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Children's Resilience in the Presence of

Mothers' Depressive Symptoms: Examining Proximal Regulatory

Processes Related to Active Agency

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Processes Related to Active Agency

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Children's Resilience in the Presence of
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Processes Related to Active Agency

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Using a large sample from the NICHD Study of Early Child Care, the current study examined the processes through which children's agentic processes promoted their resilience in the face of mothers' depressive symptoms at first grade. Children's resilience in the presence of mothers' depressive symptoms was demonstrated to be homogeneous across domains of academic performance, social competence, internalizing behavior, and externalizing behavior. Children's effortful control, self-assertion, and mastery motivation predicted their resilience in these domains to a varying degree. The agentic processes mediated the relation of different patterns of individual (i.e., child intelligence, temperament), relational (i.e., attachment security), and environmental (i.e., maternal sensitivity, childcare quality) factors to children's resilience across domains. Interrelations among child individual, relational, and environmental characteristics were also observed. Moreover, findings from two analytic approaches converged in terms of underscoring the importance of the agentic system in promoting child resilience in the face of mothers' depressive symptoms. Children's agentic processes promoted their resilience via additive main effects rather than interactive effects.

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Introduction

Mothers' depressive symptoms pose significant risks for a diverse range of children's outcomes across development (Cummings & Davis, 1994; Downey & Coyne, 1990; Goodman & Gotlib, 1999; Goodman et al., 2011). However, despite this risk, some children still develop competently and manifest resilience (Compas, Langrock, Keller, Merchant, & Copeland, 2002; Hammen, 2003; Radke-Yarrow & Sherman, 1990). There has been accumulating evidence that, in the face of mothers' depressive symptoms, children who demonstrate academic and social competence without developing adjustment problems are characterized by a particular set of individual (e.g., high intelligence, agreeable temperament, emotion regulation, self-assertion, achievement motivation), relational (e.g., attachment security), and environmental (e.g, sensitive parenting, father involvement, positive relationships with teachers) characteristics (Campbell, Brownell, Hungerford, Spieker, Mohan, & Blessing, 2004; Garber, 1999; Mezulis, Hyde, & Clark, 2004; Radke-Yarrow & Brown, 1993; Silk, Shaw, Forbes, Lane, & Kovacs, 2006). However, little attention has been paid to the mechanisms through which the complex interplay of these individual, relational, and environmental factors leads to children's resilience over time. The current study proposed that a set of proximal regulatory processes function as the core factors promoting children's resilience. Specifically, proximal regulatory processes related to children's active agency – autonomy, effortful control, and mastery motivation – were examined to predict children's academic, social, and behavioral resilience during first grade. The current

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study also examined how these agentic proximal regulatory processes are promoted by children's individual (i.e., intelligence and low negative emotionality), relational (i.e., attachment security), and environmental (i.e., maternal sensitive parenting, father involvement, child care quality) factors.

Children's Resilience to Mothers' Depressive Symptoms

Resilience refers to the dynamic processes by which individuals manifest positive or normative developmental adaptation despite experiences of significant adversity or risk (Luthar, Cicchetti, & Becker, 2000; Masten, 2007; Masten & Coatsworth, 1998). It is well established that mothers' depressive symptoms pose significant risks for children's development (Goodman et al., 2011; Goodman & Gotlib, 1999). Particularly when mothers' depressive symptoms are chronic and severe across early childhood, children are more likely to display psychopathology and developmental deficits in cognitive, affective, and social domains (Alpern & Lyons-Ruth, 1993; Brennan et al., 2000; Goodman et al., 2011; NICHD, 1999). Given the expected developmental risks children face when their mothers are high in depressive symptoms (Goodman et al., 2011), why do some children still manifest competence without developing psychological problems or psychopathology (Compas et al., 2002; Hammen, 1991; Luthar et al., 2003)?

Empirical evidence that addresses this question comes mainly from two strands of research. The first strand adopts a person-oriented approach that evaluates characteristics that differentiate resilient from non-resilient children in the face of maternal depression (Hammen, 1991, 2003; Radke-Yarrow & Brown, 1993). In a small sample (n=54) of 5- to 8-year-old children whose mothers were severely depressed and experienced severe

familial risks, children, who had no diagnosis of psychiatric disorders at a 6 years follow-up, were compared with children who had one or more diagnoses (Radke-Yarrow & Brown, 1993). Compared with their non-resilient peers, resilient children were less shy or easily embarrassed, had higher IQs, had more positive relationships with peers, had a more supportive relationship with adults, had more positive self-perceptions, were more likely to have engaging interests or aspirations, were more likely to be the favored child in the family, and had more support from outside of the family. Qualitative data analyzed using the person-oriented approach also suggests that children who demonstrate resilience in the face of having a depressed mother are high in intelligence, agreeable temperament, effortful control, self-esteem, and achievement motivation (Hammen, 1991, 2003; Radke-Yarrow & Sherman, 1990).

The second strand of evidence comes from variable-focused studies that endeavored to identify moderators of the relation of maternal depression to children's insecure attachment, low positive affect, internalizing and externalizing problems, low peer competence, and psychopathology (Goodman & Gotlib, 1999; Goodman et al., 2011). Three sets of factors have been examined. First, based on the family stress model (Conger, Ge, Elder, Lorenz, & Simons, 1994) and family systems perspectives (Cummings & Davis, 1994; Goodman & Gotlib, 1999), family economic stress has been demonstrated to moderate maternal depression's effect on children's cognitive development, children's motor skills, and parents' child rearing practices. Among 3-year-old children living in affluent families, the negative effects of maternal depression on their cognitive and motor skills were attenuated compared with those among children

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living in poor families (Petterson & Albers, 2001). A meta-analysis of parenting behaviors of depressed mothers also found that the association between maternal depression and positive maternal behavior was moderate in magnitude among economically disadvantaged families, but virtually zero among non-disadvantaged women (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Thus, under little economic stress, mothers who are high in depressive symptoms may still manage to interact with their children in a positive and affectionate fashion (e.g., play, praise, responsive contact), which attenuates the impact of maternal depression on child development.

Second, competent parenting or a positive relationship with parents also buffers children from the negative consequences of maternal depression. When depressed mothers manage to display warmth and sensitivity, low intrusiveness, and low negativity, their children are more likely to exhibit high self-worth during middle childhood (Goodman, Adamson, Riniti, & Cole, 1994), less likely to have both internalizing and externalizing problem behaviors throughout childhood (Conrad & Hammen, 1993; Wang & Dix, 2013), and less likely to develop a clinical diagnosis of depressive disorder as adolescents (Brennan, Le Brocque, & Hammen, 2003). When a non-depressed father is more involved in child rearing or a positive relationship is formed between the father and the child, children of depressed mothers are less likely to develop internalizing problems during infancy (Mezulis, et al., 2004), early childhood (Carro, Grant, Gotlib, & Compas, 1993) and adolescence (Hops et al., 1987; Tannenbaum & Forehand 1994).

Third, child characteristics moderate the association between mothers' depressive symptoms and child outcomes (Goodman & Gotlib, 1999). When the child is high in

problem solving skills (Beardslee, Schultz, & Selman, 1987), low in negative emotionality (Dix & Yan, 2013), or high in emotion regulation abilities (Silk, et al., 2006), they were less likely to develop both internalizing and externalizing behaviors, more likely to be securely attached and to display adaptive social functioning even when their mothers' depressive symptoms are high.

Proximal Regulatory Processes in The Development of Resilience

This evidence suggests that children's resilience in the face of mothers' depressive symptoms is dependent on a variety of influences from children's individual, relational, and environmental factors (Langrock, Compas, Keller, Merchant, & Copeland, 2002; Radke-Yarrow & Brown, 1993). Yet to date, much of the research has been descriptive. It has described individual, relational, and environmental factors associated with children's resilience, but the psychological processes through which these factors function to promote resilience have not been specified. The current study proposed proximal regulatory processes related to active agency as the underlying mechanism responsible for children's resilience.

By proximal regulatory processes responsible for resilience, I mean the moment-to-moment motivational, cognitive, and emotional processes in children that regulate their responses to adverse environments. These processes may not only protect children from adverse effects in the short-term, but also enable children to generate strategies proactively and select environments that protect them from negative influences.   The notion that proximal regulatory processes are the underlying mechanisms of resilience is in line with prior attempts to address the role of what has been called the "fundamental

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adaptive processes" in human resilience (Cicchetti & Rogosch, 1997; Masten, 2007; Masten & Tellegen, 2012; Radke-Yarrow & Brown, 1993). In Radke-Yarrow and Brown's (1993) study of children from high-risk families, children's motivational system, achievement motivation in particular, was invoked as a fundamental adaptive process to account for the stability of resilience over time; In Cicchetti and his colleagues' research on resilience among maltreated children (Cicchetti & Rogosch, 1997), children's self-organizing strivings, such as self-esteem and internal locus of control, were theorized as within-child adaptive factors that function to promote resilience; In Masten's seminal work on resilience (2005), the maintenance and operation of   what she called the ordinary human adaptation systems, such as the motivation system, were conceptualized as the main factors contributing to children's resilience. Thus, there is consensus that competent development is robust in the face of adversity as long as children's fundamental adaptive processes are protected and maintained (Masten, 2011, 2007; Masten & Coatsworth, 1998). However, even though the importance of fundamental adaptation processes has been proposed repeatedly in resilience research, what specific motivational, cognitive, and emotional processes regulate resilience have never been specified or examined empirically. In the current study, children's agentic regulatory processes were proposed and examined as the central factors that promote their resilience (see Figure 1).

Proximal Regulatory Processes Related to Children's Active Agency

Processes related to children's active agency may promote children's resilience in the face of adversity. This proposal is drawn from the agentic theory of human

development (Bandura, 1989, 2006) and self-determination theory (SDT; Deci & Ryan, 1985, 2000; Ryan, 1993). Both theories assume that individuals are active agents; both are concerned with the degree to which individuals' behaviors are self-motivated or self-determined; and both highlight the reciprocal interplay (in agentic theory) or dialectic (in SDT) between individual agents and the environment. Attributes pertinent to these agentic processes might be crucial, counteracting the negative impact of aversive environments (Cicchetti & Rogosch, 1997; Radke-Yarrow & Brown, 1993). When children manage to maintain beliefs about their autonomous ability to control events; remain motivated to explore, manipulate, and master; and exercise control over their cognition, emotion, and behaviors, normal development may be maintained. In the current study, three aspects of the agentic system were examined to determine if they promote children's resilience across development: autonomy, effortful control, and mastery motivation.

Autonomy/self-assertion.   Autonomy is fundamental to growth, development, and personal well-being (Deci & Ryan, 1985, 1995, 2002; Ryan, 1993). Autonomous behaviors emanate from one's integrated sense of self, are based on an internal perceived locus of causality, and reflect one's independence from control by others (Deci & Ryan, 1985, 1995; Ryan, 1993). Individuals whose striving for goals is autonomous, rather than externally controlled, have higher life satisfaction, self-actualization, vitality, and empathy (Davis, 1980; Harter & Monsour, 1992; Sheldon & Kasser, 1995). One developmental milestone of children's growing autonomy is their willingness and ability to be assertive (Crockenberg & Litman, 1990; Ryan, 1993).

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Self-assertion is the form of autonomy examined in the current study. As a way of establishing their independence, children's self-assertion emerges as they grow into more competent individuals throughout childhood (Crockenberg, & Litman, 1990; Erikson, 1963). The beneficial effects of self-assertion are evident as early as toddlerhood. Children who are more assertive or were granted more autonomy engage in more negotiations with their mothers (Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987), are more developmentally advanced than other two- and three-year-olds (Vaughn, Kopp, & Krakow, 1984), and are more popular among peers (Black & Logan, 1995).

Autonomy is low among children of depressed mothers. Mothers' depressive symptoms create harsh, intrusive, and unresponsive parenting environments (Lovejoy et al., 2000) in which children cannot control the outcomes they receive or elicit support for their needs. In turn, they inhibit active and assertive social engagement with their depressed mothers (Dix & Buck, 2011). Toddlers whose mothers are high in depressive symptoms display low self-assertion (i.e., low active resistance) and none of the age-related increase in self-assertion that occur for other children (Dix, Stewart, Gershoff, & Day, 2007). However, when children develop autonomy and self-assertion despite mothers' depressive symptoms, they have relatively positive perceptions of themselves, tend to reach out to others, and draw out support from their depressed parents (Radke-Yarrow & Brown, 1993). In the current study, whether children's self-assertion predicts their resilience in the presence of mothers' depressive symptoms was examined.

Effortful Control. Effortful control is a temperament-based individual difference. It refers to individuals' ability to inhibit a dominant response to perform a subdominant response, the efficiency of executive attention, the ability to plan, and detect errors (Eisenberg, Spinrad, & Eggum, 2010; Liew, 2012; Liew, McTigue, Barrois, & Hughes, 2002; Rothbart & Bates, 2006). It is supported by a range of mechanisms central to self-regulation. The two most important are attention control (e.g., attention focusing, attention shifting) and inhibitory/activational control (Eisenberg, et al., 2010; Liew, 2012; Rothbart & Bates, 2006). The development of effortful control relates to the development of skills required for self-regulation (e.g. control over their attention, emotion, and behaviors; Masten & Coatsworth, 1998; Posner, & Rothbart, 2000) and active agency (Bandura, 2006; Deci & Ryan, 2002; Ryan & Deci, 2006). Effortful control predicts children's social and behavioral competencies: empathy and conscientiousness (Kochanska, 1995; Rothbart, Ahadi, & Hershey, 1994), academic performance (Blair & Razza, 2007; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008), low problematic behaviors (Eisenberg et al., 2009), high social competence with peers (Fabes, et al., 1999), and low delinquency during adolescence (Moffitt, et al., 2011; Eisenberg et al., 2005; see Eisenberg, Hofer, & Vaughan, 2007, for a review).

For children of depressed mothers, effortful control (or self-regulation in a broad sense) might be undermined (Goodman & Gotlib, 1999; Lengua, Honorado, & Bush, 2007). Among children whose mothers are high in depressive symptoms, low effortful control has been shown to predict problematic behavior (Gartstein & Fagot, 2003). The development and maintenance of effortful control has been shown to promote children's

resilience in the face of adversities other than mothers' depressive symptoms (Eisenberg et al., 2003, 2004). For children at risks for developing mood disorders, such as children of depressed mothers (Goodman & Gotlib, 1999; Goodman, et al., 2011), effortful control and self-regulation might be critical in reducing internalizing problems or mood disorders (Eisenberg et al., 2009; Luthar et al., 2000). When stress is high, children high in effortful control are able to shift their attention as needed, use cognitive distraction as a coping strategy, modulate the tendency to react negatively to stressful stimuli, and use focused attention to assist their planning behaviors (Eisenberg et al., 2009). However, little is known about the role of effortful control in protecting children of depressed mothers. The only study that has examined the interactive effects between effortful control and depressive parenting yielded null findings (Gartstein & Fagot, 2003). In the current study, whether children's effortful control predicts their resilience in the presence of mothers' depressive symptoms was examined.

