

Early Frustration Predicting Trajectories of Internalizing and Externalizing Symptoms: Testing

Coping as a Mediator

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Abstract

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Early childhood frustration is a significant predictor of adolescent mental health outcomes. To understand developmental pathways leading to impairment and inform early intervention, it is essential to identify mediating factors that contribute to these trajectories. Coping style is a key predictor of youth adjustment and may be shaped by temperament. Children prone to frustration tend to react to environmental stressors with heightened frustration and struggle with adaptive coping. This dissertation examines coping strategies in preadolescence (ages 10–12) as potential mediators in the relation between early childhood frustration (ages 3–5) and adolescent psychopathology (ages 13–15) using latent growth curve modeling. Findings indicate that early childhood frustration predicts levels of externalizing symptoms and both levels and growth of internalizing symptoms. However, active and avoidant coping did not mediate this relation. These results suggest that other factors drive this developmental trajectory, highlighting the need for further research to better support at-risk youth.

Introduction

Adolescence is a key developmental stage for the onset and progression of psychopathology, particularly amidst the current youth mental health crisis. The American Psychological Association (APA) highlights an upward trend in youth psychopathology spanning over a decade (APA, 2023), while the Centers for Disease Control and Prevention (CDC) recently emphasized a nationwide worsening of mental health challenges among adolescents (CDC, 2024). To address these concerning trends in youth mental health, it is crucial to understand the factors that predict adolescent psychopathology and mechanisms through which providers may effectively intervene. Furthermore, it may be critical to intervene before the onset of pathology. Youth often experience increasing mental health difficulties in adolescence, and studies indicate that approximately half or more of all mental health disorders manifest during this vulnerable developmental window (Caspi et al., 2020; Kessler et al., 2005; Merikangas et al., 2010). Once psychopathology emerges, it places youth at heightened risk for continued impairment and worsened outcomes across the lifespan (Costello & Maughan, 2015; Moffitt et al., 2007). Evidence from a large longitudinal cohort study in New Zealand demonstrated that individuals who experienced the onset of mental health disorders during adolescence were more likely to report greater prevalence and complexity of mental health conditions later in life compared to their peers (Caspi et al., 2020). These findings illustrate the enduring impact of adolescent mental health challenges on future well-being.

Given the staggering global burden of psychopathology, estimated to affect more than 1 billion people and account for 7% of the global disease burden (Rehm & Shield, 2019), it is paramount that we identify youth at risk early and develop targeted prevention efforts to foster mental wellbeing (Arango et al., 2018; Colizzi et al., 2020). Developmental researchers have made strides in identifying profiles of children vulnerable for poorer long-term outcomes. Child

development and mental health is multifaceted and shaped by a complex interplay of interacting risk factors. Bronfenbrenner's bioecological systems theory emphasizes that child development consists of dynamic processes operating at both proximal levels, such as individual traits and home environment, and more distal, macro-level factors, such as structural inequalities, cultural norms, and media exposure (Bronfenbrenner & Morris, 2006). This theoretical framework underscores the importance of examining both micro- and macro-systems when considering the mental health needs of adolescents. However, while it is critical to conceptualize youth mental health holistically, proximal factors may be more accessible for providers to implement early intervention efforts. While larger structural interventions such as public policy and equity efforts should be considered to address macro-level risk, individual mental health providers are better able to intervene on the individual level to foster youth resilience. Given the heightened mental health risk that emerges during the transition to adolescence (Rapee et al., 2019; Merikangas et al., 2010) early childhood and preadolescence represent critical windows for early identification and intervention.

Conceptualizations of Psychopathology Symptoms

When considering the development of psychopathology in youth, categorical diagnoses often show high comorbidity and significant overlap in symptoms (Angold et al., 1999). Symptoms can overlap between different diagnoses, and they can vary significantly between individuals within the same diagnostic category. For example, as demonstrated in the Diagnostic and Statistical Manual of Mental Disorders (5th ed., DSM-5), two children diagnosed with depression may display markedly different symptom profiles, ranging from heightened to reduced appetite or insomnia to hypersomnia (American Psychiatric Association, 2013). Because of this variability and overlap, it may be more effective to focus on transdiagnostic symptoms or

factors of risk and impairment rather than diagnostic categories. The following section will summarize different approaches to conceptualizing psychopathology symptoms, culminating in the selection of the framework used for this dissertation.

Historically, psychopathology has often been conceptualized broadly as two spectra: internalizing symptoms, such as anxiety and depression, and externalizing symptoms, such as conduct problems and aggression (Achenbach et al., 2016). However, it has been shown that internalizing and externalizing symptoms are not mutually exclusive and often co-occur in youth experiencing mental health difficulties (Caron & Rutter, 1991; Willner et al., 2016). To account for the frequent co-morbidity of internalizing and externalizing symptoms, some researchers have advocated for the use of a general factor of psychopathology, referred to as the “p factor” (Caspi et al., 2014). This general psychopathology factor does not distinguish between more internally or externally oriented impairment and has been shown to be predictive of a range of maladaptive outcomes including general life impairment, academic performance, and employment outcomes (Caspi et al., 2014).

An additional approach, the Hierarchical Taxonomy of Psychopathology or HiTOP), was introduced in 2015 to propose an innovative, data-driven framework for understanding mental disorders (Hierarchical Taxonomy of Psychopathology, n.d.). Designed to address limitations inherent in the DSM-5 and the *International Classification of Diseases*, (10th Ed., ICD-10), HiTOP emphasizes a dimensional approach to mental health, moving beyond traditional categorical models (Kotov et al., 2017). Instead, HiTOP organizes mental disorders into a hierarchical structure, beginning with highly specific symptom dimensions and progressing to broader, more general traits that encapsulate these dimensions. This system aims to capture the complexity of mental illness by outlining the nuanced building blocks of psychopathology, such

as symptoms and personality, which culminate in overarching subfactors and spectra. Unlike categorical systems that group disorders into discrete boxes, HiTOP recognizes the continuous nature of many symptoms and traits, allowing for a more flexible and precise understanding of mental health and its variations. Additionally, a cornerstone of HiTOP is its commitment to empirically derived classifications, ensuring that each component of the system is rigorously supported by scientific evidence. HiTOP remains a dynamic and evolving effort in progress, as researchers continue to refine its structure and validate its utility across diverse populations and contexts (Kotov et al., 2017). Overall, examining more dimensions of psychopathology independent from categorical diagnoses may enable us to better account for individual variations in both prevention and treatment approaches. Prominent coping researchers have endorsed use of internalizing and externalizing dimensions of psychopathology to understand the development of regulatory processes due to improved power over categorical approaches (Compas et al., 2017). To this end, this dissertation will examine the development of internalizing and externalizing dimensions of psychopathology in youth.

Examining Symptom Growth

Examining mental health symptoms through a longitudinal lens offers a critical advantage for understanding how psychopathology emerges and progresses across childhood and adolescence (Bogdan et al., 2023; Danielsson et al., 2024; Masten, 2006; Sroufe & Rutter, 1984). Rather than relying on static snapshots of symptom levels at individual timepoints, longitudinal approaches enable researchers to examine change over time and work towards a more in depth characterization of dynamic developmental processes. This approach may elucidate a comprehensive understanding of both normative and atypical developmental pathways. Moreover, longitudinal data provides essential insights into early risk and protective factors that

predict mental health outcomes and can help illuminate the mechanisms underlying both impairment and resilience (Masten, 2006).

Adolescence, in particular, is a developmental period of heightened vulnerability as not only a time when mental health disorders commonly emerge (Caspi et al., 2020; Kessler et al., 2005; Merikangas et al., 2010), but also a stage marked by increasing social, academic, and existential demands. Youth must navigate complex peer relationships, manage increasingly demanding academic workloads, and begin to explore questions of identity, future goals, and autonomy (Arnett, 1999; Casey et al., 2010; Crone & Dahl, 2012; Sawyer et al., 2018). These developmental challenges can amplify stress and pose particular difficulties for emotionally reactive adolescents who experience intense negative emotions or have difficulty regulating affect.

Adolescents who rely on maladaptive coping strategies, such as avoidance or suppression, have been found to struggle to manage negative emotions and responses to distress, placing them at greater risk for internalizing difficulties such as depression and anxiety (Compas et al., 2017; Sloan et al., 2017). In addition to levels of symptoms, studies have found some risk factors to be predictive of growth in symptoms over time. For example, one longitudinal study by Kokonyei et al. (2019) demonstrated that the use of maladaptive emotion regulation strategies predicts an increase in depressive symptoms over time in adolescence. However, how risk factors may predict change in symptoms during adolescence is not yet known. Some work has discussed how difficulty managing sources of stress can lead to additional conflict or stressors, such as conflict with family or procrastination on assignments, thereby leading to a cycle of worsening symptoms over time (Sirois, 2023). By understanding how risk factors and mechanisms may predict both symptom levels and change over time, we can better understand

these developmental processes. A particularly important early risk factor that contributes to emotional reactivity and is implicated in the development of both internalizing and externalizing symptoms is child temperament (Klein et al., 2012; Nigg, 2006; Tackett et al., 2013). The following section will review the concept of temperament and how it may function as a risk factor for the development of psychopathology in adolescence.

Temperament

While great thinkers have considered ideas related to child disposition and individual differences for over 2000 years, the body of work on infant and child temperament within the field of psychology is still relatively nascent. In 1963, Thomas, Chess, and colleagues published the first major modern psychological report on child temperament in their seminal work on the New York Longitudinal Study (NYLS) (Chess et al., 1963; Chess, 1987; Sanson et al., 2004). These researchers introduced the idea of a “difficult temperament” in children and the risk such a profile could confer, as well as nine proposed dimensions to characterize child temperament: approach/withdrawal, adaptability, mood, reactivity threshold, distractibility, persistence or attention span, rhythmicity, responsiveness or intensity, and activity level (Rothbart & Bates, 2006; Sanson et al., 2004). Due to overlap within the nine dimensions and low internal consistency, these original categories were consolidated using factor analysis into the now widely accepted Rothbart & Bates conceptualization (Sanson et al., 2004). Temperament is most often defined as a relatively stable pattern of emotionality and regulation that can be observed behaviorally in young children (Rothbart & Bates, 2006). It is typically divided into two broad dimensions: reactivity, or emotionality, and self-regulation, also known as effortful control (Caspi et al., 2005; Rothbart & Bates, 2006). Rothbart further proposed two independent dimensions within reactivity - positive emotionality, also referred to as surgency or extraversion,

and negative emotionality, also referred to as negative affectivity. There are several key characteristics necessary for a trait to be classified as temperament. Temperament is widely considered to be moderately heritable, originating early in life, relatively stable, and based in a child's physiology (Rothbart & Bates, 2006; Stifter & Dollar, 2016). However, nuance is should be considering when discussing the heritability and stability of temperament. Although temperament, like most intrinsic traits, is shaped by biological factors, it is also influenced by environmental context, which can support or alter its expression. These considerations will be discussed in the following sections.

Moderately Heritable

To first consider heritability, it is important to note that the genetic basis of temperament does not mean that these traits are rigid and unaffected by a child's development and life experiences. It has been suggested that the heritability of temperament is moderate and increases throughout development. For example, researchers have noted that the heritability of temperament can be measured by toddlerhood but less so during the neonatal period, and that the genetic influence on temperament only reaches moderate strength (.3-.6) by about middle childhood (Nigg, 2006). For this reason, temperament is considered to be partially, but not completely, predicted by genetics (Bouchard & Loehlin, 2001). One potential explanation for this effect may be that while children are born with a baseline potential to manifest a certain temperament, these traits can also be impacted by a child's life experiences. Environmental influences such as stress and parenting have been shown to have bidirectional and interactive effects with child temperament (Kiff et al., 2011). For example, it has been proposed that a combination of increased reactivity to stress and increased exposure to stressful events may account for elevations in negative affect seen in children high in negative emotionality

(Shackman et al., 2016). While these children may be more sensitive to stress, their behavioral reactions may increase the likelihood of negative feedback or experiences that then expose them to more stress and create a cycle of negativity. Therefore, both environmental influences and genetic predispositions dynamically shape the development and expression of child temperament.

Relatively Stable Across the Lifespan

While environmental factors and temperament interact and influence each other across development, temperament has been shown to be relatively stable across the lifespan. A child's temperament is believed to reach relative stability after age 3 and become more stable with age (Caspi et al., 2005). This does not imply that environmental influences on emotionality and regulation cease to matter after early childhood; rather, it suggests that the core features of a child's temperament are largely established by that point, even as they continue to be shaped by contextual experiences. When considering temperamental stability, some researchers have argued that certain behaviors are more normative at certain developmental stages, which then makes temperament more readily observable depending on the age of the child (Nigg, 2006). For example, regulatory abilities are believed to increase with age, and behavioral outbursts of negative affect, such as temper tantrums, are expected to decrease with age (Hoyniak et al., 2024; Rothbart & Bates, 2006). While researchers may not observe temper tantrums in older children, this does not mean that their emotional reactivity has significantly changed. It is important to consider how temperament may present differently across the lifespan while remaining modestly stable. Certain contexts are additionally more likely to elicit behaviors demonstrative of temperament (Rothbart & Bates, 2006). For example, when thinking of children with greater temperamental sensitivity to feelings of frustration, Rothbart & Bates

(2006) argue, “Easily frustrated children are not continually irritable or angry, but when their goals are blocked or there is a failure of their expectations, they will be particularly prone to frustration” (p.10). Some personality researchers have argued that traits should be defined by individual differences in response to certain situations and stimuli (Caspi & Moffitt, 1993; Fleeson, 2007). Therefore, if heightened frustration reactivity is not observed continuously, this does not mean this temperament trait or propensity is unstable, and context should be accounted for when making such determinations of child temperament.

Negative Emotionality

Within the study of temperament, researchers have identified negative emotionality as a prominent early risk factor for the development of mental health difficulties. Negative emotionality describes greater emotional sensitivity, particularly to negative emotions such as anger, fear, and sadness (Rothbart, 1989) and is believed to precede the adult personality dimension of neuroticism, or an individual’s propensity to experience and express negative emotions such as sadness, anger, discomfort, and fear (Shiner, 2018). Negative emotionality has also been shown to be related to, but not identical with, the general factor of psychopathology “p” (Caspi et al., 2014; Tackett et al., 2013) and a large meta-analysis recently found neuroticism and negative emotionality in youth to be associated with internalizing symptoms (Katz et al., 2024). Children high in negative emotionality demonstrate a lower threshold to experiencing negative emotions and distress, as well as an increased amount and intensity of that distress (Rettew & McKee, 2005). These children tend to show greater reactivity to stressors in their environment and an increased likelihood to engage in maladaptive coping (Lengua & Long, 2002). Additionally, negative emotionality has been shown to predict higher levels of both internalizing and externalizing symptoms (Eisenberg et al., 2005; Sirois et al., 2019). Given the

significant vulnerability negative emotionality creates, it is important to understand how this temperament quality predicts later risk to support these children and intervene accordingly.

Conversely, positive emotionality refers to smiling, laughter, pleasure, and sensitivity to positive environmental cues (Rothbart & Bates, 2006). Some researchers have suggested that measures of negative emotionality have received greater attention in the literature, perhaps because increased reactivity to negative emotions may predict children's socioemotional development more strongly than positive emotionality (Sirois et al., 2019). An intriguing finding from one study suggests that the predictive strength of negative emotionality may depend on its interaction with positive emotionality, with a combination of low positive emotionality and high negative emotionality predicting depression symptoms most strongly in middle childhood (Dougherty et al., 2010). These findings underscore the importance of considering positive emotionality alongside negative emotionality when examining early risk factors for psychopathology. Similarly, children's systems of reactivity and regulation are thought to balance each other, such that children high in reactivity and low in regulation are at greatest risk for worsened mental health and other maladaptive outcomes, such as poor social functioning (Calkins & Fox, 2002; Kostyrka-Allchorne et al., 2019; Muris & Ollendick, 2005). These findings illustrate that associations between temperament and wellbeing are not always direct and it is important to understand interactions that may heighten or protect against risk.

While negative emotionality has been found to predict a multitude of outcomes, it is a broad dimension of reactivity that includes a range of negative emotion states. To further parse apart the role of temperament in child development, some researchers have argued for the merit of examining reactivity to different negative emotion states independently (Stifter & Dollar, 2016). More specifically, some researchers have proposed that negative emotionality should be

further separated into two dimensions: distress related to limitations (i.e., frustration, anger) and distress related to novelty (i.e., fearfulness) (Sanson et al., 2004). Other researchers have proposed the utility of distinguishing negative emotionality even further into more specific dimensions of affective reactivity to include sadness as well as anger and fear (Caspi et al., 2005; Stifter & Dollar, 2016). Understanding the unique associations predicted by dimensions within negative emotionality may glean greater insight into developmental risk. For example, while proneness to fear has been shown to primarily predict internalizing symptoms such as anxiety and depression (Degnan et al., 2010; Eisenberg et al., 2001), proneness to frustration has been shown to predict both internalizing and externalizing symptoms such as aggression and conduct problems (De Pauw and Mervielde, 2010; Eisenberg et al., 2001). Proneness to frustration, also referred to as temperamental anger, has received particular attention due to the multifinality of outcomes and increased impairment associated with this dimension (Calkins et al., 2019; De Pauw & Mervielde, 2010; Oldehinkel et al., 2004). Further research is needed to understand the experience of children higher in frustration, as well as how to support them and their caregivers.

