

THE ROLE OF PARENTING SENSE OF COMPETENCE IN SUPPORTING
ACADEMIC ACHIEVEMENT: IMPLICATIONS FOR STRENGTHS-BASED
PARENTING PROGRAMS

by

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A DISSERTATION

Presented to the Department of Psychology
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

September 2018

DISSERTATION APPROVAL PAGE

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Title: The Role of Parenting Sense of Competence in Supporting Academic Achievement: Implications for Strengths-Based Parenting Programs

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Degree awarded September 2018

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DISSERTATION ABSTRACT

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Doctor of Philosophy

Department of Psychology

September 2018

Title: The Role of Parenting Sense of Competence in Supporting Academic Achievement: Implications for Strengths-Based Parenting Programs

Children's language and social-emotional development are important predictors of academic success. Children raised in poverty enter school already at-risk academically due to lower levels of language and social emotional skills. Parents often are the first and most important influencers on children's development in these areas. This multi-study dissertation explored the relationships between parenting sense of competence (PSOC), parenting behaviors, and child language and social-emotional development in low-income families to identify potential intervention targets to support academic achievement.

The first study used a prospective longitudinal design to test whether PSOC has a direct effect on child language development and an indirect effect through parenting behaviors in a sample of 239 mother-child dyads. Partial support for the study hypotheses was found. There was a significant indirect effect of PSOC on children's receptive language which was mediated by parenting behaviors. This indirect effect was not observed for expressive language.

The second study explored whether parenting behaviors mediate the relationship between PSOC and social-emotional development. Within a sample of 50 mother-child

dyads, mothers who reported higher PSOC were more likely to report better child social-emotional development. There were no significant relationships between PSOC and parenting behaviors or between parenting behaviors and child social-emotional development.

The third study explored the effectiveness of a strengths-based video coaching intervention to increase mothers' PSOC, positive parenting behaviors, and child language and social-emotional development. It was hypothesized that changes in parenting behaviors would be mediated by changes in PSOC and that effects on child development would be mediated by parenting behaviors. Complete data were collected on a sample of 44 mother-child dyads in a randomized-controlled pilot study. No intervention effects were observed.

The results from the current series of studies demonstrated inconsistent relationships between PSOC, parenting behaviors, and child language and social-emotional development. Although results from these studies were limited, the existing research suggests that increasing mothers' PSOC may have a positive impact on parenting behaviors and child development. Interventions aimed at increasing PSOC may help children be more prepared for school entry and reduce the income-based disparity in academic achievement.

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Graham, A. M., Yockelson, M. B., Kim, H. K., Bruce, J., Pears, K. C., & Fisher, P. A. (2012). Effects of maltreatment and early intervention on diurnal cortisol across the start of school: A pilot study. *Child Abuse and Neglect*, 36(9), 666-70. doi: 10.1016/j.chiabu.2012.07.006

Prull, M. W., & Yockelson, M. B. (2013). Adult age-related differences in the misinformation effect for context-consistent and context-inconsistent objects. *Applied Cognitive Psychology*, 27, 384-395

ACKNOWLEDGMENTS

I wish to express sincere appreciation to Dr. Phil Fisher for years of guidance and encouragement. In addition to support with this dissertation, Dr. Fisher provided a learning environment which strengthened my desire to promote positive and innovative change in practice and policy. I would also like to thank the rest of my dissertation committee, Dr. Maureen Zalewski, Dr. Caitlin Fausey, and Dr. Melissa Redford, for their assistance and support. Thank you to all of the incredible members of the Stress, Neurobiology, and Prevention Lab. In particular, I would like to thank Dr. Melanie Berry and Laura Noll who played integral roles in the development of these projects, and in providing the support, encouragement, and solidarity needed to complete them. I am grateful for Dr. Hyoun Kim who provided input and support for the analyses presented in the first study. To Ellen Geib and Rachel Katz, thank you for your invaluable friendship and willingness to go above and beyond to help me finish this dissertation.

The data collection for this dissertation was a team effort, and each individual's participation was integral to the completion of these projects. Many lab members and research assistants made this dissertation possible. In particular, I would like to express great appreciation for the SNAP lab members who held leadership positions on the various projects: Kristen Greenley, Alex Wagnon, Sarah Beercroft-Haffner, Bryna Cooper, Madeline Cresswell, Lisa Shimonaeda, Katie Remmers, Mary Wood, and Simone Schnabler. To the women and children who participated in this research, thank you.

I am deeply appreciative of my family for providing me with the foundation of love and support which made this journey possible. I am grateful for my mom, Sue, who

provided encouragement, edited drafts late into the night, and helped me find motivation when I was struggling the most. I am grateful for my dad, who was able to strike the perfect balance between being a compassionate, supportive listener and also helping me to remember the big picture in order to find my passion and drive. To my husband, Brian, thank you for getting me through each day. Thank you for allowing me to feel your whole hearted belief in me on my most challenging days. And for doing your best to make sure I occasionally got some fresh air and stayed hydrated.

This research was supported by the Doris Duke Fellowship for the Promotion of Child Well-Being, the Center for the Study of Women in Society at the University of Oregon, a pilot grant from Oregon Social Learning Center's Translational Drug Abuse Prevention Center Grant from the National Institute on Drug Abuse, and a University of Minnesota Early Experiences, Stress, and Neurobehavioral Development Center Seed Grant.

This dissertation is dedicated to my parents, whose love, support, and unwavering belief in me helped get me to where I am today.

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CHAPTER I

GENERAL INTRODUCTION

Children who are raised in poverty are at an increased risk of poor academic achievement and associated outcomes compared to their more affluent peers (Risi, Gerhardstein & Kistner, 2003; Horn & Packard, 1985; Potter & Roksa, 2013; Sharkins, Leger, & Ernest, 2017). Poor academic achievement is associated with a host of long-term consequences that expand beyond the academic domain (Hawkins et al., 2000; Masten et al., 2005). Early language development, and more recently social-emotional development have been strongly linked to academic achievement and are negatively impacted by poverty (Briggs-Gown, Carter, Skuban, & Horowitz, 2001; Evans & Kim, 2013; Catts, Fey, Tomblin, & Zhang, 2002; Hoff, 2013; Muter, Hulme, Snowling, & Stevenson, 2004; Nelson, Welsh, Vance Trup, & Greenberg, 2010; Yoshikawa, Aber, & Beardslee, 2012).

A wealth of research highlights the role of parenting behaviors such as parental responsiveness, warmth, sensitivity, and use of language, in supporting child language and social-emotional development, as well as academic achievement more broadly (e.g., Kim, Boldt, & Kochanska, 2015; Zeytinoglu, Calkins, Swingler, & Leerkes, 2017). Additionally, parenting sense of competence (PSOC), the extent to which parents believe that they have the ability to perform their parenting roles effectively, has been linked with positive parenting behaviors and beneficial child outcomes (Ardelt & Eccles, 2001; Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier, Roskam, & Browne, 2010; Peacock-Chambers, Martin, Necastro, Cabral, Bair-Merrit, 2017; Ponomartchouk & Bouchard, 2015; Shumow & Lomax, 2002). When considering the

impact of PSOC on domains of child development and parenting behaviors, interventions targeting PSOC may be particularly effective in improving parenting behavior, quality of parental use of language, and child language and social-emotional outcomes thus leading to better academic achievement.

Poverty as a Risk Factor for Poor Academic Achievement

In the United States, 14.8 million children under the age of 18 live at 100% below the federal poverty threshold. Over 30 million children live at or well below of the federal poverty threshold (Jiang, Granja, & Koball, 2017a). Research suggests that in order to meet the most basic needs, a family needs an income about two times the federal poverty threshold and any amount below this is considered low income (Jiang, Granja, & Koball, 2017b). Throughout this dissertation, poverty will be referred to as both living below the federal poverty line as well as meeting eligibility for services based on low-income status. Compared to children in higher-income families, children raised in poverty are more likely to have poorer academic achievement (Risi et al., 2003; Horn & Packard, 1985; Potter & Roksa, 2013; Sharkins et al., 2017). Children who show difficulties with academic achievement early on are more likely to continue to have challenges with future academic achievement which may include school dropout and peer rejection (Risi., 2003; Horn & Packard, 1985). Poverty has a profound impact on foundational skills that support academic achievement such as early language and social-emotional development which develop prior to school entry.