Mastery Motivation. Mastery motivation is a critical component of children's emerging agency and competence (Bandura, 1989; Masten & Coatsworth, 1998; Ryan & Deci, 2000). It is children's experience of interest, enjoyment, focused attention, and persistence in manipulating and engaging tasks even in the face of challenge (Macturk & Morgan, 1995; Messer, 1993). When high in mastery motivation, individuals are more likely to experience intrinsic motivation, interest, enjoyment, and inherent satisfaction (Ryan & Deci, 2000). Through focused and persistent exploration, sustained by pleasurable and enthusiastic affect, mastery-oriented children are exposed to diverse environments, take advantage of opportunities to manipulate and control events, gain

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experience solving diverse problem on their own, and engage in a continuous process of accommodating and assimilating new events (Macturk & Morgan, 1995). Children's early mastery motivation predicts positive cognitive functioning among two- to eight-years-old (Banerjee & Tamis-LeMonda, 2007;   DiLalla et al., 1990; Gilmore, Cuskelly, & Purdie, 2003; Jennings, Harmon, Morgan, Gaiter, & Yarrow, 1979; Jennings, Yarrow, & Martin, 1984; Messer et al., 1986; Sigman, Cohen, Beckwith, & Topinka, 1987).

Research on child resilience has documented that constructs related to mastery motivation (e.g., achievement motivation, mastery-oriented behaviors, and intrinsic motivation) promote children's resilience (Langrock et al., 2002; Radke-Yarrow & Brown, 1993). Research suggests that, when coping with the stressful environment, mastery-related motivation and behaviors are more stable predictors of resilience than are other predictors (e.g., agreeableness, being lovable). This is thought to occur because children high in mastery motivation can shift their attention from the daily stress in the family environment to engaging in mastery-related activities and achieving mastery goals (Radke-Yarrow & Brown, 1993). Children with high mastery motivation focus their thinking on problem-solving strategies and solutions, which distracts them from the stress of parents' depressive symptoms (Langrock et al., 2002). Children's high achievement motivation, a construct related to mastery motivation, also provides a potential avenue for a positive relationship with parents, peers, and teachers (Radke-Yarrow & Brown, 1993). In the current study, the relations between children's mastery motivation and their resilience in the presence of mothers' depressive symptoms were examined.

Factors That Promote Agentic Processes

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The current study examines a set of child individual, relational, and environmental factors that have been demonstrated to affect children's agentic processes. These factors were proposed to promote children's resilience in the presence of mothers' depressive symptoms through the mediating roles of the agentic system (see Figure 1).

Children's individual characteristics. Two individual characteristics have been consistently associated with developmental competence among children who are at developmental risks due to their mothers' depressive symptoms. The first is children's temperament. Resilient children have been characterized as less shy, less easily embarrassed, and more socially engaging in temperament compared with non-resilient children (Radke-Yarrow & Brown, 1993; Radke-Yarrow & Sherman, 1990). When children are low in negative emotionality, mothers' depressive symptoms are less likely to be associated with children's behavioral problems, low social competence, unresponsive behavior, and separation distress (Dix & Yan, 2013). Child positive emotionality or easy temperament also predicts children's agentic regulatory processes. It has been associated with children's high mastery motivation (Macturk & Morgan, 1995; Morrow & Camp, 1996) and effortful control (Eisenberge, et al., 2005; Rothbart, Ellis, Rosario Rueda, & Posner, 2003). Moreover, children's low difficult temperament elicits less negative parenting from mothers high in depressive symptoms (Dix & Yan, 2013), which, in turn, might also promote mastery motivation (Macturk & Morgan, 1995), autonomy (Grolnick, Gurland, Decourcey, & Jacob, 2002) and effortful control (Eisenberg, et al., 2005). Thus, the relation of positive emotionality to children's

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resilience might be indirect, the result of high effortful control, autonomy, and mastery motivation in the proximal regulatory system.

The second individual difference in children that has been associated with children's resilience is intelligence. Among 5-, 6-, and 10-year-old children of depressed mothers, resilient children have higher IQs than non-resilient children (Radke-Yarrow & Brown, 1993; Radke-Yarrow & Sherman, 1990). Children's problem solving skills, one important facet of intelligence, have been shown to facilitate children's coping with maternal depression (Langrock et al., 2002). Related research on children who experience severe and chronic adversity (e.g., stressful life events) found that, intelligence in early childhood was a robust predictor of resilience among late adolescents (Masten et al,, 1999). Preliminary evidence has suggested that intelligence promotes children's proximal regulatory processes, particularly mastery motivation and effortful control. Documented in qualitative interviews with the resilient children of depressed mothers (Radke-Yarrow & Brown, 1993), children's intelligence could lead to successful experiences in mastery activities and thereby promote their motivation to engage in academic activities; one indicator of fluid intelligence – working memory – is associated with high attention focusing and control (Engle, Kane, Tuholski, 1999), a major component in effortful control. Therefore, the existing association between intelligence and resilience might be the result of children's agentic regulatory processes.

Relationship characteristics. Research examining child resilience in the face of a wide range of adverse factors suggests that parent-child relationships might be a particularly important predictor of child resilience. One important relationship indicator

associated with children's competent development in the face of mothers' depressive

symptoms is their secure attachment (Belsky & Fearon, 2002). It has been documented

that children of depressed mothers who do not develop psychiatric disorders during

adolescence are more likely to have secure attachment with their mothers in early

childhood (Hammen, 1991, 2003). More importantly, secure attachment is a strong

predictor of important psychological processes related to active agency. Children's secure

attachment at 18-months predicts their enthusiastic and persistent behaviors during free

play in the second year (Matas, Arend, & Sroufe, 1978). The prediction from mother-

child attachment and academic motivation has also been demonstrated in later childhood

(Learner & Kruger, 1997). Also, compared with insecurely attached children, children

with secure attachment are better at emotion understanding (Laible, 2004; Laible &

Thompson, 1998), less susceptible to negative emotions over time (Kochanska, 2001),

and, therefore, more likely to develop high effortful control. The quality of mother-child

attachment also predicts children's positive sense of self, a construct related to autonomy

(Verschueren & Marcoen, 1999). Thus, the relation of mother-child attachment to

children's resilience in the presence of mothers' depressive symptoms may be due to the

fact that the quality of mother-child attachment predicts agentic processes.

Family environment. One prominent protective factor for children whose

mothers are high in depressive symptoms is effective parenting. First, when mothers are

high in depressive symptoms, maternal warmth and supportive behaviors minimizes the

detrimental impact of their depressive symptoms on children (Campbell et al., 2004;

Goodman, et al., 2011; Masten et al., 1999; Wang & Dix, 2013). This has been

demonstrated in studies that examine the interacting effects of maternal depression and parenting behavior (Campbell et al., 2004). Studies that compare resilient and non-resilient children also suggest that resilient children receive more sensitive parenting from their mothers than do non-resilient children (Radke-Yarrow & Brown, 1993). Second, when mothers are high in depressive symptoms, positive involvement with alternative caregivers, such as fathers, reduces children's risk for behavior problems (Chang, Halpern, & Kaufman, 2007; Fletcher, 2009; Mezulis, et al., 2004). Furthermore, evidence shows that supportive, low intrusive, and autonomy-granting parenting predictes children's effortful control (Eisenberg et al., 2005; Kochanska, Murray, & Harlan, 2000; Lengua, Honorado, & Bush, 2007), autonomy (Crockenberg, & Litman, 1990; Grolnick et al., 2002), and mastery motivation (Kelley, Brownell, & Campbell, 2000; Macturk & Morgan, 1995; Messer, 1993). Thus, the association between effective parenting and children's resilience in the face of mothers' depressive symptoms might be explained by the beneficial effects of effective parenting on children's effortful control, autonomy, and mastery motivation.

Childcare environments. After entering childcare centers, children interact with their parents less. Teachers start to serve as surrogate parents. For children at risk due to their mothers' depressive symptoms, the quality of their schools or childcare centers might be particularly important. High quality childcare or school settings feature high sensitivity to children's individual needs, positive affect while interacting with children, a cognitively stimulating environment, a warm positive classroom atmosphere, and a well-structured instructional climate (Howes, 2000; Phillips, McCartney, & Scarr, 1987;

Burchinal et al., 2000).   Although to my   knowledge no studies have examined explicitly whether childcare center or school environments ameliorate the negative impact of maternal depression, there is evidence from studies of children in other high risk families that supports this proposal. High quality schooling and school-based supportive ties have been shown to buffer the child from the risks of problematic family environments and close the developmental gap between at-risk children and their low-risk peers (Dubois, Felner, Brand, Adam, & Evans, 1992; Hamre & Pianta, 2005). Intervention studies have also shown that school-based interventions help children cope with stress (Felner & Felner, 1989; Pedro-Carroll & Cowen, 1985). Positive childcare experience might contribute to children's resilience by promoting children's agentic proximal regulatory processes. Teachers' provision of autonomy support, well-structured classroom instruction, and a warm and supportive classroom climate predict children's achievement motivation (Skinner & Belmont, 1993), effortful control related self-regulation (Boekaerts & Corno, 2005), and independent and autonomous behaviors (Niemiec & Ryan, 2009; Stefanou, Perencevich, DiCintio, & Turner, 2004). Thus, the association between childcare environments and children's resilience in the face of mothers' depressive symptoms might be explained by the beneficial effects of high childcare quality on children's effortful control, autonomy, and mastery motivation.

The Homogeneity or Heterogeneity of Resilience across Developmental Domains

A secondary aim of the study is to determine whether children's resilience in the presence of mothers' depressive symptoms is homogeneous or heterogeneous across developmental domains. Prior research on children's resilience in the face of adversities

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other than maternal depression has implied the homogeneous nature of resilience across domains (Masten, 1999). However, children's functioning is not always comparable across developmental domains (Cicchetti, 1993; Luthar, et al., 2000). Different children might demonstrate different patterns of resilience in different domains (Luthar, et al., 2000; Masten, 2011). Resilience in one domain does not necessitate resilience in all domains: some children could demonstrate resilience characterized by high academic performance and social competence; other children, by low internalizing problems (Luthar, et al., 2000). Among resilient children of depressed mothers, academic resilience has been shown to be more prevalent than behavioral resilience (Luthar, 2003). Even though the heterogeneity of resilience has been repeatedly proposed (Luthar, et al., 2000; Masten, 2011), distinct patterns of resilience have not been examined empirically. The current study will explore patterns of resilience across the developmental domains of academic performance, social competence, internalizing behaviors, and externalizing behaviors. This would demonstrate whether resilience in these domains converge together or distinguish from each other. Moreover, by identifying the different patterns of resilience across domains, the current study will also be able to examine whether the mediating effects of agentic processes in promoting children's resilience would function differently for children in different resilient groups.

Methodological Considerations in Studying Resilience

Two methodological issues merit consideration in studying resilience. First, three different approaches have been employed in prior studies to understand child resilience: person-oriented approaches, variable-oriented approaches, and development-beyond-

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expectation approaches. These approaches have different advantages and disadvantages; use of any single approach is limited. In the person-oriented approach, groups of resilient and non-resilient children are identified based on their developmental competence in the face of adversity. Then, proposed resilience factors are compared between resilient and non-resilient individuals. This approach is unable to provide information on the underlying mechanisms responsible for why resilience develops, but it is an efficient method of empirically testing protective factors (Bergman & Magnusson, 1997). In the variable-oriented approach, the detection of resilience relies on the interactive effects of risk factors and resilience factors. Statistically, interacting effects are difficult to detect and tend to be unstable across studies (Luthar, et al., 2000); theoretically, factors could contribute to children's resilience either through their main effects or by modifying the impact of risk factors on outcomes. Thus, relying on interactive effects between risk and resilience factors to demonstrate resilience is not necessary. However, the variable-oriented approach is able to determine why resilience factors lead to competence by testing whether the association between the risk factor and developmental outcomes is moderated by the resilient factors (Luthar et al., 2000). Consistent with the view that adaptation can occur through trajectories that defy normative expectations (Cicchetti, 2010), the development-beyond-expectation approach models resilience as the developmental residuals not predicted by the risk factors. This approach is less often used compared with the other two approaches (Baldwin, et al., 1993; Kim-Cohen, Moffitt, Caspi, & Taylor, 2004). One limitation to this approach is that it is also possible that residual variance from a regression model reflects measurement error rather than

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meaningful variance related to resilience. However, by using residual scores, resilience can be modeled as a continuous endogenous variable, allowing for the examination of indirect paths leading to resilience. Residual scores are also completely uncorrelated with the risk factor, which minimizes the possibility that the demonstration of resilience is due to insufficient exposure to the risk environment (Luthar, et al., 2000). By employing all three approaches, the current study enables the development of a comprehensive understanding of resilience through use of diverse statistical methods.

Second, as implied by Bronfenbrenner's (1977) ecological theory, Cicchetti & Lynch's (1993) integrative ecological-transactional model, and Masten's (2007) system perspective on resilience, factors at the individual and environment levels may function together to affect an individual's resilience. As a result, they should be examined together as a system. However, there is a dearth of empirical research that examines systematically how factors function collectively to promote children's resilience (Zimmerman & Arunkumar, 1994; Masten, 2007). Typically, factors associated with children's resilience are studied separately in different studies (Beardslee, et al., 1987; Brennan et al., 2003; Mezulis, et al., 2004; Petterson & Albers, 2001). Even when a set of resilience factors is included in the same study, individual factors are examined in separate analyses, and their co-occurrence is unexamined (Luthar, 2003; Radke-Yarrow & Sherman, 1990). Children's high intelligence and emotional regulation, for example, have been associated with children's resilience (Radke-Yarrow & Brown, 1993). However, without examining both of them in the same analysis, it is unclear whether child intelligence promotes resilience independently or, instead, due to its association

with emotion regulation. Moreover, both transactional (Sameroff, 2009; Sameroff & MacKenzie, 2003) and ecological (Bronfenbrenner, 1977) models imply that the ways in which resilience is shaped by mechanisms across multiple factors may be complex. For instance, there could be child-driven effects. Children's low negative emotionality might elicit positive parenting such that the prediction from low negative emotionality to children's resilience might be mediated by children's elicitation of positive parenting environments (Masten, 2007). The complex interactions among factors associated with children's resilience will not be fully understood until these factors are conceptualized in the same system and examined together.

The Current Study

Using a large national sample followed from infancy to first grade, the current study examined the mechanisms through which children's individual, relational, and environmental characteristics contribute to their academic, social, and behavioral resilience at first grade when mothers' cumulative depressive symptoms are high. Specifically, proximal regulatory processes related to active agency were examined as the mechanism. First, the homogeneity or heterogeneity of resilience across domains in the presence of mothers' depressive symptoms were examined. Then, employing multiple methods to model resilience, the current study examined two major ways in which agentic processes regulate resilience. The first emphasizes agentic processes as mediators between their determinants and children's resilience outcomes; the second emphasizes agentic processes as moderators in the prediction of child adjustment outcomes from maternal depression.

