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The goal of this study was to examine patterns of co-occurring, externalizing, and internalizing symptoms across early childhood. These constructs, along with child emotionality, maternal emotion socialization (ES), and child emotion expression were assessed in a sample of 435 children at ages 2, 4, 5, and 7. Cross-sectional multinomial logistic regression analyses were performed. At age 2, compared to the internalizing group, the co-occurring group was higher on anger proneness, but lower on social fearfulness. Compared to the externalizing group, the co-occurring group was higher on social fearfulness. At age 4, the co-occurring group did not differ significantly from the internalizing group. At age 5, the co-occurring group did not differ significantly from the externalizing group. At age 7, the co-occurring group was lower on fear than the internalizing group. Latent transition analyses were performed to create both 2- and 3-class models representing longitudinal group patterns. These patterns of change were compared. In the 2-class model, the co-occurring stable group was higher on sad/fear expression than the decreasing group. The interaction between supportive ES and anger expression was also significant. In the 3-class model, compared to the high decreasing group, the co-occurring stable group was lower on anger. Compared to the average stable group, the co-occurring group was lower on SES and higher on anger. Results are discussed in the context of existing research on the development of emotional and behavioral problems.

CO-OCCURRING, EXTERNALIZING, AND INTERNALIZING SYMPTOMS IN EARLY CHILDHOOD: CHILD AND CONTEXTUAL FACTORS

by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

Clinical and developmental psychologists have used the terms *externalizing* and *internalizing* to describe the two major dimensions of childhood psychopathology. The externalizing dimension includes aggressive and delinquent behavior, attention problems, and hyperactivity. The internalizing dimension includes anxiety, depression, somatic complaints, and withdrawal. These descriptors have been used to describe types of children as well as to place children on a continuum based on the severity of their symptoms. Numerous studies have used empirically-derived assessments to examine the normative development of emotional and behavioral symptoms, identify children at risk, and assess treatment efficacy (see Bongers, Koot, van der Ende, & Verhulst, 2003; Sterba, Prinstein, & Cox, 2007). This work, as well as the use of more sophisticated analytical techniques, has lead to a better understanding of the normative and abnormal development of these symptom patterns, as well as the risk factors and outcomes associated with them.

Despite these advances in the understanding of the development of behavior problems in young children, the notion that externalizing and internalizing symptoms often co-occur has been largely overlooked until recently. For the most part, externalizing and internalizing syndromes—as well as their diagnostic counterparts—have been studied in isolation from each other. It is now apparent that the co-occurrence of

symptoms, particularly in early childhood, is quite common (Gilliom & Shaw, 2004; Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Children with co-occurring symptoms are found in both clinic and non-clinic samples (Lilienfeld, 2003; McConaughy & Skiba, 1993) at rates far greater than expected by chance (Caron & Rutter, 1991). Children with co-occurring symptoms often have worse outcomes than their counterparts with symptoms that fall on one dimension or the other (Brunnekreef, Sonneville, Althaus, Minderaa, Oldehinkel, et. al., 2007; Somersalo, Solantaus, & Almqvist, 1999; Tolan & Henry, 1996); and clinical treatments that are designed for disorders on one dimension may not be as efficacious for children with symptoms along two dimensions (e.g., separation anxiety disorder and oppositional defiant disorder) (Chase & Eyberg, 2008). Accordingly, an examination of co-occurring symptom patterns, as well as factors associated with these patterns, is the next step for research attempting to elucidate developmental precursors of emotional and behavioral disorders.

This paper will review the development of externalizing, internalizing, and co-occurring symptoms; discuss developmental factors that may play a part in both pure and co-occurring psychopathology; and present two methods of examining these symptom patterns and covariates using both cross-sectional and longitudinal analytical techniques.

Development of Externalizing and Internalizing Symptoms

An assessment of the development of behavioral and emotional problems over time allows for an assessment of risk factors that are common to externalizing, internalizing, or both. During toddlerhood, preschool, and early childhood, children begin to test different ways of coping with their emotions, interacting with adults, testing limits,

and navigating the social world and peer interactions more independently. Accordingly, these are appropriate developmental periods to explore when examining the nature of psychopathology.

Development of Externalizing Problems

Children who develop externalizing problems early in development often continue to have trouble with aggression and antisocial behavior throughout early and middle childhood, especially when they are physically aggressive (Broidy et al., 2003). During the preschool period, these children are also challenged with normative developmental tasks, such as language and cognitive development, and emotion regulation. If these normative developmental tasks are delayed by externalizing behaviors, these children will most likely have problems with parents, peers, teachers, and school success later in development (Coie, Lochman, Terry, & Hyman, 1992). Early externalizing behaviors have been found to be stable over 1- to 2-year periods, and show moderate stability over time (Owens and Shaw, 2003). However, a normative decline in externalizing problem behavior is seen in most children from ages 2 to 5 (Loeber and Hay, 1997), meaning that the majority of children learn how to conform to parental and social guidelines of behavior by the time they enter school (Campbell, 2002). A small group of children, however, do not show this normative decline, which has been the focus of recent work examining child and environmental factors that may contribute to the stability of behavior problems (Tremblay, 2000; Hill, Degnan, Calkins, & Keane, 2006).

Risk factors implicated in the persistence of externalizing problems include child factors, such as gender, irritability, and negative emotionality (Calkins & Johnson, 1998;

Keenan & Shaw, 2003; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003), parenting practices such as control, harshness, and poor monitoring of behavior (Denham, Workman, Cole, Weissbrod, Kendziora, & Zahn-Waxler, 2000; Gilliom & Shaw, 2004; Smith, Calkins, Keane, Anastopoulos, & Shelton, 2003), individual parenting factors such as maternal psychopathology and parenting stress (Leve et al., 2005), and family factors including low SES, marital conflict, and support from friends and family (Nagin & Tremblay, 2001). Recently, the contribution of genetic vs. environmental factors found that genetic factors explained approximately 50% of the variance in externalizing symptoms (Saudino, Carter, Purper-Ouakil, & Gorwood, 2008). The importance of these factors in the development of externalizing disorders, especially in boys, has been well documented. Interactions between child and environmental factors have also been explored. For example, children with high versus low emotionality have been found to be more susceptible to parenting factors such as harsh discipline (Bates, Pettit, Dodge, & Ridge, 1998; Leve, 2005). It is likely that behaviors classified as "difficult" earlier in development, such as non-compliance, fussiness, and attention-seeking, are early precursors of later aggressive and oppositional behavior (Shaw, Keenan, & Vondra, 1994). These behaviors may set in place the beginnings of the coercive cycle (Patterson, DeBaryshe, & Ramsey, 1989), which involves a heightening of aversive child and parenting behaviors over time.

Gender differences have been found in the development of externalizing problems (Keenan & Shaw, 2003). Research in the area of externalizing problems has been dominated by the study of boys due to a higher prevalence of these disorders, as well as

more serious outcomes later in childhood and adolescence, such as overt aggression, increased rates of suicide, and violence. Recently, however, more studies have included girls (see Hill et al., 2006; Keenan & Shaw, 1997). In a theoretical review, Keenan and Shaw (1997) argued that gender differences in externalizing behavior are nonexistent until late toddlerhood. Consistent with this view, most research shows that boys and girls are similar in their behavioral and emotional problems until the preschool period (Briggs-Gowen, Carter, Skuban, & Horwitz, 2001; Crick & Zahn-Waxler, 2003; Mesman, Bongers, & Koot, 2001), when boys begin to display more externalizing behaviors, a difference that persists throughout early childhood.

Development of Internalizing Problems

The internalizing dimension has not been studied as extensively as the externalizing dimension. This is most likely because children who are withdrawn or anxious do not pose the social and interpersonal challenges that aggressive children do. In addition, internalizing symptoms have traditionally been viewed as internal states that are more difficult to measure in children, especially before their verbal skills are well developed (Shaw, Keenan, and Vondra, 1997). As a result of these issues, less is known about the factors responsible for the maintenance, exacerbation, and attenuation of internalizing symptoms over time (Bosquet and Egeland, 2006). Still, children with internalizing problems are not immune to negative individual and interpersonal outcomes. They tend to have problems across multiple domains and often have parents who themselves suffer from internalizing symptoms (Kovacs and Devlin, 1998).

In terms of development, internalizing disorders are relatively stable over early to middle childhood but increase in adolescence, especially in girls (Leve, Kim, & Pears, 2005). Twin studies have found that the heritability of internalizing symptoms increases and shared environmental factors decrease with age (Saudino, Carter, Purper-Ouakil, & Gorwood, 2008). One research group identified three latent class trajectories of internalizing symptoms, including low-stable, variable, or high-stable (Sterba, Prinstein, & Cox, 2007). For specific internalizing disorders, a developmental model in which anxiety precedes depression has been suggested to describe how these disorders manifest over childhood and adolescence. It is assumed that children who develop early symptoms of anxiety perceive a lack of control over events occurring around them. If this perception is not countered by supportive parenting or interpersonal success, the child may develop a sense of learned helplessness (Nolen-Hoeksema, Girgus, & Seligman, 1987), a risk factor for the development of depression.

Several child and contextual factors have been implicated in the development of internalizing symptoms in childhood. Children with an inhibited temperament are more likely to experience persistent internalizing symptoms over time (Schwartz, Snidman, & Kagan, 1999). Parental factors such as harsh discipline have also been implicated in the development of internalizing disorders (Leve, Kim, & Pears, 2005). Parental overprotection has also been linked to a lack of autonomous coping in children, which resulted in internalizing symptoms, specifically anxiety (Bowen, Vitalo, Kerr, & Pelletier, 1995). Maternal depression and anxiety are also risk factors for child internalizing symptoms over time (Beardslee, Bemporad, Keller, & Klerman, 1983).

Recently, inhibited temperament and parenting factors such as maternal negative control and depression have been studied together, to examine interaction effects of these measures, specifically in boys' anxiety (Feng, Shaw, & Silk, 2008). In middle childhood, cognitive factors including the "negative cognitive triad" proposed by Beck (1974) have been observed. The perception of a loss or lack of control also may exacerbate early childhood anxiety and depression (Epkins, 2000). Finally, peer rejection and neglect are risk factors associated with internalizing disorders (Keiley, Bates, Dodge, & Pettit, 2000). Positive peer interactions have also been shown to provide a protective effect against increases in internalizing symptoms during adolescence (Dekovic & Reitz, 2004).

Gender differences exist in the rates of internalizing disorders across development. During early and middle childhood, internalizing symptoms are found equally in boys and girls. By adolescence, however, girls are twice as likely as boys to be depressed or anxious. In addition, boys who endorse symptoms of anxiety and depression are more likely to express these emotions using aggressive or delinquent means, whereas girls are more likely to become withdrawn and have interpersonal problems. Several ideas have been put forth to explain the development of this gender gap in adolescence. Keenan and Shaw (1997) proposed that girls are socialized to inhibit their aggressive tendencies, which may then be channeled into an internalizing trajectory. Girls are taught to develop an understanding of emotions and are encouraged to consider the feelings of others (Crick & Zahn-Waxler, 2003). Girls place more importance on interpersonal relationships than boys, which may leave them more susceptible to failures of social competence due to internalizing symptomatology.

Development of Co-Occurring Externalizing and Internalizing Symptoms

Despite important advances made in our understanding of the development of externalizing and internalizing problems in childhood, this work is incomplete when the co-occurrence of these symptoms is not taken into account. A consideration of the fact that children's symptoms of psychopathology such as noncompliance, irritability, and aggression often co-occur with other symptoms such as fear, worry, withdrawal, and sadness is warranted. It is possible that models examining the development of "pure" externalizing or internalizing disorders may not be representative of the group of children who exhibit symptoms from both the externalizing and internalizing dimensions. In addition, the child, parent, and contextual risk factors most commonly associated with externalizing are not exclusive to this branch of behavior problems alone—they also apply to the emotional disorders of childhood. This is not to say that children do not develop "pure" disorders that resemble aggression, anxiety, or depression in adulthood. However, especially during the preschool years, it is common for the symptoms associated with these disorders to co-occur or overlap. In fact, the DSM-IV-TR (APA, 2000) specifies that depression in children often manifests itself as irritability as opposed to depressed mood. In addition, symptoms such as distractibility, inability to concentrate, sleeping and eating problems, and psychosomatic complaints are common to both externalizing and internalizing disorders in childhood. So, it seems that when examining factors in infancy and toddlerhood that predispose children to the development of behavioral and emotional problems, taking both the externalizing and internalizing dimensions into account is important.

A small group of studies have examined co-occurring externalizing and internalizing symptom patterns empirically. Analyzing the genetic and environmental influences on internalizing and externalizing symptoms using a twin sample, Gjone and Stevenson (1997) reported that the covariance between internalizing and externalizing behavior was explained by both genetic and shared environmental common factors, with shared environmental factors being the most influential, particularly in younger children. Pure behavior problems were more genetically influenced than co-occurring conditions.

Cognitive factors implicated in the development of behavioral and emotional problems have also been explored. Epkins (2000) focused exclusively on cognitive difficulties associated with various childhood disorders, specifically cognitive deficiencies versus cognitive distortions. This study examined these factors in children ages 7 to 16. The co-occurring group differed from the externalizing group, but not the internalizing group on all cognitive measures. The authors concluded that internalizing and externalizing symptoms do not combine additively to worsen cognitive symptoms.

At a residential summer program, Wright, Zakriski, and Drinkwater (1999) behaviorally coded the responses to peer and adult interactions of children with internalizing, externalizing, mixed (co-occurring), and non-clinical symptoms patterns. These groups differed in their patterning of behavior across contexts. Children in the mixed group exhibited elevated rates of both aggression and withdrawal in response to peer talk, a context in which the other groups showed neither. The mixed cases were also unique in their lower rates of withdrawal in response to peer teasing/threatening.

A study of co-occurring symptoms in middle childhood found that boys had a higher risk of co-occurring symptoms than girls (Somersalo, Solantaus, & Almqvist, 1999). Results from this study also indicated that it was rare for both boys and girls to switch from pure internalizing to pure externalizing and vice versa. However, both pure internalizing and externalizing symptoms were related to later co-occurrence and it was more common for children with pure externalizing than pure internalizing symptoms to develop co-occurring symptoms.