Frustration

Anger proneness or frustration describes increased constitutional reactivity to frustrating situations and a greater likelihood to both experience and express heightened anger (Rothbart et al., 2001). Anger, frustration, and irritability have been used interchangeably within the temperament literature to describe the distress to limitations dimension of negative emotionality (Deater-Deckard & Wang, 2012). Children higher in anger and frustration tend to show significant maladaptive outcomes (Zentner & Shiner, 2015), including poorer emotion regulation (Eisenberg et al., 2017), increased internalizing and externalizing symptoms (Eisenberg et al., 2001; Lengua, 2006; Sirois et al., 2019), and reduced prosocial behavior (Sirois

et al., 2019). Despite this well-documented risk, critical questions remain about how and when frustration contributes to the emergence of psychopathology. For example, it is unclear whether frustration sensitivity predicts only the severity of symptoms at a given time or also contributes to the growth of these symptoms development across adolescence. Additionally, the underlying mechanisms that mediate this relationship, such as coping skills, regulatory processes, or contextual supports, remain insufficiently understood. Recent work on the longitudinal impacts of frustration and irritability have called for future research examining mechanisms that may mediate these pathways from early childhood to adolescence (Finlay-Jones et al., 2024; Silver et al., 2024). The child clinical psychology literature has experienced a recent surge of interest in understanding how early childhood irritability predicts psychopathology in adolescence. Given the substantial conceptual and empirical overlap between temperamental frustration and clinical irritability, this dissertation will incorporate a review of both the clinical irritability and temperament frustration literatures to provide a more integrated understanding of early emotional risk.

Some researchers have characterized irritable youth as being more sensitive to frustrative nonreward or having a decreased threshold for experiencing anger when presented with frustration (Brotman et al., 2017). The National Institute of Mental Health (NIMH) Research Domain Criteria (RDoC) defines frustrative nonreward as reactions to blocked or removed rewards (Insel et al., 2010). This decreased threshold to frustration may result from aberrant reward processing and greater attunement to potential threat in the environment (Avenevoli et al., 2015; Klein et al., 2021; Stringeris et al., 2018). Other researchers have conceptualized irritability as a specific presentation of emotion dysregulation towards anger (Vogel et al., 2023; Yu et al., 2023). Irritability, like temperament frustration, has been found to predict the later

development of internalizing and externalizing symptoms in childhood and adolescence (Finlay-Jones et al., 2024; Humphreys et al., 2019) and adulthood (Avenevoli et al., 2015; Brotman et al., 2006; Stringeris et al., 2009). However, despite these repeated findings, little is known about the mechanisms through which early irritability contributes to later psychopathology. A meta-analysis and systematic review conducted by Finlay-Jones and colleagues (2024) emphasized this gap, finding that among 70 studies reviewed, only six examined potential mediators of this developmental pathway. These findings underscore a significant gap in our understanding of how early irritability evolves into levels and growth of psychopathology symptoms.

Many of the central features of clinical irritability seem to correspond with traits integral to the temperament dimension of frustration reactivity, and some researchers have suggested that clinical irritability may reflect a “dispositional tendency” like temperament (Zhang et al., 2024). Given the significant overlap in these constructs, some researchers have proposed that temperament frustration and clinical irritability are capturing the same phenomenon along a spectrum of impairment (Beauchaine & Tackett, 2020). While this dissertation will focus on early life temperament, the review will draw on research examining clinical irritability to reflect and address in full the recent boom in work examining frustration reactivity in youth.

Temperament as an Early Risk Factor

Several models have been proposed to capture how early life temperament may confer long-term risk in youth. Temperament may create greater risk for psychopathology through additive effects (e.g., high negative emotionality and low effortful control are two risk factors that build upon each other), interactive effects (e.g., vulnerable temperaments exacerbating the risk conferred by environmental stress), or bidirectional/transactional effects in which two variables shape each other. Nigg (2006) describes a bidirectional model for how temperament

may increase vulnerability for psychopathology: because of a child's reactivity and the subsequent impact of eliciting certain environmental cues, such as strained caregiving from parents or conflict with peers, the pre-existing risk factor of high negative emotionality then creates an environment that exposes the child to greater subsequent risk. Additionally, children experiencing a decreased threshold and greater reactivity to anger may be unable to accurately interpret information from their environment and may have fewer opportunities for learning more adaptive behavioral responses due to peer rejection (Dollar et al., 2018). If these children are more prone to misinterpreting cues from their environments and have reduced opportunities to correct these biased interpretations, a cycle may occur in which they increasingly lash out behaviorally and consequently receive fewer and fewer positive opportunities for adjusted learning. Finally, researchers have also posited that certain temperament characteristics create risk for certain psychopathologies, and that it is likely that "the underlying lower-order temperamental structure determines the type of a child's psychopathology" (Muris & Ollendick, 2005, p. 278). However, researchers have urged caution in proposing direct pathways from early characteristics to later pathologies, because children's development is shaped by a complex interplay of micro and macro-level contextual influences (Bronfenbrenner & Morris, 2006). Overall, temperament is a complex but significant predictor of child wellbeing. Understanding how individual differences may increase vulnerability is crucial for supporting children and improving outcomes. Additionally, it may be critical to evaluate mediators that underlie trajectories from early life frustration to later psychopathology, such as a youth's capacity for managing stress.

Stress and Coping

Over the past five decades, the study of coping processes has expanded significantly, paralleling the rapid growth of infant and child temperament research. Stress research preceded work on coping; the concept of stress originated in studies of physics, where it was first defined as the strain or pressure exerted on an object (Frydenberg, 2014; Lu et al., 2021). One of the most influential figures in stress research, Hans Selye, conceptualized stress as a predictable pattern of biological responses triggered by demands placed on the body, with the body aiming to return to homeostasis. This work further distinguished between two types of stress: eustress, or adaptive stress that enhances motivation and facilitates goal achievement, and distress, which leads to impairment and adverse health outcomes (Selye, 1976). This perspective emphasizes that not all stress is negative, and some stress can be beneficial in working towards one's goals.

Building on this foundation, psychologists Richard Lazarus and Susan Folkman defined stress as a discrepancy between the demands of a situation and an individual's perceived ability to manage those demands (Lazarus, 1966; Lazarus & Folkman, 1984). In this framework, an individual's subjective evaluations of both the challenge at hand and their resources to cope play critical roles in determining whether stress manifests as eustress or distress. Lazarus and Folkman's Transactional Model of Stress and Coping proposes that individuals appraise stressors in one of three ways: as a threat, signaling potential danger or negative consequences; a loss, in which something valued has been taken away or harm has already occurred; or a challenge, which presents an opportunity for growth and mastery (Carver & Connor-Smith, 2010; Lazarus & Folkman, 1984; Skinner & Zimmer-Gembeck, 2007; Smith & Carver, 1997). Challenge appraisals have also been referred to as positive appraisals and have typically been associated

with approach-oriented coping strategies and positive outcome (Lazarus & Folkman, 1984; Carver & Connor-Smith, 2010; Smith & Carlson, 1997).

Several factors influence whether a stressor is appraised as a challenge or a threat. The perceived impact and desirability of the event, its frequency, and attributions about its cause all play meaningful roles in shaping stress perceptions (Compas et al., 2001). Additionally, an individual's sense of self-efficacy, or their confidence in their ability to cope, along with their perception of personal and social resources, influence whether an individual views a stressor as an opportunity for growth or an overwhelming burden (Moos & Holohan, 2003; Smith & Carver, 1997). These cognitive appraisals are pivotal, as they directly influence emotional responses and selection of coping strategies. Notably, children and adolescents may struggle with accurate appraisals due to their developing cognitive abilities, making it more challenging for them to regulate stress effectively and adapt to demanding situations (Smith & Carlson, 1997). These difficulties may be particularly pronounced in youth with higher levels of negative emotionality and temperamental frustration. The heightened vulnerability associated with developmental factors and individual differences in temperament highlights the importance of supporting youth in developing adaptive coping skills to manage stress.

Stress is now most commonly defined as physiological and psychological strain or pressure that arises when an individual encounters a demand that requires an adaptive response (Compas, 1987; Endler & Parker, 1994; Lazarus & Folkman, 1984). These demands can be either acute or longer-term life events that disrupt the status quo and require immediate adaptation. Acute stressors have clearly defined beginnings, often trigger immediate emotional responses, such as fear, anxiety, frustration, or anger, and are accompanied by corresponding behavioral reactions, such as avoidance or problem-solving efforts (Compas et al., 1987;

Hoffman et al., 1992; Smith & Carlson, 1997). In contrast, chronic stress stems from prolonged exposure to adversity within an individual's environment, such as economic hardship, experiences of discrimination, or long-term caregiving responsibilities. These ongoing stressors impose sustained demands, leading to a continuous cycle of potential threats and challenges (Compas et al., 2001). When stress persists over time, it can result in significant disruptions, including an increased risk for both mental and physical health conditions (Hoffman et al., 1992). Given these risks, early intervention is crucial to mitigating the negative effects of chronic stress by promoting adaptive coping.

Theoretical Frameworks of Coping

Coping encompasses the cognitive and behavioral strategies individuals employ to manage and adapt to stressful experiences. These strategies are generally considered conscious and intentional efforts to regulate both a stressor itself and its emotional and physiological consequences (Compas et al., 2017; Eisenberg et al., 1997; Lazarus & Folkman, 1984; Skinner & Zimmer-Gembeck, 2007; Smith & Carlson, 1997). While some researchers define coping strictly as voluntary responses to stress (Compas et al., 2001), others take a broader view, incorporating both automatic and deliberate processes (Carver & Connor-Smith, 2010; Eisenberg et al., 1997; Skinner & Zimmer-Gembeck, 2007). Importantly, coping efforts that begin as conscious and effortful may, with repeated use, become more automatic over time (Carver & Connor-Smith, 2010). Practicing a skill leads to greater proficiency, and, likewise, the frequent use of a particular coping behavior increases its accessibility, making it more ingrained and effortless. Given that coping responses shape how individuals manage stress, they play a crucial role in promoting psychological resilience, adaptation, and overall well-being.

Numerous frameworks have been introduced to categorize coping efforts. In their seminal text, *Stress, Appraisal, and Coping*, Lazarus and Folkman describe a multistep process to coping, in which an individual first appraises a stressor, including its causes, significance, and meaning, as well as the individual's resources to cope (1984). Once an individual has appraised a stressful encounter, they must then select an appropriate strategy to manage it and act to implement that strategy. Following this implementation, individuals evaluate the effectiveness of their selected coping strategy and potentially apply this learning to future efforts (Lazarus & Folkman, 1984). Which coping strategy an individual chooses depends on their appraisal of the situation, their coping abilities, and the focus and goals of their coping efforts.

Emotion versus Problem-Focused Coping

Susan Folkman first introduced an early conceptualization of coping behaviors in her dissertation, distinguishing between problem-focused and emotion-focused coping. (Lazarus & Folkman, 1984; Carver & Connor-Smith, 2010). Problem-focused coping strategies target the stressor directly, often involving efforts to resolve, modify, or mitigate its source. When individuals perceive a stressor as controllable, employing problem-focused coping strategies, such as problem-solving, planning, or seeking instrumental support, has been associated with more favorable psychological outcomes, including reduced emotional and behavioral difficulties and enhanced social competence (Carver & Connor-Smith, 2010; Compas et al., 2001; Cong et al., 2021; Field & Prinx, 1997; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2016). In contrast, emotion-focused coping efforts aim to alleviate the emotional distress associated with a stressor rather than targeting the stressor itself. Emotion-focused strategies include a range of responses, such as self-soothing (e.g., relaxation, seeking emotional support), negative emotional expression (e.g., yelling, crying), and cognitive processes (e.g.,

reappraisal, rumination). Notably, emotion-focused coping includes strategies known to be adaptive, such as cognitive reframing, and strategies consistently found to be maladaptive, such as rumination. Although emotion-focused coping has been associated with increased psychopathology (Carver & Connor-Smith, 2010; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2016), this mix of both adaptive and maladaptive strategies complicates our ability to draw clear conclusions about its overall effectiveness. Additionally, researchers have highlighted that the impact of emotion-focused strategies depends heavily on the context of the stressor (Horwitz et al., 2011; Losoya et al., 1998; Skinner & Zimmer-Gembeck, 2007). In situations where the stressor is out of an individual's control, such as bereavement or chronic illness, emotion-focused coping may be essential for facilitating adjustment and reducing distress.

Given the complexity of stress responses, researchers have recognized that problem-focused and emotion-focused coping are likely not mutually exclusive but rather interrelated and potentially complementary (Carver & Connor-Smith, 2010; Lazarus, 2006). For example, adaptive emotion-focused coping strategies such as support seeking and cognitive reframing can help reduce distress to create capacity for individuals to shift toward problem-solving approaches, if feasible. However, an overreliance on emotion-focused strategies at the expense of directly addressing the stressor may lead to poorer outcomes, particularly if repeated efforts to reduce distress are prioritized above taking steps to address the problem (Woo et al, 2024). Furthermore, some strategies aimed at relieving negative emotions, such as rumination, have been found to actually maintain and exacerbate distress (Nolen-Hoeksema, 1991; Shaw et al., 2019). This nuanced understanding of coping highlights the importance of context, flexibility, and the dynamic interplay between different coping strategies in shaping adaptation and well-

being. Given the inclusion of both adaptive and maladaptive strategies in emotion-focused coping, researchers have largely shifted to other conceptualizations of coping behaviors.

Active and Avoidant Coping

A widely used coping framework, particularly in research on children and adolescents, classifies coping into active (engagement) and avoidant (disengagement) strategies (Causey & Dubow, 1992; Compas et al., 2001; Skinner & Zimmer-Gembeck, 2007). Active coping involves cognitive or behavioral efforts to confront stressors and manage the emotions they provoke, incorporating problem-focused coping and certain emotion-focused strategies such as cognitive restructuring and support-seeking (Skinner & Zimmer-Gembeck, 2007). Avoidant coping, on the other hand, entails efforts to escape the stressor and its associated emotions through avoidance, denial, or wishful thinking (Moos & Schaefer, 1993; Skinner et al., 2003; Skinner & Zimmer-Gembeck, 2007). Avoidant coping is classified as emotion-focused because it primarily aims to reduce emotional distress rather than addressing the stressor (Carver & Connor-Smith, 2010). These strategies are generally considered more automatic and less effortful, offering short-term relief but often proving less effective in the long term (Rapee, 2002; Sawyer et al., 2009). Active coping has been associated with lower levels of depression and anxiety and higher psychological well-being, while avoidant coping predicts greater distress and poorer adjustment (Compas et al., 2001; Compas et al., 2017; Dariotis & Chen, 2022; Moos & Holahan, 2003; Rapee, 2002; Sawyer et al., 2009; Zimmer-Gembeck & Skinner, 2016; Zimmer-Gembeck, 2021).

As with emotion- and problem-focused coping, some researchers argue that the effectiveness of active and avoidant strategies may depend on the nature of the stressor. Active coping has been proposed to be particularly effective in controllable situations, such as academic

challenges, where problem-solving and direct action can lead to concrete improvements (Valentiner et al., 1994). This perspective aligns with a goodness-of-fit framework, which emphasizes the importance of matching coping strategies to fit the specific demands of a stressor. Efforts to problem-solve a fundamentally unchangeable situation may exacerbate distress and reinforce a sense of helplessness or futility. Clarke (2006) found that active coping was significantly associated with greater social competence in adolescents but also showed a small positive association with internalizing symptoms. Additionally, Herres (2015), using latent profile analysis (LPA), identified groups characterized by predominant reliance on social support, disengagement, independent approach strategies, or a mix of independent and dependent active coping strategies. Interestingly, adolescents who relied most heavily on social support and broad active coping strategies reported the highest levels of anxiety. In contrast, adolescents in the independent coping group, who primarily used self-directed strategies without heavy reliance on others, reported the lowest levels of internalizing symptoms. These findings raise questions about the conditions or contexts in which active coping is most effective. It could be that the benefits of active coping depend not only on the specific strategy employed, but also on individual differences such as the tendency to rely on external versus internal resources for managing stress. However, interpreting these associations requires caution. Without within-subject or longitudinal data that capture the temporal sequencing of stress and coping, it is not possible to determine whether the use of a particular coping strategy preceded or followed heightened stress. As such, further research is needed to clarify the dynamic interplay between stress exposure and coping responses over time.

Research on avoidant coping has yielded mixed findings, challenging the traditional view that avoidance is inherently maladaptive. While some many studies specifically link avoidance

and disengagement to greater psychological distress, others have found avoidant strategies to predict lower levels of distress (Hsieh et al., 2021) or to show no significant association with psychological outcomes (Wang et al., 2021). These inconsistencies suggest that nuance, such as context or the items included in the relevant methods, should be considered when interpreting findings related to avoidance. Furthermore, some researchers have argued that, rather than universally exacerbating anxiety symptoms, avoidance may, in certain situations, serve a temporary or even beneficial function. Hofmann and Hay (2018) posit that avoidance, used in moderation, can provide individuals with a sense of control as they gradually increase proximity to a feared stimulus. By reducing immediate emotional distress, avoidance may facilitate engagement with more adaptive coping strategies once an individual is more regulated. Additionally, some forms of avoidance may reflect proactive or protective coping, such as choosing not to walk alone at night or avoiding conflict in high-risk interpersonal situations. In these cases, avoidance may reflect prudent decision-making rather than emotional withdrawal or denial.