First, the study examined whether children's resilience in the presence of mothers' depressive symptoms is homogeneous or heterogeneous across the domains of social competence, academic performance, internalizing behaviors, and externalizing behaviors. Given that both the homogeneity and heterogeneity of resilience across domains have been implied in prior research without any empirical evidence, this examination of patterns of resilience across domains is exploratory in nature. With the patterns of resilience identified, whether the following two hypotheses function differently for children with different patterns of resilience were also examined.

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Second, the study examined the proposal that the relation of children's individual, relational, and environment characteristics (i.e., high intelligence, low negative emotionality, sensitive parenting, father involvement, attachment security, and high child care quality) to children's academic, social, and behavioral resilience in the face of maternal depression is mediated by children's autonomy, effortful control, and mastery motivation. In other words, the study examined whether child individual characteristics and environmental differences are associated with children's resilience due to their tendency to promote agentic processes (i.e., self-assertion, effortful, and mastery motivation).

Third, the study examined the proposal that children's self-assertion, effortful control, and mastery motivation moderates the negative impact of mothers' depressive symptoms on children's academic performance, social functioning, and behavioral problems at first grade. As children's self-assertion, effortful control, or mastery motivation increase, the association between mothers' depressive symptoms and children's academic performance, social functioning, and behavioral problems at first grade should decline.

Method

Participants

Recruited from 10 sites across the United States, participants were families from the NICHD Study of Early Child Care. Initially, they were contacted in the hospital shortly after the birth of the target child. Families were excluded if the birth included medical complications or if the mother was under 18, not fluent in English, known to abuse drugs, or lived outside of the catchment area. The final NICHD sample consisted of 1,364 families. The sample characteristics are displayed in Table 1. The sample included a comparable number of males (N=705) and females (N=659). 19.6% of the sample was from an ethnic minority group (12.9% African-American, 6.1% Hipanic, 1.6% Asian). At enrollment, on average, mothers were 28.1 years old, had 14 years of education, and an income-to-needs ratio of 2.86. 76.7 % were married; 85% of fathers lived in the home.

Procedure

This report is based on data collected at six points in early development: 6 months, 15 months, 24 months, 36 months, 54 months, and first grade ($M = 72$ months). Data were obtained from classroom and laboratory observations and the reports of mothers, fathers, and teachers. Mothers' depressive symptoms were measured at each of these assessments to index mothers' cumulative depressive symptoms. First grade adjustment measures were either observed or reported by mothers, fathers and teachers. The three agentic processes – self-assertion, effortful control, and mastery motivation – were measured at 54 months. The determinants of the agentic processes were assessed between 6 months and 54 months.

Mothers' Depressive Symptoms

Using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), mothers' reported their depressive symptoms at 6 months, 15 months, 24 months, 36 months, and 54 months. The CES-D is widely used to measure depressive symptoms in non-clinical samples. During each home visit, mothers rated on 4-point scales (from "rarely or none of the time" to "most of the time") the frequency of 20 symptoms over the past week (e.g., "I had crying spells," "My sleep was restless," "I felt lonely"). The CES-D has good internal consistency, with alphas at each assessment ranging from .87 to .91. It distinguishes psychiatric from normal populations and is correlated with measures of psychopathology and negative affect (Radloff, 1977). To capture mothers' depressive symptoms over time, CES-D scores from 6 months to first grade were averaged.

Agentic Regulatory Processes

Self-assertion. Children's self-assertion was reported by mothers and fathers using the Assertion Subscale of the Social Skill Rating System (SSRS-Parent Form; Gresham & Elliott, 1990). Parents were asked to rate how often a social behavior occurs on a 3-point scale (0 = never, 1 = sometimes, 2 = very often). The assertion subscale assesses children's initiating behaviors, such as starting conversations with others, accepting friends' ideas for play, and reporting accidents to appropriate persons. The assertion subscale has good internal reliability among mothers ($\alpha = .76$) and fathers ($\alpha = .74$; Gresham & Elliot, 1990). Mothers' and fathers' reports on self-assertion were hypothesized to form a latent factor of self-assertion for analysis.

Effortful control. Measures of children's effortful control were obtained from laboratory observations, parents' reports, and caregivers' reports at 54 months. First, children's sustained attention was measured from the Continuous Performance Task (CPT) for young children (Mirsky, Anthony, Ducan, Aheani, & Kellam, 1991). CPT is an approximately 7-minute computer-generated task in which dot matrix pictures of familiar objects are presented on a screen in front of the child. Ten stimuli were presented in each block, and there were 22 blocks in total. The target stimulus (a dot matrix of a chair) was randomly assigned in each block. The child was asked to press a button each time the targeted stimulus appeared. Following earlier published work using the same dataset (Belsky, et al., 2007; NICHD, 2003), I used the number of omission errors from this task as an indicator of sustained attention. As a measure of attention, the CPT has adequate test-retest reliability and high content validity (Halperin, Sharman, Greenblat, & Schwartz, 1991). Second, children's effortful control was reported by caregivers and mothers using the Children's Behavior Questionnaire (CBQ; Rothbart et al., 1994). This measure includes three broad dimensions of children's reactions to different situations; the dimension of effortful control was used in the current study. Specifically, mothers completed 10 items on inhibitory control and 9 items on attention focusing; caregivers completed 10 items on inhibitory control and 8 items on attention focusing. The omission error indication from the CPT, reports of mothers and teachers of inhibitory control and attention focusing were hypothesized to form the latent variable of effortful control. The measurement model was examined using Confirmatory Factory Analysis.

Mastery motivation. Mastery motivation contains two key components:

instrumental mastery (i.e., persistence, exploration) and expressive mastery (i.e.,

enthusiasm, positive affect; Macturk & Morgan, 1995; Yarrow et al., 1983). As done in

previous research (Jennings et al., 1984; Kelley et. al., 2000; Macturk & Morgan, 1995;

Messer, 1993), mastery motivation was measured here by observing children's

persistence (instrumental mastery) and enthusiasm (expressive mastery) during 15-minute

semi-structured procedure at 54 months. Among the three activities in the procedure, the

first two were too difficult for the child to carry out independently and required the

mother's assistance. The third one encouraged play between the mother and the child

(NICHD, 2003). The first activity was to complete a maze task using an Etch-A-Sketch;

the second one was to form a series of same-sized rectangular cube towers from various

shaped blocks; the third one was to play with six hand puppets (i.e., 2 parrots, 2 frogs,

and 2 alligators).

All observation videos were shipped to a central site for coding. Tapes were

randomly assigned to coders, and all coders received extensive training before coding.

Coders were blind to all information about the observed families. 7-point qualitative

rating scales were used to rate children's enthusiasm and persistent orientation to the

tasks. Inter-coder reliabilities for enthusiasm and persistence were .84 to .86 respectively.

They were hypothesized to form a latent construct, mastery motivation.

Predictors of Agentic Regulatory Processes

Child temperament. At 6-month assessments mothers completed the Infant

Temperament Questionnaire (Carey & McDevitt, 1978), a 56-item instrument that yields

scores on 5 dimensions – activity, approach, adaptability, mood and intensity. Infants'
temperamental characteristics were rated on a 6-point scale from "almost never" to
"almost always". Of principal importance here was the total difficult or irritable
temperament score, which was the average of all items.

Intelligence. Children's early mental development was used as a proxy for
intelligence. It was measured at 15 months using the Mental Development Index (MDI)
of the Bayley Scales for children. The MDI is the most widely used measure of children's
cognitive functioning in the first two years of life. Trained and certified test
administrators administered the scales to the child at the 15-month laboratory visit. The
scale taps children's sensory-perceptual acuities and discriminations; memory, learning,
and problem-solving; early verbal communication; and the ability to form generalizations
and classifications. It correlates with Stanford-Binet IQ at 24, 27, and 30 months (average
$r = .57$).

Attachment. Children's attachment was measured at 36-month using the modified
version of the Strange Situation procedure (Cassidy, Marvin, & the MacArthur Working
Group on Attachment, 1992). Two mother-child separations and subsequent reunions in
an unfamiliar laboratory context with an adult stranger were observed. Children's
reactions to these stressful episodes were observed to measure children's attachment
behaviors. Because different categories of attachment are not of major interest in the
current study, the continuous rating of secure attachment was used for analyses. Coders
made a global 9-point security rating (1 = very insecure, 3 = insecure, 5 = probably
secure, 7 = secure, and 9 = very secure). The rating was highly correlated with binary

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attachment category ($r = .85$, $p < .001$). This validity of the continuous variation of attachment rating has been demonstrated in prior research (Fraley & Spieker, 2003).

Mothers' sensitivity. Maternal sensitivity was observed during laboratory interactions at 15- and 54-months. At 15 months, mothers and children played with age-appropriate toys (e.g., toy stove, drawing materials, blocks); at 54 months, they built towers, completed an Etch-A-Sketch task, and played with puppets. Recordings of interactions were sent to a central location and evaluated by coders' blind to information about mothers and children. At 15 months, 4-point ratings of mothers' supportive presence, respect for the child's autonomy, and hostility were coded; at 54 months, the same dimensions were coded on 7-point ratings. Maternal sensitivity was the sum of these scales. The sensitivity composite had high internal consistency ($\alpha = .70$ at 15 months and .84 at 54 months) and interrater reliabilities ($\alpha = .76$ at 15 months and .88 at 54 months). Prior research has been shown that this measure of sensitivity predicts numerous aspects of children's functioning (Campbell, et al., 2007; NICHD, 1999, 2003).

Father involvement. Two indicators of fathers' involvement were examined. First, at 1-, 6-, 15-, 24-, 36-, and 54-months, whether fathers lived in the home was reported as a dichotomous variable. Second, father's involvement with the child was measured at 6-, 15-, 24-, and 36-months using the measure My Time Spent as a Parent (Part 1). It includes 16 items assessing the division of child care responsibilities within the family. These items are rated as 1 = partner's job, 2 = mostly partner's job, 3 = we share it equally, 4 = mostly my job, 5 = my job, or 6 = not applicable. The scale has

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excellent internal consistence (α = .86). However, an unacceptable proportion of missing values were detected for the second measure (i.e., 60% of data were missing on average). Therefore, whether there is a father at home was used as the indicator for the father's involvement in children's lives. Whether there was a father at home up to15-months and 54-months were averaged to create the aggregate scores used in all analyses.

Child care quality. Child care quality was observed from the Observational Record of the Caregiving Environment (ORCE) at 54-month. At least four cycles of observation were collected in two visits to the child care setting. A cycle consisted of three 10-minute intervals of continuous recording, broken by 2-minute intervals for qualitative note-taking, followed by a 10-minute interval of observation focused on global qualities of behavior. In the qualitative ratings section of the procedure (i.e., the 2-minute intervals), 4-point rating scales were developed to address important qualities of the caregiving environment. The scales include 4 dimensions of the caregivers' behaviors with the targeted child: intrusiveness, detachment, stimulation of cognitive development, and sensitivity/responsiveness. A composite score of childcare quality was created by averaging these ratings. The composite score had high internal reliability (α = .72).

Child Outcomes at First Grade

Academic performance. Children's academic performance at first grade was obtained from two teacher-report measures. Teachers evaluated first-grade cognitive functioning on two measures, the Academic Rating Scale, a 31-item instrument that yields verbal and mathematical subscales (for verbal, α =.95; for mathematics, α=.92), and the Academic Performance Subscale of the Social Skills Rating System (SSRS), a 9-

item subscale on which teachers compare children's academic competence with that of their peers (1 = lowest 10%, 5 = highest 10%; α = .94). Scores on the two teacher-report measures were used to from a latent variable, academic performance at first grade.

  Social competence. In order to reflect children's social competence across multiple contexts, measures of children's social competence were obtained from mothers, fathers, and teachers' reports respectively. First, mothers, fathers and teachers completed the 10 items on peer competence from the Social Skills Rating System (SSRS). These items assess four key social skills: cooperation, assertion, responsibility, and self-control (α = .85 for teachers, .74 for mothers; 68 for fathers). Second, on 6-point scales, teachers evaluated peer status by completing four items from the *Friends or Foe* scale (α = .88). Third, children's relationship with teachers was assessed with the 30-item *Student-Teacher Relationship Scale*. This measure yields two scores, closeness and conflict (reverse scored), which were aggregated to create a total positive relationship score (α = .91). These three measures were used to create a latent social competence factor at first grade.

  Behavioral problem. Children's behavioral problems at first grade were assessed using parents' reports on the Child Behavior Checklist (CBCL/4-18) and teachers' reports on the Teacher Report Form (TRF), which is modeled on the CBCL. About 100 items describing child behaviors currently or over the last two months were rated on 3-point scales from 0 (not true of the child) to 2 (very true of the child). Scores reflecting internalizing problems were derived from subscale scores on anxious/depressed, somatic complaints, social problems, thought problems, and withdrawal; scores reflecting

externalizing problems were derived from subscale scores on aggressive behaviors and delinquent behaviors. Mother-, father-, and teacher-reported internalizing problems were hypothesized to form a latent factor of internalizing problems; mother-, father-, and teacher-reported externalizing problems were hypothesized to form a latent factor of externalizing problems.

Covariates

Data on child gender, ethnicity, income-to-needs ratio, maternal education, marital status, and data collection site were collected at 1 month. They were controlled in all analyses.

Analysis Plan

All analyses were conducted using *SPSS 19* and *Mplus* 7 (Muthen & Muthen,

2012). Missing data were handled by using Full information maximum likelihood (FIML)

estimation.   The robust maximum likelihood (MLR) estimation was used to handle

potential violations of the independence assumption to achieve more robust standard

errors. Model fit was examined using the criteria recommended by Hu and Bentler

(1999): RMSEA < .06; CFI > .95; SRMR < .08. In multiple group analyses, the Satorra-

Bentler scaled chi-square difference test was used for model comparisons (Satorra, 2000).

The analyses proceeded in five steps. The first two steps set up the data for analyses; the

third step explored the first research question on the homogeneity or heterogeneity of

resilience across domains, and provided preliminary support for testing hypotheses two

and three; the fourth step examined the second hypothesis that children's agentic

regulatory processes mediate the relation between their determinants and children's

resilience at first grade; the fifth step tested the third hypothesis that children's agentic

regulatory processes moderate the impact of maternal depression on children's outcomes.

Preliminary Analyses

First, confirmatory factory analyses (CFAs) were used to test hypothesized

measurement models. For the agentic regulatory variables, the measurement model

included self-assertion, effortful control, and mastery motivation at 54 months (see

Figure 2). Measures for children's behavioral problems at first grade were tested in one

model (see Figure 3); measures for social competence and academic performance were

tested in a separate model (see Figure 4). As the model fit indices were all in the

recommended range and all loadings on the latent factors were strong and significant, the measurement models fit the data well and were used in following analyses. The factor scores from the CFA for children's academic performance, social competence, internalizing behaviors, and externalizing behaviors were saved for subsequent analyses.