In a sample of 1st-6th graders, Tolan and Henry (1996) examined teacher-reported externalizing and internalizing symptomatology over time, focusing specifically on the effects of aggression. The three highest rates of co-occurrence were anxiety/depression with social problems, social problems with somatization, and aggression with thought problems. The lowest elevations were for aggression with withdrawal and aggression with somatization. Co-occurrence affected about 12.5% of the sample and was more likely than a single-syndrome problem. A poorer prognosis was found for co-occurring aggression than for other patterns without aggression, but not for aggression alone.

Gilliom and Shaw (2004) sought to estimate individual trajectories of mother-reported internalizing and externalizing symptoms in a sample of 2- to 6- year-old disadvantaged boys and to describe interrelationships between externalizing and internalizing trajectories. Results revealed a normative decline in externalizing symptoms and an increase in internalizing symptoms across this age range. At age 2, boys who had higher levels of externalizing symptoms also had higher levels of internalizing symptoms and boys who increased over time in externalizing symptoms also increased over time in

internalizing symptoms. The initial status of externalizing symptoms was positively associated with the rate of change in internalizing symptoms. In terms of predictive factors, the combination of negative emotionality, fearlessness, and negative maternal control was associated with a high, stable externalizing trajectory, while a combination of negative emotionality, fearfulness, and negative maternal control was associated with a high, increasing internalizing trajectory.

Finally, Keiley et al. (2003) found risk factors specific to pure and co-occurring symptom patterns in a longitudinal study of kindergarten through 8th-grade girls and boys. The authors determined that a unique factor of co-varying externalizing and internalizing symptoms existed in mother- and teacher-reports over a 9-year period. Results revealed that girls developed more internalizing and less externalizing symptoms than boys over time. In terms of child factors, difficult temperament was related only to mother-reported co-occurring symptoms, while resistance to control was related to mother- and teacher-reported externalizing symptoms as well as mother-reported co-occurrence. Unadaptability was positively related to internalizing symptoms for both mothers and teachers and negatively related to mother- and teacher-reported externalizing symptoms. For sociocultural risk factors, lower SES was predictive of mother- and teacher-reported externalizing symptoms as well as teacher-reported co-occurrence and internalizing symptoms. European American children were more likely to have co-occurring symptoms reported by mothers and African American children had more teacher-reported externalizing symptoms. Higher life stress predicted co-occurring symptoms for both mothers and teachers and mother-reported externalizing symptoms.

Harsh parenting was related to mother- and teacher-reported externalizing symptoms as well as mother-reported co-occurring symptoms. Finally, peer measures were examined. Peer neglect was only related to teacher-reported internalizing symptoms, while peer rejection was related to mother- and teacher-reported co-occurrence and externalizing symptoms, as well as teacher-reported internalizing symptoms. In general, the co-varying group was more similar to the externalizing group in their risk-factor profile.

This work suggests that children with a co-occurring symptom pattern do differ from children who have symptoms along either the internalizing or externalizing dimension alone. These studies examine factors related to co-occurring symptoms at many levels, including genetic, cognitive, and behavioral. They also explore symptoms patterns at many ages, from pre-school to middle childhood. It seems that intrinsic child factors such as temperament, as well as contextual factors including parenting style and sociocultural risk, are implicated in not only the development of externalizing and internalizing problem behaviors, but in co-occurring symptom patterns as well. The next section will explore some of these factors in greater detail.

Developmental Factors Implicated in Co-Occurring Psychopathology

Child Factors: Negative Emotionality

One of the most consistent results from studies of the development of childhood psychopathology is that child negativity—also referred to as negative emotionality, reactivity, or difficult temperament—is implicated in pathways to difficult behavior and emotional symptoms. Negative affectivity is a global measure of a range of negative emotions including sadness, fear, anger, frustration, poor adaptability, and high emotional

intensity (Egger & Angold, 2006). Child negativity has been linked to both internalizing (e.g., Kagan, Renick, & Snidman, 1997), externalizing (e.g., Eisenberg, Cumberland, Spinrad, Fabes, Shepard, Reiser, et al., 2001), and problem behaviors as a main effect. Negativity also interacts with other measures, such as parenting style in the prediction of problem behaviors (Bates et al., 1998). Negativity has been shown to play a larger role in the development of problematic symptom patterns despite the presence of different levels of positive affectivity (Izard, Lawler, Haynes, Simons, & Porges, 1999-2000).

Infants' initial reactions to the world are usually in response to sensory stimuli of different quality and intensity (Calkins & Fox, 2002). Infants differ in their threshold to respond to these stimuli (Calkins, Fox, & Marshall, 1996). Specifically, variability among children can be observed in the latency, intensity, frequency, and duration of emotional reactions (Rothbart & Derryberry, 1981). These differences can be reliably measured starting early in infancy (Bates, Freeland, & Lounsbury, 1979). Early emotional reactions play a part not only in emotional development, but in the development of related capacities, such as attentional control and motor skills. Early reactivity, specifically fear and anger, has been linked to later psychopathology, along both the internalizing and externalizing spectrum as well as to broad personality traits, such as extraversion and neuroticism (Muris, Meesters, & Blijlevens, 2007). When children fall outside the norm on the emotionality continuum, meaning that their latency to respond is very short or their response to emotional stimuli is very strong, their ability to interact with the world may be compromised at many levels—physical, emotional, attentional, and cognitive.

Parenting Effects: Parenting Style and Emotion Socialization

Whether assessing general parenting styles—authoritative versus authoritarian—or focusing on specific aspects of parenting—warmth versus hostility—researchers have consistently found evidence linking negative parenting practices to behavioral and emotional disorders (Kaslow, Deering, & Racusin, 1994; Rothbaum & Weisz, 1994; Rubin, Burgess, Dwyer, & Hastings, 2003). Parenting styles including negative control, harsh discipline, and poor monitoring have been implicated in the development of externalizing behavior problems, while harsh discipline and parental overprotection have been related to the development of internalizing disorders. Positive parenting practices have also been shown to buffer age-related increases in adolescent externalizing and internalizing symptoms (Scaramella, Conger, & Simons, 1999).

Recent research (e.g., Aunola & Nurmi, 2005) emphasizes the need to go beyond general parenting styles to examine more proximal, emotion-laden parent-child interactions. Some researchers have focused on characterizing types of parenting practices, such as support, behavioral control, and psychological control (Galambos, Barker, & Almeida, 2003). Another more proximal parent-child interaction is termed parental emotion socialization, a construct referring to the manner in which parents react when children express both positive and negative emotions. Socialization processes are hypothesized to affect several aspects of a child's emotional development, including their understanding, experience, expression, and regulation of emotions (Eisenberg, Cumberland, & Spinrad, 1998). Although the manner in which parents respond to children's emotions may be a part of parenting style, general parenting practices have not

been found to be predictive of children's emotion-related responding (Gottman, Katz, & Hooven, 1996). Thus, parental reactions to children's displays of emotion may be particularly salient aspects of the development of emotional and social competence.

Maternal reactions to their children's emotional expressions have been found to predict future emotional and behavioral outcomes. Mothers' negative responding has been found to undermine emotional security and regulation (Cummings, 1995). So, children who experience a non-supportive reaction by a parent during an emotionally challenging situation may themselves become emotionally dysregulated. Non-supportive reactions may challenge children's abilities to constructively cope with negative states (Denham, 1997). Children may also learn to suppress negative emotion, which in turn increases negative emotional arousal and anxiety (Gross & Levenson, 1993).

Emotion socialization and the style of children's emotional expression have also been linked to one another. Wenzlaff and Eisenberg (1998) discussed the idea of "parent-instigated thought suppression." The authors presented the irony that parents who attempt to restrict their children's expression of negative feelings are especially likely to produce children who have emotional problems and social skills deficits. Existing evidence suggests that using thought suppression to control undesirable feelings may not only prevent children from developing an adequate understanding of the complexities of emotions, but it can also backfire, promoting the emotional state it was meant to avoid. Non-supportive emotion socialization strategies—those which minimize or punish the expression of negative feelings—may actually increase those feelings through physiological, emotional, and cognitive means.

Emotion Suppression: Disconnect Between Experience and Expression of Emotions

Although the effects of emotion suppression have not been explored thoroughly by developmental psychologists, avoidant coping strategies have been implicated in the development of a wide variety of negative outcomes in childhood. It seems that avoidant coping creates, maintains, and aggravates emotional problems in children. Suppression—versus expression—of emotions, both positive and negative, may be an important part of self-regulation that has not yet been fully explored in childhood and the development of different types of psychopathology. Emotional expressive style also links the constructs of negative affectivity and self-regulation. Emotion suppression in adults has been defined as the conscious inhibition of one's own emotional expressive behavior while emotionally aroused (Gross & Levenson, 1993), while emotion expression has been defined as the behavioral changes that usually accompany emotion, including the face, voice, gestures, posture, and body movement (Gross, John, & Richards, 2000). Individuals differ as to whether they are emotionally expressive or unexpressive, and these styles have been linked to externalizing and internalizing behaviors. In adults and children, research has shown that being emotionally unexpressive leads to increased physiological reactivity to a variety of emotional stimuli (Buck, 1984; Field & Walden, 1982). It is possible that when individuals do not openly express negative emotions that they are experiencing, this negative emotionality is channeled elsewhere (e.g., physiological reactivity).

In their review of the development of internalizing disorders in children, Zahn-Waxler et al. (2000) suggested that disconnections between the experiential and

expressive components of emotion along with other regulatory processes may lead to psychopathology. In relation to emotional expressivity and emotional suppression, researchers examining childhood coping with negative emotions have identified two styles of coping: active and avoidant (Lengua & Sandler, 1996; Ollendick, Langley, Jones, & Kephart, 2001). Active strategies include cognitive attempts to change ways of thinking about the problem and behavioral attempts to resolve events by dealing directly with the problem. Avoidant strategies include cognitive attempts to deny or minimize threat and behavioral attempts to get away from or avoid confronting the situations. These coping styles interacted with self regulation styles in predicting anxiety and conduct problems in 8- to 12-year-old children coping with parental divorce (Lengua & Sandler, 1996).

Extending this work to a younger age range, Blair et al., (2004) examined the contributions of temperamental styles and emotional coping strategies to the development of preschoolers' social competence and behavior problems. They found that the ability to cope with emotion was more important than temperament alone in the development of prosocial behavior. The use of passive coping strategies played a significant role in the development of maladaptive behaviors in the sample. Specifically, the use of passive coping strategies was found to moderate the relationship between temperament dimensions in predicting externalizing and internalizing behavior patterns. Active coping strategies were more successful, even in children with highly negative temperamental dispositions. So, it seems that beginning in early childhood, children use different strategies to cope with negative emotions, which has implications for later outcomes.

The Present Study

The objective of this study was to examine externalizing, internalizing, co-occurring, and normative symptom patterns in a sample of children from age 2 to age 7 as well as the effect of child and parenting factors—negative emotionality, maternal emotion socialization, and child emotion expression—on these symptoms patterns. First, cross-sectional models were assessed to examine the factors as they related to externalizing, internalizing, and co-occurring symptom patterns at different developmental periods, specifically ages 2, 4, 5, and 7. Next, patterns of change in externalizing, internalizing, and co-occurring symptom groups were examined longitudinally. Finally, differentiation between these longitudinal symptom patterns was explored using the same child and parenting factors as the cross-sectional models.

The first goal was to examine the relationship between negative emotionality, maternal emotion socialization, and child emotion expression and externalizing, internalizing, co-occurring, and low symptom patterns at each age. Factors were included in models as they became developmentally relevant. Fear and anger were included in all models, as these emotionality measures are present starting in infancy and are theorized to continue to play a role in the development of behavioral and emotional problems. Emotion socialization was added to the 5- and 7-year models, as this construct becomes more relevant as children's ability to read and interpret the emotional reactions of parents matures. Emotion expression was added to the 7-year model because by this age, children's reactions to emotional events are more solidified than at younger ages.

It was expected that negative emotionality—fear and anger—would play a role in symptom patterns at ages 2, 4, and 5. Specifically, it was hypothesized that the externalizing group would be higher on anger and lower on fear than the internalizing group. The co-occurring group was expected to be high on both fear and anger at each age. Supportive and non-supportive emotion socialization strategies were expected to become salient by age 5 and were included in models at ages 5 and 7. It was hypothesized that maternal emotion socialization would moderate the relationship between negative emotionality and symptoms patterns at age 5. Specifically, children with high emotionality whose mothers used non-supportive emotion socialization were expected to be in the symptom groups as opposed to the low group. Child emotion expression was included in 7-year analyses. Children in the externalizing and co-occurring groups were expected to report that they would express more negative emotions, while children in the internalizing group were expected to report that they would inhibit the expression of negative emotions. It was hypothesized that emotion expression would moderate the relation between emotion socialization and symptom patterns at age 7. Sex differences were examined in preliminary models before covariates were added. It was hypothesized that there would be more males than females in the externalizing and co-occurring groups, but more females in the low and internalizing groups.

The second goal was to examine patterns of externalizing and internalizing symptoms over time. Specifically, it was hypothesized that groups of children would be found that represent different patterns of change in externalizing, internalizing, and co-occurring symptoms over time. It was expected that four distinct groups would emerge: a

low stable group, a co-occurring stable group, a group that increased in internalizing symptoms, and a group that started off high on externalizing and decreased.

The final goal was to examine whether developmentally-salient factors—age 2 child negative emotionality, age 5 maternal emotion socialization, and age 7 child emotion expression—differentiated these longitudinal symptom patterns. It was hypothesized that children in the co-occurring group would be high on anger and fear, higher on non-supportive maternal emotion socialization, and report that they would be more likely to express negative emotions. It was hypothesized that the externalizing decreasing group would be high on anger but not fear, and also high on non-supportive emotion socialization and emotion expression. The internalizing group was expected to be high on fear but not anger, high on non-supportive emotion socialization, and low on emotion expression. The low group was expected to be low on anger and fear, high on supportive emotion socialization, and higher on expression of emotions.

