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LOYOLA UNIVERSITY CHICAGO

THE ROLE OF NEIGHBORHOOD AND PARENTING IN THE DEVELOPMENT OF
EFFORTFUL CONTROL AND SUBSEQUENT SOCIAL COMPETENCE
DURING EARLY CHILDHOOD

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

PROGRAM IN CLINICAL PSYCHOLOGY

BY

EDNA Y. ROMERO

CHICAGO, IL

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ABSTRACT

The current study examined ecological predictors of the trajectory of effortful control (EC) across ages 4, 5, and 6 in a community sample of young children ($N = 796$). The specific goals of the study were to examine poor neighborhood quality as a predictor of EC development, to evaluate the moderating role of supportive and hostile parenting in relation to poor neighborhood quality and EC development, and to determine if the interaction between poor neighborhood quality and parenting predicted change in children's social competence through the mediating role of EC. Data were analyzed using latent growth curve modeling (LGM). Results of the LGM analyses indicated that children experienced steady and significant improvements in EC across ages 4, 5, and 6. Poor neighborhood quality was a significant predictor of the intercept of EC (EC at age 4) and the growth in EC across the three years of study. There were significant direct effects of supportive and hostile parenting on EC intercept. Hostile parenting emerged as a significant moderator of the relationship between poor neighborhood quality and EC intercept. Neither of the mediated moderation analyses supported an indirect effect of EC on the interaction between poor neighborhood quality and parenting predicting change in children's social competence. However, several significant direct effects between supportive/hostile parenting and social skills at age 6 and between EC and social skills at age 6 emerged. Overall, the current study provides information regarding ecological predictors of EC and of the influential role of EC during early childhood.

CHAPTER ONE

INTRODUCTION

Effortful control (EC) is a self-regulatory ability that allows for the inhibition of dominant responses (e.g. ignoring unpleasant emotions or disengaging in problematic behavior) and/or the activation of subdominant responses (e.g. actively coping, confronting, or strategizing solutions to unpleasant emotions or behavior; Rothbart & Bates, 2006). Due to its role in the manifestation of emotions and behavior, EC has been studied and significantly related to a variety of child outcomes. For example, high and low levels of EC are considered risk factors for a variety of internalizing and externalizing problems and for significant deficits in social competence (Eisenberg, Smith, & Spinrad, 2011; Murphy, Shepard, Eisenberg, & Fabes, 2004; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005).

Research on the developmental path of EC reveals that it emerges in infancy, matures significantly during early childhood, and remains moderately stable throughout the lifespan (Eisenberg et al., 2011). Despite its general stability, there appears to be substantial variance in EC across time as indicated by longitudinal correlation values in the .40-.50 range (Kochanska, Murray, & Harlan, 2000; Li-Grining, 2007). Thus, the developmental path of EC is susceptible to ecological influences. Research on the predictors and correlates of EC points to ecological variables (e.g., parenting and contextual risk) as primary sources of influence (Lengua, 2009; Eisenberg et al., 2011).

For instance, harsh or hostile parenting practices (e.g. parental coercion/control) have been reliably linked to decreased EC, while supportive parenting has been consistently related to higher EC (Belsky, Pesco Fearon, & Bell, 2007; Kochanska, Aksan, Prisco, & Adams, 2008; Spinrad et al., 2007). Moreover, contextual risk variables, such as poverty and neighborhood safety, are related to decreased EC (Lengua, Bush, Long, Kovacs, & Trancik, 2008; Lengua, Hornado, & Bush, 2007).

Poor neighborhood quality is a prominent contextual risk variable that has been consistently related to child development and, until recently, has been largely neglected in the EC literature. Researchers (e.g. Nicotera, 2007; Roosa, Jones, Tein, & Cree, 2003) argue that the methodological and conceptual issues that surround the operationalization of neighborhood have prohibited it from being examined as a prominent predictor of child outcomes, particularly of individual outcome variables such as EC. In addition to neglecting the role of poor neighborhood quality, studies have also not thoroughly examined the moderating role of hostile and supportive parenting in the development of EC. This study examined the moderating effect of supportive and hostile parenting in order to determine whether the relationship between poor neighborhood quality and EC is mitigated or exacerbated by supportive or hostile parenting, consequently determining whether parenting strategies should be a focus of EC interventions. Finally, given the link between EC and childhood outcomes, the current study also conducted mediated moderation analyses evaluating the role of neighborhood quality, parenting, and EC in the development of subsequent social competence at age 6. This study contributed to the literature by exploring important ecological predictors of EC and by providing a better

understanding of the influential role of EC during early childhood.

Effortful Control

EC is a self-regulatory ability defined as “the efficiency of executive attention including the ability to inhibit a dominant response and/or activate a subdominant response, to plan, and to detect errors” (Rothbart & Bates, 2006, p. 129). Since its introduction into the child development literature in 1989 (Rothbart, 1989), researchers have become increasingly aware of the vital role that EC plays in child development. Currently, the EC construct is linked to a variety of child psychosocial outcomes including behavior problems, emotional disturbances, social competence, and academic achievement, and thus, is viewed as a salient predictor of child adjustment (Eisenberg et al., 2011). However, in order to appropriately understand the unique role that EC plays in child development, several conceptual and methodological issues must first be highlighted.

First, the inclusion of executive attention skills in the definition of EC suggests that EC cuts across neuropsychological and temperament domains. Indeed, EC is considered to be both a component of temperament and to reflect executive functioning (Rothbart & Rueda, 2005). Temperament is defined as individual differences in reactivity and self-regulation as seen in the domains of affect, activity, and attention (Rothbart & Bates, 2006; Rothbart & Derryberry, 1988). Temperament is thought to have a constitutional basis, meaning that it has a biological component, which is influenced over time by an interaction of heredity, maturity, and experience (Rothbart, Ellis, & Posner, 2011). Therefore, with regard to temperament, EC reflects both an

innate and dynamic ability to willfully regulate emotions, behaviors, and attention in situations or circumstances that elicit reactions. Similarly, with regards to the neuropsychological construct of executive functioning, EC reflects the ability to plan, switch, and inhibit attention, emotions, and behavior. Inhibitory control is the specific executive functioning construct that overlaps the most with EC; EC and executive functioning are often measured through indices of inhibitory control (Zhou, Chen, & Main, 2012). Furthermore, brain imaging studies have led researchers (e.g. Rothbart, Sheese, & Posner, 2007) to conclude that EC processes are localized in the anterior cingulate gyrus and in regions of the prefrontal cortex, which are also associated with executive function abilities. Despite the conceptual overlap between the temperament and neuropsychological literatures, the central idea is that EC refers to a biologically-based and environmentally-influenced set of self-regulatory abilities.

The second most important issue to understand regarding the measurement and conceptualization of EC is the distinction between EC, which is willful, and reactive control/inhibition, which is involuntary. Eisenberg and colleagues (2004) argue that self-regulatory abilities can be divided into voluntary or effortful versus involuntary or automatic processes. EC falls in the former category as it reflects a willful change in behavior, attention, and/or emotion, as well as the ability to directly modify whatever is causing the dominant behavior, attention, and/or emotion. In other words, EC is willfully activated under situations that promote behavioral, emotional, or attentional adaptations. Reactive or involuntary control abilities, on the other hand, involve inhibition and

impulsive approach behaviors, such as constrained or shy behavior, under circumstances that elicit emotional reactions (Eisenberg et al., 2003; Eisenberg, Spinrad, Eggum, 2010).

To illustrate the distinction between effortful versus reactive control, consider a situation in which a child is told to not touch or play with a new toy. Reactive self-regulation has to do with automatic emotional responses such as fear, which serve as the impetus that holds back behavior. Thus, a child demonstrating reactive self-regulation may keep him/herself from playing with the toy out of fear of consequences or fear of it being a novel/unfamiliar object. Alternatively, a child demonstrating EC is able to keep him/herself from playing with the toy because he/she is good at internalizing the rule not to touch the toy and engaging in voluntary strategies (e.g. self-talk) to help him/her comply with such rules.

Given the complexity in the conceptualization of EC, the final issue to bear in mind is that the construct of EC requires careful and appropriate measurement. Three common approaches to the measurement of EC have been developed that relate to specific components of the construct's definition. The two more common measurement approaches are to examine indices of attentional control (e.g. the ability to voluntarily focus or shift attention as needed) and/or inhibitory control (e.g. the ability to inhibit behavior when appropriate; Eisenberg et al., 2011; Evans & Rothbart, 2007). However, recent efforts have underscored the need to measure EC through indices of activation control (e.g. the ability to activate or perform an action when there is a strong tendency to avoid it), as it relates to the ability to activate a subdominant response (Moore, 2008). All three markers of EC involve the regulation of behaviors, emotions, and/or attention in

order to promote appropriate responses.

Effortful Control's Influence on Child Outcomes and Social Competence

The careful focus on the conceptualization and measurement of EC is a testament to the significant role it plays in child development. As such, researchers have increasingly recognized EC as an integral predictor of adaptive, maladaptive, and psychosocial outcomes. The variable influence that EC can assert partly depends on whether it exists in significantly discrepant levels. Low levels of EC, for instance, are generally associated with increased externalizing problems, and with specific externalizing disorders such as conduct disorder and attention deficit hyperactivity disorder (Eisenberg et al., 2011; Olson et al., 2005; Nigg, 2006). Alternatively, both high and low levels of EC have been linked with increased internalizing problems (Lengua, 2008; Murray & Kochanska, 2002; Spinrad et al., 2007; Valiente et al., 2006;).

In addition to its relationship with internalizing and externalizing problems, EC plays an influential role in children's social competence. The influence that EC bestows on social competence is arguably due to the functions that behavioral and attentional control play in social interactions. Indeed, the ability to regulate attention and behavior is essential to social development and to the adherence of social norms. Social competence is defined as "the possession and use of the ability to integrate thinking, feeling, and behavior to achieve social tasks and outcomes valued in the host setting and culture" (Topping, Brenner, & Holmes, 2000, p. 28). Social competence is not to be confused with prosocial behavior, which is also significantly related to EC (Eisenberg, Fabes, Murphy, Karbon, Smith, & Maszk 1996; Eisenberg et al., 1998). Prosocial behavior

refers specifically to actions or behaviors that are intended to benefit another individual or group of individuals (Eisenberg & Mussen, 1989). In other words, prosocial behavior reflects a child's ability to empathize/sympathize with others, whereas social competence refers broadly to a set of abilities that promote successful social interactions (Eisenberg & Miller, 1987).

The relationship between EC abilities and social competence can be seen as early as age 3 years. Raver, Blackburn, Bancroft, and Torp (1999) found that children who were able to use attentional strategies (e.g. self-distraction) during a delay task were rated by peers as more popular and by teachers as higher in overall social competence. Other researchers found that preschoolers' and kindergarteners' effortful attention shifting and focusing were associated with socially appropriate behavior and peer status (for boys only; Eisenberg et al., 1993). Follow-up studies by Eisenberg and colleagues (1995; 1997; Murphy et al., 2004) revealed that early EC abilities are predictive of later social adjustment. Specifically, these studies found that attentional control during preschool and kindergarten predicted children's social functioning and prosocial behavior at school 2, 4, and 6 years later. Studies with samples of older children and adolescents also provide corroborating evidence for the relationship between EC and social competence. For example, Mishel, Shoda, and Peake (1988) found that EC abilities (successful delay of gratification) at age 4 or 5 were related to social competence in adolescence. A recent Spanish study by Zorza, Marian, de Lemus, & Acosta, (2013) also found that EC positively predicted children's report of peers's social competence.

Collectively, the literature maintains that EC is related to children's externalizing

and internalizing problems, as well as to their social competence. High levels of EC, in general, are related to fewer externalizing difficulties and better social competence, whereas both high and low levels of EC are linked to internalizing problems. The relationship between EC and social competence is even observed across informants (i.e. teachers, parents, and peers), across childhood and adolescence, and across socioeconomic groups (Murphy et al., 2004; Raver et al., 1999). Despite the decades of research highlighting the influence that EC bestows broadly on children's psychosocial outcomes, and specifically on social competence, many questions regarding EC's influence on child outcomes are yet to be answered. A specific area of research that needs to be further addressed is whether the changes in EC predict changes in child outcomes. Several researchers have found that changes in EC lead to increases in externalizing problems in children as young as 4 (Eisenberg, Sadovsky, Spinrad, Fabes, Losoya, Valiente et al., 2005; Valiente, Eisenberg, Spinrad, Reiser, & Cumberland, 2006). However, the relationship between the development of EC and social competence has not been thoroughly established. Given that social competence is a vital component of healthy psychological adjustment and social development (Craig, 2000; Hartup, 1989), there is a crucial need to empirically examine the role that the development of EC plays in the development of social competence.

Development of Effortful Control

In light of the role that EC plays in the manifestation of problematic emotions and behavior, developmental psychologists have begun to examine the developmental path that it takes during childhood and beyond. The development of EC is marked by both

change and *stability* (Li-Grining, 2007; Rothbart & Bates, 2006). Stability in EC refers to the relative uniformity in children's ability to self-regulate across childhood, whereas change refers to the improvements in self-regulatory abilities that are observed as children age. Overall, EC abilities are thought to emerge in the second half of the first year of life, increase rapidly during the toddler and preschool years, and stabilize in early childhood with minor developments into adulthood (Leon-Carrion, Garcia- Orza, & Perez-Santamaria, 2004; Williams, Ponesse, Schachar, Logan, & Tannock, 1999). Proof of this developmental trajectory comes from a variety of infant, toddler, and early childhood studies. For example, infant studies show that the attentional control abilities that define EC, such as voluntarily shifting attention and planning, can be measured as early as 6 months of age (Eisenberg et al., 2011). Additionally, Sheese, Rothbart, Posner, White, and Fraundorf (2008) found that infants are able to reach for objects that are not in their line of sight and engage in anticipatory looking (i.e. looking to the location of a target prior to its appearance in that location) between the ages of 6-9 months.

Studies of toddlerhood and early childhood indicate that EC matures significantly between 2 and 7 years of age. Through the use of a Stroop-like task that required toddlers to switch attention and inhibit behavior, Posner and Rothbart (1998) found that children showed significant improvement in performance between 30 and 38 months of age. Additional improvements in EC appear to occur between 3 and 4 years of age (Jones, Rothbart, & Posner, 2003; Posner & Rothbart, 1998) and between 6 and 7 years of age (Rueda, Posner, & Rothbart, 2011), as assessed with tests of attentional control. Moderate improvements in EC, as measured through a delay of gratification task, have

also been observed between the ages of 2 and 4 among a sample of predominantly low-income African American and Latino children (Li-Grining, 2007).

In addition to the marked changes that are observed to occur during infancy and early childhood, researchers believe that there is moderate stability in EC within individuals across childhood. For example, parental reports of attentional and EC in infancy are positively correlated across toddlerhood and early childhood (Eisenberg et al, 2005; Gaertner, Spinrad, & Eisenberg, 2008), and across racial groups, low-socioeconomic conditions, and genders (Li-Grining, 2007). Kochanska and colleagues (2000) also found that EC at 22 months significantly predicted EC at 33 and 45 months. Furthermore, there appears to be relative stability in EC between early childhood and adolescence (Eisenberg et al., 2005).

Overall, the normative trajectory of EC involves early and significant developmental improvements and general stability. However, since the inter-individual stability in EC appears to be moderate, as indicated by longitudinal correlation values in the .40-.50 range (Kochanska et al., 2000; Li-Grining, 2007), there appears to be a substantial number of children who continue to experience changes (either increases or decreases) in EC across time. The moderate stability of EC suggests that four groups of children exist along the correlation matrix: 1) children with early high, later high EC, 2) early high, later low EC, 3) early low, later low EC, and 4) early low, later high EC. Thus, examining the trajectory of EC across early childhood is crucial given that it is an important time point with regards to the understanding of the change and stability in EC (Kochanska & Knaack, 2003). This study will examine the trajectory of EC across ages

4, 5, and 6 years, which is a time period when significant improvements in EC occur (Jones et al., 2003; Rueda et al., 2011).