Second, to be used in hypothesis testing, children's resilience scores for academic performance, social functioning, internalizing behaviors, and externalizing behaviors were created. Children's resilience scores at first grade were created for each domain by saving the standardized residuals from regressions analyses predicting children's first-grade outcomes from mothers' cumulative depressive symptoms. Four regression analyses were conducted, one each for children's academic performance, social competence, internalizing behaviors, and externalizing behaviors. In each analysis, the dependent variable was one of the factor scores saved from the CFAs noted above; the independent variable was mothers' cumulative depressive symptoms from 6 months to first grade. Thus, the standardized residuals from these analyses yielded a continuum of resilience scores for each of the four outcome variables. The resilience scores for internalizing and externalizing behaviors were recoded so that higher scores indicate higher resilience.

Testing Hypothesis One

Third, based on these resilience scores (i.e., residual scores), latent profile analysis (LPA) was used to explore patterns of resilience across the domains of academic performance, social functioning, internalizing behaviors, and externalizing behaviors. The profile solutions of 1 to 6 classes were tested sequentially.   The number of profiles

was determined jointly on a significant Lo-Mendel-Rubin Test (LMRT), the minimization of the Bayesian information criterion (BIC) and the sample size adjusted BIC (ABIC), and the maximization of the loglikelihood values (Nylund, Asparouhov, & Muthén, 2007).

In order to provide preliminary support for testing the second hypothesis, children with different patterns of resilience were compared on agentic regulatory processes (i.e., self-assertion, effortful control, and mastery motivation) and their determinants (i.e., child temperament, child intelligence, sensitive parenting, father involvement, and child care quality). Given that all the agentic processes and their determinants are continuous variables, mean differences were examined with ANOVAs and Tukey HSD post hoc tests.

Testing Hypothesis Two

Fourth, the hypothesis that children's agentic regulatory processes (i.e., self-assertion, effortful control, and mastery motivation) mediate the relation of child temperament, intelligence, maternal sensitivity, father involvement, and child care quality to children's resilience (i.e., academic performance, social functioning, internalizing behaviors, and externalizing behaviors) was examined using path analyses. The model used children's resilience scores (i.e., residual scores) in individual developmental domains as endogenous variables (see Figure 8); All indirect paths involving children's self-assertion, effortful control, and mastery motivation were examined to determine if the relation of individual difference and environmental variables to resilience was mediated by agentic regulatory processes.

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Multiple group analyses were conducted to examine whether the hypothesized model functioned differently for children with different patterns of resilience. The Santorra-Bentler scaled chi-square difference tests were used for model improvement testing.

Testing Hypothesis Three

Fifth, path analysis was used to test the second hypothesis, that children's self-assertion, effortful control, and mastery motivation promote resilience by moderating the impact of mothers' depressive symptoms on children's academic performance, social competence, internalizing behaviors, and externalizing behaviors. The interaction among mothers' depressive symptoms and children's self-assertion, effortful control, and mastery motivation were examined to predict children's academic performance, social competence, internalizing behaviors, and externalizing behaviors (see Figure 9).

Results

Descriptive statistics of the major variables are displayed in Table 2. The bivariate correlations among hypothesized manifest variables (see Table 3) provided preliminary support for testing hypothesized measurement models. With the latent variables verified, bivariate correlations between those factors scores and other major variables were conducted. The results are displayed in Table 3 (for additional details, see the section below).

Measurement Models and Bivariate Correlations among Major Variables

Confirmatory factor analysis was conducted to determine the adequacy of the measurement model for self-assertion, mastery motivation, effortful control, internalizing behaviors, externalizing behaviors, social competence, and academic performance. They were tested in three models respectively. The first measurement model included the three agentic processes – effortful control, self-assertion, and mastery motivation (see Figure 2). The measurement model fit the data, χ^2 (1, N=1091) = 64.89, p = .00, CFI= .981, RMSEA= .045, SRMR= .036. All observed variables loaded significantly and strongly on their corresponding latent constructs. The measurement model for internalizing and externalizing behaviors is shown in Figure 3. This model also fit the data adequately well, χ^2 (1, N=1069) = 15.58, p = .01, CFI= .992, RMSEA= .044, SRMR= .029. The third measurement model included measures of children's academic performance and social competence (see Figure 4). The model fit the data well, χ^2 (9, N=1071) = 7.42, p = .59, CFI= 1.000, RMSEA= .000, SRMR= .009. Factor scores from the measurement models were saved and used in subsequent analyses.

Using factor scores from the measurement models, bivariate correlations among the major variables of interest were examined. The results are displayed in Table 3. The correlations among the three agentic regulatory processes were all significant (rs ranged from .15 to .21). The agentic regulatory processes were all associated significantly with children's first-grade outcomes in the expected direction, except that the relation between self-assertion and externalizing behaviors was not significant. As hypothesized, the three agentic processes were significantly and consistently associated with individual and environmental differences in the expected direction, except that mastery motivation was not associated significantly with child care quality at 54-month.

Hypothesis One: Identifying Distinct Patterns of Resilience

Latent variables for each outcome (academic performance, social competence, internalizing behavior, and externalizing behavior) saved from the measurement models were used to create children's resilience scores in these four domains in four regression models separately. Each outcome was regressed on mothers' cumulative depressive symptoms in each regression model, and the standardized scores were saved as resilience scores. The descriptive statistics are in Table 2.

Based on the resilience scores in the four domains, Latent Profile Analyses were performed to identify distinctive patterns of resilience across domains. The three-class model fit the data best. The AIC, BIC, and ABIC all declined from the two to the three-class model (see Table 4). The entropy statistic for the 3-class model was higher than the recommendations in the literature (Jung &Wickrama, 2008). The LRT test also indicated that the three-class model fit the data better than the two-class model. In all cases, the

class probabilities were above 80%, indicating that the model was likely to assign parents to the correct profile. Thus, converging evidence demonstrated that the three-class model fit the data best. Based on their relative scores on the resilience measures, the three profiles were labeled the vulnerable group (low residuals), normal-functioning group (residuals close to 0), and resilient group (high residuals).

Figures 5 and 6 display two representations of the three patterns of resilience across domains. 50.3% of children were assigned to the normal-functioning group. Across the four domains, their resilience scores were close to zero, indicating that their development was at the expected level given their level of exposure to mothers' depressive symptoms. 25.4% of children were assigned to the vulnerable group. They exhibited negative residual scores across domains, indicating that they were developing more poorly than expected given their level of exposure to mothers' depressive symptoms. 24.2% of children were assigned to the resilient group. They exhibited positive residuals in all four domains of development, indicating they were developing better than expected given their level of exposure to mothers' depressive symptoms.

Among the three identified groups, resilience score discrepancies across the three groups were smaller in the behavioral problems domains than in the social and academic competence domains. ANOVA demonstrated that the resilient group did not differ significantly from the normal-functioning group in the domain of internalizing behaviors (see Table 6). Thus, internalizing behaviors among children in the resilient and normal-functioning groups were equally affected by mothers' depressive symptoms. However, in the other three domains, the resilience scores were higher among children in the resilient

group than among children in the other two groups. Resilience scores among children in the vulnerable group were significantly lower than those in the normal-functioning group in all four domains.

Profiles of Children with Different Levels and Patterns of Resilience

In order to provide preliminary support for hypothesis testing, bivariate correlations between children's resilience scores, and the agentic regulatory processes (i.e., self-assertion, effortful control, and mastery motivation) and the determinants of these processes (i.e., child temperament, child intelligence, sensitive parenting, father involvement, and child care quality) were examined (see Table 5). The correlations were all significant and in the hypothesized direction.

To determine whether children in the three groups differ significantly on their agentic regulatory processes, ANOVA were conducted across the three groups of children on these processes (see in Table 6). For self-assertion, no significant mean differences were detected between the normal-functioning and the vulnerable group. Children in the resilient group were more self-assertive than children in the other two groups. Children in the normal-functioning group did not differ significantly from children in the resilient group in mastery motivation; children in the vulnerable group had the lowest means in mastery motivation compared with the other two groups. All three groups differed significantly in effortful control. Thus, the results demonstrate that, in general, children in the resilient group demonstrated higher self-assertion, mastery motivation, and effortful control compared with the other two groups with one exception.

To determine whether children in the three groups differ significantly on the determinants of their agentic regulatory processes, ANOVA were conducted across the three groups of children on these factors. As shown in Table 6, children in the resilient group had higher intelligence, had higher child care quality, and were more likely to have a father at home compared with children in the normal-functioning and vulnerable groups. Compared with children in the vulnerable group, those in the resilient group experienced more sensitive parenting at 15- and 54-month and were more securely attached at 36 months. However, on difficult temperament children in the resilient group did not differ significantly from children either in the normal-functioning or the vulnerable group; children in the normal-functioning group had less difficult temperament than those in the vulnerable group.

Hypothesis Two: The Mediating Role of Agentic Regulatory Processes

Structural equation models were examined in *Mplus* to test the hypothesis that individual-difference and environmental factors were associated with children's resilience due to their link to agentic regulatory processes (i.e., autonomy, effortful, and mastery motivation). The model used children's resilience scores (residual scores) in individual developmental domains as endogenous variables (see Figure 5). This model fit the data well, $\chi 2$ (135, N=1364) = 282.126, p = .00, CFI=.981, RMSEA=.028, SRMR=.028. Agentic regulatory processes were predicted by individual-difference and environmental factors to varying degrees. Children's effortful control was predicted by their temperament and early intelligence, secure attachment with mothers, maternal sensitivity, having a father at home, and child care quality. Children's self-assertion was

predicted by their temperament, have a father at home, and child care quality. Children's mastery motivation was predicted by their intelligence, maternal sensitivity, and secure attachment. All significant effects were in the hypothesized direction with the exception that having a father at home predicted less self-assertion and effortful control. Agentic regulatory processes predicted children's resilience across domains as well. Children's effortful control predicted their resilience in all four domains; self-assertion predicted their resilience for internalizing behaviors; and mastery motivation predicted their resilience for academic performance and social competence. All unstandardized and standardized coefficients are presented in Table 7.

In order to examine which of these effects were part of significant mediating paths, all the possible indirect paths were tested. For children's social ($R^2 = .36$) and academic resilience ($R^2 = .25$), thirteen indirect paths were found. For children's internalizing resilience ($R^2 = .13$), ten indirect paths were found, all functioning through children' self-assertion and effortful control. Ten indirect paths were detected for children's externalizing resilience ($R^2 = .27$), all functioning through children's effortful control. The detailed standardized effects of the indirect paths are displayed in Table 8. Significant indirect paths are displayed in bolded lines in Figure 8. Indirect paths for academic performance and social competence were similar and two major patterns of indirect paths were found. First, they were predicted by children's temperament, intelligence, secure attachment, maternal sensitivity, and child care quality through the role of effortful control. Second, they were predicted by child intelligence and maternal sensitivity through the role of mastery motivation. For children's internalizing resilience,

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two patterns of indirect paths were detected. The first one resembled these indirect paths

functioning through effortful control to predict academic and social resilience. The

second indirect path predicted children's internalizing resilience from temperament

through the role of self-assertion. For children's externalizing resilience, all indirect paths

functioned through the role of effortful control.

In order to determine whether indirect paths were the same across the three

resilience groups (i.e., the resilient, normal-functioning, and vulnerable group), multiple

group analyses were conducted. The first unconstrained model allowed all parameters to

be freely estimated across the three groups; the second model constrained the parameters

of interests to be equal across groups. The Santorra-Bentler scaled chi-square differences

test demonstrated that the constrained model did not significantly decrease the overall

model fit ($X_{Difference}^2$ (171, N=1364) = 6030.58, p = .06). Thus, the hypothesized

structural model did not function differently for children with different patterns of

resilience.

Hypothesis Three: The Moderating Effects of Agentic Processes

The last model (Figure 9) examined whether the agentic regulatory processes

promoted children's resilience to mothers' depressive symptoms by moderating the

negative impact of mothers' depressive symptoms or by affecting the outcome through

additive main effects. This model fit the data well, χ^2 (27, N=1364) = 54.925, p = .00,

CFI= .988, RMSEA= .028, SRMR=.031. The unstandardized coefficients and errors are

displayed in Table 9. Consistent with the path model examined in Hypothesis 2,

children's effortful control significantly predicted children's positive development across

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the four domains; high self-assertion predicted fewer internalizing behaviors; mastery motivation predicted high social competence and academic performance. However, none of the interactive effects between maternal depression and agentic regulatory processes were significant. This indicates that agentic regulatory processes promote children's resilience over mothers' depressive symptoms through their additive main effects instead of interacting with mothers' depressive symptoms. Moreover, self-assertion, unexpectedly, predicted more externalizing behaviors.

Discussion

In the current study, frequently proposed child individual, relationship, and environmental characteristics that are associated with resilience were demonstrated to promote children's resilience in the presence of mothers' depressive symptoms by promoting agentic regulatory processes in children. Strong evidence was obtained for the role of children's effortful control, self-assertion, and mastery motivation in predicting their resilience in the domains of academic performance, social competence, internalizing behaviors, and externalizing behaviors. These agentic processes mediated the relation between children's individual (i.e., child intelligence, temperament), relational (i.e., attachment security), and environmental (i.e., maternal sensitivity, childcare quality) factors their resilience. Different patterns of mediating effects were found for resilience in different domains. Interrelations among the individual, relational, and environmental characteristics that predicted agentic processes were also observed, suggesting that multiple pathways involving these factors affect children's agentic processes and resilient outcomes. Moreover, findings from two analytic approaches converged in demonstrating the importance of the agentic system to child resilience in the face of mothers' depressive symptoms. Each approach offered a unique perspective on resilience, with one demonstrating the mediating pathways in the predictions of resilience, and the other displaying the additive main effects, instead of interactive effects, through which these predictions function.

Resilience across Developmental Domains and Its Homogeneity

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One aim of this study was to address the consistency of resilience across developmental domains – whether it is homogeneous or heterogeneous. The current study examined children's resilience in the domain of academic performance, social competence, internalizing and externalizing behaviors in the presence of mothers' depressive symptoms. Across these four developmental domains, children's resilience was largely homogeneous. Resilience across domains was moderately correlated (r_{mean} = .39). Thus, children who demonstrate resilience in one domain were likely to show resilience in other domains. This homogeneity was further verified by findings from the latent profile analysis across the four domains that the resilient, normal-functioning, and vulnerable groups were identified. Namely, in the resilient group, children are resilient in one domain were likely to demonstrate resilience in other domains. Few speculations on the structure of resilience across developmental domains can be found in prior research on children's resilience in the face of maternal depression. However, prior research on children's resilience in the face of other adversities has implied that resilience is homogeneous across domains (Masten, 1999). The current study verified this homogeneity specifically in the presence of mothers' depressive symptoms.