Poverty and language development. Numerous researchers have established the link between early language development and academic achievement (e.g., Catts et al., 2002; Muter et al., 2004; Nelson et al., 2010). Children raised in poverty show significant

delays in language development compared to children raised above the poverty line (Hoff, 2013; Yoshikawa et al., 2012). Language skills such as vocabulary and grammar predict literacy and later reading success, important markers of academic achievement (Lonigan, Schatschneider, Westberg, 2008; Muter et al., 2004; Roth, Speece, & Cooper, 2002). Vocabulary size has also been highlighted as a particularly important aspect of language that has been found to be impacted by socioeconomic status (Arriaga, Fenson, Cronan, & Pethic 1998; Hart & Risley, 1995; Hoff, 2003; Hoff-Ginsberg, 1998) and a predictor of academic achievement (Lonigan et al., 2008; Muter et al., 2004; Roth, Speece, & Cooper, 2002). Differential academic trajectories based upon socioeconomic status (SES) have been linked to language skills prior to children starting school (Dickinson & Tabors, 2001; Morrison et al., 2005; Snow, Burns, & Griffin, 1998).

Poverty and social-emotional development. Poverty negatively impacts the social-emotional skills important for academic achievement (Briggs-Gowan et al., 2001; Evans & Kim, 2013; Hughes & Kwok, 2006; Kaiser et al., 2000). Social-emotional skills such as functional social interactions, maintaining attention, and demonstrating self-control contribute to children's readiness to learn in a formal setting (Blair & Diamond, 2008; Duncan & Magnuson, 2011; Conti & Heckman, 2013). Children who do not have strong self-regulation skills struggle with the transition to school both with regard to academic achievement and peer relations (Cooper & Farran, 1988; McClelland, Morrison, & Homes 2000). Specifically, children living in poverty have increased externalizing and disruptive behaviors and less social competence than their more advantaged peers (e.g., Hughes & Kwok, 2006; Kaiser et al., 2000). For example, Kaiser et al. (2000) identified that in a sample of 259 three-year-old children growing up in

poverty and enrolled in Head Start classrooms, 40% demonstrated delays in social competencies and 20% of children demonstrated high rates of behavioral problems.

Early Childhood Education Programs to Reduce the Achievement Gap

Numerous interventions have been developed in a variety of formats and settings in order to promote school readiness and increase academic achievement for children living in poverty. More recently, interventions have begun to include social-emotional development (Domitrovich, Cortes, & Greenberg, 2007; Hickey et al., 2017; Solomon et al., 2018), and both early literacy and social-emotional development for children who are at risk for not being ready for formal schooling (Bierman, Heinrichs, Welsh, Nix, & Gest, 2017; Pears et al., 2014; Pears, Kim, Healey, Yoerger, & Fisher, 2015; Sheridan, Knoch, Kupzyk, Edwards, & Marvin, 2011). These interventions show promising results with regard to increasing children's school readiness; however many are based in preschool settings and not all children attend preschool. It is estimated that 42% of 3-year-old children and 66% of 4-year old children attend some form of preschool programs (Child Trends, 2016). In order to reach a wider population of children, it is imperative to consider the role of parents in promoting early language and social-emotional skills to bolster academic achievement in children living in poverty.

Parenting and Early Child Development

Children's early interactions with their primary caregivers form the foundation for developing both social-emotional and early language abilities which underlie academic success (e.g., Coplan, Arbeau, & Mandana, 2008; Kim et al., 2015; Zeytinoglu et al., 2017). Researchers from a range of theoretical orientations have identified positive parenting behaviors that are associated with favorable child outcomes such as academic

success (Deater-Deckard & Petrill, 2004; Isabella, Belsky, & von Eye, 1989; Kim et al., 2015). Research has found that children who had secure attachments with their primary caregiver and who continued to receive sensitive parenting for their first two years of life had fewer behavior problems, better social skills, better language, and were more prepared for school by age three than children who had either inconsistent attachment patterns or inconsistent parenting (Belsky & Fearon, 2002). Additionally, extensive research based in social-learning theory has identified that when parents show contingent responses and positive reinforcement, children demonstrate fewer behavior problems (DeGarmo, Patterson, & Forgatch, 2004; O'Connor, Matias, Futh, Tantam, & Scott, 2015; Reid, Webster-Stratton, & Beauchaine, 2001).

Parenting and language development. Parenting behaviors such as responsiveness, sensitivity, and joint attention have been found to significantly contribute to language development in young children (e.g., Dodici, Draper, & Peterson, 2003; Hudson, Levickis, Down, Nicholls, & Wake, 2015; Landry, Smith, Miller-Loncar & Swank, 1997; Morales et al., 2000; Pungello, Iruka, Dotterer, Mills-Koonce, & Reznick, 2009; Stein et al., 2008; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Mothers' responsive behaviors and joint attention when children are young have been linked to their language skills when they are several years older (Hudson et al., 2015; Pungello et al., 2009; Stein et al., 2008; Bornstein, Tamis-LeMonda, & Haynes, 1999; Tomasello & Farrar, 1986). Researchers have not only been interested in how general parenting factors such as responsiveness and sensitivity contribute to child language outcomes, but have also explored more specific behaviors such as how parental language influences child language development (Aram, 2008; Bus, Van Ijzendoorn, & Pellegrini, 1995; Cartmill et

al., 2013; Hirsh-Pasek et al., 2015; Hoff, 2003; Huttenlocher, Haight, Bryk, Seltzer, & Lyons., 1991; Rowe, 2012).

Parents' use of language. Hart and Risley's (1995) seminal research on parental use of language and child language outcomes has spurred decades of investigation into aspects of parental speech that facilitate language development. The most commonly cited finding showed a 32-million-word difference in the amount of words that higher-income children heard compared to children in lower income households. Furthermore, children in the higher income households scored better on measures of verbal comprehension. In addition to the quantity of language, several aspects of parental language quality have been identified to impact language outcomes (Aram, 2008; Bus et al., 1995; Cartmill et al., 2013; Hirsh-Pasek et al., 2015; Hoff, 2003; Huttenlocher et al., 1991; Rowe, 2012). Higher language outcomes have been found in children whose parents speak more around them, use a larger variety of words, use more sophisticated words, and engage in longer episodes of mutual engagement (Huttenlocher et al., 1991; Tamis-LeMonda, Kuchirko, & Song 2014; Tomasello & Farrar 1986).

Poverty impacts the way parents speak to their children. Low SES parents are more likely to speak less and use poorer quality language around their children than higher SES parents (e.g., Hart & Risley, 1995; Hoff, 2003; Hoff, 2006; Hoff, 2013; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Rowe, 2008; Schwab & Lew-Williams, 2016). In addition to reduced number of words spoken by low SES parents, the quality of language used is also poorer (Hoff, 2003; Hoff, 2006; Hoff, 2013; Huttenlocher et al., 2010; Rowe, 2008; Schwab & Lew-Williams, 2016). Low-income parents tend to use more directive language, a smaller variety of words, and less

sophisticated speech (Hart & Risley, 1995; Hoff, 2003; Hoff, 2006; Huttenlocher et al., 2010; Rowe, 2008).