Ecological Predictors and Correlates of Effortful Control

Just as important as understanding the developmental trajectory of EC is identifying the individual difference variables that predict or relate to the development of EC. Predictors and correlates of EC are generally described in terms of ecological systems theory (Bronfenbrenner, 1979; 1986). Ecological systems theory underscores the multilevel and transactional nature of children's development, and argues that children develop as a result of interrelated biological, cultural, socioeconomic, and environmental influences. As such, research regarding the predictors and correlates of EC largely point to parenting and environmental/contextual variables. While the majority of the literature has focused on the role of parenting, researchers are becoming increasingly aware of the role of children's larger environmental contexts. Continued examination of the role of environment/context is necessary to understanding child development, and is especially important to our understanding of the development of individual difference variables such as EC.

With regards to parental influences, increased parental responsiveness has been associated with increased EC during toddlerhood (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Kochanska, Aksan, Prisco, & Adams, 2008), while maternal support and warmth has been associated with increased EC during toddlerhood and early childhood (i.e. ages 5 and 6; Belsky et al., 2007; Spinrad et al., 2007). The positive associations between parental warmth/support and EC appear to exist longitudinally as well. For

instance, parental support at age 4 was found to predict measures of EC abilities in first grade, and again in fourth grade (Belsky et al., 2007). Alternatively, harsh/hostile parental control has been associated with decreased EC among preschoolers (Kochanska et al., 2008), while parental hostility and corporal punishment has been related to lower EC in first and second grade children (Zhou, Eisenberg, Wang, & Reiser, 2004).

Studies of the environmental or contextual correlates and predictors of EC and the broader construct of self-regulation underscore the significant role of poverty, exposure to violence, and neighborhood safety. Most of the studies in this area have focused on the influence that socioeconomic variables have on children's self-regulation. For instance, socioeconomic and environmental risk as measured by parent report of neighborhood safety and family income was negatively correlated with EC among 8- to 12-year olds, yet it did not predict to growth or changes in EC across that time period (Lengua et al., 2008). Studies with younger samples of children have also found significant relationships between contextual variables and child self-regulatory abilities, but they have not examined EC specifically. Raver, Blair, and Willoughby (2013), for example, found that family poverty predicted worse executive functioning abilities (measured through indices of inhibitory control and attentional shifting) among 4-year olds, while Sharkey, Tirado-Strayer, Papachristos, and Raver (2012) found that exposure to community violence was associated with reduced impulse and attentional control among preschoolers. An evaluation of the contextual predictors of EC among younger children revealed that family poverty, household density, single-parent status, and several other family-level variables were related to lower EC among 3 and 3 ½ year olds, and

also predicted less growth in EC across this time period (Lengua et al., 2007).

Despite the knowledge that these findings have provided with regards to contextual predictors and correlates of EC, researchers have largely neglected the direct role of neighborhood quality in the development of EC. Progress has been made with regards to examining the role of context in EC development (e.g. Bush, Lengua, & Colder, 2010; Lengua et al., 2007), but there is a notable difference between examining individual- and family- level variables that denote context or neighborhood versus examining neighborhood-level variables that denote the quality of the neighborhood in which the child and his/her family resides. Substituting neighborhood-level variables (e.g. rates of poverty in a neighborhood) with individual- or family-level variables (e.g. family socioeconomic status) is not appropriate for neighborhood-level research, nor does it allow for the findings to be generalized as neighborhood effects (Roosa et al., 2003). Neighborhood quality is considered a salient contextual influence on child development (Levanthal & Brooks-Gunn, 2000; Roosa et al., 2003) and should thus be examined in relation to a construct as developmentally important as EC.

Poor Neighborhood Quality as a Direct Predictor of Effortful Control

Researchers (e.g. Shaw and McKay, 1942) have been examining the influence of neighborhood on child development since before the emergence of Bronfenbrenner's (1979) ecological systems theory. As a result, over half a century of studies have found that neighborhood is a specific ecological context that espouses a great deal of influence on children. In particular, neighborhoods identified as having poor neighborhood quality are associated with worse child outcomes. Indicators of poor neighborhood quality, such

as high levels poverty and exposure to community violence, have been consistently attributed to increased social-emotional problems in childhood and adolescence (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Fowler, Tompsett, Braciszewski, Jacques Tiura, & Baltes, 2009). Although the majority of research on neighborhood effects has examined disadvantaged neighborhoods and poor neighborhood quality (e.g. Leventhal & Brooks-Gunn, 2000), middle-class and affluent neighborhoods have also been found to influence child development (Bush et al., 2010).

In their seminal review of literature, Jencks and Mayer (1990) proposed several models that explain the relationship between neighborhood quality and individual child outcomes. The first model, referred to as the epidemic model, posits that residents confined to a geographical area are likely to also “share the same attitudes, beliefs, and behaviors, and hence to adopt and adhere to a common ways of doing things” (Furstenberg & Hughes, 1997, p. 346). While the first model deals with how neighborhood residents influence each other, the second model, known as the collective socialization model, argues that adults influence children directly by modeling behavior, which children learn to replicate. For example, if neighborhood adults regularly engage in aggressive behaviors, children will learn to accept this behavior as appropriate and expected. The third model, known as the institutional model, states that neighborhood resources impact children by providing them (or not providing them) with access to enriching learning environments such as schools, parks, as well as community centers, and by providing needed social services (e.g. police protection). Finally, the relative deprivation model suggests that people judge their success or failure by comparing

themselves to their neighbors, and that these comparisons can put neighbors in competition for limited neighborhood resources (e.g. placement in elite schools).

Despite the significant main effects between neighborhood quality and child outcomes, and despite the strong theoretical support for the direct influence of neighborhood, a great portion of the research has focused on the mechanisms through which neighborhood confers influence (Roosa et al., 2003). One reason for focusing on the mediators of neighborhood quality, as opposed to the direct effects of neighborhood quality, is that neighborhood is considered a distal developmental influence (Roosa et al., 2003). In other words, neighborhood is considered a broader systemic variable that takes effect through other more proximal variables (e.g. parenting) in order to influence child development. However, the risk that poor neighborhood quality bestows on child development appears to exist even after controlling for individual factors, genetic susceptibility, and family socioeconomic status (SES), which suggests that the impact of poor neighborhood quality occurs independently of more proximal ecological factors (Bush et al., 2010; Caspi, Taylor, Moffitt, & Plomin, 2000; Leventhal & Brooks-Gunn, 2000).

A second reason for neglecting the direct effect of poor neighborhood quality on child outcomes is that the examination of neighborhood is plagued with a variety of conceptual and methodological limitations that cloud the results of developmental studies (Nicotera, 2007; Roosa et al., 2003). In developmental research, neighborhood is defined simply as a “geographically bound unit in which residents share proximity and the circumstances within that proximity” (Chaskin, 1995, p. 1). Intrinsic to this definition is

what Nicotera (2007) refers to as the “environment-place dichotomy.” That is to say, neighborhood is defined in terms of both objective (e.g. geographic and physical characteristics) and subjective (e.g. crime or other social processes) factors. Due to data collection limitations, however, researchers often focus on just one factor (e.g. neighborhood crime/safety) as a proxy for the overarching neighborhood quality variable, which limits the applicability of main effect analyses and the generalizability of findings.

Given that the need to examine neighborhood effects on child development is necessary for the development of policy level interventions that promote positive changes among individuals, guidelines have been proposed to address the conceptual and methodological limitations of neighborhood investigations. Specifically, neighborhood researchers recommend that neighborhood quality be operationalized in terms of both subjective and objective factors that fall into these four categories: social composition, economic composition, social processes, and physical composition/resources (Nicotera, 2007; Roosa et al., 2003). Social composition refers to the overall social make-up (e.g., cultural/racial background, percentage of female headed households) of the individuals/families who reside in the neighborhood. Economic composition describes the overall socioeconomic status (SES; e.g., educational attainment, percentage of residents poverty) of the residents in the neighborhood. Factors that denote social processes reflect the quality of the interactions between neighborhood residents (e.g., crime, organizational participation). Finally, physical composition/resources refers to the physical condition and/or resources (e.g., percentage of vacant/abandoned homes, trash/graffiti in neighborhood, number of neighborhood parks) of the neighborhood.

These four categories represent the multifaceted nature of neighborhood quality and correspond with the theoretical models proposed by Jencks and Mayer (1990). For instance, indicators of the economic composition (e.g. neighborhood poverty) and of the social processes (e.g. neighborhood crime) of neighborhood are compatible with Jencks and Mayer's institutional, epidemic, and socialization models. The more neighborhood poverty, the less of an enriching environment is provided for children. Similarly, the more neighborhood crime, the more residents begin to engage in criminal activity as a shared behavior, and the more children learn to model crime.

In order to address the limitations of previous neighborhood quality examinations, and in order to contribute to the literature regarding the ecological predictors of EC, this study will implement the recommendations set forth by Nicotera (2007) and Roosa and colleagues (2003) in examining the influence that poor neighborhood quality bestows on the development of EC. An examination of the influence of poor neighborhood quality on EC will add to the literature on the ecological and contextual predictors of EC, which could better inform intervention efforts geared toward improving child outcomes.

Supportive and Hostile Parenting as Moderators

While examinations of the relationship between poor neighborhood quality and EC have been largely neglected, the parenting predictors and correlates of EC have been extensively studied. The reason parenting has been so readily studied in relation to EC is because it is considered a vital part of children's ability to develop self-regulatory behaviors (Kochanska et al., 2000; Kopp, 1982). Many studies have shown that parents play a key role in promoting self-regulation by guiding, modeling, and correcting their

children's behavior (Eiden, Edwards, & Leon, 2004; Gartstein, & Fagot, 2003; Karreman, van Tuijl, van Aken, Dekovic, 2008; Kochanska et al., 2000). The only known meta-analysis of studies examining the role of parenting on children's self-regulation revealed that coercive or controlling parenting was predictive of children's lower self-regulation (Karreman, van Tuijl, van Aken, Dekovic, 2006). A notable limitation to Karreman et al.'s (2006) meta-analysis, however, was that it did not include studies evaluating parenting and EC specifically. Furthermore, the meta-analysis also collapsed parenting into three categories (coercive/negative control, positive control, and responsiveness), which prevented fine-grained analyses of the specific types of parenting factors (e.g. supportive parenting) that affect children's self-regulation.

Despite being excluded from the Karremans et al.'s (2006) meta-analysis, many studies have implicated parenting as an important influence of EC. As indicated earlier, supportive parenting is associated with increased EC during early childhood (Belsky, et al., 2007; Spinrad et al., 2007), whereas harsh/hostile parenting is associated with decreased EC at similar ages (Kochanska et al., 2008; Zhou et al., 2004). These two dimensions of parenting (supportive and hostile/harsh parenting) are considered important with regards to early childhood development (Lovejoy, Weis, O'Hare, & Rubin, 1999) and are frequently measured as predictors and correlates of EC (Eisenberg et al., 2011). Supportive parenting is defined as "behavior that demonstrates the parent's acceptance of the child through affection, shared activities, and emotional and instrumental support" (Lovejoy et al., 1999, p. 535). Alternatively, although the terms are different, both hostile and harsh parenting reflect behavior that expresses negative

affect or involves coercive/controlling parenting strategies (Lovejoy et al., 1999; Zhou et al., 2004).

In spite of the focus on supportive and hostile parenting as salient predictors of EC, and in spite of the push to examine the risk and protective factors that modify the negative effects of contextual risk (Lengua, 2008; Luthar, 2006), no known studies have examined the moderating role of supportive or hostile parenting in the relationship between contextual risk (i.e. neighborhood quality) and EC. Examination of the moderating role of hostile and supportive parenting would provide further support for the development of intervention efforts given that moderation effects highlight the factors that promote positive outcomes and protect against negative outcomes (Roosa et al., 2003). Moreover, examining the moderating role of hostile and supportive parenting would help identify the parenting strategies that can be most effectively targeted, and thus allow for the development of intervention efforts that address parenting as a means to overcome the risks associated with poor quality neighborhoods.

Neighborhood, Parenting, Effortful Control, and Social Competence: A Mediated Moderation

In addition to examining the trajectory of EC as influenced by poor neighborhood quality, this study will test a mediated moderation model demonstrating that poor neighborhood quality will interact with supportive and hostile parenting in predicting the slope or change in EC, which will subsequently predict change in social competence at age 6. As indicated earlier, studies on the ecological predictors of EC repeatedly point to parenting and contextual variables (Lengua et al., 2007; Lengua, 2009). However, a

major limitation to those studies is that they often examine the role of one type of ecological variable as opposed to examining how sets of variables interact in the development of EC. Even fewer studies have examined the mediating role of EC in relating contextual and parenting factors and their interactions to child outcome. The studies that have examined the mediating role of EC have looked at it in relation to parent characteristics (e.g., parental depression, maternal behavior) and externalizing (Belsky et al., 2006; Lavigne, Gouze, Hopkins, Bryant, & LeBailly, 2012) as well as internalizing symptoms (Hopkins, Lavigne, Gouze, LeBailly, & Bryant, 2013). Overall, these studies found that parent characteristics indirectly affected child outcomes through the mediating role of EC, yet they did not examine whether parent characteristics moderated or interacted with contextual risk in predicting child outcomes. The single known study (e.g., Chang et al., 2012) that examined a mediated moderation in which the interaction between ecological variables predicted child outcomes (e.g., social competence) looked the mediating role of emotional dysregulation at one time point, as opposed to longitudinally.

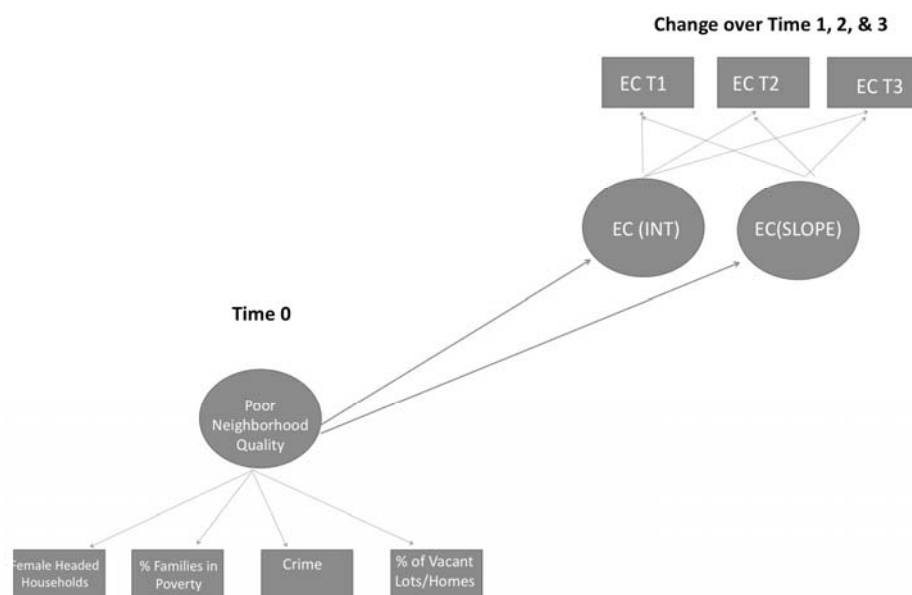
Given the unexamined relationship between the developmental trajectory of EC and social competence as well as the strong link between EC and social competence (Murphy et al., 2004), this study will test whether the interaction between neighborhood and parenting affects changes in children's social competence through the mediating role of EC. A mediated moderation analysis will determine the transactional nature of the various ecological variables that predict to EC, as well as provide support for the influential role of EC in early childhood.