Despite this homogeneity across domains, mean levels of resilience across the three groups of children diverged more in academic performance and social competence than in behavioral problems. Moreover, when resilience scores in the four domains were compared across the three groups, the resilient group did not differ from the normal-functioning group in internalizing resilience. Even though this phenomenon has not been directly examined before, it is in line with prior findings that children's internalizing

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behaviors might be more canalized compared with other developmental outcomes when their mothers are depressed.   Not explicitly testing resilience, Wang and Dix (2013) found that children of high-functioning depressed mothers develop as well as children of non-depressed mothers with the exception of their development of behavioral problems. The current findings provide further evidence for the lower prevalence of resilience in internalizing behaviors domains than the other domains. This may be due to the fact that maternal depression is a unique and strong risk factor for children's internalizing behaviors in particular (Goodman & Gotlib, 1999), and children's internalizing behaviors, once affected by mothers' depressive symptoms, are much less amenable to change compared with development in other domains.

Compared with the absence of differences in internalizing resilience between the resilient and normal-functioning group, children in the resilient group demonstrated larger differences in academic resilience from the normal-functioning group. This further supports prior speculation that children of depressed mothers are more likely to demonstrate resilience in the academic domain than in behavioral domains (Luthar, 2003). Taken together, underlying the general homogeneity of children's resilience across domains is a smaller likelihood of developing resilience in internalizing behavioral than in other domains.

The current study extends our understanding of children's resilience in the face of mothers' depressive symptoms by examining resilience in multiple domains. This stands in contrast to previous studies, which have used the absence of psychiatric diagnosis as the single criteria for children's resilience in the face of maternal depression (Hammen,

2003; Radke-Yarrow & Sherman, 1990). Different levels of resilience across domains demonstrated here suggest that research on children's resilience in the presence of maternal depression should focus, not only on reducing psychiatric disorders but also on areas of positive competence (Luthar, 2000).

Proximal Regulatory Processes Related to Active Agency

Masten (2001) proposed that, "most of the observed resilience in children results from the operation of ordinary human adaptation systems, or 'ordinary magic'". The current study lends support for this proposal by demonstrating empirically that children's agentic system promotes resilience in the presence of mothers' depressive symptoms. As long as children's self-assertion, effortful control, and mastery motivation are not jeopardized by mothers' depressive symptoms, they exhibit better-than-expected adjustment in academic performance, social competence, and behavioral problems, given the level of their mothers' depressive symptoms.

Although closely related to each other, children's self-assertion, effortful control, and mastery motivation promoted children's resilience in different ways. They predicted different domains of resilience and were predicted by different of individual, relational, and environmental factors.

Among the three processes related to active agency, effortful control was the most consistent independent predictor of resilience across domains. This corroborates existing evidence of the protective role of effortful control for children's externalizing behaviors when mothers are high in depressive symptoms (Gartstein & Fagot, 2003) and adds that these protective effects are found as well for children's internalizing behaviors, social

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competence, and academic performance. This is consistent with evidence outside of the area of resilience on the associations between effortful control and adjustment outcomes in various domains (Blair & Razza, 2007; Eisenberg et al., 2009; Fabes, et al., 1999; Kochanska, 1995; Rothbart et al., 1994;Valiente et al., 2008). Children high in effortful control are able to control their attention and behaviors, regulate their emotions, implement behaviors as planned, employ skills to engage in socially appropriate behavior, and develop as socially competent individuals (Kochanska, Murray, & Harlan, 2000; Sprinard, et al., 2007). Interactions with mothers high in depressive symptoms are stressful for children. Effortful control over emotions has been viewed as a specific and emotion-focused coping strategy that can promote effective adaptation to stressful situations (Eisenberge & Zhou, 2000).

In contrast to effortful control, mastery motivation predicted children's resilience only in only two domains, social competence and academic performance. This finding demonstrates, for the first time, the role of mastery motivation in promoting resilience in the presence of mothers' depressive symptoms. In prior research on child resilience, mastery motivation has been studied primarily in the form of achievement motivation, with a developmental focus on later childhood or adolescence (Garber & Little, 1999; Langrock et al., 2002; Macturk & Morgan, 1995; Radke-Yarrow & Brown, 1993). As demonstrated in the current study, however, the significance of mastery motivation may start in early childhood prior to school entry. Children high in mastery motivation can shift their attention from the daily stress of difficult environments to engage in mastery-related activities and acquire skills critical for school readiness (Langrock et al., 2002;

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Radke-Yarrow & Brown, 1993). Moreover, engaging in mastery-related activities promotes children's social competence, potentially by providing opportunities to establish positive relationships with peers and teachers (Radke-Yarrow & Brown, 1993). Thus, the current study suggests that, as early as 54-months, mastery motivation may offset the negative impact of maternal depression on children's social and academic outcomes at first grade.

In the current study, children's self-assertion predicted the fewest resilience outcomes at first grade, predicting resilience only in the domain of internalizing behaviors. It has been argued that children high in self-assertion are more likely to draw support from their depressed mothers or reach out to others (Radke-Yarrow & Brown, 1993). Given the substantial amount of research on the link between low-quality caregiving and children's internalizing behaviros (Mezulis et al., 2004; Zahn-Waxler, Lannotti, Cummings, & Denham, 1990), these children's active behaviors may increase the support they receive, thereby ameliorating the risk that their mothers' depressive symptoms present for subsequent internalizing problems. However, the expected relations of self-assertion to children's resilience in social competence, academic performance, and externalizing behaviors were not found. Compared with the measures of effortful control and mastery motivation, which aggregated information from mothers, fathers, teachers, and laboratory observations, the measure of self-assertion included reports only from mothers and fathers. Parents' perception of children's self-assertion may represent children's self-assertion only at home. We speculate that the lack of

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information on children's self-assertion while interacting with other people could potentially lead to these null findings.

Human agency is multi-dimensional (Bandura, 2006). Instead of testing individual components of agency in isolation, the current study examined children's self-assertion, effortful control, and mastery motivation in the same model. The findings suggest that these processes to a degree do function independently as influence on children's resilience in the face of mothers' depressive symptoms collectively. Given that the three constructs are closely related to each other in the agentic system (Macturk & Morgan, 1995; Patrick, Skinner, & Connell, 1993), at the statistical level, the examination of them in the same model could also account for potentially confounding effects among them and children's resilience outcomes.

Mechanisms Underlying Resilience: The Mediating Role of Agentic Processes

It has been proposed that resilience research should progress from empirical identification of protective factors to the exploration of the underlying processes through which these factors function to promote resilience (Luthar & Cicchetti, 2000). The current study tested such a theoretical framework that specified the mediating role of agentic processes in promoting children's resilience in the presence of mothers' depressive symptoms. Children's individual differences, familial and extra-familial environment, and relationships with significant others were linked to their resilience due in part to their relations with agentic processes. 46 indirect paths in total functioned through children's agentic processes and predicted resilience in four domains. Three major patterns of indirect paths are of particular interest.

The first pattern concerns child intelligence.   Children with high intelligence in early childhood demonstrated greater effortful control and mastery motivation at 54-months, which predicted their resilience in the domains of academic performance and social competence. Child intelligence has been shown repeatedly to be associated with better functioning when parents are depressed (Langrock, et al., 2002; Radke-Yarrow & Brown, 1993; Radke-Yarrow & Sherman, 1990). The current study is the first study to examine empirically the underlying mechanisms of effortful control and mastery motivation in linking children's intelligence and their resilience. In particular, the prediction from intelligence to child resilience through mastery motivation has been less well studied before given that the reversed prediction from mastery motivation to cognitive functioning has been of major interest in studies on children's mastery motivation (Macturk & Morgan, 1995). Children with high intelligence may have advanced reasoning, planning, or problem-solving skills, may be successful at manipulating objects and completing challenging task, and therefore over time, may be sufficiently rewarded by these experiences to develop intrinsic motivation and pleasure in mastery-related activities. These motivational processes and mastery experiences may further promote children's social and academic resilience.

The second set of indirect paths concerns child temperament. Children with less difficult temperament demonstrated resilience across all four domains due mainly to their high effortful control. This finding not only substantiates previously demonstrated associations between children's positive emotionality and effortful control (Eisenberge, et al., 2005; Rothbart et al., 2003), but, in addition, demonstrates that children's resilience in

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the presence of mothers' depressive symptoms may be due to the relation between temperament and effortful control.

A third pattern of indirect paths concerns child-care quality. Children in high quality child-care demonstrated resilience due in part to their high self-assertion and effortful control. This has important implications for the role of extra-familial environments for promoting children's resilience when mothers' depressive symptoms are high.   Research demonstrates that attending high-quality child care fosters optimal development in many domains when children are from high risks families (Hagekull & Bohlin, 1995; NICHD ECCRN, 2003; Noam, Warner, & Van Dyken, 2001; Pianta, La Paro, Payne, Cox, & Bradley, 2002; Rimm-Kaufman, et al., 2002). By establishing relations between child-care quality and children's effortful control and self-assertion, the current study clarifies why high quality child-care predicts children's resilience when mothers' depressive symptoms are high.

The framework tested here specifies that children's agentic processes mediate the relation of factors at individual, relational, family, and extra-familial level to children's resilience in the presence of mothers' depressive symptoms. Results generated by this framework have implications for interventions. Interventions for helping children of depressed mothers have endeavored to improve mothers' parenting behaviors and promote mutually responsive mother-child interactions (Field, 1998). These interventions may be most successful when the intervened parenting behaviors or mother-child interactions could promote children's agentic processes. Whether changing familial or

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extra-familial circumstances, interventions that change children's agentic processes may be successful at increasing their resilience.

Interrelations Among Predictors of Agentic Processes

Resilience develops within a complex system. The current study analyzed its complexity, not only by differentiating the functions of agentic processes and their determinants, but also by considering the interrelations among the determinants of children's agency. The complexity of these interrelations lies in the possibility that they represent parent-driven, child-driven, or relationship-driven effects. Child intelligence at 15-months predicted effortful control at 54-months indirectly through their secure attachment at 36-months; child attachment predicted effortful control indirectly through maternal sensitivity at 54-months; maternal sensitivity at 15-months predicted effortful control indirectly through its link with child intelligence at 15-months.

Even though each individual prediction in this indirect path has been demonstrated before (Laible, 2004), it is the first time that they have been incorporated together in the same model to understand how they contribute to children's resilience in the presence of mothers' depressive symptoms. Most studies examine models in which factors predict resilience individually without considering the interrelations among them (Garmezy, 1985; Hammen, 1991, 2003; Masten, Best, & Garmezy, 1990; Radke-Yarrow & Brown, 1993). This complex set of interdependent relations underscores the dynamic interplay among influences from parents, children, and their relationship on resilience in the presence of mothers' depressive symptoms.

Surprisingly, children's temperament did not predict any relational or environmental characteristics as I had expected. Compared with children high in negative emotionality, children low in negative emotionality have been shown to evoke less negative parenting from mothers (Dix & Yan, 2013). This evocative effect was not found in the current study. This may be due to the fact that child temperament was mother-reported rather than observed. Observed negativity may reflect more accurately than do mothers' reports evocative qualities of negative emotionality. It could also be due to the fact that most environmental factors studied here were observed years after the assessment of temperament, perhaps diluting relations between temperament and environmental factors.

Methodological Implications: The Utilization of Multiple Analytic Approaches

There has always been a debate over the operationalization of resilience (Luthar, Cicchetti, & Becker, 2000; Masten, 2007; Masten & Coatsworth, 1998). By incorporating two analytic approaches – treating resilience as residual scores (development-beyond-expectation approach) and examining the interaction between maternal depression and hypothesized resilient factors, the current project endeavored to yield a more comprehensive view. The findings show that these two approaches are complementary, each providing unique information about how resilience develops and functions.

First, to a large degree, findings from the two analytic approaches are consistent with each other. In both approaches, effortful control predicted children's resilience across the four developmental domains; self-assertion predicted resilience in internalizing behaviors; and mastery motivation predicted resilience in academic performance and

social competence. Their agreement underscored the role of all three agentic processes for promoting children's resilience.

Second, the examination of interactive effects between maternal depression and the three agentic processes clarified that the three agentic processes promote children's resilience through additive main effects, not by moderating the impact of maternal depression. None of the interactive effects between maternal depression and the three agentic processes were significant. The lack of significant interactive effects was not surprising and is consistent with prior studies that also fail to find significant interactive effects between maternal depression and resilience factors. In Conrad and Hammen's (1993) early exploration of the resilience among children of depressed mothers, only one out of nine variable interacted with mothers' depressive symptoms. Gartstein and Fagot (2003) also failed to find interactive effects between mothers' depressive symptoms and effortful control in predicting children's externalizing behaviors (Gartstein & Fagot, 2003). This suggests that researchers need to rethink their reliance on interactions between risks and resilience factors to assess resilience. The difficulty of detecting interacting effects might lead to Type II errors and underestimation of some resilient effects. At the theoretical level, factors could promote resilience through either interactions or often overlooked main effects. Particularly, if some psychological processes, such as effortful control, are critical for children's development (Eisenberg, Spinrad, & Eggum, 2010; Liew, 2012; Rothbart & Bates, 2006), they might be universally important regardless of the adverse environments to which children are exposed.   Therefore, interactive effects between protective factors and adversity are not

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necessary for children to demonstrate resilience in the presence of mothers' depressive symptoms.

Each analytic approach has advantages. On the one hand, by saving the residual scores of adjustment outcomes predicted by maternal depression, we were able to treat children's resilience as a continuous rather than a dichotomous variable. This enabled us to examine complex models in which complex mediating mechanisms could be explored. On the other hand, the traditional interactive effects approach can deepen our understanding of whether predictors promote resilience through main effects or interactive effects with the risk factors. Given that the residual scores involve potential interactive effects between risk and resilience factors, once the relation between the proposed resilient factors and the residual resilience scores is identified, the examination of the interactive effects between the risk and resilient factors could be further explored. The current study provides an example of how these two approaches could be coupled for a more comprehensive understanding of resilience processes.

Limitations

Several factors limit the conclusions that can be drawn from this study. First, based on a non-clinical population, the findings may not generalize to clinical populations. Second, children's agentic system and resilient outcomes were assessed at only one point in time. Multiple assessments across time are needed to determine whether changes in agency predict subsequent changes in children's resilience. This would provide a more stringent demonstration that the agentic system is essential for promoting children's resilience in the presence of mothers' depressive symptoms. Third, the theoretical framework tested in the current study demonstrates enormous sophistication and various ways of specifying the model are possible. Given that the specifications of examined models (e.g., the time of assessment, direction of effects) are sometimes arbitrary, replications are needed in the future to provide support for this theoretical framework. Fourth, we did not have the ideal measure for father involvement, which kept us from fully examining the role of father involvement in promoting children's resilience in the current study. Last, current findings generated from a North American sample may not generalize to samples in Eastern culture. In Western countries such as U.S., children's active agency (e.g., assertion, mastery-related motivation) is highly valued, which may account for why it would promote child resilience; in Eastern countries such as China, compliance and obedience is often valued and children's agency might not promote child resilience as found here in Western cultures. Replication of these findings in Eastern cultures is needed.