However, when adopting a more nuanced perspective on avoidant coping, it is essential to distinguish between distraction and avoidance as separate coping strategies. Distraction refers to the deliberate redirection of attention away from a stressor by engaging in thoughts or activities that elicit positive or neutral emotions. Although similar to avoidance in that both strategies direct attention away from a stressor, distraction is conceptually and functionally distinct (Connor-Smith et al., 2000; Waugh et al., 2020). Compas et al. (2001) emphasize that distraction involves a conscious and purposeful effort to temporarily shift focus away from a stressor. In contrast, avoidance tends to be more automatic and emotionally-driven, frequently involving efforts to suppress, deny, or escape the reality of the stressor altogether. Avoidance

may also entail the abandonment of goals associated with the stressor, contributing to longer-term maladjustment if used chronically or indiscriminately. Waugh et al. (2020) argue that distraction can be adaptive when it is used strategically to regulate distress in the short term, with the intention of later re-engaging with the stressor. In this way, distraction functions as a temporary reprieve, allowing individuals to regain composure and emotional resources before approaching the problem more directly. Distancing oneself from a stressor becomes maladaptive when this practice evolves into chronic avoidance or serves to delay necessary coping efforts indefinitely. Therefore, when proposing that avoidance may be adaptive in certain situations, is important for researchers to be clear about whether a youth may be fully disengaging from a stressor or temporarily employing distraction to manage emotional distress. Clarifying this distinction can help prevent overgeneralizations about the role of avoidance in youth adjustment and ensure that coping interventions support flexible and developmentally appropriate strategies for emotion regulation and problem-solving.

Control Coping Framework

Finally, some researchers have separated coping efforts into primary control coping, secondary control coping, and disengagement coping (Rothbaum et al., 1982; Compas et al., 2001). Primary control coping refers to direct efforts to modify a stressor or regulate one's emotional response to it through strategies such as problem-solving or emotional expression (Zimmer-Gembeck et al., 2021). Primary control coping is typically conceptualized as aligned with problem-focused and active approaches to coping (Skinner & Zimmer-Gembeck, 2007). Meanwhile, secondary control coping focuses on accommodating or adapting to the stressor without efforts to directly alter it. This approach includes strategies like acceptance and cognitive reappraisal (Connor-Smith et al., 2000; Skinner & Gembeck, 2007). Like emotion-focused

coping, secondary control coping is considered most adaptive in situations where a stressor is uncontrollable, as these strategies help individuals regulate their emotional responses when direct control over the stressor is limited (Zimmer-Gembeck et al., 2016). Disengagement coping, a subset of secondary control coping, involves withdrawing from the stressor, either mentally or behaviorally. This category includes strategies such as avoidance, denial, and wishful thinking. Similar to avoidant coping, disengagement strategies may provide short-term relief but are often linked to poorer long-term psychological outcomes, particularly when used as a primary means of coping (Skinner & Zimmer-Gembeck, 2007). The control-based framework of coping shares conceptual similarities to other models, such as problem-focused versus emotion-focused coping and active versus avoidance coping, but emphasizes different levels of engagement with the stressor itself. Importantly, active coping strategies can fall within either primary or secondary control coping, depending on whether the approach is directed toward changing the stressor or adjusting one's response to it.

While each of these models provides valuable insights into how individuals manage stress, this dissertation will examine coping through an active versus avoidant coping framework. This approach is well-supported in the child and adolescent mental health literature (Compas et al., 2017) and offers a robust empirical foundation for examining coping as a potential mechanism in the development of psychopathology.

Coping Flexibility

Recent research has increasingly focused on related factors that contribute to effective coping, such as coping variability, flexibility, and self-efficacy. Coping variability refers to the degree to which individuals utilize different coping strategies within their repertoire, with some strategies being used more frequently than others (Trudel-Fitzgerald et al., 2024; Zimmer-

Gembeck et al., 2018). Coping flexibility refers to an individual's ability to adapt their coping strategies in response to changing stressor demands, allowing them to modify their approach to match a situation (Zimmer-Gembeck, 2021). Finally, coping self-efficacy is the belief in one's own ability to manage stress effectively, reflecting confidence in one's capacity to employ coping strategies successfully (Chesney et al., 2006). Researchers have found that most individuals do not rely on a single coping strategy but more often have a profile of coping responses that can be flexibly drawn upon depending on the situation. This adaptability is a key predictor of resilience, as a flexible and diverse coping repertoire is thought to be a protective factor for psychological well-being (Zimmer-Gembeck et al., 2018; Zimmer-Gembeck, 2021). Classic theories of stress and coping have long emphasized the importance of adjusting one's responses when initial strategies fail or when stressors shift in nature (Lazarus & Folkman, 1984). The ability to modify coping efforts in response to setbacks, new situational demands, or changing stressor intensity rather than rigidly applying the same response across different contexts may play an important role in how coping efforts predict well-being, as a technique that is beneficial in one scenario may be ineffective or even maladaptive in another (Kato, 2012; White, 1974). A meta-analysis examining studies on coping flexibility and coping self-efficacy found that even among different measurement approaches to assessing these constructs, these constructs yielded at least small but meaningful positive effects on emotional adjustment (Cheng et al., 2014). However, greater consistency in measurement and conceptualization is needed to further this body of work.

It is important to note that simply having access to a greater number of coping strategies does not necessarily equate to greater flexibility in coping. In some cases, employing an excessive number of coping strategies has been linked to poorer emotional regulation, suggesting that the mere availability of multiple strategies is not inherently beneficial (Zimmer-Gembeck,

2021). Additionally, perhaps due to inconsistencies in measurement, the literature on coping flexibility remains mixed. A recent systematic review investigating the ability to match coping strategies to stressors and its association with well-being yielded inconsistent results (Finkelstein-Fox & Park, 2019). Studies examining coping self-efficacy have found that it mediates the relationship between childhood maltreatment and later psychopathology, indicating that individuals' self-perceived ability to manage stress serves as a key factor in their psychological outcomes (Su et al., 2022). However, differentiating coping self-efficacy from the coping process itself can be challenging, as appraisals are so integral to the coping process (Lazarus & Folkman, 1984; Skinner, 1995). To clarify these mixed findings and provide a more comprehensive understanding of how coping relates to outcomes such as psychopathology beyond just strategy selection, more research on coping repertoires, fit, and self-efficacy are needed.

The Development of Coping

Coping undergoes significant development and reorganization over time, evolving in parallel with key developmental milestones as children's cognitive, emotional, and problem-solving abilities become more sophisticated and independent from caregivers. Throughout childhood and adolescence, youth utilize both the resources available to them within their social environments and their personal cognitive and emotional capacities to navigate and manage daily stressors (Jenzer et al., 2019; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2016). In this way, coping mechanisms are shaped by a dynamic interplay of biological maturation, social influences, and learned experiences.

A critical factor in the development of coping is the maturation of neurophysiological systems, particularly the prefrontal cortex and executive attention system, which play a

fundamental role in effortful coping and self-regulation (Rueda & Rothbart, 2009). As these neural structures develop, children gain greater control over their emotional responses and are better able to engage in deliberate, goal-directed coping strategies. This neurological growth supports the gradual shift from reactive, caregiver-dependent regulation in early childhood to more autonomous and strategic coping efforts in later developmental stages. In accordance with these changes, broad developmental trends indicate a transition from an early reliance on caregivers for emotional regulation to increasing autonomy and a growing dependence on peer relationships for social support as children enter adolescence (Frydenberg, 2014). This shift reflects not only cognitive and social maturation but also the evolving social landscape of childhood and adolescence, when peer interactions become central to emotional well-being. Longitudinal research has further demonstrated a general increase in approach-oriented coping strategies such as problem-solving and cognitive reappraisal, while avoidance-based coping declines over time as children develop more adaptive, flexible methods for managing stress (Hoffman et al., 1992; Seiffge-Krenke et al., 2009; Stavish & Lengua, 2023; Vierhaus et al., 2007; Wingo et al., 2015). These findings highlight the continuous and dynamic nature of coping development, underscoring the importance of both individual capacities and social contexts in shaping how children and adolescents respond to challenges across their lifespan. The following review examines coping behaviors most typical to different developmental stages.

During infancy (0–18 months), emotion regulation is primarily dependent on caregivers, who play a crucial role in soothing distress and modulating arousal (Rueda & Rothbart, 2009; Zimmer-Gembeck & Skinner, 2016). At this early stage, infants exhibit basic regulatory strategies, including gaze aversion to reduce overstimulation, comfort-seeking behaviors such as reaching for a caregiver, and simple self-soothing actions like thumb-sucking (Skinner &

Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2011). These early behaviors lay the foundation for the gradual development of independent coping mechanisms.

As children transition into toddlerhood and the preschool years (2–5 years old), they begin to display more intentional and voluntary coping efforts. Comfort-seeking remains a primary strategy, but it becomes more purposeful, as toddlers actively seek out caregivers for reassurance and support (Skinner & Zimmer-Gembeck, 2007; Skinner & Zimmer-Gembeck, 2009). Additionally, more purposeful distraction-based coping emerges, with young children engaging in play or shifting their attention away from stressors to manage distress more independently. These early coping strategies reflect the increasing role of cognitive and behavioral regulation as children gain greater autonomy.

Middle childhood (6–8 years old) represents a significant developmental shift, as children begin to employ basic cognitive coping strategies and become more consciously aware of their coping efforts (Hoffman et al., 1992). At this stage, children demonstrate early reflective coping, problem-solving, and cognitive reappraisal, working cooperatively with adults to manage stress (Compas et al., 2017; Skinner & Zimmer-Gembeck, 2007; Skinner & Zimmer-Gembeck, 2009; Zimmer-Gembeck & Skinner, 2016). Their ability to report on their coping strategies also improves, signifying the emergence of more deliberate and effortful forms of regulation.

Preadolescence (9–12 years old) is an important period preceding the transition into adolescence, marked by substantial changes in coping abilities alongside increased vulnerability for the development of psychopathology (Rapee et al., 2019; Zimmer-Gembeck & Skinner, 2011). During this stage, problem-solving skills become more refined, while avoidance-based coping strategies tend to decline (Eschenbeck et al., 2018; Skinner & Zimmer-Gembeck, 2007). Additionally, more advanced proactive and metacognitive coping strategies, such as strategic

planning and reflection, begin to emerge, equipping preadolescents with greater flexibility in navigating stressors and planning for future challenges (Skinner & Zimmer-Gembeck, 2007; Skinner & Gembeck, 2009; Zimmer-Gembeck & Skinner, 2016). These developmental progressions set the stage for the more sophisticated coping abilities that will continue to evolve in adolescence.

Adolescence has been described as a period of “storm and stress” (Meng et al., 2011, p. 649). This developmental stage is a dynamic period characterized by significant physical and hormonal changes, cognitive maturation, and shifting social dynamics toward autonomy and peer relationships (Patel et al., 2007; Sisk & Gee, 2022; Zimmer-Gembeck & Skinner, 2016). Adolescents face heightened social pressures from peers, rigorous academic challenges, and questions about their future paths and success (Sawyer et al., 2018). These changes are paralleled by developments in how adolescents manage stress and regulate their emotions (Hoffman et al., 1992; Zimmer-Gembeck & Skinner, 2016). For example, adolescents seeking external support to manage stress are more likely to increasingly turn to peers rather than parents for emotional and instrumental support (Skinner & Zimmer-Gembeck, 2007). As cognitive abilities mature, coping strategies, on average, become more advanced and effective. Avoidant coping during adolescence has been shown to decline while problem-solving approaches become more frequent and effective due to improvements in cognitive and emotional regulation skills (Eschenbeck et al., 2018; Skinner & Zimmer-Gembeck, 2007; Stavish & Lengua, 2023; Zimmer-Gembeck & Skinner, 2011). Adolescence is also marked by improved proactive coping strategies, which involve anticipating and preparing for future stressors and developing a greater sense of independence in managing challenges (Zimmer-Gembeck & Skinner, 2016). Alongside these developments, adolescents begin to engage in more sophisticated coping mechanisms, such as

cognitive distraction and coping strategies based in their personal values, allowing for greater flexibility and adaptability in response to stress (Skinner & Zimmer-Gembeck, 2007; Skinner & Gembeck, 2009; Zimmer-Gembeck & Skinner, 2011). By late adolescence, coping strategies increasingly align with emerging values and long-term goals (Skinner & Gembeck, 2009). While research on developmental trajectories of coping flexibility remains limited, theoretical perspectives suggest that it increases with age, continuing from the late teens into early or even late adulthood (Babb et al., 2010; Skinner & Zimmer-Gembeck, 2016; Zimmerman & Iwanski, 2014; Zimmer-Gembeck, 2018).

As previously discussed, the coping strategies individuals rely on play crucial roles in predicting mental health outcomes, particularly in childhood and adolescence (Compas et al., 2017). Adolescents who primarily use adaptive strategies, such as support-seeking, problem-solving, and cognitive distraction, tend to experience more positive outcomes, including reduced internalizing symptoms. In contrast, those who engage in maladaptive coping strategies are more likely to exhibit increased externalizing symptoms over time (Compas et al., 2017; Skinner & Gembeck, 2007; Zimmer-Gembeck & Skinner, 2011). Avoidant coping strategies, such as withdrawal or escape behaviors, have been associated with higher levels of anxiety, depression, risk-taking behaviors, and eating pathology (Compas et al., 2017; Richardson et al., 2021; Schmidt & Treasure, 2006; Zimmer-Gembeck & Skinner, 2011). These relationships have been replicated in different cultural populations; for example, in a Korean sample of adolescents, problem-focused coping strategies were positively associated with psychological well-being, whereas emotion-focused strategies predicted poorer outcomes (Lee & Lim, 2015). More broadly, effective coping during adolescence is linked to greater social competence, academic

achievement, and emotional regulation (Compas et al., 2017; Zimmer-Gembeck & Skinner, 2011). These findings highlight the importance of coping efforts in protecting youth well-being.

In addition to coping's evolution across development, gender differences in coping efforts have also been observed, although these findings are at times mixed. Overall, girls have been found to be more likely than boys to seek emotional and social support in response to stress (Eschenbeck et al., 2018; Herres, 2015; Seiffge-Krenke, 2011). Some research also suggests that girls tend to employ more problem-solving strategies and demonstrate lower reliance on avoidant coping compared to boys (Herres, 2015; Richardson et al., 2021). However, findings regarding avoidant coping are less consistent. While several studies have reported that boys are more likely to engage in avoidant strategies, especially in response to interpersonal stressors (Tamres et al., 2002), De Boos and Spiering (2010) found that girls engaged in more avoidant coping in specific situations, highlighting the importance of considering contextual factors when examining gender differences. Taken together, although these findings may reflect methodological or sample-related differences, they also highlight the importance of considering individual variability in coping, such as gender. To account for potential differences in coping patterns, this dissertation will consider child sex as a covariate in all analytic models.

Coping as a Mediator from Stress to Pathology

While adversity and stressful life events can lead to emotional distress, not all individuals exposed to such challenges go on to develop mental health symptoms. This variability has led researchers to investigate the factors that mediate or moderate the relation between stress and psychopathology, aiming to understand what may explain the development of future symptoms (Compas et al., 2001). A mediator explains the causal mechanism underlying the association between two variables, clarifying how or why a predictor such as stress influences mental health

outcomes (Baron & Kenny, 1986). To support a causal interpretation, the proposed mediator must occur both logically and temporally between the predictor and outcome. Specifically, theoretical justification should guide the hypothesis that the predictor variable exerts a direct effect on the mediator, which in turn predicts the outcome. This sequential pathway underscores the importance of establishing both conceptual plausibility and temporal precedence when testing mediation. For example, stressful life events have been found to predict coping responses, which, in turn, predict internalizing and externalizing symptoms (Compas et al., 2017; Evans et al., 2015; Meng et al., 2011; Nolen-Hoeksema & Watkins, 2011; Ohashi et al., 2024; Su et al., 2022; Zimmer-Gembeck & Skinner, 2016). Understanding these mediating mechanisms can inform prevention efforts and intervention targets against psychopathology.

Self-reported stress has been directly linked to adolescent psychopathology and life satisfaction but also indirectly linked to these outcomes through maladaptive coping. More specifically, stress has been found to predict increased reliance on maladaptive coping strategies including avoidance, withdrawal, and externalizing behaviors like aggression or substance use (Evans et al., 2015; Milas et al., 2021), as well as emotion-focused strategies such as rumination, which then predict worsened mental health outcomes (Meng et al., 2021; Sheffler et al., 2019). These findings have been examined for different life stressors. For example, avoidant coping has been found to mediate the relation between cyberbullying and depression (Siah et al., 2022), suggesting that youth who disengage rather than confronting the issue of online bullying may be more vulnerable to developing depressive symptoms. When considering coping behaviors as mediators towards impairment, the strategies of rumination, social withdrawal, and substance use have been identified as particularly impairing for adolescents.