Current Study Aims and Hypotheses

This study used a large, longitudinal, and diverse sample of children to better understand the development of EC and its relationship with neighborhood, parenting, and social competence. Specifically, this study addressed the following questions:

1. Do children experience changes in EC between and within the ages of 4, 5, and 6? It was hypothesized that the overall sample of children will experience a steady linear increase in EC across ages 4, 5, and 6.
2. Does neighborhood quality affect EC during early childhood? Specifically, does neighborhood quality as measured by percentage of female headed households (depicting Social Composition), percentage of families living below poverty (depicting Economic Composition), crime (depicting Social Processes), and percentage of vacant lots/homes (depicting Physical Composition/Resources) influence the rate of change in EC across ages 4, 5, and 6? It was hypothesized that poor neighborhood quality would be inversely related to increases in EC. In other words, it was expected that poor neighborhood quality would be related to stagnant or non-significant increases in EC (see Figure 1).

Figure 1. Structural Diagram of Proposed Latent Growth Curve Model



Note. The measurement error variance of each observed measure has been omitted from the above diagram and from the remaining diagrams below in order to streamline the presentation.

3. Does supportive and/or hostile parenting interact with poor neighborhood quality in the development of EC? Specifically, does supportive and/or hostile parenting moderate the relationship between poor neighborhood quality and EC? It was hypothesized that children who experienced higher levels of supportive parenting at age 4 would also experience a more pronounced increase in EC across ages 4, 5 and 6 (see Figure 2). Conversely, children who experienced higher levels of hostile parenting at age 4 were hypothesized to experience an attenuated increase in EC across ages 4, 5 and 6 (see Figure 3). Thus, supportive parenting was hypothesized to mitigate the negative effects of poor neighborhood quality on the development of EC, whereas hostile parenting was expected to exacerbate the negative relationship

between poor neighborhood quality and EC.

Figure 2. Structural Diagram of Proposed Latent Variable Interaction, Poor Neighborhood Quality \times Supportive Parenting \rightarrow EC Intercept and Slope

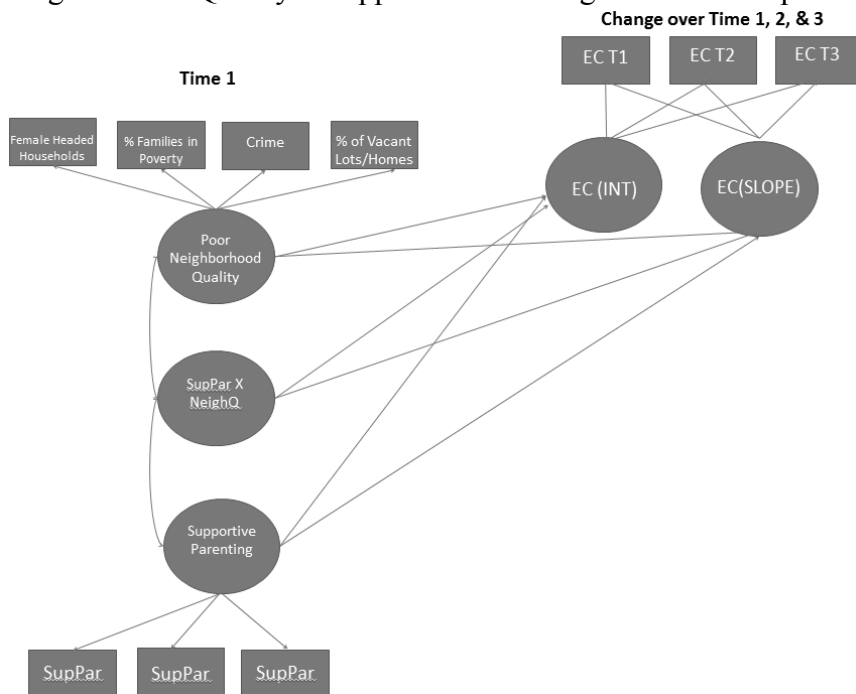
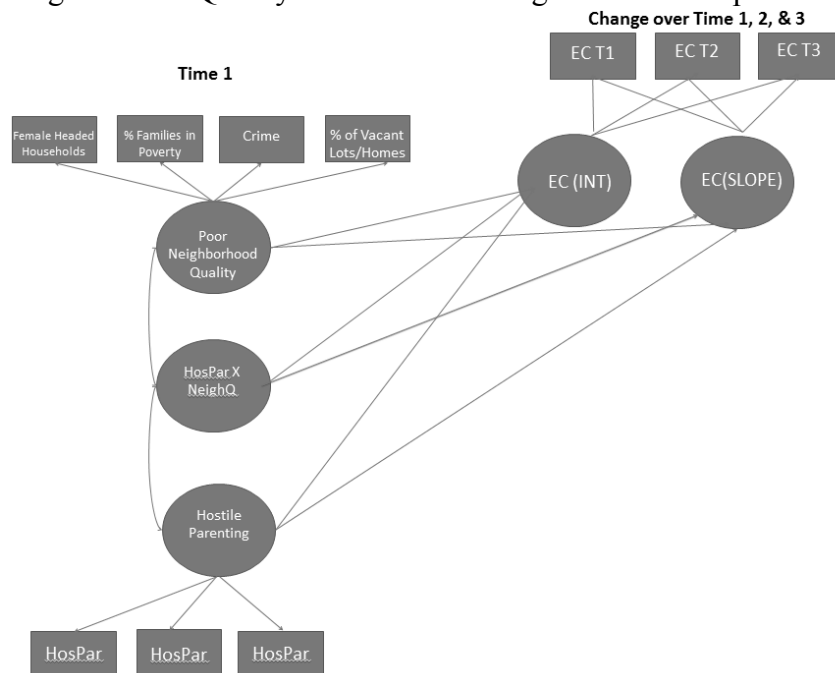


Figure 3. Structural Diagram of Proposed Latent Variable Interaction, Poor Neighborhood Quality \times Hostile Parenting \rightarrow EC Intercept and Slope



4. Does the hypothesized relationship between neighborhood quality, parenting, and EC affect children's social competence? A mediated moderation process was hypothesized to emerge demonstrating that supportive and hostile parenting interact with neighborhood quality in predicting the slope or change in EC, which would subsequently predict change in social competence at age 6 (see Figures 4 and 5).

Figure 4. Structural Diagram of Proposed Latent Growth Curve Model for Testing Mediated Moderation for Supportive Parenting

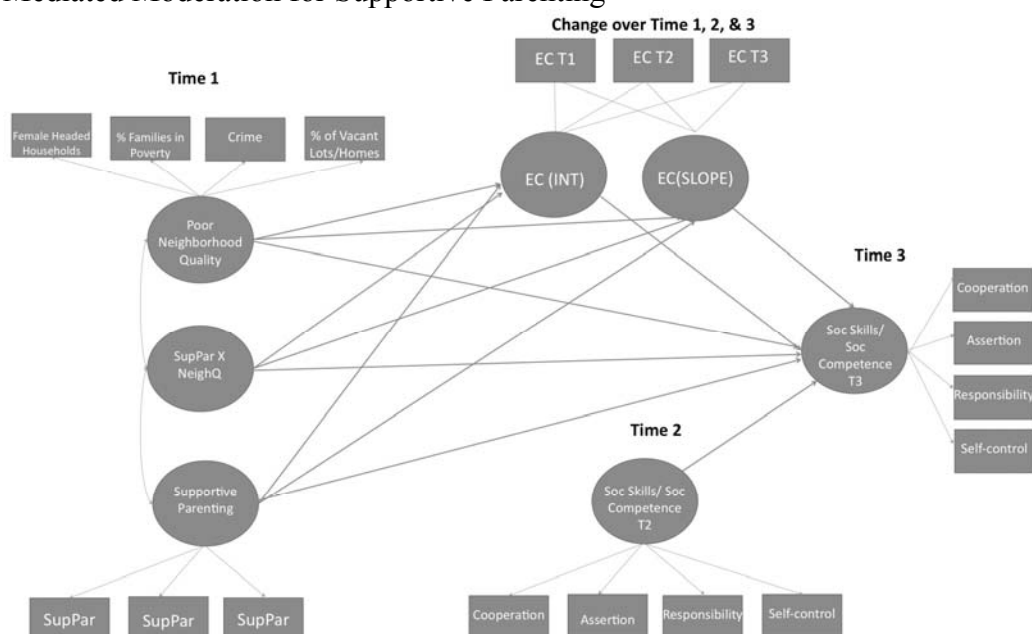
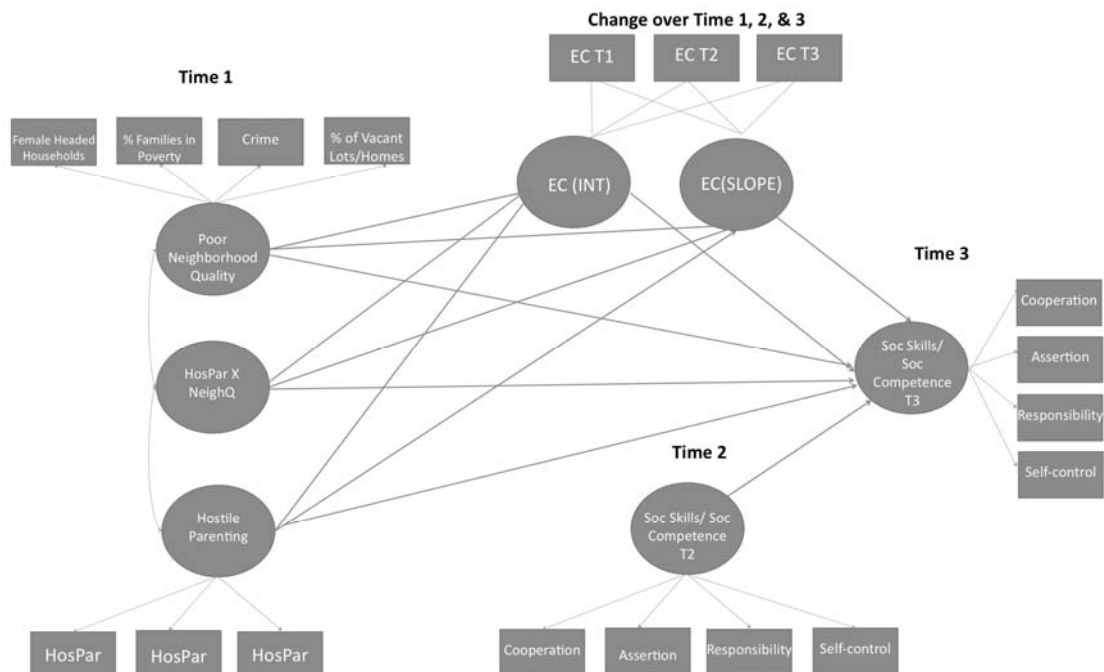


Figure 5. Structural Diagram of Latent Growth Curve Model for Testing Mediated Moderation for Hostile Parenting



CHAPTER TWO

METHOD

Participants

Participants were recruited through 23 pediatric practices and 13 public schools in Cook County, Illinois for the purposes of enrolling in a longitudinal study of psychosocial factors associated with symptoms of ODD, anxiety, and depression. A total of 827 families agreed to participate in the study. Parents agreeing to participate were sent a packet containing approximately half of the questionnaire-based items. At the time of the home visit, the remaining questionnaires were completed along with the observational measures. After the home visits, 31 children were deemed ineligible (i.e., eligibility required that they had lived with parents for 6 months, had not been diagnosed with an autism spectrum disorder, were 4 years of age, could read Spanish or English, scored > 70 on the Peabody Picture Vocabulary Test, included to make sure children could participate in study tasks). The final time 1 sample included 796 children, comprised of 391 (49.1%) boys and 405 girls (50.9%). Mean age was 4.44 years (Range = 47-61 months). Parent-identified racial/ethnic distribution was 433 (54.4%) White; 162 (20.4%) Hispanic; 133 (16.7%) African American; 19 (2.4%) Asian; 35 (4.4%) multi-racial or “other;” and 14 (1.8%) not reporting. Social class representation (Hollingshead, 1975) was 303 (38.1%) in Class I (highest); Class II, 290 (36.4%); Class III, 79 (9.9%); Class IV, 63 (7.9%); and Class V, 61 (7.7%). About 78% (n=622) of the children lived

with parents who were married. Mothers completed 765 evaluations and primary caretaker fathers completed 31.

Participants were followed for two years after the initial home visit, participating in a total of one home visit per year for three years. A total of 627 children and families (78.8%) participated in all three waves of data collection. The mean age for children at time 2 was 5.11 ($SD = .35$). The mean age at time 3 was 6.20 ($SD = .46$).

Measures

SES

Demographic information regarding child's age, gender, race, parent education, and employment was collected. Parent education and employment were coded for SES according to Hollingshead Four-Factor Index of Social Status (Hollingshead, 1985). The overall sample was skewed in the direction of higher SES; more than half (59%) of the parents reported having a bachelor's degree or higher. SES was used as a covariate in all analyses to control for family and individual level variables that could confound the effects of neighborhood.

Effortful Control

The *Children's Behavior Questionnaire* (CBQ; Rothbart, Ahadi, Hershy, & Fisher, 2001), a widely-used parent-report measure of temperament across ages 3 to 7, was used to measure EC. The CBQ required that caregivers rate 126 items describing their child's reactions to various situations using a 7-point scale (ranging from "1" = Extremely untrue, to "7" = Extremely true). The CBQ assessed fifteen temperament characteristics and three broad dimensions of temperament including

Extraversion/Suregency, Negative Affectivity, and Effortful Control. The temperament characteristics that loaded onto the EC scale were *Low Intensity Pleasure* (e.g. “Rarely enjoys just being talked to”), *Smiling/Laughter* (e.g. “Laughs a lot at jokes and silly happenings”), *Inhibitory Control* (e.g. “Can lower his/her voice when asked to do so”), *Perceptual Sensitivity* (e.g. “Notices smoothness or roughness of objects s(he) touches”), and *Attentional Control* (e.g. When picking up toys or other jobs, usually keeps at the task until done”). Alpha coefficients for items that load onto the Effortful Control scale range from .72 to .88 (Eisenberg et al., 2004). The CBQ has been validated across cultures and races (Rothbart et al., 2001).

Despite its widely accepted use, researchers have raised concerns (e.g., Eisenberg et al., 2009; Lengua, West, & Sandler, 1998) about the overlap between the CBQ items that measure EC and childhood adjustment problems, such as social competence; measurement overlap between these two constructs could arguably inflate their relationship. In order to reduce item contamination between the EC scale and the social competence outcome measure, and following the recommendations set forth by Lengua and colleagues (1998), this study utilized expert opinion and confirmatory factor analysis (procedures outlined in Lavigne et al., 2012 and Hopkins et al., 2013) in order to derive two unique indicators of EC: *attentional focusing* and *inhibitory control*. Composite reliability for the EC indicators ranged from .54 to .66 across the three years of study (see Table 1).

Poor Neighborhood Quality

In order to comply with the recommendations set forth by Nicotera (2007) and Roosa and colleagues (2003) regarding the need to examine the multifaceted nature of neighborhood, four indicators depicting *Social Composition*, *Economic Composition*, *Social Processes*, and *Physical Composition/Resources* were used to measure and assess the neighborhood construct.

Table 1. Descriptive Statistics: Means, Standard Deviations, Composite Reliabilities, Skewness and Kurtosis Values

Measure	Mean	S.D.	Internal Consistency	Skewness	Kurtosis
1. SES	47.10	14.57	NA	-.86	-.11
2. Effortful Control (EC) Times 1, 2, 3			.56 (T1) .59 (T2) .66 (T3)		
EC-Atten Focus T1	4.92	1.04		-.47	.39
EC-Atten Focus T2	5.10	.99		-.42	.19
EC-Atten Focus T3	5.10	1.02		-.45	.19
EC- Inhibit Cont T1	4.89	1.18		-.66	.17
EC- Inhibit Cont T2	5.02	1.12		-.68	.17
EC- Inhibit Cont T3	5.19	1.09		-.62	.19
3. Poor Neighborhood Quality*			.87		
% Female Households	6.33	5.01		1.82	3.41
% Families in Poverty	12.12	11.71		1.13	.31
% Vacant Lots	5.13	3.57		2.04	5.08
Crime Statistics**	2898.63	2168.48		.91	.34
4. Supportive Parenting			.86		
Support Parent Parcel 1	13.95	1.86		-2.38	16.18
Support Parent Parcel 2	13.54	2.06		-2.48	8.85
Support Parent Parcel 3	12.63	2.35		-1.47	3.28
5. Hostile Parenting			.71		
Hostile Parent Parcel 1	1.31	.73		.74	.75
Hostile Parent Parcel 2	.55	.67		1.95	5.25
Hostile Parent Parcel 3	2.40	.85		.26	.20
6. Social Competence Times 2 and 3			.83(T2), .84(T3)		
Cooperation SSRSC2	12.79	3.20		-.23	.06
Assertion SSRSC2	16.19	2.84		-.80	.31
ResponsibilitySSRSC2	12.27	3.18		-.29	.18
Self-Control SSRSC2	13.0	3.25		-.12	-.21
Cooperation SSRSC3	12.66	3.23		-.26	.06
Assertion SSRSC3	16.12	2.91		-.76	.08
ResponsibilitySSRSC3	12.87	3.01		-.28	.00
Self-Control SSRSC3	13.47	3.32		-.28	.01

Note. Descriptives for poor neighborhood quality and social competence indicator are based off of observed variables. Descriptives for remaining indicators are based off of parcels and scales developed based on expert ratings.