CHAPTER II

METHOD

Participants

The current sample utilized data from three cohorts of children and their mothers who are part of an ongoing longitudinal study, the RIGHT Track Project. Cohorts were recruited through child day care centers, the County Health Department, and the local Women, Infants, and Children (WIC) program. Potential participants for cohorts 1 and 2 were recruited at age 2 (cohort 1: 1994-1996 and cohort 2: 2000-2001) and screened using the Child Behavior Checklist (CBCL 2-3; Achenbach, 1992) completed by the mother in order to over-sample for externalizing behavior problems. Efforts were made to obtain approximately equal numbers of males and females (n = 307). Cohort 3 was initially recruited when infants were 6 months of age (in 1998) based on laboratory observation and parent report of their frustration levels and followed through the toddler period (See Calkins, Dedmon, Gill, Lomax, & Johnson, 2002, for more information). Children whose mothers completed the CBCL at age 2 were included in the current study (n = 140). Of the entire sample (N = 447), 37% of the children were identified as being at risk for future externalizing problems. Children were identified as being at risk for future externalizing behaviors if they received an externalizing T-score of 60 or above**.** There were no significant demographic differences between cohorts with regard to gender, χ^2 (2, N = 447) = .63, p = .73, race, χ^2 (2, N = 447) = 1.13, p = .57, or 2-year SES, F (2, 444) =

.53, $p = .59$. Cohort 3 had a significantly lower average 2-year externalizing T-score ($M = 50.36$) compared to cohorts 1 and 2 ($M = 54.49$), $t\ (445) = -4.32$, $p = .00$.

Of the 447 original screened participants, 12 were not included because they did not participate in any 2 year data collection. At 4 years of age, 399 families participated. Families lost to attrition included those who could not be located, who moved out of the area, who declined participation, and who did not respond to phone and letter requests to participate. There were no significant differences between families who did and did not participate in terms of child gender, $\chi^2\ (1, N = 447) = 3.27$, $p = .07$, race, $\chi^2\ (1, N = 447) = .70$, $p = .40$, 2-year SES, $t\ (424) = .81$, $p = .42$, or 2-year externalizing T-score, $t\ (445) = -.36$, $p = .72$. At 5-years of age, 365 families participated including 4 that did not participate in the 4-year assessment. Again, there were no significant differences between families who did and did not participate in terms of child gender, $\chi^2\ (1, N = 447) = .76$, $p = .38$, race, $\chi^2\ (1, N = 447) = .17$, $p = .68$, 2-year socioeconomic status, $t\ (424) = 1.93$, $p = .06$) and 2-year externalizing T-score, $t\ (445) = -1.73$, $p = .09$. At 7-years of age 350 families participated including 19 that did not participate in the 5-year assessment. Again, there were no significant differences between families who did and did not participate in terms of child gender, $\chi^2\ (1, N = 447) = 2.12$, $p = .15$, race, $\chi^2\ (3, N = 447) = .60$, $p = .90$, 2-year socioeconomic status, $t\ (445) = 1.46$, $p = .15$) and 2-year externalizing T-score ($t\ (445) = -.47$, $p = .64$). The current study employs the 435 children and families that participated in the 2 year data collection.

Procedures

Children and their mothers participated in the study when the children were ages 2, 4, 5, and 7. This study used measures from laboratory visits at each of these ages. Mothers and children participated in laboratory visits during which mothers were provided a detailed verbal description of the tasks that would be conducted. Mothers provided full informed consent for their children to participate. Children and mothers participated in a series of laboratory tasks designed to elicit a variety of behaviors of developmental interest. Mothers also completed several questionnaires during laboratory visits.

Measures

Child emotionality. At age 2, Children participated in two tasks designed to elicit negative affect. These tasks included a *cookie barrier task,* in which children were given a container of cookies that they were unable to open (2 min); and a *high chair* task, in which the children were placed in a high chair with their mother in the room, but sitting away from them (5 min). At age 4, the frustration tasks included a *perfect circles task,* in which children were asked to draw a perfect circle and given negative feedback after each drawing (2 ½ min); and a *toy-in-box task,* during which children were asked to open a locked box to retrieve preferred toys, but were given the wrong set of keys. At age 5 these tasks included a *candy task* during which the examiner did not share candy with the child (~3 min); and an *end of the line task* during which the child's mother took a toy away from the child (1 min). During the 2-, 4-, and 5-year-old laboratory visit, the children's emotional responses to frustration tasks were coded according to the

Laboratory Temperament Assessment Battery – Preschool Version (Goldsmith, Reilly, Lemery, and Prescott, 1995). The measure used for the purposes of this study was the *global affective response,* a measure of the child's negative affect during the duration of the tasks. This measure was coded on a 5-point scale of increasing severity of the emotional response. Two research assistants coded 10% of the sample together and coded another 10% separately to assess reliability. Adjusted kappa coefficients were above .80 for all tasks. The *global affective response* measure was calculated by taking the average of this code across the two tasks, as these two measures were significantly and positively correlated at each age (r = .14 to .30, $p < .01$). Higher scores on this measure indicated an increased negative affective response.

During the 2-year-old laboratory visit, mothers completed the Toddler Behavior Assessment Questionnaire (TBAQ: Goldsmith, 1996). When completing the TBAQ, mothers indicate how often they observe specific behaviors on the part of their children during the past month. Items are rated on a 7-point Likert scale, where a score of 1 corresponds to "never," a score of 4 corresponds to "about half the time," and a score of 7 corresponds to "always." It is composed of five scales: activity level (20 items), pleasure (17 items), social fearfulness (19 items), anger proneness (28 items), and interest/persistence (22 items). In the current study, we plan to use the *anger proneness* and *social fearfulness* scales, which address concepts that are close to the theoretical ideas underlying infant negative emotionality. A high score indicates that the mother perceives her infant as high on the measured trait. During the 4- and 5-year-old laboratory visits, mothers completed the Child Behavior Questionnaire (CBQ: Goldsmith

& Rothbart, 1991). The CBQ is designed to measure temperament in children age 3 to age 7. It assesses 15 dimensions of temperament, including Activity Level, Anger/Frustration, Approach, Attentional Focusing, Discomfort, Falling Reactivity and Soothability, Fear, High Intensity Pleasure, Impulsivity, Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, Sadness, Shyness, Smiling and Laughter. In the current study, we plan to use the *anger/frustration* and *fear* dimensions of temperament.

Parental emotion socialization. At the 5- and 7-year assessments, mothers completed the Coping with Children's Negative Emotions Scale (CCNES; Fabes, Eisenberg, & Bernzweig, 1990), which measures the degree to which parents perceive themselves as reactive to young children's negative affect in distressing situations. The CCNES has been found to be internally reliable with sound test-retest reliability and construct validity (Fabes, Eisenberg, & Madden-Derdich, 2002). Six subscales were derived that reflect the specific types of coping response parents tend to use in these situations. These subscales were divided into supportive and non-supportive strategies. The supportive subscales were: *expressive encouragement,* the degree to which parents encourage children to express negative affect or the degree to which they validate child's negative emotional states; *emotion-focused reactions,* the degree to which parents respond with strategies that are designed to help the child feel better; and *problem-focused reactions,* the degree to which parents help the child solve the problem that caused the child's distress. The non-supportive subscales were: *distress reactions,* the degree to which parents experience distress when children express negative affect; *punitive reactions,* the degree to which parents respond with punitive reactions that

decrease their exposure or need to deal with the negative emotions of their children; and *minimization reactions,* the degree to which parents minimize the seriousness of the situation or devalue the child's problem or distressful reaction.

Child emotion expression. At age 7, children were interviewed using the semi-structured Emotion Management Interview (EMI) that was developed based on past research (Zeman & Garber, 1996; Zeman & Shipman, 1996) and pilot testing. Children were presented with emotion-invoking situations in which the emotion was labeled for the child. After each vignette, using a 4-point scale, children were asked about their decision to manage their expression of sadness, happiness, fear, or anger in the hypothetical situation ("Would you show or not show your *emotion* feelings to your mother?). Children were then asked an open-ended question that assessed their expectancies regarding how others would respond to their emotional displays ("What would your mother do if you showed your *emotion* feelings*?")*. Children were asked how they would comfort themselves if they felt the stated emotion ("If you wanted to make yourself feel better, what would you do?"). Finally, children were asked a question that assessed their expectancies regarding how others would feel after their emotional display ("How would your mom feel if you showed your *emotion* feelings?"). Data from open-ended questions were coded based on past research that has investigated children's expectancies regarding emotional expressiveness in a variety of social contexts (Zeman & Garber, 1996). The score from the 4-point scale were used, which indicates how likely children are to express anger, sadness, fear, and happiness.

Child externalizing and internalizing. The Child Behavior Checklist (Achenbach & Edelbrock, 1983) Externalizing and Internalizing T scores were used as broadband indexes of mother-reported symptoms of behavior problems. During the 2-year-old assessment, mothers completed the Child Behavior Checklist 2-3 (CBCL: Achenbach, 1992). During the 4- and 5-year-old assessments, mothers completed the Child Behavior Checklist for 4 to 18-year-olds (CBCL 4-18: Achenbach, 1991). During the 7-year-old assessment, mothers completed the Child Behavior Checklist 6-18 (CBCL: Achenbach & Rescorla, (2001). The CBCL has demonstrated internal consistency, test-retest reliability, as well as convergent and construct validity (Achenbach & Rescorla, 2001).

Data Analysis Outline

First, descriptive analyses were conducted on all study variables to examine gender, race, and socioeconomic status (SES) effects and the normality of all measures. Bivariate correlations between all variables were examined. Based on Child Behavior Checklist externalizing and internalizing T scores, children were placed into four groups at ages 2, 4, 5, and 7.

To address the first goal, to examine the relationship between developmentally salient factors and their relation to symptom outcome groups at each age, cross-sectional multinomial logistic regression (MLR) analyses were performed using the four symptom groups as outcomes. These models were run using the SPSS NOMREG procedure. MLR enables the prediction of discrete dependent variables with multiple categories (Hosmer & Lemeshow, 2000). MLR was used to identify which child and contextual factors increase or decrease the likelihood of being in the co-occurring group versus the

externalizing, internalizing, and low groups, the externalizing group versus the internalizing group, and the externalizing and internalizing versus the low group. The parameter estimates obtained from MLR give the magnitude of effect of each factor on being in each symptom group in comparison to the normative group. Exponents of the effects are the odds ratios (OR) of being in a group versus the reference group in the analysis. Before analyses were performed, all independent variables were centered in order to examine the proposed interactions. The planned interaction effects that were examined included negative emotionality by emotion socialization at age 5 and emotion socialization by child emotion expression at age 7.

To achieve the second goal, to examine different patterns of change in externalizing/internalizing/co-occurring symptoms over time, a series of latent transition analyses (LTA) were performed. LTA is a type of longitudinal autoregressive model, which builds on the latent class analysis (LCA) model. The outcome variable in LTA is a latent categorical variable, made up of classes of any number, based on model fit. The model presented in Figure 1 displays a general LTA model with four time-points (t = 4). The same 2 outcome measures—externalizing and internalizing T-scores—are repeatedly measured at each age. These manifest outcomes are used as indicators of the categorical latent class variables, $C_{2\text{-}7}$. Each latent variable has k classes. So at each age, classes of children are created representing different patterns of their externalizing and internalizing T-scores, which may include any combination of externalizing, internalizing, or co-occurring patterns. There are *t*-1 transition points for any LTA model. The values for these transitions allow for examination of the likelihood of transitioning from once class

to another over time. For example, this might be the probability of moving from a low class at age 2 to a co-occurring class at age 4. For the model depicted, the latent class variable for time point *t* is regressed on the latent class variable at time point *t*-1 (i.e., C_4 on C_2, C_5 on C_4, C_7 on C_5). This allows for examination of movement in and out of class status from age 2 to age 7.

For the purposes of this study, measurement of latent classes was constrained to be the same at each age, referred to as measurement invariance. Partial measurement invariance was used in this study, meaning that the means of externalizing and internalizing in each class were constrained across time, but their variances were not. This allowed for more flexibility in defining the externalizing and internalizing latent classes. For the models proposed, this meant that the same number and type of classes occurred at all time points. As a result, the interpretation of the transition probabilities is straightforward since the meaning of the classes is the same at each time.

There is not one commonly accepted way to assess overall model fit for LTA models. Different from other longitudinal models, the frequency table chi-square statistics is not recommended for the LTA model (McLachlan & Peel, 2000). This is because the chi-square distribution is not well approximated when there are large numbers of sparse cells, which often occurs with LTA models. For this study, the Bayesian Information Criteria (BIC) fit statistic was used as a means of assessing model fit. Several 2- and 3-class models were fit using both full and partial measurement invariance before deciding on the final models (McLachlan & Peel, 2000).

To address the third goal, to examine whether developmentally-salient factors—child negative emotionality, maternal emotion socialization, and child coping style—differentiated the longitudinal symptom patterns from the LTA, a second set of multinomial logistic regression analyses were performed. MLR was used to identify which child and contextual factors increased or decreased the likelihood of being in each of the latent longitudinal class patterns.

CHAPTER III

RESULTS

Missing Data

Due to attrition at ages 4, 5, and 7, both the externalizing and internalizing outcome measures as well as predictor measures—child emotionality, parent emotion socialization, and child emotion expression—were significantly diminished when using list-wise deletion in analyses. To address this issue, all study measures were imputed through maximum likelihood estimation (*mle)* using the expectation method (EM) algorithm in SPSS 15. The EM method is an iterative process used to impute missing values and has been found to be superior to list-wise deletion, mean substitution, and multiple regression (Garson, 2006). The use of latent transition analysis (LTA) for longitudinal analyses accounts for missing data longitudinally under the assumption that data are missing at random (MAR). Thus, despite attrition in the internalizing and externalizing data at ages 4, 5, and 7, all 435 participants were included in the analyses below.