Conclusions and Implications

The current study examined a framework for research on children's resilience in the presence of mothers' depressive symptoms. Children's agentic processes were demonstrated to be one mechanism through which child characteristics, familial environment, and child-care quality promoted children's resilience in the presence of maternal depression. Three constructs in the agentic system – effortful control, self-assertion, and mastery motivation – predicted different domains of resilience and were predicted by different sets of factors at the child, familial, and child-care level. The complex interrelations among child characteristics, family environment, and child-care quality were also investigated, and they served as important pathways in the prediction of children's agentic processes and resilience outcomes. This suggests that when their mothers have high depressive symptoms, a number of distinct processes function to promote or undermine children's resilience. Also, by integrating two analytic approaches for studying resilience, the current study demonstrated that children's agentic processes may promote their resilience through additive, instead of interactive, effects.

If children's agentic processes play a key role in promoting resilience when mothers' depressive symptoms are high, interventions that foster these processes would lead to positive change in children's adjustment. Dweck's (1975) pioneering intervention studies demonstrated that changing children's global self-attributions enhanced their persistence in the face of failure, a component of mastery motivation, Although empirical evidence on agency in intervention practices is unknown, the findings obtained here

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suggest that a focus on children's agentic processes holds promise for interventions for

children of depressed mothers.

Table 1 Sample Characteristics

Variable	n	%	M	SD
Child Gender (female)	1364	48.3%		
Child Ethnicity (White)	1364	80.4		
Mothers' Education (Years)	1363		14.23	2.51
Mothers' Age (Years)	1364		28.11	5.63
Marital Status (Average)	1363		.75	.39
Father at Home (Average)	1364		.79	.35
Income-to-needs Ratio (Average)	1355		3.42	2.86

Table 2 Descriptive Statistics for Major Variables in the Study

Variable	n	*M(%)*	*SD*	Min.	Max.
Mothers' Depressive symptoms					
1-month	1363	11.36	9.02	0	53
6-month	1278	8.97	8.34	0	52
15-month	1241	9.05	8.18	0	54
24-month	1119	9.40	8.63	0	51
36-month	1202	9.22	8.31	0	57
54-month	1077	9.83	8.70	0	55
1st Grade	1009	8.39	8.47	0	50
Average	1363	9.75	6.68	0	40
Child outcomes at First Grade					
Academic Performance: SSRS Academic	1007	33.01	8.19	10	45
Academic Rating	1004	3.28	.90	1.04	5.00
Social Competence: SSRS_M_Peer	1029	15.69	2.70	6	20
SSRS_F_Peer	775	15.27	2.53	5	20
SSRS_T_ Peer	1001	15.30	3.62	4	20
T-C relationship	1007	65.04	8.16	28	75
Peer Status	1000	16.14	3.16	4	20
Internalizing Behavior: Mother report	1028	48.27	8.937	33	79
Teacher	1008	49.21	9.178	36	84
Father	775	47.69	9.188	33	81
Externalizing Behavior: Mother report	1028	48.64	9.178	30	83
Teacher	1008	50.67	8.717	39	84
Father	775	49.07	9.292	40	75
Agentic Processes at 54-month					
Effortful Control: CPT Omission	1002	9.13	7.59	.00	41.07
CBQ_M_Atten.	1023	4.71	.85	1.25	6.88
CBQ_M_Inhn. Cnt.	1061	4.66	.78	2.00	6.70
CBQ_T_Atten.	788	4.84	1.01	1.25	7.00
CBQ_T_ Inhn. Cnt.	795	5.07	1.05	1.70	7.00
Mastery Motivation: Enthusiasm	1040	4.63	1.14	1	7
Persistence	1040	4.74	1.28	1	7
Autonomy/Assertion: SSRS_M Assertion	1055	14.35	2.97	2	20
SSRS_T Assertion	781	14.57	2.77	1	20
Predictors of Agentic Regulatory Processes					
Child Temperament at 6-months	1279	3.18	.40	1.54	4.72
Child Intelligence at 15-months	1180	108.58	14.07	63	150
Secure Attached at 36-months	1140	5.03	1.72	1	9
Maternal Sensitivity: 15-months	1240	9.40	1.65	3	12
54-months	1040	16.95	2.91	4	21
Father Involvement: 6-months	425	2.49	.38	1.14	4.80
36-months	275	2.59	.36	1.69	3.69
Father at Home: 1-month	1364	85.0%			

Table 2 Continued.

6-months	1279	85.3%			
15-month	1243	83.9%			
24-month	1207	82.5%			
36-month	1216	79.7%			
54-month	1084	77.3%			
Child Care Quality: 54-month	854	11.80	2.13	4.59	16.00
Resilience Scores					
Academic Performance	1071	0	1	-2.85	2.31
Social Competence	1071	0	1	-3.20	2.21
Internalizing Behavior	1069	0	1	-2.62	3.64
Externalizing Behavior	1069	0	1	-3.07	3.61

Table 3 Bivariate Correlations among Major Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Deprssion	–														
2. Mastery Motivation	-.12**	–													
3. Effortful Control	-.28**	.21**	–												
4. Assertion	-.23**	.54**	.35**	–											
5. Academic	-.22**	.21**	.34**	.14**	–										
6. Social Competence	-.22**	.20**	.41**	.19**	.67**	–									
7. Internalizing Behv.	.31**	-.14**	-.28**	-.19**	-.19**	-.39**	–								
8. Externalizing Behv.	.29**	-.13**	-.47**	-.03	-.28**	-.45**	.55**	–							
9. Temperament	.24**	-.09**	-.16**	-.20**	-.07*	-.07*	.10**	.10**	–						
10. Intelligence	-.11**	.16**	.21**	.12**	.27**	.22**	-.06	-.11**	-.06*	–					
11. Secure Attachment	-.13**	.20**	.16**	.09**	.19**	.17**	-.10**	-.07*	-.07*	.16**	–				
12. Sensitivity at 15-m	-.25**	.14**	.19**	.15**	.23**	.18**	-.08**	-.14**	-.13**	.21**	.13**	–			
13. Sensitivity at 54-m	-.26**	.50**	.27**	.14**	.26**	.24**	-.16**	-.22**	-.12**	.15**	.28**	.35**	–		
14. Father at Home	-.29**	.08*	.20**	.09**	.25**	.25**	-.14**	-.23**	-.14**	.15**	.12**	.31**	.31**	–	
15. Child care Quality	-.06	.05	.15**	.11**	.09**	.09**	-.09*	-.04	-.02	.07	.05	.12**	.08*	.14**	–

Table 4 Comparison of Model Fit for Different Class Solutions for Resilient Outcomes

	AIC	BIC	Adj. BIC	Entropy	LRT *p* value	class probabilities
One Class	12154.11	12193.92	12168.51			
Two Class	11404.67	11489.26	11435.27	.695	.00	.87-.93
Three Class	11130.04	11259.42	11176.84	.745	.00	.85-.90
Four Class	11019.94	11194.11	11082.95	.692	.47	.78-.84
Five Class	10943.14	11162.10	11022.34	.693	.19	.77-.88
Six Class	10889.57	11153.31	10984.98	.707	.48	.74-.85

Table 5 Bivariate Correlations among Agentic Regulatory Processes and Resilience Scores Across Domains

	1	2	3	4	5	6	7
1. Resilience: Internalizing	–						
2. Resilience: Externalizing	.50**	–					
3. Resilience: Social Comp.	.35**	.41**	–				
4. Resilience: Academic	.13**	.23**	.69**	–			
5. Autonomy/Assertion	.19**	.19**	.26**	.22**	–		
6. Mastery Motivation	.11**	.10**	.18**	.19**	.54**	–	
7. Effortful Control	.21**	.42**	.36**	.35**	.35**	.21**	

Table 6 Results from ANOVA and Post-hoc Turkey Test for Children in The Three Resilience Groups

	Group #1 Normal	Group #2 Vulnerable	Group #3 Resilient	F	p 1 vs. 2	p 1 vs. 3	p 2 vs. 3
Resilience Outcomes							
Internalizing Resilience	.18	-.69	.29	94.44***	.000	.277	.000
Externalizing Resilience	.15	-.78	.43	133.07***	.000	.000	.000
Social Resilience	.11	-1.37	1.10	1549.00***	.000	.000	.000
Academic Resilience	-.08	-.99	1.13	665.18***	.000	.000	.000
Agentic Processes							
Assertion	.017	-.31	.28	8.80***	.021	.072	.000
Mastery Motivation	.08	-.28	.16	15.66***	.000	.569	.000
Effortful Control	.02	-.10	.06	89.87***	.000	.000	.000
Determinants of the Agentic Processes							
Child Temperament	3.14	3.22	3.18	3.16*	.039	.375	.598
Child Intelligence	108.91	104.21	113.44	28.02***	.375	.598	.000
Secure Attachment	5.11	4.68	5.29	9.732***	.003	.382	.000
Sensitivity@15-month	.06	-.20	.18	24.32***	.002	.218	.000
Sensitivity@54-month	.11	-.35	.20	8.582***	.000	.396	.000
Child Care Quality	11.68	11.72	12.25	5.376**	.980	.005	.032
Father at Home@15-mon.	.86	.75	.92	1.784***	.000	.121	.000
Father at Home@54-mon.	.78	.65	.88	3.322***	.000	.006	.000

Table 7 Parameter estimates of paths in the Longitudinal Structure Equation Models

	Unstand.	Standardized
Agentic Processes Predicting Resilience		
Self-assertion → Academic Resilience	-.005	-.013
Self-assertion → Social Resilience	.039	.103
Self-assertion → Internalizing Resilience	-.089	-.236**
Self-assertion → Externalizing Resilience	.036	.094
Effortful Control → Academic Resilience	1.494	.438***
Effortful Control → Social Resilience	2.235	.659***
Effortful Control → Internalizing Resilience	-1.022	-.301***
Effortful Control → Externalizing Resilience	-2.130	-.622***
Mastery Motivation → Academic Resilience	.099	.108**
Mastery Motivation → Social Resilience	.087	.095**
Mastery Motivation → Internalizing Resilience	-.057	-.062
Mastery Motivation → Externalizing Resilience	-.011	-.012
Children's Individual and Environmental Differences Predicting Agentic Processes		
Temperament → Self-assertion	-.342	-.204***
Temperament → Mastery Motivation	-.136	-.050
Temperament → Effortful Control	-.104	-.143***
Intelligence → Self-assertion	1.169	.062
Intelligence → Mastery Motivation	.858	.111***
Intelligence → Effortful Control	.387	.186***
Sensitivity @15-month → Self-assertion	.164	.062
Sensitivity @15-month → Mastery Motivation	-.030	-.028
Sensitivity @15-month → Effortful Control	.009	.032
Sensitivity @54-month → Self-assertion	-.019	-.007
Sensitivity @54-month → Mastery Motivation	.595	.549***
Sensitivity @54-month → Effortful Control	.078	.267***
Father-at-Home @15-month → Self-assertion	.421	.055
Father-at-Home @15-month → Mastery Motivation	.019	.006
Father-at-Home @15-month → Effortful Control	-.118	-.140*
Father-at-Home @54-month → Self-assertion	-1.088	-.158*
Father-at-Home @54-month → Mastery Motivation	-.153	-.054
Father-at-Home @54-month → Effortful Control	.009	.130
Attachment Security → Self-assertion	.072	.047
Attachment Security → Mastery Motivation	.043	.068*
Attachment Security → Effortful Control	.017	.103*
Child Care Quality → Self-assertion	.116	.093*
Child Care Quality → Mastery Motivation	.009	.018
Child Care Quality → Effortful Control	.016	.114**
Interrelations among Children's Individual and Environment Differences		
Sensitivity @15-month → Intelligence	.017	.118***
Sensitivity @15-month → Attachment Security	.080	.047
Sensitivity @15-month → Sensitivity @54-month	.173	.172***

Table 7 Continued.

Father-at-Home @15-mon. → Intelligence	-.009	-.022
Father-at-Home @15-mon. → Attachment Security	.071	.014
Father-at-Home @15-mon. → Father-at-Home @54-m.	.483	.436***
Temperament → Sensitivity @15-month	-.023	-.036
Temperament → Attachment Security	-.103	-.024
Temperament → Child Care Quality	.083	.016
Intelligence → Sensitivity @54-month	.103	.014
Intelligence → Attachment Security	1.682	.137***
Intelligence → Child Care Quality	.278	.018
Attachment Security → Sensitivity @54-month	.120	.206***
Attachment Security → Child Care Quality	.041	.033

Table 8 Significant Indirect Paths from The Determinants of Regulatory Processes to Children's Resilience

	Standardized Coefficient	p values
Predicting Internalizing Resilience		
Temperament ->Effortful Control	.043	.016
Temperament -> Assertion	.048	.005
Intelligence ->Effortful Control	-.056	.009
Intelligence -> Attachment -> Sensitivity@54 -> Effortful Control	-.002	.031
Attachment -> Effortful Control	-.031	.050
Attachment -> Sensitivity@54 -> Effortful Control	-.017	.010
Sensitivity@15 -> Sensitivity@54 -> Effortful Control	-.014	.016
Sensitivity@15 -> Intelligence -> Effortful Control	-.007	.040
Father at home@15 -> Father at home@54	-.073	.007
Child Care Quality -> Effortful Control	-.034	.036
Predicting Externalizing Resilience		
Temperament -> Effortful Control	.089	.003
Intelligence -> Effortful Control	-.116	.000
Intelligence -> Attachment -> Effortful Control	-.009	.047
Intelligence -> Attachment -> Sensitivity@54 -> Effortful Control	-.005	.007
Attachment -> Effortful Control	-.064	.026
Attachment -> Sensitivity@54 -> Effortful Control	-.034	.000
Sensitivity@15 -> Sensitivity@54 -> Effortful Control	-.029	.001
Sensitivity@15 -> Intelligence -> Effortful Control	-.014	.013
Sensitivity@15 -> Intelligence -> Attachment -> Sensitivity@54 -> Effortful Control	-.001	.027
Child Care Quality -> Effortful Control	-.071	.013
Predicting Social Resilience		
Temperament ->Effortful Control	-.094	.003
Intelligence -> Effortful Control	.123	.001

Table 8 Continued.