Parenting and social-emotional development. Parenting practices are also known to influence the development of specific skills associated with social-emotional competence (Birmingham, Bub, & Vaughn, 2017; Bridgett, Laake, Gartstein, & dorn, 2013; Kochanska, Murray, & Harlan, 2000; Lindsey, Cremeens, Colwell, & Caldera, 2009; Raver, 1996; Russell, Lee, Spieker, & Oxford, 2016). For example, parenting sensitivity and responsiveness have been strongly associated with secure attachments between parent-child dyads resulting in positive social-emotional and language outcomes. From this perspective, a mother helps her child learn about the world by providing consistent feedback and information about the world, such as through reinforcing specific behavior and encouraging imitation (Gardner, Burton, & Klimes, 2006; Stormshak, Bierman, McMahon, & Lengua, 2000). Extensive research has identified that when parents receive support in increasing contingent responses and positive reinforcement, children demonstrate fewer behavior problems (DeGarmo et al., 2004; Reid et al., 2001; O'Connor et al., 2010).

These parenting behaviors that support social-emotional development are negatively impacted by poverty (e.g., Brody, Murray, Kim, & Brown, 2002; Conger, Ge, Elder, Lorenz, & Simons, 1994; Ellingsen, Baker, Blacher, & Crnic, 2014; Guo & Harris, 2000; Jeon & Neppl, 2016; Linver, Brooks-Gunn & Kohen, 2002; McLeod & Shanahan, 1996; Neppl, Jeon, Schofield, & Donnellan, 2015; Strohschein & Gauthier, 2017). For example, economic disadvantage consistently has been associated with harsh discipline, less sensitive and responsive parenting, less positivity, and fewer child-oriented

interactions (Bradley & Corwyn, 2002; Conger et al, 1994; McLeod & Shanahan, 1996; Neppl et al., 2015). Children from low-income households have been found to experience less positive affect, warmth, sensitivity, and cognitive stimulation from their parents (Ellingsen et al., 2014; Neppl et al., 2015).

Protective Factors and Resilience

Many families are able to avoid the negative outcomes of poverty such as poor academic outcomes or behavior problems by increasing protective factors in a child's environment (Benzies & Mychasiuk, 2009; Conger & Conger, 2002). Most economically disadvantaged families are able to keep their children in school and engage in developmentally supportive caregiving and activities to raise resilient children (e.g., Benzies & Mychasiuk, 2009; Conway & McDonough, 2006; Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999; Runyon et al., 1998). Established protective factors include social support, the ability to provide emotional and structural support, family cohesion, and a parent's sense of confidence to successfully problem solve and resolve challenges (Conger & Conger, 2002; McCubbin & McCubbin, 1996; Orthner, Jones-Sanpei, & Williamson, 2004). Orthner et al. (2004) found conflicting evidence suggesting that family cohesion did not play a significant role in overcoming the possible negative effects of low SES; however, these authors added that a self-reported sense of confidence in their parenting skills and ability to problem-solve within the family unit were significant factors contributing to improved outcomes in low-income families.

Parenting Sense of Competence as a Protective Factor

Factors that contribute to positive parenting practices provide invaluable information on areas to be targeted for parenting interventions focused on increasing

child academic achievement. Research suggests that cognitive factors such as self-efficacy and other subjective experiences of parenting also serve as important protective factors for at risk families (e.g., Benzies & Mychasiuk, 2009; Orthner et al., 2004). PSOC is one such factor to consider in relation to parenting behaviors. PSOC, which has also been called parenting self-efficacy, has been defined as the extent to which parents expect to or believe that they have the ability to perform their parenting roles competently and effectively (Jones & Prinz, 2005; Peacock-Chambers et al., 2017).

Bandura's early research on personal self-efficacy and Social Cognitive Theory (Ardelt & Eccles, 2001; Bandura, 1977; Bandura, 1989; Jones & Prinz, 2005) provides the foundation for understanding how PSOC may serve as a protective factor and intervention target. According to Social Cognitive Theory, personal efficacy has important implications for human agency (Bandura, 2018). Bandura proposed that feelings of efficacy contribute to and motivate human behavior such that when a person believes that they can perform well, they will in fact perform well (Bandura, 1977; Bandura, 2018). Ardel and Eccles (2001) proposed that parents who feel that they can effectively raise their children are more likely to engage in positive and supportive parenting behaviors which will contribute to successful child developmental outcomes.

The relationship between PSOC and parenting behaviors may have particular relevance for families living in poverty. Research has identified that low-income parents are more likely to report lower PSOC (e.g. Coleman & Karraker, 2003; Copeland & Harbaugh, 2017; Farkas & Valdez, 2010; Raikes & Thompson, 2005). In this way, low PSOC for families living in poverty may explain some of the observed differences in

parenting behaviors across SES (Brody et al., 2002; Brody, Flor, & Gibson, 1999; Jones & Prinz, 2005).

PSOC and parenting. Research has found consistent evidence that PSOC is associated with parenting behaviors (Ardelt & Eccles, 2001; Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002). Mothers with lower PSOC have been shown to engage in less responsive and less sensitive parenting behaviors and demonstrate a less secure attachment with their children (e.g., Donovan, Leavitt, & Walsh, 1990; Kochanska & Murray, 2000; Teti & Gelfand, 1991). Parents with higher PSOC often demonstrate higher rates of praise and affection and engage in more child-focused activities such as reading, singing, and playing with their infants, toddlers, and school-aged children (Glatz & Buchanan, 2015; Peacock-Chambers et al., 2017; Ponomartchouk, 2015).

PSOC and child social-emotional development. Low PSOC has been directly associated with poor developmental outcomes in children such as behavior problems, internalizing and externalizing symptoms, and inadequate age-appropriate social skills (Côté et al., 2009; Glatz & Buchanan, 2015; Heerman, Taylor, Wallston, & Barkins, 2017; Izzo, Weiss, Shanahan, & Rodriguez-Brown, 2000; Knoche, Givens, & Sheridan, 2007; Matthies et al., 2017; Salari, Wells, Sarkadi, 2014; Steca, Bassi, Caprara, & Delle Fave, 2011). For example, in a sample of adolescents, higher PSOC predicted better social-emotional adjustment (Shumow & Lomax, 2002). Higher levels of parental PSOC have also been found to contribute to less depressive symptoms and fewer behavioral

problems in early childhood and better self-regulation in infancy (Steca et al., 2011; Matthies et al., 2017).

PSOC and child language development. Limited research has examined the relationship between PSOC and child language development. In one study, Albarran and Reich (2014) found that mothers' ratings of their PSOC when their children were two months of age significantly predicted their expressive and receptive language abilities at 18 months. Research on PSOC and child outcomes have focused on social-emotional development as previously discussed or on broad measures of academic achievement (Shumow & Lomax, 2002; Steca et al., 2011). Shumow and Lomax (2002) found that in a sample of adolescents, low PSOC was associated with lower grades and behavioral problems at school. However, this relationship was partially explained by parental involvement with the school and monitoring. Steca et al. (2011) similarly identified that adolescents with parents that reported lower PSOC demonstrated poorer academic achievement.

Malleability of Parenting Sense of Competence

There is evidence to suggest that PSOC can change over time. For example, researchers have identified that parenting self-efficacy can increase when parents have opportunities to engage in conversations with other parents, as they gain more experience parenting, and through interventions that provide educational information and guidance on child development and parenting (e.g., Albarran & Reich, 2014; Reich, Bickman, Saville, & Alvarez, 2010). Albarran & Reich (2014) conducted a study exploring the impact of an educational intervention on mothers PSOC. Mothers participating in the study were randomly assigned to either the intervention group, in which they were

provided with six baby books which had information about typical child development and optimal parenting behaviors embedded, or were assigned to an active control or standard control condition. Mothers in the educational intervention group experienced a significantly steeper rate of increase in their PSOC from the time their children were 2 months to 18 months of age compared to mothers in the other conditions. Additionally, Roskam, Brassart, Loop, Moutan, and Schelstraete (2015) conducted a study in which they randomly assigned parents of preschool-aged children to a 8-week self-efficacy condition or to a control condition. Parents in the intervention condition reported significantly greater increases in their PSOC than parents in the control condition.