When faced with increased stress, adolescents have been found to engage in greater rumination, which, in turn, predicts increased internalizing symptoms (Ohashi et al., 2024). Rumination as a maladaptive strategy has been validated cross-culturally; findings from a Spanish-speaking sample indicate that self-critical rumination mediated the relationship between emotion dysregulation and psychopathology in adolescence (Martinez-Sanchis et al., 2021). Substance use has also been examined as a maladaptive emotion-focused strategy with the goal of avoidance and withdrawal that plays a significant mediating role in the pathway from early life stress to later psychopathology. For example, one study found that substance use mediated the relation between adverse childhood events and both college adaptation difficulties and psychopathology (Kalpidou et al., 2021). While ecological momentary assessment (EMA) studies have not replicated these findings, retrospective reports of active coping strategies have been repeatedly shown to be negatively associated with substance use, whereas avoidant and disengagement coping strategies have been linked to greater substance use (Eftekhari et al., 2004; McConnell et al., 2014; Wills et al., 2001). The stress-vulnerability model posits that coping mediates the link between stress and engagement in risky behaviors, reinforcing the notion that the way adolescents manage stress significantly influences their likelihood of poorer outcomes and engagement in harmful activities (Meng et al., 2011; Sinha, 2001). However, the mediating role of coping strategies appears to vary across different risk behaviors. For example, coping has not been found to mediate the relation between stress and delinquency, though it fully mediated the relation between stressful life events and substance use and partially mediated the link between stressful life events and risky sexual behavior (Dariotis & Chen, 2022). These findings illustrate the important role coping style may play in some, but not all, developmental pathways towards impairment.

Some research suggests that vulnerability pathways involving maladaptive or negative coping strategies may play a more influential role in predicting psychological outcomes than protective pathways characterized by positive coping efforts. For example, one study found that negative coping strategies had a stronger mediating effect than positive coping in the relation between exposure to stressful life events and symptoms of anxiety and depression (Dariotis & Chen, 2022). This finding highlights the particularly detrimental impact that maladaptive coping can have on mental health, potentially outweighing the benefits of adaptive strategies in certain contexts. Additionally, not all coping strategies appear to serve mediating roles in stress-psychopathology pathways. One study found that distraction did not mediate the relation between childhood adversity and later psychopathology (Miu et al., 2022). Taken together, these findings underscore the importance of identifying and directly targeting maladaptive coping behaviors in prevention and intervention efforts, as doing so may be essential for reducing vulnerability to psychopathology in the face of stress or adversity.

One important individual-level factor that may predict heightened negative emotional responses following stressful life events and lead to coping difficulties is child temperament. Temperament traits such as greater emotional reactivity, poor self-regulation, and a tendency toward negative affectivity can significantly shape how children perceive and respond to environmental stressors. Youth with these characteristics may be more easily overwhelmed by stress and experience emotions more intensely. As a result, they may be more likely to engage in maladaptive coping behaviors, such as avoidance, rumination, or aggression, which can, in turn, intensify their risk for developing internalizing or externalizing psychopathology. In this way, temperament not only influences a child's initial emotional reaction to stress but may also

contribute to the development of enduring patterns of maladaptive coping that exacerbate vulnerability to adverse mental health outcomes over time.

Coping and Temperament

The stability of individual coping behaviors and relationship to personality has long been debated. Some researchers argue that coping tendencies are relatively stable, functioning as trait-like and habitual patterns that change little over time (Moos & Holahan, 2003; Carver & Connor-Smith, 2010). In contrast, others suggest that coping is more dynamic and depends on situational demands (Lazarus & Folkman, 1984; Jenzer et al., 2019). A more integrative perspective reconciles these views, proposing that while individuals may favor a particular repertoire of coping strategies, the specific strategy employed likely varies depending on the context (Moos & Holahan, 2003; Jenzer et al., 2019). Overall, research indicates that personality is related to coping efforts. Personality traits show modest associations with coping strategies, and coping has been found to predict adjustment beyond personality traits alone (Connor-Smith & Flachsbart, 2007), suggesting that intervening on maladaptive coping strategies could protect those with more vulnerable personality traits. Personality not only predicts coping tendencies but also influences how individuals encounter and appraise stressors (Vollrath, 2001). For instance, individuals high in neuroticism are more likely to interpret events as threatening and experience heightened negative affect, which, in turn, is associated with greater reliance on maladaptive coping strategies (Mairet et al., 2014; Moos & Holahan, 2003). This heightened emotional reactivity may overwhelm regulatory resources, leading to a preference for coping strategies aimed at immediately reducing distress rather than resolving the underlying problem. As a result, these individuals often rely on maladaptive coping strategies such as avoidance, denial, rumination, or emotional suppression (Compas et al., 2017). In developmental research,

temperament is thought to play an even more significant role in predicting coping responses than adult personality traits, as young children have yet to develop the regulatory skills gained through adulthood (Skinner & Zimmer-Gembeck, 2007). Notably, regulatory functioning is considered a core component of temperament, further underscoring the importance of studying temperament's association with early coping development.

Temperament has been proposed as an early, biologically based precursor to coping responses to stress, shaping how children perceive, experience, and manage challenges (Derryberry et al., 2003; Jenzer et al., 2019). The two core dimensions of temperament, emotional reactivity and regulatory abilities, are central to the development of coping strategies (Skinner & Zimmer-Gembeck, 2009). Emotional reactivity influences the intensity and duration of stress responses, while regulatory abilities determine how effectively a child can modulate their emotions and behaviors in stressful situations. Additionally, temperament plays a crucial role in shaping a child's sensitivity to environmental stressors, stress reactivity, cognitive appraisals, and flexibility in adapting to adversity (Eisenberg et al., 1994; Lengua & Sandler, 1996). Heightened emotional reactivity can increase children's vulnerability to stress by amplifying their sensitivity to perceived threats or challenges in the environment. Children with these traits tend to experience stronger and more prolonged emotional responses, which can overwhelm their developing regulatory capacities and make it more difficult to modulate distress (Eisenberg et al., 1994). This heightened reactivity not only intensifies their subjective experience of stress but may also interfere with the use or development of adaptive emotion regulation strategies, such as cognitive reappraisal or problem-solving (Skinner & Zimmer-Gembeck, 2009). Given these biological and cognitive intersections, temperament is thought to directly shape the development and selection of coping strategies, influencing whether a child

engages in adaptive or maladaptive responses to stress (Compas et al., 2004; Smith & Carlson, 1997). Understanding the interplay between temperament and coping is essential for identifying children at risk for poor stress regulation and developing early interventions to promote resilience.

Youth with high negative reactivity and low effortful control may experience heightened negative emotions in response to stressful life events and struggle to engage in adaptive appraisals and coping strategies due to emotional dysregulation or impulsivity. These difficulties can lead to poorly coordinated coping efforts or a mismatch between the coping strategy and the stressor (Derryberry et al., 2003). Temperament traits such as fearfulness and irritability are associated with greater emotion dysregulation, which can hinder coping efforts (Skinner & Zimmer-Gembeck, 2007; Smith & Carlson, 1997). Research has found that introversion, fearfulness, and negativity emotionality predict greater reliance on avoidance-based coping strategies such as withdrawal and denial, which can increase their vulnerability to internalizing disorders (Compas et al., 2004; Mairet et al., 2014; Rueda & Rothbart, 2009; Skinner & Zimmer-Gembeck, 2007; Thompson et al., 2014; Zimmer-Gembeck & Skinner, 2011, 2016). Similarly, heightened sensitivity to frustration and blocked rewards has been linked to increased use of disengagement strategies (Melegari et al., 2021), suggesting that increased emotion dysregulation may predict less effective coping behaviors. These results have been replicated in developmental periods that represent significant risk for the onset of psychopathology. In a study of preadolescents, fearfulness and impulsivity were found to predict greater use of avoidant coping, whereas frustration was associated with less active coping over time (Thompson et al., 2014). Overall, negative emotionality and impulsivity appear to put youth at significantly increased risk for maladaptive coping.

Conversely, youth with higher effortful control have been found to be more likely to engage in adaptive, active coping strategies that foster resilience (Eisenberg et al., 1996; Liu et al., 2024; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2011). These children may also be better equipped to employ complex cognitive coping strategies, such as those involving secondary control, which require greater cognitive effort and allow for greater flexibility in managing stress (Compas et al., 2004). Beyond effortful control, temperament traits associated with positive emotionality, such as sociability and humor, have been identified as protective factors against psychopathology (Smith & Carlson, 1997), perhaps due to increased social support or ability to positively frame stressors with humor. Lower levels of negative emotionality have been similarly linked to greater psychological resilience. While distraction has been less consistently associated with temperament traits, one study found that distraction strategies may be particularly beneficial for individuals lower in negative affect (Lagacé-Séguin & Gionet, 2009). Additionally, children with less fearful temperaments tend to demonstrate more adaptive coping and greater resilience (Markovic et al., 2013; Zimmer-Gembeck & Skinner, 2011), and these temperamental characteristics appear to support more effective coping outcomes.

Coping as a Mediator from Temperament to Outcomes

Coping researchers have suggested that adaptive coping strategies may serve as a protective mechanism against the impact of vulnerable temperament traits or exposure to life stressors (Skinner & Zimmer-Gembeck, 2007). In a sample of children diagnosed with cancer, active coping was found to mediate the relationship between negative affectivity and anxiety symptoms, suggesting that youth with lower negative affectivity engaged in more adaptive coping, which then predicted reduced impairment from the significant stress and emotional

distress experienced by cancer patients (Miller et al., 2009). On the other hand, avoidant coping has been explored as mediating the relation between irritable and fearful temperament to predict psychopathological outcomes, highlighting the potential risks associated with less effective coping responses (Skinner & Zimmer-Gembeck, 2007). One study found avoidant coping mediated the relation between impulsive temperament and internalizing symptoms, suggesting that youth who struggle to direct their regulation efforts and tend to try to escape stressors may develop more internalizing symptoms (Thompson et al., 2014). Another recent study found that, in a sample of preadolescent youth, suppression mediated the link between negative affectivity and depression symptoms (Liu et al., 2024). It may be that youth more prone to negative emotionality who try to suppress or avoid these difficult feelings go on to develop internalizing difficulties. However, findings on this topic have been mixed and another study found no evidence that emotion regulation strategies mediated the association between temperament reactivity and depression (Van Beveren et al., 2016). Given frustration's role as a core temperament trait associated with emotional dysregulation and increased risk for mental health difficulties, examining this developmental pathway could offer critical insights into early intervention strategies aimed at fostering adaptive coping skills in young children, and increase our understanding of how pathology emerges across childhood.

Given the significant conceptual overlap between negative emotionality and irritability, as well as between emotion regulation and coping, this review integrates findings from both bodies of literature. A recent systematic review found that childhood irritability is associated both cross-sectionally and longitudinally with deficits in emotion regulation skills and biases in emotional information processing (Urban et al., 2024). Irritability has further been linked to heightened sensitivity to threat and difficulties in processing emotional information (Salum et al.,

2016). These biases may disrupt cognitive appraisals, an essential step in processes of effective coping (Lazarus & Folkman, 1984). To mitigate the negative longitudinal tendency for irritable youth to develop internalizing and externalizing symptoms, cognitive-behavioral interventions have been explored as potential mechanisms for improving emotion regulation and reducing psychopathology risk. One study of boys ages 6–11 found that an intervention targeting emotion regulation skills led to significant reductions in irritability symptoms (Derella et al., 2019). Another study of preadolescents (ages 8–10) found that irritability conferred risk for externalizing symptoms through poor coping with sadness and for internalizing symptoms through poor coping with anger and intolerance of uncertainty; however, rumination did not serve as a mediator in these pathways (Evans et al., 2020). This study suggests that some regulatory processes may mediate the pathway from early frustration to later pathology.

Two recent studies examined emotion regulation strategies in adolescence as potential mediators in the path from early irritability to later internalizing symptoms. Trait anxiety, non-acceptance of emotions, and difficulties with emotion clarity were found to mediate the relationship between irritability and depression (Malhi et al., 2021), and emotion dysregulation was found to mediate the association between irritability and internalizing symptoms (2017). However, both studies utilized cross-sectional models to examine mediation, limiting conclusions about directionality due to a lack of temporal sequencing. Researchers have emphasized the need for more longitudinal studies examining the relations among coping, temperament, and psychopathology, to build on existing cross-sectional findings (Zimmer-Gembeck & Skinner, 2016). Without longitudinal data, we cannot conclude whether coping and regulatory efforts mediate the path from early child frustration to later psychopathology.

This Study

In addition to calls for examining these processes using longitudinal datasets, coping researchers have stressed the importance of examining these processes in preadolescence, a critical period marked by the rapid acquisition of more complex coping skills (Zimmer-Gembeck & Skinner, 2011). Targeting this developmental window for early interventions may be especially beneficial in promoting resilience and preventing the emergence of maladaptive coping patterns that could contribute to significant increases in psychopathology seen in adolescence (Rapee et al., 2019). To protect against this onset, researchers have advocated for coping-focused interventions as both a preventative and therapeutic approach against symptoms of psychopathology (Compas et al., 2010; Compas et al., 2017; Zimmer-Gembeck & Skinner, 2016). However, without examining whether coping mediates these relations, it is unclear whether coping-focused interventions are an effective approach for protective intervention for youth higher in frustration. Given that frustration is a temperament trait characterized by heightened emotional reactivity and increased risk for mental health difficulties, understanding whether maladaptive coping explains the deficits seen in this pathway is crucial. To address this gap, this dissertation aims to examine whether preadolescent-endorsed coping style mediates the relation between early childhood frustration and the subsequent development of mental health symptoms in adolescence.

Aims and Hypotheses

Aim 1: Examine whether an aggregate score of early life frustration predicts the development of internalizing and externalizing symptoms in this sample.

Hypothesis 1: Higher observed frustration in early childhood will predict higher levels of and greater growth in internalizing and externalizing symptoms in adolescence.

Aim 2: Assess avoidant and active coping during pre-adolescence as partial mediators in the relation between early temperament frustration and the development of internalizing and externalizing symptoms in adolescence.

Hypothesis 2: Coping style will partially mediate the relation between early frustration and the later development of psychopathology.

Hypothesis 2: Children high in frustration will report increased avoidance and decreased active coping, which will, in turn, lead to higher levels of and greater growth in internalizing and externalizing symptoms.

Exploratory: To deepen our understanding of coping response patterns and their impact on mental health outcomes, this study will examine both a ratio of active to avoidant coping strategies and the total number of strategies endorsed as potential mediators between early life frustration and later internalizing and externalizing symptoms. Research suggests that some use of avoidant coping, such as distraction or withdrawal, may be adaptive in uncontrollable situations (Hofmann & Hay, 2018). Additionally, a flexible coping profile, in which youth match strategies for managing stress with situational demands, has been associated with positive outcomes (Zimmer-Gembeck et al., 2018; Zimmer-Gembeck, 2021). However, studies also indicate that endorsing a greater number of coping strategies may be linked to poorer outcomes, potentially due to difficulties in effective implementation or because children experiencing greater distress attempt more strategies (Zimmer-Gembeck, 2021). To explore different approaches to conceptualizing coping, we will analyze both the proportion of active to avoidant strategies and the overall number of strategies used by youth.

Exploratory Aim 1: Assess whether a ratio of active to avoidant coping strategies endorsed by preadolescent youth partially mediates the relationship between early frustration and adolescent psychopathology.

Exploratory Hypothesis 1: Greater temperament frustration will predict a greater use of avoidant compared to active coping strategies, represented by a lower ratio score, which will then predict greater levels and growth in adolescent internalizing and externalizing symptoms.

Exploratory Aim 2: Assess whether the number of coping strategies endorsed by preadolescents overall (both active and avoidant) partially mediates the relation between early frustration and adolescent psychopathology.

Exploratory Hypothesis 2: Increased temperament frustration will predict a greater number of coping strategies endorsed in preadolescence, which will, in turn, predict greater levels and growth of internalizing and externalizing symptoms.

Methods

Participants

This study analyzes data from a pre-existing sample of youth from a larger longitudinal and community-based study conducted in the Pacific Northwest, spanning from the early 2010s through 2022. The original sample includes 306 children and their mothers ($n = 306$), assessed multiple times starting when the child was approximately 36 months old (Time 1 (T1): $M_{\text{age}} = 3.06$ years, $SD = 0.07$). The aim of this study was to examine the development of regulatory abilities in low-income contexts. Participants were locally recruited from hospitals and community organizations, including daycares, health clinics, charitable agencies, and libraries. The recruitment process intentionally targeted families across a range of income levels to capture a breadth of socioeconomic circumstances. This study operationalized income level using

income-to-needs ratios based on household size, as outlined in the 2009/2010 Federal HHS Poverty Guidelines. Exclusion criteria included insufficient English proficiency to comprehend the consent procedures and the presence of developmental delays in the child.

At T1, mothers provided demographic information, including their child's birth sex and household income. 50.3% of the sample identified the child's birth sex as female. Income level was measured using a 14-point Likert scale to assess income-to-needs ratios and identify families at or below the federal poverty level. On this scale, the sample's mean income-to-needs ratio was 8.75 (approximately \$38,000–\$39,000), with a standard deviation of 3.93 and a range capturing a broad spectrum of income: from 1.00 ($\leq$ \$14,570) to 14.00 ($>$ \$150,000). Income-to-needs ratios and total income were highly correlated ($r = 0.92$) and remained relatively stable from T1 to T4, with correlations ranging from 0.80 to 0.88. Mothers and children provided consent and assent to participate in the study and were compensated for each assessment.

