's ability to modify emotions may lead to fewer feelings of sadness in response to an emotion-provoking situation. The systems principle further incorporates interactions between an individual and their context (e.g., classroom emotional support and children's anxious symptoms; Masten, 2006). For instance, experiencing more warmth and connectedness from teachers and peers in the preschool classroom may lessen children's feelings of anxiety. From the systems principle, it is expected that specific profiles of self-regulation and domains of classroom climate will predict elevated or prolonged depressive and anxious symptomology while others will predict a low frequency of depressive and anxious symptoms in early childhood. These findings will inform knowledge on risk and promotive factors related to symptom experience and identify targets for evidence-based practices to support young children's mental health.

CHAPTER II

Literature Review

Depressive and Anxious Symptoms

Depression and anxiety are both argued to involve the experience of negative affectivity (Clark & Watson, 1991; De Bolle & De Fruyt, 2010). For instance, features of depression include feelings of sadness and irritability, with irritability being particularly common among children (Egger & Angold, 2006; Luby, 2010; Sander & Ollendick, 2016). Depression can also be characterized by feelings of helplessness and hopelessness, such that negative events are interpreted as internal (i.e., caused by the individual), stable (i.e., will not change), and global (i.e., will affect all aspects of life; Abramson et al., 1999; Henkel et al., 2002). Features of anxiety include feelings of fear and worry that elicit cognitive ideation (e.g., catastrophic thoughts) and behavioral responses (e.g., avoidance; Beesdo et al., 2009; Egger & Angold, 2006; Sander & Ollendick, 2016). Some features of depression and anxiety, including feelings of sadness and fear, are common. It is when feelings of sadness become so pervasive and compromise functioning, however, that such experiences are considered as maladaptive and depressive (Sander & Ollendick, 2016; Cole et al., 2008). Likewise, if feelings of fear are elicited by situations that do not threaten one's well-being, such experiences are considered as maladaptive and anxious.

While depression and anxiety commonly share negative affectivity, there is distinction in their features. For instance, depression is argued to be uniquely characterized by a lack of positive affectivity including anhedonia, or the absence of pleasure (Clark & Watson, 1991; De Bolle & De Fruyt, 2010; Sander & Ollendick, 2016). Anxiety is further argued to be uniquely characterized by physiological arousal (e.g., increased heart rate). Depression and anxiety also

differ in their occurrence among children. While comorbidity can occur in the experience of depressive and anxious symptoms, such comorbidity is less common among young children (Sander & Ollendick, 2016). The experience of anxious symptoms tends to be greater than and precede the experience of depressive symptoms, suggesting that anxiety may be more prevalent in early childhood (Sander & Ollendick, 2016). For instance, in a review of research on internalizing symptoms in early childhood, depression was found to have an approximate 2% prevalence rate among preschool children (Whalen et al., 2017). Prevalence rates for anxiety disorders have been reported as 6% in a systematic review of research with children aged 3 to 17 years (Baxter et al., 2013) to a range of 10% to 20% in a review of research with preschoolers (Whalen et al., 2017). In further support of the differentiation between depressive and anxious symptoms, different average trajectories have been found for each symptomology. Carter et al. (2010) found depressive symptoms remained low on average, while Carter et al. (2010) and Green et al. (2015) found that anxious symptoms increased across early childhood. Zatto and Hoglund (2022) also investigated the average trajectories for depressive and anxious symptoms in early childhood, though these patterns differed from Carter et al. (2010) and Green et al. (2015): depressive symptoms increased in frequency while anxious symptoms decreased in frequency. Differences in prevalence and average patterns suggest that depressive and anxious symptoms are differentially experienced in early childhood.

Differences across studies in the patterns of change for both depressive and anxious symptoms further suggest there is significant heterogeneity in these experiences. Guided by a developmental psychopathology perspective, identification of heterogeneity in depressive and anxious symptoms can lead to better understanding of what may distinguish adaptive from more maladaptive patterns of change (Cicchetti, 2020; Masten, 2004, 2006). In support of this

perspective, children may have different experiences of depressive and anxious symptoms as early as preschool, with some experiencing frequent symptoms and others experiencing few symptoms. To better understand heterogeneity in the emergence of and change in both depressive and anxious symptoms, investigation of whether there are subgroups of children who follow different trajectories of depressive and anxious symptoms in early childhood is needed.

Heterogeneity of Depressive and Anxious Symptoms

Internalizing Symptoms

When heterogeneity in symptomology has been researched, focus has largely been directed to the identification of qualitatively distinct trajectories of overall internalizing symptoms. Many different patterns of trajectories have been identified. For instance, research has identified trajectories of internalizing symptoms that are initially low and either remain stable or change over time. Trajectories with low and stable internalizing symptoms have been found spanning early childhood (Côté et al., 2009) as well as early childhood through middle childhood (Fanti & Henrich, 2010; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Papachristou & Flouri, 2020; Parkes et al., 2016) and adolescence (Davis et al., 2015; Gutman & McMaster, 2020). The low and stable trajectories, characterized by internalizing symptoms that remain low in frequency over time, often include a modest to large proportion of the sample, ranging from 28.6% (Klein et al., 2019) to 86% of children (de Lijster et al., 2019). Some children have demonstrated initially low but increasing symptoms across early childhood to middle childhood (de Lijster et al., 2019; Klein et al., 2019; Papachristou & Flouri, 2020) and adolescence (Gutman & McMaster, 2020), with these trajectories ranging in proportions from 7.4% (de Lijster et al., 2019) to 23.5% of children (Gutman & McMaster, 2020). These increases tended to occur around ages 5 to 7 years. Less commonly, a trajectory with initially low and

decreasing internalizing symptoms has characterized 67% of children across early to middle childhood (Sterba et al., 2007) and 21.6% of children across early childhood to adolescence (Min et al., 2021). These decreases tended to occur around ages 3 to 4 years. Initially low experiences of internalizing symptoms appear to be common in early childhood, with many children continuing to experience low symptoms over time. Some children may experience an increase in their internalizing symptoms, though having initially low symptoms decrease across early childhood is less common.

Research has also identified trajectories of internalizing symptoms that are generally moderate in frequency. Some studies have identified a moderate and stable trajectory of symptoms spanning early childhood through middle childhood (Fanti & Henrich, 2010; Klein et al., 2019; Miller & Votruba-Drzal, 2017) and adolescence (Davis et al., 2015), generally representing around 43% of sample children. Other children have demonstrated initially moderate but increasing symptoms across early childhood (Côté et al., 2009) as well as across early childhood through middle childhood (Parkes et al., 2016; Miller & Votruba-Drzal, 2017) and adolescence (Davis et al., 2015; Min et al., 2021), with these increases typically occurring around ages 4 to 7 years. The moderate and increasing trajectories range in proportions from 8% (Parkes et al., 2016) to 55.4% of children (Côté et al., 2009). Children have also demonstrated initially moderate and decreasing symptoms, typically occurring around ages 3 to 4 years, with proportions of children at 6% across early to middle childhood (de Lijster et al., 2019) and 34.2% across early childhood to adolescence (Min et al., 2021). Most commonly, children may experience initially moderate internalizing symptoms that remain stable or increase during early childhood, though a decrease in symptoms is less common.

Trajectories of internalizing symptoms that are generally high in frequency have also been identified. These trajectories tend to include smaller proportions of children, due to the greater symptom experience. A high and stable trajectory, characterized by consistently high internalizing symptoms, has been found spanning early childhood through middle childhood (Klein et al., 2019; Sterba et al., 2007) and adolescence (Gutman & McMaster, 2020; Min et al., 2021). Proportions for the high and stable trajectories range from 9.2% (Gutman & McMaster, 2020) to 17% of children (Sterba et al., 2007). Several studies have also identified children with initially high symptoms that increase across early childhood (Côté et al., 2009) and early to middle childhood (Fanti & Henrich, 2010; Papachristou & Flouri, 2020), with these increases occurring around ages 4 to 6 years. The high and increasing trajectories ranged in proportions from 3% (Papachristou & Flouri, 2020) to 18.1% of children (Fanti & Henrich, 2010). Trajectories characterized by initially high symptoms that decrease over early childhood (Parkes et al., 2016) as well as across early childhood through middle childhood (Miller & Votruba-Drzal, 2017; Papachristou & Flouri, 2020) and adolescence (Min et al., 2021) were also found, with these decreases occurring around ages 5 to 7 years. The high and decreasing trajectories spanned in proportion from 4.3% (Miller & Votruba-Drzal, 2017) to 20.1% of children (Min et al., 2021). Overall, a smaller subgroup of children may experience a high frequency of internalizing symptoms in early childhood, though whether these symptoms are more likely to remain stable or change over time is not clear.

While research has examined heterogeneity in overall internalizing symptoms, different frequencies and patterns of trajectories have been identified. These mixed findings may be due to the different number of trajectories identified for internalizing symptom experience. For instance, three (Côté et al., 2009; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Parkes et

al., 2016; Sterba et al., 2007), four (Davis et al., 2015; de Lijster et al., 2019; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Papachristou & Flouri, 2020), and five (Min et al., 2021) patterns of trajectories of internalizing symptoms have been identified. The mixed findings may also be due to the different age periods during which internalizing symptoms were examined. Only two studies spanned across the early childhood period, ranging from ages 1.5 to 5 years (Côté et al., 2009) and ages 3 to 7 years (Parkes et al., 2016). Most research investigating heterogeneity in internalizing symptoms spans across early and middle childhood, with research following children from as young as 2 years to as old as 12 years (de Lijster et al., 2019; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Papachristou & Flouri, 2020; Sterba et al., 2007). Still, some research spans early childhood into adolescence, following children from as young as 2 years to as old as 15 years (Davis et al., 2015; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Min et al., 2021). Min et al. (2021) also included samples from low income (67.6%) and ethnically diverse (78.9%) backgrounds while other research has focused on samples from predominantly Caucasian and middle to high income backgrounds (Côté et al., 2009; Davis et al., 2015; de Lijster et al., 2019; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Papachristou & Flouri, 2020; Parkes et al., 2016; Sterba et al., 2007). Inconsistency in research findings may also be due to the examination of overall internalizing symptoms rather than depressive and anxious symptoms separately.

Depressive and Anxious Symptoms

Few studies have examined heterogeneity in the trajectories of depressive symptoms (Castelao & Kröner-Herwig, 2013; Lewis et al., 2020). With children aged 4 years and followed for 10 years, Lewis et al. (2020) identified four trajectories of caregiver-reported depressive symptoms. Children in the *low-stable* trajectory (74.9%) experienced initially low symptoms that

remained consistent over time. Children in the *high-decreasing* trajectory (10.7%) experienced initially high symptoms that were above clinical levels but declined below clinical levels by ages 6 to 7 years. Children in the *moderate-increasing* trajectory (8.9%) experienced initially modest symptoms that rose to above clinical levels by ages 13 to 14 years. Children in the *high-increasing* trajectory (5.6%) initially experienced symptoms below clinical levels but increased above clinical levels by ages 6 to 7 years. Their symptoms remained high until ages 14 to 15 years, at which symptoms decreased below clinical levels. With children aged 7 to 14 years and followed for 4 years, Castelao and Kröner-Herwig (2013) identified four child-reported trajectories of depressive symptoms. Children in the *low-increasing* trajectory (62.5%) experienced initially low symptoms that rose significantly over time, while children in the *moderate-increasing* trajectory (28.3%) experienced initially modest symptoms that slightly increased over time. Children in the *high-decreasing* trajectory (8.1%) experienced initially high symptoms that declined over time, while those in the *very high-stable* trajectory (1.1%) experienced particularly high symptoms initially that did not change. Studies by Castelao and Kröner-Herwig (2013) and Lewis et al. (2020) suggest that children may demonstrate moderate and increasing and high and decreasing trajectories of depressive symptoms, though conclusions across the studies are limited due to the differences in the age range of their samples.

Few studies have also investigated heterogeneity in children's anxious symptoms (Kertz et al., 2019; Wanner et al., 2012). Kertz et al. (2019) followed a sample of children oversampled for depressive symptoms across ages 3 to 12 years and identified four trajectories of caregiver-reported anxious symptoms. Children in the *low-decreasing* trajectory (40.4%) experienced initially low symptoms that declined steadily over time. Children in the *moderate-stable* trajectory (24.3%) experienced a modest frequency of symptoms that remained consistent over

time. Children in the *high-decreasing* trajectory (24.3%) experienced initially high symptoms that significantly declined over time, while children in the *high-stable* trajectory (11.0%) experienced initially high symptoms that did not change. With children aged 6 years and followed to age 12 years, Wanner et al. (2012) identified four trajectories of child-reported anxious symptoms. Children in the *moderate-decreasing* trajectory (26.7%) experienced an initially modest frequency of symptoms that gradually decreased starting around age 7 years. Children in the *low-increasing* trajectory (26.2%) experienced initially low symptoms that steadily rose over time. Children in the *low-stable* trajectory (25.7%) experienced initially low symptoms that did not change, while children in the *high-stable* trajectory (21.5%) experienced initially high symptoms that remained consistent over time. Kertz et al. (2019) and Wanner et al. (2012) are in agreement for a high and stable trajectory of anxious symptoms. Yet conclusions across both studies are limited, as Kertz et al.'s (2019) sample includes children identified as experiencing depressive symptoms. This sample characteristic makes it difficult to understand whether depressive symptoms are not also captured in the anxious symptoms trajectories.

Overall, research on distinct patterns of depressive and anxious symptoms across early childhood remain inconsistent. Such inconsistency may be due to the different developmental periods examined by the studies. While investigations by Kertz et al. (2019) and Lewis et al. (2020) spanned across early and middle childhood, Wanner et al. (2012) focused on middle childhood and Castelao and Kröner-Herwig (2013) focused on middle childhood to adolescence. Other inconsistencies may be due to differences in sample, such as the vast recruitment age of 7 to 14 years by Castelao and Kröner-Herwig (2013) and the depressive symptom inclusion criteria in Kertz et al.'s (2019) investigation of anxious symptoms. Kertz et al. (2019) also included an ethnically-diverse sample (45.5% ethnic minority) while studies by Castelao and Kröner-Herwig

(2013), Lewis et al. (2020), and Wanner et al. (2012) involved samples from a predominantly Caucasian background (76.39% to 88%). Investigation of heterogeneity of depressive and anxious symptoms is needed in early childhood in order to better inform understanding of early symptom experience as well as identify important risk and promotive factors of elevated and prolonged symptom experience, such as self-regulation and heterogeneity in self-regulatory abilities.

Self-Regulation

Developmental psychopathology (Cicchetti, 2020; Masten, 2004, 2006) and relational-developmental systems perspectives (Lerner, 2006; McClelland et al., 2015) guide the current investigation of heterogeneity in children's experiences of self-regulation. A relational-developmental systems perspective proposes that development represents an interactional relationship between an individual and their context (Lerner, 2006; McClelland et al., 2015). This relationship is considered as mutually regulating, with an individual regulating their context and the context providing conditions to regulate the individual's development. Self-regulation is thus suggested to involve processes for regulation in pursuit of a goal within any given context. These processes have the potential to be differently expressed in different individuals, with some children demonstrating more adaptive or maladaptive patterns of self-regulation. In this way, children can employ different self-regulatory abilities in order to adapt to and achieve goals within their context, though competence across these abilities may vary.

Accordingly, self-regulation has been argued to include processes related to emotional, cognitive, and behavioral arousal (Nigg, 2017; Ziv et al., 2017). Self-regulation of emotional arousal involves the ability to manage emotional stimulation. Such aspects of emotional self-regulation include the ability to monitor, evaluate, and modify negative emotion (e.g., sadness,

anger, fear) and positive emotion (e.g., excitement, happiness; Calkins & Perry, 2016; Gross & Thompson, 2007). While children can vary on how well they manage negative emotion and excitement, others may demonstrate inhibition of positive affect, suggesting some difficulty with emotional self-regulation. Self-regulation of cognitive arousal involves the ability to manage attentional stimulation, including engaging, directing, and coordinating attention and memory (Doebel, 2020; Wanless et al., 2016). Common components of cognitive self-regulation include working memory, the ability to quickly recall and operate pieces of information, and attentional or cognitive flexibility, the ability to maintain focus on a task, ignore distractions, and shift attention between tasks (Best et al., 2009; Ziv et al., 2017). Self-regulation of behavioral arousal involves the ability to manage action stimulation, including engaging, directing, and coordinating actions (Wanless et al., 2016). Inhibitory control, the ability to inhibit an automatic or dominant response for a more appropriate response, is often examined in relation to behavioral self-regulation (Day & Connor, 2017). Behavioral inhibition, or inhibition in unfamiliar settings or situations, is also connected to behavioral self-regulation (Calkins & Perry, 2016; Eisenberg et al., 2018). Some children may show a tendency to overly inhibit behavior when faced with a novel situation, such as maintaining proximity to caregivers as well as withdrawal and restricted social behavior with peers.

The emotional, cognitive, and behavioral aspects of self-regulation can demonstrate integration and differentiation (Bridgett et al., 2013; McClelland et al., 2015; Nigg, 2017). Across aspects of self-regulation, there are shared processes, determinants, and effects that can influence overall function. This suggests that at points in development, regulation in one aspect of self-regulation may be related to regulation in another aspect of self-regulation, thus demonstrating integration across abilities. For example, some children who can maintain focus

on a task may be better able to inhibit their behavior in order to stay on task as well. Children can also vary in their self-regulation of emotion, cognition, and behavior based on differences in developmental abilities and contextual demands (McClelland et al., 2015; Nigg, 2017). This suggests that children can demonstrate differentiation in their self-regulatory abilities, showing poorer management of one type of arousal but greater management in another type of arousal (Bridgett et al., 2013; Nigg, 2017). For instance, some children can maintain focus and inhibit behavior to stay on task but find managing emotional situations more difficult, such as remaining calm in a fear-inducing situation. Investigation of profiles of self-regulation across emotional, cognitive, and behavioral abilities can provide better understanding of such integration and differentiation. Some profiles may characterize children who are more or less adept at self-regulation across emotion, cognition, and behavior, representing integration. Other profiles may characterize children who are more or less adept or with certain aspects of self-regulation than others, suggesting differentiation in self-regulatory abilities.

Profiles of Self-Regulation

Research has examined profiles involving children's self-regulation, though no study has examined profiles across aspects of emotional, cognitive, and behavioral self-regulation. For example, Williams et al. (2016) identified two profiles of children's mother-reported emotional and cognitive self-regulation and sleep problems from birth to age 5 years. The *normative* profile (69%) included children with consistently average or higher emotional and cognitive self-regulation and decreasing sleep problems over time. The *non-normative* profile (31%) included children with average to below average emotional and cognitive self-regulation and increasing sleep problems over time. Results from Williams et al. (2016) suggest an integration of self-

regulatory abilities, with children demonstrating either greater or lower emotional and cognitive self-regulation.

Using self-reports, Elvin et al. (2021) assessed the self-regulation of positive and negative emotion, irritability, behavioral control, positive well-being (e.g., hope, flourishing), and social functioning (e.g., prosocial behavior, peer problems) of children aged 9 to 11 years, with three profiles identified. Children in the *low irritability/high positive well-being* profile (57%) demonstrated the highest self-regulation of positive and negative emotion, behavioral control, prosocial behavior, and well-being as well as the lowest irritability and peer problems relative to the other profiles. Children in the *moderate irritability/low behavioral control* profile (34%) demonstrated some irritability, low self-regulation of positive emotion, and low behavioral control. Children in the *high irritability/low self-regulation of negative emotion* profile (9%) demonstrated frequent irritability and peer problems and the lowest self-regulation of negative emotion, prosocial behavior, and well-being. Results from Elvin et al. (2021) suggest both integration and differentiation among aspects of self-regulation. While children in the *low irritability/high positive well-being* profile demonstrated similar emotional and behavioral self-regulation, children in the *moderate irritability/low behavioral control* profile differed in their ability to regulate irritability and behavioral control.

Research has also examined constructs that include a combination of aspects of self-regulation (Granziera et al., 2021; Laible et al., 2014; Mägi et al., 2016). With children aged 4.5 years, Laible et al. (2014) identified four profiles of children's mother-reported effortful control (e.g., inhibitory control, attention) and negative emotionality (e.g., fear, anger, sadness). Children in the *moderate regulation and negative emotionality* profile (51.56%) demonstrated slightly lower anger, sadness, and fear and slightly higher effortful control as compared to mean scores.

Children in the *low regulation and high negative emotionality* profile (33.74%) had greater anger, sadness, and fear but lower effortful control. Children in the *high regulation and low negative emotionality* profile (10.08%) demonstrated greater effortful control and lower fear, anger, and sadness. Children in the *very low regulation and high anger emotionality* profile (4.62%) demonstrated low effortful control, sadness, and fear but greater anger. These results suggest integration of self-regulatory abilities, as children generally demonstrated similar emotional self-regulation to effortful control, which represented a combination of cognitive and behavioral abilities, across the identified profiles.

With kindergarten children identified as vulnerable to hyperactivity and inattention, Granziera et al. (2021) found six profiles of behavioral self-regulation based on teacher reports of children's cognitive-behavioral (e.g., learning behavior), social-behavioral (e.g., socially responsible behavior), and emotional-behavioral self-regulation (e.g., aggressive-disruptive behavior). Children in the *mixed-unregulated* profile (32%) demonstrated average learning behavior, below average socially responsible behavior, and above average aggressive-disruptive behavior. Children in the *moderately-regulated* profile (25%) demonstrated above average learning and socially responsible behavior and below average aggressive-disruptive behavior. Children in the *aggressive-unregulated* profile (14%) demonstrated low learning and socially responsible behavior and high aggressive-disruptive behavior. Children in the *well-regulated* profile (12%) demonstrated above average learning and socially responsible behavior and low aggressive-disruptive behavior. Children in the *nonaggressive-unregulated* profile (10%) demonstrated low learning and below average socially responsible and aggressive-disruptive behavior. Lastly, children in the *aggressive-regulated* profile (7%) demonstrated above average to high learning, socially responsible, and aggressive-disruptive behavior. Although Granziera et

al.'s (2021) approach combines behavioral self-regulation with cognitive and emotional self-regulation, evidence of integration and differentiation across self-regulatory abilities is shown. Children demonstrated generally similar self-regulatory abilities in the *well-regulated*, *moderately-regulated*, and *aggressive-unregulated* profiles, while children in the *aggressive-regulated*, *mixed-unregulated*, and *nonaggressive-unregulated* profiles demonstrated varying ability by aspect of self-regulation.

Using a behavioral assessment and teacher-report, Mägi et al. (2016) identified five profiles of cognitive and behavioral self-regulation (e.g., planning, task persistence) among children in Grade 1 and followed to Grade 2. Children in the *mixed self-regulation* profile (32%) demonstrated initially low but improving planning skills and average task-persistent behavior. Children in the *high self-regulation* profile (25%) demonstrated high planning skills and high and increasing task persistence. Children in the *excellent self-regulation* profile (23%) demonstrated the highest planning skills and task persistence, with both increasing from Grades 1 to 2. Children in the *low self-regulation* profile (12%) demonstrated low planning skills and decreasing task persistence. Children in the *poor self-regulation* profile (7%) demonstrated the lowest planning and task persistence, with their task persistence decreasing from Grades 1 to 2. Given that cognitive and behavioral self-regulation are investigated as a combined construct, conclusions regarding integration and differentiation of self-regulatory abilities cannot be made.

Altogether, evidence from Laible et al. (2014) suggests children's self-regulatory abilities may be integrated while evidence from Elvin et al. (2021), Granziera et al. (2021), and Williams et al. (2016) suggests both integration and differentiation of children's self-regulatory abilities. Still, this evidence is confounded with inclusion of constructs not directly related to self-regulation, such as sleep problems (Williams et al., 2016), peer relations (Elvin et al., 2021;

Granziera et al., 2021), and well-being (Elvin et al., 2021). Inclusion of such constructs may misrepresent children's experiences of self-regulation. The lack of consensus on the number of profiles that best represent children's self-regulation also suggests a need for further research. For instance, two (Williams et al., 2016), three (Elvin et al., 2021), four (Laible et al., 2014), five (Mägi et al., 2016), and six profiles (Granziera et al., 2021) have been identified. Lack of consensus on the number of profiles that best represent children's self-regulation may be due to the inclusion of combined indicators of emotional, cognitive, and behavioral self-regulation as well as the inclusion of components not directly involved in self-regulation. To better understand children's self-regulatory abilities, examination of heterogeneity in emotional, cognitive, and behavioral self-regulation is needed.

Self-Regulation and Depressive and Anxious Symptoms

According to a developmental psychopathology perspective, interactions among systems within a child can influence development toward competence and psychopathology (Cicchetti, 2020; Masten, 2004, 2006). Investigation of such interactions between children's self-regulation and depressive and anxious symptoms may lead to better understanding of pathways toward adaptive and maladaptive development. Further aligning with a relational-developmental systems perspective, children's self-regulatory processes may help to support their development, as they can better attend to feelings of sadness and anxiety in order to achieve contextual goals (McClelland et al., 2015). Alternatively, children's self-regulatory processes may not be effective at attending to feelings of sadness and anxiety, leading to obstruction in goal pursuit and the development of depressive and anxious symptomology.

Although self-regulation tends to be prominent in early childhood, some children may demonstrate more difficulty with self-regulation, which can increase their risk of experiencing

depressive and anxious symptoms (Robson et al., 2020; Ziv et al., 2017). However, little research has examined how children's varied experiences across emotional, cognitive, and behavioral self-regulation associate with depressive and anxious symptomology. With children followed from birth to age 5 years, Williams et al. (2016) found that children in the *non-normative* profile (31%) exhibited more emotional problems (e.g., depression, anxiety) at ages 6 to 7 years compared to those in the *normative* profile (69%). In their cross-sectional study with children aged 9 to 11 years, Elvin et al. (2021) found that children in the *high irritability/low self-regulation of negative emotion* (9%) and *moderate irritability/low behavioral control* (34%) profiles experienced more depressive and anxious symptoms than those in the *low irritability/high positive well-being* profile (57%). Children in the *high irritability/low self-regulation of negative emotion* profile also experienced more depressive symptoms than those in the *moderate irritability/low behavioral control* profile. Notably, these results suggest different associations between self-regulation profiles with depressive and anxious symptoms, such that aspects of emotional self-regulation may be important for both symptomologies but aspects of behavioral self-regulation may be more associated to depressive symptoms. Evidence from Elvin et al. (2021) and Williams et al. (2016) suggest that differences in children's self-regulatory abilities can be important indicators of risk for the experience of symptomology.

Emotional Self-Regulation

Difficulty with regulating emotion is generally the component of self-regulation most closely tied to the experience of depressive and anxious symptoms. Several meta-analyses have provided support for the association between emotional self-regulation and depressive and anxious symptoms. For instance, emotional self-regulation was negatively associated with depressive and anxious symptoms among children and adolescents aged 5 to 19 years in a meta-

analysis by Compas et al. (2017) of cross-sectional and longitudinal research. Sendzik et al.'s (2017) meta-analysis of cross-sectional relationships between emotional awareness (e.g., perception, description, and differentiation of emotional experiences) and depressive and anxious symptoms found that increased symptoms were positively related to impaired emotional awareness across ages that ranged from 7 to 19 years. In another meta-analysis of cross-sectional and longitudinal research among children 18 years of age or younger, Mathews et al. (2016) showed that children with greater anxious symptoms tended to have less emotional awareness, emotional expression (e.g., verbal or physical expression of emotion), emotion understanding (e.g., knowledge of emotion and one's own emotions), emotional acceptance (e.g., acceptance of one's emotional experiences), and emotional self-efficacy (e.g., sense of efficacy of one's emotional competence). Mathews et al. (2016) also found that children with greater anxious symptoms were more likely to use avoidant (e.g., distraction, distancing) and externalizing (e.g., venting, hostility) coping strategies and more maladaptive cognitive coping strategies (e.g., rumination, catastrophizing).

Empirical studies also support the association between emotional self-regulation and overall internalizing symptoms. Wang et al. (2018) examined the association between children's mother-reported emotional dysregulation at ages 4.5 and 6.5 years and internalizing symptoms across ages 4.5 to 10.5 years. Emotional dysregulation at 4.5 years was positively associated with children's concurrent internalizing symptoms, whereas emotional dysregulation at 6.5 years was predictive of increasing symptoms over time. McCoy and Raver (2011) investigated the relationship between observed emotional self-regulation strategies and teacher-reported internalizing symptoms in preschool children using a cross-sectional design. Lower emotional self-regulation was related to more frequent symptom experience.

Research has also identified an association between aspects of emotional self-regulation and depressive symptoms. In their cross-sectional study, Belden et al. (2008) found that preschool children with more excessive and aggressive tantrums tended to experience more depressive symptoms compared to less depressive peers, as reported by caregivers. In their 15-year longitudinal study, Vogel et al. (2019) interviewed children aged 3 to 5 years to assess their irritability dysregulation as well as their depressive symptoms eight times at ages 4 to 6 years until 16 to 19 years. Children's irritability dysregulation was positively associated with later diagnosis of depression across ages 4 to 19 years at each assessment. Associations between emotional self-regulation and depressive symptoms have also been identified during middle childhood. Using self-reports from children in Grades 4 and 5 in a cross-sectional study, Uhl et al. (2019) found that children's emotional dysregulation was positively associated with their depressive symptoms, though no association was found between emotional dysregulation and anxious symptoms. In their cross-sectional study with children aged 4 to 19 years, Sfärlea et al. (2021) found that children's self-reported adaptive emotional self-regulation (e.g., distraction, acceptance) negatively predicted their depressive symptoms while maladaptive emotional self-regulation (e.g., withdrawal, rumination) positively predicted symptom experience. Altogether, research points to an association between emotional self-regulation with depressive and anxious symptoms, with greater self-regulation associated with less symptom experience, though this association may be particularly prominent for depressive symptoms.

Cognitive Self-Regulation

Aspects of self-regulation related to cognition including attentional or cognitive flexibility have been associated with children's experiences of depressive and anxious symptoms. In a 1-year longitudinal study, teachers reported on children's internalizing symptoms

and children completed a cognitive flexibility task at four timepoints across kindergarten and Grade 1 (Patwardhan et al., 2021). It was found that cognitive flexibility contributed to subsequent lower levels of internalizing symptoms across each of the four timepoints. Kertz et al. (2016) followed preschool children for 7.5 years, with parents reporting on their child's attentional shifting (e.g., move between tasks, switch attention, flexible problem solving) and depressive and anxious symptoms. Lower attentional shifting at preschool was associated with greater depressive symptoms up to 5.5 years later and greater anxious symptoms 3.5 years later. Notably, these results suggest that attentional shifting may be similarly related to depressive and anxious symptoms, though association with depressive symptoms may be longer lasting. Overall, the studies by Kertz et al. (2016) and Patwardhan et al. (2021) suggest an association between aspects of children's cognitive self-regulation and their depressive and anxious symptoms, with greater cognitive self-regulation associated with less symptom experience.