Data Reduction

Given the number of independent measures, preliminary analyses were used to reduce the number of variables to be used in subsequent analyses. First, the externalizing, internalizing, co-occurring, and low groups at each age were created. These groups were

defined as follows: (1) Low Externalizing (T < 60) and Internalizing (T < 60), (2) High Externalizing (Text > 60; Tint < 60), (3) High Internalizing (Tint > 60; Text < 60), and (4) High Externalizing (T > 60) and Internalizing (T > 60): *Co-Occurring*. See Table 1 for frequencies of these groups at each age.

The three supportive subscales and three non-supportive subscales of the CCNES were combined to form two higher-order variables. At ages 5 and 7, the supportive factor was created by taking the mean of the three supportive subscales as they were significantly correlated (r = .44 to .68, p < .01). The non-supportive factor was created by taking the mean of the three non-supportive subscales as they were significantly correlated (r = .31 to .67, p < .01).

To explore whether items on the Emotion Management Interview (EMI) could be reduced to simplify analyses, a principal components factor analysis utilizing oblimin rotation (to allow the factors to be correlated) was performed using the four items. Two factors emerged, which explained 61% of the variance, cumulatively. The first factor (eigenvalue = 1.33) loaded highly and positively on the likelihood that the child would express feelings of sadness and fear (factor loadings were .77 and .73 respectively). In subsequent analyses, this factor is called *sad/fear expression.* The second factor (eigenvalue = 1.12) loaded highly and positively on the likelihood that the child would express mad feelings and loaded negatively on the likelihood that the child would show happy feelings (factor loadings were .71 and -.75, respectively). In subsequent analyses, this factor is named *anger expression.* Weighted factor scores were created for each

participant after the factor analysis was completed. See Table 2 for descriptive statistics for all study measures.

Bivariate Analyses

Intercorrelations between all measures were examined and are presented in Table 3. All correlations were in the positive direction. The 2-year global affective response was related to 2-year anger, the 4-year global affective response, anger, the 5-year global affective response, and 7-year anger expression. Two-year social fear was related to anger, 4-year anger and fear, and 5-year fear. Two-year anger was related to 4-year anger and fear; 5-year anger, fear, and supportive emotion socialization; and 7-year non-supportive emotion socialization and sadness/fear expression. The 4-year global affective response was related to 4-year anger; the 5-year global affective response, fear, non-supportive emotion socialization, and supportive emotion socialization; and 7-year non-supportive emotion socialization. Four-year anger was related to four-year fear; the 5-year global affective response, anger, fear, and non-supportive emotion socialization; and 7-year non-supportive emotion socialization. Four-year fear was related to 5-year anger and fear. The 5-year global affective response was related to 5-year anger and non-supportive emotion socialization and 7-year non-supportive emotion socialization. Five-year anger was related to 5-year fear and non-supportive emotion socialization and 7-year non-supportive emotion socialization and anger expression. Five-year fear non-supportive emotion socialization was related to 7-year non-supportive emotion socialization and 5-year supportive emotion socialization was related to 7-year non-supportive emotion socialization.

Cross-Sectional Analyses: Multinomial Logistic Regression

The goal of the cross-sectional analyses was to answer the first question, whether child emotionality, maternal emotion socialization, and child emotion expression differentiated externalizing, internalizing, co-occurring, and low groups at ages 2, 4, 5, and 7. Multinomial logistic regressions were used to achieve this goal.

Age 2 analyses. A multinomial logistic regression was performed to identify whether the emotionality measures were significantly related to the four outcome groups. First, a preliminary model was run to examine if child sex, race, and SES were significant predictors. SES was the only significant factor in this model ($\chi^2 = 24.30$, *df = 3,* $p < .001$) and was retained in the final model as a covariate. The contributions of the *global affective response, social fearfulness, and anger proneness* were examined in a second multinomial logistic regression. After adding SES as a covariate, all independent factors were significant in the overall model ($\chi^2 = 39.35$, *df* = 15*,* $p < .01$). The strongest association with differential group membership was for anger proneness ($\chi^2 = 73.71$, *df* = 3, $p < .001$) followed by social fearfulness ($\chi^2 = 16.99$, *df* = 3, $p < .01$) and the global affective response ($\chi^2 = 10.66$, *df* = 3, $p < .05$).

Follow-up contrasts were conducted to compare the groups on these three factors. Table 4 lists the variables that emerged as significant factors for each contrast. Compared to the co-occurring group, the low group was higher on SES (OR = 1.05, $p < .01$), but lower on the global affective response (OR = .61, $p < .01$), and anger proneness (OR = .28, $p < .001$); the internalizing group was lower on anger proneness (OR = .22, $p < .001$), but higher on social fearfulness (OR = 1.95, $p < .05$); and the externalizing group

was lower on the global affective response (OR = .54, $p < .01$) and social fearfulness (OR = .59, $p < .05$). Compared to the internalizing group, the externalizing group was lower on social fearfulness (OR = .30, $p < .001$) and higher on anger proneness (OR = 4.70, $p < .001$); and the low group was lower on social fearfulness (OR = .46, $p < .01$). Compared to the externalizing group, the low group was higher on SES (OR = 1.04, $p < .01$) and social fearfulness (OR = 1.50, $p < .05$), but lower on anger proneness (OR = .28, $p < .001$).

These analyses did not reveal any sex or race differences at age 2, but did indicate that children in the low group had a higher SES than both the externalizing and co-occurring groups. The co-occurring group differed from the externalizing and internalizing groups on the emotionality measures. Specifically, the internalizing group was higher on social fearfulness, but the externalizing group was lower, when compared to the co-occurring group. The internalizing group was lower on anger proneness and the externalizing group was lower on the coded global affective response. The externalizing group was higher on anger proneness and lower on social fearfulness than the internalizing group, which was anticipated.

Age 4 analyses. A multinomial logistic regression was performed to identify whether the emotionality measures were significantly related to the four outcome groups. First, a preliminary model was run to examine if child sex, race, and SES were significant predictors. None of these measures were significant in the model ($\chi^2 = 17.96$, $df = 15$, $p > .05$). The contribution of the *global affective response, anger/frustration,* and *fear* was examined in a second multinomial logistic regression using the co-occurring group as the

reference group. Anger/frustration and fear were significant in the overall model (χ^2 = 72.03, *df* = 9, $p < .001$), however, the global affective response measure was not. The strongest association with differential group membership was for anger/frustration (χ^2 = 42.13, *df* = 3, $p < .001$) followed by fear (χ^2 = 16.61, *df* = 3, $p < .01$).

Follow-up contrasts were conducted to compare the groups on these three factors. Table 5 lists the variables that emerged as significant factors for each contrast. Compared to the co-occurring group, the low group was lower on anger/frustration (OR = .31, $p < .01$) and fear (OR = .37, $p < .01$); the internalizing group was not significantly different from the co-occurring group on these factors; and the externalizing group was lower on fear (OR = .43, $p < .05$). Compared to the externalizing group, the low group was lower on anger (OR = .29, $p < .001$); and the internalizing group was higher on fear (OR = 2.46, $p < .05$) and marginally lower on anger/frustration (OR = .44, $p < .10$). Compared to the internalizing group, the low group was lower on fear (OR = .35, $p < .01$).

The age 4 analyses did not result in as many group differences as the age 2 analyses. There were no sex, race, or SES differences. The internalizing group did not differ from the co-occurring group at this age and the externalizing group was only lower on fear. Again, the externalizing and internalizing groups differed on the emotionality measures as expected.

Age 5 analyses. A multinomial logistic regression was performed to identify whether the temperament and emotion socialization measures were significantly related to the four outcome groups. First, a preliminary model was run to examine if child sex, race, and SES were significant predictors (χ^2 = 25.22, *df* = 15, $p < .05$). Child sex was

significant in the model ($\chi^2 = 9.93$, $df = 3$, $p < .05$) and was entered first as a covariate in subsequent models. The contributions of the *global affective response, anger/frustration, fear, non-supportive emotion socialization, and supportive emotion socialization* were examined in a second multinomial logistic regression using the co-occurring group as the reference group. Interactions between the emotionality (anger and fear) and emotion socialization (non-supportive and supportive) measures were included in the first model. None of these interactions were significant, thus they were dropped from subsequent models. Child sex, anger/frustration, and fear were significant in the overall model ($\chi^2 = 156.78$, $df = 18$, $p < .001$). The strongest association with differential group membership was for anger/frustration ($\chi^2 = 106.01$, $df = 3$, $p < .001$) followed by child sex ($\chi^2 = 12.38$, $df = 3$, $p < .01$), fear ($\chi^2 = 8.22$, $df = 3$, $p < .05$) and the global affective response, which approached significance ($\chi^2 = 6.96$, $df = 3$, $p < .10$).

Follow-up contrasts were conducted to compare the groups on these factors. Table 6 lists the variables that emerged as significant factors for each contrast. Compared to the co-occurring group, the low group was lower on anger/frustration (OR = .16, $p < .001$) and marginally lower on fear (OR = .70, $p < .10$); the internalizing group was more likely to be male (OR = 6.80, $p < .01$), and was also lower on the global affective response (OR = .40, $p < .05$) and anger/frustration (OR = .17, $p < .001$); and the externalizing group was not significantly different on these factors. Compared to the externalizing group, the low group was lower on anger/frustration (OR = .15, $p < .001$); and the internalizing group was more likely to be male (OR = 7.92, $p < .001$), lower on the global affective response (OR = .36, $p < .05$) and anger/frustration (OR = .31, $p < .01$), and higher on fear

(OR = 2.08, $p < .05$). Compared to the internalizing group, the low group was more likely to be female (OR = .22, $p < .05$), higher on the global affective response (OR = 2.18, $p < .05$), and lower on both anger/frustration (OR = .47, $p < .05$) and fear (OR = .47, $p < .05$). Neither of the emotion socialization measures was significant in any of the comparisons.

Sex differences between groups were revealed at this age, but no race or SES differences emerged. Surprisingly, compared to the externalizing and co-occurring groups, the internalizing group was more likely to be male. At this age, it was the externalizing group that did not differ from the co-occurring group. The internalizing group was lower on both the global affective response and anger than the co-occurring group. Again, compared to the internalizing group, the externalizing group was higher on the global affective response and anger/frustration, but lower on fear. Neither the maternal socialization measures nor the proposed interactions between emotionality and emotion socialization were significant.

Age 7 analyses. A multinomial logistic regression was performed to identify whether the temperament and emotion socialization measures were significantly related to the four outcome groups. First, a preliminary model was run to examine if child sex, race, and SES were significant predictors. None of these factors was significant in the model ($\chi^2 = 18.08$, $df = 3$, $p > .05$). The contribution of *non-supportive emotion socialization, supportive emotion socialization, sad/fear expression, and anger/happy expression* was examined in a second multinomial logistic regression. In order to include child emotionality, the 5-year *global affective response, anger/frustration*, and *fear* were included as well. In addition to main effects, interactions between the emotionality

measures (anger and fear) and the emotion socialization (ES) measures (non-supportive and supportive) were included. Interactions between the emotion socialization (non-supportive and supportive) and emotion expression measures (sad/fear and anger/happy) were also included. The two interactions that were significant were anger/frustration by non-supportive ES and supportive ES by mad/happy expression. These interactions were retained for subsequent models. All of the factors in the model ($\chi^2 = 122.32$, $df = 27$, $p < .001$) were significant, except for the global affective response and sad/fear coping, which approached significance. The strongest association with differential group membership was for fear ($\chi^2 = 17.90$, $df = 3$, $p < .001$), followed by anger/frustration ($\chi^2 = 15.36$, $df = 3$, $p < .01$), supportive emotion socialization ($\chi^2 = 10.94$, $df = 3$, $p < .05$), mad/happy expression ($\chi^2 = 9.84$, $df = 3$, $p < .05$), the interaction of supportive ES and mad/happy expression ($\chi^2 = 9.18$, $df = 3$, $p < .05$), non-supportive ES ($\chi^2 = 7.79$, $df = 3$, $p < .10$), and the interaction of anger/frustration and non-supportive ES ($\chi^2 = 7.45$, $df = 3$, $p < .10$).

Follow-up contrasts were conducted to compare the groups on these factors. Table 7 lists the variables that emerged as significant factors for each contrast. Main effects were only interpreted in comparisons where the interactions containing the main effects were not significant. Compared to the co-occurring group, the low group was lower on anger/frustration (OR = .05, $p < .01$), non-supportive emotion socialization (OR = .02, $p < .05$), and sad/fear expression (OR = .54, $p < .05$). The interaction of supportive ES and anger expression was significant (OR = .39, $p < .05$). This interaction is displayed in Figure 3. Examining this figure, the relationship between supportive ES and anger

expression is positive for the co-occurring group, but negative approaching non-significant for the low group. So, for children in the co-occurring group, the more their mothers used supportive emotion socialization techniques, the more likely they were to express anger, but not happiness. This relationship was the opposite for the low group. Compared to the co-occurring group, the internalizing group was higher on fear (OR = 2.54, $p < .05$). The interaction of supportive ES and anger expression was significant (OR = .27, $p < .01$) and is depicted in Figure 4. In this figure, for the co-occurring group, the relationship between supportive ES and anger expression is positive, meaning that children in this group who have mothers who use more supportive ES are more likely to express anger. For the internalizing group, the relationship is negative. Children in this group whose mothers use more supportive ES are less likely to express anger. Compared to the co-occurring group, the externalizing group was lower on supportive ES (OR = .24, $p < .01$) and marginally higher on anger expression (OR = 81.84, $p < .10$).

Compared to the externalizing group, the low group was higher on supportive ES (OR = 1.94, $p < .05$) and marginally lower on anger/frustration (OR = .09, $p < .10$); and the internalizing group was higher on fear (OR = 3.14, $p < .01$) and marginally higher on anger expression (OR = 35.31, $p < .10$). Compared to the internalizing group, the low group was lower on fear (OR = .31, $p < .001$) and the interaction of anger/frustration and non-supportive ES (OR = 2.74, $p < .05$) was also significant. This relationship is depicted in Figure 5. For the low group, there was a positive relationship between age 5 anger/frustration and age 7 non-supportive emotion socialization. For the internalizing group, this relationship was negative.