Procedures

Children and parents were assessed at multiple time points (T1-T8). The first four timepoints (T1-T4) included tasks and questionnaires collected in a university lab setting. T1 was collected when children were around 3 years old, and subsequent time points (T2-T4) were collected about 9 months apart. The children's ages at these time points were 36-40 months, 45-49 months, 54-58 months, and 63-67 months old, respectively. At T4, $M_{\text{age}} = 5.35$ years, $SD = 0.28$. Approximately 6 years later (T5), participants ($n = 226$) completed a follow-up assessment capturing their adjustment and wellbeing, $M_{\text{age}} = 11.00$ years, $SD = 0.59$. Exclusionary criteria for the age 11 assessment included: no longer living in the local area, $IQ < 80$, active substance dependence, psychosis, or a diagnosis of pervasive developmental disorder.

Finally, three parent and child surveys (T6-T8) assessing experiences and adjustment were collected during the COVID-19 pandemic (spring 2020, winter 2021, and winter 2022) when the participants were about 13-17 years old. These surveys coincided with stay-at-home orders in the Pacific Northwest region. At T6, $M_{\text{age}} = 14.33$ years, $SD = 0.48$; T7, $M_{\text{age}} = 14.87$ years, $SD = 0.49$; T8, $M_{\text{age}} = 16.23$ years, $SD = 0.50$. Notably, the COVID-19 pandemic was a period of significant global stress that has been linked to increased internalizing and externalizing symptoms in youth (Panchal et al., 2023). The pandemic brought exceptional isolation, worry, and conflict at home for many. Therefore, this study is able to examine how regulatory styles may mediate the pathway from early risk to psychopathology during a period exemplifying increased stress. In total, 214 participants responded to at least one of the surveys assessing internalizing or externalizing symptoms. 50.5% of these participants identified as female, with the following racial/ethnic breakdown: 7.5% Black or African American, 5.1% Asian, 10.3% Latino(a) or Hispanic, 1% American Indian or Alaskan Native, 1% Native Hawaiian or Pacific Islander, 64% White or European American, and 10.7% indicating multiple identities. All procedures were approved by the university Institutional Review Board associated with this study.

Missingness

Given the long-term nature of the study and the additional challenges faced by families during the COVID-19 pandemic, some participant attrition occurred. Of the original sample ($n = 306$), 214 participants responded to at least one of the three follow-up surveys, and 156 participants completed two out of three. To assess potential biases introduced by attrition, participants with and without data from at least one follow-up survey were compared using t -tests on key variables, including observed child temperament, maternal anxiety and depression

symptoms, child sex, race/ethnicity, and family income. These analyses revealed no significant differences between the groups with and without missingness. Under these conditions, full-information maximum likelihood estimation (FIMLE) was deemed appropriate. FIMLE leverages all available data to estimate parameters, providing less biased results and greater efficiency and statistical power compared to other methods (e.g., listwise deletion) for handling missing data (Arbuckle, 1996; Enders & Bandalos, 2001).

Measures

Temperament

This study assessed temperament using behavioral observations collected during tasks conducted in a university lab setting at T1 (age 3) through T4 (age 5). The two frustration tasks, Transparent Box and Knotted Sack, were derived from the Laboratory Temperament Assessment Battery: Preschool Version and designed to prompt scenarios to elicit frustration (Lab-TAB; Goldsmith et al., 1993). In the Transparent Box task, children were instructed to try to open a see-through box containing a desired toy for two minutes, without help and with nonfunctional keys. In the Knotted Sack task, children were instructed to untie the drawstring of a bag with a desired toy inside for two and a half minutes without help, however the drawstring was sewn so that it could not be unknotted.

Administration of the Transparent Box task and the Knotted Sack task was alternated at each timepoint in an effort to avoid the children remembering the task and confounding their reactions (e.g., Transparent Box at T1, Knotted Sack at T2, Transparent Box at T3, Knotted Sack at T4). Trained observers scored frustration for 2-minutes in 30 second epochs and coded for observations of physical, facial, and verbal responses, as well as asking for help and expressing annoyance with the task administrator. These behaviors were rated for intensity (0-2; no response to strong response), and epochs were averaged to create a total frustration score for each

timepoint. The Cronbach's alpha for the scale items was $T1 = 0.83$ and $T4 = 0.75$. 20% of these tasks were double coded to establish interrater reliability, $ICC = 0.72 - 0.79$.

To investigate the relation between early childhood frustration and later symptoms of psychopathology, we calculated an average frustration score by taking the mean of observed frustration levels from T1 to T4. Observations of child temperament in a laboratory setting were used to minimize potential biases associated with subjective parent reporting. This approach provides an objective measure of frustration and ensures consistency through the use of standardized stimuli and comparisons with age-matched peers (Dougherty et al., 2011). Laboratory assessments have been shown to be reliable and valid in measuring child temperament traits (Durbin et al., 2007). However, internal consistency of our observed frustration scores was poor across timepoints ($\alpha = .44$). Correlations between individual timepoints ranged from $r = .32$ to $r = .07$, indicating limited stability over time. By aggregating data across a 2.5-year span, we aimed to better capture patterns of observed early childhood frustration. This approach was intended to enhance the reliability of our frustration measure by incorporating both the frequency and consistency of frustration-related behaviors observed over time.

Coping

Coping was assessed at T5 (age 11) using the Children's Coping Strategies Checklist (CCSC; Ayers et al. 1996). The CCSC is one of the most widely used instruments for measuring coping in children and assesses for active, accommodative, and passive coping as well as active coping, avoidance, and distraction (Ayers et al., 1996; Compas et al., 2017). Children were asked to rate how often they used various behaviors to cope with a problem of their choosing over the past month, such as "Try to stay away from the problem" or "Write down my feelings." Responses were ranked on a four-point Likert scale (0 = *not at all*, 1 = *sometimes*, 2 = *often*, and

3 = *most of the time*). This study uses the active and avoidant subscales of the CCSC. The active coping subscale assesses for strategies such as seeking understanding, direct problem solving, and positive cognitive restructuring. The avoidant coping subscale assesses for strategies such as cognitive avoidance and avoidant actions. Good internal consistency was found for the active ($\alpha = 0.92$) and avoidant ($\alpha = 0.81$) coping scales.

Psychopathology Symptoms

At T5 (age 11) children's internalizing and externalizing symptoms were assessed using parent and child reports on the Child Behavior Checklist (CBCL) and the Youth Self Report (YSR), respectively (Achenbach, 1991). Mother and child report of symptoms were moderately correlated at T5 for internalizing ($r = .32$) and externalizing ($r = .31$) symptoms. At T6 (age 13) to T8 (age 15), children and their mothers completed the 25-item Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001). This measure has been shown to be correlated with other measures of youth outcomes including the CBCL and YSR, but with fewer items for reduced burden on participants (Goodman & Scott, 1999). Example stems include "I get very angry and often lose my temper" and "I get a lot of headaches, stomach-aches, or sickness." Participants rated these items on a three-point Likert scale (1 = *not true*, 2 = *somewhat true*, and 3 = *certainly true*). To center the child's experience of their mental health and maintain consistency with the child-reported coping measure, we used child report for our measure of adjustment. Mother- and child-reported symptoms on the SDQ were moderately to strongly correlated for internalizing symptoms, $r_s = .34$ (T6), $.61$ (T7), and $.49$ (T8), and for externalizing symptoms, $r_s = .42$ (T6), $.40$ (T7), and $.33$ (T8). T5 internalizing symptoms reported on the YSR showed small correlations with SDQ internalizing symptoms at T6 ($r = .22$), T7 ($r = .22$), and T8 ($r = .20$). Similarly, YSR externalizing symptoms showed small correlations with SDQ externalizing at T6 ($r = .21$), T7 ($r = .21$), and T8 ($r = .18$). The SDQ has been shown to have good measure

reliability and validity (Dickey & Blumberg, 2004). Acceptable internal consistency was found for child report of internalizing ($\alpha = 0.74$) and externalizing ($\alpha = 0.76$) on the SDQ from T6 to T8.

Analytic Approach

Correlations were calculated in RStudio using the `cor_results` function, which applies pairwise deletion and calculates Pearson correlation coefficients. To characterize early childhood frustration, we calculated an aggregate frustration score by averaging observed frustration reactivity scores across four timepoints (T1–T4), collected when children were approximately 3–5 years old. Using structural equation modeling, we examined how this early frustration score relates to the development of adolescent psychopathology within a latent growth curve modeling (LGCM) framework (Duncan & Duncan, 2004; von Soest & Hagtvet, 2011). This approach evaluated how early frustration predicted initial levels (intercept) and growth (slope) of internalizing and externalizing symptoms across three timepoints in adolescence. LGCM enables the examination of between-participant differences in within-person change (Curran et al., 2010).

Finally, to explore a potential underlying process partially accounting for the relation between early frustration and later psychopathology, we assessed whether coping style (active and avoidant coping) mediates the pathway from temperament frustration to adolescent internalizing and externalizing symptoms by examining each pathway of our indirect effect models (Baron & Kenny, 1986; Hayes, 2009; MacKinnon et al., 2007; von Soest & Hagtvet, 2011). Separate models were constructed to assess the mediating effects of avoidance and active coping. Furthermore, internalizing and externalizing symptoms were analyzed independently, resulting in a total of four distinct models. Path diagrams are presented in Figure 1. All analyses were conducted in R (Version 4.0.1, 2021) using the “lavaan” and “mediation” packages (Rosseel, 2012; Tingley et al., 2014). Full information maximum likelihood (FIML) estimation

was employed to handle missing data, and the precision of indirect effect estimates was assessed via bootstrapping (5,000 iterations as recommended in Hayes, 2009) to generate confidence intervals (CIs) for significance testing (Hayes, 2009; von Soest & Hagtvet, 2011). Indirect effects were estimated for all models, regardless of the significance of direct effect paths.

Unconditional growth models were initially examined to assess model fit and variance for prediction. Model fit was evaluated using Chi-squared tests (non-significant results indicating adequate fit), comparative fit index (CFI), standardized root mean square (SRMR), and root mean square error of approximation (RMSEA). CFI values $\geq .95$ indicated good fit, and values $\geq .90$ were deemed acceptable (Hu & Bentler, 1999; Little, 2024). RMSEA and SRMR values $< .05$ indicated good fit, while values between .05 and .08 were considered acceptable. Statistical significance was set at $p < .05$.

Covariates

Covariates were selected based on theoretical relevance to help satisfy causal assumptions, aiming to reduce potential confounds and better isolate the specific contributions of early frustration to the later development of psychopathology. To account for child mental health prior to adolescence and the onset of the COVID-19 pandemic, we controlled for a child-reported score of youth mental health symptoms on the YSR at age 11 (T5). Additionally, child sex has been directly associated with several variables in our models. Research indicates that female children are more likely to report greater use of problem-solving strategies and the enlisting of social supports, whereas male children tend to rely more on avoidant coping strategies (Eschenbeck et al., 2007; Richardson et al., 2021; Tamres et al., 2002). Additionally, male children have also been found to exhibit higher levels of externalizing behaviors (Bongers et al., 2004) and temperament frustration/anger compared to their female counterparts (Liu et al., 2021). These differences in coping and behavioral outcomes may have important implications

for understanding individual variations in the relationship between early irritability and adolescent psychopathology. It is important to note that this study considers child sex as assigned at birth, rather than gender identity. As a post hoc exploratory analysis, COVID-19–related stress was included as a covariate to account for the unique stress experienced by families during pandemic lockdown.

Exploratory Aim

Research on coping behaviors suggests that individuals often use both adaptive and maladaptive strategies, with positive and negative coping approaches frequently found to be correlated. This may reflect a tendency for individuals under stress to draw on a broader range of coping strategies in an effort to alleviate distress, rather than relying exclusively on one type (Compas et al., 2001; Parrish et al., 2021). To examine whether a larger coping repertoire mediates the relation between early temperament frustration and adolescent internalizing and externalizing symptoms, we computed a total coping score by summing active and avoidant strategy scores.

Next, to examine whether children with higher levels of temperament frustration tend to use active and avoidant coping strategies in equal measure or favor one approach over the other, we calculated a ratio score between endorsed active and avoidant coping strategies. Drawing on previous work using ratios of coping strategies (Connor-Smith et al., 2000; Parrish et al., 2021), we first calculated the proportion of individuals' active or avoidant coping strategies endorsed to the total active or avoidant coping scores possible. For example, the CCSC has 45 items total. 20 of the CCSC items assess for active coping and each of these items is ranked on a scale from zero to three. Therefore, 20 items $\times$ 3 = 60 score of total active coping possible. This calculation was repeated for avoidant coping (e.g., 11 items $\times$ 3 = 33 score of total avoidant coping possible; avoidant coping proportion = child's avoidant coping score / score of total avoidant coping

possible). Finally, to create our ratio of active coping endorsed by avoidant coping endorsed, we divided the active coping proportion by the avoidant coping proportion. Higher ratio scores indicate a greater use of active compared to avoidant coping strategies. After calculating our ratios, we assessed whether these scores mediate the pathway from early childhood frustration to the development of psychopathology during adolescence by examining two indirect effects models - one for internalizing and one for externalizing symptoms.

Results

Descriptives and Correlations

Study variable descriptives are presented in Table 1, and correlations among study variables are shown in Table 2. Aggregated temperament frustration (T1-T4) was positively correlated with child sex, indicating that male children exhibited higher early frustration levels. Additionally, aggregate frustration was positively associated with externalizing symptoms at T5 on the YSR. Active coping was positively correlated with avoidant coping, indicating youth who endorsed more adaptive coping also endorsed more maladaptive coping. Active coping was negatively correlated with internalizing symptoms at T5 and internalizing and externalizing symptoms at T7. Avoidant coping was positively correlated with internalizing and externalizing symptoms at T5. Internalizing symptoms were consistently positively correlated with externalizing symptoms across time points. Female sex at birth was positively correlated with internalizing symptoms at both T7 and T8 compared to male sex.

Unconditional Growth Models

Fit indices and unstandardized estimates of means and variances for the unconditional growth models of internalizing and externalizing symptoms across adolescence are presented in Table 3. The models demonstrated acceptable model fit for both internalizing ($\chi^2(1) = 0.11, p = .736$; CFI = 1.00; RMSEA = .00; SRMR = .007) and externalizing symptoms ($\chi^2(1) = 0.81, p =$

.370; CFI = 1.00; RMSEA = .00; SRMR = .017). Internalizing ($B = 1.17$, $SE = 0.15$, $p < .001$) and externalizing ($B = 0.51$, $SE = 0.15$, $p = .001$) symptoms increased significantly from T6 to T8. Participants' symptom trajectories are presented in Figures 2a (internalizing) and 2b (externalizing). Significant individual variability was observed only in initial levels of internalizing ($\sigma^2 = 8.61$, $SE = 2.16$, $p < .001$), suggesting that youth differed in their initial levels of internalizing symptoms, but followed similar trajectories over time. Significant variability was observed in both intercepts ($\sigma^2 = 8.40$, $SE = 1.94$, $p < .001$) and slopes ($\sigma^2 = 1.92$, $SE = 0.85$, $p = .024$) of externalizing symptoms, indicating that youth differed not only in their initial levels but also in the rate of change of externalizing symptoms from T6 to T8. For both the unconditional internalizing and externalizing models, the covariance between intercept and slope was not statistically significant, indicating no consistent association between initial symptom levels and the rate of change over time.

Latent Growth Curve Mediation Models

Assessing Frustration Predicting Symptom Levels and Growth

To begin to assess for mediation, we first examined whether our aggregate score of early childhood frustration predicted the intercept and slope of internalizing and externalizing symptoms from T6 to T8, controlling for child sex and symptoms levels at T5 (either internalizing or externalizing symptoms, to match the corresponding model). The models demonstrated acceptable fit for predicting internalizing ($\chi^2(4) = 0.45$, $p = .978$; CFI = 1.00, RMSEA = .000, SRMR = .009) and externalizing symptoms ($\chi^2(4) = 6.07$, $p = .194$; CFI = 0.98, RMSEA = .05, SRMR = 0.03).

Higher early frustration significantly predicted greater internalizing symptoms at T6 ($B = 8.61$, $SE = 2.90$, $\beta = .27$, $p = .003$) and a significantly flatter slope over time ($B = -4.02$, $SE =$

2.01, $\beta = -.28$, $p = .045$), indicating that children high in early frustration began with more symptoms and exhibited less change in internalizing symptoms from T6 to T8 (plotted in Figure 3a). Prior internalizing symptoms at T5 also predicted higher internalizing levels at T6 ($B = 0.11$, $SE = 0.03$, $\beta = .27$, $p = .001$), and child sex (coded as 0 = female, 1 = male) was associated with T6 levels of internalizing ($B = -2.14$, $SE = 0.49$, $\beta = -.36$, $p < .001$), with male children reporting lower internalizing symptoms. In our externalizing models, early frustration significantly predicted elevated externalizing symptoms at T6 ($B = 6.45$, $SE = 3.03$, $\beta = .22$, $p = .034$), but was not significantly related to symptom change over time ($B = -1.47$, $SE = 1.78$, $\beta = -.12$, $p = .410$) (plotted in Figure 3b). Prior externalizing symptoms at T5 predicted higher symptoms at T6 ($B = 0.13$, $SE = 0.05$, $\beta = .26$, $p = .005$). Child sex did not predict the intercept or slope of externalizing symptoms.

Assessing Frustration Predicting Preadolescent Coping

Next, using linear regression we assessed whether temperament frustration predicted the proposed mediators of active and avoidant coping. Frustration was not a significant predictor of active coping ($B = -13.15$, $SE = 10.18$, $F(1, 189) = 1.67$, $p = .198$), or avoidant coping ($B = 0.88$, $SE = 5.27$, $F(1, 189) = 0.03$, $p = .867$). Given the lack of a significant association between early frustration and preadolescent coping, the conditions necessary for coping to function as a mediator between temperament frustration and adolescent psychopathology were not met.