*Internal consistency based on Z-scores for manifest indicators of poor neighborhood quality

**Total crime numbers reported by census zip code

A combination of census and police department data depicting percentage of female headed households (Social Composition), percentage of families living below poverty (Economic Composition), crime (Social Processes), and percentage of vacant lots/homes (Physical Composition/Resources) were utilized to create four neighborhood variables for each zip code that was identified per participant during the first year (time 1) of the study. Because there currently are no known theories of neighborhood effects that suggest how each neighborhood factor should be weighted (see Nicotera, 2007), each of the four neighborhood values were standardized across participants and then combined to reflect an overall latent neighborhood factor. A total of 134 zip code identified neighborhoods were included in this study, with an average of six participants living in each zip code. The internal consistency of the four standardized indicators was .87 (see Table 1).

Parent Support and Hostility

The Parent Behavior Inventory (PBI; Lovejoy, Weis, O'Hare, & Rubin, 1999), a 20-item self-report measure of parenting behavior, was used to measure the supportive and hostile dimensions of parenting. Responses were rated on a 5-point scale ranging from 1 = "not at all true (I do not do this)" to 5 = "very true (I often do this)." The Support/Engagement dimension assessed "behavior that demonstrates the parent's acceptance of the child through affection, shared activities, and emotional and instrumental support" (Lovejoy et al., 1999, p. 535). Items that assessed Support/Engagement included "I listen to my child's feelings and try to understand them" and "I thank or praise my child." The Hostility/Coercion parenting dimension assessed parent "behavior that expresses negative affect or indifference toward the child and may

involve the use of coercion, threat, or physical punishment to influence the child's behavior" (Lovejoy et al., 1999, p. 535). Items that assessed Hostility/Coercion include "I threaten my child" and "I lose my temper when my child doesn't do something I ask him/her to do." Items in this scale were divided into 3 parcels (~~see data analysis section~~) to provide three indicators of the supportive and hostile parenting latent factors at time 1. Internal consistency for the latent supportive parenting factor was .86, and .71 for the latent hostile parenting factor (see Table 1).

Child Social Competence

The Social Skills Rating System (SSRS; Gresham & Elliot, 1990) was used to assess children's social competence. The SSRS is a widely used parent-report measure of children's social abilities, consisting of 38 items rated on 3-point scales. The measure was normed on a diverse, U.S. sample of 3- to 5-year old children, and it has been used with racial/ethnic minority and low-income samples (Bain & Pelletier, 1999; Fagan & Fantuzzo, 1999). The SSRS includes four factor-analytically derived subscales, *cooperation* (e.g. "cooperates with family members without being told to do so"), *assertion* ("starts conversations without waiting for others to do so"), *responsibility* ("puts away toys or other household property"), and *self-control* (e.g. "controls temper in conflict situations with you"). The four subscales were combined to create latent social competence factors for times 2 and 3. The internal consistency of the time 2 and 3 latent factors was .83 and .84, respectively.

Data Analysis

The four research aims and hypotheses were examined via latent growth curve modeling (LGM), a special form of structural equation modeling (SEM) that enables one to analyze individual variation in temporal change as either an independent or dependent variable. All models were tested using Mplus 7.11 (Muthén & Muthén, 2013). Full-information maximum likelihood (referred to as MLR) estimation was used as it accommodates missing data by using all available data for each parameter (Enders & Bandalos, 2001). SEM was the ideal analytic approach for this study for several reasons. First, it allowed for latent variables comprised of multiple measures to be used, which partials out measurement error and thereby disattenuates relationships for the effects of unreliability. Importantly, the use of latent variables allowed for a comprehensive measure of neighborhood that met the measurement recommendations set forth by Nicotera (2007) and Roosa et al. (2003). Latent variables were also created for all other constructs under investigation. For constructs that were measured through a questionnaire with multiple items (e.g. hostile and supportive parenting), the individual items were combined into parcels, or groups of items to create a set of reliable multiple indicators, which were used to estimate latent factors. Confirmatory factor analyses (CFA) were run to determine appropriateness of model fit for latent variables.

Second, SEM allowed for dependent variables to also be examined as independent variables (Kline, 2005), which was a necessary method for testing the hypothesized mediated moderation model wherein EC served as both a dependent variable influenced by initial predictors, as well as an independent variable that predicts subsequent social

competence. Finally, SEM allowed for greater modeling flexibility in contrasting alternative models and allowed for testing proposed associations amongst multiple variables within a single model.

Overall model fit for each of the LGM and CFA models was based on multiple indices. Typically, good-fitting models are indicated by non-significant chi-square values. However, because large sample size can inflate chi-squared values, results in this analysis follow Brown's method (Brown, 2006) in reporting the chi-square but not interpreting its value. Additional indices of model fit, including an index of absolute fit (Standardized Root Mean Square Residual; SRMR), an index adjusting for model parsimony (Root Mean Square Error of Approximation; RMSEA), and comparative fit indices (Tucker Lewis Index, TLI; and Comparative Fit Index, CFI) are reported. Following the recommendations of Hu and Bentler (1999) and Kline (2010), criteria for good-fitting models were $SRMR < .08$, $RMSEA < .06$, and TLI and $CFI > .90$. After examining overall model fit, unstandardized (*b*) coefficients were examined to determine the relationship between the variables under investigation.

Analysis for Hypothesis 1

The first research question addressed whether there was a change in EC across ages 4, 5, and 6. LGM accomplished this goal through the use of an unconditional LGM model depicting the intercept and rate of change, referred to as slope, of EC (Preacher, Wichman, MacCallum, Briggs, 2008). The intercept of EC corresponds to the initial values of EC; a significant intercept indicates that the observed mean value is significantly greater than zero. The slope of EC corresponds to the mean level of growth

within the overall sample; significant slope values indicate significant rates of change in the overall sample from age 4 to 6. The LGM also provides variance estimates for the intercept and slope values of EC, which indicate whether there was significant individual variance in EC at nested (age 4) or in the change in EC across time. A correlation between the two variance estimates is also reported to show the strength of the relationship between initial level of EC and change in EC.

Analysis for Hypothesis 2

A conditional LGM was used to evaluate the predictive role of poor neighborhood quality on the trajectory of EC. Unstandardized (*b*) and standardized (β) coefficients indicating the strength of the relationship between the latent poor neighborhood quality variable and the intercept and slope of EC are reported.

Analysis for Hypothesis 3

The interaction of poor neighborhood quality and parenting type (poor neighborhood quality x supportive parenting; poor neighborhood quality x hostile parenting) was calculated using Klein and Moosbrugger's (2000) latent moderated structural equations (LMS) method. The LMS method uses a special form of maximum-likelihood estimation that takes into account the degree of non-normality implied by the interaction term of the latent variables (Kline, 2005). The LMS method estimated the latent interaction effect directly from the poor neighborhood quality and parenting indicators without having to create separate product-indicators for a moderator latent variable within the structural equation model. In this study, four separate models were run to test the moderating role of supportive parenting and hostile parenting. First,

models were run that excluded the latent variable interaction. The overall model fit of these model is reported. Second, models that included the latent variable interaction were run. Log-likelihood chi-square difference tests based on procedures outlined by Muthén (2012) were subsequently run in order to compare the models, and thus determine whether the interaction model demonstrated good fit to the data, as it compared to the original nested model. Specifically, the H0 log-likelihood of the nested model was contrasted with the H0 log-likelihood of the interaction model. According to Muthén and Muthén (2013), -2 times the log-likelihood difference is distributed as chi-square, which can be used to assess model fit. Significant $\Delta\chi^2$ values indicate that interaction model fits the data better than the nested model, whereas non-significant $\Delta\chi^2$ values indicate that there is no difference between the nested and interaction model, and thus, both are acceptable if the nested model has suitable fit statistics (Werner & Schermelleh-Engel, 2010). Significant direct and interaction effects are reported in terms of unstandardized *b*. Mplus does not provide standardized (β) coefficients for analyses that include latent variable interactions. Thus, for all significant interaction effects, standardized (β) coefficients and variance estimates were computed manually based on procedures outlined by Muthén (2012).

Analysis for Hypothesis 4

A mediated moderation analysis was run to test the final research aim and hypothesis. In this model, the indirect effect of the latent variable interaction (poor neighborhood quality \times supportive parenting; poor neighborhood quality \times hostile parenting) through latent growth in EC was examined in relation to change in children's

social competence from ages 5 to 6 years. In order to establish model fit for the mediated moderation model (indirect effect model), two nested models (for supportive and hostile parenting) excluding the interaction terms were run. Then the mediated moderation models were run. Once again, log-likelihood chi-square difference tests were run in order to compare the models (Muthén, 2012). For each of the two mediated moderation analyses, the H0 log-likelihood of the nested model that excluded the latent variable interactions was compared against the interaction model. As stated earlier, the -2 times the log-likelihood difference between the two models provided a chi-square value, which was used to compare model fit. Significant $\Delta\chi^2$ values indicate that interaction model fits the data better than the nested model; non-significant $\Delta\chi^2$ values indicate that there is no difference between the nested and interaction model (Werner & Schermelleh-Engel, 2010).

Significant direct and interaction effects are reported in terms of unstandardized *b*. To evaluate the significance of the indirect effect of EC, an asymmetric confidence interval was calculated to determine if the mediated effect was statistically significant (Muthén, 2011). In the case of the mediational model, the null hypothesis of no indirect effect is rejected at the .05 level of significance, if the 95% confidence interval (CI) for the indirect effect does not contain 0 (Muthén, 2011).

CHAPTER THREE

RESULTS

Preliminary Analyses

First, descriptive and frequency analyses were run in order to screen for missing data and potential outliers. Data were determined to be missing at random based on Little's Missing Completely at Random test (Little 1988). Maximum imputation procedures are considered a preferred method for handling data that is missing at random (Allison, 2002). Thus, missing values were imputed using SPSS 15 expectation maximization procedures prior to conducting SEM.

Second, means, standard deviations, and skew index and kurtosis values were calculated in order to assess normality (Table 1). Skewness values greater than 3 and kurtosis values greater than 10 may indicate problems with normality (Kline, 2010). In this study, the first supportive parenting parcel exceeded the recommended kurtosis value. However, MLR is robust with regards to violating the assumption of normality (Muthén & Asparouhov, 2002). Thus, no transformations were utilized.

Finally, the inter-correlations between all manifest indicators were evaluated (Table 2). Significant correlations existed between many of the study variables. The manifest indicators comprising each of the respective latent construct variables for EC, neighborhood quality, supportive parenting, hostile parenting, and social skills were positively correlated.

Table 2. Inter-correlations Between Manifest Indicators

Variables (Manifest Indicators)	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SES	1												
2. EC- Atten Focus W1	.07	1											
3. EC- Atten Focus W2	.04	.54**	1										
4. EC- Atten Focus W3	.03	.52**	.60**	1									
5. EC- Inhibit Cont W1	.12**	.37**	.33**	.31**	1								
6. EC- Inhibit Cont W2	.19**	.28**	.42**	.38**	.52**	1							
7. EC- Inhibit Cont W3	.09*	.28**	.40**	.49**	.49**	.58**	1						
8. % Female Households	-.37**	-.08*	-.05	-.08**	-.10**	-.14**	-.14**	1					
9. % Families in Poverty	-.44**	-.05	-.04	-.09*	-.12**	-.13**	-.16**	.78**	1				
10. % Vacant Lots	-.32**	-.01	-.00	-.04	-.07	-.10*	-.11**	.72**	.84**	1			
11. Crime Statistics	-.23**	.04	.07	.03	-.09*	-.09*	-.08*	.30**	.59**	.56**	1		
12. Support Parent Parcel1	.21**	.18**	.12**	.17**	.18**	.22**	.21**	-.08*	-.20**	-.10**	-.13**	1	
13. Support Parent Parcel2	.26**	.21**	.17**	.22**	.26**	.24**	.27**	-.16**	-.23**	-.13**	-.11**	.70**	1
14. Support Parent Parcel3	.17**	.23**	.17**	.21**	.22**	.18**	.19**	-.00	-.10**	-.03	-.02	.64**	.69**
15. Hostile Parent Parcel 1	-.05	-.14**	-.24**	-.18**	-.12**	.27**	-.18**	.01	.04	.02	-.00	-.02	.02
16. Hostile Parent Parcel 2	-.20**	-.14**	-.22**	-.11**	-.18**	-.18**	-.13**	.17**	.18**	.14**	.09	-.16**	-.19**
17. Hostile Parent Parcel 3	.02	-.01	-.09*	-.02	-.05	-.19**	-.04	-.03	-.04	-.01	-.05	-.19**	.20**
18. Cooperation SSRSC2	.05	.35**	.46**	.46**	.33**	.42**	.38**	-.04	-.05	-.01	.01	.20**	.26**
19. Assertion SSRSC2	.24**	.25**	.31**	.32**	.25**	.30**	.25**	-.19**	-.23**	-.17**	-.09*	.31*	.32**
20. ResponsibilitySSRSC2	.05	.22**	.30**	.30**	.27**	.35**	.29**	-.03	-.05	-.02	.01	.23**	.28**
21. Self-Control SSRSC2	.16**	.38**	.46**	.45**	.34**	.43**	.39**	-.12**	-.12**	-.07	-.02	.20**	.27**
22. Cooperation SSRSC3	.11**	.32**	.43**	.52**	.32**	.41**	.45**	-.08*	-.11**	-.05	-.04	.18**	.21**
23. Assertion SSRSC3	.26**	.25**	.31**	.41**	.20**	.29**	.30**	-.17**	-.22**	-.14**	-.10*	.23**	.26**
24. ResponsibilitySSRSC3	.07	.19**	.29**	.37**	.26**	.34**	.34**	-.07	-.08	-.05	-.02	.20**	.23**
25. Self-Control SSRSC3	.15**	.35**	.45**	.55**	.28**	.38**	.42**	-.09*	-.11**	-.03	-.02	.20**	.25**

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

Table 2 (cont). Inter-correlations Between Manifest Indicators

Variables	14	15	16	17	18	19	20	21	22	23	24	25
1. SES												
2. EC- Atten Focus W1												
3. EC- Atten Focus W2												
4. EC- Atten Focus W3												
5. EC- Inhibit Cont W1												
6. EC- Inhibit Cont W2												
7. EC- Inhibit Cont W3												
8. % Female Households												
9. % Families in Poverty												
10. % Vacant Lots												
11. Crime Statistics												
12. Support Parent Parcel1												
13. Support Parent Parcel2												
14. Support Parent Parcel3	1											
15. Hostile Parent Parcel 1	-.04	1										
16. Hostile Parent Parcel 2	-.19**	.50**	1									
17. Hostile Parent Parcel 3	.17**	.50**	.36**	1								
18. Cooperation SSRSC2	.26**	-.20**	-.15**	-.05	1							
19. Assertion SSRSC2	.25**	-.10**	-.18**	.06	.48**	1						
20. ResponsibilitySSRSC2	.27**	-.12**	-.14**	.02	.58**	.62**	1					
21. Self-Control SSRSC2	.25**	-.26**	-.25**	-.08*	.57**	.50**	.55**	1				
22. Cooperation SSRSC3	.18**	-.21**	-.19**	-.04	.65**	.32**	.43**	.43**	1			
23. Assertion SSRSC3	.19**	-.15**	-.18**	.06	.37**	.66**	.47**	.43**	.47**	1		
24. ResponsibilitySSRSC3	.19**	-.14**	-.14**	.03	.44**	.43**	.63**	.40**	.55**	.60**	1	
25. Self-Control SSRSC3	.22**	-.28**	-.24**	-.06	.47**	.42**	.43**	.68**	.59**	.59**	.58**	1

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

The EC indicators across times 1, 2, and 3 were positively correlated and ranged from .60 to .28, which is consistent with previous research that found moderate stability in EC across time (Kochanska, Murray, & Harlan, 2000; Li-Grining, 2007). Notably, there were weak negative correlations between EC indicators and the poor neighborhood quality indicators. Supportive parenting indicators were also weakly correlated with EC. Hostile parenting was negatively, yet weakly correlated with EC. Time 2 and 3 social competence indicators shared weak to moderate positive correlations with the EC indicators. Furthermore, there were significant correlations between SES, and most of the manifest indicators of neighborhood quality, supportive and hostile parenting, and social competence, which justified the examination of SES as a covariate in all SEM analyses.