At age 7, the interaction between supportive emotion socialization and child anger expression was significant in differentiating the co-occurring from both the low and internalizing groups. For the co-occurring group this relationship was positive, for the low group the relationship was close to zero, and for the internalizing group, the relationship was negative. So, higher supportive maternal socialization resulted in more anger expression for the co-occurring group but less anger expression for the internalizing group. Children who were in the externalizing group had mothers who used less supportive emotion socialization than those in the co-occurring group.

Longitudinal Analyses

The goal of the longitudinal analyses was to examine different patterns of change in externalizing/internalizing/co-occurring/low symptoms over time and to assess whether child emotionality at age 2, maternal emotion socialization at age 5, and child emotion expression at age 7 differentiated the identified patterns. A series of LTA models were fit using the two observed items—externalizing and internalizing T-scores—administered at ages 2, 4, 5, and 7. Both two (BIC = 20445.42) and three (BIC = 20304.73) latent class models constraining only the observed means over time were determined to have the best fit and are presented. The models provided similar fits statistically and both could be argued theoretically. Thus, both are presented. In addition, the three-class model offered more information regarding the structure of the symptom patterns across time. Each model defines the class structure at each age, the probabilities of transitioning from class to class at each age, and latent class patterns over time.

Two-class model. The two-class model created two latent classes at each time-point. For class one, the externalizing T-score mean (T ext = 45.56) and the internalizing T-score mean (Tint = 41.58) were both below the mean of 50 for the T scores. This class was called "Low" for each observed measure. For class two, the externalizing T-score mean (T ext = 59.35) and the internalizing T score mean (T int = 56.29) were high. This class was called the "Co-occurring" class for each observed measure. Membership in Class 1 increased over time and membership in Class 2 decreased over time (see Table 8 for these results). At age 2, 51% of the sample was in the low class and 49% was in the co-occurring class. By age 7, 71% of the sample was in the low class and 29% of the sample was in the co-occurring class.

Latent class transition probabilities from age 2 to 4, age 4 to 5, and age 5 to 7 are presented in Table 9. The diagonal elements of the table represent stability, (i.e., the proportion of individuals who remain in the same class at both time points). From age 2 to age 4, 95% of the children in the low group remained in the low group and 64% of the children in the co-occurring group remained in the co-occurring group. Five percent of those in the low group transitioned to the co-occurring group at age 4 and 36% of those in the co-occurring group transitioned to the low group at age 4. From age 4 to age 5, 93% of the children in the low group remained in the low group and 64% of the children in the co-occurring group remained in this group. Eight percent of those in the low group transitioned to the co-occurring group at age 5 and 36% of those in the co-occurring group transitioned to the low group at age 5. From age 5 to age 7, 99% of the children in the low group remained in the low group and 64% of the children in the co-occurring

group remained in the co-occurring group. Less than 1% of those in the low group transitioned to the co-occurring group at age 7 and 36% of those in the co-occurring group transitioned to the low group at age 7. These probabilities indicate that the number of children moving in and out of the classes at each age remained relatively constant across time. The low group had a very high retention rate (96%) and the co-occurring group had a moderate retention rate (64%). Moreover, more children moved from the co-occurring group to the low group than from the low group to the co-occurring group.

The 2-class LTA resulted in sixteen latent class patterns (see Table 10 for results), representing all combinations of the two classes over the four time points (e.g., 1111, 1121, 2111, etc.). These patterns ranged in sample size from 0 to 202. Theses patterns were collapsed to create four patterns of change over time: the (1) "Low Stable" group (n = 202, 46%) had low scores on both externalizing and internalizing at all four ages; the (2) "Increasing" group (n = 11, 3%) was low at ages 2 and 4 and co-occurring at ages 5 and 7; the (3) "Decreasing" group (n = 104, 25%) started in the co-occurring class at age 2 and moved to the low class at either age 4, 5, or 7; and the (4) "Co-occurring Stable" group (n = 109; 25%) was in the co-occurring class at all ages.

To summarize, the two class model resulted in a low class and a co-occurring class at each age. The low class increased in membership over time and the co-occurring class decreased. A large proportion of the low group remained in the low group over time, but a small number of children at each transition did move to the co-occurring group. Four latent class patterns were examined: low stable, increasing, decreasing, and

co-occurring stable. The low group was the largest group, followed by the co-occurring stable and decreasing groups. The increasing group only had 11 members.

Three-class model. The three-class model created three latent classes at each time-point. For class one, the externalizing T-score mean (T ext = 51.33) and the internalizing T-score mean (T int = 46.24) were both near the mean for the T scores. This class was called the "Average" class for each observed measure. For class two, the externalizing T-score mean (T ext = 41.68) and the internalizing T score mean (T int = 39.30) were both well below the mean for the T scores. This class was called the "Low" class for each observed measure. For class three, the externalizing T score mean (T ext = 61.51) and the internalizing T-score mean (T int = 58.37) were both above the mean. This class was called the "Co-occurring" class. Membership in the average class increased from age two to age four, but decreased at ages 5 and 7. Membership in the low class increased steadily over the four time points. Membership in the co-occurring class decreased from age 2 to age 4, remained stable from age 4 to age 5, and decreased at age 7. (see Table 11 for these results). At age 2, 37% of the sample was in the average class, 26% was in the low class, and 37% of the sample was in the co-occurring class. By age 7, 46% of the sample was in the average class, 35% of the sample was in the low class, and 19% of the sample was in the co-occurring class.

Latent class transition probabilities from age 2 to 4, age 4 to 5, and age 5 to 7 are presented in Table 12. The diagonal elements of the table represent stability, (i.e., the proportion of individuals who remain in the same stage at both time points). From age 2 to age 4, 85% of the children in the average group remained in the average group, 73% of

the children in the low group remained in the low group, and 52% of the children in the co-occurring group remained in the co-occurring group. Fifteen percent of those in the average group transitioned to the low group at age 4, but no children in the average group transition to the co-occurring group. Twenty-six percent of children in the low group transitioned to the average group at age 4 and 1% of children in the low group transitioned to the co-occurring group. Thirty-nine percent of children in the co-occurring group transitioned to the average group and 18% of these children transitioned to the low group. From age 4 to age 5, 83% of the children in the average group remained in the average group, 100% of the children in the low group remained in the low group, and 52% of the children in the co-occurring group remained in the co-occurring group. Six percent of those in the average group transitioned to the low group at age 5, and 12% of the children in the average group transition to the co-occurring group. None of children in the low group transitioned to the average group or the co-occurring group at age 5. Thirty percent of children in the co-occurring group transitioned to the average group and 18% of these children transitioned to the low group. From age 5 to age 7, 81% of the children in the average group remained in the average group, 100% of the children in the low group remained in the low group, and 52% of the children in the co-occurring group remained in the co-occurring group. Eighteen percent of those in the average group transitioned to the low group at age 4, and 1% of the children in the average group transition to the co-occurring group. None of children in the low group transitioned to the average group or the co-occurring group at age 7. Thirty percent of children in the co-

occurring group transitioned to the average group and 18% of these children transitioned to the low group.

As with the two-class model, these transition probabilities indicated that the number of children moving in and out of classes at each age remained relatively constant across time for all three classes. The largest probability occurred at each age transition, where 30% of children in the co-occurring group moved to the average group. The average group had a relatively high retention rate (~82%). The low group had a moderate retention rate from age 2 to age 4 (73%), but for the two other transitions, the probability of staying in the low group was 100%, indicating that more change occurred for this group at the earlier time points. Just over half of the children in the co-occurring group remained in that group at each transition. Of those who transitioned to a different class, more moved to the average group (~30%) than the low group (~18%).

The 3-class LTA resulted in 81 latent class patterns (see Table 13 for results) representing all combinations of the three classes over the four time points (e.g., 1111, 1112, 1131, etc.). These patterns ranged in size from 0 to 122. The patterns were collapsed to create four patterns of change over time: the (1) "Average Stable" group (n = 145, 33%) had average externalizing and internalizing T scores at all four ages; the (2) "Low Stable" group (n = 116, 27%) had low externalizing and internalizing T scores at all four ages; the (3) "Co-occurring Decreasing" group (n = 71, 16%) started in the co-occurring class at age 2 and moved to the low class at either age 4, 5, or 7; and the (4) "Co-occurring Stable" group (n = 74; 17%) had high internalizing and externalizing T scores at all ages.

To summarize, the three class model resulted in a low class, an average class, and a co-occurring class at each age. Membership in the low class increased over time, the average class increased in numbers from age 2 to 4 and decreased from age 4 to 5, and the co-occurring class's membership decreased over time. The average group had a relatively high rate of retention, about 84% across the transitions and the low group had a high retention rate, especially from ages 4 to 7 when no children moved out of this group. About half of the co-occurring group remained in that group at each transition. Again, four latent class patterns were examined: average stable, low stable, increasing, co-occurring decreasing, and co-occurring stable. The average group was the largest group, followed by the low, co-occurring stable, and co-occurring decreasing groups.

Differentiating Patterns of Change

After the 2- and 3-class LTA models were assessed for definition of classes, transition probabilities, and longitudinal patterns of change, the next goal was to examine whether 2-year child emotionality, 5-year maternal emotion socialization, and 7-year child emotion expression differentiated these patterns. These factors were added to multinomial logistic regression models as main effects. In addition, emotionality by emotion socialization and emotion socialization by emotion expression interactions were added to each model.

Two-class model. Multinomial logistic regression analyses were used to examine if covariates differentiated the longitudinal groups. For these analyses, the "Increasing" group was removed, as it was too small (n =11) for the logistic analysis to be valid. So, the analyses compared the low stable, decreasing, and co-occurring stable groups. First, a

preliminary model was run to examine if child sex, race, and SES were significant predictors. Socioeconomic status was significant ($\chi^2 = 19.59$, $df = 2$, $p < .001$) and was entered first as a covariate in subsequent models. The contributions of the 2-year *global affective response, anger/frustration,* and *fear,* 5-year *non-supportive emotion socialization and supportive emotion socialization,* and 7-year *sad/fear expression* and *anger expression* were examined in a second multinomial logistic regression. Interactions between the emotionality (anger and fear) and emotion socialization (non-supportive and supportive) measures and emotion socialization and emotion coping (sad/fear and anger expression) were included in the model. Supportive ES by anger expression was the only interaction significant in the overall model, thus it was retained for subsequent models. Socioeconomic status, anger, sad/fear expression, anger expression, and the interaction of supportive ES by anger expression were significant in the overall model ($\chi^2 = 80.88$, $df = 18$, $p < .001$). The strongest association with differential group membership was for anger ($\chi^2 = 34.07$, $df = 2$, $p < .001$) followed by socioeconomic status ($\chi^2 = 15.74$, $df = 2$, $p < .001$), sad/fear expression ($\chi^2 = 7.47$, $df = 2$, $p < .05$), anger expression ($\chi^2 = 6.26$, $df = 2$, $p < .05$) and the supportive ES by anger expression interaction ($\chi^2 = 6.17$, $df = 2$, $p < .05$).

Follow-up contrasts were conducted to compare the groups on these factors. Table 14 lists the variables that emerged as significant factors for each contrast. Main effects were only interpreted in comparisons where the interactions containing the main effects were not significant. Compared to the co-occurring stable group, the low stable group was higher on SES ($OR = 1.03$, $p < .05$) and lower on anger ($OR = .42$, $p < .001$) and non-supportive ES ($OR = .64$, $p < .05$); the decreasing group was lower on sad/fear

expression (*OR* = .70, $p < .05$) and the interaction of supportive ES and anger expression was significant (*OR* = 1.63, $p < .05$). This relationship is depicted in Figure 6. For the co-occurring stable group, the relationship between supportive ES and anger expression was negative, meaning that children in this group whose mothers used more supportive ES were less likely to express anger. The slope for this relationship for the decreasing group appeared to be close to zero. Compared to the decreasing group, the low stable group was higher on SES (*OR* = 1.05, $p < .001$) and sad/fear expression (*OR* = 1.35, $p < .05$), but lower on anger (*OR* = .46, $p < .001$).

In the two-class model, there were no sex or race differences between the co-occurring stable, decreasing, and low stable groups; however, the low stable group was higher on SES than the co-occurring stable and decreasing groups. Compared to the co-occurring group, the decreasing group was lower on sad/fear expression. The interaction between supportive emotion socialization and anger expression also differentiated these groups. For the co-occurring stable group, children whose mothers used more supportive emotion socialization strategies expressed less anger. There was not a significant relationship between these factors for the decreasing group. Children in the decreasing group reported that they expressed more anger than the low stable group, but their mothers rated them lower on the 5-year anger measure.

Three-class model. Multinomial logistic regression analyses were also used to examine if covariates differentiated the longitudinal groups from the three-class model. The analyses compared the average stable, low stable, high decreasing and high stable groups. First, a preliminary model was run to examine if child sex, race, and SES were

significant predictors. Socioeconomic status was significant in the model ($\chi^2 = 26.28$, $df = 3$, $p < .001$) and was entered first as a covariate in subsequent models. The contributions of the 2-year *global affective response, anger/frustration,* and *fear,* 5-year *non-supportive emotion socialization and supportive emotion socialization,* and 7-year *sad/fear expression* and *anger expression* were examined in a second multinomial logistic regression. Interactions between the emotionality (anger and fear) and emotion socialization (non-supportive and supportive) measures and emotion socialization and emotion coping (sad/fear and anger expression) were included in the model. None of these interactions were significant in the overall model, thus they were dropped from further analyses. Socioeconomic status and anger, were significant in the overall model and non-supportive emotion socialization approached significance ($\chi^2 = 100.04$, $df = 24$, $p < .001$). The strongest association with differential group membership was for anger ($\chi^2 = 36.43$, $df = 3$, $p < .001$) followed by socioeconomic status ($\chi^2 = 23.29$, $df = 3$, $p < .001$), and non-supportive emotion socialization ($\chi^2 = 6.55$, $df = 3$, $p < .10$).