Behavioral Self-Regulation

Difficulty with inhibitory control has been associated with the experience of depressive and anxious symptoms in childhood. Denio et al. (2020) had children complete an inhibitory control task at age 5 years and had mothers report on their children's internalizing symptoms at ages 5 and 10 years. Children's inhibitory control was negatively correlated with their internalizing symptoms at 10 years. In their 7.5-year longitudinal study, Kertz et al. (2016) found that children with lower parent-reported inhibitory control at preschool experienced greater parent-reported depressive and anxious symptoms up to age 7.5 years. Findings from Denio et al. (2020) and Kertz et al. (2016) suggest that greater inhibitory control is associated with less internalizing symptoms. Yet research from Koojimans et al. (2000) contradicts these findings. In their cross-sectional study with children aged 6 to 12 years, Koojimans et al. (2000) had teachers

report on children's internalizing symptoms and had children complete an inhibitory control task. It was found that children with greater inhibitory control demonstrated greater internalizing symptoms. This finding suggests that behavioral overregulation, as indicated by greater inhibitory control, may make children vulnerable to depressive symptom experience. Interestingly, Hassan and Schmidt (2022) found a U-shaped association between children's inhibitory control and internalizing symptoms. In their longitudinal study, Hassan and Schmidt (2022) found that both lower and greater inhibitory control at age 3.5 years, as reported by mothers and measured through behavioral assessment, were related to greater mother-reported internalizing symptoms at age 4.7 years. Altogether, studies by Denio et al. (2020), Hassan and Schmidt (2022), Kertz et al. (2016), and Koojimans et al. (2000) suggest inhibitory control is associated with the experience of depressive and anxious symptoms, though evidence regarding the direction of this association is mixed.

Children's behavioral inhibition may also be related to the experience of depressive and anxious symptoms. Behavioral inhibition is typically conceptualized as a form of behavioral overregulation, in which children overly inhibit their behavior in novel situations. Research has generally found that behavioral inhibition is positively related to symptom experience. For instance, Barker et al. (2015) assessed children's behavioral inhibition at ages 2 and 3 years via observation and parent report. Children and their parents also completed reports of children's anxious symptoms and internalizing symptoms at age 9 years. Behavioral inhibition was found to be positively associated with internalizing symptoms but not anxious symptoms. Dodd et al. (2020) assessed children's behavioral inhibition via behavioral assessment and parent report when they entered preschool. Parents also reported on children's anxious symptoms at entry to preschool and entry to elementary school. Behavioral inhibition was found to positively predict

anxious symptoms at entry to preschool and elementary school. Overall, research suggests that greater behavioral inhibition is associated with greater internalizing symptom experience, though findings regarding anxious symptoms are mixed.

Altogether, self-regulation appears to be associated with the experience of depressive and anxious symptoms, although gaps remain in this line of research. For instance, research often focused only on emotional (Belden et al., 2008; McCoy & Raver, 2011; Sfärlea et al., 2021; Uhl et al., 2019; Vogel et al., 2019; Wang et al., 2018), cognitive (Patwardhan et al., 2021) or behavioral self-regulation (Barker et al., 2015; Denio et al., 2020; Dodd et al., 2020; Hassan & Schmidt, 2022; Koojimans et al., 2000) in relation to symptom experience. Only two studies examined children's experiences across aspects of self-regulation, including emotional self-regulation and behavioral (Elvin et al., 2021) or cognitive self-regulation (Williams et al., 2016), and how these experiences associate with symptomology. Research has also often focused on the association between aspects of self-regulation and overall internalizing symptoms (Barker et al., 2015; Denio et al., 2020; Hassan & Schmidt, 2022; Koojimans et al., 2000; McCoy & Raver, 2011; Patwardhan et al., 2021; Wang et al., 2018; Williams et al., 2016). Fewer studies have focused on examining either depressive (Belden et al., 2008; Sfärlea et al., 2021; Vogel et al., 2019) or anxious symptoms (Barker et al., 2015; Dodd et al., 2020) and their association with self-regulation. Only three studies examined both depressive and anxious symptoms separately in their association with self-regulation (Elvin et al., 2021; Kertz et al., 2016; Uhl et al., 2019). Across these studies, findings generally suggest that all aspects of self-regulation are associated with depressive and anxious symptoms, though emotional and behavioral self-regulation may be more important for depressive symptoms.

Classroom Climate

While self-regulation may be a salient individual predictor of heterogeneity in early depressive and anxious symptoms, contextual factors may also contribute to symptom experience. According to a social setting systems perspective, contexts act as systems whose factors, such as social processes and organization of resources, interact with an individual's characteristics and development (Tseng & Seidman, 2007). In this way, the quality of social processes and organization in the classroom context can stimulate change in developmental outcomes, including children's experience of depressive and anxious symptoms. The support provided by social actors, as well as the supportive nature of the organizational setting, can further relate to developmental outcomes. In this way, the support provided for children to positively and actively engage in the classroom, such as through relations between teachers and children and the organization of peer relations, can figure notably in children's development (Pianta, 2016; Tseng & Seidman, 2007). Specifically, preschool marks the time when the classroom context becomes prominent in children's lives, particularly the quality of social processes and organization within the classroom. Preschool classrooms can thus organize experience in meaningful ways for children, which can have implications for their adaptation and development (Pianta, 2016). As further suggested by a developmental psychopathology perspective, interactions between children and their contexts can influence development toward competence and psychopathology (Cicchetti, 2020; Masten, 2004, 2006). Investigation of such interactions between classroom climate and children's depressive and anxious symptoms may then lead to better understanding of pathways toward adaptation and maladaptation.

Classroom climate encapsulates the interactive and interpersonal dynamics in classrooms, and includes the domains of emotional support, instructional support, and organization (Eccles & Roeser, 2011; Hamre et al., 2009; Wang et al., 2020). Emotional support involves the quality of

classroom interactions and is represented by the positive climate (e.g., positive affect, cooperation), negative climate (e.g., negative affect, aggression), teacher sensitivity (e.g., provision of comfort and reassurance), and regard for student perspectives (e.g., flexibility, provision of student choices) in a classroom (Hamre et al., 2009). In this way, emotional support reflects the warmth and connectedness between children and teachers and peers as well as the autonomy given to children (Hamre et al., 2009; Wang et al., 2020). Instructional support involves the quality of instructional practices in the classroom. Instructional support is represented by the concept development (e.g., problem solving, use of why/how questions), quality of feedback (e.g., follow-up questions, provision of clarification), and language modeling (e.g., repetition and expansion of student comments) within a classroom (Hamre et al., 2009). As such, instructional support can provide insight into how learning expectations and feedback are communicated by teachers and understood by children as well as the modalities of helping children learn. The domain of organization is represented by the behavior management (e.g., clear expectations, consistency of enforcement), productivity (e.g., few disruptions, little student wandering), and instructional learning formats (e.g., teacher involvement, active listening) in a classroom (Hamre et al., 2009), allowing insight into how behavioral expectations and classroom rules are communicated by teachers and understood by children.

Classroom Climate and Depressive and Anxious Symptoms

The degree to which the quality of interactions in the classroom are supportive of children's well-being, learning, and exploration and organized in a way that children understand expectations may be associated with children's emotional development. Enabling children to more positively and confidently explore and engage in classroom activities may help to limit their feelings of sadness or anxiety (Eccles & Roeser, 2011; Hamre et al., 2009; Wang et al.,

2020). Conversely, children may be less likely to engage independently and have more negative experiences when classroom interactions are generally unresponsive to children's emotional needs and well-being, unsupportive of children's learning needs, and disorganized with unclear expectations. Young children also often show elevated symptomology and learning challenges across transitions that can be stressful for them, such as the transition into preschool or kindergarten (Fumoto, 2011; Phillips et al., 2019). With risks for depressive and anxious symptomology emerging during the early school years, the transition into preschool is a critical juncture to assess how classroom climate relates to children's symptom experience (Eccles & Roeser, 2011).

Even though young children spend a notable amount of time in the classroom, assessment of how depressive and anxious symptoms are influenced by the quality of instructional practices and relationships in the classroom remains scarce (Pianta, 2016; Wang et al., 2020). A meta-analysis by Wang et al. (2020) provides support for the influence of classroom climate on socioemotional outcomes, including psychological well-being, anxiety, depression, and social competence. Among studies examining children and adolescents in kindergarten to Grade 12, emotional and instructional support demonstrated a negative association with socioemotional distress, though classroom organization did not demonstrate a significant association. These results suggest that the domains of classroom climate may differentially relate to children's socioemotional development. However, it may be that domains of classroom climate demonstrate different associations with children's depressive and anxious symptoms and with trajectories characterized by elevated or low symptoms.

Empirical studies have investigated the association between classroom climate and children's experiences of depressive and anxious symptoms, though these studies spanned

periods in elementary (Gazelle, 2006; Griggs et al., 2016; Weyns et al., 2019; Yan et al., 2016) and junior high school (Shochet & Smith, 2014). With children recruited in kindergarten or Grades 1 to 4, Griggs et al. (2016) found that the association between teacher-reported fall and spring internalizing symptoms was lower for children in classrooms observed to have greater emotional support. With a sample of children with a history of anxious solitude (e.g., shyness, social anxiety), Gazelle (2006) found that observed classroom emotional climate (e.g., positive and negative emotion, over-control, classroom management) was negatively correlated with children's teacher-reported depressive symptoms in Grade 1. Using self-reports of children recruited in Grades 7 and 8, Shochet and Smith (2014) also found that classroom climate (e.g., involvement, teacher support, affiliation) was negatively associated with children's depressive symptoms at each of three assessment points across two school years. At the start of kindergarten, Weyns et al. (2019) found that children demonstrated less frequent anxious symptoms, as reported by teachers, when they were in classrooms with greater observed teacher sensitivity (e.g., responsiveness to academic and emotional functioning). However, Yan et al. (2016) did not find a significant correlation between observed classroom emotional climate (e.g., positive and negative emotion, over-control, classroom management) and children's internalizing symptoms in Grade 1, as reported by mothers, fathers, and teachers.

Research generally suggests classroom climate and primarily emotional support is negatively associated with children's experiences of depressive and anxious symptoms (Gazelle, 2006; Griggs et al., 2016; Shochet & Smith, 2014; Wang et al., 2020; Weyns et al., 2019). Still, research has been limited by not examining multiple domains of classroom climate in association with children's depressive and anxious symptoms. Research regarding classroom climate and children's depressive and anxious symptoms has also not been conducted in the preschool

period. Altogether, it is unclear how the domains of classroom climate may associate with children's emerging symptomologies, particularly during a period when children are first introduced to an early learning classroom context.

Family, Peer, and Teacher Covariates

To adequately examine the influence of self-regulation and classroom climate on heterogeneity in children's experiences of depressive and anxious symptoms, important contextual factors must be considered. Research suggests factors related to family, peer, and teacher-child contexts are associated with depressive and anxious symptoms. Specifically, attachment theory guides the investigation of caregiver, peer, and teacher influences on children's experiences of depressive and anxious symptoms (Sherman et al., 2015; Sroufe et al., 1999). Attachment theory proposes that children form attachment patterns, or organized behavior in a relationship, with their caregivers. Based on these attachment patterns, children are believed to develop expectations of caregiver behavior as well as mental representations of themselves based on their attachment relationships. Such behavior expectations and mental representations can further extend to relationships with peers and teachers. Relationships between children and their caregivers, peers, and teachers can thus figure prominently in children's adjustment (Pianta, 1999; Sherman et al., 2015; Sroufe et al., 1999). Accordingly, dimensions of the relationships of children with their caregivers, peers, and teachers are accounted for in the current research.

Family Covariates

Three aspects of children's family context that have been associated with depressive and anxious symptomology include family socioeconomic status, caregiver depression, and qualities of the caregiver-child relationship. Socioeconomic status is measured by various factors including caregiver education, household income, and whether it is a single- or two-caregiver

household. Research shows that family socioeconomic status can have influence on children's experiences of depressive and anxious symptoms. Using caregiver reports, caregiver education when children were aged 5 years was negatively associated with children's internalizing symptoms at age 6 years (Hosokawa & Katsura, 2017). In another study by Merz et al. (2018), it was found that caregiver education was negatively associated with experience of self-reported depressive and anxious symptoms in a sample of children and adolescents aged 7 to 21 years. In a study with single mothers and their children aged 2 to 6 years, it was found that mothers' greater experience of chronic stressors (e.g., financial concerns, role overload, employment problems) was positively associated with children's internalizing symptoms, as reported by mothers (Hall et al., 2008). Given the evidence of association between socioeconomic status and children's depressive and anxious symptoms, the current investigation takes into account the influence of two factors related to socioeconomic status, primary caregiver education and household number of caregivers.

Caregiver characteristics are also found to be associated with children's experiences of depressive and anxious symptoms. The characteristic most often researched in relation to children's depressive and anxious symptoms is caregiver depression. For instance, Hall et al. (2008) found that mother's depressive symptoms were positively associated with the internalizing symptoms of their children aged 2 to 6 years, as reported by mothers. Similarly, Wagner and Valdez (2020) found with children aged 4 to 10 years that mother's self-reported depressive symptoms were positively associated with their child's teacher-reported internalizing symptoms. Roubinov et al. (2022) also found that mother's self-reported depressive symptoms when their children were 18-months-old were positively associated with children's mother-reported depressive symptoms at age 4 years.

Qualities of the caregiver-child relationship have also been found to be important for children's experiences of depressive and anxious symptoms, such as the attachment relationship. In a meta-analysis by Madigan et al. (2016), it was found that secure caregiver attachment was associated with less experience of internalizing symptoms for children and adolescents aged 3 to 18 years, while insecure attachment was positively associated with internalizing symptoms. Sirois and Bernier (2018) also found that observed attachment security at 26-months-old was negatively associated with children's teacher-reported internalizing symptoms in kindergarten and Grade 1. Children's depressive and anxious symptoms have also been influenced by conflict between caregivers and children. With children aged 5 to 8 years, Nelson et al. (2019) found that for mothers who reported low caregiver-child conflict, their children also experienced less mother-reported internalizing symptoms, as compared to mothers that reported moderate to high conflict. Sirois and Bernier (2018) also found that mother-reported sensitivity (e.g., appropriate responses to child) when their children were 12-months-old was negatively associated with children's teacher-reported internalizing symptoms at kindergarten and Grade 1. Based on these findings, caregiver depressive symptoms and caregiver-child attachment and relational frustration (e.g., overreaction, impatience) are taken into account in the current investigation.

Peer Covariates

In addition to family contextual factors, the peer context has also been associated with children's experiences of depressive and anxious symptoms. For instance, experience of peer conflict, including peer aggression and victimization, are associated with symptom experience. Peer sociability, including social preference and prosocial behavior, has also been associated with depressive and anxious symptoms. With children assessed six times between ages 3 and 11 years, Rappaport et al. (2021) found that children's increases in peer victimization, as reported

by caregivers and teachers, were related to increases in depressive and anxious symptoms, as reported by children and caregivers. More specifically, peer victimization was found as a leading predictor of depressive symptoms but not anxious symptoms. Rappaport et al. (2021) also found that increases in peer aggression and decreases in prosocial behavior, as reported by caregivers and teachers, were related to increases in depressive but not anxious symptoms. Another study by Krygsman and Vaillancourt (2019) found that children's physical peer aggression was positively associated with their depressive symptoms in preschool, as reported by teachers. Eggum-Wilkens et al. (2014) found that children's peer popularity in Grade 1, as reported by caregivers and teachers, negatively predicted their internalizing symptoms in Grade 2, as reported by caregivers. In their longitudinal study across kindergarten to Grade 12, Lansford et al. (2007) found that children's social preference across kindergarten to Grade 3, assessed via interview, negatively predicted their depressive symptoms at Grades 4 and 7, as reported by teachers, mothers, and children. Altogether, these results suggest that peer conflict is positively associated and peer sociability is negatively associated with children's symptomologies, particularly depressive symptoms. Given the association between peer conflict and sociability with the experience of depressive and anxious symptoms, these peer relations are accounted for in the current investigation.

Teacher Covariates

Another prominent figure in a young child's life is their teacher. Characteristics of the teacher-child relationship have been associated with children's experiences of depressive and anxious symptoms. For example, Zatto and Hoglund (2019) found that children who had greater teacher-child conflict and less positive teacher-child relations (e.g., closeness, positive engagement) concurrently experienced more frequent internalizing symptoms in the fall and

spring of preschool, as reported by teachers. Zatto and Hoglund (2022) further found that children with more teacher-child conflict concurrently experienced more frequent depressive and anxious symptoms in the fall and spring of preschool and kindergarten, as reported by teachers. Roorda et al. (2013) found that children aged 3 to 5 years who were observed to share fewer positive teacher interactions also experienced more frequent teacher-reported internalizing symptoms. Using teacher reports, Roorda et al. (2014) also found that teacher-child conflict was positively and reciprocally associated with children's internalizing symptoms across the first term of preschool. Pianta and Stuhlman (2004) found that teacher-child conflict and children's internalizing symptoms in Grade 1 were concurrently and positively associated, as reported by teachers. Findings suggest that the quality of the relationship between teachers and children is associated with children's depressive and anxious symptoms. Subsequently, the current investigation takes into account teacher-child positive engagement and conflict.

Current Study

Guided by a developmental psychopathology perspective (Cicchetti, 2020; Masten, 2004, 2006), the overarching aim of this research is to characterize and explain variability in the trajectories of depressive and anxious symptoms in early childhood. This aim will be addressed by four research objectives and respective research questions. To address the first objective aimed at better understanding the emergence of and heterogeneity in the change in depressive and anxious symptoms, the following research question is investigated: Are there qualitatively distinct trajectories of both depressive and anxious symptoms across preschool and kindergarten? Guided by research involving overall internalizing symptoms (Côté et al., 2009; Davis et al., 2015; de Lijster et al., 2019; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Min et al., 2021; Papachristou & Flouri, 2020; Parkes et

al., 2016) and depressive symptoms (Castelao & Kröner-Herwig, 2013; Lewis et al., 2020), it is expected that four trajectories of depressive symptoms will be identified. These trajectories are expected to be characterized by initially low symptoms that remain stable, initially low symptoms that increase over time, initially moderate symptoms that increase over time, and initially high symptoms that decrease over time. It is also expected that four trajectories of anxious symptoms will be identified, characterized by initially low symptoms that remain stable, initially low symptoms that increase over time, initially moderate symptoms that remain stable or increase over time, and initially high symptoms that remain stable. These hypotheses are supported by research involving overall internalizing symptoms (Côté et al., 2009; Davis et al., 2015; de Lijster et al., 2019; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Min et al., 2021; Papachristou & Flouri, 2020; Parkes et al., 2016; Sterba et al., 2007) and anxious symptoms (Kertz et al., 2019; Wanner et al., 2012).

To achieve the second objective aimed at understanding young children's experiences of self-regulation, the following research question is investigated: Are there qualitatively distinct profiles of children's self-regulation, across aspects of emotional, cognitive, and behavioral self-regulation, at the fall of preschool? It is expected that five profiles of self-regulation will be identified. One profile is expected to be characterized by high self-regulation across emotion, cognition, and behavior (Elvin et al., 2021; Granziera et al., 2021; Laible et al., 2014; Mägi et al., 2016; Williams et al., 2016). A second profile is expected to be characterized by moderate self-regulation across emotion, cognition, and behavior (Granziera et al., 2021; Laible et al., 2014; Mägi et al., 2016). The third profile is expected to be characterized by low self-regulation across emotion, cognition, and behavior (Granziera et al., 2021; Laible et al., 2014; Mägi et al., 2016; Williams et al., 2016). A fourth profile is expected to be characterized by difficulty with

emotional self-regulation (Elvin et al., 2021; Granziera et al., 2021). The fifth profile is expected to be characterized by difficulty with cognitive and behavioral self-regulation (Granziera et al., 2021; Mägi et al., 2016).

To address the third objective aimed at investigating how self-regulation discriminates between symptom experiences, the following research question is investigated: Do the profiles of self-regulation in the fall of preschool uniquely predict heterogeneity in the trajectories of depressive and anxious symptoms across preschool and kindergarten? It is expected that the profiles of self-regulation will differentiate between the trajectories of children's depressive and anxious symptoms. It is expected that profiles characterized by low or moderate self-regulation will be associated with trajectories of depressive and anxious symptoms demonstrating elevated or increasing patterns of change (Barker et al., 2015; Denio et al., 2020; Dodd et al., 2020; Elvin et al., 2021; Kertz et al., 2016; Hassan & Schmidt, 2022; Koojimans et al., 2000; Patwardhan et al., 2021; Williams et al., 2016). It is also expected that self-regulation profiles characterized by difficulty with emotional self-regulation will be related to trajectories demonstrating elevated or increasing symptoms (McCoy & Raver, 2011; Wang et al., 2018), particularly in the case of depressive symptoms (Belden et al., 2008; Elvin et al., 2021; Sfärlea et al. 2021; Uhl et al., 2019; Vogel et al., 2019). It is further expected that profiles characterized by difficulty with cognitive or behavioral self-regulation will be related to elevated or increasing symptoms of depression (Elvin et al., 2021; Hassan & Schmidt, 2022; Kertz et al., 2016).

To achieve the fourth research objective aimed at investigating how classroom climate discriminates between symptom experiences, the following research question is investigated: Do domains of classroom climate (i.e., emotional support, instructional support, organization) in the fall of preschool predict heterogeneity in the trajectories of depressive and anxious symptoms

across preschool and kindergarten? It is expected that classroom emotional support will be negatively associated with children's experience of depressive and anxious symptoms, with poorer emotional support predictive of elevated or increasing trajectories of symptom experience (Gazelle, 2006; Griggs et al., 2016; Shochet & Smith, 2014; Wang et al., 2020; Weyns et al., 2016). It is further expected that instructional support will be negatively associated with depressive and anxious symptoms, with poorer instructional support predictive of elevated or increasing trajectories of symptom experience (Shochet & Smith, 2014; Wang et al., 2020; Weyns et al., 2019). No prediction is made for the association between classroom organization and children's depressive and anxious symptom experience. The current investigation will also account for family, peer, and teacher covariates that may also be influential for the experience of depressive and anxious symptoms.

Addressing the current research objectives will contribute to knowledge and practice in multiple ways. For instance, identification of heterogeneity in the trajectories of both depressive and anxious symptoms will help to better characterize young children's symptom experience as well as better enable identification of risk and promotive factors of elevated and prolonged depressive and anxious symptomology. Identification of self-regulation profiles will help to better characterize young children's experiences of self-regulation across emotional, cognitive, and behavioral abilities. Identification of the associations between profiles of self-regulation and trajectories of depressive and anxious symptoms will aid in better understanding which aspects and experiences of self-regulation may act as risk or promotive factors of elevated and prolonged depressive and anxious symptomology. Identification of the association between the domains of classroom climate and trajectories of depressive and anxious symptoms will also help to better understand whether and how the quality of instructional practices and relationships in the

preschool classroom are associated with early symptomology. Such findings will further aid understanding of which self-regulatory abilities and aspects of the classroom context are the best targets for mental health prevention and intervention efforts aimed at the early childhood period.

Limitations of Previous Research

The current research addresses four limitations from previous research. First, the current research examines depressive and anxious symptoms separately. While depressive and anxious symptoms tend to be related, these symptomologies may show developmental differences early on (Carter et al., 2010; Zatto & Hoglund, 2022). This separate examination further helps to better discern what profiles of self-regulation and domains of classroom climate are more associated with depressive or anxious symptoms. Instead, research has often investigated the association of self-regulation with overall internalizing symptoms (Barker et al., 2015; Denio et al., 2020; Hassan & Schmidt, 2022; Koojimans et al., 2000; McCoy & Raver, 2011; Patwardhan et al., 2021; Wang et al., 2018; Williams et al., 2016) or either depressive (Belden et al., 2008; Sfärlea et al., 2021; Vogel et al., 2019) or anxious symptoms (Barker et al., 2015; Dodd et al., 2020). While some research has focused on depressive (Gazelle, 2006; Shochet & Smith, 2014), anxious (Weyns et al., 2019), or internalizing symptoms (Griggs et al., 2016; Yan et al., 2016) in relation to classroom climate, no research has examined both depressive and anxious symptoms.

Second, the current research takes a person-centered approach by investigating heterogeneity in trajectories of depressive and anxious symptoms. Predominantly, research has focused on average trajectories of overall internalizing symptoms or separate depressive and anxious symptoms, though average trajectories largely do not reflect children's lived experiences (Carter et al., 2010; Egger & Angold, 2006; Whalen et al., 2017). A person-centered approach can identify patterns of elevated and increasing symptom trajectories, leading to greater

knowledge on the identification of characteristics of young children vulnerable to elevated or prolonged symptoms. A person-centered approach is also taken in the investigation of heterogeneity in children's self-regulatory abilities. This person-centered approach can identify profiles of children's self-regulation, leading to a better understanding of children's self-regulation experiences. This approach can also lead to better understanding of how varying experiences of self-regulation are uniquely or commonly related to heterogeneity in the experience of depressive and anxious symptoms.

Third, profiles of self-regulation are examined across aspects of emotional, cognitive, and behavioral self-regulation to better understand the variability in children's self-regulation experiences. Predominantly, research has focused on profiles of self-regulation that do not include aspects across emotional, cognitive, and behavioral self-regulation (Elvin et al., 2021; Granziera et al., 2021; Laible et al., 2014; Mägi et al., 2016; Williams et al., 2016), limiting interpretation of children's self-regulation experiences. Often research has also focused on one aspect of self-regulation in association with depressive and anxious symptoms (Barker et al., 2015; Belden et al., 2008; Denio et al., 2020; Dodd et al., 2020; Hassan & Schmidt, 2022; Koojimans et al., 2000; McCoy & Raver, 2011; Patwardhan et al., 2021; Sfärlea et al., 2021; Uhl et al., 2019; Vogel et al., 2019; Wang et al., 2018), limiting interpretation of how self-regulation may be differentially associated with symptom experience. These approaches are insufficient in their ability to identify experiences of self-regulation as salient risk and promotive factors of depressive and anxious symptom experience and to more specifically target intervention and prevention efforts.

Fourth, the current research examines multiple domains of classroom climate in association with experiences of depressive and anxious symptoms. Research has largely focused

on the emotional climate of classrooms in relation to symptom experience (Gazelle, 2006; Griggs et al., 2016; Yan et al., 2016). Research has also taken a conflated approach, examining an overall factor that encompasses two domains of classroom climate (Shochet & Smith, 2014; Weyns et al., 2019). These approaches limit interpretations of how domains of classroom climate are differentially associated with depressive and anxious symptoms. Subsequently, the ability to identify salient contextual risk and promotive factors of symptom experience and the ability to target intervention and prevention efforts aimed at the classroom context are constrained. Investigation of the association between classroom climate and symptoms of depression and anxiety have also only been conducted in middle childhood (Gazelle, 2006; Griggs et al., 2016; Shochet & Smith, 2014; Weyns et al., 2019; Yan et al., 2016), leaving these associations in the preschool period unstudied.

CHAPTER III

Method

Participants

Participants include two cohorts of children recruited from two half-day preschool programs (Programs A and B). Program A was charity-funded whereas Program B was government-funded and faith-based. Both programs offered classroom-based education and care, used comparable activities to support social, emotional, and academic learning, and included eligibility for low-income families to receive free services and programming. Low income was a requirement to enroll in Program A; families could pay to enroll in Program B. Both offered multidisciplinary support for families and children, although fewer services were offered in Program B.

Preschool Program A included seven sites and preschool Program B included two sites. Of the nine preschool sites, six were located within elementary schools. Each site had one to three classrooms with morning and afternoon classes. Children were recruited from 23 classes in Fall 2014 (Cohort 1) and from 20 classes in Fall 2015 (Cohort 2) to participate in a 2-year longitudinal study. Participants included 443 preschool children: 47.9% girls, M_{age} = 4.08 years, *SD* = 0.34 years, range = 3.00-5.25 (Cohort 1, *n* = 232, 50.4% girls, M_{age} = 4.11 years, *SD* = 0.35 years; Cohort 2, *n* = 211, 45.0% girls, M_{age} = 4.05 years, *SD* = 0.33 years). Overall, 70% of caregivers provided demographic data for their children. The sample was ethnically diverse, with the primary languages spoken in the household also diverse (see Table 1). Overall, 67.1% of children were from immigrant families (Cohort 1, 63.2%; Cohort 2, 71.8%). Of these children, 49.5% were not born in Canada (Cohort 1, 51.8%; Cohort 2, 46.1%). Caregiver-reported data also indicated that all children from both cohorts lived below the Statistics Canada low-income

threshold. Further demographic data regarding families, including single- and two-caregiver household and primary caregiver education, are presented in Table 1.

There were 173 teachers who participated, including 22 preschool teachers at Waves 1 and 2 (Cohort 1, n = 12; Cohort 2, n = 10) and 151 kindergarten teachers at Waves 3 and 4 (Cohort 1, n = 72; Cohort 2, n = 79). Overall, 100% of preschool teachers and 77% of kindergarten teachers provided demographic data. Of the teachers, 32 participated in both years of the study; eight taught Cohort 1 and Cohort 2 children in preschool and 24 taught Cohort 1 and Cohort 2 children in kindergarten. Teachers were predominantly female (preschool, 100%; kindergarten, 98.6%) and Caucasian/Canadian (preschool, 75%; kindergarten, 67.7%). Preschool and kindergarten teachers were similar in age (preschool, M_{age} = 38.71 years, SD = 10.75 years; kindergarten, M_{age} = 40.10 years, SD = 10.52 years) and had been teaching for a similar number of years (preschool, M = 11 years, SD = 10.10 years; kindergarten, M = 14.10 years, SD = 9.50 years). Preschool teachers were more likely to have a Bachelor's (81.8%) or Master's (9.1%) degree than kindergarten teachers (69.5% and 1.0%, respectively). Kindergarten teachers were more likely to have a 2-year after-degree (29.5%) than preschool teachers (9.1%), equivalent to a M.Ed. completed after the Bachelor's degree.