Parenting Sense of Competence and the Present Studies

The extant literature which will be further reviewed in Chapters II, III, and IV, provides strong evidence for the importance of PSOC and positive parenting behaviors in supporting children's social-emotional and language development. However, several gaps in the current literature must be filled in order to further understand how PSOC, parenting behaviors, and child outcomes relate temporally, and how this information can be used to develop more cost effective and scalable interventions aimed at reducing the income based academic achievement gap. First, PSOC has been directly linked to increased positive parenting behaviors, child social-emotional outcomes, and broad measures of academic achievement (e.g., Ardel & Eccles, 2001; Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002; Steca et al., 2011). However, only one known study, Albarran and Reich (2014), has assessed the link between PSOC and specific measures of child language development. These researchers identified that

children with mothers that reported higher PSOC when they were two months of age performed significantly better on standardized measures of expressive and receptive language development at 18 months. Therefore, further research is needed in order to replicate this association.

Second, few studies have explicitly explored a causal relationship between PSOC and positive parenting. For example, one quasi-experimental study found that parents who were provided with positive feedback about their parenting and their child's development were more likely to demonstrate positive affect and emotional responsiveness compared to parents who were not provided with feedback about their parenting (Moutan & Roskam, 2015). In line with these findings, Glatz & Buchanan (2015) report results that suggest that higher PSOC predicts positive parenting, which in turn predicts better child developmental outcomes. However, due to research methods that limit the ability to make causal claims and the presence of conflicting findings (e.g., Slagt, Dekovic, de Hann, van den Akker, & Prinzie, 2012), further research is needed to clarify the nature of the relationships between PSOC, parenting behavior, and child outcomes.

Finally, although there is some empirical evidence to support the effectiveness of these interventions, much of the research has been quasi-experimental and effect sizes in the randomized controlled trials are small (Gomby, 2005; Magnuson & Duncan, 2016). Evidence-based interventions designed to target the achievement gap of children living in poverty, beginning at the earliest stages of development are an identified area of need. In considering the malleability of PSOC and the impact of PSOC on other domains of child development and parenting behaviors that support language and social-emotional

development, interventions targeting PSOC may be particularly effective in improving parenting behavior, quality of parental use of language, and child language and social-emotional outcomes.

The Present Studies

The present studies were designed to address the above-mentioned gaps in the literature and to elucidate the relations between PSOC and parenting behaviors on child language and social-emotional skills. A summary table of the variables examined in each study are provided in Table 1, and conceptual models are provided in Figures 1, 2, and 3.

Table 1. Summary of study variables.

Variables of Interest	Study 1	Study 2	Study 3
Parenting Sense of Competence	X	X	X
Positive Parenting Behaviors	X	X	X
Child Language Development	X		X
Child Social-Emotional Development		X	X
Parenting Intervention			X

Study 1 aims. The aims of study 1 are: (a) to examine the associations between PSOC, positive parenting behaviors, and child language development in a sample of mothers considered at risk due to a variety of psychosocial and socioeconomic factors; (b) to identify whether positive parenting behaviors mediate the relation between PSOC and child language outcomes.

Study 1 hypotheses. Hypotheses for study 1 are: (1) Mothers’ self-reported PSOC when children were 12 months will predict child language outcomes when children were 36 months old and their vocabulary at preadolescence; (2) The relationship

between PSOC and child language development at 26 months will be mediated through positive parenting behaviors when children were 24 months of age, and the relationship between PSOC and vocabulary in adolescence will be mediated by both parenting behaviors at 24 months and language development at 36 months; (3) This mediating effect will be consistent when including receptive, expressive, and total language scores at 36 months.

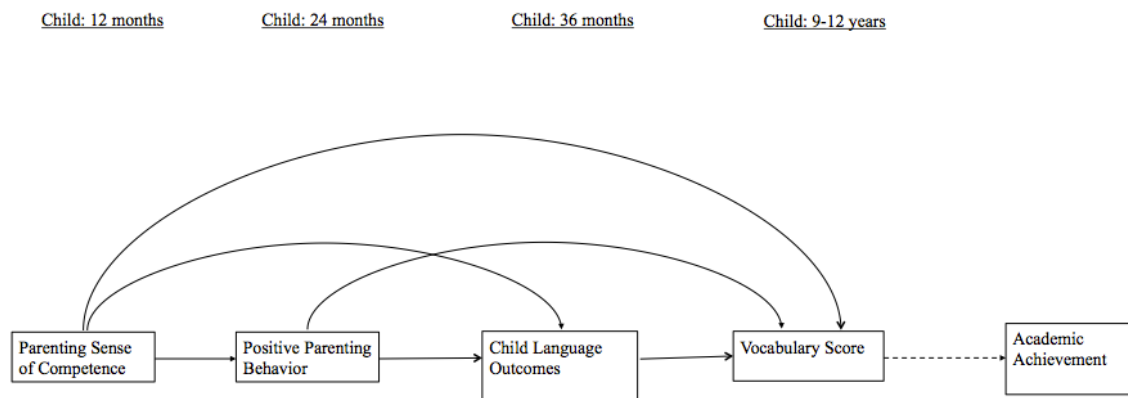


Figure 1. Study 1 conceptual model.

*Academic achievement was not assessed in the current study.

Study 2 aims. The aim of study 2 is to examine within the context of poverty whether a brief assessment of PSOC, parenting behaviors, and child social-emotional development will be sensitive enough to provide empirical evidence that in low-income mothers, positive parenting behavior mediates the relation between PSOC and child social-emotional development.

Study 2 hypotheses. Hypotheses for study 2 are: (1) Mothers' self-reported PSOC will be positively correlated with observed parenting behaviors and child social-emotional development; (2) Positive parenting behaviors will mediate the relationship between PSOC and child social-emotional development such that parents with greater

levels of PSOC will demonstrate more positive parenting behaviors which will account for better child social-emotional development.

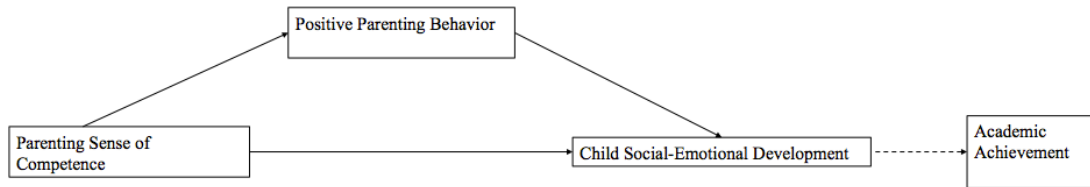


Figure 2. Study 2 conceptual model.

*Academic achievement was not assessed in the current study.

Study 3 aims. The aims of study 3 are: (a) to identify the extent to which a strength-based video coaching intervention is effective in improving mothers’ parenting sense of competence, positive parenting, and quality of maternal use of language; (b) to identify whether improvement in PSOC mediates the intervention effects on positive parenting and quality of maternal use of language; (c) to identify whether change in positive parenting and quality of maternal use of language is associated with improvements in child language and social-emotional development.

Study 3 hypotheses. Hypotheses for study 3 are: (1) Parents who receive the intervention will have a greater increase in their PSOC compared to parents in the control condition; (2) Parents who receive the intervention will have a greater increase in their positive parenting and quality of language compared to parents in the control condition; (3) Changes in positive parenting and quality of language as a result of intervention will be partially mediated through changes in parenting sense of competence; (4) Changes in child language and social-emotional development as a result of the intervention will be

mediated through the identified changes in positive parenting behavior and quality of maternal language.