Follow-up contrasts were conducted to compare the groups on these factors. Table 15 lists the variables that emerged as significant factors for each contrast. Compared to the co-occurring stable group, the average stable group was higher on SES ($OR = 1.04$, $p < .05$) and lower on anger ($OR = .42$, $p < .05$); the low stable group was higher on SES ($OR = 1.04$, $p < .01$) and lower on anger ($OR = .27$, $p < .001$) and non-supportive emotion socialization ($OR = .50$, $p < .05$); and the co-occurring decreasing group was lower on anger ($OR = .57$, $p < .05$). Compared to the co-occurring decreasing group, the average stable group was higher on SES ($OR = 1.06$, $p < .001$) and marginally higher on

sad/fear expression (OR = 1.30, $p < .10$); the low stable group was higher on SES (OR = 1.06, $p < .001$) and marginally higher on sad/fear expression (OR = 1.35, $p < .10$), but lower on the global affective response (OR = .68, $p < .05$) and anger (OR = .48, $p < .05$). Compared to the low stable group, the average stable group was higher on anger (OR = 1.54, $p < .05$), and marginally higher on non-supportive emotion socialization (OR = 1.52, $p < .10$) and supportive emotion socialization (OR = 1.47, $p < .10$).

As with the 2-class model, there were no sex or race differences between the longitudinal patterns; however, the co-occurring stable group was lower on SES than the average stable and low stable groups. The average stable group was also higher on SES than the co-occurring decreasing group. The co-occurring group was higher on anger than the three other groups. Children in the low stable group had mothers who used less non-supportive emotion socialization strategies than those in the co-occurring group. Surprisingly, compared to the low stable group, children in the average stable group had mothers who reported using more non-supportive and supportive emotion socialization strategies. It is possible that mothers in this group were inconsistent in their parenting techniques.

CHAPTER IV

DISCUSSION

The purpose of this study was to examine patterns of externalizing, internalizing, and co-occurring symptom patterns in a sample of children at ages 2, 4, 5, and 7 as well as to explore whether developmentally-salient child and contextual factors differentiated these symptom patterns. These goals were explored using both cross-sectional and longitudinal analytical techniques in order to study these relations at specific developmental time points as well as across time. This allowed for a detailed assessment of symptom patterns at specific ages as well as whether symptom patterns at an earlier age played a part in symptom pattern at later ages.

Symptom Differentiation at Specific Developmental Time-Points

The first goal of the study was to examine relations between child, parent, and contextual factors and symptom patterns at different developmental time-points. The cross-sectional models at ages 2, 4, 5, and 7 included factors that were hypothesized to be salient in differentiating groups of children with co-occurring symptoms, externalizing symptoms, internalizing symptoms, and low symptoms. So, child emotionality was included in models at all ages, emotion socialization was added at ages 5 and 7, and child emotion expression of sadness/fear and anger was included at age 7. Where hypothesized, interactions between these measures were included as well. Socioeconomic status (SES),

child sex, and race were included in all initials models. Child race did not differentiate symptom patterns at any age and child gender was only significant in the model at age 5. Socioeconomic status played a more consistent role in differentiating symptom groups across time.

At age 2, compared to the co-occurring group, the externalizing group was lower on the global affective response and social fearfulness; the internalizing group was lower on anger, but higher on social fearfulness; and the low group was higher on SES, but lower on the global affective response and anger. These results make intuitive sense when you consider the symptoms that comprise the externalizing and internalizing dimensions. As would be expected, the externalizing group was higher on anger and lower on social fearfulness than the internalizing group. These results are consistent with previous work that has linked early child emotionality to the development of externalizing and internalizing symptoms (Kagan, Renick, & Snidman, 1997; Eisenberg, Cumberland, Spinrad, Fabes, Shepard, Reiser, et al., 2001). The co-occurring group had a higher frustration response during coded frustration tasks than both the externalizing and internalizing groups. The co-occurring group was also higher on social fearfulness than the externalizing group and higher on anger than the internalizing group. So, even during toddlerhood, children with a co-occurring symptom pattern were differentiated by emotionality measures from children with symptoms along either the externalizing or internalizing dimensions.

At age 4, results indicated fewer differences between symptom groups. No differences emerged between the co-occurring group and the internalizing group. This is

somewhat surprising given that differences did appear at age 2. However, it is possible that at age 2, emotionality and behavioral symptoms may be exhibited more frequently by children before they have started to learn to regulate their emotions more effectively. Therefore, parents may have rated their children more highly at age 2 than age 4 on these measures. Compared to the co-occurring group, the externalizing group was lower only on fear; and the low group was lower on both anger and fear. Again, the externalizing group was lower on fear and marginally higher on anger than the internalizing group. The low group was lower on anger than the externalizing group and lower on fear than the internalizing group. Taken together, at age 4, there were fewer group differences between the co-occurring group and other symptom groups than at age 2. As at age 2, the co-occurring group was higher on fear than the externalizing group, but was not statistically different from the internalizing group. Also similar to age 2, the co-occurring group did not differ from the externalizing group on the anger measure. This indicates that behaviorally, the co-occurring group may look similar to the externalizing group when observed by parents and teachers, who are more likely to see symptoms of externalizing, such as anger than symptoms of internalizing, such as fear.

At age 5, there were no differences between the externalizing group and the co-occurring group. Previous work has found that children with co-occurring symptoms are more likely to be more similar to groups of children with externalizing than internalizing symptoms (e.g., Keiley et al., 2003). In this sample, this trend only emerged in the model at age 5. Compared to the co-occurring group, the internalizing group was lower on the global affective response and anger; and the low group was lower on anger and

marginally lower on fear. Compared to the externalizing group, the internalizing group was lower on the global affective response and anger, but higher on fear. Sex differences also emerged at age 5. There were more males in the internalizing group than the co-occurring group and the externalizing group. This finding is counterintuitive, as most studies find that girls are more likely to exhibit internalizing symptoms. This finding may be due to the fact that these gender differences often do not emerge until later childhood and early adolescence. In addition, this sample was over-selected for children who were at-risk for externalizing problems, which may have resulted in a higher proportion of girls with externalizing problems than in a more normative sample.

At age 7, differences between the co-occurring and other symptom groups reappeared. Compared to the co-occurring group, the externalizing group was lower on SES and marginally higher on anger expression. At this age, interactions between maternal emotion socialization and child emotion expression were explored. The interaction between supportive emotion socialization and anger expression was significant in differentiating the co-occurring from both the internalizing and low groups. For the co-occurring group, children whose mothers used more supportive emotion socialization strategies were more likely to express anger. This relationship was negative for the internalizing group. So, even when children in the internalizing group are receiving positive, supportive parenting, they are less likely to express anger, which may exacerbate their internalizing symptoms over time. For the low group, there was no relationship between supportive emotion socialization and anger expression. In this case, the expression of anger did not consistent result in either symptomatic or normative

outcomes at age 7. This brings into question the idea that expression versus suppressing anger is linked with positive outcomes. Since this is a cross-sectional model, however, the direction of effects between the covariates and the co-occurring, internalizing, and low outcomes cannot be assumed.

Compared to the externalizing group, the low group was higher on supportive emotion socialization and marginally higher on anger expression. Compared to the internalizing group, the low group was lower on fear. The interaction between anger/frustration and non-supportive emotion socialization was also significant in differentiating these groups. For the low group, children who exhibited more anger/frustration at age 5 were more likely to have mothers who used non-supportive emotion socialization techniques at age 7. This relationship was negative for the internalizing group. For these children, exhibiting higher levels of anger/frustration at age 5 was related to lower levels of non-supportive parenting at age 7. This relationship is somewhat counterintuitive, as non-supportive parenting strategies have usually been linked with abnormal symptom outcomes, including both externalizing and internalizing symptoms. It is possible that mothers of children in the low symptom group are not accustomed to their children expressing anger or frustration and when they do, these mothers are more likely to use non-supportive strategies in lieu of supportive strategies.

These models suggest that child emotionality, maternal emotion socialization, and child emotion expression all play a role in co-occurring, externalizing, internalizing, and low symptom patterns. These relations, however, are different depending on the age at which the model is examined. At age 4, the co-occurring group was no different from the

internalizing group and at age 5, the co-occurring group was no different than the externalizing group. At age 7, the co-occurring group only different significantly with the externalizing group on SES, for which the externalizing group was higher. So, consistent with previous work, starting at age 5 and continuing at age 7, the co-occurring group was more similar to the externalizing group than the internalizing and low groups. As hypothesized, child emotionality played a consistent role in differentiating symptom patterns across all four ages. This points to the notion that children's emotional reactions—anger versus fear/withdrawal—are not only important to examine in early childhood, but continue to influence the development of problem behaviors over time. The co-occurring group was similar to the externalizing group on anger at each age, suggesting that mothers are observing similar behaviors in these groups of children at age 2. Children in the co-occurring group were more likely to report that they would express anger at age 7 than those in the externalizing group, however. At age 7, interactions between child and maternal measures appeared. In the context of supportive emotion socialization, the co-occurring group was more likely to express anger than the low group. Socioeconomic status also played a consistent role in these models suggesting that the context in which these emotionality by maternal behavior and maternal behavior by emotion expression interactions play out is important.

Most of these findings are consistent with previous work that has linked child emotionality and parenting practices to behavioral and emotional problems. However, a detailed examination of these relations including not only externalizing and internalizing symptoms, but a co-occurring symptom pattern as well, adds to this literature. If children

with co-occurring symptoms do have more negative outcomes than their counterparts with symptoms along one dimension or the other, it would be important to identify these children early and to examine the child and contextual factors that differentiate these patterns early in development. Examining these factors and symptom patterns longitudinally was the next step, to allow for examination of the stability or change in symptom patterns across development.

Symptom Differentiation Over Time

To examine different patterns of change in co-occurring, externalizing, internalizing, and low symptoms over time, a series of latent transition analyses (LTA) were performed. LTA allowed for examination of movement in and out of symptom classes from age 2 to age 7. Both 2- and 3-class models were run, as these models fit almost equally well and they allowed for an examination of different class patterns over time, offering more information about externalizing, internalizing, and co-occurring symptoms in early childhood.

For the two-class model, the 1st class was below the mean on both the externalizing and internalizing T scores and was called the "Low" class. The 2nd class was above the mean on both scores and was called the "Co-occurring" class. The low class increased in membership over time and the co-occurring class decreased over time. Retention for each class remained constant at each transition—about 96% for the low class and 64% for the co-occurring class. More children moved from the co-occurring class to the low class than vice versa. Sixteen total patterns of change across ages 2, 4, 5,

and 7 were collapsed to 4 patterns: low stable, increasing, decreasing, and co-occurring stable.

Multinomial logistic regression analyses were used to explore whether developmental factors differentiated these patterns of change, excluding the increasing group due to small sample size. Compared to the co-occurring stable group, the low stable group was higher on SES and lower on anger and non-supportive emotion socialization and the decreasing group was lower on sad/fear expression. Here, less expression—or suppression—of sadness and fear resulted in decreasing externalizing and internalizing symptoms. The interaction between supportive emotion socialization and anger expression was also significant in differentiating the co-occurring and decreasing groups. For the co-occurring stable group, children whose mothers used more supportive emotion socialization strategies were less likely to express anger. The slope for this relationship was close to zero for the decreasing group. So, in the context of supportive emotion socialization, children who expressed less anger were more likely to be in the co-occurring stable group. In this sample, the co-occurring stable group was more likely to express sadness and fear than the low stable group and more likely to express anger than the decreasing group, but only in the context of supportive emotion socialization. Compared to the decreasing group, the low stable group was higher on SES and sad/fear expression and lower on anger. For this comparison, the low group, exhibiting lower externalizing and internalizing symptoms over time, expressed more sadness and fear, and were also lower on mother-rated anger.

For the three-class model, the first class was close to the mean on both the externalizing and internalizing T scores and was called the "Average" class, the 2nd class was significantly lower than the mean on both T scores and was called the "Low" class, and the 3rd class was significantly above the mean on both T scores and was called the "Co-occurring" class. The average class increased in membership from ages 2 to 4 and decreased from ages 5 to 7; the low class increased over time; and the co-occurring class decreased from ages 2 to 4, remained stable from ages 4 to 5 and decreased again at age 7. As with the 2-class model, transition probabilities remained relatively stable over time. At each transition, 30% of children in the co-occurring group moved to the average group and 18% moved to the low group. The average group had the highest retention rate at age 2 to age 4 and the low group had 100% retention from age 4 to age 7. A very low percentage of children moved from the average group to the co-occurring group and the probability of transitioning from the low group to the co-occurring group was close to zero.

The overall patterns of change were collapsed into four patterns for subsequent analyses: average stable, low stable, co-occurring decreasing, and co-occurring stable. Multinomial logistic regression analyses were performed to examine how 2-year emotionality, 5-year emotion socialization, and 7-year emotion expression differentiated these patterns of change. Compared to the co-occurring stable group, the average stable and low stable groups were higher on SES and lower on anger. The low stable group was also lower on non-supportive emotion socialization. The co-occurring decreasing group was lower on anger. So, again, the co-occurring stable group was higher on anger than all

other groups. Compared to the co-occurring decreasing group, the average stable and low stable groups were higher on SES and marginally higher on sad/fear expression. Again, the expression of sadness and fear resulted in a better outcome. The low stable group was also lower on the global affective response and anger. Compared to the low stable group, the average stable group was higher on anger and marginally higher on both non-supportive and supportive parenting.

Integration of Findings

These longitudinal analyses allowed for examination of stability and instability of co-occurring, externalizing, and internalizing symptoms over time as well as the covariates that played a role in catalyzing these transitions from age 2 to age 7. The classes created by the latent transition analyses were not those that were hypothesized, however. It was expected that the patterns would include a low stable group, a co-occurring stable group, a group that started off high on externalizing and decreased over time, and a purely internalizing group. The two-class model had only a low group and a comorbid group, which limited the examination of externalizing and internalizing patterns over time. The three-class model included an average group and a high group, but also a very low group. The externalizing and internalizing T scores for the very low group were well below the means for these measures. So, no "pure" externalizing or internalizing group was created by using this type of analysis. It is possible that this may have something to do with the sample of children used for this study. Again, the children were over-selected for being at-risk for externalizing disorders, which may have made finding a group of children with "pure" internalizing difficult. Perhaps if a group of very

inhibited children had also been selected at age two, an internalizing group would have emerged as well.