Procedure

Following University of Alberta Research Ethics Board (Project No. 00051399) and School Board approval, consent packages were sent home to all caregivers of children in the participating preschool classrooms informing them of the study and seeking consent for their children to participate. Given that families came from predominantly ethnically diverse and low-income backgrounds, several strategies were employed to support informed consent of caregivers for their children to participate, including translated consent forms, collaboration with social

workers, and attendance by researchers at the preschool programs (Sieber, 2012). Families who spoke one of the predominant languages in the preschools other than English (e.g., Arabic, Punjabi) received a consent package in their primary language. Social workers working with the preschools also supported families in reading the consent packages, with social workers commonly sharing the same primary language as families. Social workers were also knowledgeable about the research project in order to address any questions from caregivers. Researchers attended caregiver sessions offered by the preschool programs to inform caregivers of the research and to answer questions. At Wave 2, consent was requested for children new to the preschool and for those who had not previously returned their consent forms. Caregivers were asked to return consent forms regardless of whether they granted consent. Overall, 68.5% of consent forms were returned (Cohort 1, 72%; Cohort 2, 65%), with 91% of those caregivers consenting for their child to participate (Cohort 1, 87%; Cohort 2, 95%). Of all eligible children, 59.3% of caregivers provided consent for participation (Cohort 1, 60.5%; Cohort 2, 58.0%).

Data were collected on four occasions. Baseline data were collected in the fall to early winter of preschool (Wave 1, W1). Follow-up data were collected in the spring of preschool (Wave 2, W2), fall to early winter of kindergarten (Wave 3, W3), and spring of kindergarten (Wave 4, W4). Each data collection period lasted about 3 months, with approximately 4 months between each wave. Data collection visits were rescheduled within 2 weeks for absent children. Before each data collection visit, children were asked to provide verbal assent of their willingness to participate in the research project. Debrief forms were also sent home with children after each data collection visit to inform caregivers of their child's participation in the research project and to describe what assessments the child completed. Of the 443 child participants, 433 participated at W1 (Cohort 1, $n = 222$; Cohort 2, $n = 211$), 437 participated at

W2 (Cohort 1, *n* = 229; Cohort 2, *n* = 208), 410 participated at W3 (Cohort 1, *n* = 212; Cohort 2, *n* = 198), and 397 participated at W4 (Cohort 1, *n* = 209; Cohort 2, *n* = 188). Participant retention rates were 98.6% from W1 to W2, 93.8% from W2 to W3, and 96.8% from W3 to W4. Overall, there was a 91.7% retention rate from W1 to W4.

For each child with consent to participate, teachers completed surveys on the child's depressive and anxious symptoms at each wave (Reynolds & Kamphaus, 2004). Teachers also reported on child emotional self-regulation at W1 (Shields & Cicchetti, 1997). Caregivers reported on child temperament, as indicators of child emotional, cognitive, and behavioral self-regulation, at W1 and also at W2 for those missing data at W1 (Putnam & Rothbart, 2006). Children completed behavioral assessments of their emotional, cognitive, and behavioral self-regulation at W1 (Cole, 1986; Ponitz et al., 2008; Zelazo, 2006). Caregivers further completed demographic surveys of their household and reported on their attachment and relational frustration with their children at W1 and also at W2 for those missing W1 data (Kamphaus & Reynolds, 2006). Caregivers also reported on their own experience of depressive symptoms at W1 and also at W2 to W4 for those missing data at W1 (Radloff, 1977).

Trained observers conducted structured observations of each participating child to assess their task orientation with peers and teachers in their classroom at W1. Observers completed a two-day training session on the Individualized Classroom Assessment Scoring System Pre-K (inCLASS) observation tool led by a certified inCLASS trainer (Downer et al., 2011). Following training, all observers completed a reliability test which involved viewing and correctly scoring five video clips. All observers were required to demonstrate reliability before conducting observations. Each participating child was observed by a trained observer for a 60-minute period in their classroom, with four 10-minute observation cycles. Observers rotated between observing

two to three children in the classroom over a 2- to 3-hour period. Dimensions of children's task orientation were used as indicators of child cognitive and behavioral self-regulation.

Trained observers also completed structured observations of the quality of interactions in the preschool classrooms at W1 using the Classroom Assessment Scoring System Pre-K (CLASS; Pianta, La Paro, et al., 2008). Observers completed a two-day training session on the CLASS observation tool led by a certified CLASS trainer. Following training, all observers completed a reliability test which involved viewing and correctly scoring four video clips. All observers were required to demonstrate reliability before conducting observations. Each classroom was observed by a trained observer for a 90-minute period, with three 20-minute observation cycles.

Measures

Depressive and Anxious Symptoms

Teachers reported on child depressive and anxious symptoms on the Behavior Assessment System for Children II – Teacher Rating Scale for preschool children (Reynolds & Kamphaus, 2004). Teachers rated how often in the past month children demonstrated *depressive* (e.g., "is easily upset"; 9 items) and *anxious symptoms* (e.g., "is nervous"; 9 items) on a 4-point scale: 0 (*Never*), 1 (*Sometimes*), 2 (*Often*), 3 (*Always*). Item scores were averaged within subscale and showed moderate to high internal consistency at each wave: depression, αs = 0.85 to 0.88; anxiety, αs = 0.76 to 0.83 (see Table 4).

Self-Regulation

Child self-regulation was assessed from commonly used assessments, including reports by teachers and caregivers, observations of children in their classrooms, and behavioural assessments, across aspects of emotional, cognitive, and behavioral self-regulation. Specifically,

emotional self-regulation was assessed from teacher reports (i.e., positive emotion maintenance, negative emotion dysregulation, exuberant emotion dysregulation; Shields & Cicchetti, 1997), caregiver reports (i.e., negative affect; Putnam & Rothbart, 2006), and a behavioral assessment (i.e., negative response to disappointment; Cole, 1986). Cognitive self-regulation was assessed from caregiver reports (i.e., effortful control; Putnam & Rothbart, 2006), child observations (i.e., self-reliance, engagement; Downer et al., 2011), and a behavioral assessment (i.e., Dimensional Change Card Sort performance; Zelazo, 2006). Behavioral self-regulation was assessed from caregiver reports (i.e., impulsivity, adaptability; Putnam & Rothbart, 2006), child observations (i.e., behavior control; Downer et al., 2011), and a behavioral assessment (i.e., Head-Toes-Knees-Shoulders performance; Ponitz et al., 2008).

Teacher reports. Teachers reported on aspects of children's emotional self-regulation on the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997). Teachers rated how often in the past month children demonstrated *emotion regulation* (e.g., "responds positively to neutral or friendly overtures by peers"; 8 items) and *lability/negativity* (e.g., "is prone to angry outbursts or tantrums easily"; 16 items) on a 4-point scale: 0 (*Never*), 1 (*Sometimes*), 2 (*Often*), 3 (*Always*). Item scores were averaged within subscale and showed high internal consistency at W1: emotion regulation, $a = 0.80$; lability/negativity, $a = 0.90$. When conducting measurement invariance analyses for lability/negativity, model fit was less than adequate (see Table 3). Given the importance of examining emotional self-regulation across categories of both positive and negative emotion (see Appendix), three new factors were identified. The measurement invariance of these factors demonstrated improved model fit (see Table 3). Therefore, the current investigation examines these new factors, p*ositive emotion maintenance* (e.g., "responds positively to neutral or friendly overtures by peers"; 7 items), *negative emotion dysregulation*

(e.g., “is prone to angry outbursts or tantrums easily”; 10 items), and *exuberant emotion dysregulation* (e.g., “is overly exuberant when attempting to engage others in play”; 7 items). Item scores were again averaged within subscale and showed high internal consistency at W1: positive emotion maintenance, $a = 0.82$; negative emotion dysregulation, $a = 0.90$; and exuberant emotion dysregulation, $a = 0.83$ (see Table 4).

Caregiver reports. Caregivers reported on their child’s temperament using the Children’s Behavior Questionnaire – Very Short Form (CBQ-VSF; Putnam & Rothbart, 2006). Caregivers rated how often in the past month their child demonstrated *effortful control* (e.g., “when drawing or coloring in a book, shows strong concentration”; 12 items), *negative affect* (e.g., “is very difficult to calm down when she or he becomes upset”; 12 items), and *surgency* (e.g., “seems in a big hurry to get from one place to another”; 12 items) on a 4-point scale: 0 (*Never*), 1 (*Sometimes*), 2 (*Often*), 3 (*Always*). For caregivers missing W1 data, their W2 scores were used for a more complete score. Item scores were averaged within subscale and showed moderate internal consistency: effortful control, $a = 0.68$; negative affect, $a = 0.63$; surgency, $a = 0.58$. When conducting measurement invariance analyses for surgency, model fit was poor (see Table 3). It was found that the surgency items loaded onto two different factors. The measurement invariance of these factors was assessed and provided improved model fit (see Table 3). Therefore, the current investigation examines these new factors, *impulsivity* (e.g., “seems in a big hurry to get from one place to another”; 7 items) and *adaptability* (e.g., “seems to be at ease with almost any person”; 5 items). Item scores were similarly averaged within subscale and showed moderate internal consistency: impulsivity, $a = 0.57$; and adaptability, $a = 0.69$ (see Table 4). The CBQ-VSF has shown cross-cultural validity in Chinese, Dutch, and

Japanese samples (Sleddens et al., 2011) and has shown factorial validity in diverse American and Canadian samples (Putnam & Rothbart, 2006; Sleddens et al. 2012).

Observations. Trained observers rated children's cognitive and behavioral self-regulation using the task orientation domain of the inCLASS (Downer et al., 2011). Observers rated children's three dimensions of task orientation, including *engagement* (e.g., sustained attention, active engagement), *self-reliance* (e.g., personal initiative, independence), and *behavior control* (e.g., patience, matching classroom expectations, physical awareness) in the classroom on a 7-point scale: 1 (*Low*) to 7 (*High*). This was rescaled to a 0 (*Low*) to 6 (*High*) scale for a meaningful zero. Scores were averaged across each of the four observation segments within each dimension. To ensure adequate inter-rater reliability, a portion of children (11.4%) were observed by two research assistants and scores from these double-coded sessions were averaged across observers. Inter-rater reliability (κ) was calculated as the proportion of time that observers were within one point on the rating scale for each dimension. Inter-rater reliability was high for the three dimensions across each of the four observation segments at W1: engagement, κs = 0.83-0.97; self-reliance, κs = 0.84-0.97; and behavior control, κs = 0.87-0.95.

Behavioral assessments. Children completed three behavioral assessments to assess emotional, cognitive, and behavioral self-regulation. First, to measure emotional self-regulation, children completed the Disappointing Gift Task (DGT; Cole, 1986). At the start of a behavioral assessment battery, children were presented with a selection of five toys that ranged from an undesirable toy (e.g., a soother) to a desirable toy (e.g., a toy car). Children were then asked to pick their favorite to least favorite toy and were told they would receive a gift after completing the behavioral assessments. After completing the battery of assessments, children were provided a gift bag with their identified least favorite toy. A second trained research assistant observed

children as they were handed the gift bag. Starting when the child first saw the gift, trained research assistants coded children's *negative response to disappointment* (e.g., distances from or ignores toy; 5 items) for 20 seconds. Following the 20 seconds, children were presented with their favorite toy. Items were coded on a 0 to 1 scale, where 0 indicated absence of the response and 1 indicated presence of the response. Some children (7%) had their responses double-coded, with good inter-rater reliability demonstrated for negative response to disappointment: $k = .96$.

Second, to assess behavioral self-regulation, children completed the Head-Toes-Knees-Shoulders task (HTKS; Ponitz et al., 2008). In part one of the task, the research assistants asked children to touch their head (or their toes), and children were instructed to do the opposite and touch their toes (or their head). Children were assessed across 10 test trials. Part two of the task was administered to preschool children who responded correctly to at least five items during part one. In part two, when children were asked to touch their shoulders (or their knees), they were instructed to do the opposite and touch their knees (or their shoulders). There were 10 test trials for part two that included both sets of opposites: head/toes and knees/shoulders. Children's responses on each trial were scored on a 3-point scale: 0 (*Incorrect response*), 1 (*Self-corrected response*), and 2 (*Correct response*). A response was considered self-corrected when children initially motioned toward an incorrect response but immediately corrected themselves. The range of possible scores across all 20 trials was 0 (*No correct responses*) to 40 (*All correct responses*). On average, children demonstrated a low performance on the HTKS task at W1 (see Table 4).

Third, to assess cognitive self-regulation or attentional flexibility, children completed the Dimensional Change Card Sort task (DCCS; Zelazo, 2006). The task includes seven age-appropriate levels with a different rule for each level. The first four levels have five test trials and one rule. Levels five to seven have 10 test trials and two rules. For each level, the research

assistant states the rule and gives examples (e.g., "If it is blue, then it goes here, and if it is red, then it goes here"). The child is then given the card and they place it in the box that follows the rule. If the child correctly places four or more cards, they move on to the next level. If a child correctly places three or fewer cards, the research assistant moves down a level in the task. The task is complete once the child has achieved a basal or lowest level the child can correctly place four of five cards, highest level where the child can correctly place four or more cards, and a ceiling level the child reached but placed three or fewer cards correctly. A total score is calculated from the seven levels of the task, with a maximum score of 70. On average, children demonstrated a moderate performance on the DCCS task (see Table 4).

Classroom Climate

Trained observers completed observations of the preschool classrooms using the CLASS observational tool (Pianta, La Paro et al., 2008). Observers rated classroom climate on domains of *emotional support* (e.g., positive climate, negative climate, teacher sensitivity, regard for student perspectives), *instructional support* (e.g., concept development, quality of feedback, language modeling), and *organization* (e.g., behavior management, productivity, instructional learning formats) on a 7-point scale: 1 (*Low*) to 7 (*High;* Pianta, La Paro, et al., 2008). This was rescaled to a 0 (*Low*) to 6 (*High*) scale for a meaningful zero. Scores were averaged across each of the three observation segments within each dimension.

Depending on the space and number of adults in the classroom, one to two research assistants conducted observations simultaneously. To assess inter-rater reliability, a portion of classrooms (37.9%) were observed by two research assistants and scores for these double-coded sessions were averaged across observers. Inter-rater reliability (κ) was calculated as the proportion of time that research assistants were within one point for each dimension. Inter-rater

reliability for the 10 dimensions across each of the three observation segments at W1 were as follows: (1) *emotional support*, positive climate κs = 0.50-1.00, negative climate κs = 0.75-1.00, teacher sensitivity κs = 0.75-1.00, regard for student perspectives κs = 0.50-1.00; (2) *instructional support*, concept development κs = 0.75-1.00, quality of feedback κs = 0.75-1.00, language modeling κs = 0.75-1.00; and (3) *organization*, behaviour management κs = 0.63-1.00 (W1), productivity κs = 0.88-1.00, and instructional learning formats κs = 1.00.

Baseline Covariates

Baseline covariates included: (1) demographic information on the preschool program (0 = *Program A*, 1 = *Program B*), child gender (0 = *boys*, 1 = *girls*), household number of caregivers (0 = *two-caregiver household*, 1 = *single-caregiver household*), and primary caregiver education (0 = *did not finish high school*, 1 = *high school diploma/equivalent and/or some post-secondary education*, 2 = *post-secondary degree*); (2) caregiver depressive symptoms; (3) caregiver-child attachment and relational frustration; (4) peer sociability and conflict; and (5) teacher-child positive engagement and conflict.

Caregivers reported on their *depressive symptoms* on the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). Caregivers rated how often in the last two weeks they felt the statements reflected their feelings (e.g., “I felt depressed”; 20 items) on a 5-point scale: 0 (*Never*), 1 (*Rarely*), 2 (*Sometimes*), 3 (*Often*), and 4 (*Always*). Caregiver depressive symptom data was used for the first wave reported (e.g., W2 depressive symptoms was used for caregivers missing these data at W1). Item scores were averaged and caregiver depressive symptoms showed high internal consistency at each wave: αs = 0.88 to 0.92. On average, caregiver depressive symptoms were moderate in frequency (see Table 4). The CES-D has shown factorial validity across Armenian, Black South African, Chinese, Greek, Japanese,

Polish, and diverse American samples (Cheung & Bagley, 1998; Fountoulakis et al., 2001; Kazarian, 2009; Moore et al., 2016; Orme et al., 1986; Pretorius, 1991; Sugawara et al., 2011; Zhang et al., 2012; Ziarko et al., 2013).

Caregivers reported on their attachment and relational frustration with their child using the Parenting Relationship Questionnaire (PRQ; Kamphaus & Reynolds, 2006). Caregivers reported how often statements regarding *attachment* (e.g., "My child enjoys spending time with me"; 11 items) and *relational frustration* (e.g., "I overreact when my child misbehaves"; 8 items) described their beliefs as a parent and experiences with their child on a 5-point scale: 0 (*Never*), 1 (*Rarely*), 2 (*Sometimes*), 3 (*Often*), 4 (*Always*). For caregivers who did not report attachment or relational frustration data at W1, their W2 data was used. Item scores were averaged within subscale and showed high internal consistency at W1 and W2: attachment, αs = 0.81 to 0.82; relational frustration, αs = 0.82 to 0.84. On average, attachment was reported as high and relational frustration was reported as moderate in frequency (see Table 4).

Trained research assistants rated children's peer sociability and conflict and teacher-child positive engagement and conflict using the inCLASS observational tool (Downer et al., 2011). Observers coded children's levels of *peer sociability* (e.g., proximity-seeking, shared positive affect, cooperation, popularity), *peer conflict* (e.g., aggression, negative affect, attention-seeking, confrontation), *teacher-child positive engagement* (e.g., attachment, proximity-seeking, shared positive affect), and *teacher-child conflict* (e.g., aggression, negative affect, attention-seeking, noncompliance) on a 7-point scale at W1: 1 (*Low*) to 7 (*High*). This was rescaled to a 0 (*Low*) to 6 (*High*) scale for a meaningful zero. On average, peer sociability and teacher-child positive engagement were rated as moderate and peer and teacher-child conflict were rated as low. Inter-rater reliability was relatively high for the peer and teacher-child relations across each of the four

observation segments at W1: peer sociability, κs =. .89-.97; peer conflict, κs = .95-1.00; teacher-child positive engagement, κs = .61-.89; and teacher-child conflict, κs = .95-1.00.

Data Analytic Plan

Data analyses are conducted in six sections. First, confirmatory factor analyses (CFAs) are used to assess the measurement invariance of (1) depressive and anxious symptoms across the four waves of data, and (2) depressive and anxious symptoms and the self-regulation indicators by gender at W1. Second, descriptive statistics and bivariate correlations of depressive and anxious symptoms, self-regulation indicators, classroom climate domains, and baseline covariates (i.e., caregiver depressive symptoms, caregiver-child attachment and relational frustration, peer sociability and conflict, teacher-child positive engagement and conflict) are examined. Third, latent growth curve models (LCGM) are used to examine the average change in the frequency of depressive and anxious symptoms from fall of preschool to spring of kindergarten. Fourth, latent growth mixture models (LGMM) are used to estimate heterogeneity in the trajectories of depressive and anxious symptoms across preschool and kindergarten. Fifth, latent profile analyses (LPA) are used to identify qualitatively distinct profiles of self-regulation at fall of preschool. Sixth, multinomial logistic regression is used to examine whether the profiles of self-regulation identified in the LPAs and the classroom climate domains discriminate between the depressive and anxious symptoms trajectories identified in the LGMMs. Conditional LGMMs and multinomial logistic regressions that included the set of baseline covariates were tested last and included: preschool program, child gender, single- or two-caregiver household, caregiver education, caregiver depressive symptoms, caregiver-child attachment and relational frustration, peer sociability and conflict, and teacher-child positive engagement and conflict. Conditional LGMMs and multinomial logistic regressions were also clustered by preschool

classroom to account for dependency in the data from teacher-child variables (e.g., teacher-child conflict) and classroom variables (e.g., organization).

Model fit of the CFAs and LGCMs was 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, 2016). Good-fitting models should demonstrate a non-significant χ^2, although this measure is sensitive to sample size and thus other fit indices are used. CFI values of 0.95 or greater signify excellent model fit and values of 0.90-0.94 signify adequate fit (Kline, 2016). RMSEA and SRMR values of 0.05 or lower signify excellent model fit whereas values of 0.06-0.08 indicate adequate fit. All model comparisons were assessed using the Satorra-Bentler scaled χ^2 likelihood ratio test to assess differences in model fit of nested models. The Bayesian information criterion (BIC) assesses differences in model fit of non-nested models. Lower BIC values indicate a better fit to the model; differences in BIC values between 6 and 10 indicate strong support and differences over 10 demonstrate very strong support for a significantly better fit (Raftery, 1995). Model selection was guided by model fit comparison using the Satorra-Bentler scaled χ^2 likelihood ratio test for nested models or BIC value for non-nested models, highest CFI value, and lowest RMSEA and SRMR values. Model selection was also guided by improvement in CFI, RMSEA, and SRMR values for nested and non-nested models.

Model fit of the LGMMs and LPAs was assessed using the following criteria: (a) log-likelihood; (b) Akaike information criterion (AIC); (c) Bayesian information criterion (BIC); (d) sample-size adjusted Bayesian information criterion (SABIC); (e) Lo-Mendell-Rubin adjusted likelihood ratio test (LLRT); (f) Vuong-Lo-Mendell-Rubin likelihood ratio test (VLRT); (g) bootstrapped likelihood ratio test (BLRT); (h) entropy; and (i) a conceptually clear model (Ram

& Grimm, 2009). The log-likelihood allows comparison among nested models, with greater values indicating better model fit. The AIC, BIC, and SABIC also allow comparison among non-nested models, with lower values indicating better model fit; differences in values between 6 and 10 indicate strong support and differences over 10 demonstrate very strong support for a significantly better fit (Raftery, 1995). The LLRT, VLRT, and BLRT compare models with *k* classes and *k*-1 classes, with significant *p*-values indicating the *k*-class model shows significant improvement over the *k*-1 class model. Entropy indicates classification accuracy on a range from 0.00 to 1.00, with higher values (> 0.80) indicating clear separation between the latent classes and greater precision in predicting class membership.

Results from the multinomial logistic regression analyses were assessed via: (a) the logistic regression coefficient; and (b) the odds ratio and its 90% confidence interval. Multinomial logistic regression analyses produce a logistic regression coefficient that, if significant, suggests significant influence of a predictor on the outcome variable. A significant logistic regression coefficient suggests that a predictor significantly discriminates between two identified latent class trajectories. The logistic regression coefficient is not directly interpretable. Instead, the logistic regression coefficient is converted into an odds ratio as logistic regression estimates the log odds, or the natural logarithm of the odds ratio (Norton et al., 2018). The odds ratio is an interpretable statistic and is compared to 1, with values significantly greater or less than 1 suggesting influence of a predictor on the outcome variable. The odds ratio 90% confidence interval provides further interpretation, with confidence intervals that do not include 1 considered to be statistically significant at $p < .05$ (Norton et al., 2018). Given the interpretability of the odds ratio confidence interval, this statistic was used to guide determination of influence by the predictors and baseline covariates.

Missing Data

This study had missing data due to varied reasons, including non-response on complete surveys, non-response on select survey items, challenges conducting child assessments (e.g., child disinterested or unable to focus), and absenteeism during the data collection period. Missing data were examined across teacher and caregiver reports, child observations, and child behavioral assessments. Children missing data by reporter or assessment at any wave were compared to children with no missing data on (a) cohort (1 = *Cohort 1*, 2 = *Cohort 2*), child ethnicity (0 = *Canadian/European*, 1 = *ethnic minority*), child immigration status (0 = *not ever a landed immigrant or permanent resident,* 1 = *ever a landed immigrant or permanent resident*), caregiver immigration status (0 = *not ever a landed immigrant or permanent resident*, 1 = *ever a landed immigrant or permanent resident*), frequency of a language other than English spoken in the household (0 = *Never* to 4 = *All the time*), and the set of baseline covariates, (b) baseline depressive and anxious symptoms (for caregiver-reported data and child observations and behavioral assessments), and (c) indicators of self-regulation.

Missing Teacher-, Caregiver-, and Observer-Reported Data

Overall, 49.0% (n = 217) of children had teacher-reported data at all waves, 16.7% (n = 74) had teacher-reported data at three waves only, 22.6% (n = 100) had teacher-reported data at two waves only, 8.4% (n = 37) had teacher-reported data at one wave only, and 3.4% (n = 15) had no teacher-reported data at any wave. Compared to children not missing teacher-reported data, children missing teacher-reported data at any wave were more likely to: (1) be in preschool Program A (55.1%) than Program B (44.9%), χ^2 (1) = 7.32, $p < .05$; (2) show less observed engagement (M = 3.46, SE = 0.08 vs M = 3.70, SE = 0.07), t (337) = 2.22, $p < .05$; and score lower on the DCCS (M = 36.10, SE = 1.03 vs M = 38.95, SE = 0.97, t (349) = 2.00, $p < .05$.

There were no differences in missing teacher-reported data by cohort, child ethnicity, child or caregiver immigration status, or frequency of a language other than English spoken in the household.

Across W1 and W2, 41.5% (n = 184) of children had caregiver-reported data at both waves, 29.1% (n = 129) had caregiver-reported data at one wave, and 29.3% (n = 130) had no caregiver-reported data at either wave. Compared to children with no missing caregiver-reported data, children missing caregiver-reported data were more likely to: (1) be in preschool Program A (36.1%) than Program B (15.9%), χ^2 (1) = 19.08, $p < .05$; (2) live in a single-caregiver household (18.0%) than a two-caregiver household (5.2%), χ^2 (1) = 11.84, $p < .05$; (3) have a caregiver with lower education (M = 2.78, SE = 0.46 vs M = 4.35, SE = 0.11), t (325) = 3.68, $p < .01$; and (4) show less peer sociability (M = 1.29, SE = 0.10 vs M = 1.68, SE = 0.07), t (338) = 3.07, $p < .01$. There were no differences in missing caregiver-reported data by cohort, child ethnicity, child or caregiver immigration status, frequency of a language other than English spoken in the household, or baseline depressive and anxious symptoms.

Overall, 77.0% (n = 341) of children had observation data at W1. Compared to children with no missing data, children missing observation data at W1 showed less teacher-reported anxious symptoms at W1 (M = 0.35, SE = 0.04 vs M = 0.47, SE = 0.02); t (112) = 2.53, $p < .05$. There were no differences in missing observation data by cohort, child ethnicity, child or caregiver immigration status, frequency of a language other than English spoken in the household, any baseline covariate, baseline depressive symptoms, or any indicator of self-regulation.

Missing Behavioral Assessment Data

Overall, 80.1% (n = 355) of children had DGT data at W1. Compared to children not missing DGT data, children missing DGT data at W1 were more likely to: (1) be in preschool Program A (26.9%) than Program B (4.1%), χ^2 (1) = 32.14, $p < .01$; (2) show less observed peer conflict (M = 0.10, SE = 0.03 vs M = 0.18, SE = 0.02), t (95) = -2.05, $p < .05$; and (3) show less teacher-reported positive emotion maintenance (M = 1.89, SE = 0.07 vs M = 2.08, SE = 0.03), t (385) = -2.46, $p < .05$. There were no differences in missing DGT data by cohort, child ethnicity, child or caregiver immigration status, frequency of a language other than English spoken in the household, or baseline depressive and anxious symptoms.

Overall, 74.3% (n = 329) of children had HTKS data at W1. Compared to children missing no HTKS data, children missing HTKS data at W1 were more likely to: (1) be in preschool Program A (31.6%) than Program B (11.7%), χ^2 (1) = 20.50, $p < .01$; (2) show less observed teacher-child positive engagement (M = 1.30, SE = 0.10 vs M = 1.56, SE = 0.06), t (338) = 2.09, $p < .05$, and task engagement (M = 3.26, SE = 0.12 vs M = 3.67, SE = 0.06), t (337) = 3.08, $p < .01$; (3) show less teacher-reported positive emotion maintenance (M = 1.88, SE = 0.06 vs M = 2.10, SE = 0.03), t (385) = 3.22, $p < .01$; and (4) score lower on the DCCS (M = 29.6, SE = 2.82 vs M = 38.24, SE = 0.73), t (349) = 3.16, $p < .01$. There were no differences in missing HTKS data by cohort, child ethnicity, child or caregiver immigration status, frequency of a language other than English spoken in the household, or baseline depressive and anxious symptoms.

Overall, 77.9% (n = 345) of children had DCCS data at W1. Compared to children missing no DCCS data, children missing DCCS data at W1 were more likely to: be in preschool Program A (27.9%) than Program B (8.3%), χ^2 (1) = 22.20, $p < .01$; (2) show less observed peer conflict (M = 0.09, SE = 0.03 vs M = 0.19, SE = 0.02), t (147) = 2.64, $p < .01$, teacher-child

positive engagement (M = 1.27, SE = 0.12 vs M = 1.55, SE = 0.05), t (338) = 2.01, $p < .05$, and task engagement (M = 3.33, SE = 0.14 vs M = 3.64, SE = 0.06), t (337) = 2.03, $p < .05$; and (3) show less teacher-reported positive emotion maintenance (M = 1.83, SE = 0.06 vs M = 2.10, SE = 0.03), t (385) = 3.55, $p < .01$. There were no differences in missing DCCS data by cohort, child ethnicity, child or caregiver immigration status, frequency of a language other than English spoken in the household, or baseline depressive and anxious symptoms.

In the LGCM, LPA, and LGMM analyses, missing data were handled using full information likelihood (FIML) estimation with robust standard errors (Allison, 2002). FIML estimation uses data available from each case to produce unbiased parameter estimates and standard errors. The likelihood estimate is computed separately for cases with incomplete data and for cases with complete data, integrating estimates over all possible values to produce parameter estimates that are most likely to have resulted in the observed data (Allison, 2002; Enders & Bandalos, 2001). FIML estimation is an accepted approach for handling longitudinal data missing at random (Asendorpf et al., 2014). The self-regulation indicators were regressed on child gender and child age in the LPAs to address missingness, as these are standard demographic covariates. As FIML does not impute missing values, baseline covariates were imputed using multiple imputation in the LGMMs and multinomial logistic regression analyses. A total of 20 imputed datasets were estimated using Mplus 8 (Muthén & Muthén, 2017). The average values across the imputations were included in the LGMMs and multinomial logistic regression analyses.