Structural Equation Modeling

Results for Hypothesis 1

Do children experience changes in EC between and within the ages of 4, 5, and 6? It was hypothesized that the overall sample of children will experience a steady linear increase in EC across ages 4, 5, and 6.

Results of the LGM assessing the growth of EC demonstrated good model fit $\chi^2(1, N = 784) = 2.40, p = 0.12, RMSEA = .042, CFI = .997, TLI = .991, SRMR = .013$. Examination of the parameter estimates suggested that there is significant growth in EC across ages 4, 5, and 6 (Mean EC intercept = 9.84, Mean EC slope = .20, $p < .001$). On average, children in the study had an initial EC value of 9.84 that grew by a rate of .20 each subsequent year of study. Notably, there was a negative correlation between the

mean intercept value and the mean slope value (-.099), which suggests that there was a weak inverse relationship between children's initial level of EC and their rate of change in EC. Additionally, the variance of EC intercept was statistically different from zero ($b = 2.00$ $p < .001$), indicating significant variability in initial levels of EC across children. The variance of EC slope was not statistically different than zero ($b = .18$, $p = .14$), suggesting that rates of growth in EC were not significantly different across children.

Results for Hypothesis 2

Does neighborhood quality affect EC during early childhood? Specifically, does neighborhood quality as measured by percentage of female-headed households (depicting Social Composition), percentage of families living below poverty (depicting Economic Composition), crime (depicting Social Processes), and percentage of vacant lots/homes (depicting Physical Composition/Resources) influence the rate of change in EC across ages 4, 5, and 6? It is hypothesized that poor neighborhood quality will be inversely related to increases in EC. In other words, it is expected that poor neighborhood quality will be related to stagnant or non-significant increases in EC.

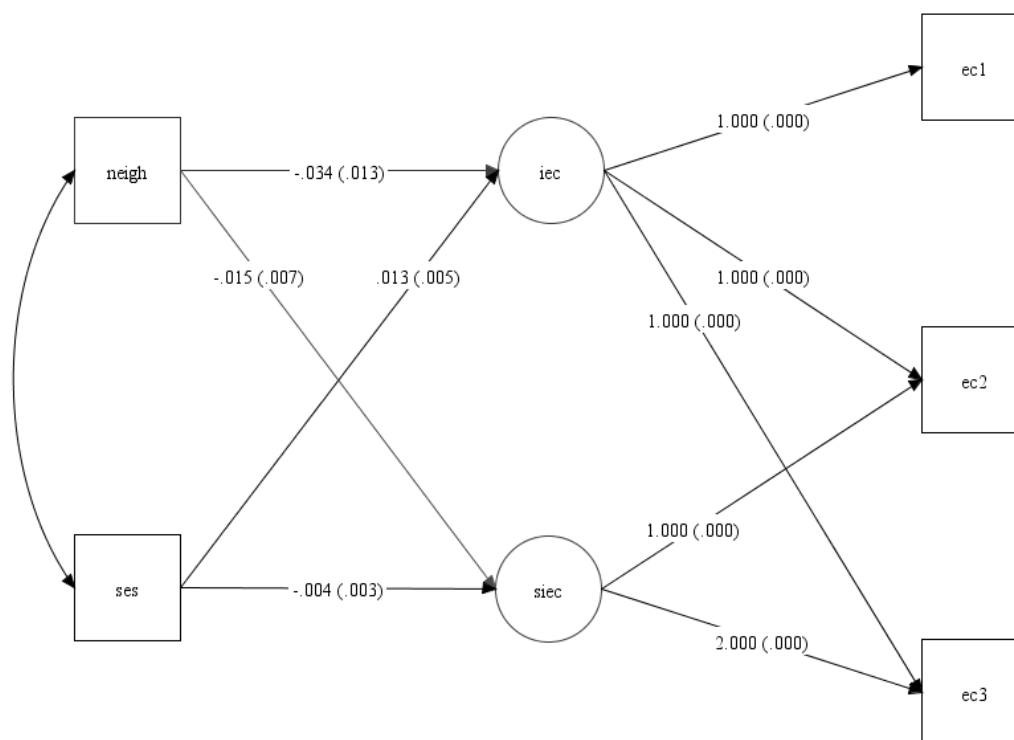
To test the second hypothesis, a CFA for the four manifest indicators of neighborhood quality (percentage of female-headed households, percentage of families living below poverty, crime, and percentage of vacant lots/homes) was run. Initially, a formative model whereby the latent variable for poor neighborhood quality was comprised of a composite of the four neighborhood indicators was run. Formative measurement models operate under the assumption that the latent construct is formed or comprised of manifest indicators (Coltman, Devinney, Midgley, & Venaik, 2008; Kline,

2011). However, the solutions in the formative model for poor neighborhood quality were inadmissible. To overcome this limitation, the poor neighborhood quality construct was re-conceptualized as a reflective indicator. Reflective measurement models assume that the latent construct is pre-existing and reflects or causes the manifest indicators. Thus, given that the construct of poor neighborhood quality could be conceived as either a composite of indicators or a reflection or cause of indicators, a reflective CFA was run to create the latent poor neighborhood quality variable. The initial reflective CFA model for neighborhood quality, in which the manifest indicators were hypothesized to result from the latent neighborhood quality variable, demonstrated ill-fit due to the exclusion of a correlation between the residuals for two of the manifest indicators, crime and percent of female headed households. The negative correlation between these two residuals suggested that the unexplained variability in percentage of female-headed households was negatively associated with the unexplained variability in crime. Recent Census and Department of Justice statistics indicating that percentage of female-headed households has risen in the last two decades while crime has decreased support this negative correlation (U.S. Census Bureau, 2000; U.S. Department of Justice, 2010). Additionally, criminal justice scholars have identified other factors, such as the increase in male incarceration, as a possible explanation for the reduction in crime and increase in female-headed households (Lynch & Sabol, 2004). Thus, given the support for the negative correlation between these two manifest indicators, the CFA model for poor neighborhood quality was respecified according to guidelines by MacCallum (1995), to allow the residuals for crime and percentage of female-headed households to correlate, ($b = -.203, p$

$<.001$, $\beta = -.203$, $p <.001$). The respecified CFA model showed good fit, $\chi^2 (1, N= 788) = 0.003$, $p = .96$, RMSEA = .000, CFI = 1.000, TLI = 1.007, SRMR = 0.001.

The model assessing the relationship between latent poor neighborhood quality and the LGM for EC showed adequate fit, $\chi^2 (4, N= 784) = 6.49$, $p = .17$, RMSEA = .028, CFI = .996, TLI = .991, SRMR = .010 (see Figure 6).

Figure 6. Direct Effect of Latent Poor Neighborhood Quality on EC Intercept and Growth, Controlling for SES



Note. Unstandardized coefficients for each parameter are presented. Standard errors are reported in parentheses. Significant path, $p < .05$, are in red. EC 1 = effortful control time 1; EC 2 = effortful control time 2; EC 3 = effortful control time 3; IEC = Intercept of effortful control; SIEC = Slope of effortful control; Neigh = Latent variable for poor neighborhood quality

As hypothesized, the direct effect of latent poor neighborhood quality on the intercept of EC (EC at age 4), $b = -.034$, $p < .05$, $\beta = -.025$, $p < .05$, and slope or growth of EC across ages 4, 5, and 6 $b = -.015$, $p < .05$, $\beta = -.041$, $p < .05$. were both statistically significant. The negative coefficient values indicate that higher levels of poor

neighborhood quality were related to a lower level of EC at age 4 and a slower growth in EC across ages 4, 5, and 6. Overall, poor neighborhood quality significantly accounted for about 5% ($R^2 = .05, p < .05$) of the variance in EC intercept, but did not significantly account for variance in EC slope ($R^2 = .05, p = .29$).

Results for Hypothesis 3

Does supportive and/or hostile parenting interact with poor neighborhood quality in the development of EC? Specifically, does supportive and/or hostile parenting moderate the relationship between poor neighborhood quality and EC? It was hypothesized that children who experience higher levels of supportive parenting at ages 4, 5, and 6 will also experience a more pronounced increase in EC across ages 4, 5 and 6. Conversely, children who experience higher levels of hostile parenting at ages 4, 5, and 6 were hypothesized to experience an attenuated increase in EC across ages 4, 5 and 6 (see Figure 3). Thus, supportive parenting was hypothesized to mitigate the negative effects of poor neighborhood quality on the development of EC, whereas hostile parenting is expected to exacerbate the negative relationship between poor neighborhood quality and EC.

Poor neighborhood quality \times supportive parenting. The CFA for latent supportive parenting demonstrated adequate fit, $\chi^2 (2, N = 796) = 7.766, p < .05$, RMSEA = .060, CFI = .990, TLI = .985, SRMR = .043.

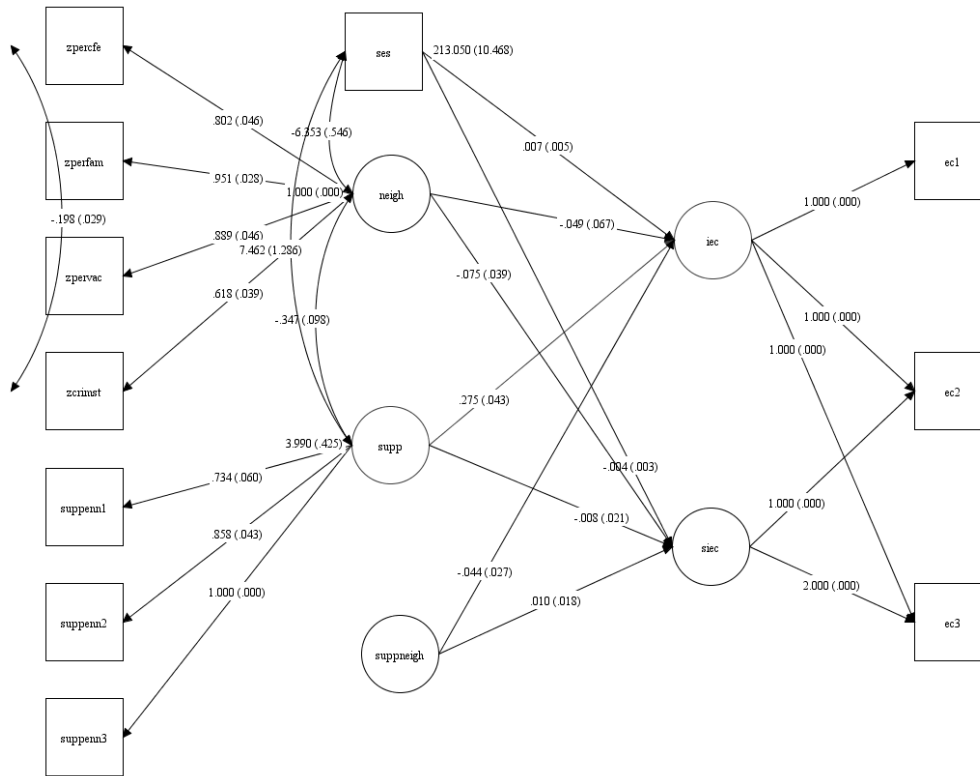
The model depicting the direct effect of latent poor neighborhood quality and supportive parenting on EC intercept and growth demonstrated acceptable fit, $\chi^2 (39, N = 796) = 114.44, p < .01$, RMSEA = .049, CFI = .975, TLI = .965, SRMR = .037 (see

Figure 6). Log-likelihood chi-square difference test showed that the interaction model was not significantly different than the nested model, $\Delta\chi^2(2, N=796) = 2.21, p = .33$, thus, the interaction model was determined to have acceptable fit.

Several significant effects emerged in the interaction model. Supportive parenting had a significant effect on intercept of EC ($b = .275, p < .001$), indicating that higher levels of supportive parenting were related to higher levels of EC at age 4. However, supportive parenting did not significantly predict the slope of EC ($b = -.008, p = .70$). Similarly, there were no significant main effects of poor neighborhood quality on intercept of EC, $b = -.049, p = .47$, nor on slope of EC, $b = .075, p = .054$. Contrary to predictions, the latent variable interaction between poor neighborhood quality and supportive parenting did not significantly predict the intercept of EC, $b = -.044, p = .11$, nor the slope of EC, $b = -.01, p = .58$. Thus, supportive parenting did not moderate the relationship between poor neighborhood quality and EC development (see Table 3 and Figure 7).

Poor neighborhood quality \times hostile parenting. The CFA for latent hostile parenting demonstrated adequate fit, $\chi^2(0, N = 796) = .002, p < .001$, RMSEA = .000, CFI = 1.000, TLI = 1.000, SRMR = .000. The model depicting the direct effect of latent poor neighborhood quality and hostile parenting showed adequate fit, $\chi^2(37, N = 796) = 107.74, p < .001$, RMSEA = .049, CFI = .973, TLI = .960, SRMR = .046 (see Figure 8). The log-likelihood chi-square difference test showed that the interaction model was not significantly different than the nested model, $\Delta\chi^2(2, N = 796) = 5.13, p = .08$; thus, the interaction model was deemed to have acceptable fit.