Assessing Coping Predicting Levels and Growth in Adolescent Psychopathology

To continue to assess for significant relations between our mediation model variables, we next assessed whether active and avoidant coping directly predicted our outcome variables of internalizing and externalizing pathology while controlling for early childhood frustration.

Active Coping.

The indicators of fit for the models testing active coping predicting levels and growth in internalizing symptoms were mixed ($\chi^2(3) = 11.46, p = .009$; CFI = .92; RMSEA = .12*; SRMR = .05). Active coping did not significantly predict levels ($B = -.04, SE = .02, \beta = -.16, p = .08$) or slope ($B = -.01, SE = .01, \beta = -.07, p = .66$) of internalizing symptoms. The indicators of fit for the models testing active coping predicting levels and growth in externalizing symptoms showed acceptable model fit ($\chi^2(3) = 4.05, p = .26$; CFI = .99; RMSEA = .04; SRMR = .03). Active coping was also not a significant predictor of the intercept ($B = -.04, SE = .02, \beta = -.19, p = .06$) or slope ($B = .01, SE = .01, \beta = 0.14, p = .42$) of externalizing symptoms.

Avoidant Coping.

The fit indices of avoidant coping predicting levels and growth in internalizing symptoms showed adequate model fit ($\chi^2(3) = 3.23, p = .358$; CFI = .998; RMSEA = .02; SRMR = .03). Avoidant coping did not significantly predict either initial symptom levels ($B = -.02, SE = .05, \beta = -.04, p = .72$) or growth ($B = -.03, SE = .03, \beta = -.13, p = .35$) of internalizing symptoms. The fit indices of avoidant coping predicting levels and growth in externalizing symptoms showed adequate model fit ($\chi^2(3) = 4.63, p = .20$; CFI = .98; RMSEA = .05; SRMR = .03). Avoidant coping was not a significant predictor of either initial levels ($B = -.03, SE = .05, \beta = -.08, p = .51$) or growth in externalizing symptoms over time ($B = .01, SE = .03, \beta = .07, p = .71$).

Examining Latent Growth Curve Models with Mediation

Finally, to examine associations between variables in our full models, latent growth curve mediation models were conducted to test the mediating role of coping in the association between temperament frustration reactivity and levels and change in internalizing and externalizing symptoms in adolescence. Four models were tested - avoidant and active coping predicting levels and growth of internalizing and externalizing symptoms - with child sex and symptoms at the

time of coping measurement (T5) as covariates. Results are also presented in Tables 5 (internalizing) and 6 (externalizing).

Fit Indices.

The results of the internalizing models are presented in Table 5 and the results of the externalizing models are presented in Table 6. Fit indices of active coping mediating the path from early frustration to internalizing symptoms ($\chi^2(4) = 13.67, p = .008$; CFI = .93; RMSEA = .10; SRMR = .04) and externalizing symptoms ($\chi^2(4) = 7.09, p = .13$; CFI = .97; RMSEA = .06; SRMR = .03) showed adequate model fit. Average early frustration from T1-T4 significantly predicted higher internalizing symptoms at T6 ($B = 8.49, SE = 3.56, \beta = .28, p = .017$) and less growth over time ($B = -3.92, SE = 1.94, \beta = -.33, p = .041$).

Assessing Frustration to Symptoms via Active Coping.

Frustration also significantly predicted higher externalizing symptoms at T6 ($B = 6.36, SE = 2.96, \beta = .22, p = .032$), but not slope from T6 to T8 ($B = -1.44, SE = 1.68, \beta = -.13, p = .39$). Early frustration did not predict active coping, and the indirect effects on both the intercept ($p = .54$) and slope ($p = .66$) were nonsignificant. Active coping at T5 was not significantly related to concurrent internalizing ($B = -.24, SE = .12, \beta = -.14, p = .06$) or externalizing ($B = -.30, SE = .21, \beta = -.12, p = .15$) symptoms at T5. Active coping was also not predictive of internalizing ($B = -0.04, SE = .02, \beta = -.16, p = .09$) or externalizing symptom levels at T6 ($B = -0.04, SE = .02, \beta = -.17, p = .13$), confirming that active coping did not mediate the relationship between frustration and adolescent psychopathology.

Assessing Frustration to Symptoms via Avoidant Coping.

The model testing avoidant coping mediating the relationship between internalizing ($\chi^2(4) = 2.69, p = .610$; CFI = 1.00; RMSEA = .00; SRMR = .02) and externalizing ($\chi^2(3) = 4.63, p =$

.201; CFI = .98; RMSEA = .06; SRMR = .03) symptoms demonstrated adequate model fit.

Avoidant coping was not significantly associated with the intercept ($B = -0.05$, $SE = .05$, $\beta = -.11$, $p = .32$) or slope ($B = -0.03$, $SE = .04$, $\beta = -.16$, $p = .41$) of internalizing symptoms, or the intercept ($B = -0.04$, $SE = .05$, $\beta = -.10$, $p = .42$) or slope ($B = 0.01$, $SE = .03$, $\beta = .09$, $p = .65$) of externalizing symptoms. Higher internalizing ($B = .23$, $SE = .07$, $\beta = .27$, $p = .001$) and externalizing ($B = .23$, $SE = .09$, $\beta = .18$, $p = .01$) symptoms at T5 were significantly related to more avoidant coping at T5. There were no significant indirect effects and no mediation was observed.

Exploratory Analyses

Correlations between our coping ratios (active: avoidant strategies endorsed) and coping sums (active + avoidant strategies endorsed) were examined in relation to key study variables (Table 2). A higher relative use of active coping compared to avoidant coping was significantly associated with lower levels of internalizing and externalizing symptoms at T5, as measured by the YSR. Additionally, a greater overall endorsement of coping strategies was negatively associated with internalizing and externalizing symptoms at T7, as assessed by SDQ. However, these exploratory ratio and sum variables were not significantly predicted by early life frustration, nor did they emerge as significant predictors of internalizing or externalizing symptom levels or growth trajectories over time (outcome statistics presented in Tables 7 and 8).

Given the low internal consistency of observed frustration across timepoints T1 to T4, we also examined maternal ratings of child frustration as an alternative predictor. Correlations between maternal-reported frustration from T1 to T4 and child-reported psychopathology from T5 to T8 ranged from small to moderate in magnitude ($r_s = .03-.31$). The fit indices of the latent growth models demonstrated acceptable model fit: active coping and internalizing symptoms

($\chi^2(4) = 13.90, p = .008, CFI = .93, RMSEA = .10, SRMR = .04$), active coping and externalizing symptoms ($\chi^2(8) = 13.01, p = .11, CFI = .96, RMSEA = .05, SRMR = .04$), avoidant coping and internalizing symptoms ($\chi^2(4) = 5.31, p = .26, CFI = .99, RMSEA = .04, SRMR = .02$), and avoidant coping and externalizing symptoms ($\chi^2(4) = 7.11, p = .13, CFI = .98, RMSEA = .06, SRMR = .03$). Contrary to our primary models, maternal ratings of frustration did not significantly predict the intercept ($B = 0.17, SE = 0.24, \beta = .07, p = .49$) or slope ($B = 0.31, SE = 0.17, \beta = .35, p = .06$) of internalizing symptoms. However, maternal frustration significantly predicted the intercept ($B = 0.59, SE = 0.25, \beta = .23, p = .02$), but not the slope ($B = 0.02, SE = 0.14, \beta = .02, p = .89$), of externalizing symptoms. Otherwise, findings were consistent with the primary models, and no significant mediation effects were observed.

Additionally, to account for the extraordinary stress experienced during the COVID-19 pandemic, we examined a measure of pandemic-related stress at the start of COVID as an exploratory covariate in our full models. The model testing active coping predicting internalizing levels and growth demonstrated acceptable fit, ($\chi^2(5) = 13.15, p = .02, CFI = .95, RMSEA = .10, SRMR = .04$). Early frustration ($B = 6.80, SE = 2.67, \beta = 2.45, p = .01$), child sex ($B = -1.93, SE = .45, \beta = -.69, p < .001$), T5 internalizing symptoms ($B = .09, SE = .03, \beta = .03, p = .002$), and pandemic-related stressors ($B = .71, SE = .13, \beta = .26, p < .001$) all significantly predicted internalizing symptom levels. However, none of these predictors were significantly associated with internalizing symptom growth over time.

The fit indices of active coping predicting externalizing levels and growth demonstrated acceptable fit, ($\chi^2(5) = 6.59, p = .25, CFI = .99, RMSEA = .05, SRMR = .02$). When pandemic-related stress was included as a covariate, early frustration was no longer a significant predictor of externalizing symptom levels ($B = 5.47, SE = 2.93, \beta = 2.21, p = .06$). However, T5

externalizing symptoms ($B = .12$, $SE = .05$, $\beta = .05$, $p = .01$) and pandemic-related stress ($B = .61$, $SE = .14$, $\beta = .25$, $p < .001$) both significantly predicted externalizing symptom levels. Pandemic-related stress additionally predicted growth in externalizing symptoms over time ($B = -.16$, $SE = .09$, $\beta = -.19$, $p = .05$).

The fit indices of avoidant coping predicting internalizing levels and growth demonstrated acceptable model fit, ($\chi^2(5) = 1.23$, $p = .94$, CFI = 1.00, RMSEA = .00, SRMR = .01). Consistent with the active coping and internalizing symptoms model, early frustration ($B = 6.90$, $SE = 2.69$, $\beta = 2.44$, $p = .01$), child sex ($B = -1.87$, $SE = .44$, $\beta = -.66$, $p < .001$), T5 internalizing symptoms ($B = .10$, $SE = .03$, $\beta = .03$, $p = .001$), and pandemic-related stress ($B = .73$, $SE = 0.13$, $\beta = .26$, $p < .001$) significantly predicted internalizing levels. However, none of these variables were significantly associated with symptom growth.

The fit indices of avoidant coping predicting externalizing levels and growth demonstrated acceptable model fit, ($\chi^2(5) = 6.30$, $p = .28$, CFI = .99, RMSEA = .04, SRMR = .03). Again, in parallel with the active coping and externalizing model, when pandemic-related stress was included in our models, early frustration was no longer a significant predictor of T6 externalizing symptom levels ($B = 5.5$, $SE = 2.96$, $\beta = 3.33$, $p = .06$). T5 externalizing symptoms ($B = .13$, $SE = .05$, $\beta = .05$, $p = .007$) and pandemic-related stress ($B = .62$, $SE = .14$, $\beta = .25$, $p < .001$) significantly predicted levels of externalizing symptoms. Additionally, pandemic-related stress predicted externalizing symptom growth over time ($B = -.17$, $SE = .09$, $\beta = -.20$, $p = .05$).

Discussion

Elevated frustration reactivity in early childhood has been widely recognized as a significant risk factor for the later development of psychopathology and overall poorer life outcomes (De Pauw and Mervielde, 2010; Eisenberg et al., 2001). Children who exhibit heightened reactivity to blocked goals may be more prone to experiencing intense negative

emotions, struggling with emotion regulation, and encountering greater challenges in their social and environmental interactions. Given these risks, identifying mechanisms that explain these trajectories to support children's development and protect against maladaptive outcomes is critical to inform research on early intervention and prevention efforts. For example, whether coping mediates this relationship could inform whether individual coping skills may be an impactful clinical target to support youth who present with early childhood frustration and protect against the development of adolescent psychopathology.

This study utilized a longitudinal dataset to investigate whether the coping strategies preadolescents endorse in response to stress partially mediate the relationship between early frustration reactivity and internalizing and externalizing trajectories in adolescence. Consistent with prior research (De Pauw & Mervielde, 2010; Eisenberg et al., 2001; Finlay-Jones et al., 2024; Humphreys et al., 2019; Lunetti et al., 2022; Sorcher et al., 2024), we found that higher frustration reactivity in early childhood was associated with greater levels of both internalizing and externalizing symptoms in adolescence.

Additionally, early frustration reactivity predicted growth in internalizing symptoms from T6 to T8. Although higher frustration reactivity was associated with less pronounced growth in internalizing symptoms over time, model-based trajectory plots indicated that by T9, youth with high frustration reactivity reached similar levels of internalizing symptoms as their peers (Figure 3a). This pattern suggests that while youth high in frustration may begin adolescence with greater internalizing symptoms, these differences may diminish by mid-to-late adolescence. To this author's knowledge, how early frustration predicts growth in internalizing symptoms, rather than symptom levels, has received comparatively little attention. While prior work has shown that early effortful control predicts both levels and growth of internalizing symptoms in

adolescence (Lunetti et al., 2022), no previous studies have demonstrated internalizing growth predicted by early frustration reactivity. Relatedly, a study by Leadbeater and Homel (2015) found that irritability was concurrently associated with internalizing symptoms and that increases in irritability over time predicted subsequent increases in both internalizing and externalizing symptoms; conversely, increases in these symptoms also predicted later elevations in adolescent irritability, suggesting a bidirectional relationship. Further, Silver et al. (2024) found that youth with higher initial irritability exhibited slower declines in irritability across adolescence relative to peers with lower initial irritability. This finding may parallel the current study's pattern of internalizing symptom change—namely, youth with higher early symptoms show more stable symptom trajectories, whereas those with initially lower symptoms demonstrate more pronounced increases over time.

However, alternative explanations for this finding should be considered. Given that data collection occurred during the COVID-19 pandemic, it is possible that youth high in frustration exhibited elevated internalizing symptoms at the onset of lockdown, but that these vulnerabilities diminished over time as they adapted to ongoing stressors, leading to less symptom growth. Another possibility is that youth with higher levels of early frustration do not exhibit greater increases in internalizing symptoms over time compared to peers lower in frustration due to the behavioral tendencies typically associated with frustration and anger. Frustration-prone youth often display a more approach-oriented response style rather than the avoidance-oriented behaviors commonly linked with a more inhibited temperament (Rothbart, 1989). Internalizing symptoms are frequently characterized by withdrawal, inhibition, and avoidance, and youth high in anger and frustration reactivity may be more likely to approach and engage with their environment, even if in reactive or dysregulated ways. As such, despite their emotional

dysregulation, these youth may be less likely to internalize distress in a manner that leads to escalating internalizing symptoms over time. Notably, the internalizing items on the SDQ primarily capture emotional symptoms (e.g., “I get a lot of headaches, stomach-aches or sickness,” “I have many fears, I am easily scared,” “I am often unhappy, down-hearted or tearful”) and peer difficulties (e.g., “Other people my age generally like me,” “Other children or young people pick on me or bully me”). The SDQ is designed as a brief screening tool, whereas the CBCL represents a more intensive and comprehensive assessment that more closely maps onto DSM-based symptoms. Although studies have demonstrated moderate to strong correlations between SDQ and CBCL total and subscale scores (e.g., Goodman & Scott, 1999; van de Looij-Jansen et al., 2011), it is possible that youth high in frustration exhibit increases in internalizing symptoms that are more accurately captured by the broader and more clinically oriented scope of the CBCL, rather than the narrower snapshot provided by the SDQ.

Consistent with previous research, youth who endorsed greater use of active coping strategies also tended to report higher use of avoidant coping strategies (Compas et al., 2001; Parrish et al., 2021; Smith et al., 2022), suggesting that adolescents may not rely exclusively on one coping style but instead use a mix of strategies in response to stress. Unexpectedly, our exploratory coping sum variable was negatively associated with internalizing and externalizing symptoms at T7. This finding challenges prior research suggesting that greater endorsement of many coping strategies is linked to increased psychopathology (Zimmer-Gembeck, 2021). However, this relation was not observed at other time points, suggesting that any potentially protective effect of broader strategy endorsement may be coincidental or time specific. Our T7 data point was collected during the winter of 2021, a time when pandemic-related lockdowns had been in place for an extended period for youth in the Seattle area. While having a broader

repertoire of coping strategies may have been associated during this prolonged period of stress, our coping measure was collected in preadolescence, and further investigation would be needed to understand how these strategies were being applied by youth in real time. It may be that concurrent avoidance is more predictive of outcomes than prospective avoidant coping; unexpectedly, endorsed avoidant coping at T5 did not relate to mental health symptoms at T6-T8. Finally, active coping was negatively associated with internalizing symptoms at T5 and both internalizing and externalizing symptoms at T7, further supporting its hypothesized role as a protective factor for youth mental health, and internalizing and externalizing symptoms were positively correlated across timepoints, supporting the idea that for many youths there is overlap in these symptom presentations (Caspi et al., 2014).

While previous research has established coping as a mediator in the pathway from early life stress to long-term mental health outcomes (Compas et al., 2017; Evans et al., 2015; Meng et al., 2011; Nolen-Hoeksema & Watkins, 2011; Ohashi et al., 2024; Su et al., 2022; Zimmer-Gembeck & Skinner, 2016), the present study did not find evidence to support coping as a mediating factor between early frustration reactivity and later psychopathology. While early frustration reactivity did predict levels and growth in adolescent symptoms, frustration did not predict coping and coping did not predict subsequent symptoms (though coping did predict symptoms concurrently). These findings suggest that other mechanisms may play a more influential role in shaping the developmental trajectories of children with high frustration reactivity. As Thompson and colleagues note, “...there are likely many complicated causal mechanisms in the relation between temperament and children’s adjustment” (2014). Identifying these alternative pathways remains critical for developing targeted interventions that foster resilience and promote adaptive outcomes for children prone to heightened frustration. A recent

meta-analysis and systematic review conducted by Finlay-Jones and colleagues (2024) highlighted the scarcity of research examining mediators in the relation between early irritability and later mental health difficulties. Among the 70 studies reviewed, only six investigated potential mediating processes, underscoring a significant gap in our understanding of how early irritability evolves into patterns of psychopathology. Without a more comprehensive understanding of these developmental trajectories, intervention and prevention researchers may not be well-equipped to select the most impactful targets to support youth high in frustration.