CHAPTER IV

Results

Confirmatory Factor Analyses

A series of confirmatory factor models were conducted to assess the measurement invariance of depressive and anxious symptoms across waves and across gender at W1 (Widaman & Grimm, 2014). A series of confirmatory factor models also assessed the measurement invariance of emotion regulation, lability/negativity, effortful control, negative affect, and surgency across gender at W1. First, a measurement model for each construct was tested. Next, a configural invariance model was tested to assess whether the pattern of factor loadings was the same across waves or gender. If configural invariance was achieved, a metric invariance model assessed whether the factor loadings were invariant across waves or gender. Upon achievement of metric invariance, a scalar invariance model tested whether the factor loadings and indicator intercepts were invariant across waves or gender.

Across waves, partial metric invariance was achieved for depressive symptoms (i.e., one factor loading was freed to vary across waves) and partial scalar invariance was achieved for anxious symptoms (i.e., four item intercepts were freed to vary across waves; see Table 2). Across gender, partial scalar invariance was achieved for depressive symptoms (i.e., two item intercepts were freed to vary across gender) and partial metric invariance was achieved for anxious symptoms (i.e., two factor loadings were freed to vary across gender; see Table 3). Based on these results, depressive and anxious symptoms were modeled as manifest constructs.

Across gender, partial scalar invariance was achieved for emotion regulation (i.e., four item intercepts were freed to vary across gender), and partial metric invariance was achieved for lability/negativity (i.e., three factor loadings were freed to vary across gender; see Table 3),

though model fit was less than adequate (see Table 3). Based on these results and the importance of examining emotional self-regulation across categories of both positive and negative emotion (see Appendix), three dimensions were tested from the emotion regulation and lability/negativity items: positive emotion maintenance, negative emotion dysregulation, and exuberant emotion dysregulation. Partial scalar invariance was achieved for positive emotion maintenance (i.e., three item intercepts were freed to vary across gender) and negative emotion dysregulation (i.e., two item intercepts were freed vary to vary across gender), while partial metric invariance was achieved for exuberant emotion dysregulation (i.e., one factor loading was freed to vary across gender; see Table 3). The measurement invariance of these dimensions provided improved model fit. Based on these results, positive emotion maintenance and negative and exuberant emotion dysregulation were modeled as manifest constructs.

Across gender, full metric invariance was achieved for effortful control and partial scalar invariance was achieved for negative affect (i.e., two item intercepts were freed to vary across gender; see Table 3). Partial scalar invariance was achieved for surgency though model fit was poor. Based on the results from the measurement invariance analyses, two separate dimensions were tested from the surgency items: impulsivity and adaptability. The impulsivity dimension achieved partial scalar invariance (i.e., one item intercept was freed to vary across gender) and the adaptability dimension achieved full scalar invariance, with both providing improved model fit (see Table 3). Based on these results, effortful control, negative affect, impulsivity, and adaptability were modeled as manifest constructs.

Descriptives Statistics and Bivariate Correlations

Descriptive statistics of depressive and anxious symptoms, self-regulation, and baseline covariates for the overall sample are presented in Table 4. On average, teachers reported a low

frequency of children's depressive and anxious symptoms across all waves. Teachers also reported a high frequency of positive emotion maintenance and a low frequency of negative and exuberant emotion dysregulation at W1. Caregivers reported a moderate frequency of their children's effortful control, negative affect, impulsivity, and adaptability across W1 and W2. Observers reported a low degree of self-reliance, moderate degree of engagement, and a high degree of behavior control for children at W1. Children demonstrated few negative responses to disappointment in the DGT at W1. Children also had moderate DCCS and low HTKS performance at W1. Regarding baseline covariates, caregivers reported a moderate frequency of depressive symptom experience across waves, as well as high child attachment and moderate relational frustration across W1 and W2. Research assistants observed children as low in peer sociability and conflict as well as low in teacher-child positive engagement and conflict at W1.

Research assistants observed preschool classrooms as high in emotional support and classroom organization but low in instructional support at W1: emotional support, $M = 4.79$, $SD = 0.30$, range = 4.19 to 5.53, variance = 0.09; classroom organization, $M = 4.52$, $SD = 0.41$, range = 3.75 to 5.25, variance = 0.17; instructional support, $M = 1.18$, $SD = 0.44$, range = 0.33 to 2.25, variance = 0.20.

The repeated-measure data in this study were nested within child and within preschool classroom. To assess the dependency of these symptom data by classroom clustering, intraclass correlation coefficients (ICCs) were calculated for depressive and anxious symptoms at each wave. Small to moderate ICCs were found for depressive (W1 = 0.17, W2 = 0.15, W3 = 0.03, W4 = 0.05) and anxious symptoms (W1 = 0.27, W2 = 0.25, W3 = 0.05, W4 = 0.07). The small to moderate ICCs suggest that the proportion of variance in depressive and anxious symptoms was predominantly within-classroom rather than between-classroom at each wave.

Bivariate correlations between depressive and anxious symptoms and baseline covariates are presented in Table 5. Rank order stability was moderate to high for depressive symptoms (*r*s = 0.30 - 0.67) and low to high for anxious symptoms (*r*s = 0.07 - 0.63). Depressive and anxious symptoms were positively and strongly correlated within each wave as well as positively correlated with caregiver depressive symptoms. Depressive symptoms were also positively correlated with peer and teacher-child conflict. No other correlations with the baseline covariates were significant.

Bivariate correlations between depressive and anxious symptoms and indicators of self-regulation are presented in Table 6. Depressive and anxious symptoms were negatively and weakly to moderately correlated with positive emotion maintenance, effortful control, and behavior control, as well as positively and weakly to strongly correlated with negative and exuberant emotion dysregulation and negative response to disappointment. Anxious symptoms were positively and weakly correlated with negative affect and behavior control. No other correlations with the self-regulation indicators were significant.

Correlations among the indictors of emotional self-regulation, including positive emotion maintenance, negative and exuberant emotion dysregulation, and negative response to disappointment, were generally significant (see Table 6). Correlations were also found among the indicators of cognitive self-regulation, with engagement positively correlated with self-reliance and DCCS performance. Correlations were further found among the caregiver-reported indicators, effortful control, negative affect, impulsivity, and adaptability, which demonstrated positive correlations. Correlations among the observed indicators, engagement, behavior control, and self-reliance, demonstrated positive correlations. Generally, the observed indicators were also correlated with positive emotion maintenance and negative and exuberant emotion

dysregulation. HTKS and DCCS performance were also positively correlated with each other as well as correlated with positive emotion maintenance, exuberant emotion dysregulation, negative response to disappointment, engagement, self-reliance, and behavior control. Finally, effortful control was correlated with negative and exuberant emotion dysregulation and behavior control.

At W1, classroom emotional support was positively and strongly correlated with classroom organization ($r = 0.79$, $p < .01$) but not significantly correlated with classroom instructional support ($r = 0.24$, *ns*). Classroom organization was positively and strongly correlated with classroom instructional support ($r = 0.49$, $p < .01$).

Latent Growth Curve Models

A series of unconditional LGCMs was examined to assess change in depressive and anxious symptoms. 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), assuming measurement error would be related within school year and reporter. The indicator variances were constrained to be equal across waves. Fixed and random growth factors were added sequentially, and the best-fitting LGCMs were determined by comparing the fit of each nested model.

Comparison of the unconditional LGCMs indicated that the fixed quadratic slope model fit the data best for depressive symptoms, with this model providing an adequate fit to the data (see Table 7). The fixed quadratic slope model showed that depressive symptoms were low in frequency at fall of preschool ($B = .40$, $SE = .02$, $p < .01$), increased linearly ($B = .05$, $SE = .02$, $p < .05$), and decelerated by spring of kindergarten ($B = -.02$, $SE = .01$, $p > .01$).

The best-fitting LGCM for anxious symptoms was a random linear slope model, with this model providing an excellent fit to the data (see Table 7). The random linear slope model

showed that anxious symptoms were low in frequency at fall of preschool (B = .46, SE = .02, p < .01) and decreased linearly by spring of kindergarten (B = -.03, SE = .01, p < .01).

Objective One: Latent Growth Mixture Models

LGMMs were used to identify qualitatively distinct subgroups of children who followed different latent class trajectories of depressive and anxious symptoms from preschool through kindergarten. LGMM is a person-centered approach that involves the addition of a latent categorical classification variable in a latent growth curve model (Grimm et al., 2017). The latent categorical classification variable influences the growth parameters and allows for estimation of qualitatively distinct latent class trajectories that vary around different mean scores. LGMM allows for between-person differences to manifest as differences in classification (Grimm et al., 2017).

Ram and Grimm (2009) propose a series of steps for conducting LGMM analysis. First, a baseline growth model is obtained by applying latent growth curve modeling procedures to the full data set. Second, the number of classes are sequentially increased from the baseline growth model (e.g., 2-class, 3-class, etc.). Third, the specified models are estimated and the best-fitting model is selected by examining parameter estimates and fit statistics, with attention to both the empirical and theoretical justification.

Depressive Symptoms

A two-class model was determined as the best-fitting LGMM (see Tables 8 and 9; see Figure 1). The two latent class trajectories were labeled: *low with decelerated growth* (n = 396; 92.81%) and *moderate with accelerated growth* (n = 31; 7.19%). Children in the *low with decelerated growth* trajectory demonstrated a low frequency of depressive symptoms at fall of preschool (B = 0.34, SE = 0.02, p < .01) that gradually increased over time (B = 0.04, SE = 0.02,

$p < .01$) and marginally decelerated in frequency by spring of kindergarten ($B = -0.02$, $SE = 0.01$, $p < .01$). Children in the *moderate with accelerated growth* trajectory demonstrated a moderate frequency of depressive symptoms at fall of preschool ($B = 1.20$, $SE = 0.16$, $p < .01$) that gradually increased over time ($B = 0.05$, $SE = 0.14$, $p < .01$) and marginally accelerated by spring of kindergarten ($B = 0.01$, $SE = 0.04$, $p < .01$).

Prediction of the depressive symptoms trajectories by baseline covariates in the two-class model are presented in Table 10. Peer conflict demonstrated significant influence on the trajectories of depressive symptoms. Compared to children who demonstrated less peer conflict, children with greater peer conflict were 3.89 times more likely to be in the *moderate with accelerated growth* than the *low with decelerated growth* trajectory. The remainder of the baseline covariates did not discriminate between the depressive symptoms trajectories.

Anxious Symptoms

A three-class model was determined as the best-fitting LGMM for anxious symptoms (see Tables 11 and 12; see Figure 2). The three latent class trajectories were labeled: *low and stable* ($n = 361$; 84.40%), *moderate and decreasing* ($n = 37$; 8.66%), and *low and increasing* ($n = 29$; 6.94%). Children in the *low and stable* trajectory showed a low frequency of anxious symptoms at fall of preschool ($B = 0.37$, $SE = 0.03$, $p < .01$) that remained stable across preschool and kindergarten ($B = -0.02$, $SE = 0.01$, *ns*). Children in the *moderate and decreasing* trajectory showed a moderate frequency of anxious symptoms at fall of preschool ($B = 1.26$, $SE = 0.20$, $p < .01$) and decreased in their symptoms across preschool and kindergarten ($B = -0.30$, $SE = 0.07$, $p < .01$). Children in the *low and increasing* trajectory showed a low frequency of anxious symptoms at fall of preschool ($B = 0.52$, $SE = 0.10$, $p < .01$) and increased in their symptoms across preschool and kindergarten ($B = 0.22$, $SE = 0.05$, $p < .01$). Across the LGMMs

for anxious symptoms, the variance of the linear slopes was constrained due to some models with a negative slope invariance. Prediction of the anxious symptoms trajectories by baseline covariates in the three-class model are presented in Table 13. None of the baseline covariates significantly influenced the anxious symptoms trajectories.

There was overlap in the classification between the depressive and anxious symptoms trajectories, χ^2 (2) = 107.04, $p < .01$. For instance, 91.7% of children classified in the *low with decelerated growth* depressive symptoms trajectory were also classified in the *low and stable* anxious symptoms trajectory, suggesting substantial overlap in the classification of these trajectories (see Table 14). There was moderate overlap between the *moderate with accelerated growth* depressive symptoms trajectory with each of the anxious symptoms trajectories: 32.1% of children were also classified in the *low and stable* trajectory, 25.0% were classified in the *moderate and decreasing* trajectory, and 42.8% were classified in the *low and increasing* trajectory.

Objective Two: Latent Profile Analysis of Self-Regulation

LPA was used next to determine whether there were qualitatively distinct profiles of children who demonstrated different self-regulatory abilities at the fall of preschool. LPA is a person-centered approach that involves the addition of a latent categorical classification variable in a generalized linear model (Masyn, 2013). The latent categorical classification variable influences the manifest indicators of self-regulation and allows for estimation of qualitatively distinct profiles that vary around different relative frequencies of item endorsements. Masyn (2013) proposed a series of steps for conducting LPA. A one-profile model is estimated by designating the latent categorical classification variable as one, with this model estimation repeated by increasing the latent categorical classification variable by one at each repetition until

a model is not well identified. These subsequent models are tested against the previous model, with one less estimated class, based on fit indices: log-likelihood, AIC, BIC, SABIC, LLRT, VLRT, BLRT, entropy, and a conceptually clear model.

The best-fitting LPA for self-regulation was a three-profile model (see Table 15). While the two-profile model provided the lowest VLRT and LLRT *p*-values, the three-profile model demonstrated significant VLRT and LLRT *p*-values, indicating the three-profile model differs significantly from the two-profile model (Masyn, 2013). The four-profile model demonstrated better log-likelihood, AIC, and entropy values than the three-profile model. Yet the log-likelihood and AIC can be sensitive to the number of profiles selected, usually leading to greater log-likelihood values and lower AIC values demonstrated when a greater number of profiles are estimated. The three-profile model entropy value was 0.87, indicating adequate precision in profile classification. The four-profile model had a profile with a low proportion (3.30%), smaller than the typical minimum 5% proportion needed to be considered a distinct profile in LPA. For these reasons and the distinction of the pattern of item endorsements across the self-regulation indicators, the three-profile model was chosen as the best-fitting model.

In the three-profile model, the largest profile consisted of 69.95% (n = 294) of the sample and was labeled the *typically-regulated* profile. The second profile, labeled the *behaviorally-overregulated* profile, consisted of 20.84% (n = 88) of the sample. The smallest profile had 9.50% (n = 40) of the sample and was labeled the *emotionally-dysregulated* profile. Identical model-estimated class prevalences and modal class assignment proportions, great average posterior class probabilities (*AvePP*), and high odds of correct classification ratios (*OCC*) for each profile further support the three-profile model (see Table 16). The self-regulation indicators showed low variability across the profiles, ranging from 0.87 to 0.99, suggesting that

the profiles had a high degree of homogeneity with respect to all indicators (see Table 17). The observed and model-estimated values for the means, variables, and skewness of each self-regulation indicator were the same or had a difference of 0.01 (see Table 18). The observed and model-estimated kurtosis values differed by a range of 0.01 to 0.07, indicating a degree of over-estimation in the kurtosis of some of the indicators. Even with this, the profiles demonstrated good separation and accurate profile assignment for each indicator.

In Table 19, the distance estimates for each pairwise profile comparison on each self-regulation indicator is presented. The *typically-regulated* profile (69.95%) demonstrated moderate emotional, cognitive, and behavioral self-regulation. The *behaviorally-overregulated* profile (20.84%) demonstrated greater behavioral self-regulation, specifically greater HTKS performance, than the other profiles, with large estimated differences. The *emotionally-dysregulated* profile (9.50%) demonstrated poorer emotional self-regulation as compared to the other profiles. The *emotionally-dysregulated* profile demonstrated more emotional dysregulation, with large estimated differences found for negative emotion dysregulation and moderate estimated differences also found for exuberant emotion dysregulation. The *emotionally-dysregulated* profile also demonstrated lower positive emotion maintenance than the *behaviorally-overregulated* profile and lower behavior control than the *typically-regulated* profile, with moderate estimated differences. No estimated differences were found related to cognitive self-regulation. The standardized means of the self-regulation indicators per profile are shown in Figure 3.

Objectives Three and Four: Multinomial Logistic Regression

Multinomial logistic regression was used to assess whether the self-regulation profiles, domains of classroom climate, and baseline covariates discriminate between the depressive and

anxious symptoms trajectories. The regressions with the self-regulation profiles were conducted by adding the probabilities of profile membership for the *emotionally-dysregulated* and *behaviorally-overregulated* profiles as auxiliary variables to the final LGMMs, with the *typically-regulated* profile as the referent group. The classroom climate domains were included separately in the model by sequentially adding classroom emotional support, organization, or instructional support as an auxiliary variable to the final LGMMs. Thus three models were tested for both the depressive and anxious symptoms trajectories, one for each classroom climate domain. The baseline covariates were also included as auxiliary variables. After conducting the initial analyses with all baseline covariates, preschool program, caregiver marital status, and caregiver education were not included in the final multinomial logistic regression models as they did not demonstrate significant influence. Removal of these baseline covariates allows for a more accurate interpretation of predictor influence, as the addition of more independent variables can reduce the scaling factor involved in logistic regression, resulting in an arbitrary increase in the odds ratio of these variables (Norton et al., 2018).

Depressive Symptoms

The multinomial logistic regression analyses for depressive symptoms are presented in Table 20. The self-regulation profiles discriminated between the depressive symptoms trajectories. Across the three classroom climate domain models and relative to the *typically-regulated* self-regulation profile, children in the *emotionally-dysregulated* profile were 33.53 to 36.01 times more likely to be in the *moderate with accelerated growth* than the *low with decelerated growth* trajectory. Relative to the *typically-regulated* profile, children in the *behaviorally-overregulated* profile were 3.06 to 3.19 times more likely to be in the *moderate with accelerated growth* than the *low with decelerated growth* trajectory. The classroom climate

domains did not discriminate between children's depressive symptoms trajectories (see Table 20).

Anxious Symptoms

While the variance of the anxious symptoms linear slope was constrained in the final LGMM, the variance of the linear slope was allowed to be free in the multinomial logistic regression analyses. This resulted in a small degree of shifting in the class proportions, with 85.10% of children in the *low and stable* trajectory, 7.90% of children in the *moderate and decreasing* trajectory, and 7.00% of children in the *low and increasing* trajectory. The growth parameters for each latent class trajectory were unchanged.

Results from the multinomial logistic regression analyses for anxious symptoms are presented in Tables 21 and 22. The *emotionally-dysregulated* self-regulation profile demonstrated significant discrimination between the anxious symptoms trajectories. Across the three classroom climate domain models and compared to the *typically-regulated* profile, children in the *emotionally-dysregulated* profile were 15.27 to 32.06 times more likely to be in the *moderate and decreasing* than the *low and stable* trajectory. Compared to the *typically-regulated* profile, children in the *emotionally-dysregulated* profile were 2.77 to 3.62 times more likely to be in the *low and increasing* than the *low and stable* trajectory. The *emotionally-dysregulated* profile only demonstrated influence in the model that included instructional support. The *behaviorally-overregulated* profile did not significantly discriminate between the anxious symptoms trajectories.

Classroom emotional support and organization significantly differentiated between the *moderate and decreasing* and *low and stable* anxious symptoms trajectories (see Table 21). Children in classrooms with greater emotional support were 35.96 times more likely to be in the

moderate and decreasing than the *low and stable* anxious symptoms trajectory. Children in classrooms with greater organization were 11.62 times more likely to be in the *moderate and decreasing* than the *low and stable* anxious symptoms trajectory. The classroom climate domains did not demonstrate any other significant discrimination between the anxious symptoms trajectories.

Baseline Covariates

The baseline covariates were accounted for in the multinomial logistic regression analyses that included the profiles of self-regulation and domains of classroom climate. Peer conflict demonstrated significant influence on the trajectories of depressive symptoms (see Table 20). Children who experienced more frequent peer conflict were 5.63 to 5.97 times more likely to be in the *moderate with accelerated growth* than the *low with decelerated growth* trajectory. The remainder of the baseline covariates did not discriminate between the depressive symptoms trajectories (see Table 20).

Caregiver attachment and peer sociability and conflict discriminated between the *low and increasing* and *low and stable* anxious symptoms trajectories in the multinomial logistic regression analyses (see Table 22). Caregiver attachment and peer conflict significantly differentiated between the *low and increasing* and *low and stable* trajectories when classroom instructional support was included. Compared to children with less caregiver attachment, children with greater caregiver attachment were 3.24 (90% confidence interval: 1.25 to 8.40) times more likely to be in the *low and stable* than the *low and increasing* trajectory. Children with greater peer conflict were 3.74 times more likely to be in the *low and increasing* than the *low and stable* trajectory. Compared to children with less peer sociability, children with greater peer sociability were 1.94 (90% confidence interval: 1.01 to 3.73) to 2.12 (90% confidence

interval: 1.02 to 4.78) times more likely to be in the *low and stable* than the *low and increasing* trajectory when classroom emotional support and instructional support were included. The remainder of the baseline covariates did not demonstrate significant influence on the anxious symptoms trajectories (see Table 22).

CHAPTER V

Discussion

Guided by a developmental psychopathology perspective (Cicchetti, 2020; Masten, 2004, 2006), the current research addressed the overarching aim to characterize and explain variability in trajectories of depressive and anxious symptoms in early childhood. First, the current research investigated heterogeneity in depressive and anxious symptoms across preschool and kindergarten, with two trajectories identified for depressive symptoms and three trajectories identified for anxious symptoms. These findings make two main contributions to understanding the development of depressive and anxious symptoms in early childhood. First, depressive and anxious symptoms demonstrated unique developmental trajectories, supporting separate examination of these symptomologies in early childhood. Second, while most children demonstrated a low and decelerating pattern of depressive symptoms and low and stable pattern of anxious symptoms, other children are vulnerable to elevated or increasing symptoms in early childhood that may warrant intervention.

The current research further tested for qualitatively distinct profiles of children's self-regulation at the fall of preschool and their association with heterogeneity in depressive and anxious symptoms, consistent with developmental psychopathology (Cicchetti, 2020; Masten, 2004, 2006) and relational-developmental systems perspectives (Lerner, 2006; McClelland et al., 2015). A total of three profiles were identified, with these profiles further distinguishing between the trajectories of depressive and anxious symptoms. These findings make three main contributions to understanding of self-regulation in early childhood and its relation to depressive and anxious symptoms. First, separate profiles characterized by difficulty with emotional self-regulation and behavioral overregulation were identified, along with a more typical trajectory of

moderate self-regulation. This finding suggests that young children can demonstrate both integration and differentiation across emotional, cognitive, and behavioral aspects of self-regulation. Second, the profile characterized by difficulty with emotional self-regulation was associated with elevated and increasing trajectories of depressive and anxious symptoms. Third, the profile characterized by behavioral overregulation was also associated with elevated depressive symptoms. These findings further suggest that variability in self-regulatory abilities is important in relation to depressive and anxious symptoms and that emotional and behavioral self-regulation may be best targeted by early mental health prevention and intervention efforts.

In alignment with developmental psychopathology (Cicchetti, 2020; Masten, 2004, 2006) and social setting systems perspectives (Tseng & Seidman, 2007), the current research also investigated how domains of classroom climate at fall of preschool were associated with heterogeneity in children's depressive and anxious symptoms. This investigation makes two main contributions to understanding of the relation between preschool classroom climate and symptoms of depression and anxiety. First, the domains of classroom climate demonstrated differential association with children's anxious symptoms, with only emotional support and organization associated with moderate and decreasing symptoms. Second, none of the domains of classroom climate were predictive of the trajectories of depressive symptoms. These findings suggest that classroom emotional support and organization may be the best targets for early prevention and intervention efforts in relation to children's anxious symptoms during the transition into preschool.

Objective One: Heterogeneity in the Developmental Trajectories of Depressive and Anxious Symptoms

The first objective of this research was to investigate heterogeneity in the patterns of change in depressive and anxious symptoms in early childhood, consistent with a developmental psychopathology perspective (Cicchetti, 2020; Masten, 2004, 2006). Two trajectories were identified for depressive symptoms, while three trajectories were identified for anxious symptoms. These results are contrary to the expectation that four trajectories of depressive and anxious symptoms would be found. Research has identified four trajectories for depressive symptoms across early to middle childhood (Lewis et al., 2020) and middle childhood to adolescence (Castelao & Kröner-Herwig, 2013), as well as four trajectories of anxious symptoms across early to middle childhood (Kertz et al., 2019) and across middle childhood (Wanner et al., 2012). While no research has identified two trajectories of internalizing or depressive symptoms, research has identified three trajectories for overall internalizing symptoms in early to middle childhood (Côté et al., 2009; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Parkes et al., 2016; Sterba et al., 2007). Still, only some of the trajectories identified by these studies align with the anxious symptoms trajectories found here. Overall, the different number of trajectories found highlight the importance of examining depressive and anxious symptomologies separately in early childhood. The investigation of heterogeneity in overall internalizing symptoms may misrepresent children's experiences of depressive and anxious symptoms, which may lead to poorer identification of maladaptive symptom patterns. The different trajectories found also highlight the importance of examining heterogeneity in depressive and anxious symptoms, rather than average symptoms, as children demonstrate variability in their early symptom experiences.

Depressive Symptoms

Depressive symptoms reflect children's excessive feelings of sadness and helplessness (Egger & Angold, 2006; Luby, 2010). For depressive symptoms, two developmental trajectories

were identified: *low with decelerated growth* (92.81%) and *moderate with accelerated growth* (7.19%). The majority of children experienced infrequent depressive symptoms that slightly increased and then slowed across early childhood. The *low with decelerated growth* trajectory aligns with the current expectation that a depressive symptoms trajectory characterized by low and increasing symptoms would be found. Research has identified low and decreasing trajectories of overall internalizing symptoms across early childhood through middle childhood (Sterba et al., 2007) and adolescence (Min et al., 2021). The decreases in depressive symptoms across the studies by Min et al. (2021) and Sterba et al. (2007) occurred around ages 3 to 4 years, converging with the pattern of deceleration found for the *low with decelerated growth* trajectory.

Representing a smaller portion of children, the *moderate with accelerated growth* trajectory showed an initially modest frequency of depressive symptoms that increased and escalated in frequency across preschool and kindergarten. The *moderate with accelerated growth* trajectory aligns with current expectations that a depressive symptoms trajectory characterized by moderate and increasing symptoms would be found, as well as with research that identified moderate and increasing trajectories of overall internalizing symptoms across early childhood (Côté et al., 2009) and across early childhood through middle childhood (Parkes et al., 2016; Miller & Votruba-Drzal, 2017) and adolescence (Davis et al., 2015; Min et al., 2021). Across these studies, internalizing symptoms tended to increase around ages 4 to 7 years, aligning with the pattern of change shown by the *moderate with accelerated growth* trajectory.

Studies by Castelao and Kröner-Herwig (2013) and Lewis et al. (2020) provide further evidence that converges with the *moderate with accelerated growth* depressive symptoms trajectory. Lewis et al. (2020) found a trajectory characterized by initially moderate and increasing depressive symptoms across ages 4 to 14 years, while Castelao and Kröner-Herwig

(2013) found a trajectory characterized by initially moderate depressive symptoms that slightly increased across ages 7 to 14 years. The proportion of children (8.9%) in the trajectory found by Lewis et al. (2020) is also similar to the proportion found for the *moderate with accelerated growth* trajectory (7.19%). Yet Castelao and Kröner-Herwig (2013) had 28.3% of children in their moderate and increasing trajectory. Such discrepancies may be due to differences in the examined age range, with Lewis et al. (2020) capturing the early childhood to adolescence period and Castelao and Kröner-Herwig (2013) focusing on middle childhood to adolescence. Overall, the studies by Castelao and Kröner-Herwig (2013) and Lewis et al. (2020), as well as research examining internalizing symptoms (Côté et al., 2009; Davis et al., 2015; Parkes et al., 2016; Miller & Votruba-Drzal, 2017; Min et al., 2021; Sterba et al., 2007), provide support for the depressive symptoms trajectories identified here.

Aligning with the mutually informative principle of developmental psychopathology (Masten, 2006), the current findings indicate both normative and non-normative trajectories of depressive symptoms. Generally infrequent depressive symptom experience, as shown by the *low with decelerated growth* trajectory, is indicated as the normative experience of depressive symptoms across early childhood. Most children may experience slight increases in feelings of sadness and become easily upset after entrance into preschool, given that the transition involves less primary caregiver support and more contextual demands (Cryer et al., 2005; Margetts, 2006; Rous et al., 2010). Still, these symptoms may ease as they become better adjusted to the early school context. Elevated depressive symptoms that rise across early childhood, as shown by the *moderate with accelerated growth* trajectory, is indicated as the non-normative depressive symptom experience. Some children may enter preschool already experiencing elevated feelings of sadness, possibly due to increased individual risk factors (e.g., poor self-concept, precocious

inhibitory control; Luby & Belden, 2012; Whalen et al., 2017). These children may then struggle to manage their feelings of sadness, as they receive less primary caregiver support and experience more contextual demands in the transition to preschool (Cryer et al., 2005; Margetts. 2006; Rous et al., 2010). Subsequently, children already vulnerable to depressive symptoms may then escalate in their symptom experience across early childhood. Children who experience elevated and accelerating depressive symptoms in early childhood may be at risk for continued symptom experience in middle childhood (Luby, 2010).

Of further note, Whalen et al. (2017) identified a prevalence rate of 2% for clinical depression among preschool children. Though this prevalence is smaller than the proportion of children identified in the *moderate with accelerated growth* trajectory (7.19%), it may be that some children demonstrating elevated depressive symptoms in early childhood are experiencing clinical symptoms (e.g., persistent feelings of sadness and irritability, decreased activity level, preoccupation with negative play themes; Luby, 2010). The early identification of and intervention for children experiencing elevated depressive symptoms is thus imperative to deter further symptom escalation and the compounding of challenges across early childhood into middle childhood, such as impairment in social and emotional functioning in the home, school, and peer contexts (Luby, 2010).

Anxious Symptoms

Anxious symptoms are characterized by excessive fearfulness and worrying (Beesdo et al., 2009; Egger & Angold, 2006). For anxious symptoms, three developmental trajectories were identified: *low and stable* (84.40%), *moderate and decreasing* (8.66%), and *low and increasing* (6.94%). The largest proportion of children were represented in the *low and stable* trajectory and experienced consistently infrequent anxious symptoms across early childhood, aligning with the

expectation of a trajectory characterized by low symptoms that would remain unchanged. Internalizing symptom trajectories found in investigations across early childhood (Côté et al., 2009) and across early childhood through middle childhood (Fanti & Henrich, 2010; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Papachristou & Flouri, 2020; Parkes et al., 2016) and adolescence (Davis et al., 2015; Gutman & McMaster, 2020) also reflect a low and stable pattern of change.