Intelligence -> Mastery Motivation	.011	.028
Intelligence -> Attachment -> Sensitivity@54 -> Effortful Control	.005	.010
Intelligence -> Attachment -> Sensitivity@54 -> Mastery Motivation	.001	.031
Attachment -> Effortful Control	.068	.031
Attachment -> Sensitivity@54 -> Effortful Control	.036	.001
Attachment -> Sensitivity@54 -> Mastery Motivation	.011	.012
Sensitivity@15 -> Sensitivity@54 -> Effortful Control	.030	.003
Sensitivity@15 -> Intelligence -> Effortful Control	.014	.018
Sensitivity@15 -> Sensitivity@54 -> Mastery Motivation	.009	.019
Sensitivity@15 -> Intelligence -> Attachment -> Sensitivity@54 -> Effortful Control	.001	.035
Child Care Quality -> Effortful Control	.075	.014
Predicting Academic Resilience		
Temperament ->Effortful Control	-.063	.005
Intelligence -> Effortful Control	.081	.003
Intelligence -> Attachment -> Sensitivity@54 -> Effortful Control	.003	.015
Intelligence -> Mastery Motivation	.012	.023
Intelligence -> Attachment -> Sensitivity@54 -> Mastery Motivation	.002	.024
Attachment -> Effortful Control	.045	.044
Sensitivity@15 -> Sensitivity@54 -> Effortful Control	.024	.003
Sensitivity@15 -> Sensitivity@54 -> Mastery Motivation	.012	.007
Sensitivity@15 -> Intelligence	.011	.029
Sensitivity@15 -> Sensitivity@54 -> Effortful Control	.020	.007
Sensitivity@15 -> Intelligence -> Effortful Control	.010	.024
Sensitivity@15 -> Sensitivity@54 -> Mastery Motivation	.010	.013
Child Care Quality -> Effortful Control	.050	.017

Table 9 Parameter Estimates for The Prediction from Maternal Depression, Agentic Regulatory Processes, and Their Interactions to Children's Developmental Outcomes at First Grade

	Academic Performance	Social Competence	Internalizing Behaviors	Externalizing Behaviors
Depression	-.028	-.011	.064***	.076***
	(.039)	(.011)	(.010)	(.016)
Assertion	.109	.112**	-.125***	.181**
	(.127)	(.039)	(.033)	(.062)
Mastery Motivation	.9444***	.225***	-.099	-.085
	(.216)	(.062)	(.055)	(.102)
Effortful Control	10.295***	4.187***	-2.146***	-9.379***
	(1.367)	(.426)	(.350)	(.666)
Depress X Assertion	.035	.006	.008	.002
	(.019)	(.006)	(.005)	(.008)
Depress XMastery Motivation	.015	.005	.013	.029
	(.036)	(.011)	(.009)	(.016)
Depress X Effortful Control	-.361	-.028	-.058	.042
	(.205)	(.063)	(.059)	(.100)

Figure 1 Proposed Theoretic Framework On Children's Agentic Processes and Resilience
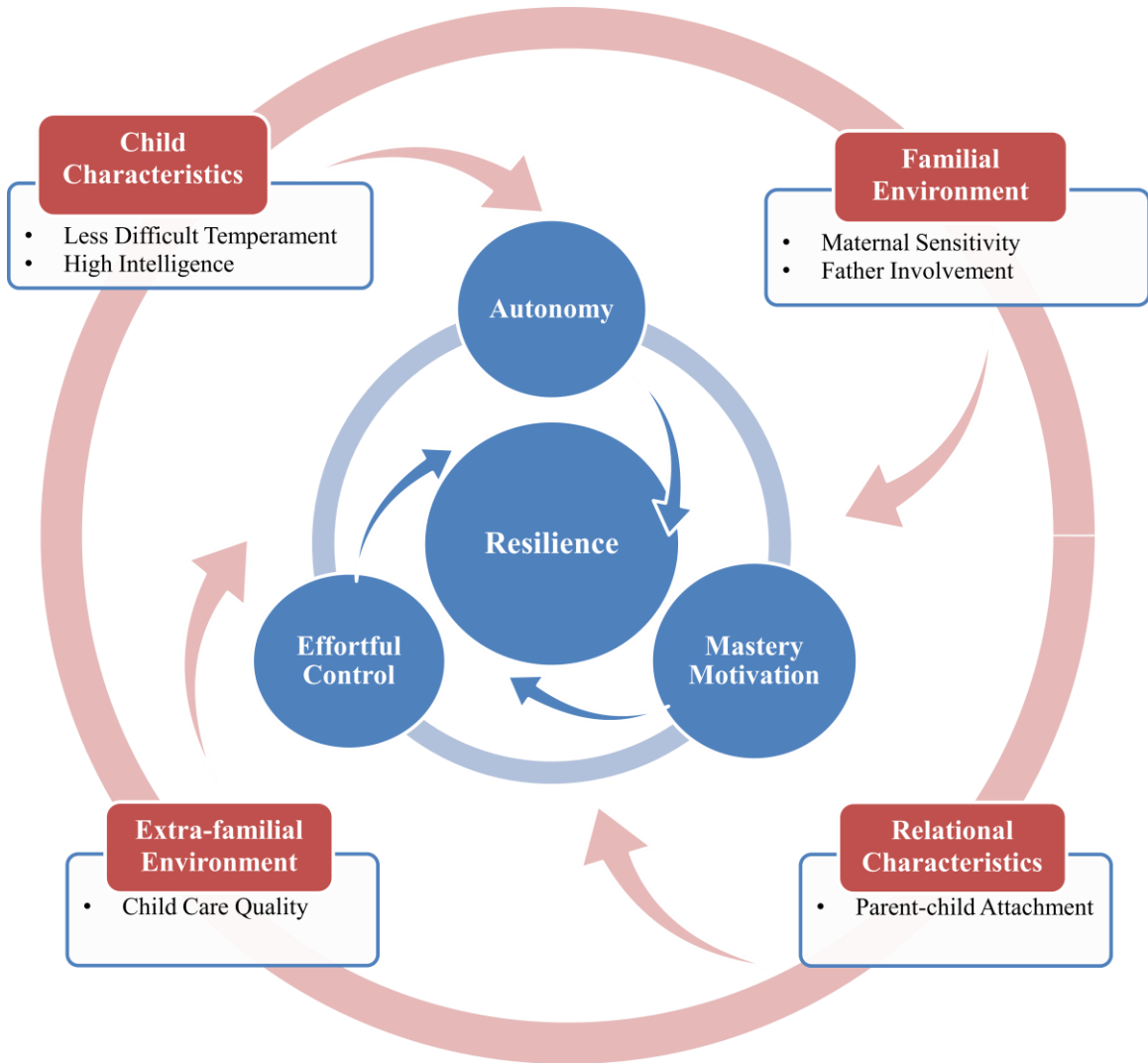
Figure 2 Measurement Model for Agentic Regulatory Process Variables
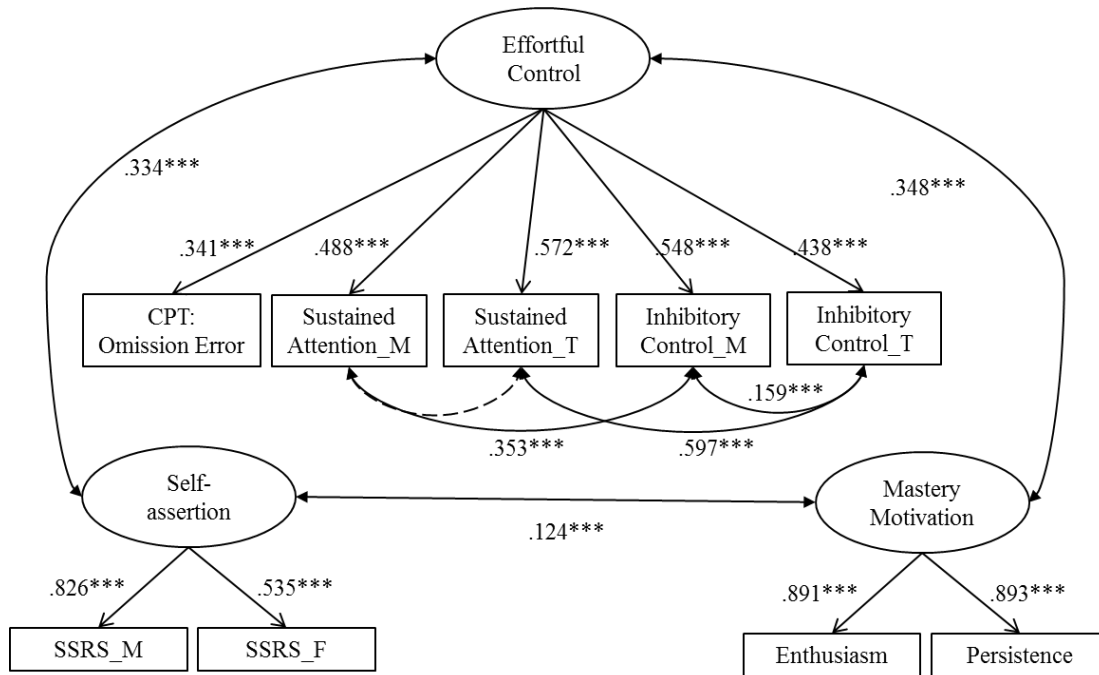
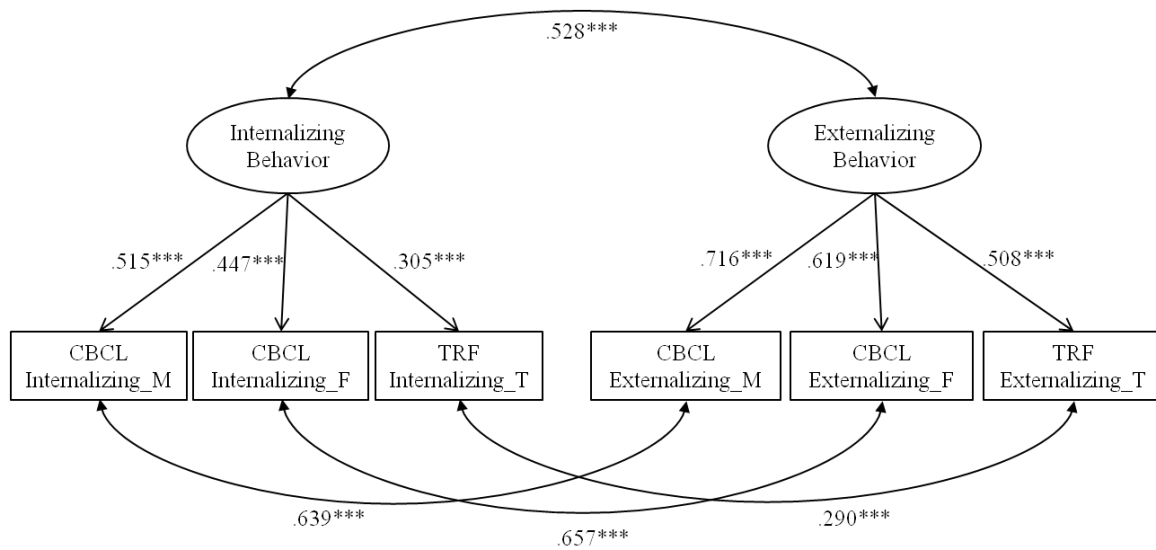Figure 3 Measurement Model for Behavior Problems at First Grade

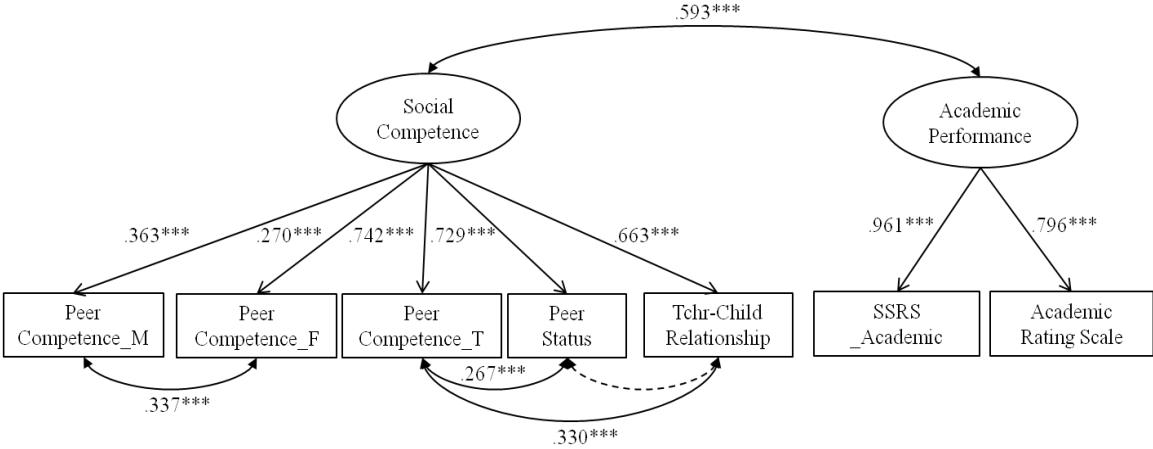Figure 4 Measurement Model for Behavior Problems at First Grade

Figure 5 Standardized mean scores for resilience across in the domain of internalizing, externalizing, social, and academic competence (Presentation 1)
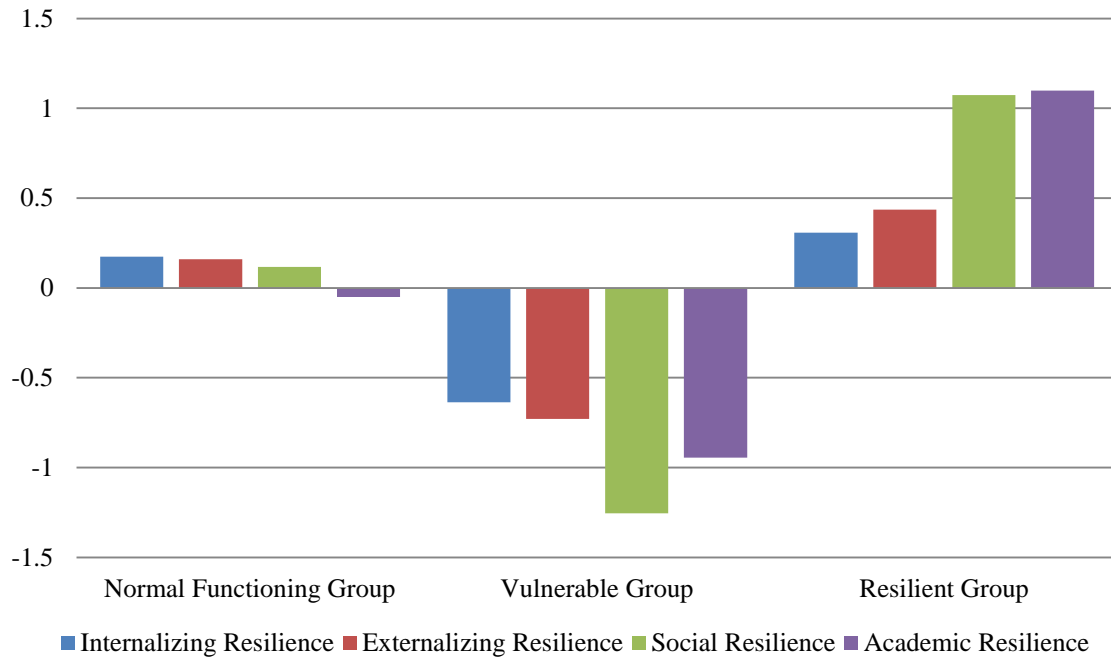