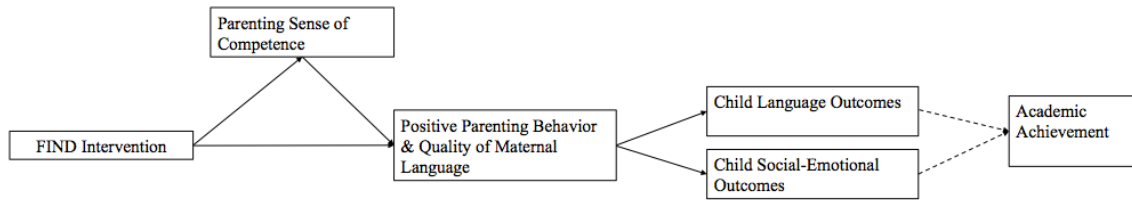


Figure 3. Study 3 conceptual model.

*Academic achievement was not assessed in the current study.

CHAPTER II

STUDY 1: THE LONGITUDINAL RELATIONSHIP BETWEEN PARENTING SENSE OF COMPETENCE AND CHILD LANGUAGE OUTCOMES

This study is the first of a series of three independent studies that aim to explore the relationships between PSOC, parenting behaviors, and early language and social-emotional development within families living in poverty. The present paper aims to identify the longitudinal relationship, spanning from one-year post-partum to preadolescence, between PSOC, parenting behaviors, and child language development. This paper contributes to the series by formally exploring whether PSOC has direct and indirect effects through parenting behavior on child language development, an important contributor to academic achievement. Whereas this study did not explore the relationship between language skills and academic achievement, there is a body of research which does (e.g. Catts et al., 2002; Muter et al., 2004; Nelson et al, 2010). Results from this study may have important implications for identifying intervention targets to bolster language development that can begin when children are 1-year of age.

Introduction

Early language development is an important predictor of success for young children and contributes to a successful developmental trajectory into adulthood (e.g., Fernald, Marchman, & Weisleder, 2013; Hoff 2006; Moffit & Caspi, 2001). Researchers have identified that receptive and expressive language development and vocabulary size significantly predict positive outcomes later in childhood such as future academic achievement, reading comprehension, social-emotional competence and fewer behavior problems (Durham, Farkas, Scheffner, Tomblin, & Catts, 2007; Johnson et al. 1999;

Menting, van Lier, & Koot, 2011; Nelson et al., 2010; Spackman, Fujiki, Brinton, Nelson, & Allen, 2005).

Early childhood language development has also been shown to have a significant impact on future cognitive and academic performance (Catts et al., 2002; Johnson et al., 1999; Muter et al., 2004; Nelson et al., 2010; Sharkins et al., 2017). Longitudinal research from early childhood through adolescence has identified that children who demonstrated early language impairment had significantly poorer cognitive and academic performance compared to children without language impairment (Johnson et al., 1999). For instance, Sharkins et al. (2017) found further support that language development has a direct effect on children's cognitive scores for children prior to school entry.

In addition to impact on cognitive development, language skills have a significant effect on children's social-emotional and behavioral development (e.g., Clegg, Law, Rush, Peters, & Roulstone, 2015; Hill, 2002; Menting et al., 2011; Nelson et al., 2010; Seguin, Parent, Tremblay, & Zelazo, 2009; Spackman et al., 2005). The impact of early language development on social-emotional skills is significant given that both early language and social-emotional skills impact future academic achievement (Blair & Diamond, 2008; Conti & Heckman, 2013; Fantuzzo, Bulotsky-Shearer, McDermott, McWayne, & Frye, 2007; Howse, Calkins, Anastopoulos, Keane, & Terri, 2003; McClelland et al., 2000). Thus, there are different pathways through which language development sets the stage for children's future success.

Poverty and Language Development

Poverty negatively effects early language development (e.g. Arriaga et al., 1998; Hart & Risley, 1995; Hoff, 2013; Hoff-Ginsberg et al., 1998; Yoshikawa et al., 2012) and

therefore, places children at an increased risk for experiencing the associated negative outcomes such as poor reading skills, school performance, and social-emotional development (Dickinson & Tabors, 2001; Snow et al., 1998). Children raised in low-income households are more likely to have poorer language skills that are noticeable as early as infancy and can persist into adulthood (Arriaga et al., 1998; Dollaghan et al., 1999; Fernald et al., 2013; Hart & Risley, 1995; Hoff, 2006). Vocabulary size has been found to be the component of language that is most affected by SES (Arriaga et al., 1998; Hart & Risley, 1995; Hoff, 2003). Past research has identified that toddlers living in low-income families are significantly behind in their expressive communication skills, have poorer vocabularies, as well as a slower rate of vocabulary growth compared to toddlers living in middle- to high-income homes (Arriaga et al., 1998; Hoff, 2003; Rescorla & Alley, 2001).

More recently, Vernon-Feagans, Garret-Peters, Willoughby and Mills-Koonce, (2012) sought to further explore the relationship between SES and poor language development in children. Specifically, they predicted that the day-to-day experiences related to poverty such as living in a chaotic home environment may significantly predict poor language development above and beyond the impact of low SES alone. Furthermore, they sought to see if parenting behaviors mediated this relationship. Vernon-Feagans et al. (2012) found that more disorganized homes such as homes with a higher density, more mess, and higher noise levels, significantly and negatively predicted child receptive and expressive language development, above and beyond SES. The authors also concluded that family disorganization accounted for a significant portion of language development even when controlling for observed parenting behaviors.

Parenting and Language Development in Low-Income Families

Parenting Behaviors are one of the primary contributing mediators to the relationship between poverty and language development as parents play an important role in supporting language development (Dodici et al., 2003; Hart & Risley, 1995; Hirsch-Pasek et al., 2015; Huttenlocher et al., 1991; Landry et al., 1997; Morales et al., 2000; Newman, Rowe, & Ratner, 2016; Tamis-LeMonda et al., 2001; Tamis-LeMonda et al., 2014; Tomasello & Farrar, 1986). Research has found that parents in lower-income homes not only speak less around their children, but also primarily use commands and directives with their young children while families in middle-income homes use language that is more conversational and responsive to children's interests (Hart & Risley, 1995; Rowe, 2012). The type of language used by higher-income parents is more typical of language that is used in school settings and is linked to better child language outcomes and academic achievement (Huttenlocher et al., 1991; Rowe, 2012; Tamis-LeMonda et al., 2014; Tomasello & Farrar, 1986; Weisleder & Fernald, 2013).

Parental language use and child language development. One of the seminal studies on the contribution of parents' use of language and child language development across income levels was conducted by Hart and Risley (1995). In their longitudinal study, they assessed the cognitive and verbal abilities of a sample of 42 children when they were 3 and 9 years of age. Hart and Risley (1995) then obtained detailed information on the quantity and diversity of language that parents used around their children. Families were categorized into three different SES groups based on income and education levels including "professional", "working class", and welfare". They reported that there was approximately a 32-million-word difference in the number of words heard by 3-year-old

children in the “welfare” families compared to those living in the “working class” and “professional” households. Children in the higher SES families performed better on standardized measures of verbal comprehension and on standardized measures of cognitive abilities at 3 and 9 years of age.

Expanding on this work, Hoff (2003) found that parents in the high SES group used more words, a greater variety of words, had greater mean length of utterances, and used more language with the intention of continuing conversation and engagement than parents in the low-SES group. Furthermore, the quality and variety of words that mothers used fully mediated the relationship between SES and the rate of growth in children’s vocabulary. Rowe (2012) was interested in further understanding the components that might contribute to the quality of language used by parents, and gaining a deeper understanding of the potential unique contributions of quantity and quality of language use on children’s language outcomes. Specifically, when controlling for family SES, the quantity of language used had the greatest impact when children were 30 months, the diversity and sophistication of vocabulary words used had the greatest impact when children were 42 months, and the use of decontextualized language had the greatest impact when children were 54 months.