Children in the *moderate and decreasing* trajectory experienced a modest frequency of anxious symptoms at fall of preschool that declined significantly by the spring of kindergarten. The *moderate and decreasing trajectory* was not included in the current expectations, as trajectories characterized by initially moderate symptoms that remained stable (Davis et al., 2015; Fanti & Henrich, 2010; Klein et al., 2019; Miller & Votruba-Drzal, 2017) or increased over time were more often identified (Davis et al., 2015; Côté et al., 2009; Miller & Votruba-Drzal, 2017; Min et al., 2021; Parkes et al., 2016). Still, the *moderate and decreasing* trajectory aligns with some research involving examination of internalizing symptoms across early to middle childhood (de Lijster et al., 2019) and adolescence (Min et al., 2021). These studies generally found that children's internalizing symptoms were initially moderate and decreased around ages 3 to 4 years, which corresponds with the pattern of change found for the *moderate and decreasing* trajectory.

Representing the smallest portion of children, the *low and increasing* trajectory demonstrated infrequent anxious symptoms at fall of preschool that rose significantly by the spring of kindergarten. The *low and increasing* trajectory aligns with current expectations that a trajectory characterized by initially low and rising symptoms would be identified. Research across early to middle childhood (de Lijster et al., 2019; Klein et al., 2019; Papachristou &

Flouri, 2020) and adolescence (Gutman & McMaster, 2020) also identified low and increasing internalizing symptoms trajectories. Across these studies, the increase in internalizing symptoms tended to occur around ages 5 to 7 years, which is slightly later than the linear increase identified for the current *low and increasing* trajectory. This discrepancy could be due to this research focusing on overall internalizing symptoms as well as extending their investigations beyond the early childhood period.

The identified anxious symptoms trajectories also generally align with research by Wanner et al. (2012), who found four trajectories of anxious symptoms with children followed across ages 6 to 12 years: *moderate-decreasing* (26.7%), *low-increasing* (26.2%), *low-stable* (25.7%), and *high-stable* (21.5%). While the trajectories found in the current research are all similarly indicated (i.e., *low and stable*, *moderate and decreasing*, *low and increasing*), Wanner et al. (2012) also found a fourth trajectory characterized by initially high symptoms that remained consistent across middle childhood. Wanner et al. (2012) also found different proportions of children in their trajectories, with a smaller proportion identified in the low and stable trajectory and larger proportions in the moderate and decreasing and low and increasing trajectories, as compared to the current proportions in the identified anxious symptoms trajectories. Discrepancies between the current research and Wanner et al.'s (2012) study may be due to the different age period examined, as Wanner et al. (2012) focused on middle childhood. Even with these discrepancies, the alignment of the current findings with Wanner et al.'s (2012) study and internalizing symptoms research (Côté et al., 2009; Davis et al., 2015; de Lijster et al., 2019; Fanti & Henrich, 2010; Gutman & McMaster, 2020; Klein et al., 2019; Miller & Votruba-Drzal, 2017; Min et al., 2021; Papachristou & Flouri, 2020; Parkes et al., 2016) provides support

for *low and stable*, *moderate and decreasing*, and *low and increasing* trajectories of anxious symptoms.

The anxious symptoms trajectories further support the mutually informative principle of developmental psychopathology, given that both normative and non-normative trajectories were found (Masten, 2006). As most children experienced infrequent fearfulness and worrying across early childhood (*low and stable*), this pattern of change designates normative development, with these symptoms unchanged by the transition into the early school context. The experience of moderately frequent but decreasing fearfulness and worrying (*moderate and decreasing*) and infrequent but increasing fearfulness and worrying (*low and increasing*) may designate non-normative development. Children may have initial difficulty adjusting to preschool due to feeling nervous about the new setting or worrying about leaving their caregiver but gradually adapt to the demands of the early school context, as it is common for some children to experience elevated anxious symptoms when entering preschool (Cryer et al., 2005; Margetts, 2006; O'Farrelly & Hennessy, 2014; Phillips et al., 2019; Rous et al., 2010). Other children may initially experience infrequent nervousness at the entrance to preschool but grow increasingly fearful and worrisome across the early school year. Such increases in anxiety may be due to difficulties engaging positively in the early school context, such as with peers. For instance, children who experience anxious symptoms are more likely to be socially withdrawn and excluded by peers, which may contribute to symptom elevation as children progress through school (Avant et al., 2011; Gazelle, 2013). These children are thus at most risk for experiencing elevated and clinical symptoms of anxiety.

In further support of non-normative development, the proportions of children in the *moderate and decreasing* (8.66%) and *low and increasing* (6.94%) trajectories align with

prevalence rates found in previous research. In their systematic review, Whalen et al. (2017) identified a range of 10% to 20% prevalence of anxiety disorders among preschool children, which would reflect the combined proportions for both the *moderate and decreasing* and *low and increasing* trajectories. Baxter et al. (2013) also found a prevalence rate of anxiety disorders among children aged 3 to 17 years as 6% in their systematic review. This prevalence rate aligns with the proportion of children in the *low and increasing* anxious symptoms trajectory, suggesting that these children may be particularly at risk for experiencing clinical symptoms (e.g., persistent worrying, avoidance of fearful situations, increased physiological responses) into middle childhood and adolescence (Beesdo et al., 2009).

Co-occurrence of the depressive and anxious symptoms trajectories was also examined. The majority of children who experienced generally few depressive symptoms also experienced few anxious symptoms across preschool and kindergarten. This finding aligns with knowledge of the association between symptomologies, such that experiences of negative affectivity, including sadness and fear, are generally related (Clark & Watson, 1991; De Bolle & De Fruyt, 2010; Sander & Ollendick, 2016). Interestingly, elevated depressive symptoms were associated with infrequent and rising anxious symptoms. Elevated depressive symptoms were also modestly associated with infrequent anxious symptoms but not with moderate and declining anxious symptoms. These findings suggest that some young children may experience elevated depressive symptoms but not elevated anxious symptoms, diverging from common symptom experiences found in early childhood (Sander & Ollendick, 2016). This divergence may be due to the current study focusing on distinct trajectories of symptom experience rather than average trajectories. This divergence may also be due to the current study focusing on general symptoms rather than clinically significant symptoms. It may also be that depressive symptoms are more trait

dependent, while anxious symptoms are more context dependent (Whalen et al., 2017). For instance, the transition into the early classroom context may be more influential on anxious symptom experience, leading to increasing symptoms over time. Depressive symptoms may be more influenced by individual factors, leading to already elevated symptoms at entry to preschool. Indicators of anxious symptoms may also be more readily observable and distinct to educators, allowing educators to report on different frequencies of anxious symptoms more easily. Indicators of depressive symptoms may be less discernible for educators, such that they can more easily report on elevated or low symptoms but have more difficulty reporting on change and variability in symptom frequency. Future research could examine heterogeneity in the trajectories of depressive and anxious symptoms across toddlerhood and early childhood to better understand the developmental co-occurrence of these symptom experiences. Overall, findings regarding heterogeneity in the trajectories of depressive and anxious symptoms support differentiation in symptom experience by symptomology in early childhood.

Objective Two: Profiles of Self-Regulation

Guided by developmental psychopathology (Cicchetti, 2020; Masten, 2004, 2006) and relational-developmental systems perspectives (Lerner, 2006; McClelland et al., 2015), the second objective of this research was to investigate heterogeneity in children's experience of self-regulation. Across emotional, cognitive, and behavioral self-regulation, three profiles were identified: *typically-regulated* (69.65%), *behaviorally-overregulated* (20.84%), and *emotionally-dysregulated* (9.50%). This diverges from the expectation that five profiles of self-regulation would be identified. Only one other study has identified three profiles of self-regulation, with these profiles identified in children aged 9 to 11 years (Elvin et al., 2021). Other research in early childhood identified two profiles from birth to age 5 years (Williams et al., 2016), four profiles at

age 4.5 years (Laible et al., 2014), and six profiles of self-regulation at kindergarten (Granziera et al., 2021), while research in middle childhood identified five profiles from Grades 1 to 2 (Mägi et al., 2016). Such discrepancies in the number of self-regulation profiles may be due to the different ages at which self-regulation profiles were examined. Research including constructs not directly related to self-regulation, such as sleep problems (Williams et al., 2016), peer relations (Elvin et al., 2021; Granziera et al., 2021), and well-being (Elvin et al., 2021), may also contribute to the discrepancies. Lack of consensus may further be due to the inclusion of combined indicators of emotional, cognitive, and behavioral self-regulation, such as emotional-behavioral (Granziera et al., 2021) and cognitive-behavioral self-regulation (Granziera et al., 2021; Laible et al., 2014; Mägi et al., 2016). The inclusion of confounding constructs and combined indicators may misrepresent self-regulation, leading to poorer identification of children's varied self-regulation experiences. The different self-regulation profiles identified highlight the importance of examining heterogeneity in early emotional, cognitive, and behavioral self-regulation experiences, as children demonstrate both integration and differentiation across self-regulatory abilities.

Typically-Regulated Profile

While similar self-regulation profiles have been identified in previous research, the characteristics across the profiles identified here do not particularly align with findings from any one study. Most children (69.65%) were identified in the *typically-regulated* self-regulation profile, characterized by moderate emotional, cognitive, and behavioral self-regulation. Children in this profile may be better able to voluntarily self-regulate but still show limitations in their abilities (Ziv et al., 2017). For instance, these children may use more reactive emotional self-regulation strategies, such as distraction, rather than more planful strategies (Calkins & Perry,

2016; Ziv et al., 2017). Children in the *typically-regulated* profile may also be able to concentrate on tasks and inhibit behavior but demonstrate less flexibility in these skills between contexts and less coordination of these skills to achieve goals (Ziv et al., 2017). The *typically-regulated* profile aligns with current expectations that a self-regulation profile characterized by moderate self-regulation across abilities would be identified. Research from Laible et al. (2014) and Williams et al. (2016) further aligns with the *typically-regulated* profile. Laible et al. (2014) identified a m*oderate regulation and negative emotionality* profile (51.56%) with children aged 4.5 years, in which children demonstrated anger, sadness, fear and effortful control (e.g., inhibitory control, attention) that were generally around mean scores. Following children from birth to age 5 years, Williams et al. (2016) identified a *normative* profile (69%) characterized by generally average emotional and cognitive self-regulation as well as decreasing sleep problems. Profiles from Laible et al. (2014) and Williams et al. (2016) indicate moderate emotional, cognitive, and behavioral self-regulation demonstrated by the majority of children, converging with the *typically-regulated* profile.

The early childhood period is typically when children are experiencing developmental gains in relation to regulating their own arousal, such as labeling emotions, maintaining attention, and directing actions, as well as internalizing social norms and display rules (Ziv et al., 2017). It is thus during the early childhood period that children shift from extrinsic self-regulation, in which they rely on caregivers for regulation, to intrinsic self-regulation, where they become more self-directed (Ziv et al., 2017). Children will generally demonstrate some self-regulation skills as they develop and practice their abilities. For instance, those in early childhood will often rely on distraction to manage emotional arousal, whereas more sophisticated strategies that are more active and planful are common in middle childhood (e.g., problem

solving; Calkins & Perry, 2016; Ziv et al., 2017). Children are also more controlled in their behavior and attention in early childhood than in toddlerhood, though children are better adept at adapting to contextual demands in middle childhood (Best et al., 2009; Ziv et al., 2017). For example, toddlers will mostly demonstrate cognitive and behavioral self-regulation in the form of compliance to caregivers, such as postponing an act if directed, while those in early childhood can control their attention and resist distractions in their context more voluntarily (Ziv et al., 2017). By the time children reach middle childhood, they can adjust their cognition and behavior to various contexts and attend to more challenging demands within these contexts, such as completing chores at home, meeting classroom expectations at school, and navigating social groups (Best et al., 2009; Ziv et al., 2017). Altogether, the moderate abilities demonstrated by the majority of young children in the *typically-regulated* profile align with knowledge of self-regulation during this developmental period and suggest that most children will show integration across self-regulatory abilities.

Behaviorally-Overregulated Profile

A smaller portion of children (20.84%) were identified in the *behaviorally-overregulated* profile, characterized by moderate emotional and cognitive self-regulation but high behavioral self-regulation, specifically in regard to the HTKS task. Children in this profile may demonstrate some voluntary regulation of emotion and cognition, but demonstrate advanced ability in inhibiting involuntary responses and following behavioral rules (Ziv et al., 2017). The *behaviorally-overregulated* profile does not align with current expectations of profile characteristics but does demonstrate some similarity with the *well-regulated* profile identified by Granziera et al. (2021). With kindergarten children, Granziera et al. (2021) identified the *well-regulated* profile (12%) of behavioral self-regulation by aspects of cognitive-behavioral (e.g.,

learning behavior), social-behavioral (e.g., socially responsible behavior), and emotional-behavioral self-regulation (e.g., aggressive-disruptive behavior). Children in the *well-regulated* profile demonstrated above average cognitive-, social-, and emotional-behavioral self-regulation. Given that children in this profile demonstrated greater ability across aspects of behavioral self-regulation, the *well-regulated* profile aligns with children's greater behavioral self-regulation ability shown in the *behaviorally-overregulated* profile identified here. Still, a greater proportion of children were identified in the *behaviorally-overregulated* profile than in Granziera et al.'s (2021) *well-regulated* profile. This discrepancy may be due to the current investigation focusing on preschool while Granziera et al. (2021) focused on kindergarten. The discrepancy may also be due to Granziera et al.'s (2021) focus on behavioral self-regulation, which confounded aspects of behavioral self-regulation with emotional and cognitive self-regulation. Still, evidence from Granziera et al. (2021) converges with the current findings that some children may be more adept at managing behavior in early childhood.

Children who demonstrate skillful behavioral self-regulation may show more behavioral inhibition, in which they overly inhibit their behavior when faced with a novel situation (Calkins & Perry, 2016; Eisenberg et al., 2018). In this way, children with greater inhibitory control may be more restrictive and less reactive in their behavior in new situations (Eisenberg et al., 2018). For instance, in response to the transition to preschool, some children may be overly cautious and display over-controlled behavior to help them adjust to the new context. Such behavioral inhibition may manifest as greater behavioral self-regulation when in reality these children may need more support to appropriately and actively engage in novel contexts. In the current investigation, participation in the HTKS task may have provided such a novel situation, in which children overly-inhibited their behavior, resulting in greater performance. Children with greater

inhibitory control may also demonstrate more shyness. Children who are particularly shy may approach situations with new individuals with caution, resulting in overly-inhibited behavior and greater performance on behavioral tasks. For example, Hassan and Schmidt (2022) found that children aged 3.5 years with greater inhibitory control demonstrated greater avoidant social behaviors at age 4.7 years. Overall, behavioral inhibition and shyness may account for some children's overregulation of behavior in early childhood.

Children who are behaviorally overregulated in early childhood may also be particularly susceptible to contextual supports regarding behavior management. For instance, some children may experience home contexts that are more focused on regulating children's behavior and preparing them for the expectations of school, such as through use of behavior charts and routine schedules (Vernon-Feagans et al., 2016). It may also be that children who demonstrate behavioral overregulation in early childhood are in classrooms with predictable routines and clear behavioral expectations for children, such as how to line up for recess (Hamre et al., 2009). In such classrooms, some children may quickly adapt to contextual demands and subsequently demonstrate behavioral overregulation. For instance, Rimm-Kaufman et al. (2009) found that kindergarten classrooms with greater observed organization (e.g., prevention of misbehavior, implementation of routines) were associated with children's greater behavioral self-control, as assessed by behavioral assessment. Altogether, contextual supports may account for the behavioral overregulation demonstrated by children in the *behaviorally-overregulated* profile.

Emotionally-Dysregulated Profile

The smallest portion of children (9.50%) were identified in the *emotionally-dysregulated* profile, characterized by difficulty managing negative and exuberant emotion and maintaining positive emotion. The *emotionally-dysregulated* profile converges with current expectations that

a profile characterized by difficulty with emotional self-regulation would be found and most closely aligns with evidence from Elvin et al. (2021). Elvin et al. (2021) sought to examine profiles of self-regulation based on self-regulation of positive and negative emotion, behavioral control, positive well-being, social functioning (e.g., prosocial behavior, peer problems), and irritability among children aged 9 to 11 years. Elvin et al. (2021) identified a *high irritability/low self-regulation of negative emotion* profile (9%), in which children demonstrated greater irritability and peer problems and poorer self-regulation of negative emotion, prosocial behavior, and well-being. Children in the *high irritability/low self-regulation of negative emotion* profile similarly struggled with management of negative emotion and maintenance of positive emotion as children in the *emotionally-dysregulated* profile identified here. The proportion of children in the *high irritability/low self-regulation of negative emotion* profile is also similar to the proportion identified in the *emotionally-dysregulated* profile. Convergence with evidence from Elvin et al. (2021) suggests that children may differentially struggle with emotional self-regulation.

Interestingly, those in the *emotionally-dysregulated* profile also demonstrated less behavior control as compared to children in the *typically-regulated* profile. In this way, the *emotionally-dysregulated* profile demonstrates similarity to Elvin et al.'s (2021) *moderate irritability/low behavioral control* profile (34%), characterized by modest irritability and poorer behavioral control and self-regulation of positive emotion. Children in the *emotionally-dysregulated* profile struggled with behavior control, similar to those in the *moderate irritability/low behavioral control* profile. Yet children in the *emotionally-dysregulated* profile demonstrated greater difficulty with management of negative and exuberant emotion and maintenance of positive emotion. The *emotionally-dysregulated* profile also included a smaller

proportion of children as compared to the *moderate irritability/low behavioral control* profile identified by Elvin et al. (2021). Discrepancy with the *moderate irritability/low behavioral control* profile may be due to Elvin et al.'s (2021) focus on middle rather than early childhood. The discrepancy may also be due to Elvin et al. (2021) including constructs not directly related to self-regulation, such as positive well-being and peer relations. Still, evidence from the current research and Elvin et al. (2021) suggest that difficulty with emotional self-regulation may also manifest in aspects of behavioral self-regulation. It could be that children who struggle with their emotional self-regulation are also perceived as having less control over their patience and physical awareness as well as having more difficulty matching expectations of the preschool classroom. Further investigation into the association among aspects of children's emotional and behavioral self-regulation is warranted to better understand early challenges with self-regulation.

The *emotionally-dysregulated* profile suggests that struggles with self-regulation in early childhood may be most prominent regarding management of emotional arousal. Difficulties with appropriate emotional self-regulation in early childhood may stem from a delay in transitioning from caregiver-initiated to self-initiated regulation (Kovacs et al., 2008). Other reasoning for poorer emotional self-regulation includes having fewer adaptive responses available for emotional stimuli or the continued use of rudimentary responses, such as withdrawal. Children who struggle with emotional self-regulation may also have a caregiver who provides less verbal interaction, stimulation, and affection, leading to fewer learning opportunities for emotion management (Kovacs et al., 2008). For example, Hu et al. (2017) found that mothers who reported using more negative expressions of emotion (e.g., scolding) also reported their preschool-aged children as using more negative emotional self-regulation strategies (e.g., passive reactions, venting). Classrooms that focus less on emotional support for children transitioning

into preschool may also lead to subsequent difficulty with emotional self-regulation (Hamre et al., 2009). For instance, Li et al. (2022) found that teachers' punitive and minimizing responses to preschool children's negative emotions negatively predicted children's emotional self-regulation growth over 6 months, as reported by teachers. Altogether, difficulty managing emotion may be the most common self-regulation struggle in early childhood, with such struggles potentially due to developmental delays and less supportive contexts.

Of note, children's self-regulation profiles were not differentiated by aspects of cognitive self-regulation. This finding suggests that young children are similar in their cognitive self-regulation skills, such as the ability to sustain attention, follow rules, and problem-solve, with children generally demonstrating moderate performance. It may be that children are adjusting similarly to the cognitive demands of the preschool classroom, leading to similarities in their cognitive self-regulation. Children may also diverge in their cognitive self-regulation as they progress through preschool and into elementary school, when they are tasked with more cognitive demands and classroom expectations (Best et al., 2009). Still, it may be that cognitive self-regulation reflects general cognitive control skills that are implemented in the service of specific goals, and thus do not involve separable components that demonstrate differentiation in functioning (Doebel, 2020). Further investigation into children's experience of cognitive self-regulation across early and middle childhood is warranted to better understand whether variability in these abilities occurs.

Overall, there is evidence for both integration and differentiation in children's self-regulation. This finding aligns with the relational-developmental systems perspective, as children both similarly and differentially express self-regulation in relation to their abilities to adapt to and meet goals in their context (Lerner, 2006; McClelland et al., 2015). The *typically-regulated*

profile suggests that children generally demonstrate integration across emotion, cognition, and behavior in their self-regulatory abilities. Differentiation in self-regulation may occur when young children become particularly adept in one aspect of self-regulation, specifically behavioral self-regulation as shown in the *behaviorally-overregulated* profile. As evidenced by the *emotionally-dysregulated* profile, experiencing particular difficulty in one aspect of self-regulation, namely emotion, may also lead to some difficulty in other aspects, namely behavior. These findings highlight the importance of examining self-regulation across aspects of emotion, cognition, and behavior to identify how these experiences may vary and influence developmental outcomes. As suggested by the mutually informative principle of developmental psychopathology (Masten, 2006), this variation in children's self-regulation may lead to better understanding of pathways toward adaptation and maladaptation.

Objectives Three and Four: Discrimination of Developmental Trajectories

Self-Regulation

Emotionally-dysregulated profile. Guided by developmental psychopathology (Cicchetti, 2020; Masten, 2004, 2006) and relational-developmental systems perspectives (Lerner, 2006; McClelland et al., 2015), the third objective of this research was to investigate whether profiles of self-regulation predict heterogeneity in depressive and anxious symptoms. It was found that children in the *emotionally-dysregulated* self-regulation profile were more likely to experience moderate and accelerating depressive symptoms as well as moderate and decreasing and low and increasing anxious symptoms. These findings converge with expectations that a self-regulation profile characterized by difficulty with emotional self-regulation would be associated with trajectories of elevated and increasing symptoms. Only two studies that identified profiles of self-regulation also examined how these profiles were

associated with depressive and anxious symptoms (Elvin et al., 2021; Williams et al., 2016). With children followed from birth to age 5 years, Williams et al. (2016) found that children in the *non-normative* profile, characterized by low emotional and cognitive self-regulation and increasing sleep problems, were more likely to show emotional problems (e.g., depression, anxiety) at ages 6 to 7 years. With children aged 9 to 11 years, Elvin et al. (2021) found that children in the *high irritability/low self-regulation of negative emotion* profile, characterized by greater irritability and poorer self-regulation of negative emotion, social functioning, and well-being, were more likely to experience depressive and anxious symptoms than children with low irritability and high well-being. Children in the *moderate irritability/low behavioral control profile*, characterized by modest irritability and poorer behavioral control and self-regulation of positive emotion, were also more likely to experience depressive and anxious symptoms. Overall, children who experience difficulty with their emotional self-regulation may be more susceptible to elevated or increasing trajectories of depressive and anxious symptoms. While the current findings generally converge with those from Elvin et al. (2021) and Williams et al. (2016), these studies did not account for heterogeneity in children's depressive and anxious symptoms. Williams et al. (2016) also only considered overall internalizing symptoms and Elvin et al. (2021) focused on the middle childhood period.

Evidence from studies examining the association between emotional self-regulation and internalizing symptoms also support the current findings (McCoy & Raver, 2011; Wang et al., 2018). For instance, children's emotional self-regulation was found to be negatively associated with their internalizing symptoms in preschool (McCoy & Raver, 2011), while emotional dysregulation was positively and concurrently associated with internalizing symptoms at age 4.5 years and prospectively related to symptoms by age 10.5 years (Wang et al., 2018). The

association between emotional self-regulation and depressive symptoms has also been demonstrated in early (Belden et al., 2008) and middle childhood (Uhl et al., 2019) and across early childhood through middle childhood (Vogel et al., 2019) and adolescence (Sfärlea et al., 2021). For instance, Vogel et al. (2019) found that children's irritability dysregulation at ages 3 to 5 years was positively associated with later depression diagnosis across ages 4 to 19 years. Overall, research converges with the finding that emotional dysregulation is associated with greater experience of depressive symptoms (McCoy & Raver, 2011; Sfärlea et al., 2021; Uhl et al., 2019; Vogel et al., 2019; Wang et al., 2018). While research with internalizing symptoms also converges with the finding that emotional dysregulation is associated with anxious symptoms, evidence from Uhl et al. (2019) diverges from this finding. In their cross-sectional study with children in Grades 4 and 5, Uhl et al. (2019) found that children's emotional dysregulation was positively associated with their depressive symptoms but not with their anxious symptoms. This discrepancy may be due to Uhl et al. (2019) focusing their investigation in middle childhood. Altogether, the current findings highlight the importance of emotional self-regulation for children's risk for and experience of elevated and increasing depressive and anxious symptoms.

Emotional self-regulation is generally the aspect of self-regulation most often researched in relation to depressive and anxious symptoms (Ziv et al., 2017). The experience of depressive symptoms is connected to negative feelings like sadness, though also can manifest as irritability in early childhood (Calkins & Perry, 2016; Ziv et al., 2017). Similarly, negative feelings like fear are often associated with anxious symptoms. Difficulty with regulating negative emotions may thus put children at risk for experiencing elevated depressive symptoms and elevated or increasing anxious symptoms in early childhood. For instance, these children may respond more

intensely and for longer durations to situations that elicit negative emotions. Children who experience difficulty regulating exuberant emotions may also struggle to meet the expectations of the classroom and peer context, further leading to the experience of elevated or increasing depressive and anxious symptoms (Sander & Ollendick, 2016). The absence of positive affect has also been associated with the experience of depressive and anxious symptoms (Calkins & Perry, 2016). Children's ability to analyze neutral situations and display positive emotion may be more challenging for children vulnerable to depressive and anxious symptoms, leading to behavior like emotion suppression in such circumstances (Compas et al., 2017). Children who demonstrate difficulty with regulating negative emotion and demonstrating positive emotion in neutral situations may benefit from more targeted mental health support to deter continued or increasing depressive and anxious symptom experience.

Behaviorally-overregulated profile. Interestingly, children in the *behaviorally-overregulated* profile were more likely to experience initially moderate and accelerating depressive symptoms. This finding diverges from the expectation that profiles characterized by difficulty with behavioral self-regulation would be most associated with elevated or increasing symptoms of depression. A cross-sectional study with children aged 6 to 12 years supports the current finding, with children's greater inhibitory control related to greater internalizing symptoms (Koojimans et al., 2000). A longitudinal study with preschool children also supports this finding, with greater inhibitory control at age 3.5 years related to greater internalizing symptoms at age 4.7 years (Hassan & Schmidt, 2022). Still, research by Denio et al. (2020) and Kertz et al. (2016) suggest that poorer inhibitory control is associated with greater depressive symptoms, diverging from the current findings. Denio et al. (2020) found that children's inhibitory control at age 5 years was negatively correlated with internalizing symptoms at age 10

years. Kertz et al. (2016) similarly found that preschool children's inhibitory control was negatively associated with depressive symptoms up to age 7.5 years. Divergence from the current finding may be due to Denio et al. (2020) focusing on internalizing symptoms assessed in middle childhood, as well as Kertz et al. (2016) not considering heterogeneity in children's depressive symptoms. Research regarding behavioral inhibition also supports the current finding. For instance, Barker et al. (2015) found that children's behavioral inhibition at ages 2 to 3 years was positively associated with their internalizing symptoms at age 9 years. The current finding along with evidence from Barker et al. (2015), Hassan and Schmidt (2022), and Koojimans et al. (2000) suggest that over-controlled behavioral self-regulation is predictive of greater depressive symptoms.

Children who demonstrate greater inhibitory control may also demonstrate behavioral inhibition, which may lead to risk for the experience of depressive symptoms (Calkins & Perry, 2016; Eisenberg et al., 2018). For instance, when young children are faced with a novel situation, such as entry to preschool, they may be overly inhibited in their behavior, leading to better performance on behavioral tasks. It may be that children's behavioral performance is greater due to the desire to avoid failure or upsetting others, which may bring about the negative emotions that accompany depressive symptom experience. Children who are overly inhibited in their behavior may then be practicing avoidance or suppression of negative emotion. Future research targeted at the association between inhibitory control and behavioral inhibition with depressive symptom experience in early childhood is needed to better understand how behavioral overregulation may lead to greater depressive symptoms.

Evidence of discrimination of the depressive and anxious symptoms trajectories by profiles of self-regulation aligns with the systems principle of developmental psychopathology

(Masten, 2006) as well as a relational-developmental systems perspective (Lerner, 2006; McClelland et al., 2015). Findings suggest that children's self-regulation and symptoms of depression and anxiety represent distinct but related systems within an individual, and that these systems can interact to influence development toward competence and psychopathology. In accordance with this interaction, some children's self-regulatory processes may be ineffective at attending to feelings of sadness and anxiety (McClelland et al., 2015). For instance, challenges with emotional self-regulation may lead to obstruction in goal pursuit in situations evaluated as sad or fearful, leading to elevated or increasing depressive and anxious symptoms. Overregulation of behavior may also obstruct goal pursuit in sad situations, further leading to elevated depressive symptoms. The interactions of emotional dysregulation and behavioral overregulation with depressive and anxious symptoms suggest early pathways toward maladaptation and psychopathology (Cicchetti, 2020; Masten, 2004, 2006). These findings thus highlight the importance of examining heterogeneity in self-regulation and trajectories of depressive and anxious symptoms in order to better understand their association.