Among the most frequently proposed mediators in this process are parenting behaviors and youth emotion regulation. In response, researchers have endorsed interventions such as parent management training (PMT) and therapies targeting emotional intolerance and dysregulation, including exposure-based approaches and dialectical behavior therapy (DBT), as promising strategies for youth with heightened irritability and frustration reactivity (Leibenluft et al., 2024). Future research should continue to explore these mechanisms alongside additional contextual (e.g., socioeconomic stress, school climate) and biological (e.g., neurobiological reactivity, genetic vulnerability) factors. A more nuanced understanding of these pathways will be critical to refining and personalizing intervention strategies aimed at supporting children with high frustration reactivity and reducing their risk for adverse mental health outcomes.

Limitations

Several limitations should be considered when interpreting the present findings. First, our ability to detect a predictive relation between preadolescent coping and later psychopathology may have been limited by the shift in measurement from the YSR at T5 to the SDQ at time points T6 through T8. Although the SDQ has been validated against other widely used measures of youth psychopathology, including the CBCL and YSR (Goodman & Scott, 1999), it was not

significantly correlated with our participants' self-reported coping on the CCSC. In contrast, our study's YSR scores showed stronger associations with coping on the CCSC, suggesting that the YSR may have been a more sensitive outcome measure in this context. Notably, early frustration reactivity did significantly predict SDQ outcomes, indicating that the issue may not lie solely with the SDQ itself. Rather, these findings underscore the importance of using consistent and developmentally appropriate measurement tools across timepoints in longitudinal research to improve the reliability and comparability of results.

Another limitation concerns the nature of youth self-report in coping measurement. While coping has been frequently cited as a potential mediator linking frustration to later psychopathology, the CCSC is a self-report measure that primarily captures the types of strategies youth report attempting, rather than the effectiveness or skill with which those strategies are applied. Prior work has shown that irritability in preadolescence predicts self-reported difficulties with emotion coping, intolerance of uncertainty, and rumination (Evans et al., 2020). Self-report measures may not fully capture youths' actual regulatory abilities or success in applying coping strategies in real-world contexts. Adolescents' perceptions of their coping efforts may differ from their observed behavior, which could limit researchers' ability to detect meaningful associations with later outcomes. Use of more objective and multimodal assessments of self-regulation, including behavioral tasks, physiological markers of stress regulation, and reports from parents or teachers, could capture a more comprehensive picture of how coping and emotion regulation function in developmental pathways from early irritability to later psychopathology.

An additional limitation of this study is that the internal consistency of our observed measure of frustration was found to be unacceptably low. By aggregating across four separate

observations of frustration, we aimed to capture elevated occurrences and relative consistency that may have been present in early childhood. However, this poor internal consistency raises concerns that frustration observed at individual timepoints may have reflected situational or context-specific reactions rather than a stable, temperament-based trait. Given this concern, we conducted additional analyses using maternal-reported frustration, which demonstrated greater consistency across timepoints. While parent-reported measures are not without limitations, such as potential reporting biases, varying interpretations of items, and the influence of parental stress or expectations, they can offer a broader view of the child's behavior across multiple settings and time frames, extending beyond the clinic or lab environment (Bennetts et al., 2016; Morsbach & Prinz, 2006). Interestingly, our maternal ratings of frustration did not significantly predict the intercept or slope of internalizing symptoms, suggesting that maternal perceptions of child frustration may not be strongly associated with internalizing trajectories in this sample. However, maternal-reported frustration did significantly predict higher levels of externalizing symptoms, indicating a possible specificity in how different measures of frustration relate to different domains of psychopathology. These findings raise the possibility that observed and reported frustration may be capturing distinct, though related, constructs. Observer-rated frustration, particularly when assessed across multiple structured tasks, may be more sensitive to context-dependent expressions of dysregulation, such as difficulties managing frustration in goal-blocking situations. In contrast, maternal ratings may reflect general behavioral tendencies or patterns more noticeable in daily life. Future research should continue to explore the convergence and divergence between different assessment methods and consider how observational and informant-based measures may uniquely contribute to our understanding of early temperament and its developmental consequences.

Finally, it is important to acknowledge that our follow-up assessments of youth psychopathology coincided with the onset of the COVID-19 pandemic, a period characterized by widespread disruption, chronic stress, and substantial alterations to daily life, including reduced access to typical social, academic, and mental health supports (Panchal et al., 2023). These unprecedented circumstances have been found to have significantly impacted the emotional and behavioral functioning of children and adolescents (Bera et al., 2022), potentially confounding the interpretation of symptom trajectories. As such, the mental health outcomes observed during this period may reflect pandemic-related stressors rather than typical developmental patterns associated with early frustration reactivity. To account for this time of extraordinary stress, we examined a measure of pandemic-related stress at the start of COVID-19 as an exploratory covariate in our full models. Although the inclusion of this variable did not significantly alter the predictive relationship between early frustration and internalizing symptoms, it had a notable effect on externalizing outcomes; while early frustration continued to significantly predict internalizing symptoms, its association with externalizing symptoms was no longer significant when pandemic-related stress was accounted for. Additionally, COVID-19-related stress emerged as a robust predictor of both the levels of internalizing and externalizing symptoms and the growth of externalizing symptoms from T6 to T8, suggesting that the pandemic may have introduced unique stressors that influenced externalizing behaviors more directly than early temperament. These findings underscore the importance of considering contextual influences, particularly large-scale disruptions, when interpreting developmental research (Bronfenbrenner & Morris, 2006). The extraordinary nature of the COVID-19 pandemic may have shaped symptom expression in ways that do not generalize to more typical developmental environments. Therefore, caution is warranted in generalizing these results

beyond the pandemic context. Future research would benefit from replicating this work in post-pandemic cohorts, allowing for a clearer understanding of how frustration-related trajectories unfold under more normative conditions.

Future Directions

Future research should prioritize replicating prior findings that emotion regulation mediates the relation between early frustration and later mental health difficulties, with an emphasis on longitudinal designs. While cross-sectional studies have provided important preliminary insights (Malhi et al., 2017; 2021), they inherently limit the ability to draw conclusions about developmental processes and the directionality of effects. It remains possible that, when examined prospectively, emotion regulation may not consistently function as a mediating mechanism, an outcome reflected in the present study's findings. Longitudinal data are essential for capturing the evolving nature of emotional development and for clarifying the temporal sequencing of risk and protective factors that contribute to long-term psychological outcomes.

Additionally, it is important for future studies to consider distinct subgroups of children who present with high frustration reactivity, as these temperamental profiles may arise from diverse etiological pathways. For example, early irritability has been shown to be particularly prevalent among autistic youth (Leibenluft et al., 2024), suggesting that the developmental trajectory of frustration in this population may differ meaningfully from that of neurotypical peers. Recent work by Leno and colleagues (2024) found that the pathway from early irritability to adolescent depression was mediated by preadolescent peer relationship quality, highlighting the need to examine population-specific mechanisms to intervene most effectively. Similarly, researchers have called for studies that incorporate large, diverse samples to better capture the

sociocultural factors that may shape the expression and impact of early irritability (Leibenluft et al., 2024). Examining how cultural values, parenting norms, and environmental stressors interact with early temperament will be critical for developing equitable and culturally responsive models of risk and resilience.

Conclusions

Overall, although coping did not emerge as a significant mediator in the pathway from early childhood frustration to adolescent psychopathology, the current study replicated and extended prior findings by demonstrating that early frustration reactivity is a robust predictor of later mental health difficulties. These findings underscore the importance of identifying alternative mechanisms that account for this trajectory toward impairment. Future research should prioritize the investigation of alternative individual, relational, and contextual factors to explain why some children with high frustration reactivity go on to experience significant psychopathology, while others demonstrate more adaptive functioning. By uncovering these pathways, researchers and clinicians can develop more targeted, developmentally sensitive strategies to support at-risk youth and promote more favorable long-term outcomes.

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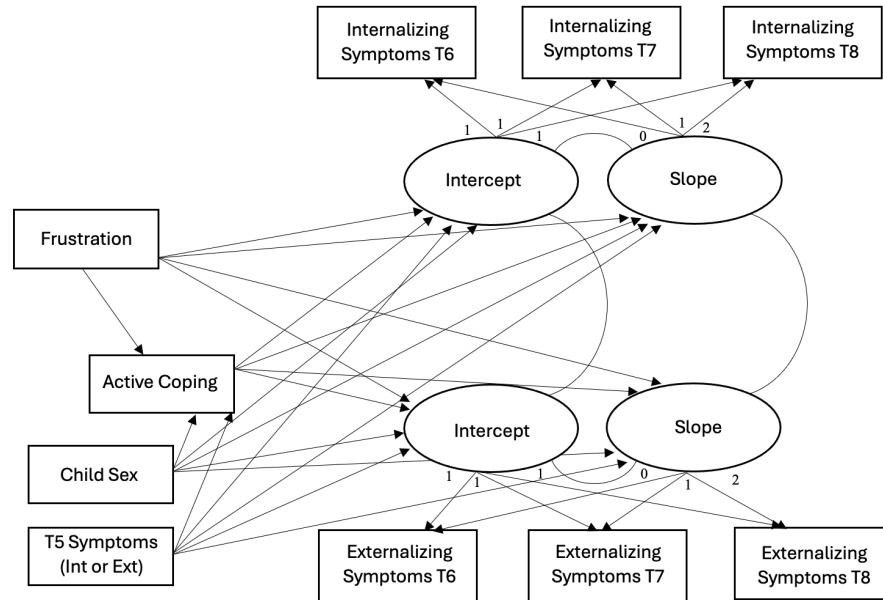
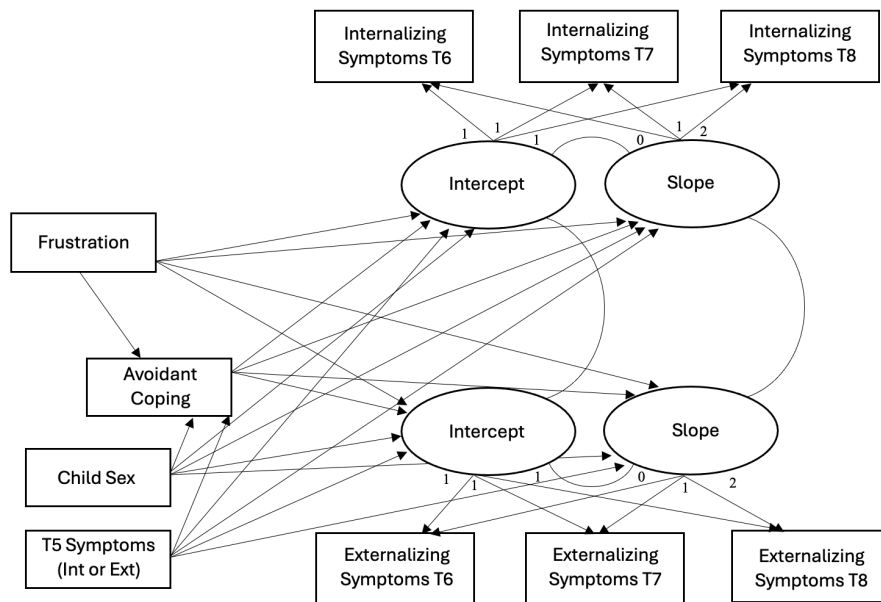
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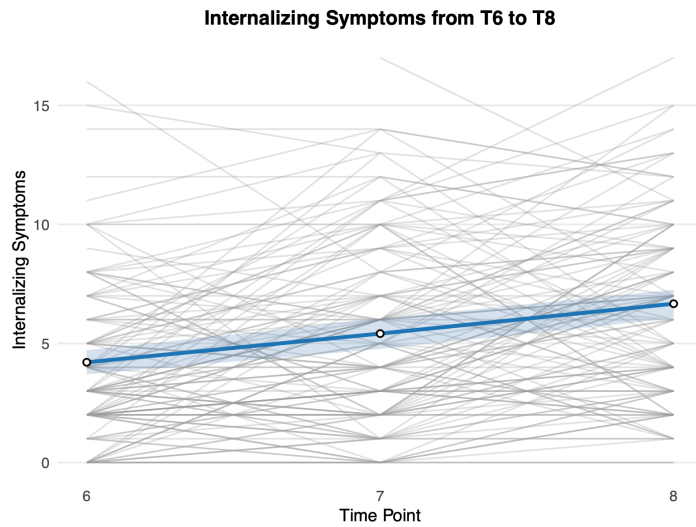
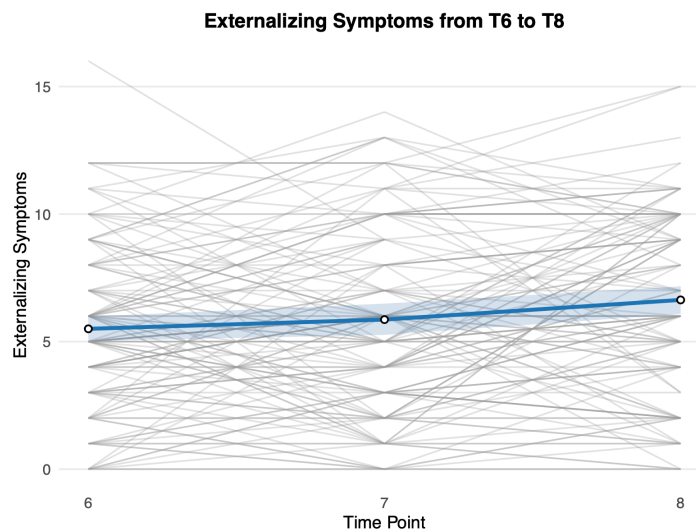
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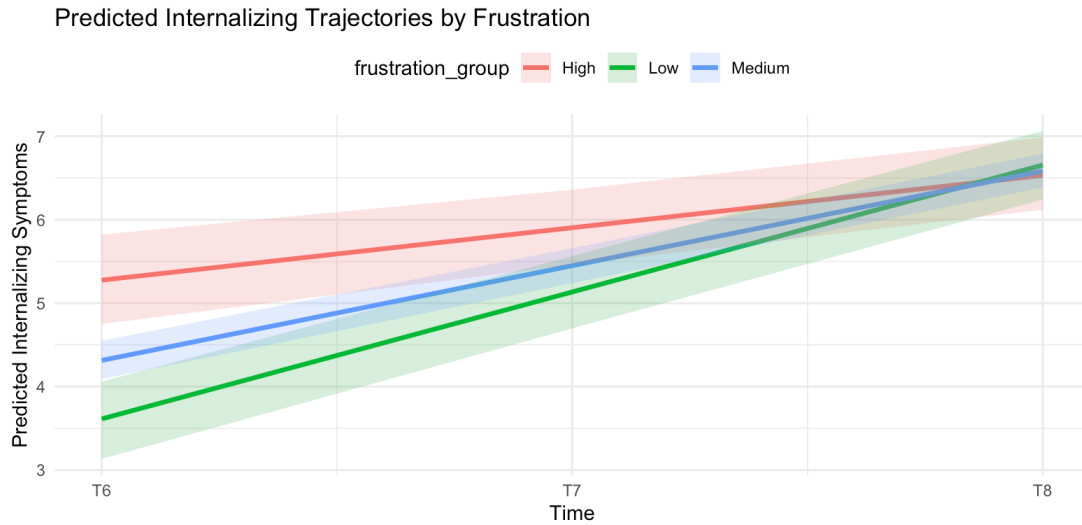
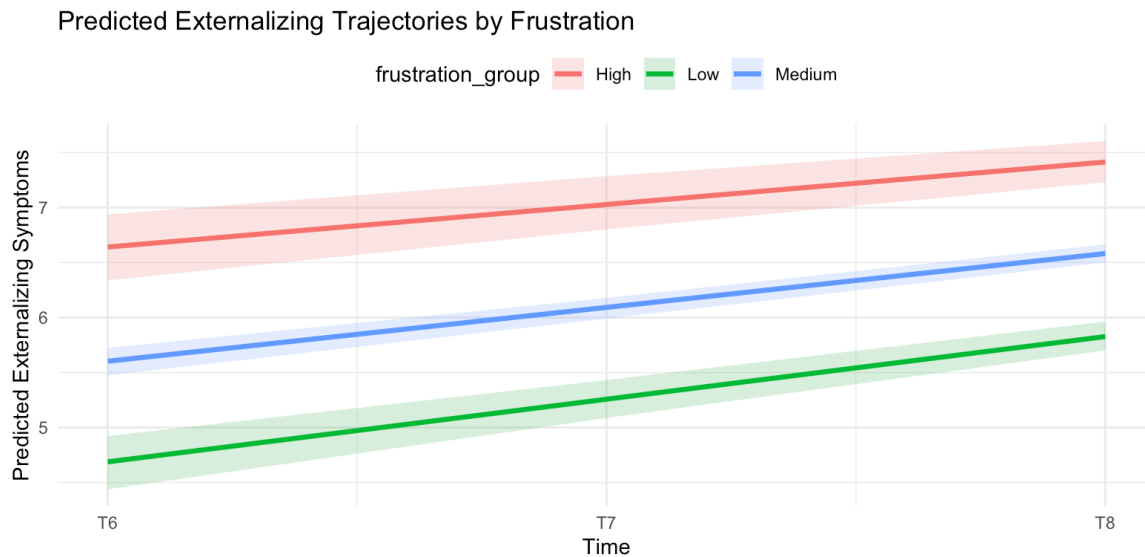
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Figure 1*Path Diagram of Early Frustration Predicting Psychopathology with Coping as a Mediator***(A) Active Coping****(B) Avoidant Coping**

Note: T5 ~ 11 years old, T6-T8 ~ 13-15 years old

Figure 2*Observed Trajectories of Internalizing and Externalizing Symptoms from T6 to T8***(A) Internalizing Symptoms****(B) Externalizing Symptoms**

Note. Gray lines represent individual participants' symptom trajectories across timepoints T6 to T8. The bold blue line represents the group mean at each time point, and the shaded region reflects the 95% bootstrapped confidence interval around the mean. Higher scores indicate greater symptoms.