Another unexpected finding was the lack of differences between groups for boys and girls. Boys have traditionally been theorized to have higher levels of externalizing symptoms and lower levels of internalizing symptoms, especially after the preschool years. Most research supports this assertion and shows that boys and girls are similar in their behavioral and emotional problems until the preschool period (Briggs-Gowen, Carter, Skuban, & Horwitz, 2001; Crick & Zahn-Waxler, 2003; Mesman, Bongers, & Koot, 2001), when boys begin to display more externalizing behaviors, a difference that persists throughout early childhood. Some sex differences did emerge at age 5, but in a counterintuitive direction. Again, because this was a party at-risk sample, there may have been more girls with externalizing symptoms than would be normally expected.

Regardless of these unexpected findings, the patterns of change observed in both the 2- and 3-class models allowed for rich examination of how child emotionality, maternal emotion socialization, and child emotion expression played a role in these processes. Child anger and fear were consistently related to their expected symptom groups—externalizing and internalizing, respectively. In general, it appeared the children high on 2-year anger were more likely to end up in both the cross-sectional co-occurring groups and the longitudinal co-occurring stable groups. Again, it seems that early emotionality plays a part in later externalizing and internalizing symptoms at age 7. Consistent with previous work, the externalizing group was more similar to the co-occurring group on anger and fear in cross-sectional analyses. Maternal emotion

socialization was also related to change patterns, most commonly when interacting with anger expression. For the co-occurring stable group in the two-class model, children whose mothers used more supportive emotion socialization strategies at age 5 expressed more anger at age 7. It seems that these children with high internalizing and externalizing symptoms may not be responding to supportive emotion socialization in the same way as their counterparts in the decreasing and low groups. This relationship did not hold for the decreasing group. Expression versus suppression of sadness and fear as well as anger was also examined as a main effect and in interaction with maternal emotion socialization. In cross-sectional analyses at age 7, the interaction between supportive emotion socialization and anger expression was significant. For the co-occurring group, children with higher supportive emotion socialization were more likely to express anger. In the two-class longitudinal model, expression of sadness and fear was higher in the decreasing group than in the co-occurring group. The low stable group also expressed more sadness and fear. Children in the co-occurring stable group were also less likely to express anger, but only in the context of supportive emotion socialization. This finding was opposite that of the finding in the 7-year cross-sectional analysis, which indicates that examining these data using cross-sectional versus longitudinal analytical techniques may result in different findings.

Although both of these models are informative in exploring the relation between the developmental factors and longitudinal symptom patterns, the 2-class model seems to be the best fit for the data and makes the most sense theoretically for several reasons. First, considering parsimony, the 2-class model describes the data just as well as the 3-

class model, given that children in the "average" and "low" classes in the 3-class model are likely not very different from one another, especially when considering the clinical utility of the Child Behavior Checklist. Children in the low group may exhibit fewer symptoms than children in the average group, but this difference would likely be difficult to observe behaviorally. Given this sample, the 2-class model also fits well, considering that the sample included children that were at-risk for developing externalizing problems. Although it would have been ideal to find separate groups of children with only high externalizing and only high internalizing, this was unlikely, especially in the case of internalizing symptoms. If at age 2, the sample also included a set of children who were very withdrawn and at-risk for internalizing symptoms, the structure of the classes may have differed to include an internalizing-only class. The age of the sample also played a part in this, as internalizing symptoms usually do not develop until late childhood and early adolescence. Finally, although there are only two classes to work with at each age in the 2-class model, because LTA allows for examination of class membership over time, this model still allows for a detailed look at changes in these classes and how the child and contextual factors differentiate this change. Again, the information in the 3-class model did not add much to these results. Replication of these results with a similar sample as well as performing similar analyses using a different sample would be important to clarify the fit of these models.

Strengths and Limitations

This study produced many findings that are in agreement with previous work. Moreover, the longitudinal statistical approach used here supplements many previous

studies by allowing for examination of change in symptom patterns over time. The ability to examine the relation between child and contextual factors and outcome measures at specific developmental time-points as well as across time allowed for a more detailed look at these constructs. In addition, a range of child, parent, and contextual factors were assessed over time in relation to the behavioral symptom patterns. Finally, the study used multiple means of data collection, including mother-reported measures of behavioral and emotional symptoms, observational coding of child emotionality, and child-report of emotion expression.

The use of maternal report was also a limitation, however, as mothers reported on both externalizing and internalizing symptoms as well as child emotionality and maternal emotion socialization. A second limitation was that the study did not include measures of peer relationships, which have been shown to be important for the development of social competence and the maintenance of behavior problems once children begin school. Finally, the focus on broadband measures of externalizing and internalizing symptoms did not allow for looking at more specific patterns of co-variation (e.g., oppositional defiant disorder and depression).

Conclusions

The issue of co-occurring symptoms has become central to the study of behavioral and emotional problems in early childhood. This study adds to the literature exploring the differences between children with co-occurring externalizing and internalizing symptoms versus symptoms along only one dimension or the other. Especially early in childhood, children often exhibit symptoms that fall along both of these dimensions. These types of

studies are essential to the generation of theories that take both co-occurrence and single-dimension behavioral and emotional problems into account. The results of this study suggest that although the majority of children "grow out" of their early behavior problems, some children persist in externalizing, internalizing, and co-occurring symptoms patterns, at least until age 7. It also seems plausible that these children with co-occurring symptoms may be more likely to develop more serious behavioral and emotional issues into adolescence and early adulthood. Moreover, these children seem to differ in their emotionality and self-reported emotion expression and have parents who use different socialization techniques from their non-symptomatic peers and peers whose symptoms are decreasing over time.

Since we know that co-occurring symptoms often result in more negative outcomes, this examination of early symptom constellations and the child and contextual factors associated with them contributes to work that may inform the developing models of early childhood psychopathology. For example, one theory, which posits that children with early anxiety develop later symptoms of depression may be augmented by examining children who not only have early symptoms of anxiety, but perhaps co-occurring anxiety and externalizing symptoms. The behavioral and emotional outcomes in adolescence for this group may look different than those for a group with "pure" anxiety symptoms in childhood. It is possible that there is a separate group of children who have co-occurring symptoms early on and without appropriate parental and contextual support, may develop more serious behavioral and emotional problems into adolescence. In addition, as in one study described earlier, the examination of the genetic

and shared environmental influences on "pure" externalizing and internalizing symptoms and disorders may be different than the picture for co-occurring symptoms. This may be one reason for the inconsistent and sometimes conflicting findings in this area of research.

In addition to contributing to models of psychopathology, the study of co-occurring symptoms may also enhance the development of clinical methods used to treat children whose symptoms fall at the extremes of the externalizing and internalizing dimensions. Since in this sample, children with co-occurring symptoms were more similar to children with either externalizing or internalizing patterns at certain ages, existing clinical protocols used to treat children with symptoms along one dimension or the other may be beneficial at these specific ages for children with co-occurring symptoms. In addition, parenting programs that target fostering emotion regulation may benefit from a more detailed assessment of child temperament and emotion coping mechanisms to help parents to observe their children's reactions to emotionally demanding situations. It is possible that different parenting techniques (e.g., emotion socialization) may be more effective for children with co-occurring symptoms compared to children with externalizing- or internalizing-only symptoms. Specifically, it is possible that for some children, parental encouragement of the expression of anger versus sadness and fear may be beneficial, while for others, it may not. Future research should explore the efficacy of these approaches and continue to explore developmental factors that relate to these symptoms patterns in early- to late-childhood and into adolescence.

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APPENDIX A. TABLES

Table 1

Frequencies for Symptom Groups at Ages 2, 4, 5, and 7

	n	%	Male	Female
2-year groups				
Low	292	64.5	137	155
Internalizing	23	5.1	8	15
Externalizing	72	15.9	42	30
Co-occurring	49	10.8	22	27
4-year groups				
Low	337	74.4	166	171
Internalizing	13	2.9	9	4
Externalizing	68	15.0	28	40
Co-occurring	18	4.0	6	12
5-year groups				
Low	316	69.8	153	163
Internalizing	18	4.0	14	4
Externalizing	54	11.9	21	33
Co-occurring	48	10.6	21	27
7-year groups				
Low	369	79.2	171	188
Internalizing	26	5.7	18	8
Externalizing	28	6.2	12	16
Co-occurring	23	5.1	8	15

Table 2

Descriptive Statistics for Study Measures

	N	Range	Minimum	Maximum	Mean	Std. Dev.	Skewness Statistic
Hollingshead Score	436	57.04	14.00	71.04	39.62	11.19	-.12
2-year CBCL Externalizing T score	436	61.00	30.00	91.00	51.87	0.14	.29
2-year CBCL Internalizing T score	436	60.00	30.00	90.00	48.97	9.89	.31
2-year Global Affective Response Mean	436	4.79	-.79	4.00	.81	.89	1.19
2-year TBAQ Anger Proneness	436	4.76	1.67	6.43	4.00	.86	.19
2-year TBAQ Fearfulness	436	5.12	1.62	6.74	3.89	.87	.16
4-year CBCL Externalizing T score	436	46.00	30.00	76.00	52.22	8.95	-.02
4-year CBCL Internalizing T score	436	40.00	33.00	73.00	45.92	8.68	.50
4-year Global Affective Response Mean	436	3.12	-.12	3.00	.86	.60	.61
4-year CBQ Anger	436	4.66	1.92	6.58	4.68	.81	-.52
4-year CBQ Fear	436	5.63	1.20	6.83	4.02	.83	-.08
5-year CBCL Externalizing T score	436	55.49	26.00	81.49	50.93	10.16	.17
5-year CBCL Internalizing T score	436	52.00	30.00	82.00	50.54	9.21	.24
5-year Global Affective Response Mean	436	4.35	-.35	4.00	1.46	.77	.36
5-year CBQ Anger	436	5.46	1.38	6.85	4.60	.89	-.29
5-year CBQ Fear	436	4.52	1.83	6.35	3.97	.85	-.05
5-year CCNES Non-Supportive Mean	436	4.99	1.08	6.08	2.43	.62	1.02
5-year CCNES Supportive Mean	436	4.22	2.67	6.89	5.62	.62	-.67
7-year CBCL Externalizing T score	436	53.22	21.78	75.00	47.93	9.37	.26
7-year CBCL Internalizing T score	436	54.66	26.34	81.00	46.96	9.33	.56
7-year CCNES Non-Supportive Mean	436	4.99	1.08	6.08	2.43	.62	1.02
7-year CCNES Supportive Mean	436	4.47	2.53	7.00	5.62	.67	-.52
7-year EMI Sadness/Fear factor score	436	4.77	-2.55	2.22	0.00	1.00	-.16
7-year EMI Mad/Negative Happy factor score	436	7.60	-3.39	4.21	0.00	1.00	1.00

Table 3

Bivariate Correlations Between Study Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. 2yr Global affective response	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. 2yr Social fear	.08	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3. 2yr Anger proneness	.11*	.33**	1	-	-	-	-	-	-	-	-	-	-	-	-
4. 4yr Global affective response	.10*	-.07	.05	1	-	-	-	-	-	-	-	-	-	-	-
5. 4yr Anger	.20**	.13**	.55**	.24**	1	-	-	-	-	-	-	-	-	-	-
6. 4yr Fear	-.02	.24**	.17**	-.04	.20**	1	-	-	-	-	-	-	-	-	-
7. 5yr Global affective response	.31**	-.09	.07	.27**	.23**	-.01	1	-	-	-	-	-	-	-	-
8. 5yr Anger	.08	.06	.53**	.15**	.76**	.23**	.20**	1	-	-	-	-	-	-	-
9. 5yr Fear	-.06	.22**	.14**	-.04	.21**	.69**	-.03	.23**	1	-	-	-	-	-	-
10. 5yr Non-supportive ES	.04	-.03	.25**	.11*	.22**	.05	.13**	.19**	.09	1	-	-	-	-	-
11. 5yr Supportive ES	.06	.02	.04	.13**	.00	.06	.04	-.03	.08	-.06	1	-	-	-	-
12. 7yr Non-supportive ES	.04	-.03	.25**	.11*	.22**	.05	.13**	.19**	.09	.99**	-.06	1	-	-	-
13. 7yr Supportive ES	.09	.04	.02	.04	-.06	.08	.00	-.08	.08	-.03	.65**	-.03	1	-	-
14. 7yr Sad/fear expression	-.09	-.00	.17**	-.01	.05	-.09	.03	.08.	-.08	-.03	.06	-.03	.08	1	-
15. 7yr Anger expression	.11*	-.04	.07	.08	.14*	-.00	-.01	.18**	.01	.04	-.05	.04	-.08	.01	1

Table 4

Age 2 Factors Contributing Significantly in Distinguishing Between Groups

Int vs. Low	Ext vs. Int	Co-occurring vs. Low
SES: 1.04†	Social fearfulness: 3.30**	SES: 1.05**
Social fearfulness: .46**	Anger proneness: .21**	Global affective response: .61**
		Anger proneness: .28**
	Ext vs. Low	Co-occurring vs. Int
	SES: 1.04**	GAR: .59†
	Social fearfulness: 1.50*	Social fearfulness: 1.95*
	Anger proneness: .28**	Anger proneness: .22**
		Co-occurring vs. Ext
		Global affective response: .54**
Full model: $\chi^2 = 124.48$**, $df = 12$, $R^2 = .29$		Social fearfulness: .59*

†$p < .10$, *$p < .05$; **$p < .01$

Note: The values represent odds ratios of being in the 2nd versus the 1st listed group

Table 5

Age 4 Factors Contributing Significantly in Distinguishing Between Groups

Int vs. Low	Ext vs. Int	Co-occurring vs. Low
Fear: .35**	Anger/Frustration: .44†	Anger/Frustration: .31**
	Fear: 2.46*	Fear: .37**

Ext vs. Low	Co-occurring vs. Ext
Anger/Frustration: .29**	Fear: .43*

Full model: $\chi^2 = 72.03$**, $df = 9$, $R^2 = .20$

†$p < .10$, *$p < .05$; **$p < .01$

Note: The values represent odds ratios of being in the 2nd versus the 1st listed group

Table 6

Age 5 Factors Contributing Significantly in Distinguishing Between Groups

Int vs. Low	Ext vs. Int	Co-occurring vs. Low
Female: .22*	Female: 7.92**	Anger/Frustration: .16**
Global Affective Response: 2.18*	Global Affective Response: .36*	Fear: .70†
Anger/Frustration: .47*	Anger/Frustration: .31**	
Fear: .47*	Fear: 2.08*	
	Ext vs. Low	Co-occurring vs. Int
	Anger: .15**	Female: 6.69**
		Global Affective Response: .40*
Full model: $\chi^2 = 158.14$**, $df = 21$, $R^2 = .37$		Anger/Frustration: .34**

†$p < .10$, *$p < .05$; **$p < .01$

Note: The values represent odds ratios of being in the 2nd versus the 1st listed group.