Classroom Climate

Guided by developmental psychopathology (Cicchetti, 2020; Masten, 2004, 2006) and social setting systems perspectives (Tseng & Seidman, 2007), the fourth objective of this research was to investigate how domains of classroom climate predict heterogeneity in depressive and anxious symptoms. It was found that children who were in more emotionally supportive and organized classrooms, characterized by warm interactions with teacher and peers and by predictable routines, were more likely to experience a *moderate and decreasing* trajectory of anxious symptoms across early childhood. This finding aligns with the expectation that classroom emotional support would be associated with symptom trajectories as well as with

research conducted in elementary school (Griggs et al., 2016; Wang et al., 2020; Weyns et al., 2019). For instance, classrooms with greater emotional support were associated with less internalizing symptoms among children in kindergarten to Grade 4 (Griggs et al., 2016) and less anxious symptoms in kindergarten (Weyns et al., 2019). Wang et al.'s (2020) meta-analysis further found that classroom emotional support demonstrated a negative association with socioemotional distress (e.g., psychological well-being, anxiety, depression, social competence) in studies across kindergarten to Grade 12, though no association was found for classroom organization. Yan et al. (2016) also did not find a significant correlation between classroom emotional climate (e.g., positive and negative emotion, over-control, management) and children's internalizing symptoms in Grade 1. Discrepancy of the current finding with the studies by Wang et al. (2020) and Yan et al. (2016) may be due to their focus on internalizing symptoms and socioemotional distress, rather than on the separate experience of depressive and anxious symptoms. Yan et al. (2016) also combined aspects of classroom emotional support and organization, which may misrepresent the way in which these domains of classroom climate relate to internalizing symptoms. Wang et al. (2020) and Yan et al. (2016) further focused their investigations after preschool, with the current findings suggesting that the emotional support and organization of the preschool classroom may be particularly important for children's initially elevated anxious symptoms.

The transition into the preschool context may be driving some children's initially elevated anxious symptoms, and classrooms characterized by emotional support may subsequently lead children to feel more comfortable exploring and engaging in the classroom context (Eccles & Roeser, 2011; Hamre et al., 2009; Phillips et al., 2019). Some preschool classrooms can be more emotionally supportive to provide comfort during a transitional period

for young children (Fumoto, 2011). For instance, children who enter preschool with anxiety may find symptom relief in classrooms characterized by warmth and connectedness among the children and teachers. In such classrooms, positive peer relations may be supported, allowing initially anxious children to experience fewer symptoms across the school year (Gazelle, 2013). Similar to the finding regarding emotional support, it may be that children who are particularly anxious at the entrance to preschool may find symptom relief when the classroom is structured and predictable. Some preschool classrooms focus on children needing greater support in understanding the classroom structure and providing easier task demands, particularly at the beginning of the school year (Fumoto, 2011). These organized classrooms may make it easier for children to adapt to behavioral expectations and rules, subsequently easing children's anxiety in the preschool context. Educators that are also more effective in their behavioral management, have more routine management structures, and are effective in making students active participants in classroom activities tend to have greater success with student engagement and behavioral issues (Hamre et al., 2009).

The discrimination by classroom emotional support and organization on the trajectories of anxious symptoms further aligns with the systems principle of developmental psychopathology (Masten, 2006) and a social setting systems perspective (Tseng & Seidman, 2007). The prediction of moderate but decreasing anxious symptoms by classroom emotional support and organization suggests that children's anxious symptoms can interact with their preschool context (Masten, 2006). In accordance with a social setting systems perspective, social processes and organization in the classroom context can stimulate change in children's anxious symptoms (Tseng & Seidman, 2007). In this way, the support of social processes and organization provided by social actors, such as educators, in the preschool classroom can lead to

more positive and active engagement from children and less symptom experience. The associations found indicate that the presence of emotional support and organization in the classroom can deter children's elevated anxious symptoms, leading these children on a pathway toward adaptation (Masten, 2006). These findings thus highlight the importance of examining domains of classroom climate in relation to heterogeneity in children's anxious symptoms in order to better understand these associations across children and their context.

It was expected that the domains of classroom climate would demonstrate some association with the depressive symptoms trajectories, though no discrimination between the trajectories was found. This finding diverges from research that found a negative association between classroom emotional climate (e.g., positive and negative emotion, over-control, classroom management) in Grade 1 (Gazelle, 2006), and classroom climate (e.g., involvement, teacher support, affiliation) in Grades 7 and 8 (Shochet & Smith, 2014) with depressive symptoms. Still, this finding does converge with Yan et al.'s (2016) study that found no correlation between classroom emotional climate and children's internalizing symptoms in Grade 1. It may be that children's depressive symptoms are less influenced by the interactional and instructional quality and management of the preschool classroom. Children with elevated depressive symptoms may be responding to less primary caregiver support and greater contextual demands associated with the transition into the early school years with feelings of sadness. While children's feelings of anxiety may be eased by warmth and structure in the classroom, the feelings of sadness may be less influenced by such classroom qualities. It may also be that aspects of the new peer context, such as initiating peer interactions and building friendships, are more associated with children's elevated depressive symptoms than the qualities of the preschool classroom (Margetts, 2006). Given that children's emotional dysregulation and behavioral

overregulation both differentiated between the depressive symptoms trajectories, these individual risk factors are indicated as more associated with the experience of elevated depressive symptoms as opposed to preschool classroom climate.

It was also expected that classroom instructional support would demonstrate discrimination between the trajectories of depressive and anxious symptoms, though no such discrimination was found. This finding diverges from studies that generally found that instructional support was related to less frequent symptom experience in kindergarten (Weyns et al., 2019) and Grades 7 and 8 (Shochet & Smith, 2014), as well as across research conducted in kindergarten to Grade 12 (Wang et al., 2020). As it pertains to children's anxiety, the emotional support and organization of the classroom may be more influential than instructional support for symptom experience. Given that children are just entering the preschool context, their academic demands may be particularly low while their demands to adjust to the structure and relationships in the classroom may be more prominent (Fumoto, 2011). In this way, instructional support may become more influential for children's feelings of sadness and worries as they progress through school and are met with more academic demands. Future research could investigate classroom instructional support across preschool and into elementary school to determine whether the pattern of change in instructional support is associated with patterns of change in depressive and anxious symptoms.

Baseline Covariates

The current investigation also examined how various baseline covariates differentiate between the identified depressive and anxious symptoms trajectories. In alignment with attachment theory (Sherman et al., 2015; Sroufe et al., 1999), aspects of the peer and caregiver relationships were associated with experiences of depressive and anxious symptoms. Of note is

the influence of peer conflict, with children demonstrating greater peer conflict at the fall of preschool more likely to experience elevated depressive symptoms and increasing anxious symptoms. Previous research has demonstrated positive associations between symptoms of depression and anxiety and peer aggression and victimization (Krygsman & Vaillancourt, 2019; Hoglund & Chisholm, 2014; Rappaport et al., 2021). Children who experience conflict with peers, such as aggression and victimization, may subsequently feel more sadness or anxiety in relation to engaging with peers, leading to the elevated or increasing symptoms found here. These findings suggest that children with greater peer conflict in early childhood may be susceptible to experiencing more frequent depressive symptoms and increasing anxious symptoms. Of note, peer conflict was the only baseline covariate to discriminate between the depressive symptoms trajectories. This finding suggests that peer relations may be the most important relational factor in connection to depressive symptom experience, particularly negative peer relations. Future research could investigate various factors of peer conflict in relation to the trajectories of depressive symptoms to better understand this relationship.

Peer sociability also demonstrated influence, with less sociable children in the fall of preschool more likely to experience increasing anxious symptoms across early childhood. In alignment with this finding, research has demonstrated negative associations between peer sociability and internalizing symptoms (Eggum-Wilkens et al., 2014). Children who demonstrate less sociability with peers may become socially withdrawn, which may then influence their experience of anxious symptoms (Gazelle, 2013). For instance, children who experience greater social withdrawal are also shown to experience greater anxiety (Rubin et al., 2009). It may be that the transition to the preschool context, in which more peers are generally present than in contexts previously, heightens children's social withdrawal and leads to the experience of

anxiety for some children. Overall, supporting children's positive engagement in the preschool classroom with peers may deter elevated depressive symptom and increasing anxious symptom experience.

Children who shared less attachment with their caregiver were more likely to experience increasing anxious symptoms across preschool and kindergarten. Previous research has found associations between poorer caregiver-child attachment and children's internalizing symptoms (Madigan et al., 2016; Sirois & Bernier, 2018). It may be that children's uncertainty about the availability of their caregiver increases their experience of anxiety over time (Shamir-Essakow et al., 2005). For instance, feeling rejected by a caregiver may lead children to demonstrate increased self-reliance to manage distressing situations as well as a decreased desire for social contact. The combination of self-reliance, avoidance, and greater emotional arousal may then increase the risk for anxious symptoms over time. Caregivers that are also overprotective of their children may not allow them to practice self-managing feelings of fear and worry, also leading to risk for anxious symptoms over time (Shamir-Essakow et al., 2005). Providing caregivers with support to learn about secure attachment relationships and strategies to improve attachment relationships may be beneficial during the early childhood period to deter children from anxious symptomology.

The associations between children's peer conflict and sociability and caregiver attachment with depressive and anxious symptoms suggest that children's attachment patterns may figure in their symptom experience (Sherman et al., 2015; Sroufe et al., 1999). The quality of relationships between children with caregivers and peers may lead children to develop mental representations of themselves as socially inadequate, leading to the experience of moderate and accelerating depressive symptoms and low and increasing anxious symptoms. Further

investigation of different aspects of caregiver-child and peer relationships in association with heterogeneity in depressive and anxious symptoms could lead to greater understanding of these associations in early childhood.

While caregiver attachment demonstrated influence on the trajectories of anxious symptoms, other family and caregiver characteristics did not. It may be that the influence of caregiver attachment suppressed the influence from family socioeconomic status and caregiver depressive symptoms and relational frustration on children's anxious symptoms. For instance, Hosokawa and Katsura (2017) had parents report on socioeconomic status and positive caregiving practices (e.g., involvement, positive communication) when children were in preschool as well as children's internalizing symptoms at Grade 1. Positive caregiving practices acted as a mediator, with greater socioeconomic status predictive of less frequent internalizing symptoms through more positive and secure caregiver relations. Campbell et al. (2004) conducted observations of maternal sensitivity when children were 6- and 15-months-old and attachment security when children were aged 3 years. Mothers also reported on their depressive symptoms at five timepoints across their child's age of 1 month to 3 years. Mothers with greater depressive symptoms and poorer maternal sensitivity, as shown by more intrusive and hostile interactions, were more likely to share insecure attachment relationships with their children. Based on these findings, it may be that influence from family socioeconomic status and caregiver depressive symptoms and relational frustration manifest in the attachment relationship between caregivers and children. In this way, caregiver attachment may be more influential on children's symptom experience when considered with other family and caregiver factors. Future research that investigates caregiver attachment as a mediator in the association between family

socioeconomic status and caregiver depressive symptoms and relational frustration with children's anxious symptoms could lead to better understanding of these relationships.

Characteristics of the teacher-child relationship, including positive engagement and conflict, did not demonstrate influence on the trajectories of depressive and anxious symptoms. It may be that other relationships are more influential on children's symptom experience than relationships between children and teachers. The current findings that caregiver attachment and peer conflict and sociability discriminated between the symptom trajectories provide support for this lack of influence. Teacher-child relationship quality has also shown association with children's depressive and anxious symptoms within time but not over time in early childhood. Using teacher reports, Zatto and Hoglund (2022) found that children's depressive and anxious symptoms were concurrently related to teacher-child conflict in preschool and kindergarten; however, no prospective associations across preschool and kindergarten were found. The consideration of aspects of the greater classroom context may also explain the lack of influence from the teacher-child relationship. Given that children are just entering preschool, they are still early in building their relationships with their teachers. The climate of the preschool classroom may then be more influential during this transition, supported by the current finding that classroom emotional support and organization discriminated between the anxious symptoms trajectories. Future research could investigate how patterns of change in caregiver, peer, and teacher-child relationships are associated with patterns of change in children's depressive and anxious symptoms to better identify influential relational factors and examine whether the teacher-child relationship becomes more salient for symptom experience over time.

Limitations and Future Research

The current research has many strengths, including its separate examination of depressive and anxious symptoms, person-centered approach to examining symptom trajectories and self-regulation, and examination of the association between profiles of self-regulation and domains of classroom climate with symptom trajectories in early childhood. Still, the current study has several limitations. For example, the lower caregiver response rate regarding consent for children to participate may limit the generalizability of our findings. Caregivers were provided consent forms in their language most commonly spoken at home and encouraged to return the forms whether or not consent was granted. Despite informational sessions with both the researchers and with social workers who were knowledgeable about the research and commonly shared caregivers' language, only 68.5% of consent forms were returned. This study targeted a population of children from ethnically diverse and low-income backgrounds, which may have added to the low response rate (Esbensen et al., 2008). More vulnerable families may be less comfortable granting consent regardless of efforts made by the researchers and social workers to ensure that families fully understood the project (Sieber, 2012). In this way, the current study may not capture the full range of vulnerability present in the targeted population. Additional strategies for caregivers to learn about the study, such as through community events and both printed and online materials, and opportunities for written or oral consent could better engage the most vulnerable families in research (Esbensen et al., 2008). Ensuring families understand all aspects of the study may also encourage greater consent from vulnerable families (Sieber, 2012). For instance, social workers and researchers could ask for families to verbally explain what is being asked of them and their children for their participation in the study. Another strategy is to encourage feedback and collaboration from families regarding the research project, such as through a caregiver advisory group. In conjunction with strategies used in the current study,

including translated consent forms, collaboration from social workers, and attendance by researchers at preschool programs, additional strategies like a caregiver advisory group and participatory action research methods may encourage participation among vulnerable families.

Only 49% of children had teacher-reported data at all waves of assessment. Missing teacher-reported data were due, in part, to children moving away, difficulty locating children after school transitions, and kindergarten teachers not consenting to participate. Given that children missing data at any wave differed by preschool program, engagement, and DCCS performance compared to children without missing data, missing teacher-reported data may have influenced the current findings. Still, engagement and DCCS performance did not significantly differentiate the identified self-regulation profiles and thus were not as influential in discriminating between trajectories of depressive and anxious symptoms. Preschool program also did not significantly discriminate between the symptom trajectories. The use of FIML estimation further helps to address missingness in teacher-reported data and is considered an acceptable approach to handle data missing at random (Asendorpf et al., 2014). While the researchers collected information from caregivers about their children's future school and additional contacts, future research could implement other proactive strategies to maintain contact with families and engage future teachers of the study. Future research could also use multiple reporters of depressive and anxious symptoms in order to address missingness across waves of assessment in a longitudinal study.

Reliance on teachers to rate children's depressive and anxious symptoms may have influenced the trajectories found here. Change in teacher, and thus reporter, from preschool to kindergarten may have influenced reports of depressive and anxious symptoms. For instance, means of depressive and anxious symptoms tended to be similar within grade but dissimilar

between grades. Teachers tend to demonstrate less agreement in their reports of children's internalizing symptoms due to perceptions of the severity of these symptoms and their impact on classroom management and performance varying by teacher (Splett et al., 2020). It could be that differences in perceptions of depressive and anxious symptoms influenced teacher reports. Some teachers may have reported symptoms as more or less frequent than objectively demonstrated by children, influencing the trajectories of depressive and anxious symptoms found here. Still, differences by grade level were not found to be influential on teacher's reports of children's internalizing symptoms in kindergarten to Grade 5 (Splett et al., 2020). This finding suggests that the change in teacher by grade level is less influential on reports of symptoms than on differences between teachers in general. The change in teacher by grade level may also help to avoid shared method bias, which may have occurred if only one teacher had assessed depressive and anxious symptoms across all waves. Future research could implement a multi-informant approach, such that children, caregivers, or observers report on children's depressive and anxious symptoms along with teacher reports to account for potential biases.

While the ethnic diversity of the sample is a strength of the current study, this demographic characteristic may have influenced findings. Different values are placed on social initiative and behavioral constraint by cultural background, which may lead to different socialization practices for children (Chen, 2010). Children from group-oriented cultural backgrounds may be more likely to be socialized to restrain desires and actions to better attend to the needs and interests of others. In this way, reserved and inhibited behavior may be encouraged. In individual-oriented cultural backgrounds, such as Canada, shyness and inhibition are often regarded as less developmentally competent and may increase the likelihood for such children to be reported as demonstrating greater internalizing symptoms. These cultural

differences may have influenced findings regarding heterogeneity in the trajectories of depressive and anxious symptoms. Children from group-oriented cultural backgrounds may also demonstrate more inhibitory control, which may have influenced findings regarding the self-regulation profiles and their association with the symptom trajectories. Future research could examine differences by cultural background or ethnic group in children's trajectories of depressive and anxious symptoms and profiles of self-regulation.

Use of the PRQ (Kamphaus & Reynolds, 2006) to assess caregiver-child attachment and relational frustration may not have adequately captured caregiver-child relations among this ethnically diverse sample. While the PRQ has shown factor validity (Kamphaus & Reynolds, 2006), it has not been examined in relation to cross-cultural validity or factorial validity across diverse samples. It may be that the PRQ demonstrates cultural bias, such that the items are most related to caregivers from Caucasian and middle- or upper-class backgrounds (Rubinic & Schwickrath, 2010). While caregiver attachment discriminated between the moderate and decreasing and low and stable anxious symptoms trajectories, different influence by caregiver-child relations may have been found using a more culturally sensitive assessment tool. Future research would benefit from examining the cross-cultural validity of the PRQ as well as using a more culturally sensitive tool to assess caregiver-child relations.

Another limitation of the current study is regarding the inflated odds ratios and confidence intervals found for some of the multinomial logistic regression analyses. These inflated odds ratios and confidence intervals may be due to the fact that a smaller proportion of the sample are captured in the *moderate with accelerated growth* depressive symptoms trajectory and the *moderate and decreasing* and *low and increasing* anxious symptoms trajectories. Such small class sizes may result in more inflated estimates and may overestimate the effects found

(Nemes et al., 2009). Future research could recruit a larger sample to allow for a greater number of cases in each latent trajectory in order to deter the occurrence of inflated odds ratios and confidence intervals.

While the influence of some predictors was identified across the multinomial logistic regression analyses, others were only found in models with select classroom climate domains. This discrepancy in findings suggests that the influence of these predictors may be less pronounced when certain domains of classroom climate are considered. For instance, the significant discrimination between the *low and increasing* and *low and stable* anxious symptoms trajectories by caregiver attachment, peer conflict, and the *emotionally-dysregulated* self-regulation profile were only found in the model that included classroom instructional support. The associations between children's anxious symptoms and caregiver attachment, peer conflict, and emotional dysregulation may be less related to instructional support, resulting in the significant findings here. The significant discrimination between the *low and increasing* and *low and stable* anxious symptoms trajectories by peer sociability was also only found in the models that included classroom emotional and instructional support. Similarly, the association between anxious symptoms and peer sociability may be less related to emotional and instructional support as opposed to classroom organization. Findings regarding the influence of caregiver attachment, peer sociability and conflict, and emotional dysregulation on children's low and increasing anxious symptoms may be unstable and unreliable, such that these findings may not replicate across populations or contexts for these predictors.

Finally, while the sample size of the current study ($N = 443$) is a strength and power to detect between-group effects in a multilevel design was generally sufficient, the degree of power for prediction in a LGMM may be limited. It may be that the models were overfit with the

number of predictors that were included in the multinomial logistic regression models. The partitioning of the data in mixture models by the number of predictors may have diluted the associations and led to large standard errors with wide and imprecise confidence intervals. It may have also been that spurious associations were identified with the number of predictor variables included.

While this research has implications for the areas of depressive and anxious symptomology, self-regulation, and classroom climate in early childhood, continued research will further add to this knowledge. An important next step in this line of research is investigating how the classroom climate may play a role in the association between self-regulation and experience of depressive and anxious symptoms. It may be that in more supportive and organized classroom contexts, children are better able to practice and develop their self-regulatory abilities, dampening the experience of depressive and anxious symptoms in early childhood. Another aim of future research is to investigate profiles of self-regulation across early childhood. Such research could identify if and when children's varying experiences of self-regulation change and how such change has implications for the experience of depressive and anxious symptoms. Further investigation of the domains of classroom climate indicated as influential on depressive and anxious symptoms is also warranted. It may be that there are certain aspects of emotional support and classroom organization that most contribute to the experience of symptomology. Additional research could also include externalizing symptoms, such as hyperactivity and conduct problems, to examine how such symptoms covary with depressive and anxious symptoms and are influenced by profiles of self-regulation and domains of classroom climate. Such an investigation could capture comorbidity in experiences of internalizing and

externalizing symptoms as well as how influence by self-regulation and classroom climate may differ by symptomology.

Implications

While most children experienced infrequent depressive and anxious symptoms, other children may demonstrate elevated or increasing symptoms that warrant prevention and intervention efforts. Findings here suggest that prevention and intervention efforts should be aimed at the early childhood period to prevent and lessen symptom experience as well as support adaptive development. Focusing on children's strengths and adaptive development may be particularly beneficial in preventing and intervening on depressive and anxious symptom experience (Beaver, 2008). Such prevention and intervention efforts could also incorporate support of adaptive self-regulation and promotion of classroom emotional support and organization.

Providing caregivers and early childhood educators with the information and strategies needed to identify children's depressive and anxious symptoms and promote adaptive development is warranted. One approach could be to inform caregivers and educators of the experience of depressive and anxious symptoms in early childhood. For instance, caregivers and educators could be provided with information about early symptoms of depression and anxiety to enable identification of symptomology that may require additional support. Another approach is to inform caregivers and educators of strengths-based approaches to support children's adaptive development (Beaver, 2008). For example, caregivers and educators could focus on children's positive emotions and events to support children in developing a positive attributional style. Identification of how different emotions feel can also support children's emotional knowledge and better enable them to communicate their feelings and the ways in which they would like

support. Such support from caregivers and educators may allow children to develop a greater awareness of internal cues and emotional states, as opposed to avoidance of negative emotion, making positive emotions and cognitions more accessible.

Aspects of self-regulation may also be targeted in efforts to prevent and intervene on early depressive and anxious symptom experience. Most young children show moderate abilities to self-regulate their emotion and behavior, though those who are more adept at regulating their behavior or demonstrate difficulty regulating their emotion may be vulnerable to symptom experience. Prevention efforts aimed at promoting children's self-regulation, particularly in relation to emotion and behavior, may deter symptom experience. For instance, caregivers and early childhood educators could incorporate games that promote behavioral inhibition and disinhibition to support children's adaptive behavioral self-regulation. Another strategy is for caregivers and educators to discuss with children when behavior should be managed and when it is okay for behavior to be less managed. In this way, children may gain more comfort to be less behaviorally-regulated when appropriate, which may lessen depressive symptom experience. Regarding emotional self-regulation, caregivers and educators could use strategies such as discussing emotions with children and labeling emotional expressions (Izard et al., 2008). Caregivers and educators could also use puppet play to act out emotions and emotion-inducing situations as well as interactively read emotion storybooks with children. Overall, prevention and intervention efforts that target adaptive emotional and behavioral self-regulation may help to deter depressive and anxious symptom experience while also supporting children's self-regulation development.

There are several ways in which support of children's adaptive development could be implemented through prevention and intervention efforts. As a universal approach, caregivers

could be provided with information regarding depressive and anxious symptoms, self-regulation, and support of adaptive development by educators at the start of preschool or by family doctors or pediatricians at routine visits. Educators could also be provided with this information through training in their professional programs and through professional development opportunities after employment. Another approach could include implementation of social-emotional learning programs in the early classroom context (Denham et al., 2014; Taylor et al., 2017). These efforts can support children in recognizing and managing feelings of sadness and anxiety as well as identifying strengths in their social and emotional functioning. Social-emotional learning programs also commonly focus on self-regulation, with objectives aimed at regulation of emotion and behavior as well as recognition and adherence to contextual demands for regulation. Such interventions can support the use of classroom-based strategies to promote children's emotional and behavioral self-regulation. Emotion-based preventive interventions are further aimed at increasing children's emotional competence through support of emotional knowledge and self-regulation (Izard et al., 2008). While social-emotional learning programs and emotion-based preventive interventions are universally implemented to support the adaptive development of all children within an early learning context, these approaches also often include targeted components. Such targeted components can provide additional and direct support to children experiencing elevated or increasing depressive and anxious symptoms. Class-wide interventions aimed at monitoring children's behaviors in the classroom may also help educators to provide proactive support, as day-to-day fluctuations in children's depressive and anxious symptoms could be identified and addressed through a strengths-based approach (Barnett et al., 2007; Beaver, 2008).

Enhancing the emotional support and organization of the early classroom context may further help to intervene on children's elevated anxious symptoms. The focus on emotional support and organization may act as an intervention effort to lessen feelings of anxiety for children less familiar with engaging with large groups of children, less familiar engaging in more structured contexts, and experiencing separation anxiety from caregivers (Eccles & Roeser, 2011; Hamre et al., 2009; Phillips et al., 2019). Professional development opportunities that focus on positive affectivity, teacher sensitivity, and flexibility may help to enhance emotional support in the classroom, while opportunities that focus on providing clear and consistent behavioral expectations and clear instructions with active teacher involvement may help to enhance organization. For example, My Teaching Partner provides educators with access to resources related to the domains of classroom climate as well as a consultation process to provide ongoing support and feedback regarding their classroom dynamics (Pianta, Mashburn, et al., 2008). Subsequently, such professional development opportunities may lead to less experience of anxious symptoms as well as faster relief from anxious symptoms for young children. Class-wide interventions can further support early childhood educators in promoting emotional support and organization (Barnett et al., 2007). Such interventions emphasize evidence-based methods of instruction and management in the hopes of improving goal setting and progress monitoring in the classroom. In this way, class-wide interventions could focus on monitoring and improving the emotional support and organization implemented in the early classroom.

Conclusion

In conclusion, young children demonstrate distinct trajectories of depressive and anxious symptoms, suggesting that some children experience elevated or increasing symptoms in early

childhood. Variability in children's early self-regulatory abilities discriminates between these symptom trajectories, with emotional dysregulation and behavioral overregulation demonstrating risk for elevated or increasing symptom experience. Domains of the preschool classroom context, namely emotional support and organization, also demonstrated promotion of decreases in anxious symptom experience. Efforts related to the prevention and intervention of depressive and anxious symptoms are thus warranted in early childhood, and may benefit from targeting children's emotional and behavioral self-regulation as well as emotional and organizational qualities of the early classroom context.

Table 1

Child and Family Demographic Data for the Overall Sample and by Cohort

	Overall Sample	Cohort 1	Cohort 2
Child's Ethnicity			
Caucasian/Canadian	33.0%	42.3%	20.0%
South Asian	18.4%	14.3%	24.2%
Multiple ethnicities	11.1%	14.3%	6.7%
Arab/West Asian	10.1%	6.5%	15.0%
Black/African Canadian	7.6%	5.4%	10.8%
Southeast Asian	7.3%	5.4%	10.0%
East Asian	5.2%	4.8%	5.8%
Indigenous	3.8%	3.0%	5.0%
Latin	3.5%	4.2%	2.5%
Primary Language Spoken in Household			
South Asian (e.g., Punjabi, Hindi)	25.2%	23.9%	27.4%
Other European (e.g., Polish, Ukrainian)	17.7%	8.5%	33.0%
English	12.4%	19.9%	0.0%
Southeast Asian (e.g., Vietnamese, Tagalong)	12.4%	11.4%	14.2%
West Asian (e.g., Turkish, Arabic)	12.1%	10.2%	15.1%
Multiple languages	3.9%	5.7%	0.9%
African/Caribbean (e.g., Dinka, Amharic)	3.5%	5.7%	0.0%
East Asian (e.g., Mandarin, Japanese)	3.5%	5.7%	0.0%
Latin (e.g., Spanish, Portuguese)	3.5%	2.8%	4.7%
French	3.2%	2.8%	3.8%
Indigenous (e.g., Cree, Blackfoot)	2.5%	3.4%	0.9%
Family Demographics			
Single-caregiver household	18.4%	16.0%	21.4%
Primary caregiver did not finish high school	14.8%	13.0%	17.0%
Primary caregiver has high school diploma or some post-secondary education	30.2%	24.5%	37.6%
Primary caregiver has a post-secondary degree	55.1%	62.5%	45.4%

Table 2

Model Fit Indices of the Measurement Invariance Models for Depressive and Anxious Symptoms Across Waves

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Depressive Symptoms[a]						
1. Measurement	306.93(27), p<.01	.82	.16 (.15-.18)	.07	4952.04	
2. Configural Invariance	1410.25(534), p<.01	.86	.06 (.06-.07)	.07	16776.18	
3. Metric Invariance	1460.39 (558), p<.01	.85	.06 (.06-.07)	.07	16680.90	vs. Configural Invariance: $\Delta\chi^2$=50.40(24), p<.01
4. Partial Metric Invariance	**1435.42(555), p<.01**	**.86**	**.06 (.06-.07)**	**.07**	**16674.11**	**vs. Configural Invariance: $\Delta\chi^2$=25.17(21), *ns***
Anxious Symptoms[a]						
1. Measurement	140.12(27), p<.01	.89	.10 (.09-.12)	.06	5408.42	
2. Configural Invariance	1030.38(534), p<.01	.88	.05 (.04-.05)	.06	18068.89	
3. Metric Invariance	1065.82(558), p<.01	.88	.05 (.04-.05)	.07	17958.91	vs. Configural Invariance: $\Delta\chi^2$=35.44(24), *ns*
4. Scalar Invariance	1158.60(585), p<.01	.86	.05 (.04-.05)	.07	17888.10	vs. Metric Invariance: $\Delta\chi^2$= 92.78(27), p<.01
5. Partial Scalar Invariance	**1093.45(573), p<.01**	**.88**	**.05 (.04-.05)**	**.07**	**17372.03**	**vs. Metric Invariance: $\Delta\chi^2$=27.63(15), *ns***

Notes. Best-fitting models shown in boldface. [a] = Teacher report. *ns* = not significant.