Similarly, Hirsh-Pasek et al. (2015) further exploring how the quality of parent-child communication as well as the quantity of language used impacted language development in a sample of 60 low-income families. They defined the quality of communication between the dyads in a more relational manner, as opposed to using the type and variety of words. Quality of communication was defined as how well the parent-child dyad had joint attention on objects, events, or words in play, how often they

engaged in routine or rituals such as turn taking or book reading, as well as how fluent and connected the interactions between the dyad were such as having balanced back and forth conversations. When children were 24 months of age, communication quality significantly predicted children's expressive language when they were 36 months. Similar to the previous research, the quality of the language input was a stronger predictor than the quantity of language used.

Parental responsiveness and sensitivity and child language development. In addition to how parents use language around their children, more broad and general parenting practices also significantly contribute to child language development (Bradley & Corwyn, 2005; Hudson et al., 2015; Masur, Flynn, & Eichorist, 2005; Raviv, Kessenich, & Morrison, 2004; Tamis-LeMonda et al., 2014). Extensive research has identified that parenting behaviors such as sensitivity and responsiveness benefit children, while controlling or harsh parenting negatively affect development (Burchinal, Cambell, Bryant, Wasik, & Ramey, 1997; Pungello et al., 2009; Stein et al., 2008.) In a longitudinal study, Tamis-LeMonda et al. (2004) found that positive parenting behaviors (i.e., sensitivity, positive regard, cognitive stimulation) as rated by trained research assistants from videotaped interactions were associated with higher receptive language scores when children were 36 months of age.

The impact of responsive parenting on child language development has garnered particular attention (e.g., Hudson et al., 2015; Pungello et al., 2009; Stein et al., 2008). Stein et al. (2008) also investigated the relationship between parenting behaviors (i.e., maternal responsivity, opportunities for learning), SES, and children's language development in a sample of 1,201 mother-child dyads involved in the study from birth-3

years of age. Findings showed that higher ratings of positive caregiving were the primary predictor of more positive language outcomes. Stein et al. (2008) also found that this relationship differed according to SES, such that for less advantaged mothers, depressive symptoms more strongly impacted caregiving behaviors. Regardless of SES, poorer caregiving predicted lower language outcomes. Pungello et al. (2009) found that maternal sensitivity was positively related to the rate of growth of children's receptive and expressive language skills. Alternatively, mothers' intrusive behaviors were negatively related to the rate of growth of children's receptive language skills but were not related to expressive language. In addition, Hudson et al. (2015) conducted a study to assess whether a global rating of responsiveness when children were 2 years of age would predict child language outcomes when children were 3 and 4 years of age. In their sample, maternal responsiveness significantly predicted children's expressive language, auditory comprehension, and total language scores when children were 3 and 4 years of age.

One of the benefits of understanding parenting factors that are related to child language outcomes, is that it allows researchers and clinicians to identify intervention targets to reduce the language gap. Targeting parental responsiveness in interventions designed to ameliorate the language gap and bolster academic achievement is promising, as responsiveness has been linked to a variety of positive outcomes such as improved social-emotional development as well as language development (Birmingham et al., 2017; Bridgett et al., 2013; Brophy-Herb et al., 2011; Dodici et al., 2003; Kochanska et al., 2000; Landry et al., 1997; Morales et al., 2000). Additionally, there is evidence to suggest that models that utilize a strengths-based approach are effective in increasing

engagement in services and changing behavior (Brun & Rapp, 2001; Nese, Anderson, Ruppert, & Fisher, 2016; Sheely-Moore & Bratton, 2010; Waters & Sun, 2016).

Increasing parents sense of efficacy in their abilities to successfully care for their children (PSOC) is one mechanism that has been hypothesized to contribute to the success of strengths-based programs for parents. Increasing PSOC may promote positive parenting behaviors such as responsiveness as well as improved developmental outcomes in children (Ardelt & Eccles, 2001). Although some research exists on the relationship between PSOC, positive parenting behaviors, and child social-emotional and behavioral outcomes, less is known about the potential relationship between PSOC and child language outcomes.

PSOC as a Potential Predictor of Child Language Development

As has been discussed, parenting behaviors have been strongly linked to child language outcomes, however, little research has investigated the impact of parental beliefs and attitudes about child rearing on child language outcomes. Much of the research on parents' subjective experiences, thoughts and attitudes, have emphasized negative cognitions such as those related to depression and anxiety (e.g., Apter-Levi et al., 2016; Feldman et al., 2009; Gross, Shaw, Burwell, & Nagin, 2009; Korja, Nolvi, Grant, & McMahon, 2017; Mackler, Kelleher, Shanahan, Keane, & O'Brien, 2015; Olino et al., 2016). Much less research has been conducted on positive parental beliefs that can contribute to providing an enriching and stimulating environment in the home, particularly for low-income families (Peacock-Chambers et al., 2017). For example, parental self-efficacy, or parenting sense of competence (PSOC) is one such example of a parenting belief that has a known association with parenting behaviors and child

developmental outcomes (Coleman & Karraker, 2005; Jones & Prinz, 2005; Steca et al., 2011; Wilson Gettings, Guntzviller, & Munz, 2014).

Studies have found that low PSOC is significantly associated with adverse child outcomes, such as internalizing and externalizing symptoms as well as developmentally inadequate social skills (Côté et al., 2009; Izzo et al., 2000; Knoche et al., 2007; Steca et al., 2011). High PSOC, in contrast, has been identified as a protective factor (Côté et al., 2009; Izzo et al., 2000). High PSOC has also been associated with academic success in adolescence (Ardelt & Eccles, 2001; Hoover-Dempsey et al., 2001; Shumow & Lomax, 2002). Furthermore, researchers have found that children of parents with high levels of depression but high PSOC had better outcomes than did parents with high depression and low PSOC (Knoche et al., 2007) providing support for the protective function of PSOC.

Surprisingly, only one study has specifically explored the relationship between PSOC and child language development. In their study, Albarran and Reich (2014) found that mothers reporting on their PSOC when their infants were 2 months was significantly related to their children's expressive and receptive language development when they were 18 months. Although the research linking PSOC to child language development is currently limited, some researchers have explored ways in which parenting self-efficacy may promote parenting behaviors known to promote academic achievement (e.g., Hoover-Dempsey, Bassler, & Brissie, 1992; Machida, Taylor, & Kim, 2002; Peacock-Chambers et al., 2017). For example, higher PSOC has been linked to greater amounts of time that families spend engaged in home learning activities such as shared book reading (Machida et al., 2002; Peacock-Chambers et al., 2017). Peacock-Chambers et al. (2017) identified that English speaking parents with higher levels of education had higher levels

of self-efficacy and greater perceived perception of having personal control of their child's development and behaviors. Furthermore, higher self-efficacy and perceived control was related to positive changes in the home learning environment.

Although extant research has investigated the relationship between PSOC, parenting behaviors, and child outcomes in early childhood, late childhood, and adolescence, most of these studies relied on cross-sectional data or longitudinal data that occurred over a relatively short time span, such as over the course of a few years. As a result, it is difficult to draw conclusions about the potential long-term impact of PSOC on child outcomes. Accordingly, the current study aimed to address this gap by using fully prospective longitudinal data spanning infancy to preadolescence.

The Present Study

The purpose of the present study was to examine a conceptual model of a longitudinal framework to better understand the relationship between early PSOC, positive parenting behaviors, and children's language development (see Figure 1). The first hypothesis was that mothers' self-reported PSOC when children were 12 months would predict child language outcomes when children were 36 months old and their vocabulary at preadolescence. A second hypothesis was that the relationship between PSOC and child language development at 26 months would be mediated through positive parenting behaviors when children were 24 months of age. The third hypothesis was that the relationship between PSOC and vocabulary in adolescence would be mediated by both parenting behaviors at 24 months and language development at 36 months.