Figure 6 Standardized mean scores for resilience across in the domain of internalizing, externalizing, social, and academic competence (Presentation 2)
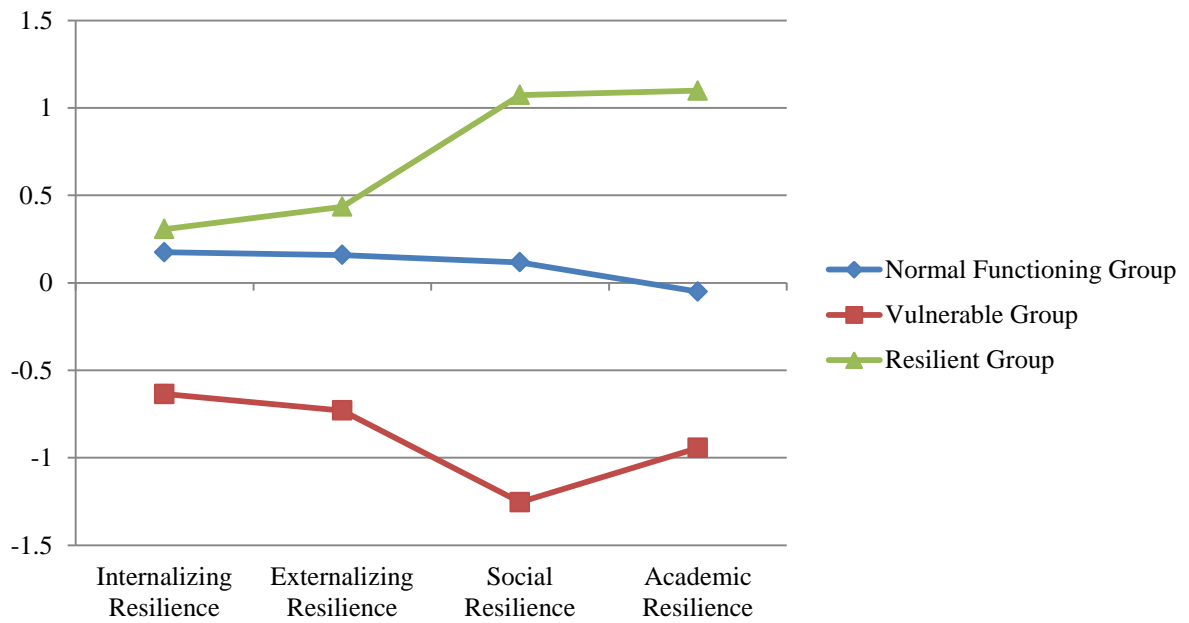
Figure 7 Results from the Structural Equation Models Examining the Relation Among Predictors, Proximal Regulatory Processes, and Resilient Outcomes
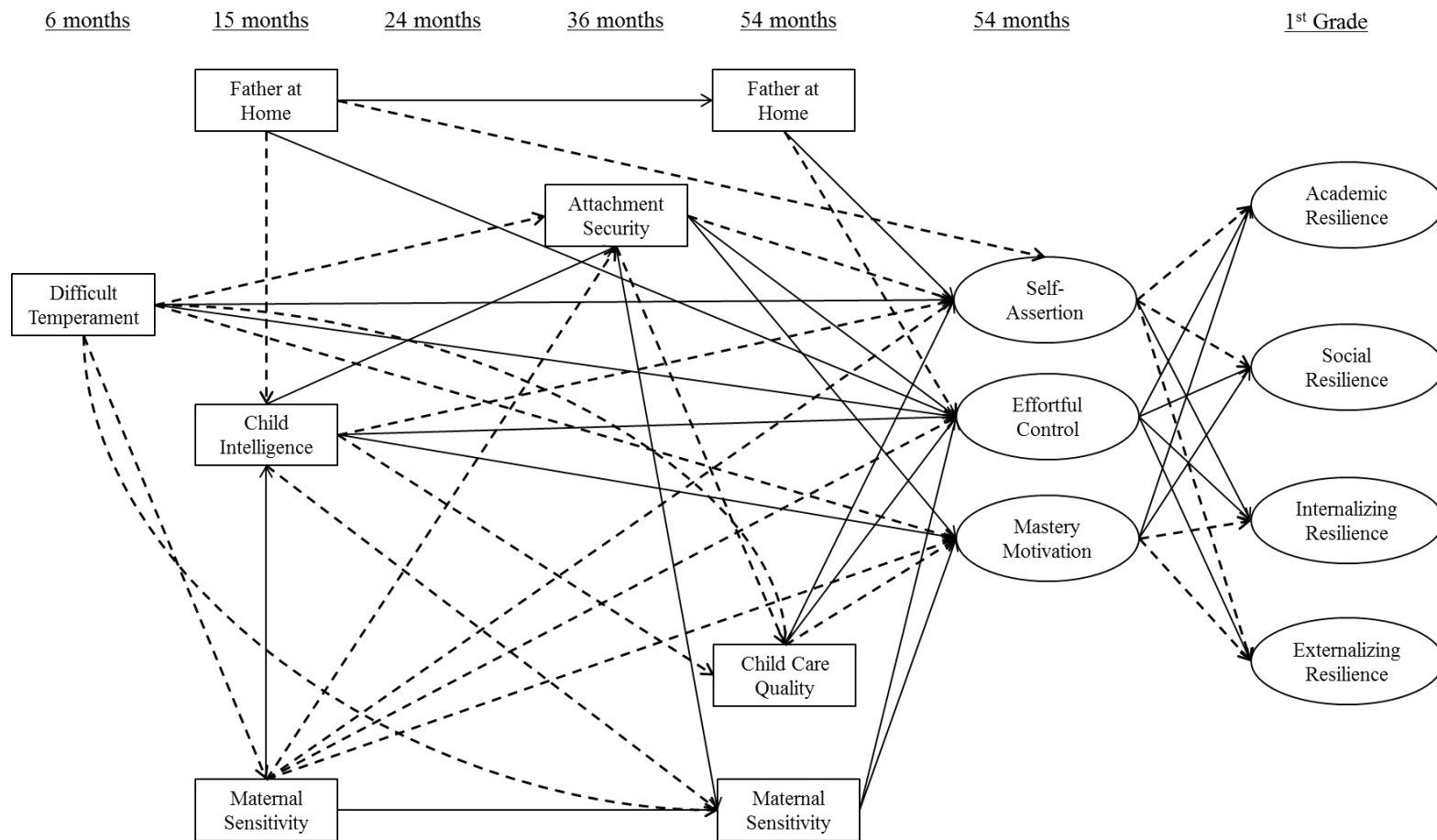
Figure 8 Demonstration of Significant Indirect Paths (Bolded Lines) Predicting
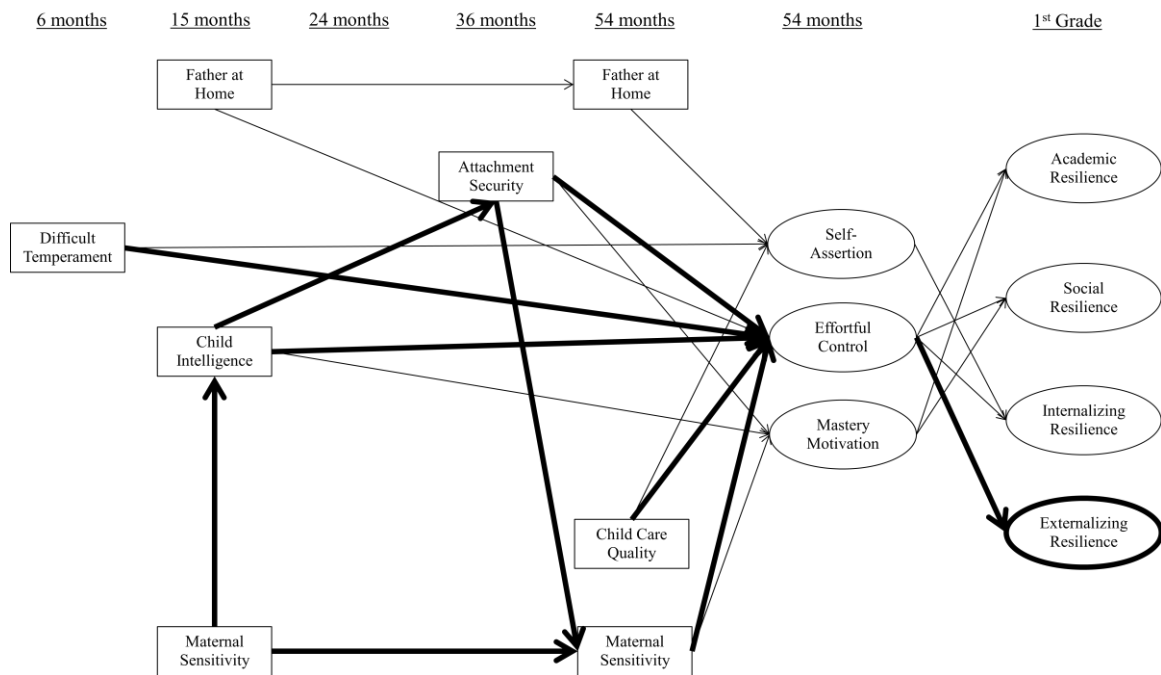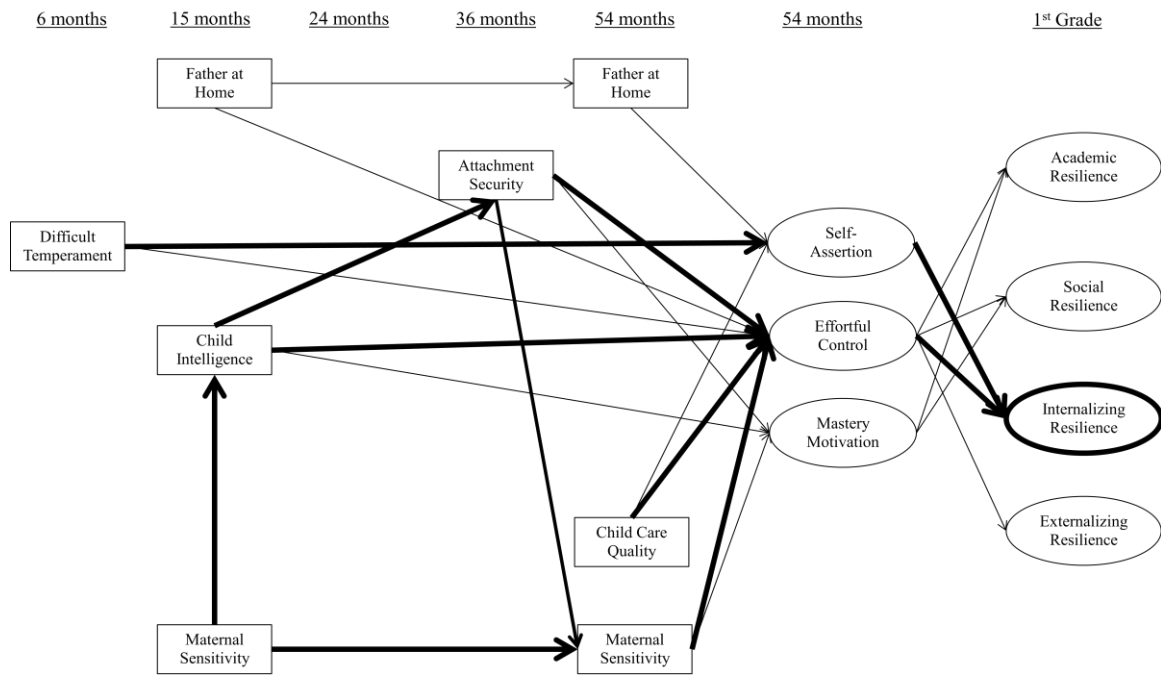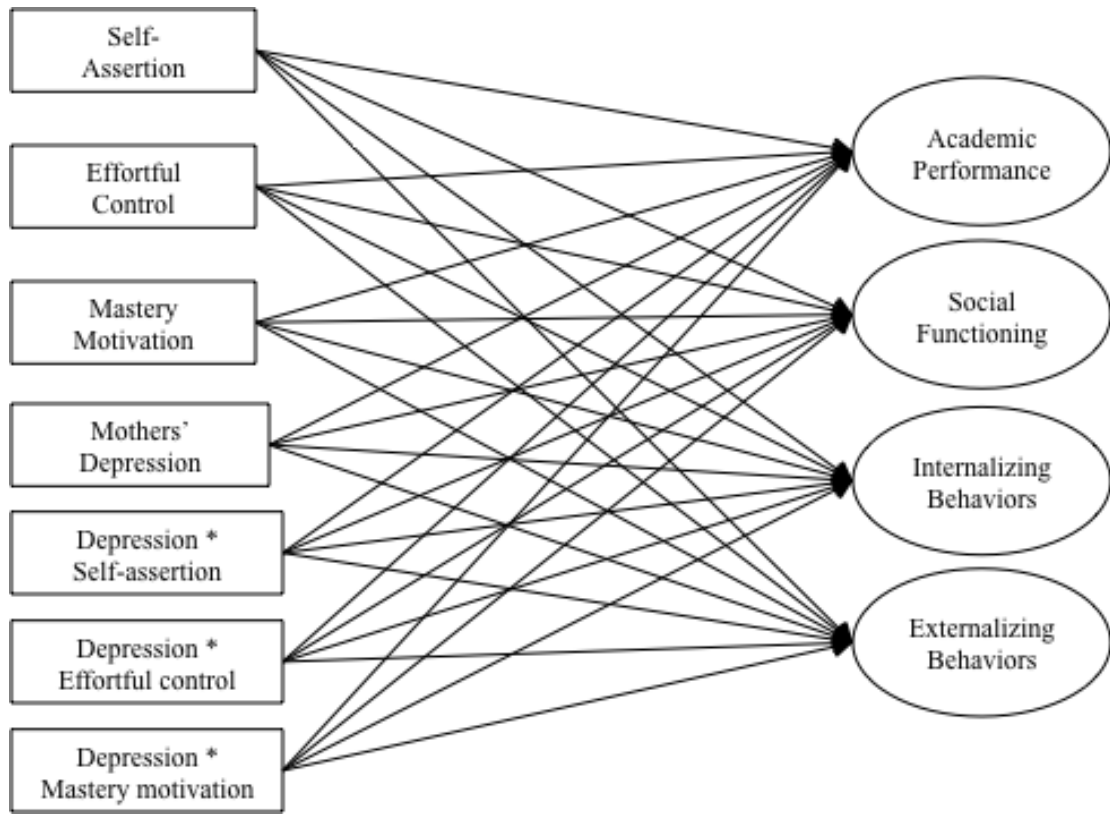Resilience in Each Domain

Figure 8 Continued.

Figure 9 SEM Model that Examined the Moderating Effects of Self-Assertion, Effortful Control, and Mastery Motivation in the Relation of Mothers' Depressive Symptoms and Child Academic Performance, Social Functioning, Internalizing Behaviors, and Externalizing Behaviors

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