Table 3

Model Fit Indices of the Measurement Invariance Models for Depressive and Anxious Symptoms and Self-Regulation Indicators by Gender at Baseline

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Depressive Symptoms[a]						
1. Measurement	306.93(27), p<.01	.82	.16 (.15-.18)	.07	4952.04	
2. Configural Invariance	384.35(54), p<.01	.80	.18(.16-.20)	.08	4998.20	
3. Metric Invariance	388.03(62), p<.01	.80	.17 (.15-.18)	.08	4954.21	vs. Configural Invariance: $\Delta\chi^2$=3.68(8), *ns*
4. Scalar Invariance	414.49(71), p<.01	.79	.16 (.14-.17)	.09	4927.04	vs. Metric Invariance: $\Delta\chi^2$=26.46(9), p<.01
5. Partial Scalar Invariance	**400.95(69), *p*<.01**	**.80**	**.16 (.14-.17)**	**.08**	**4925.43**	**vs. Metric Invariance: $\Delta\chi^2$=12.92(7), *ns***
Anxious Symptoms[a]						
1. Measurement	140.12(27), p<.01	.89	.10 (.09-.12)	.06	5408.42	
2. Configural Invariance	210.51(54), p<.01	.87	.12 (.11-.14)	.07	5466.06	
3. Metric Invariance	246.04(62), p<.01	.84	.12 (.11-.14)	.09	5453.91	vs. Configural Invariance: $\Delta\chi^2$=35.53(8), p<.01
4. Partial Metric Invariance	**221.57(60), *p*<.01**	**.86**	**.12 (.10-.14)**	**.08**	**5441.36**	**vs. Configural Invariance: $\Delta\chi^2$=11.06(6), *ns***
Emotion Regulation[a]						
1. Measurement Model	144.70(20), p<.01	.86	.13 (.11-.15)	.06	6395.46	
2. Configural Invariance	167.34(40), p<.01	.86	.13 (.11-.15)	.07	6442.99	
3. Metric Invariance	173.98(47), p<.01	.86	.12 (.10-.14)	.08	6407.92	vs. Configural Invariance: $\Delta\chi^2$=6.64(7), *ns*
4. Scalar Invariance	213.06(55), p<.01	.82	.12 (.11-.14)	.11	6399.33	vs. Metric Invariance: $\Delta\chi^2$=39.08(8), p<.01
5. Partial Scalar Invariance	**182.48(51), *p*<.01**	**.85**	**.12 (.10-.13)**	**.09**	**6392.59**	**vs. Metric Invariance: $\Delta\chi^2$=8.5(4), *ns***

Table 3 continued on next page.

Table 3 continued

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Lability/Negativity[a]						
1. Measurement Model	640.87(77), *p*<.01	.80	.14 (.13-.15)	.07	9997.52	
2. Configural Invariance	767.04(154), *p*<.01	.78	.14 (.13-.15)	.08	10074.17	
3. Metric Invariance	798.83(167), *p*<.01	.77	.14 (.13-.15)	.09	10028.50	vs. Configural Invariance: $\Delta\chi^2$=31.79(13), *p*<.01
4. Partial Metric Invariance	**781.90(164), *p*<.01**	**.78**	**.14 (.13-.15)**	**.08**	**10029.45**	**vs. Configural Invariance: $\Delta\chi^2$=14.86(10), *ns***
Positive Emotion Maintenance[a]						
1. Measurement Model	123.66(14), *p*<.01	.87	.14 (.12-.17)	.06	5486.04	
2. Configural Invariance	139.75(28), *p*<.01	.87	.14 (.12-.17)	.07	5529.02	
3. Metric Invariance	142.82(34), *p*<.01	.87	.13 (.11-.15)	.08	5496.34	vs. Configural Invariance: $\Delta\chi^2$=3.07(6), *ns*
4. Scalar Invariance	178.99(41), *p*<.01	.84	.13 (.11-.15)	.11	5490.80	vs. Metric Invariance: $\Delta\chi^2$=36.17(7), *p*<.01
5. Partial Scalar Invariance	**150.61(38), *p*<.01**	**.87**	**.12 (.10-.15)**	**.09**	**5480.29**	**vs. Metric Invariance: $\Delta\chi^2$=7.79(4), *ns***
Negative Emotion Dysregulation[a]						
1. Measurement Model	127.46(35), *p*<.01	.95	.08 (.07-.10)	.04	6293.85	
2. Configural Invariance	204.76(70), *p*<.01	.93	.10 (.08-.12)	.05	6354.74	
3. Metric Invariance	217.01(79), *p*<.01	.93	.10 (.08-.11)	.06	6313.36	vs. Configural Invariance: $\Delta\chi^2$=12.25(9), *ns*
4. Scalar Invariance	244.55(89), *p*<.01	.92	.10 (.08-.11)	.08	6281.32	vs. Metric Invariance: $\Delta\chi^2$=27.54(10), *p*<.01
5. Partial Scalar Invariance	**232.36(87), *p*<.01**	**.92**	**.09 (.08-.11)**	**.07**	**6281.04**	**vs. Metric Invariance: $\Delta\chi^2$=15.35(8), *ns***
Exuberant Emotion Dysregulation[a]						
1. Measurement Model	120.17(14), *p*<.01	.92	.14 (.12-.16)	.06	5573.80	
2. Configural Invariance	140.73(28), *p*<.01	.91	.14 (.12-.17)	.06	5614.17	
3. Metric Invariance	153.47(34), *p*<.01	.90	.14 (.11-.16)	.07	5591.16	vs. Configural Invariance: $\Delta\chi^2$=12.74(6), *p*<.05
4. Partial Metric Invariance	**144.51(33), *p*<.01**	**.91**	**.13 (.11-.16)**	**.07**	**5588.16**	**vs. Configural Invariance: $\Delta\chi^2$=3.78(5), *ns***

Table 3 continued on next page.

Table 3 continued

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Negative Affect[b]						
1. Measurement Model	161.79(54), *p*<.01	.76	.08 (.07-.09)	.06	10969.87	
2. Configural Invariance	213.04(108), *p*<.01	.77	.08 (.06-.09)	.07	11112.82	
3. Metric Invariance	228.79(119), *p*<.01	.76	.08 (.06-.09)	.08	11065.36	vs. Configural Invariance: $\Delta\chi^2$=15.75(11), *ns*
4. Scalar Invariance	259.75(131), *p*<.01	.72	.08 (.07-.09)	.08	11027.36	vs. Metric Invariance: $\Delta\chi^2$=30.96(12), *p*<.01
5. Partial Scalar Invariance	**244.44(129), *p*<.01**	**.75**	**.08 (.06-.09)**	**.08**	**11023.54**	**vs. Metric Invariance: $\Delta\chi^2$=15.65(10), *ns***
Effortful Control[b]						
1. Measurement Model	128.69(54), *p*<.01	.83	.07 (.05-.08)	.06	10484.23	
2. Configural Invariance	205.03(108), *p*<.01	.76	.08 (.06-.09)	.08	10609.21	
3. Metric Invariance	**214.29(119), *p*<.01**	**.76**	**.07 (.06-.09)**	**.08**	**10555.26**	**vs. Configural Invariance: $\Delta\chi^2$=9.26(11), *ns***
4. Scalar Invariance	263.84(131), *p*<.01	.67	.08 (.07-.10)	.10	10535.85	vs. Metric Invariance: $\Delta\chi^2$=49.55(12), *p*<.01
5. Partial Scalar Invariance	231.41(125), *p*<.01	.74	.07 (.06-.09)	.09	10537/91	vs. Metric Invariance: $\Delta\chi^2$=17.12(6), *p*<.01
Surgency[b]						
1. Measurement Model	219.40(54), *p*<.01	.56	.10 (.09-.11)	.10	10951.26	
2. Configural Invariance	277.87(108), *p*<.01	.57	.10 (.09-.12)	.10	11092.75	
3. Metric Invariance	289.60(119), *p*<.01	.57	.10 (.08-.11)	.11	11041.26	vs. Configural Invariance: $\Delta\chi^2$=11.73(11), *ns*
4. Scalar Invariance	327.12(131), *p*<.01	.50	.10 (.09-.11)	.11	11009.84	vs. Metric Invariance: $\Delta\chi^2$=37.52(12), *p*<.01
5. Partial Scalar Invariance	**300.16(130), *p*<.01**	**.57**	**.09 (.08-.11)**	**.11**	**10988.62**	**vs. Metric Invariance: $\Delta\chi^2$=10.56(11), *ns***

Table 3 continued on next page.

Table 3 continued

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Impulsivity[b]						
1. Measurement Model	39.41(14), p<.01	.84	.08 (.05-.11)	.05	6508.93	
2. Configural Invariance	61.14(28), p<.01	.80	.09 (.06-.12)	.06	6583.38	
3. Metric Invariance	64.91(34), p<.01	.81	.08 (.05-.10)	.07	6552.67	vs. Configural Invariance: $\Delta\chi^2$=3.77(6), *ns*
4. Scalar Invariance	100.55(41), p<.01	.63	.10 (.07-.12)	.09	6548.09	vs. Metric Invariance: $\Delta\chi^2$=35.64(17), p<.01
5. Partial Scalar Invariance	**71.58(40), *p*<.01**	**.81**	**.07 (.04-.10)**	**.07**	**6524.87**	**vs. Metric Invariance: $\Delta\chi^2$=6.67(6), *ns***
Adaptability[b]						
1. Measurement Model	6.93(5), *ns*	.99	.04 (.00-.09)	.02	4322.79	
2. Configural Invariance	11.80(10), *ns*	.99	.03 (.00-.10)	.03	43887.79	
3. Metric Invariance	20.07(14), *ns*	.97	.05 (.00-.10)	.06	4373.08	vs. Configural Invariance: $\Delta\chi^2$=8.27(4), *ns*
4. Scalar Invariance	**24.35(19), *ns***	**.98**	**.04 (.00-.09)**	**.07**	**4348.63**	**vs. Metric Invariance: $\Delta\chi^2$=4.28(5), *ns***

Notes. Best-fitting models shown in boldface. [a] = Teacher report. [b] = Caregiver report. *ns* = not significant.

Table 4

Descriptive Statistics of Depressive and Anxious Symptoms, Self-Regulation Indicators, and Caregiver, Peer, and Teacher Baseline Covariates

	Overall Sample				
Variables	**α**	***N***	**Mean**	***SD***	**Range**
Depression[a]					
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[a]					
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
Self-Regulation					
Emotional Self-Regulation Indicators					
Positive Emotion Maintenance[a]	0.82	387	2.06	0.53	0.43-3.00
Negative Emotion Dysregulation[a]	0.90	387	0.45	0.50	0.00-2.30
Exuberant Emotion Dysregulation[a]	0.83	387	0.85	0.59	0.00-3.00
Negative Affect[b]	0.63	311	2.05	0.48	0.75-3.75
Negative Response to Disappointment[d]	n/a	354	0.11	0.16	0.00-0.83
Cognitive Self-Regulation Indicators					
Effortful Control[b]	0.68	311	2.73	0.49	1.25-3.92
Self-Reliance[c]	n/a	340	1.50	0.91	0.00-4.00
Engagement[c]	n/a	339	3.59	1.00	0.67-5.75
DCCS Performance[d]	n/a	351	37.62	13.34	4.00-69.00
Behavioral Self-Regulation Indicators					
Impulsivity[b]	0.57	311	2.35	0.58	1.00-3.86
Adaptability[b]	0.69	311	2.32	0.68	0.40-4.00
Behavior Control[c]	n/a	340	4.20	1.04	0.25-5.75
HTKS Performance[d]	n/a	326	6.83	9.98	0.00-39.00
Baseline Covariates					
Caregiver Covariates					
Caregiver Depressive Symptoms[b]	0.90	298	1.05	0.55	0.00-2.89
Caregiver-Child Attachment[b]	0.80	312	3.30	0.43	2.00-4.00
Caregiver-Child Relational Frustration[b]	0.81	312	1.55	0.64	0.00-3.75
Peer Covariates					
Peer Sociability[c]	n/a	340	1.57	1.04	0.00-4.50
Peer Conflict[c]	n/a	340	0.17	0.38	0.00-2.75
Teacher Covariates					
Teacher-Child Positive Engagement[c]	n/a	340	1.51	0.92	0.00-4.00
Teacher-Child Conflict[c]	n/a	340	0.19	0.56	0.00-5.00

Notes. Cronbach's alphas for effortful control, negative affect, impulsivity, adaptability, and caregiver-child attachment and relational frustration represent caregivers' first report across W1 and

W2. The Cronbach's alpha listed for caregiver depressive symptoms represents caregivers' first report across W1 to W4. [a] = Teacher report. [b] = Caregiver report. [c] = Observation. [d] = Behavioral assessment. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4. n/a = Not applicable.

Table 5

Bivariate Correlations between Depressive and Anxious Symptoms and Caregiver, Peer, and Teacher Baseline Covariates for the Overall Sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Depression[a]														
1. W1														
2. W2	**.67****													
3. W3	**.39****	**.43****												
4. W4	**.30****	**.43****	**.67****											
Anxiety[a]														
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****							
9. Caregiver Depressive Symptoms[b]	.19**	.23**	.06	.09	.10	.21**	-.01	.06						
10. Caregiver-Child Attachment[b]	-.05	-.11	.01	.00	-.05	-.11	-.02	-.02	-.23**					
11. Caregiver-Child Relational Frustration[b]	.07	.06	.03	.01	.01	.04	.01	.02	.38**	-.31**				
12. Peer Sociability[c]	-.07	.00	-.12	-.11	-.06	-.02	-.05	-.08	.06	-.02	.07			
13. Peer Conflict[c]	.21**	.16**	.26**	.25**	.06	.06	.12	.10	.00	-.03	.04	.05		
14. Teacher-Child Positive Engagement[c]	.01	.02	-.08	-.05	.00	-.04	-.07	-.08	.11	-.06	.14*	.14**	.02	
15. Teacher-Child Conflict[c]	.24**	.23**	.21**	.18**	.10	.08	.08	.08	.07	-.12*	.13*	-.18**	.55**	-.02

Notes. Stability estimates shown in boldface. [a] = Teacher report. [b] = Caregiver report. [c] = Observation. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4. *$p < .05$, **$p < .01$.

Table 6

Bivariate Correlations between Depressive and Anxious Symptoms and Self-Regulation Indicators for the Overall Sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Depression[a]																				
1. W1																				
2. W2	**.67***																			
3. W3	**.39***	**.43***																		
4. W4	**.30***	**.43***	**.67***																	
Anxiety[a]																				
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***													
9. Pos. Emotion Maintenance[a]	-.33*	-.27*	-.16*	-.11	-.42*	-.29*	-.19*	-.16*												
10. Neg. Emotion Dysregulation[a]	.81*	.63*	.44*	.37*	.52*	.37*	.21*	.16*	-.39*											
11. Exu. Emotion Dysregulation[a]	.49*	.44*	.34*	.26*	.21*	.20*	.13*	.12	-.24*	.65*										
12. Neg. Response to Disappointment[d]	.10	.13*	.20*	.12	.04	.09	.12	.05	-.02	.12*	.09									
13. Impulsivity[b]	.11	.09	.01	.03	.07	.01	-.06	.02	-.01	.08	.16*	.08								
14. Adaptability[b]	.02	.07	.01	.18*	.04	.07	-.03	.10	-.02	.00	.06	.11	.65*							
15. Negative Affect[b]	.08	.00	-.08	.02	.13*	.11	.08	.04	.00	.01	.02	.08	.30*	.33*						
16. Effortful Control[b]	.17*	.16*	-.12	.04	.04	.05	.02	.05	.07	.25*	.24*	.04	.12	.17*	.13*					
17. Engagement[c]	.10	.04	-.11	.11	.02	.04	.11	.06	.35*	.21*	.16*	.02	.01	.11	.05	.10				
18. Self-Reliance[c]	.08	.03	-.01	.04	.07	.04	.06	.01	.21*	.05	.09	.01	.10	.05	.04	.00	.40*			
19. Behavior Control[c]	.16*	.15*	-.27*	.24*	.12*	.06	.09	.09	.12*	.34*	.37*	.01	.06	.04	.01	.23*	.60*	.22*		
20. HTKS Performance[d]	.01	.09	-.01	.03	.00	.08	.04	.01	.25*	.05	.17*	.05	.06	.01	.03	.02	.13*	.12*	.01	
21. DCCS Performance[d]	.03	.09	.01	.02	.02	.01	.00	.04	.23*	.10	.18*	.12*	.07	.02	.01	.11	.18*	.10	.17*	.32*

Notes. Stability estimates shown in boldface. Pos. = Positive. Neg. = Negative. Exu. = Exuberant. [a] = Teacher report. [b] = Caregiver report. [c] = Observation. [d] = Behavioral assessment. W1 = Wave 1. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4. *$p < .05$.

Table 7

Latent Growth Curve Models for Depressive and Anxious Symptoms

Model	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	BIC	Model Comparisons: $\Delta\chi^2$ (df)
Depressive Symptoms[a]						
1. Fixed Intercept	99.66(9), p<.01	.79	.15 (.13-.18)	.23	1199.78	
2. Random Intercept	29.67(8), p<.01	.95	.08 (.05-.11)	.06	1135.85	vs. Fixed Intercept: $\Delta\chi^2$=69.99(1), p<.01
3. Fixed Linear Slope	27.97(7), p<.01	.95	.08 (.05-.12)	.05	1140.21	vs. Random Intercept: $\Delta\chi^2$=1.70(1), *ns*
4. Random Linear Slope	21.83(5), p<.01	.96	.09 (.05-.13)	.05	1146.19	vs. Random Intercept: $\Delta\chi^2$=7.84(3), p<.05
5. Fixed Quadratic Slope	**13.78(4), p<.01**	**.98**	**.08 (.04-.12)**	**.04**	**1144.19**	**vs. Random Linear Slope: $\Delta\chi^2$=8.05(1), p<.01**
6. Random Quadratic Slope	Not positive definite.					
Anxious Symptoms[a]						
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*

Notes. Best-fitting models shown in boldface. [a] = Teacher report. *ns* = not significant.

Table 8

Latent Growth Mixture Model Fit Indices and Class Proportions for Depressive Symptoms

										% in each class ($AvePP_k$)			
K	**LL**	***npar***	**AIC**	**BIC**	**SABIC**	**BLRT*p***	**VLRT*p***	**LLRT*p***	**Ent.**	**1**	**2**	**3**	**4**	**5**
1	-	10	1103.62	1144.19	1112.45	-	-	-	-	100.00	-	-	-	-
2	-481.25	14	990.50	1047.30	1002.87	**.00**	**.01**	**.01**	**.94**	7.19(.94)	92.81(.99)	-	-	-
3	-462.66	16	957.32	1022.23	971.46	**.00**	.23	.25	.87	85.69(.96)	8.31(.79)	6.00(.96)	-	-
4	-440.60	20	921.20	1002.33	938.86	**.00**	.33	.34	.76	5.47(.95)	61.74(.88)	16.96(.84)	15.84(.82)	-
5	**-411.30**	24	**870.60**	**967.97**	**891.81**	**.00**	.05	.05	.79	56.72(.86)	17.62(.88)	3.04(.99)	4.65(.84)	17.97(.84)

Notes. *npar* = Number of parameters. Ent. = Entropy. Best fitting model indices are shown in boldface.

Table 9

Growth Factor Estimates and Class Proportions from the Two-Class Latent Growth Mixture Model for Depressive Symptoms

Latent Trajectory Class	**n (%)**	**Intercept**		**Linear Slope**		**Quadratic Slope**		$AvePP_k$
		Est.	***SE***	**Est.**	***SE***	**Est.**	***SE***	
C1: Moderate with Accelerated Growth	31 (7.19)	1.20	0.16**	0.05	0.14**	0.01	0.04**	0.94
C2: Low with Decelerated Growth	396 (92.81)	0.34	0.02**	0.04	0.02**	-0.02	0.01**	0.99

Notes. C = Latent trajectory class. ** $p < .01$.

Table 10

Baseline Covariates as Predictors of the Depressive Symptoms Latent Class Trajectories

	Moderate with Accelerated Growth (7.19%)	
	***B* (*SE*)**	***OR* (90% CI)**
Preschool Program	-0.43 (.54)	0.65 (0.27, 1.59)
Gender	0.17 (.55)	1.18 (0.48, 2.92)
Household Number of Caregivers[a]	0.99 (.61)	2.68 (0.98, 7.30)
Caregiver Education[a]	-0.54 (.35)	0.58 (0.33, 1.04)
Caregiver Depressive Symptoms[a]	0.48 (.46)	1.61 (0.76, 3.42)
Caregiver-Child Attachment[a]	0.02 (.62)	1.02 (0.37, 2.83)
Caregiver-Child Relational Frustration[a]	-0.09 (.42)	0.91 (0.46, 1.83)
Peer Sociability[b]	-0.07 (.32)	0.93 (0.55, 1.58)
Peer Conflict[b]	1.36 (.65)*	3.89 (1.34, 11.30)
Teacher-Child Positive Engagement[b]	0.06 (.32)	1.06 (0.63, 1.79)
Teacher-Child Conflict[b]	0.19 (.41)	1.21 (0.61, 2.39)

Notes. Low with decelerated growth trajectory is the referent group (92.81%). [a] = Caregiver report. [b] = Observation. Preschool program: Program A = 0, Program B = 1. Child gender: Boys = 0, Girls = 1. Household number of caregivers: Two-caregiver household = 0, Single-caregiver household = 1. Caregiver education: Did not complete high school = 0, Completed high school and no post-secondary degree = 1, Completed post-secondary degree = 2. Caregiver depressive symptoms: *Never* = 0 to *Always* = 4. Caregiver-child attachment: *Never* = 0 to *Always* = 4. Caregiver-child relational frustration: *Never* = 0 to *Always* = 4. Peer sociability: *Low* = 0 to *High* = 6. Peer conflict: *Low* = 0 to *High* = 6. Teacher-child positive engagement: *Low* = 0 to *High* = 6. Teacher-child conflict: *Low* = 0 to *High* = 6. *OR* = Odds ratio. CI = Confidence interval. *$p <$ .05.

Table 11

Latent Growth Mixture Model Fit Indices and Class Proportions for Anxious Symptoms

									% in each class (*AvePP$_k$*)			
K	**LL**	***npar***	**AIC**	**BIC**	**SABIC**	**BLRT*p***	**VLRT*p***	**LMRT*p***	**Ent.**	**1**	**2**	**3**	**4**
1	-	9	834.95	871.48	842.92	-	-	-	-	100.00	-	-	-
2	-386.95	10	793.91	834.50	802.76	**0.00**	0.39	0.40	**0.91**	95.70 (.98)	4.30 (.81)	-	-
3	-356.43	13	738.86	**791.62**	750.37	**0.00**	0.01	0.01	0.83	6.94 (.86)	84.40 (.94)	8.66 (.84)	-
4	**-344.01**	16	**720.03**	**784.97**	**734.20**	**0.00**	**0.00**	**0.00**	0.80	16.09 (.78)	76.33 (.91)	6.46 (.93)	1.12 (.98)

Notes. *npar* = Number of parameters. Ent. = Entropy. Best fitting model indices are shown in boldface.

Table 12

Growth Factor Estimates and Class Proportions from the Three-Class Latent Growth Mixture Model for Anxious Symptoms

Latent Trajectory Class	**n (%)**	**Intercept**		**Linear Slope**		***AvePP$_k$***
		Est.	***SE***	**Est.**	***SE***	
C1: Low and Increasing	29 (6.94)	0.52	0.10**	0.22	0.05**	0.86
C2: Low and Stable	361 (84.40)	0.37	0.03**	-0.02	0.01	0.94
C3: Moderate and Decreasing	37 (8.66)	1.26	0.20**	-0.30	0.07**	0.84

Notes. C = Latent trajectory class. ***p* < .01.

Table 13

Baseline Covariates as Predictors of the Anxious Symptoms Latent Class Trajectories

	Moderate and Decreasing (8.66%)		**Low and Increasing (6.94%)**	
	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**
Preschool Program	-0.70 (.97)	0.50 (0.10, 2.46)	-0.11 (.74)	0.90 (0.27, 3.04)
Gender	0.13 (.55)	1.14 (0.46, 2.81)	0.39 (.75)	1.47 (0.43, 5.06)
Household Number of Caregivers[a]	-0.14 (.77)	0.87 (0.24, 3.11)	0.37 (.89)	1.44 (0.33, 6.21)
Caregiver Education[a]	-0.24 (.41)	0.79 (0.40, 1.56)	-0.45 (.42)	0.64 (0.32, 1.27)
Caregiver Depressive Symptoms[a]	0.59 (.51)	1.81 (0.78, 4.19)	0.39 (.60)	1.48 (0.55, 3.97)
Caregiver-Child Attachment[a]	-0.23 (.68)	0.79 (0.26, 2.44)	-0.51 (.74)	0.60 (0.18, 2.05)
Caregiver-Child Relational Frustration[a]	0.16 (.42)	1.18 (0.59, 2.34)	-0.04 (.68)	0.97 (0.31, 2.97)
Peer Sociability[b]	-0.14 (.25)	0.87 (0.58, 1.31)	-0.40 (.46)	0.67 (0.32, 1.43)
Peer Conflict[b]	-1.26 (1.12)	0.28 (0.05, 1.78)	1.17 (.77)	3.22 (0.91, 11.45)
Teacher-Child Positive Engagement[b]	-0.14 (.26)	0.87 (0.57, 1.33)	-0.08 (.49)	0.93 (0.41, 2.06)
Teacher-Child Conflict[b]	0.43 (.56)	1.54 (0.62, 3.85)	-0.06 (.55)	0.94 (0.38, 2.32)

Notes. Low and stable trajectory is the referent group (84.40%). [a] = Caregiver report. [b] = Observation. Preschool program: Program A = 0, Program B = 1. Child gender: Boys = 0, Girls = 1. Household number of caregivers: Two-caregiver household = 0, Single-caregiver household = 1. Caregiver education: Did not complete high school = 0, Completed high school and no post-secondary degree = 1, Completed post-secondary degree = 2. Caregiver depressive symptoms: *Never* = 0 to *Always* = 4. Caregiver-child attachment: *Never* = 0 to *Always* = 4. Caregiver-child relational frustration: *Never* = 0 to *Always* = 4. Peer sociability: *Low* = 0 to *High* = 6. Peer conflict: *Low* = 0 to *High* = 6. Teacher-child positive engagement: *Low* = 0 to *High* = 6. Teacher-child conflict: *Low* = 0 to *High* = 6. *OR* = Odds ratio. CI = Confidence interval.

Table 14

Classification Overlap of the Depressive and Anxious Symptoms Trajectories

	Anxious Symptoms Trajectories		
	Low and stable (n = 361)	Moderate and decreasing (n = 37)	Low and increasing (n = 29)
Depressive Symptoms Trajectories			
Low with decelerated growth (n = 396)	91.7%	5.8%	2.5%
Moderate with accelerated growth (n = 31)	32.1%	25.0%	42.8%

Note. Percentages indicate the proportion of children classified in the depressive symptoms trajectories that were also classified in the anxious symptoms trajectories.

Table 15

Fit Statistics and Classification Coefficients of the Latent Profile Analyses for Self-Regulation

K	LL	*npar*	AIC	BIC	BLRT*p*	VLRT*p*	LLRT*p*	Ent.
1	-3761.77	143	7809.53	8387.97	-	-	-	-
2	-3625.57	157	7565.14	8200.20	**0.00**	**0.00**	**0.00**	0.84
3	-3548.78	171	7439.57	**8131.26**	**0.00**	0.02	0.03	0.87
4	**-3511.46**	185	**7392.92**	**8141.25**	**0.00**	0.26	0.26	**0.88**

Note. Best fit index values are bolded.

Table 16

Model Classification Diagnostics for the Three-Profile Latent Profile Analysis for Self-Regulation

Profile	π_k	$mcaP_k$	$AvePP_k$	OCC_k
P1: Typically-Regulated	0.70	0.70	0.93	1.07
P2: Emotionally-Dysregulated	0.10	0.10	0.94	1.06
P3: Behaviorally-Overregulated	0.21	0.21	0.99	1.01

Notes. π_k = Model-estimated class prevalence. $mcaP_k$ = Modal class assignment proportion. $AvePP_k$ = Average posterior class probability. OCC_k = Odds of correct classification ratio. P = Profile.

Table 17

Model-Estimated, Class-Specific Standardized Means and Variances with Bootstrap 95% Confidence Intervals Based on the Three-Profile Latent Profile Analysis for Self-Regulation

Profile	Variable	Mean (CI)	Variance (CI)
Typically-Regulated (69.95%)	Positive Emotion Maintenance[a]	1.86 (1.08, 2.78)	0.90 (0.84, 0.94)
	Negative Emotion Dysregulation[a]	0.99 (-0.69, 2.85)	0.98 (0.93, 1.00)
	Exuberant Emotion Dysregulation[a]	2.22 (1.14, 3.39)	0.95 (0.90, 0.98)
	Negative Response to Disappointment[d]	-0.21 (-1.28, 1.07)	0.99 (0.96, 1.00)
	Negative Affect[b]	3.48 (2.18, 4.81)	0.97 (0.91, 0.99)
	Effortful Control[b]	5.41 (4.22, 7.07)	0.91 (0.83, 0.97)
	Self-Reliance[c]	0.29 (-0.66, 1.38)	0.97 (0.91, 0.99)
	Engagement[c]	1.06 (0.07, 2.37)	0.93 (0.88, 0.98)
	DCCS Performance[d]	0.41 (-0.84, 1.79)	0.94 (0.87, 0.99)
	Behavior Control[c]	2.92 (1.66, 4.72)	0.94 (0.87, 0.97)
	HTKS Performance[d]	-0.38 (-2.15, 1.61)	0.99 (0.94, 1.00)
	Impulsivity[b]	4.39 (3.15, 5.70)	0.97 (0.92, 0.99)
	Adaptability[b]	2.82 (1.52, 4.33)	0.99 (0.95, 1.00)
Emotionally-Dysregulated (9.50%)	Positive Emotion Maintenance[a]	1.27 (0.32, 2.27)	0.88 (0.84, 0.94)
	Negative Emotion Dysregulation[a]	5.41 (3.72, 7.71)	0.98 (0.93, 1.00)
	Exuberant Emotion Dysregulation[a]	3.82 (2.46, 5.27)	0.94 (0.90, 0.98)
	Negative Response to Disappointment[d]	0.08 (-1.10, 1.36)	0.99 (0.96, 1.00)
	Negative Affect[b]	3.90 (2.39, 5.26)	0.97 (0.91, 0.99)
	Effortful Control[b]	4.89 (3.80, 6.60)	0.91 (0.83, 0.97)
	Self-Reliance[c]	0.31 (-0.67, 1.31)	0.96 (0.91, 0.99)
	Engagement[c]	0.60 (-0.43, 1.75)	0.93 (0.88, 0.98)
	DCCS Performance[d]	0.12 (-1.07, 1.65)	0.94 (0.87, 0.99)
	Behavior Control[c]	1.92 (0.45, 3.39)	0.92 (0.87, 0.97)
	HTKS Performance[d]	0.53 (-1.26, 3.43)	0.99 (0.94, 1.00)
	Impulsivity[b]	4.61 (3.17, 5.85)	0.97 (0.93, 1.00)
	Adaptability[b]	2.83 (1.40, 4.29)	0.99 (0.95, 1.00)
Behaviorally-Overregulated (20.84%)	Positive Emotion Maintenance[a]	2.34 (1.48, 3.37)	0.87 (0.84, 0.94)
	Negative Emotion Dysregulation[a]	0.88 (-0.74, 2.57)	0.98 (0.93, 1.00)
	Exuberant Emotion Dysregulation[a]	1.91 (0.84, 3.18)	0.93 (0.90, 0.98)
	Negative Response to Disappointment[d]	-0.18 (-1.14, 1.08)	0.99 (0.96, 1.00)
	Negative Affect[b]	3.47 (2.25, 4.96)	0.97 (0.91, 0.99)
	Effortful Control[b]	5.42 (4.09, 6.85)	0.91 (0.83, 0.97)
	Self-Reliance[c]	0.42 (-0.55, 1.63)	0.96 (0.91, 0.99)
	Engagement[c]	1.22 (0.18, 2.59)	0.93 (0.88, 0.98)
	DCCS Performance[d]	0.87 (-0.53, 2.51)	0.94 (0.87, 0.99)
	Behavior Control[c]	2.70 (1.45, 4.47)	0.92 (0.87, 0.97)
	HTKS Performance[d]	4.70 (2.87, 7.32)	0.99 (0.94, 1.00)
	Impulsivity[b]	4.21 (2.99, 5.42)	0.97 (0.92, 0.99)
	Adaptability[b]	2.89 (1.49, 4.46)	0.99 (0.95, 1.00)

Notes. CI = Confidence interval. [a] = Teacher report. [b] = Caregiver report. [c] = Observation. [d] = Behavioral assessment.