It is important to acknowledge that data from the present study was obtained from a larger longitudinal study and included a diverse sample. Slightly less than half of the

mothers involved in the study preferred to speak Spanish during at least one assessment time point (45.7%, $n = 106$). However, all child language measures were administered in English. Although research suggests that children in bilingual environments tend to reach important language development milestones at the same age as children in monolingual environments, there is also evidence to suggest that bilingual children acquire language skills at the same rate as children exposed to a single language, but the skills spread across both languages (Paradis & Genesee, 1996; Petitto et al., 2001). Therefore, children living in bilingual environments tend to have lower scores on language testing than monolingual children when only the common language is assessed. Single language measures may underestimate the true language abilities of bilingual children (Hoff et al., 2012; Hoff, Rumiche, Burridge, Ribot, & Welsh, 2014; Oller, Pearson, & Cobo-Lewis, 2007; Pearson & Fernandez, 1994; Thordardottir, Rothenberg, Rivard, & Naves, 2006).

Recent research has sought to better understand the importance of parental use of language on child language development within bilingual households. Previous researchers reported consistent findings for studies conducted in monolingual homes. Bilingual parents' use of language such as the quantity of each language used and engagement in learning activities such as book reading is just as important for language learning as it is for children with monolingual parents (Feng, Gai, & Chen, 2014; Hammer et al., 2012; Marchman, Martinez, Hurtado, Gruter, & Fernald, 2017; Quiroz, Snow, & Zhao, 2010; Song, Tamis-LeMonda, Yoshikawa, Kahana-Kalman, & Wu, 2012).

Quiroz et al. (2010) explored the relationship between maternal language use and child language development in a sample of 50 bilingual mothers and their 3-5-year-old

children. Children in homes where more Spanish was spoken tended to have better Spanish vocabularies, assessed with the Spanish version of the Picture Vocabulary test from the Woodcock Johnson Language Proficiency Battery-Revised, than on the English version. Similarly, children in homes where English was spoken more tended to have better English vocabularies. Interestingly, the amount of questions that parents asked during book reading in Spanish significantly predicted children's English and Spanish vocabulary scores (Quiroz et al., 2010).

Song et al. (2012) conducted a longitudinal study in which they explored parental language use through parent report and videotaped observations in relation to toddlers' vocabulary development in a sample of 155 Dominican American and Mexican American families. The number of utterances parents made in English significantly predicted children's English vocabulary at 14 and 24 months. However, the amount of time that parents engaged in singing songs, reading books, and telling stories in English did not predict English vocabulary scores. In contrast, the number of utterances parents made in Spanish and the amount of time that parents sang songs, read books, and told stories in Spanish predicted children's Spanish vocabulary at 14 and at 24 months.

Feng et al. (2014) conducted a similar study but also examined access to educational materials such as books. Specifically, the authors examined how monolingual ($n = 5350$) and bilingual families ($n = 1200$) differed with regard to access to books and time spent engaged in learning activities such as book reading, telling stories, and singing songs from birth through Kindergarten. Families in bilingual households tended to have fewer books and spent less time reading books, telling stories, and singing songs than families in monolingual households. Furthermore, Feng et al. (2014) found that children

in monolingual households tended to have better reading abilities in preschool and in kindergarten than children in bilingual households. This discrepancy could be partially explained by the differences in resources and time spent engaged in learning activities.

Given the emphasis on responsive parenting behaviors and child language development in the present study, it is also important to acknowledge that there may be cultural factors that influence maternal responsiveness. For example, acculturation level has been associated with parenting behaviors such that Mexican American mothers who reported high acculturation also demonstrated more warmth and less intrusiveness than mothers who reported less acculturation (Ispa et al., 2004). However, within families who hold traditional values, intrusiveness is linked with more positive child outcomes and is considered typical (Grusec, Rudy, & Martini, 1997; Ispa et al., 2004).

Research on the impact of responsive parenting and language learning in bilingual environments is much less extensive than in monolingual environments. However, there is some evidence to suggest that similar to monolingual families, parental responsiveness within ethnically diverse families is related to language outcomes and in some instances has been found to predict vocabulary growth in both languages (e.g. Song et al., 2012).

The data for the present study were not collected with the purpose of comparing bilingual and monolingual families with regard to child language outcomes. As a result, there is limited data on the amount or frequency in which mothers spoke English or Spanish in the home and there is not available information on acculturation. As this was not an aim of the present study but is an important factor to consider, mothers' language use (Spanish or English) was included as a variable of interest in analyses.

This study advances the existing research by directly exploring the relationship between PSOC and child language development within a sample of low-income mother-child dyads. Previous research has focused on more broad measures of academic achievement, primarily through parent report (e.g., Ardelt & Eccles, 2001; Shumow & Lomax 2002). Furthermore, this study utilizes a fully prospective longitudinal design with children from 12 months of age through preadolescence. A longitudinal approach spanning such a large age range has not yet been conducted on this topic and will assist with identifying important targets for preventive intervention programs for at-risk populations in order to address the aforementioned language disparities.

Methods

Participants

Data for this paper were originally collected from the Healthy Families America San Diego clinical trial (Landsverk, Carrilio, Connelly, Ganger, & Slymen, 2002) as well as through a follow-up study conducted at the Oregon Social Learning Center (Martin, Bruce, & Fisher, 2012). The original aim of the Healthy Families America study was to test the effectiveness of a home visiting program for at-risk families with regard to preventing child maltreatment by improving parenting behaviors and promoting healthy child development (Daro & Harding, 1999). The original study did not identify expected intervention effects from the home visiting program (Delker, Noll, Kim, & Fisher, 2014; Landsverk et al., 2002; Martin, Kim, Bruce, & Fisher, 2014), however this paper will explore any potential group differences on all study variables between the control condition and intervention condition.

The sample for the current paper includes a subset of mothers who were originally recruited after giving birth at a San Diego hospital between February 1996 and March 1997. Inclusion criteria at the time of recruitment required that mothers were living in San Diego, spoke English or Spanish, and were not involved in the military. Mothers who met these initial criteria then participated in a two-part screening procedure. The Hawaii Risk Indicators Checklist (Hawaii Family Stress Center, 1994) was first used to identify certain risk factors (e.g., received inadequate prenatal care, history of abortion, being single, showing multiple risk factors) within mothers' medical charts. Mothers who met criteria were then further assessed with the Family Stress Checklist (Kempe & Kempe, 1976), a 10-item questionnaire assessing risk for child maltreatment. Mothers who reported a score of 25 or higher and who did not have an open case with child protective services were invited to participate in the study. This resulted in a sample of 488 mothers ranging in age from 14-42 ($M = 24.26$, $SD = 6.4$) and their children. The initial interview (T1) occurred within two weeks post-partum, and follow-up interviews occurred when children were 12 (T2), 24 (T3), and 36 (T4) months. The screening and assessment procedures during this initial phase of the study were conducted by trained research assistants who were blind to the study condition.

The subsample for the current paper included 239 mother-child dyads who also participated in the longitudinal follow-up (T5) conducted by the Oregon Social Learning Center when children were between the ages of 9 and 12 years ($M = 10.99$, $SD = .73$; 53% female). Children within the subsample were racially and ethnically diverse: 44% Hispanic ($n = 106$), 28% Caucasian ($n = 67$), 19% African American ($n = 45$), and 9% Asian American or other ($n = 21$). At T1, mothers' level of education varied: 11% ($n =$

27) had schooling less than eighth grade, 34% ($n = 80$) had some high school education, 23% ($n = 63$) graduated high school or received a GED, 26% ($n = 63$) completed some college courses, and 6% ($n = 13$) had bachelor's or associates degrees. The median annual net income at the follow-up time point fell within \$25,000 to \$29,999, based on a 12-point scale ranging from less than \$4,999 to \$50,000 or more.