Table 7

Age 7 Factors Contributing Significantly in Distinguishing Between Groups

Int vs. Low	Ext vs. Low	Co-occurring vs. Low
Anger: .04**	Anger: .09†	Anger: .05**
Fear: .31**	Supportive ES: 1.94*	Non-supportive ES: .02*
Non-supportive ES: .01*		Supportive ES: .47†
Anger x Non-supportive ES: 2.74*		Sad/fear expression: .54*
		Anger expression: 374.78*
		Supportive ES x Anger expression: .39**
	Ext vs. Int	Co-occurring vs. Int
	Fear: 3.14**	Fear: 2.54*
	Anger expression: 35.31†	Supportive ES: .35*
		Anger expression: 2890.09**
		Supportive ES x Anger expression: .27**
		Co-occurring vs. Ext
		Supportive ES: .24**
Full model: $\chi^2 = 122.32$**, $df = 27$, $R^2 = .33$		Anger expression: 81.84†

†$p < .10$, *$p < .05$; **$p < .01$

Note: The values represent odds ratios of being in the 2nd versus the 1st listed group.

Table 8

Two-Class Model Classification of Individuals Based on Their Most Likely Latent Class Membership

Latent Class Variable	Class	*N*	%
C2	Low	220	51
	Co-occurring	215	49
C4	Low	299	69
	Co-occurring	136	31
C5	Low	297	68
	Co-occurring	138	32
C7	Low	310	71
	Co-occurring	125	29

Table 9

Two-Class Model Latent Transition Probabilities

	Low	High
	Age 4 latent status	
Age 2 latent status		
Low	.95	.05
High	.36	.64
	Age 5 latent status	
Age 4 latent status		
Low	.93	.08
High	.36	.64
	Age 7 latent status	
Age 5 latent status		
Low	.99	.01
High	.36	.64

Table 10

Two-Class Model Classification of Individuals Based on Their Most Likely Latent Class Pattern

Latent Class Pattern	*N*	%	Collapsed Group Membership
1111	202	46	(1) “Low Stable”
1112	1	<1	Not included
1121	1	<1	Not included
1122	11	3	(2) “Increasing”
1211	0	0	Not included
1212	0	0	Not included
1221	2	<1	Not included
1222	3	1	Not included
2111	82	19	(3) “Decreasing”
2112	0	0	Not included
2121	1	<1	Not included
2122	1	<1	Not included
2212	0	0	Not included
2211	12	3	(3) “Decreasing”
2221	10	2	(3) “Decreasing”
2222	109	25	(4) “High Stable”

Table 11

Three-Class Model Classification of Individuals Based on Their Most Likely Latent Class Membership

Latent Class Variable	Class	*N*	%
C2	Average	160	37
	Low	115	26
	Co-occurring	160	37
C4	Average	206	47
	Low	133	31
	Co-occurring	96	22
C5	Average	201	46
	Low	138	32
	Co-occurring	96	22
C7	Average	199	46
	Low	152	35
	Co-occurring	84	19

Table 12

Three-Class Model Latent Transition Probabilities

	Average	Low	Co-occurring
	Age 4 latent status		
Age 2 latent status			
Average	.85	.15	.00
Low	.26	.73	.01
Co-occurring	.30	.18	.52
	Age 5 latent status		
Age 4 latent status			
Average	.83	.06	.12
Low	.00	1.00	.00
Co-occurring	.30	.18	.52
	Age 7 latent status		
Age 5 latent status			
Average	.81	.18	.01
Low	.00	1.00	.00
Co-occurring	.30	.18	.52

Table 13

Three-Class Model Classification of Individuals Based on Their Most Likely Latent Class Pattern

Latent Class Pattern	*N*	%	Collapsed Group Membership
1111	122	28	(1) Average Stable
1112	10	2	(1) Average Stable
1122	1	<1	Not included
1131	1	<1	Not included
1132	1	<1	Not included
1133	9	2	Not included
1222	16	4	(2) Low Stable
2111	13	3	(1) Average Stable
2131	1	<1	Not included
2222	100	23	(2) Low Stable
2331	1	<1	Not included
3111	44	10	(3) Co-occurring Decreasing
3112	2	<1	Not included
3131	1	<1	Not included
3133	1	<1	Not included
3222	17	4	(3) Co-occurring Decreasing
3311	10	2	(3) Co-occurring Decreasing
3322	4	<1	Not included
3331	6	1	Not included
3332	1	<1	Not included
3333	74	17	(4) Co-occurring Stable

Note: Only those patterns with at least one member were included in this table.

Table 14

Factors Contributing Significantly in Distinguishing Between Two-Class LTA Change Patterns

Co-Occurring Stable vs. Low Stable	Decreasing vs. Low stable
SES: 1.03*	SES: 1.05**
Anger: .42**	Anger: .46**
Non-Supportive ES: .64*	Sad/fear expression: 1.35*

Co-Occurring Stable vs. Decreasing
Sad/Fear expression: .70*
Anger expression: .06*
Supportive ES x Anger expression: 1.63*
Full model: $\chi^2 = 80.88$**, $df = 18$, $R^2 = .20$

$^{\dagger}p < .10$, *$p < .05$; **$p < .01$
Note: The values represent odds ratios of being in the 2nd versus the 1st listed group

Table 15

Factors Contributing Significantly in Distinguishing Between Three-Class LTA Change Patterns

Co-occurring Stable vs. Average Stable	Co-occurring Decreasing vs. Average Stable	Low Stable vs. Average Stable
SES: 1.04* Anger: .42**	SES: 1.06** Sad/fear expression: 1.30†	Anger: 1.54* Non-supportive ES: 1.52† Supportive ES: 1.47†

Co-occurring Stable vs. Low Stable	Co-occurring Decreasing vs. Low Stable
SES: 1.04** Anger: .27** Non-supportive ES: .50*	SES: 1.06** Global Affective Response: .68* Anger: .48** Sad/fear expression: 1.35†

Co-occurring Stable vs. Co-occurring Decreasing
Anger: .57*
Full model: $\chi^2 = 100.04$**, $df = 24$, $R^2 = .24$

$^{\dagger}p < .10$, *$p < .05$; **$p < .01$

Note: The values represent odds ratios of being in the 2nd versus the 1st listed group

APPENDIX B. FIGURES

Figure 1. A Latent Transition Model Diagram With Two Observed Continuous Variables and Four Measurement Points.

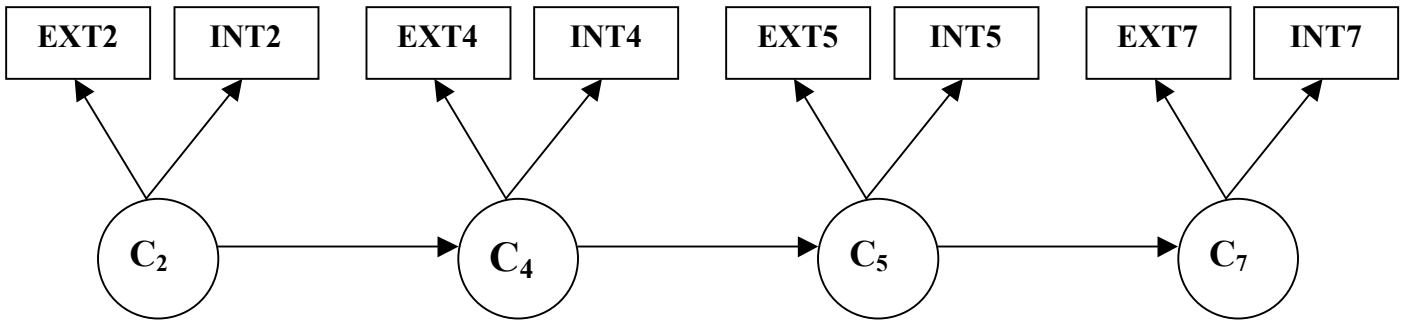

Figure 2. Interaction of Supportive Emotion Socialization and Anger Expression Differentiating 7-Year Co-Occurring and Low Groups.

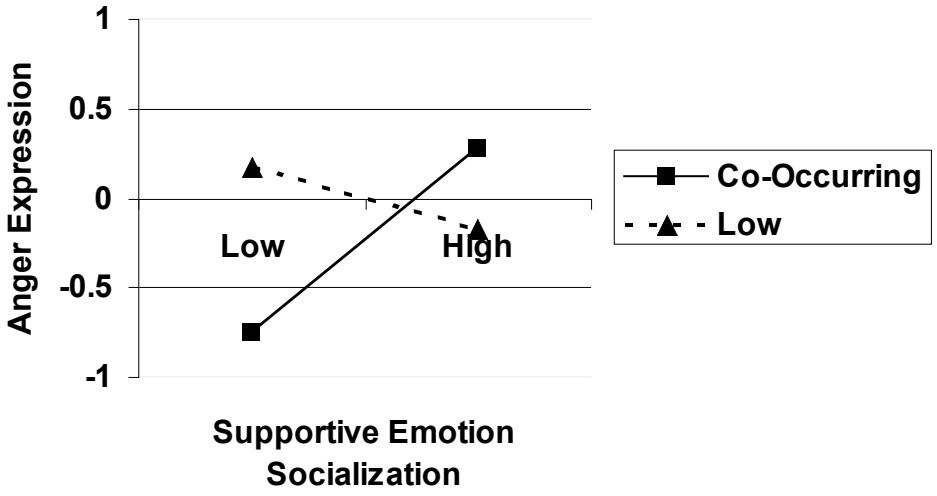

Figure 3. Interaction of Anger Expression and Supportive Emotion Socialization Differentiating 7-Year Co-Occurring and Internalizing Groups.

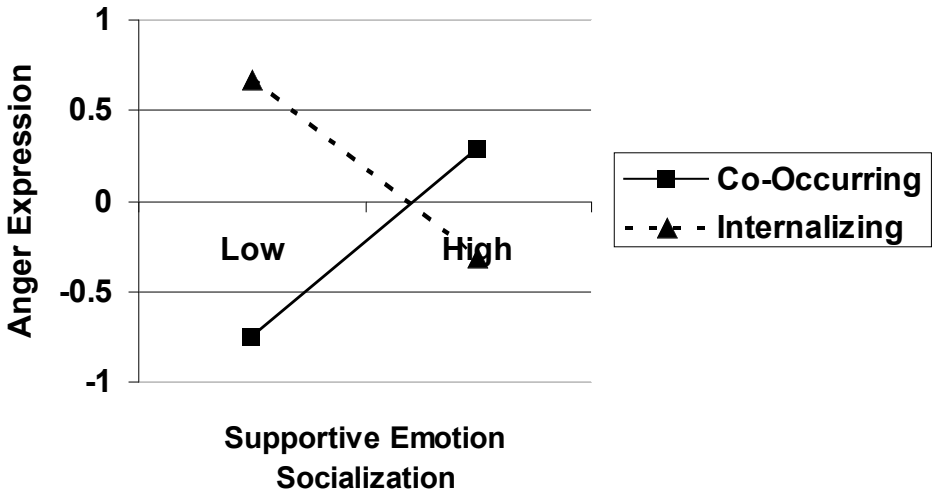

Figure 4. Interaction of 5-Year Anger and 7-Year Non-Supportive Emotion Socialization Differentiating 7-Year Low and Internalizing Groups.

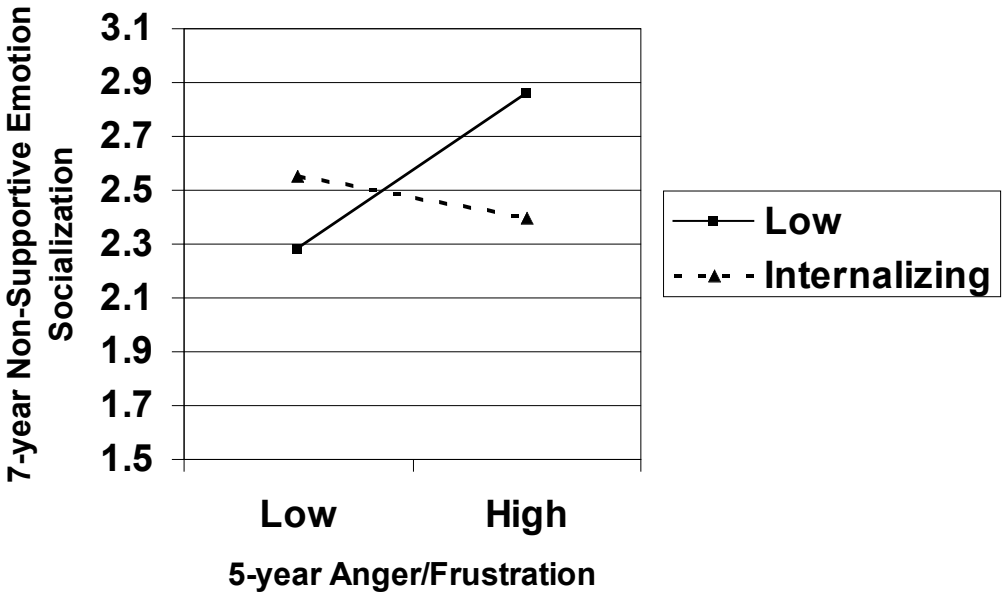

Figure 5. Interaction of Anger Expression and Supportive Emotion Socialization Differentiating Decreasing and Co-Occurring Stable Longitudinal Groups From 2-Class LTA Model