Figure 7. Latent Variable Interaction Between Poor Neighborhood Quality × Supportive Parenting → EC Intercept and Growth, Controlling for SES



Note. Unstandardized coefficients for each parameter are presented. Standard errors are reported in parentheses. Significant path, $p < .05$, are in red. EC 1 = effortful control time 1; EC 2 = effortful control time 2; EC 3 = effortful control time 3; IEC = Intercept of effortful control; SIEC = Slope of effortful control; Neigh = Latent variable for poor neighborhood quality; Zpercfam = % Families in poverty; Zpervac = % Vacant lots; Zcrimst = Crime statistics; Suppenm = Supportive parenting parcel; Suppneigh = Poor neighborhood quality X Supportive parenting

Tests of direct effects revealed that there was a significant effect of poor neighborhood quality on the slope or growth of EC, $b = -.077$, $p < .05$, indicating that poorer neighborhood quality was related to less EC growth over the three years of study. Poor neighborhood quality did not predict EC intercept, $b = -.080$, $p = .25$, $\beta = -.09$, $p = \text{NA}$. The main effect of parent hostility on EC slope was also non-significant, $b = -.023$, $p = .75$. However, there was a significant direct effect of parent hostility on EC intercept $b = -.617$, $p < .001$, $\beta = -.475$, $p = \text{NA}$, indicating that higher levels of parental hostility were associated with lower levels of EC at age 4. Finally, the interaction between poor

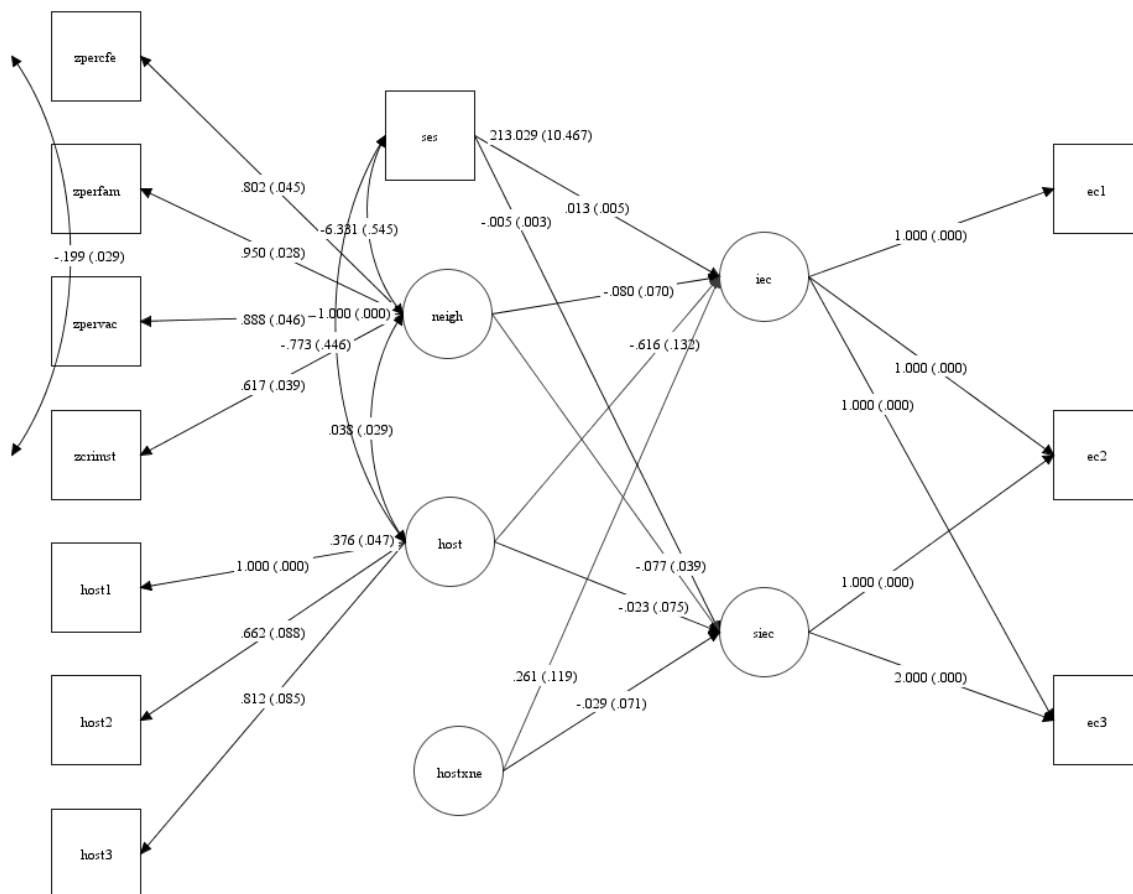
neighborhood quality and hostile parenting had a significant effect on the intercept of EC, $b = .261, p < .05, \beta = .283$ $p = \text{NA}$, but no significant effect on the slope or growth of EC, $b = -.029, p = .678$ (see Table 4 and Figure 8).

Table 3. Summary of Latent Growth Modeling Results for Hypothesis 3: Poor Neighborhood Quality \times Supportive Parenting \rightarrow EC

Parameter Estimate	Unstandardized b	Standardized β	p -value
<u>Interaction Model</u>			
Poor neighborhood quality \rightarrow EC intercept	-.049 (.07)	NA	.47
Poor neighborhood quality \rightarrow EC slope	-.075 (.08)	NA	.06
Supportive parenting \rightarrow EC intercept	.275 (.04)	NA	<.001
Supportive parenting \rightarrow EC slope	-.008 (.02)	NA	.70
Poor neighborhood quality \times supportive parenting \rightarrow EC intercept	-.044 (.02)	NA	.11
Poor neighborhood quality \times supportive parenting \rightarrow EC slope	.010 (.02)	NA	.58

Note. $\chi^2 (39, N = 796) = 114.44, p < .01, \text{RMSEA} = .049, \text{CFI} = .975, \text{TLI} = .965, \text{SRMR} = .037. \Delta\chi^2 (2, N = 796) = 2.21, p = .33$. Standard errors are in parentheses.

Figure 8. Latent Variable Interaction Between Poor Neighborhood Quality \times Hostile Parenting \rightarrow EC Intercept and Growth, Controlling for SES



Note. Unstandardized coefficients for each parameter are presented. Standard errors are reported in parentheses. Significant paths, $p < .05$, are in red. EC 1 = effortful control time 1; EC 2 = effortful control time 2; EC 3 = effortful control time 3; IEC = Intercept of effortful control; SIEC = Slope of effortful control; Neigh = Latent variable for poor neighborhood quality; Zpercfam = % Families in poverty; Zpervac = % Vacant Lots; Zcrimst = Crime statistics; Host = Hostile parenting parcel; Hostxne = Poor neighborhood quality \times Hostile parenting

Table 4. Summary of Latent Growth Modeling Results for Hypothesis 3: Poor Neighborhood Quality \times Hostile Parenting \rightarrow EC

Parameter Estimate	Unstandardized <i>b</i>	Standardized β	<i>p</i> -value
<u>Interaction Model</u>			
Poor neighborhood quality \rightarrow EC intercept	-.080 (.07)	-.09*	.25
Poor neighborhood quality \rightarrow EC slope	-.077 (.04)	NA	< .05
Hostile parenting \rightarrow EC intercept	-.617 (.13)	-.475*	< .001
Hostile parenting \rightarrow EC slope	-.023 (.08)	NA	.76
Poor neighborhood quality \times hostile parenting \rightarrow EC intercept	.261(.12)	.283*	< .05
Poor neighborhood quality \times hostile parenting \rightarrow EC slope	-.029 (.07)	NA	.68

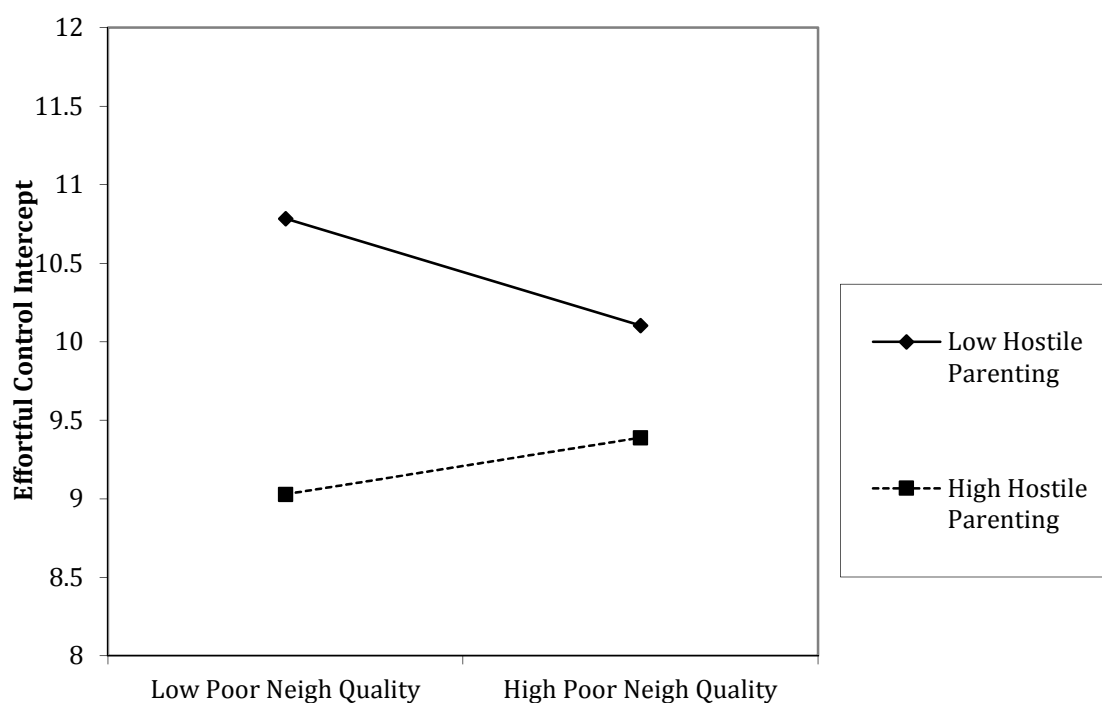
Note. χ^2 (37, $N = 796$) = 107.74, $p < .001$, RMSEA = .049, CFI = .973, TLI = .960, SRMR = .046. $\Delta\chi^2$ (2, $N = 796$) = 5.13, $p = .08$. Standard errors are in parentheses.

*Standardized β computed manually based on procedures by Muthén (2012). No standard error or p -value provided.

Methods outlined by Muthén & Muthén (2012; 2015) were used to probe the strength of the moderating effect of hostile parenting on the relationship between poor neighborhood quality and EC intercept. Specifically, simple slope tests were run by calculating two variables to represent participants one standard deviation above (i.e., high hostile parenting) and below (i.e., low hostile parenting) the mean on hostile parenting. Then, analyses were run in which the newly computed high and low hostile parenting variables were separately entered into the interaction model. Simple slope tests revealed that poor neighborhood quality was significantly associated with EC intercept for children with low hostile parenting, $b = -.240$, $p < .05$, but not for children with high hostile parenting, $b = .08$, $p = .40$. For children who were one standard deviation below

the mean of hostile parenting (low hostile parenting), a standard deviation increase in poor neighborhood quality led to a -0.37 decrease in EC intercept. The R^2 of the interaction is 0.41 and percent of variance due to the interaction is 12%. Collectively, the results indicate that hostile parenting moderated the relationship between poor neighborhood quality and EC intercept; children low in hostile parenting experienced lower EC intercepts as their level of poor neighborhood quality increased (see Figure 9).

Figure 9. Two-way Interaction Between Poor Neighborhood Quality and Hostile Parenting Style, in Predicting Intercept of EC



Results for Hypothesis 4

Does the hypothesized relationship between neighborhood quality, parenting, and EC affect children's social competence? A mediated moderation was hypothesized to

emerge demonstrating that supportive and hostile parenting interact with neighborhood quality in predicting the slope or change in EC, which will subsequently predict change in social competence at age 6.

Prior to assessing mediated moderation, CFAs were conducted using the manifest indicators of social competence at times 2 and 3 (ages 5 and 6, respectively). The CFA for social competence at time 2 demonstrated acceptable model fit based on SRMR = .018, CFI = .989, and TLI = .934, but not based on $\chi^2 (1, N = 679) = 5.526, p < .05$ and RMSEA = .115. Similarly, the CFA for social competence at time 3 showed good model fit based on $\chi^2 (1, N = 627) = 3.317, p = .068$, CFI = .995, TLI = .968, and SRMR = .013, but not based on RMSEA = .084. Given that RMSEA can be overly sensitive to models with low degrees of freedom (Kenny, Kaniskan, & McCoach, 2014), the CFA models for both social competence at time 2 and time 3 were retained.

Mediated moderation for supportive parenting. The model depicting the direct effect of latent poor neighborhood quality and supportive parenting on social competence at time 3 through growth in EC demonstrated good fit, $\chi^2 (133, N = 796) = 356.42, p < .001$, RMSEA = .046, CFI = .966, TLI = .956, SRMR = .047. The log-likelihood chi-square difference test revealed that the interaction model fit the data better than the nested model, $\Delta\chi^2 (4, N = 796) = 11.85, p < .05$.

Few significant paths emerged in the overall mediated moderation model (see Table 5 and Figure 10). There was a significant direct effect of supportive parenting on change in social competence from time 2 to time 3 in the interaction model, $b = .221, p < .01$. There was also a significant direct effect of EC slope on change in social competence

from time 2 to time 3 in the interaction model, $b = 4.321$, $p < .05$.

Table 5. Summary Mediated Moderation Results for Hypothesis 4: Poor Neighborhood Quality \times Supportive Parenting \rightarrow Social Competence Through EC

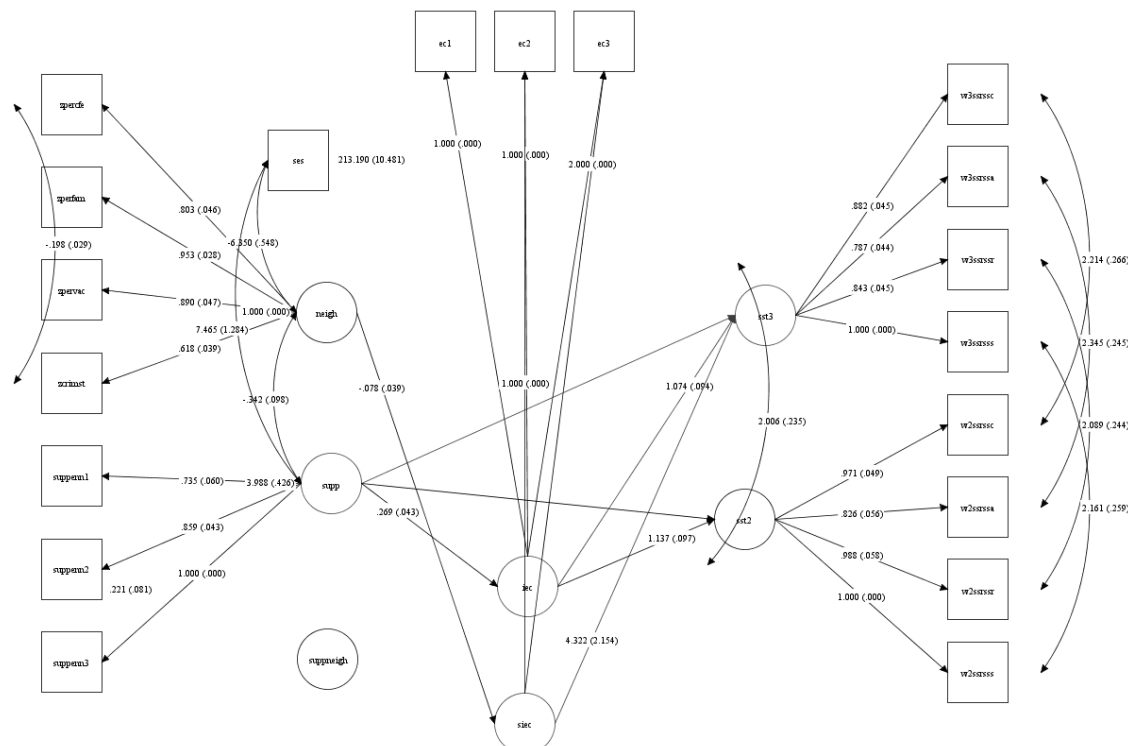
Parameter Estimate	Unstandardized <i>b</i>	Standardized β	<i>p</i> -value
Poor neighborhood quality \rightarrow social competence Time 3	.241(.22)	NA	.27
Supportive parenting \rightarrow social competence Time 3	.221(.08)	NA	<.01
EC intercept \rightarrow social competence Time 3	1.074 (.09)	NA	< .001
EC slope \rightarrow social competence Time 3	4.322 (2.15)	NA	<.05
Poor neighborhood quality \times supportive parenting \rightarrow EC slope	.011(.02)	NA	.53
Poor neighborhood quality \times supportive parenting \rightarrow social competence Time 3	-.175 (.09)	NA	.06

Note. χ^2 (133, $N = 796$) = 356.42, $p < .001$, RMSEA = .046, CFI = .966, TLI = .956, SRMR = .047. $\Delta\chi^2$ (4, $N = 796$) = 11.85, $p < .05$. Standard errors are in parentheses.