Table 18

Observed, Model-Estimated, and Residual Values for Means, Variances, Univariate Skewness, and Univariate Kurtosis Based on the Three-Profile Latent Profile Analysis for Self-Regulation

Variable	Mean			Variance			Skewness			Kurtosis		
	Obs	ME	Res	Obs	ME	Res	Obs	ME	Res	Obs	ME	Res
Positive Emotion Maintenance[a]	2.06	2.06	0.00	0.28	0.28	0.00	-0.33	-0.33	0.00	-0.31	-0.32	0.01
Negative Emotion Dysregulation[a]	0.45	0.45	0.00	0.25	0.25	0.00	1.76	1.75	0.01	2.73	2.68	0.05
Exuberant Emotion Dysregulation[a]	0.85	0.85	0.00	0.34	0.34	0.00	0.83	0.82	0.01	0.78	0.75	0.03
Negative Response to Disappointment[d]	0.11	0.11	0.00	0.02	0.02	0.00	1.79	1.78	0.01	3.70	3.63	0.07
Negative Affect[b]	2.05	2.05	0.00	0.24	0.23	0.01	0.02	0.02	0.00	0.06	0.04	0.02
Effortful Control[b]	2.73	2.74	-0.01	0.24	0.24	0.00	-0.23	-0.23	0.00	0.06	0.04	0.02
Self-Reliance[c]	1.50	1.50	0.00	0.83	0.83	0.00	0.36	0.36	0.00	-0.39	-0.40	0.01
Engagement[c]	3.59	3.59	0.00	1.00	1.00	0.00	-0.39	-0.39	0.00	0.13	0.11	0.02
DCCS Performance[d]	3.76	3.76	0.00	1.78	1.77	0.01	-0.37	-0.37	0.00	-0.03	-0.05	-0.02
Behavior Control[c]	4.20	4.20	0.00	1.07	1.07	0.00	-1.06	-1.06	0.00	1.41	1.37	0.04
HTKS Performance[d]	0.68	0.68	0.00	1.00	0.99	0.01	1.43	1.42	0.01	0.89	0.86	0.03
Impulsivity[b]	2.35	2.35	0.00	0.34	0.33	0.01	-0.05	-0.05	0.00	-0.41	-0.42	-0.01
Adaptability[b]	2.32	2.32	0.00	0.47	0.46	0.01	-0.08	-0.08	0.00	-0.32	-0.33	-0.01

Notes. Obs = Observed. ME = Model-estimated. Res = Residual values. [a] = Teacher report. [b] = Caregiver report. [c] = Observation. [d] = Behavioral assessment.

Table 19

Estimated Standardized Differences in Class-Specific Indicator Means from the Three-Profile Latent Profile Analysis for Self-Regulation

Variable	Profile 1 vs. Profile 2	Profile 1 vs. Profile 3	Profile 2 vs. Profile 3
Positive Emotion Maintenance[a]	0.59	-0.48	-1.07
Negative Emotion Dysregulation[a]	**-4.42**	0.11	**4.53**
Exuberant Emotion Dysregulation[a]	-1.60	0.31	1.91
Negative Response to Disappointment[d]	-0.29	-0.03	0.26
Negative Affect[b]	-0.42	0.01	0.43
Effortful Control[b]	0.52	-0.01	-0.53
Self-Reliance[c]	-0.02	-0.13	-0.11
Engagement[c]	0.46	-0.16	-0.62
DCCS Performance[d]	0.29	-0.46	-0.75
Behavior Control[c]	1.00	0.22	-0.78
HTKS Performance[d]	-0.91	**-5.08**	**-4.17**
Impulsivity[b]	-0.22	0.18	0.40
Adaptability[b]	-0.01	-0.07	-0.06

Notes. Bolded values indicate large estimated absolute distance values (i.e., greater than 2.0). Profile 1, *typically-regulated* (69.65%). Profile 2, *emotionally-dysregulated* (9.50%). Profile 3, *behaviorally-overregulated* (20.84%). [a] = Teacher report. [b] = Caregiver report. [c] = Observation. [d] = Behavioral assessment.

Table 20

Self-Regulation Profiles, Classroom Climate Domains, and Baseline Covariates as Predictors of the Depressive Symptoms Latent Class Trajectories

	Classroom Emotional Support		**Classroom Organization**		**Classroom Instructional Support**	
	Moderate w/ Accelerated Growth (7.19%)		**Moderate w/ Accelerated Growth (7.19%)**		**Moderate w/ Accelerated Growth (7.19%)**	
	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**
Self-Regulation Profiles						
Emotionally-Dysregulated	3.53 (.56)**	34.01 (13.46, 85.94)	3.58 (.56)**	36.01 (14.35, 90.40)	3.51 (.55)**	33.53 (13.57, 82.84)
Behaviorally-Overregulated	1.12 (1.15)	3.06 (1.09, 8.61)	1.13 (.64)	3.10 (1.09, 8.81)	1.16 (.64)	3.19 (1.12, 9.08)
Classroom Climate						
Emotional Support[a]	-0.63 (1.15)	0.53 (0.08, 3.52)	n/a	n/a	n/a	n/a
Organization[a]	n/a	n/a	-0.58 (.74)	0.56 (0.17, 1.89)	n/a	n/a
Instructional Support[a]	n/a	n/a	n/a	n/a	0.49 (.38)	1.63 (0.88, 3.04)
Baseline Covariates						
Gender	0.55 (.56)	1.73 (0.69, 4.35)	0.54 (.54)	1.72 (0.71, 4.20)	0.62 (.55)	1.85 (0.74, 4.60)
Caregiver Depressive Symptoms[b]	0.81 (.54)	2.26 (0.94, 5.44)	0.81 (.51)	2.25 (0.97, 5.23)	0.84 (.54)	2.31 (0.95, 5.62)
Caregiver-Child Attachment[b]	0.00 (.68)	1.00 (0.33, 3.07)	0.00 (.63)	1.00 (0.35, 2.85)	-0.19 (.64)	0.83 (0.29, 2.38)
Caregiver-Child Relational Frustration[b]	-0.70 (.66)	0.50 (0.17, 1.46)	-0.70 (.63)	0.50 (0.18, 1.40)	-0.67 (.68)	0.51 (0.17, 1.56)
Peer Sociability[a]	-0.29 (.32)	0.75 (0.44, 1.27)	-0.27 (.31)	0.76 (0.46, 1.27)	-0.33 (.32)	0.72 (0.43, 1.21)
Peer Conflict[a]	1.77 (.82)*	5.85 (1.51, 22.71)	1.79 (.81)*	5.97 (1.57, 22.67)	1.73 (.74)*	5.63 (1.67, 19.01)
Teacher-Child Positive Engagement[a]	-0.09 (.25)	0.92 (0.60, 1.39)	-0.07 (.25)	0.94 (0.62, 1.41)	-0.17 (.22)	0.85 (0.59, 1.22)
Teacher-Child Conflict[a]	-0.41 (.36)	0.67 (0.37, 1.21)	-0.40 (.36)	0.67 (0.38, 1.21)	-0.39 (.36)	0.68 (0.38, 1.23)

Notes. Low with decelerated growth trajectory is the referent group (92.81%). [a] = Observation. [b] = Caregiver report. Child gender: Boys = 0, Girls = 1. Caregiver depressive symptoms: *Never* = 0 to *Always* = 4. Caregiver-child attachment: *Never* = 0 to *Always* = 4. Caregiver-child relational frustration: *Never* = 0 to *Always* = 4. Peer sociability: *Low* = 0 to *High* = 6. Peer conflict: *Low* = 0 to *High* =

6. Teacher-child positive engagement: *Low* = 0 to *High* = 6. Teacher-child conflict: *Low* = 0 to *High* = 6. *OR* = Odds ratio. CI = Confidence interval. w/ = With. n/a = Not applicable. *$p < .05$. **$p < .01$.

Table 21

Self-Regulation Profiles, Classroom Climate Domains, and Baseline Covariates as Predictors of the Moderate and Decreasing Anxious Symptoms Latent Class Trajectory

	Classroom Emotional Support		**Classroom Organization**		**Classroom Instructional Support**	
	Moderate and Decreasing (7.90%)		**Moderate and Decreasing (7.90%)**		**Moderate and Decreasing (7.90%)**	
	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**
Self-Regulation Profiles						
Emotionally-Dysregulated	3.47 (.88)**	32.06 (7.58, 135.69)	3.00 (.88)**	20.11 (4.76, 84.88)	2.73 (.64)**	15.27 (5.30, 44.01)
Behaviorally-Overregulated	0.35 (.93)	1.42 (0.31, 6.56)	0.02 (.94)	1.02 (0.22, 4.74)	-0.13 (.98)	0.88 (0.18, 4.38)
Classroom Climate						
Emotional Support[a]	3.58 (.91)**	35.96 (8.10, 159.71)	n/a	n/a	n/a	n/a
Organization[a]	n/a	n/a	2.45 (1.09)*	11.62 (1.92, 70.24)	n/a	n/a
Instructional Support[a]	n/a	n/a	n/a	n/a	0.58 (.75)	1.78 (0.52, 6.16)
Baseline Covariates						
Gender	0.72 (.49)	2.05 (0.92, 4.55)	0.60 (.49)	1.81 (0.81, 4.06)	0.55 (.57)	1.74 (0.68, 4.45)
Caregiver Depressive Symptoms[b]	1.09 (.73)	2.99 (0.90, 9.93)	1.02 (.77)	2.77 (0.78, 9.81)	0.67 (.68)	1.96 (0.64, 5.95)
Caregiver-Child Attachment[b]	-0.96 (.87)	0.38 (0.09, 1.62)	-0.87 (.98)	0.42 (0.08, 2.09)	-0.46 (1.02)	0.63 (0.12, 3.37)
Caregiver-Child Relational Frustration[b]	0.28 (.76)	1.33 (0.38, 4.60)	0.08 (.85)	1.08 (0.27, 4.37)	0.22 (.61)	1.25 (0.46, 3.38)
Peer Sociability[a]	-0.30 (.37)	0.74 (0.40, 1.36)	-0.52 (.56)	0.60 (0.24, 1.49)	-0.32 (.44)	0.73 (0.35, 1.50)
Peer Conflict[a]	-0.63 (.74)	0.53 (0.16, 1.79)	-0.47 (.76)	0.62 (0.18, 2.17)	-0.71 (.96)	0.49 (0.10, 2.39)
Teacher-Child Positive Engagement[a]	-0.53 (.36)	0.59 (0.32, 1.07)	-0.50 (.36)	0.61 (0.33, 1.10)	-0.31 (.44)	0.73 (0.36, 1.51)
Teacher-Child Conflict[a]	0.29 (.44)	0.75 (0.36, 1.55)	-0.42 (.47)	0.66 (0.30, 1.42)	-0.22 (.54)	0.81 (0.33, 1.96)

Notes. Low and stable trajectory is the referent group (85.10%). [a] = Observation. [b] = Caregiver report. Child gender: Boys = 0, Girls = 1. Caregiver depressive symptoms: *Never* = 0 to *Always* = 4. Caregiver-child attachment: *Never* = 0 to *Always* = 4. Caregiver-child relational frustration: *Never* = 0 to *Always* = 4. Peer sociability: *Low* = 0 to *High* = 6. Peer conflict: *Low* = 0 to *High* = 6. Teacher-

child positive engagement: *Low* = 0 to *High* = 6. Teacher-child conflict: *Low* = 0 to *High* = 6. *OR* = Odds ratio. CI = Confidence interval. w/ = With. n/a = Not applicable. *$p < .05$. **$p < .01$.

Table 22

Self-Regulation Profiles, Classroom Climate Domains, and Baseline Covariates as Predictors of the Low and Increasing Anxious Symptoms Latent Class Trajectory

	Classroom Emotional Support		**Classroom Organization**		**Classroom Instructional Support**	
	Low and Increasing (7.00%)		**Low and Increasing (7.00%)**		**Low and Increasing (7.00%)**	
	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**	***B* (*SE*)**	***OR* (90% CI)**
Self-Regulation Profiles						
Emotionally-Dysregulated	1.02 (.77)	2.77 (0.78, 9.85)	1.17 (.73)	3.21 (0.97, 10.61)	1.29 (.72)	3.62 (1.12, 11.72)
Behaviorally-Overregulated	0.14 (.87)	1.15 (0.28, 4.77)	0.17 (.87)	1.18 (0.28, 4.93)	0.20 (.86)	1.23 (0.30, 5.06)
Classroom Climate						
Emotional Support[a]	-1.48 (1.10)	0.23 (0.04, 1.39)	n/a	n/a	n/a	n/a
Organization[a]	n/a	n/a	-0.66 (.73)	0.52 (0.16, 1.71)	n/a	n/a
Instructional Support[a]	n/a	n/a	n/a	n/a	0.98 (.62)	2.67 (0.97, 7.35)
Baseline Covariates						
Gender	0.30 (.74)	1.35 (0.40, 4.53)	0.30 (.70)	1.34 (0.42, 4.26)	0.39 (.75)	1.48 (0.43, 5.09)
Caregiver Depressive Symptoms[b]	0.28 (.76)	1.33 (0.38, 4.64)	0.33 (.67)	1.39 (0.46, 4.13)	0.43 (.64)	1.54 (0.54, 4.41)
Caregiver-Child Attachment[b]	-0.77 (.59)	0.46 (0.18, 1.22)	-0.87 (.58)	0.42 (0.16, 1.09)	-1.17 (.59)*	0.31 (0.41, 0.81)
Caregiver-Child Relational Frustration[b]	0.02 (.73)	1.02 (0.31, 3.36)	0.03 (.63)	1.04 (0.37, 2.93)	0.03 (.56)	1.03 (0.41, 2.57)
Peer Sociability[a]	-0.66 (.39)	0.52 (0.27, 0.99)	-0.60 (.39)	0.55 (0.29, 1.05)	-0.79 (.46)	0.46 (0.22, 0.97)
Peer Conflict[a]	1.15 (.79)	3.16 (0.87, 11.55)	1.12 (0.73)	3.08 (0.93, 10.16)	1.32 (.79)	3.74 (1.01, 13.81)
Teacher-Child Positive Engagement[a]	-0.05 (.49)	0.95 (0.42, 2.13)	-0.04 (.45)	0.96 (0.46, 1.99)	-0.19 (.43)	0.83 (0.41, 1.67)
Teacher-Child Conflict[a]	-0.38 (.48)	0.69 (0.31, 1.51)	-0.34 (.45)	0.71 (0.34, 1.49)	-0.34 (.47)	0.71 (0.33, 1.54)

Notes. Low and stable trajectory is the referent group (85.10%). [a] = Observation. [b] = Caregiver report. Child gender: Boys = 0, Girls = 1. Caregiver depressive symptoms: *Never* = 0 to *Always* = 4. Caregiver-child attachment: *Never* = 0 to *Always* = 4. Caregiver-child relational frustration: *Never* = 0 to *Always* = 4. Peer sociability: *Low* = 0 to *High* = 6. Peer conflict: *Low* = 0 to *High* = 6. Teacher-

child positive engagement: *Low* = 0 to *High* = 6. Teacher-child conflict: *Low* = 0 to *High* = 6. *OR* = Odds ratio. CI = Confidence interval. w/ = With. n/a = Not applicable. *$p < .05$.

Figure 1

Latent Class Trajectories of the Two-Class Latent Growth Mixture Model for Depressive Symptoms

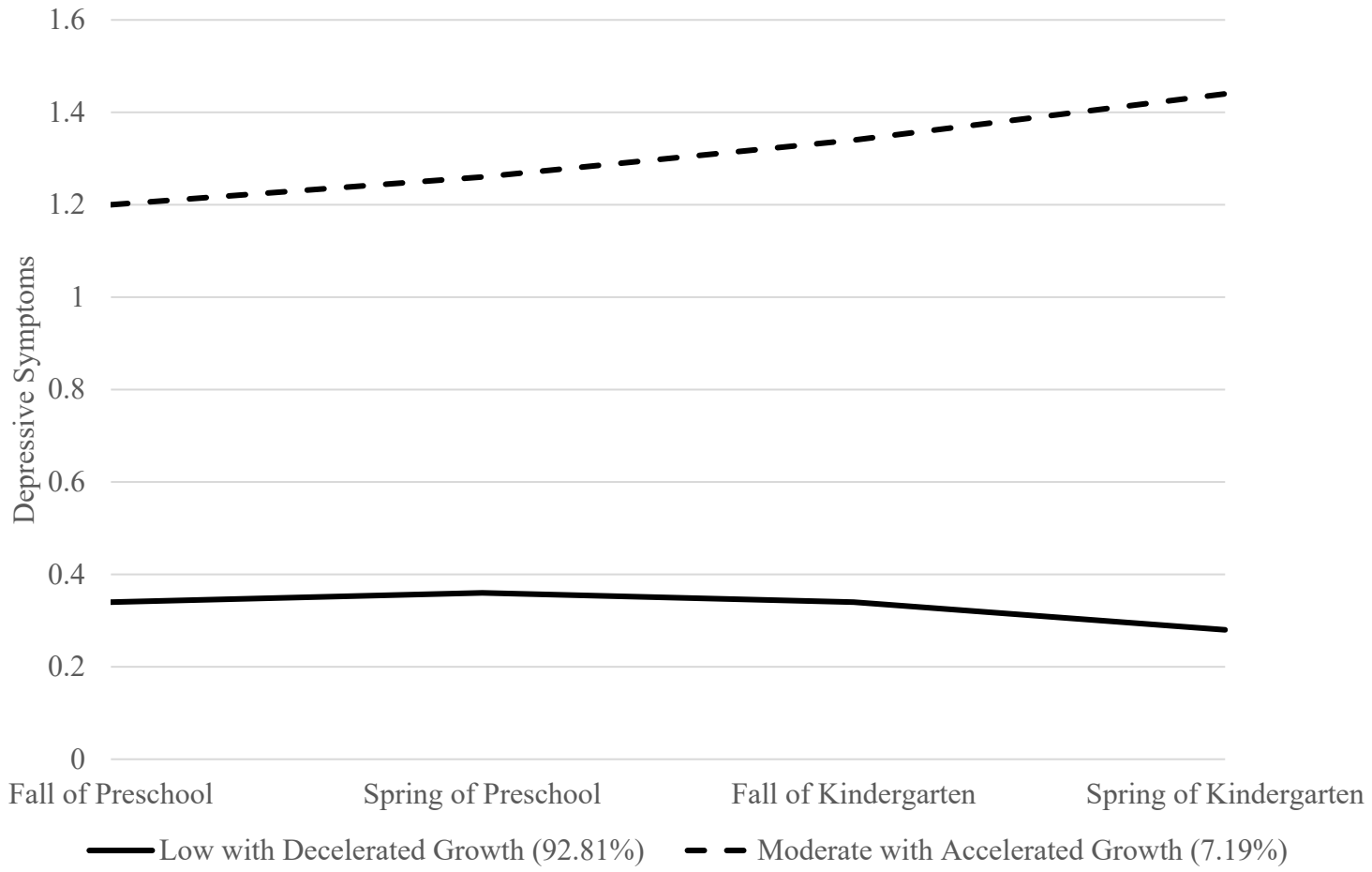


Figure 2

Latent Class Trajectories of the Three-Class Latent Growth Mixture Model for Anxious Symptoms

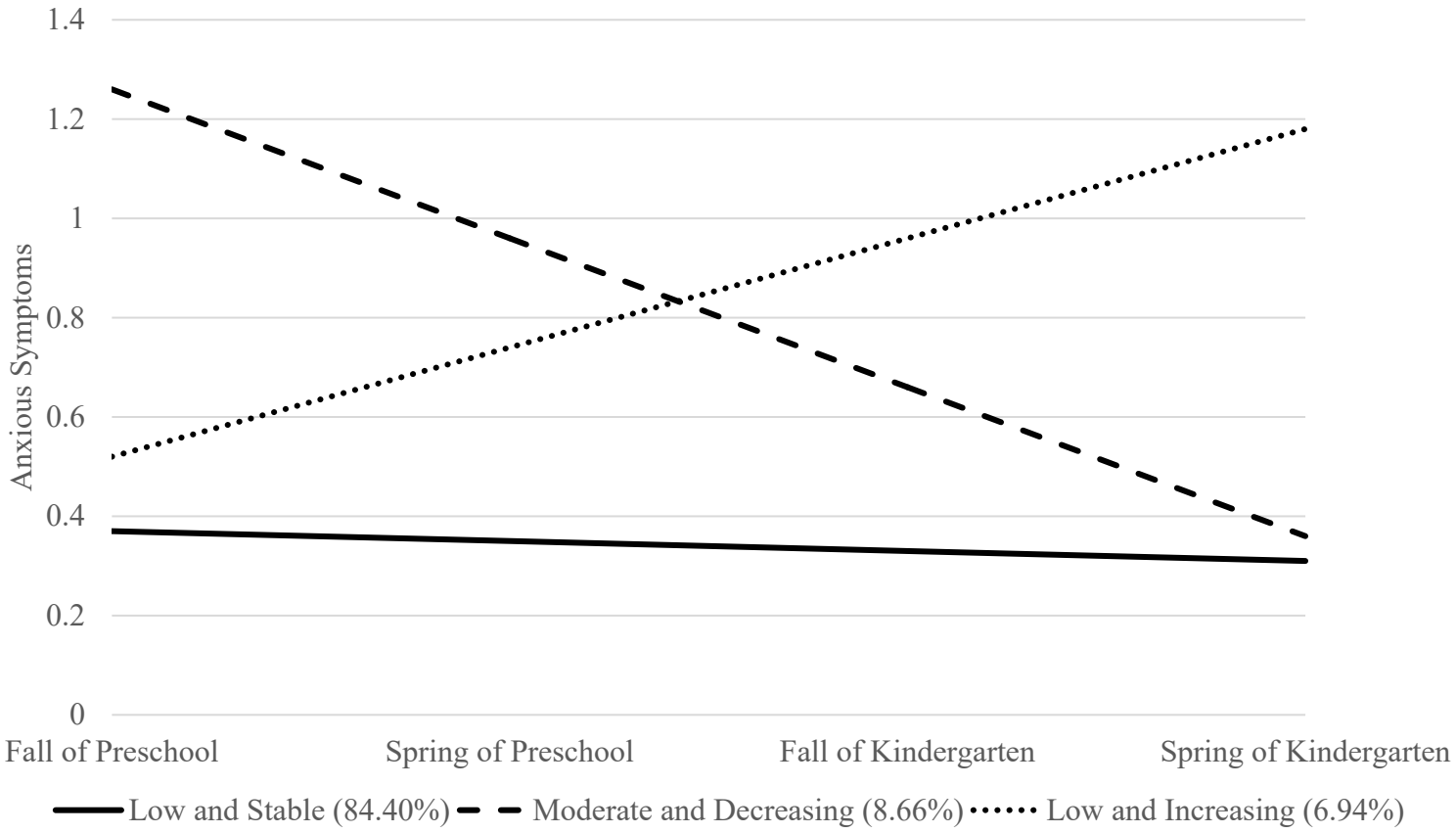
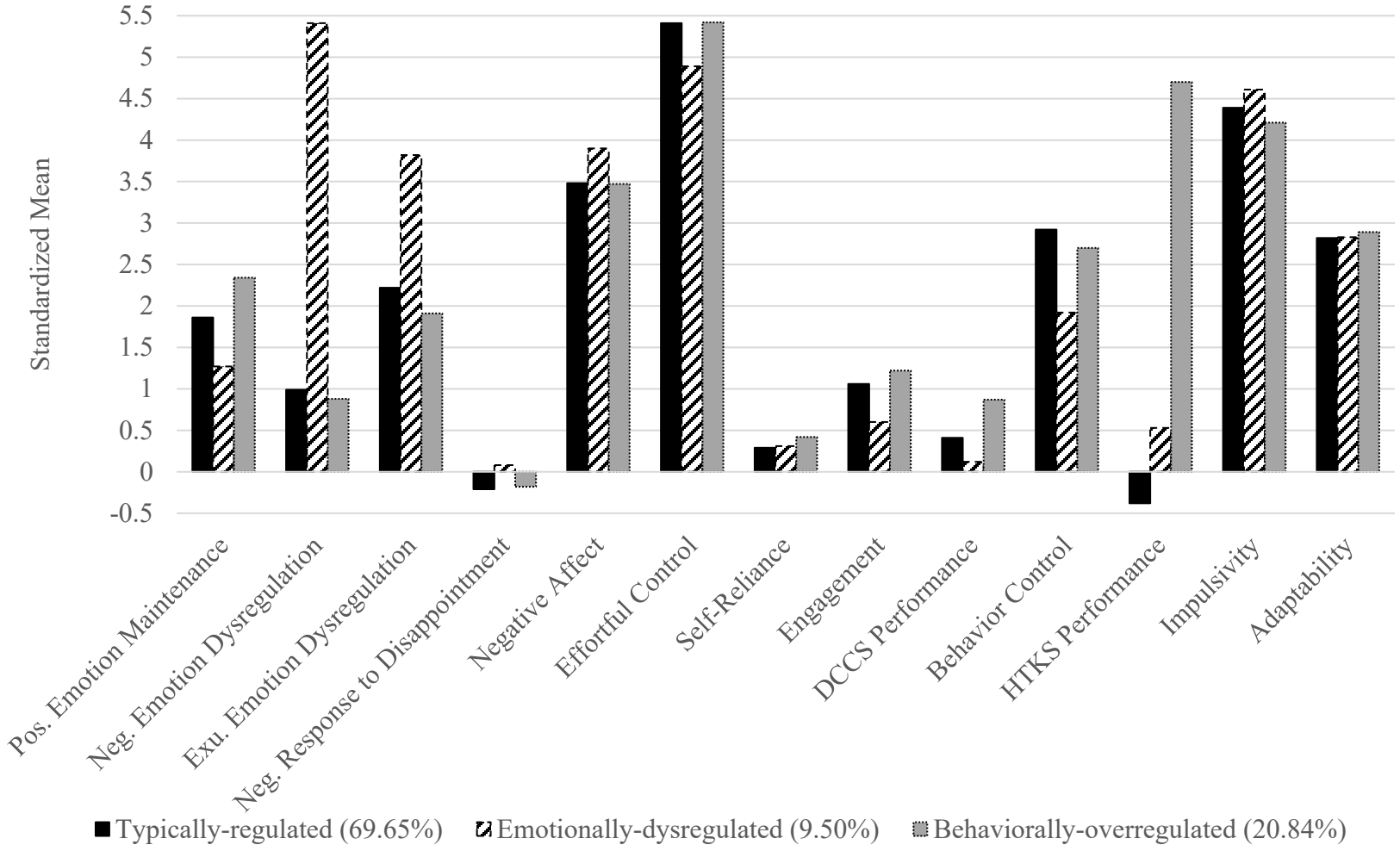


Figure 3

Standardized Means of the Self-Regulation Indicators Per Latent Profile



Notes. Pos. = Positive. Neg. = Negative. Exu. = Exuberant.

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APPENDIX

Empirical focus on categories of emotion and children's abilities to self-regulate these emotions may lead to better understanding of emotional self-regulation (Bridges et al., 2004; Calkins & Perry, 2016). Due to implications for developmental psychopathology, past research has heavily focused on the regulation of negative emotions at the expense of examining regulation and maintenance of positive emotions (Calkins & Perry, 2016; Vaish, 2019). Yet both positive and negative emotions are implicated in emotional self-regulation, with children regulating emotions such as intense sadness, anger, and excitement (Calkins & Perry, 2016; Gross & Thompson, 2007). Examination of negative and positive emotions may illuminate numerous regulatory mechanisms salient to the understanding of psychopathology and adaptive functioning (Bridges et al., 2004; Calkins & Perry, 2016; Gross & Thompson, 2007). Still little is known on the importance of regulating and maintaining positive emotion for development.

While research has not often used emotion-based dimensions of emotional self-regulation, Zalewski et al. (2011) demonstrated various profiles of children's self-regulation of specific emotions, including frustration and anxiety. Feng et al. (2008) also explored unique dimensions of preschoolers' emotional self-regulation strategies: active regulation (joy), passive toleration (sadness), and disruptive behaviour (anger). Such research provides support for measuring emotional self-regulation based on emotion categories than general composite scores or an adaptive and maladaptive dichotomy.

Self-regulation of positive and negative emotion may be influential on the development of depressive and anxious symptoms (Calkins & Perry, 2016; Gross & Thompson, 2007; Kovacs et al., 2008; Stegge & Terwogt, 2007). Though research has predominantly focused on negative emotional self-regulation, children's abilities to maintain and regulate positive emotions in

challenging situations may also be influential in their experience of symptoms (Calkins & Perry, 2016; Clark & Watson, 1991; De Bolle & De Fruyt, 2010). Further, what distinguishes depression from anxiety, as suggested by Clark and Watson's (1991) tripartite model of internalization, may be aspects of positive emotionality, with depression typically involving an absence of positive emotion that is not experienced with anxiety (De Bolle & De Fruyt, 2010). Altogether, emotional self-regulation can illuminate how emotional functioning differs within and between psychopathologies, improving our understanding of developmental outcomes.