Figure 3*Model-Based Trajectories of Symptoms at Levels of Early Frustration from T6 to T8***(A) Internalizing Symptoms****(B) Externalizing Symptoms**

Note. Estimated symptom trajectories are plotted by observed frustration levels defined using standard deviation cutoffs: Low (≥ 1 SD below the mean), Medium (within ± 1 SD), and High (≥ 1 SD above the mean). Lines represent group means of predicted values from the latent growth curve model, and shaded areas indicate bootstrapped 95% confidence intervals.

Table 1*Descriptive Statistics for Study Variables*

	M	SD	Min	Max	Skew	Kurtosis
Frustration T1 (LB)	0.27	0.16	.00	0.83	0.57	0.15
Frustration T2 (KS)	0.21	0.14	.00	0.97	1.29	3.64
Frustration T3 (LB)	0.22	0.13	.00	0.78	0.78	0.75
Frustration T4 (KS)	0.25	0.16	.00	0.80	0.73	0.42
Mean Child Frustration T1-T4	0.24	0.09	0.04	0.59	0.71	0.79
Active Coping T5	31.92	12.99	3.00	60.00	0.02	-0.84
Avoidant Coping T5	14.28	6.66	.00	33.00	-0.07	-0.44
Internalizing T5 CBCL (age 11, covariate)	10.87	7.66	.00	41.00	1.09	1.08
Externalizing T5 CBCL (age 11, covariate)	7.61	5.23	.00	30.00	0.95	1.09
Internalizing T6 SDQ	4.21	3.37	.00	16.00	0.96	0.61
Internalizing T7 SDQ	5.41	3.97	.00	17.00	0.57	-0.52
Internalizing T8 SDQ	6.67	4.07	.00	17.00	0.43	-0.65
Externalizing T6 SDQ	5.50	3.29	.00	16.00	0.38	-0.18
Externalizing T7 SDQ	5.86	3.67	.00	14.00	0.34	-0.76
Externalizing T8 SDQ	6.63	3.54	.00	15.00	0.04	-0.70

Table 2*Correlations between study variables*

	Sex	Frus T1	Frus T2	Frus T3	Frus T4	Active Cope	Avd Cope	T5 Int CBCL	T5 Ext CBCL	T6 Int SDQ	T6 Ext SDQ	T7 Int SDQ	T7 Ext SDQ	T8 Int SDQ	T8 Ext SDQ	Aggr. Frus	Coping Ratio	Coping Sum
Sex	1.00																	
Frustration T1	0.11	1.00																
Frustration T2	0.01	0.12	1.00															
Frustration T3	0.12*	0.15*	0.22*	1.00														
Frustration T4	0.14*	0.07	0.13*	0.32*	1.00													
Active Coping	-0.10	-0.06	-0.01	-0.07	-0.09	1.00												
Avoidant Coping	-0.02	0.04	0.08	0.04	-0.09	0.44*	1.00											
T5 Internalizing CBCL	0.08	0.13	0.02	0.07	0.07	-0.16*	0.25*	1.00										
T5 Externalizing CBCL	0.21*	0.14*	0.07	0.13	0.12	-0.14	0.17*	0.65*	1.00									
T6 Internalizing SDQ	-0.26*	0.19*	0.06	0.08	-0.04	-0.12	0.01	0.22*	0.06	1.00								
T6 Externalizing SDQ	0.02	0.24*	-0.01	0.06	-0.02	-0.12	0.02	0.25*	0.21*	0.47*	1.00							
T7 Internalizing SDQ	-0.32*	0.09	0.07	0.02	-0.08	-0.36*	-0.11	0.22*	0.12	0.54*	0.23*	1.00						
T7 Externalizing SDQ	-0.06	0.08	0.02	0.15	0.08	-0.20*	-0.08	0.26*	0.21*	0.30*	0.57*	0.59*	1.00					
T8 Internalizing SDQ	-0.25*	0.01	0.03	-0.06	-0.01	-0.07	-0.09	0.18*	0.00	0.49*	0.18*	0.52*	0.34*	1.00				
T8 Externalizing SDQ	0.04	0.09	0.05	0.10	0.01	-0.03	0.03	0.20*	0.17*	0.10	0.43*	0.25*	0.56*	0.48*	1.00			
Aggr. Frustration T1-4	0.15*	0.59*	0.59*	0.66*	0.65*	-0.09	0.01	0.11	0.19*	0.12	0.15	0.02	0.13	-0.02	0.12	1.00		
Coping Ratio	-0.09	-0.02	-0.08	-0.03	0.05	0.18*	-0.62*	-0.28*	-0.25*	-0.08	-0.08	-0.13	-0.07	0.07	-0.01	0.00	1.00	
Coping Sum	-0.08	-0.03	0.03	-0.04	-0.10	0.94*	0.73*	-0.03	-0.04	-0.09	-0.09	-0.33*	-0.18*	-0.09	-0.01	-0.07	-0.09	1.00

Note. Aggr = Aggregate, Frus = Frustration, Avd = Avoidant, Int = Internalizing, Ext = Externalizing.

* $p < .05$

Table 3*Unstandardized estimates and standard errors of means and variances of unconditional growth models*

	Fit Indices		Intercept factor				Slope factor			
	CFI	RMSEA	Estimate	z	Var.	z var.	Estimate	z	Var.	z var.
Internalizing	1.000	0.000	4.34 (0.25)	17.46**	8.61 (2.16)	3.98**	1.17 (0.15)	7.68**	1.57 (1.08)	1.46
Externalizing	1.000	0.000	5.60 (0.24)	22.90**	8.40 (1.94)	4.34**	0.51 (0.15)	3.44**	1.92 (0.85)	2.25*

Note. Standard errors are reported in parentheses. Var. = variance.

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

Table 4*Unstandardized regression coefficients (standard errors) and standardized regression coefficients of the effects of temperament frustration and covariates directly predicting of internalizing and externalizing symptoms*

Variable	Internalizing symptoms		Externalizing symptoms	
	Intercept	Slope	Intercept	Slope
Frustration	8.61 (2.90), .27**	-4.02 (2.01), -.28*	6.45 (3.03), .22*	-1.47 (1.78), -.12
Child sex	-2.14 (0.49), -.36**	0.19 (0.33), .07	-0.60 (.523), -.11	0.45 (.30), .20
T5 symptoms	0.11 (0.03), .27**	0.001 (0.02), .01	0.13 (0.05), .26**	-0.03 (0.03), -.14

Note. Standard errors are in parentheses.

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

Table 5

Internalizing Symptoms - Latent Growth Curve Model with Mediation Pathways (Bootstrapped Estimates, 95% CI)

Model	Path	Estimate	z-value	95% CI	p-value	Model Fit (χ^2 , CFI, RMSEA)
Step 1: Unconditional Growth Model						$\chi^2(1) = 0.11$, CFI = 1.000, RMSEA = 0.000
	Intercept → Outcome (b0)	4.34 (0.25)	17.46	[3.85, 4.83]	0.000	
	Slope → Outcome (b1)	1.17 (0.15)	7.68	[0.87, 1.47]	0.000	
	Variance (Intercept)	8.61 (2.16)	3.98	[4.37, 12.85]	0.000	
	Variance (Slope)	1.57 (1.08)	1.46	[-0.54, 3.68]	0.14	
Step 2: Add Predictor and Covariates						$\chi^2(4) = 0.45$, CFI = 1.000, RMSEA = 0.000
	Frustration → Intercept	8.61 (2.90)	2.97	[2.93, 14.28]	0.003	
	Child Sex → Intercept	-2.14 (0.49)	-4.40	[-3.09, -1.19]	0.000	
	T5 Internalizing → Intercept	0.11 (0.03)	3.40	[0.05, 0.17]	0.001	
	Frustration → Slope	-4.02 (2.01)	-2.01	[-7.95, -0.09]	0.045	
	Child Sex → Slope	0.19 (0.33)	0.56	[-0.46, 0.83]	0.57	
	T5 Internalizing → Slope	0.001 (0.02)	0.04	[-0.04, 0.04]	0.97	
Active Coping						
Step 3a: Testing Mediation Paths (Active Coping)						$\chi^2(4) = 13.67^{**}$, CFI = 0.932, RMSEA = 0.104
	Frustration → Active coping	-8.61 (10.96)	-0.79	[-30.44, 12.83]	0.43	
	Active coping → Intercept	-0.04 (0.02)	-1.66	[-0.08, 0.01]	0.09	
	Active coping → Slope	-0.01 (0.02)	-0.48	[-0.04, 0.02]	0.63	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	0.31 (0.51)	0.60	[-0.53, 1.56]	0.55	
	Indirect Effect (Slope)	0.07 (0.23)	0.28	[-0.38, 0.62]	0.78	

Avoidant Coping						
Step 3a: Testing Mediation Paths (Avoidant Coping)						$\chi^2(4) = 2.69$, CFI = 1.000, RMSEA = 0.000
	Frustration → Avoidant coping	-0.57 (5.16)	0.11	[-10.64, 9.75]	0.91	
	Avoidant coping → Int. Intercept	-0.05 (0.05)	-0.99	[-0.14, 0.05]	0.32	
	Avoidant coping → Int. Slope	-0.03 (0.04)	-0.84	[-0.10, 0.04]	0.40	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	0.03 (0.34)	0.08	[-0.68, 0.82]	0.94	
	Indirect Effect (Slope)	0.02 (0.25)	0.07	[-0.55, 0.51]	0.94	

Note: SE = Standard Error; CI = Confidence Interval; Int = Internalizing; b0 = Intercept; b1 = Slope. Fit indices: CFI $\geq$.95, RMSEA $\leq$.05 indicate good model fit. Indirect effect significance tested using bootstrapping (5,000 resamples). Active coping tested separately from avoidant coping.

Table 6

Externalizing Symptoms - Latent Growth Curve Model with Mediation Pathways (Bootstrapped Estimates, 95% CI)

Model	Path	Estimate	z-value	95% CI	p-value	Model Fit (χ^2 , CFI, RMSEA)
Step 1: Unconditional Growth Model						$\chi^2(1) = 0.81$, CFI = 1.000, RMSEA = 0.000
	Intercept → Outcome (b0)	5.60 (0.24)	22.90	[5.12, 6.07]	0.000	
	Slope → Outcome (b1)	0.51 (0.15)	3.44	[0.22, 0.80]	0.001	
	Variance (Intercept)	8.40 (1.94)	4.34	[4.60, 12.19]	0.000	
	Variance (Slope)	1.92 (0.85)	2.25	[0.25, 3.60]	0.024	
Step 2: Add Predictor and covariates						$\chi^2(4) = 6.07$, CFI = 0.982, RMSEA = 0.048
	Frustration → Intercept	6.45 (3.03)	2.13	[0.50, 12.39]	0.034	
	Child Sex → Intercept	-0.60 (0.52)	-1.15	[-1.63, 0.42]	0.25	
	T5 Externalizing → Intercept	0.13 (0.05)	2.78	[0.04, 0.23]	0.005	
	Frustration → Slope	-1.47 (1.78)	-0.82	[-4.97, 2.03]	0.41	
	Child Sex → Slope	0.45 (0.30)	1.49	[-0.14, 1.05]	0.14	
	T5 Externalizing → Slope	-0.03 (0.03)	-1.04	[-0.09, 0.03]	0.30	
Active Coping						
Step 3a: Testing Mediation Paths						$\chi^2(4) = 7.09$, CFI = 0.974, RMSEA = 0.059
	Frustration → Active coping	-8.71 (10.83)	-0.81	[-29.83, 12.31]	0.42	
	Active coping → Ext. Intercept	-0.04 (0.02)	-1.51	[-0.08, 0.01]	0.13	
	Active coping → Ext. Slope	0.01 (0.01)	0.86	[-0.01, 0.04]	0.39	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	0.30 (0.49)	0.61	[-0.50, 1.48]	0.54	
	Indirect Effect (Slope)	-0.10 (0.21)	-0.45	[-0.61, 0.26]	0.66	

Avoidant Coping						
Step 3a: Testing Mediation Paths (Avoidant Coping)						$\chi^2(4) = 4.63$, CFI = 0.976, RMSEA = 0.057
	Frustration → Avoidant coping	-0.43 (5.45)	-0.08	[-11.20, 10.31]	0.94	
	Avoidant coping → Int. Intercept	-0.04 (0.05)	-0.80	[-0.14, 0.05]	0.42	
	Avoidant coping → Int. Slope	0.01 (0.03)	0.46	[-0.05, 0.08]	0.65	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	0.02 (0.34)	0.05	[-0.73, 0.79]	0.96	
	Indirect Effect (Slope)	-0.01 (0.19)	-0.03	[-0.48, 0.37]	0.97	

Note: SE = Standard Error; CI = Confidence Interval; Ext = Externalizing; b0 = Intercept; b1 = Slope. Fit indices: CFI $\geq .95$, RMSEA $\leq .05$ indicate good model fit. Indirect effect significance tested using bootstrapping (5,000 resamples). Active coping tested separately from avoidant coping.

Table 7

Externalizing Exploratory Model Output

Model	Path	Estimate	z-value	95% CI	p-value	Model Fit (χ^2 , CFI, RMSEA)
Coping Ratio						
Step 3a: Testing Mediation Paths						$\chi^2(4) = 4.41$, CFI = 0.997, RMSEA = 0.021
	Frustration → Coping Ratio	0.62 (1.26)	0.49	[-1.48, 3.39]	0.62	
	Coping Ratio → Int. Intercept	-0.05 (0.34)	-0.14	[-0.66, 0.65]	0.89	
	Coping Ratio → Int. Slope	0.01 (0.23)	0.04	[-0.44, 0.43]	0.97	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	-0.03 (0.48)	-0.06	[-0.99, 0.97]	0.95	
	Indirect Effect (Slope)	0.01 (0.32)	0.02	[0.79, 0.58]	0.99	
Total Coping						
Step 3a: Testing Mediation Paths						$\chi^2(4) = 7.80$, CFI = 0.968, RMSEA = 0.065
	Frustration → Total coping	-9.12 (14.70)	-0.62	[-37.85, 20.23]	0.53	
	Total coping → Int. Intercept	-0.03 (0.02)	-1.43	[-0.06, 0.01]	0.15	
	Total coping → Int. Slope	0.008 (0.01)	0.79	[-0.01, 0.03]	0.43	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	0.24 (0.48)	0.49	[-0.62, 1.38]	0.63	
	Indirect Effect (Slope)	-0.08 (0.22)	-0.35	[-0.60, 0.32]	0.73	

Table 8

Internalizing Exploratory Model Output

Model	Path	Estimate	z-value	95% CI	p-value	Model Fit (χ^2 , CFI, RMSEA)
Coping Ratio						
Step 3a: Testing Mediation Paths						$\chi^2(4) = 1.62$, CFI = 1.000, RMSEA = 0.000
	Frustration → Coping Ratio	0.49 (1.18)	0.42	[-1.48, 3.13]	0.68	
	Coping Ratio → Ext. Intercept	-0.03 (0.32)	-0.10	[-0.69, 0.58]	0.92	
	Coping Ratio → Ext. Slope	0.21 (0.23)	0.95	[-0.29, 0.62]	0.34	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	-0.02 (0.41)	-0.04	[-0.82, 0.94]	0.97	
	Indirect Effect (Slope)	0.11 (0.37)	0.29	[-0.55, 0.99]	0.77	
Total Coping						
Step 3a: Testing Mediation Paths						$\chi^2(4) = 11.42$, CFI = 0.945, RMSEA = 0.091
	Frustration → Total Coping	-9.09 (15.03)	-0.60	[-39.35, 19.50]	0.55	
	Total coping → Ext. Intercept	-0.03 (0.02)	-1.58	[-0.06, 0.01]	0.11	
	Total Coping → Ext. Slope	-0.01 (0.01)	-0.73	[-0.04, 0.02]	0.47	
Step 3b: Indirect Effect (Bootstrapped)						
	Indirect Effect (Intercept)	0.25 (0.52)	0.48	[-0.63, 1.51]	0.63	
	Indirect Effect (Slope)	0.09 (0.27)	0.32	[-0.48, 0.68]	0.75	