EC intercept was significantly related to change in social competence from time 2 to time 3, $b = 1.074$, $p < .001$. However, poor neighborhood quality did not predict social competence at time 3, $b = .241$, $p = .27$. The interaction between poor neighborhood quality and supportive parenting did not significantly predict EC growth, $b = .011$, $p = .53$. The interaction between poor neighborhood quality and supportive parenting predicting social competence at time 3, after controlling for social competence at time 2, was also not significant, $b = -.175$, $p = .06$. Additionally, The 95% CI indicated that the unstandardized indirect effect of the interaction between poor neighborhood quality and supportive parenting on social skills at time 3 through EC growth was not significantly different from zero (95% CI = -.098, .193). Taken together, the results of these path

models do not support the hypothesized mediated moderation between poor neighborhood quality and supportive parenting on social competence through EC growth.

Figure 10. Mediated Moderation for Poor Neighborhood Quality \times Supportive Parenting \rightarrow Social Skills at Time 3 Through EC Growth, Controlling for SES and Time 2 social Competence



Note. Unstandardized coefficients for each parameter are presented. Standard errors are reported in parentheses. Only significant paths are depicted in order to streamline figure. Significant paths, $< .05$, pertaining to mediated moderation are in red. EC 1 = effortful control time 1; EC 2 = effortful control time 2; EC 3 = effortful control time 3; IEC = Intercept of effortful control; SIEC = Slope of effortful control; Neigh = Latent variable for poor neighborhood quality; Zpercfam = % Families in Poverty; Zpervac = % Vacant Lots; Zcrimst = Crime statistics; Suppenn = Supportive parenting parcel; Suppneigh = Poor neighborhood quality X Supportive parenting; SST2 = Latent social skills time 2 variable, SST3 = Latent social skills time 3 variable, W2SSRSSC = Time 2 Social Skills Cooperation subscale, W2SSRSSA = Time 2 Social Skills Assertion subscale, W2SSRSSR = Time 2 Social Skills Responsibility subscale, W2SSRSSS = Time 2 Social Skills Self-Control subscale, W3SSRSSC = Time 3 Social Skills Cooperation subscale, W3SSRSSA = Time 3 Social Skills Assertion subscale, W3SSRSSR = Time 3 Social Skills Responsibility subscale, W3SSRSSS = Time 3 Social Skills Self-Control subscale

Mediated moderation for hostile parenting. The model depicting the direct effect of latent poor neighborhood quality and hostile parenting on social competence at time 3 through growth in EC demonstrated poor fit, $\chi^2(131, N = 796) = 366.83$ $p < .001$,

RMSEA = .047, CFI = .961 TLI = .950, SRMR = .058. The log-likelihood chi-square difference test showed that the interaction model was not significantly different than the nested model, $\Delta\chi^2(4, N = 796) = 9.46, p = .051$.

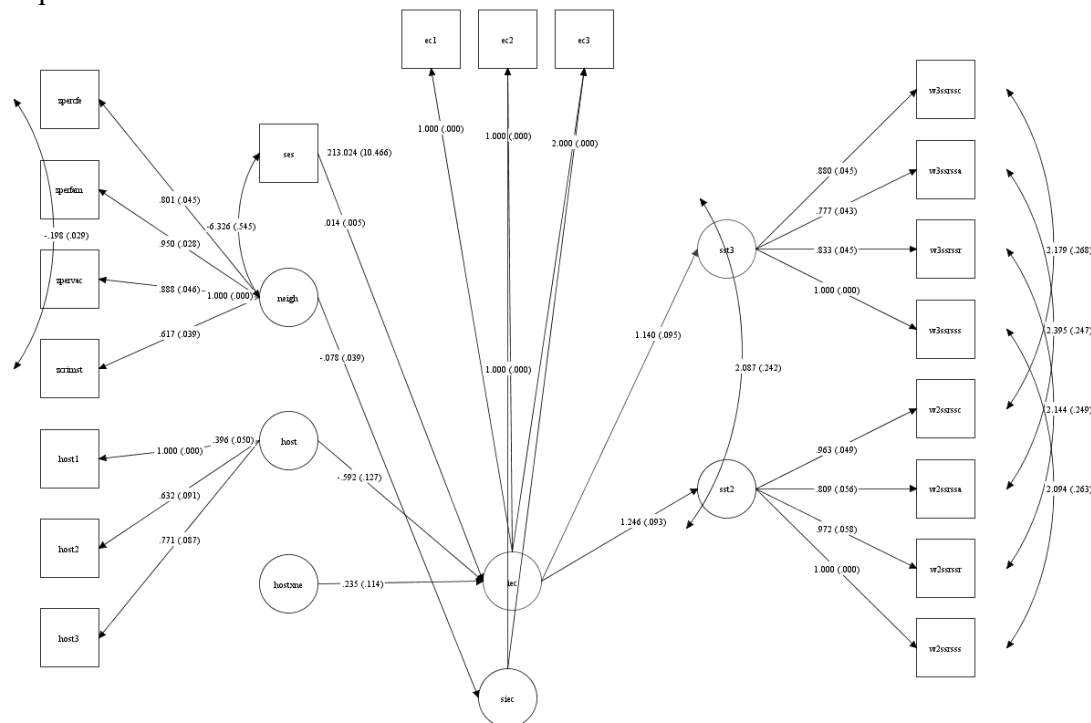
The single significant path that emerged in the mediated moderation model was between intercept of EC and change in social competence from time 2 to time 3, $b = 1.14, p < .001$. None of the remaining paths in the mediated moderation model were statistically significant. Neither poor neighborhood quality ($b = .25, p = .56$) nor hostile parenting ($b = -.351, p = .33$) significantly predicted change in social competence from time 2 to 3. The interaction between poor neighborhood quality and hostile parenting predicting EC growth was not significant, $b = -.024, p = .72$. The interaction between poor neighborhood quality and hostile parenting predicting social skills at time 3, after controlling for social skills at time 2, was not significant, $b = -.345, p = .24$. The direct effect of EC growth on social competence at time 3 after controlling for social competence at time 2 was also not significant, $b = 4.659, p = .08$. Lastly, the 95% CI indicated that the indirect effect of the latent variable interaction between poor neighborhood quality and hostile parenting on social skills at time 3 through EC growth was not significantly different from zero (95% CI = $-.748, .522$). Thus, the hypothesized mediated moderation between poor neighborhood quality and hostile parenting predicting social skills at time 3 through growth in EC was not supported (see Table 6 and Figure 11).

Table 6. Summary Mediated Moderation Results for Hypothesis 4: Poor Neighborhood Quality \times Hostile Parenting \rightarrow Social Competence Through EC

Parameter Estimate	Unstandardized <i>b</i>	Standardized <i>β</i>	<i>p</i> -value
Poor neighborhood quality \rightarrow social competence Time 3	.25(.26)	NA	.18
Hostile parenting \rightarrow social competence Time 3	-.351(.26)	NA	.33
EC intercept \rightarrow social competence Time 3	1.14(1.0)	NA	<.001
EC slope \rightarrow social competence Time 3	4.659(2.65)	NA	.08
Poor neighborhood quality \times Hostile parenting \rightarrow EC slope	-.024(.29)	NA	.72
Poor neighborhood quality \times Hostile parenting \rightarrow social competence Time 3	-.345(.29)	NA	.24

Note. χ^2 (131, $N = 796$) = 366.83 $p < .001$, RMSEA = .047, CFI = .961 TLI = .950, SRMR = .058. $\Delta\chi^2$ (4, $N = 796$) = 9.46, $p = .051$. Standard errors are in parentheses.

Figure 11. Mediated Moderation for Poor Neighborhood Quality \times Hostile Parenting \rightarrow Social Skills at Time 3 Through EC Growth, Controlling for SES and Time 2 Social Competence



Note. Unstandardized coefficients for each parameter are presented. Standard errors are reported in parentheses. Only significant paths are depicted in order to streamline figure. Significant paths, $< .05$, pertaining to mediated moderation are in red. EC 1 = effortful control time 1; EC 2 = effortful control time 2; EC 3 = effortful control time 3; IEC = Intercept of effortful control; SIEC = Slope of effortful control; Neigh = Latent variable for poor neighborhood quality; Zpercfam = % Families in Poverty; Zpervac = % Vacant Lots; Zcrimst = Crime statistics; Suppenn = Supportive parenting parcel; Host = Hostile parenting parcel; Hostxne = Poor neighborhood quality X Hostile parenting; SST2 = Latent Social skills time 2, SST3 = Latent social skills time 3, W2SSRSSC = Time 2 Social Skills Cooperation subscale, W2SSRSSA = Time 2 Social Skills Assertion subscale, W2SSRSSR = Time 2 Social Skills Responsibility subscale, W2SSRSSS = Time 2 Social Skills Self-Control subscale, W3SSRSSC = Time 3 Social Skills Cooperation subscale, W3SSRSSA = Time 3 Social Skills Assertion subscale, W3SSRSSR = Time 3 Social Skills Responsibility subscale, W3SSRSSS = Time 3 Social Skills Self-Control subscale

CHAPTER FOUR

DISCUSSION

Previous research has identified EC as an important predictor of children's social and emotional development (Eisenberg et al., 2011; Murphy et al., 2004; Olson et al., 2005). The important role that EC plays in child development has led to the examination of the developmental trajectory of EC as well as of the possible ecological predictors of EC (Lengua, 2009; Eisenberg et al., 2011). Although recent research has found links between ecological variables (contextual risk, parenting, SES; citation) and EC development, few studies have examined the concurrent and interactive role that multi-level ecological predictors, such as neighborhood quality and parenting, have on the developmental path of EC. Identifying the ecological predictors of EC development would create a foundation for prevention and intervention efforts geared toward promoting children's well-adjustment.

The aims of the current study were to examine the growth of EC during an important developmental time period, examine the interaction effects of various ecological predictors, namely poor neighborhood quality and supportive and hostile parenting, on the development of EC (intercept and growth), and test whether the interaction of poor neighborhood quality and supportive/hostile parenting predicted children's social competence through the mediating effect of EC growth. The SEM results for each of the four research hypotheses will be discussed in terms of relevance to

the current literature. The clinical implications, study limitations, and future directions will also be addressed.

Development of Effortful Control

The first aim of the study was to examine the trajectory of EC across ages 4, 5, and 6. As hypothesized, the LGM analysis testing the growth of EC revealed that EC did in fact significantly increase across ages 4, 5, and 6. This finding is consistent with previous research that has found significant improvement in EC across early childhood (e.g., Jones et al., 2003; Posner & Rothbart, 1998; Rueda et al., 2011) and supports the notion that early childhood continues to be an important time point with regards to EC development (Eisenberg et al., 2011).

The results of the LGM for EC also indicated that there was significant variance in the intercept of EC, but not significant variance in the slope of EC. This suggests that children in this sample had markedly different initial levels of EC at age 4, but that their EC slopes did not differ significantly. Interestingly, there was a negative correlation between EC intercept and slope, indicating that the higher the initial level of EC, the less change (i.e., fewer increases) the children experienced in their EC over time. Although the negative correlation between EC intercept and slope was weak ($-.099$), it still provides some evidence that children's EC abilities begin to plateau or stabilize at different ages. When considered along with the preliminary correlation analyses which indicated that the manifest indicators of EC had weak to moderate stability across the three years of study, these LGM findings provide further evidence for the moderate

stability and change in EC across early childhood and further justification for the need to study the possible ecological predictors that affect EC development.

Poor Neighborhood Quality as a Direct Predictor of Effortful Control

The second aim of the study assessed the role that poor neighborhood quality played in EC development. In keeping with the guidelines for examining the direct effect of neighborhood on individual outcomes proposed by Nicotera (2007) and Roosa et al. (2003), poor neighborhood quality was based off of a latent variable reflecting percentage of female-headed households (depicting Social Composition), percentage of families living below poverty (depicting Economic Composition), crime (depicting Social Processes), and percentage of vacant lots/homes (depicting Physical Composition/Resources). Creating a latent variable for poor neighborhood quality allowed for a more comprehensive, and thus more accurate, depiction of participants' neighborhood environment. Results of the direct effect of latent poor neighborhood quality on EC showed that neighborhood significantly predicted the intercept and slope of EC. An important distinction to highlight from this analysis is that the path coefficients estimating the effect of poor neighborhood quality and EC intercept and slope were both negative. Negative coefficients support the hypothesized negative relationship between poor neighborhood quality and EC development. As expected, poor neighborhood quality was significantly related to a lower starting level of EC at age 4 and to slower growth in EC across ages 4, 5, and 6. These findings were observed even after controlling for individual SES, which suggests that neighborhood influenced EC development independent of the more proximal contextual variable of family economic

resources and education variable that affects families and that is often thought to mediate the effect of neighborhood (Roosa et al., 2003). A notable contribution of this study is this specific finding that the relationship between poor neighborhood quality and EC development held true for a sample that was skewed toward higher SES. The bulk of studies that have examined the influence of neighborhood context have looked exclusively at lower-income and underserved samples. Thus, this study showed that neighborhood quality affects children from middle to upper-middle class backgrounds as well.

The finding that poor neighborhood quality negatively affected EC development supports decades of research highlighting the broad influence that neighborhood has on child development (e.g., Brooks-Gunn et al., 1993), and suggests that neighborhood context is an important predictor of individual temperament and self-regulatory characteristics (Colder et al., 2006; Lengua, 2008). This finding also corroborates the research that has found a negative association between contextual risk variables (e.g., exposure to community violence, parent report of neighborhood safety) and children's EC and self-regulatory skills (Lengua et al., 2007; Lengua et al., 2008; Sharkey et al., 2012). Importantly, when considered along with Lengua and colleagues' (2008) study in which contextual risk did not predict EC growth across ages 8 to 12, this study suggests that neighborhood context may have more of an influence on EC development during early childhood. However, this conclusion should be interpreted with caution given that there is more opportunity for EC growth during early childhood as opposed to middle

childhood (Kochanska et al., 2000; Li-Grining, 2007; Rothbart & Rueda, 2005), and that Lengua et al. (2008) did not use a comparable measure of neighborhood quality.

A second significant finding that merits attention is that only about 5 percent of the variance in the intercept of EC was accounted for by poor neighborhood quality. This is consistent with previous studies which have found that neighborhood context accounts for a small proportion of the overall variance in individual-level child outcomes (Chung & Steinberg, 2006; Elliot, Wilson, Huizinga, Sampson, Elliot, & Ranking, 1996; Furstenberg, 1999). The small amount of variance accounted for by poor neighborhood quality is not surprising given the myriad of ecological predictors that affect child development and that likely provide an intermediary and/or moderating role between neighborhood context and child development (Roosa et al., 2003). Despite its small effect on child outcomes, the significant role that neighborhood plays in child development cannot be ignored. Taken together, these research findings supported the examination of additional ecological variables, in this case supportive and hostile parenting, that could interact with poor neighborhood quality and possibly moderate the relationship between neighborhood and EC development.

Supportive and Hostile Parenting as Moderators

The first latent variable interaction in this study examined the relationship between poor neighborhood quality and supportive parenting. The purpose of analyzing this interaction was to determine whether supportive parenting served as a moderator or buffer between poor neighborhood quality and EC development. The results of this analysis revealed that there was no significant interaction between poor neighborhood

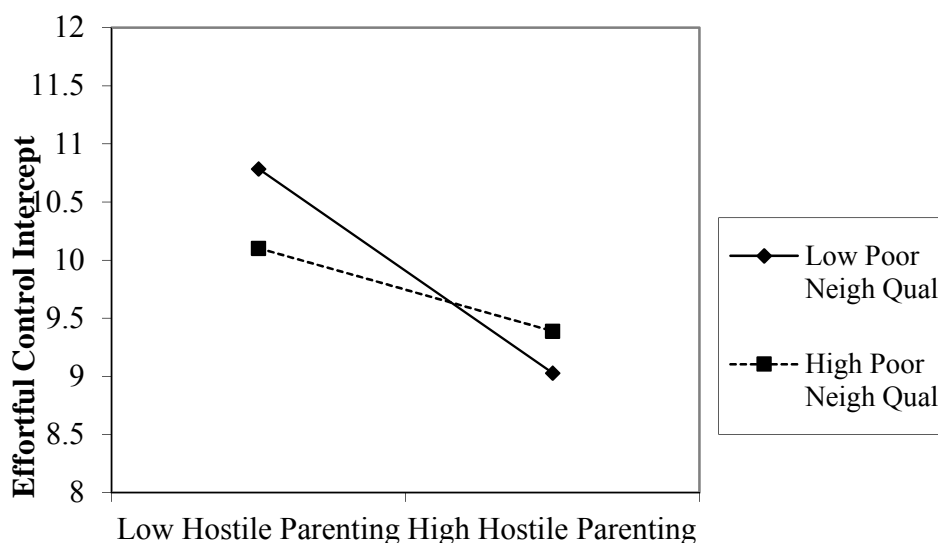
quality and supportive parenting, and thus, the relationship between neighborhood, EC intercept, and slope did not differ based on the supportive parenting children experienced. However, there was a significant direct effect of supportive parenting on the intercept of EC, which suggests that supportive parenting was more influential in early EC development, as opposed to the growth of EC after age 4. This finding replicates several other studies that found positive associations between supportive parenting and EC development before age 4 (Eisenberg, Zhou, et al., 2005; Spinrad et al., 2007). Further studies are needed to determine whether supportive parenting has differential effects on EC growth across childhood given that at least one known study (Belsky et al., 2007) has observed longitudinal associations (increases) between supportive parenting and EC development across first through fourth grade.

Unlike the first latent variable interaction that attempted to test the buffering effect of supportive parenting, the second latent variable interaction tested whether hostile parenting exacerbated the negative relationship between poor neighborhood quality and EC growth. Similar to the results of the first latent variable interaction, this model revealed a significant direct effect of hostile parenting on EC intercept, such that higher rates of hostile parenting were related to lower EC intercept values. A second similarity is that this model also did not find a significant interaction between poor neighborhood quality and hostile parenting in predicting EC growth, which indicates that the relationship between poor neighborhood quality and EC growth did not depend on hostile parenting. There was, however, a significant interaction between poor neighborhood quality and hostile parenting in predicting the intercept of EC. Simple

slope analyses and procedures outlined by Muten (2012) were utilized to determine if the relationship between poor neighborhood quality and EC intercept differed depending on high versus low levels of hostile parenting. Results showed that children with lower levels of hostile parenting experienced lower EC intercept values as their level of poor neighborhood quality increased. Unexpectedly, the relationship between poor neighborhood quality and EC intercept was not significant for children with high levels of hostile parenting.

An important caveat to this finding is that since time 1 values were used for both poor neighborhood quality and hostile parenting, the significant latent variable interaction between hostile parenting and poor neighborhood quality could also mean that poor neighborhood quality moderates the relationship between hostile parenting and EC intercept. Unstandardized coefficients from the significant interaction effect were used to graph the possible moderating role of poor neighborhood quality (see Figure 12). The graph demonstrates that children with both high and low poor neighborhood quality experienced decreases in EC as their level of hostile parenting increased. A simple slope analysis was not conducted as the finding was not germane to the current study. The strength of the moderating role of poor neighborhood quality was nevertheless tested using Muthén's (2012) latent variable interaction standardization procedures. This computation showed that the relationship between hostile parenting and EC intercept was stronger for children with low levels of poor neighborhood quality.

Figure 12. Possible Moderating Role of Poor Neighborhood Quality on Relationship Between Hostile Parenting and EC Intercept



Despite this caveat, the results of the latent variable interaction can be taken as support for the hypothesized moderating effect of hostile parenting because they indicate that the relationship between poor neighborhood quality and the starting level of EC at age 4 differed depending on children's experience of hostile parenting. The findings, however, do not fully support the study's a priori hypothesis regarding the exacerbating effect hostile parenting would have on poor neighborhood quality and EC development because the relationship was only significant for children with low levels of hostile parenting. The unfounded relationship between poor neighborhood quality and EC intercept among children with high levels of hostile parenting could point to the need for differential parenting styles based on neighborhood or environmental context. Some studies have found that excessive parental monitoring and coercive control is more common among children living in high-risk communities (Brody and Flor, 1998; Steele, Nesbitt-Daly, Daniel, & Forehand, 2005), and is related to reduced externalizing behavior

among children living in highly disadvantaged neighborhoods (Goldner et al., 2014). Controlling and coercive parenting strategies are seen as beneficial in disadvantaged neighborhoods because they limit children's exposure to high-risk behaviors. In this study, hostile parenting included the use of coercion, threat, or physical punishment to influence [the child's] behavior. Although it is unlikely that hostile parenting conferred benefit to children in this study, it is possible that this study captured facets of hostile parenting that proved to not be as harmful to children. More studies are needed to tease apart the parenting tactics that confer possible benefit for children residing in high-risk environments.

Overall, the results of the latent variable interactions provided some evidence for the moderating role of parenting on the relationship between neighborhood context and EC development across early childhood. In this study, hostile parenting played a more important role than supportive parenting, particularly with regards to initial levels of EC. The lack of significant results regarding the poor neighborhood quality \times parenting interaction on EC growth suggests that parenting has a more influential role in EC development before age 4. Most studies that have linked parenting practices to EC found that parenting predicted EC growth before age 4 (Lengua et al., 2007; Spinrad et al., 2007). Again, this could simply be an artifact of the higher propensity for increases in EC during the first few years of life (Kochanska et al., 2000; Li-Grining, 2007; Rothbart & Rueda, 2005).

Neighborhood, Parenting, Effortful Control, and Social Competence: A Mediated Moderation

The final hypothesis tested whether poor neighborhood quality interacted with supportive and hostile parenting in predicting social competence at time 3, through the mediating role of EC growth. The purpose of this analysis was to investigate the intermediary role EC plays between ecological risk and child outcomes. Contrary to what was hypothesized, neither of the mediated moderation models (for supportive parenting figures X and hostile parenting Figure X) revealed a significant indirect effect of EC growth in predicting change in social competence from time 2 to time 3. Thus, in this study EC did not mediate ecological factors in predicting child outcomes.

Several explanations can account for this lack of finding. First, as stated earlier, perhaps this sample of children experienced the bulk of EC growth during their first few years of life, which subsequently limited the ability to find significant effects related to EC growth across ages 4, 5, and 6. Second, perhaps the hypothesized mediated moderation model inadequately describes the relationship between neighborhood quality, parenting, EC, and subsequent social competence. Third, it is possible that the hypothesized direction of the effects (e.g., ecological predictors → EC development) between the ecological predictors of EC was not thoroughly captured. Although the study hypothesized that neighborhood and parenting would affect EC development, it is quite possible that initial levels of EC affected subsequent parenting, and/or that parenting mediated the relationship between neighborhood and EC. Several studies have supported a bidirectional relationship between parenting and EC (Belsky et al., 2007;

Bridgett et al., 2009; Eisenberg et al., 2011), as well as a mediating role of parenting (Belsky et al., 2007, Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005; Valiente et al., 2006).

Despite the inability to detect mediated moderation effects, the LGM analyses revealed several significant direct effects that merit discussion. The first mediated moderation model (for supportive parenting) found a significant direct effect of EC intercept and slope on social competence at time 3. Additionally, there was a significant direct path between supportive parenting and change in social competence from time 2 to time 3. The second mediated moderation model (for hostile parenting) found a significant direct effect of the intercept of EC on change in social competence from time 2 to time 3. Collectively, these results add strength to the previous studies that have found a significant positive relationship between self-regulatory abilities and children's social competence (Murphy et al., 2004; Raver et al., 1999) as well as between supportive parenting and social competence (Eiden et al., 2009). However, no known studies have examined whether the trajectory of EC is related to improvements in children's social competence across time. The fact that the current study found that growth in EC predicted positive changes in children's social competence from ages 5 to 6 adds a significant contribution to the literature regarding the important role that EC development plays in children's general socio-emotional development over time.

Clinical Implications

Several clinical implications can be inferred from the results of this study. First, the results of the developmental path of EC suggest that early childhood is an important

time with regards to EC growth. Thus, prevention and intervention efforts geared at improving or promoting effortful control abilities should target children under the age of 6 in order to maximize the significant growth that occurs in EC before this age.

Second, the results of this examination underscore the important role that neighborhood context plays in the development of EC. Specifically, this study highlights the need for a thorough ecological assessment of neighborhood context for both clinical and research purposes in order to frame a child's clinical presentation, as well as a study's research questions.

Third, the moderating role of hostile parenting coupled with the significant direct effects of supportive and hostile parenting on EC intercept, suggest that both parenting styles could be the focus of interventions aiming to improve children's self-regulatory abilities. Furthermore, previous research regarding the paradoxical role that certain facets of authoritarian parenting (e.g., controlling behavior) have among children from high poor quality neighborhoods suggests that parenting interventions need to consider the overall environment in which the family lives in order to fully target a family's clinical needs.

Finally, the fact that previous studies have linked discrepant levels of EC to either internalizing or externalizing problems, and the fact that this study found a link between EC and social competence supports the need to target self-regulatory skills in clinical work with children. Although no known interventions have specifically targeted EC in relation to child psychopathology, several researchers have targeted self-regulatory skills that share conceptual overlap with EC (e.g., inhibitory control) as a means to improve

psychosocial development and prevent psychopathology (Blair & Diamond, 2008; Diamond, Barnett, Thomas, & Munro, 2007; Eisenberg et al., 2010; Izard et al., 2008). Therefore, it stands to reason that children who present with low EC abilities might benefit from therapeutic interventions that teach affect and behavioral regulation as a means to improve their emotional and behavioral expression as well as their social competence.

Limitations

The study has several limitations that must be considered when evaluating its results. First, although the sample included families from diverse racial and SES backgrounds, the overall sample was primarily White and middle- to upper- middle class. The skewed sample may limit the generalizability of the results across socioeconomic and racial groups. Second, the latent poor neighborhood quality variable reflected indicators that provided a comprehensive depiction of neighborhood, but not an exhaustive one. Other possible indicators that could have increased the validity of the latent neighborhood variable include positive neighborhood characteristics, such as levels of collective efficacy. Collective efficacy is referred to as the social cohesion of neighbors and their ability to promote neighborhood safety; it is seen as a salient indicator of neighborhood context and as an important supplement to census-based indicators of neighborhood (Roosa et al., 2003; Sampson, Raudenbush, & Earls, 1997).

Third, mediators of the relationship between poor neighborhood quality and EC could have determined if the overall neighborhood context confers risk through more proximal variables. For instance, Roosa and colleagues (2003) note that an examination

of individual perceptions of neighborhood helps determine whether the influence of poor neighborhood quality is dependent on how the individual interprets their neighborhood context. Including a measure of perception of neighborhood also addresses the heterogeneity that exists among residents in most neighborhoods, which could further confound examinations of neighborhood effects (Roosa et al., 2003).

Fourth, the study assessed EC during an important developmental time point (ages 4, 5, and 6). However, an examination of EC prior to age 4 could have added to the literature regarding the stability and change of EC, especially in light of the fact that the most significant improvements in EC are likely to occur during the first few years of life (Kochanska et al., 2000; Li-Grining, 2007; Rothbart & Rueda, 2005). An examination of EC from infancy through middle childhood would help evaluate the different pathways of EC development that fall along the correlation matrix.

Finally, the study was limited in its assessment of EC. As mentioned earlier, this study only utilized expert ratings of a parent-report (CBQ) to measure EC. Although this method was chosen in order to reduce the likelihood of measurement overlap between children's social competence and EC, inclusion of multi-informant and/or multi-method (e.g., observation) ratings of EC would have added to the depth of the EC construct. Additionally, more fine-grained latent growth analyses of the factors that comprise EC (e.g., attentional versus inhibitory control) would have contributed to the understanding of the complexity of EC.

Future Directions

Several future directions are recommended in order to address the limitations of this study and to further the research regarding the ecological predictors and correlates of EC. First, additional examinations of the trajectory of EC are needed to thoroughly understand EC development and to identify the children who are at risk of experiencing delayed and/or limited EC growth.

Second, several studies have found a bidirectional relationship between parenting and EC, such that increases in EC were related to less negative parenting and more supportive parenting over time (Belsky et al., 2007; Bridgett et al., 2009; Eisenberg et al., 2011). Thus, future studies should examine the transactional nature of EC and parenting in order to fully appreciate the role that EC plays in eliciting and responding to parenting behaviors, and in order to comprehensively assess the protective role of parenting.

A third direction for future studies would be to test the possible bidirectional relationship between neighborhood quality/context and EC. Some have postulated that the effects of neighborhood may depend on children's individual characteristics, such as temperament-based EC (Bush et al., 2010). Therefore, future studies should assess whether children's EC abilities make them differentially sensitive to the risks associated with neighborhood quality, and whether this sensitivity to neighborhood affects subsequent EC. Examining the latter relationship is especially important in light of recent research (Sharkey et al., 2012) that found an almost immediate (one week) effect of neighborhood violence on children's impulse and attentional control.

Finally, follow-up investigations should also examine the concurrent role of individual child characteristics and ecological variables in predicting EC. Previous studies have examined gender (Kochanska & Knaack, 2003; Li-Grining, 2007) and biological variables such as low birth weight (Li-Grining, 2007) and genotypic variants (Kochanska, Philibert, & Barry, 2009) in relation to EC. However, few studies (Lengua, 2008; Lengua et al., 2008; Li-Grining, 2007) have examined the collaborative role of individual child characteristics and ecological variables in predicting EC. Examinations of the ways in which individual child characteristics interact with larger systemic variables in predicting EC would provide an even broader and more accurate picture of EC development.

Conclusions

In sum, this study confirmed previous work regarding the change and stability of EC across early childhood. Specifically, this study found significant and steady growth in EC across ages 4, 5, and 6. The fact that most SEM analyses in this study found direct effects for the intercept of EC (starting value of EC), as opposed to the slope of EC, also suggests that examining EC before age 4 may provide more opportunity for detecting the influence of ecological predictors on the growth of EC given that there is more propensity for EC growth before age 4 (Kochanska et al., 2000; Li-Grining, 2007; Rothbart & Rueda, 2005).

Additionally, the study underscored the importance of examining neighborhood context in relation to individual child outcomes. The finding that poor neighborhood quality had a small yet significant negative effect on EC across early childhood solidifies

the salient role neighborhood environment plays with regards to child development, and supports the continued examination of ecological predictors, such as supportive and hostile parenting, that could moderate or mediate the influence of neighborhood. The effect that high hostile parenting had on EC in the context of poor neighborhood quality also warrants follow-up studies looking at the differential effects that parenting has across various neighborhood contexts, particularly as it pertains to the development of self-regulatory skills. Finally, the links that this study found between EC and social competence support the continued exploration of the effect that EC has across psychosocial and developmental domains.

Overall, this study provided further evidence of the pivotal and dynamic role that EC has in child development as well as for the need for continued assessment of the ecological predictors that influence and are influenced by it.

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VITA

Edna Romero received her doctoral degree in clinical psychology at Loyola University Chicago specializing in child, adolescent, and family issues. She received her B.A. in Psychology from Purdue University in 2006. During her graduate career at Loyola University Chicago, Dr. Romero completed four years of clinical practicum in neuropsychological testing and psychotherapy at Loyola University Medical Center and John H. Stroger Hospital of Cook County, respectively. She completed her pre-doctoral internship at Ann and Robert H. Lurie Children's Hospital of Chicago, and will remain at Lurie Children's for a second training year as a clinical child and pediatric psychology post-doctoral fellow.

Dr. Romero's research work has focused on the ecological contexts and variables that influence child development. Her master's thesis examined the effects of subjective and objective markers of neighborhood on the development of aggression among African- American youth from urban, low-income environments. Her dissertation project investigated the role of neighborhood and parenting in predicting the development of effortful control and social skills during early childhood. Additionally, as a member of Dr. Maryse Richards' research lab, Dr. Romero has been involved in the development and administration of intervention programs that reduce stress and promote psychological well-being among middle school youth who live in impoverished urban neighborhoods.

All of her research endeavors have resulted in numerous peer-reviewed publications and conference presentations.