Procedure

All study procedures were reviewed and approved by the Institutional Review Boards at San Diego State University, Children's Hospital of San Diego, and Oregon Social Learning Center. Mothers were provided informed consent and were compensated for each interview. Mothers completed measures of their demographics, social support, past and present substance use, psychological health, parenting characteristics, and their children's adjustment at each time point. Additionally, parent consent and permission as well as child assent were obtained prior to participating in the longitudinal follow-up study. Follow-up interviews were conducted in English or Spanish according to the mothers' preference and occurred either in the family's home or by phone. Additionally, parents and children separately participated in a 2.5-hour assessment.

Measures

Maternal PSOC at T2. Mothers' sense of parenting efficacy and competency was assessed using the Parenting Sense of Competence Scale when their children were 12 months (PSOC; Johnston & Mash, 1989). The PSOC is a 17-item self-report questionnaire that includes questions about parents' perception of their own childrearing abilities. Sample items include "I would make a fine model for a new parent" and "I have all the skills to be a good parent." The mothers responded to the items using a 6-point

Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). A total score was computed by calculating the sum of the 17 items, with higher scores indicating a greater sense of parenting competence. Scores ranged from 41 to 102 ($M = 76.00$, $SD = 11.02$). The PSOC had adequate internal reliability in this sample (Cronbach's $\alpha = .78$).

Maternal positive parenting at T3. The positive parenting scale was developed from a specific set of items on the Nursing Child Assessment Satellite Training (NCAST) Teaching Scale, Birth to Three Years (Barnard, 1994). Using the NCAST, an observer rated the presence or absence of 71 distinct behaviors during a structured interaction. A subset of 8 items from the NCAST that reflect the presence of positive caregivers' behavior were identified and tested for reliability. Examples of items include: "Caregiver praises child's successes or partial successes" and "Caregiver smiles, or touches child within five seconds after the child smiles or vocalizes." Higher scores indicate more positive parenting behaviors. Scale reliability was adequate (Cronbach's $\alpha = .72$) and thus a composite measure was formed by summing responses on the 8 items with higher scores indicating more positive parenting behaviors. Scores ranged from 0 to 8 ($M = 4.55$, $SD = 2.12$).

Child language development at T4. Children's language abilities at T4 were assessed with the Preschool Language Scales-3 (PLS-3; Zimmerman, Steiner, & Pond, 1992). The PLS-3 provides age-normed language scores for children birth to seven years of age. It is an interactive assessment that measures auditory comprehension, expressive communication, and total language scores. It has been validated in a sample of 1,400 children, representative of the U.S. Census figures for race and ethnicity. Internal reliability ranges from .80 to .97. Total language score ranged from 58 to 112 ($M = 86.46$,

$SD = 11.13$), auditory comprehension scores ranged from 56 to 118 ($M = 87.54$, $SD = 12.28$), and expressive communication scores ranged from 56 to 117 ($M = 88.76$, $SD = 9.360$).

Child vocabulary at T5. At T5, the vocabulary subtest of the Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003) was administered. The vocabulary subtest measures children's verbal fluency, word knowledge, and word usage. Scale scores were calculated in order to compare children's performance to age based norms. Scores Ranged from 1 to 14 ($M = 9.05$, $SD = 2.59$).

Analysis Plan

All variables were examined for missing data, outliers, and deviations from normality. Little's Missing Completely at Random (MCAR) test (Little, 1988), was conducted in PASW Statistics Version 18 $\chi^2(11) = 7.12$, ns . To take full advantage of available data, full information maximum likelihood was used in Mplus, permitting the inclusion of participants with partial data on dependent variables (Múthen & Múthen, 1998–2012).

Descriptive statistics and bivariate correlations among the study variables were calculated. A path analysis was then conducted to examine the hypothesized association between early parenting sense of competence, positive parenting behaviors, and child language measures. Separate analyses were conducted to include children's auditory comprehension scores, expressive language scores, and total language score at T4 as a part of the path model. Moreover, bootstrapping analysis was used to test the significance of the mediation hypothesis that the influence of PSOC at T1 on preadolescents' vocabulary scores is mediated by positive parenting behaviors at T2 and child language

development at age 36 months. Path analyses were conducted using Mplus version 7.3 (Muthén & Muthén, 1998–2012).

Results

Descriptive Analyses

Means, standard deviations, and bivariate correlations of primary study variables are presented in Table 2 and main correlations of interest are discussed below. Maternal PSOC when children were 12 months significantly and positively correlated with positive parenting behaviors when children were 24 months of age ($r(21) = .23, p < .01$), and with child auditory comprehension ($r(148) = .17, p < .05$), expressive communication ($r(145) = .17, p < .05$), and total language scores ($r(145) = .21, p < .05$) when children were 36 months of age. Maternal PSOC was also significantly correlated with children's vocabulary scores at preadolescence ($r(151) = .23, p < .01$). Parenting behavior when children were 24 months of age was significantly correlated with children's auditory comprehension ($r(159) = .26, p < .01$) and total language scores ($r(156) = .21, p < .05$) but not with expressive communication ($r(156) = .14, ns$) when children were 36 months of age. Parenting behavior was significantly correlated with preadolescent vocabulary scores ($r(164) = .26, p < .01$). Vocabulary scores during preadolescence were significantly correlated with child auditory comprehension ($r(167) = .49, p < .01$), expressive communication ($r(164) = .33, p < .01$) and total language scores ($r(164) = .47, p < .01$) at 36 months of age.

Table 2. Correlations between study 1 variables

Measure	1	2	3	4	5	6	<i>M</i>	<i>SD</i>
1. Maternal sense of competence							76.00	11.02
2. Maternal positive parenting	.23**						4.54	2.12
3. Child Auditory comprehension	.17*	.26**					87.54	12.28
4. Child expressive communication	.17*	.16	.66**				88.76	9.36
5. Child total language	.21*	.21*	.87**	.77**			86.46	11.13
6. Adolescent vocabulary	.23**	.26**	.49**	.33**	.47**		9.05	2.60

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

As this was a diverse sample and some mothers spoke Spanish to their children, a variable was created in order to conduct independent sample *t*-tests to explore the relationship between the language mothers spoke and study variables. Mothers who only spoke English during all study visits were given a score of 0 and mothers who spoke Spanish at any of the study assessments were given a score of 1. Mothers who only spoke English reported significantly higher PSOC at T2 ($M = 78.94$, $SD = 10.41$) than mothers who spoke Spanish ($M = 72.33$, $SD = 10.82$; $t(204) = 4.45$, $p < .01$). Mothers' language was not significantly related to observed parenting behaviors ($t(218) = 1.84$, *ns*). Children whose mothers only spoke English had significantly better auditory comprehension scores ($M = 91.18$, $SD = 13.62$) than children whose mothers spoke Spanish ($M = 83.34$, $SD = 9.99$; $t(167) = 3.75$, $p < .01$) and had significantly better total language scores ($M = 88.87$, $SD = 11.32$) than did children whose mothers spoke Spanish ($m = 84.28$, $sd = 10.54$; $t(164) = 2.71$, $p < .01$) at 36 months of age. Mothers use of language did not relate to children's expressive communication scores at 36 months, *t*

(164) = 1.67, *ns*). Finally, children whose mothers only spoke English had significantly better vocabulary scores at preadolescence ($M = 9.47$, $SD = 2.41$) than did children whose mothers spoke Spanish ($M = 8.69$, $SD = 2.71$; $t(172) = 1.99$, $p < .05$). Therefore, in order to account for the effect of mothers' language use on children's language outcomes, a measure of maternal language use was included in the models.

Path Analyses

The path models shown in Figures 4, 5, and 6 fit the data well when including auditory comprehension, $\chi^2(4) = 2.70$, $p = .61$; CFI = 1.00; TLI = 1.05; RMSEA = .00 (90% CI = 0.00–0.08); expressive language, $\chi^2(4) = 2.75$, $p = .60$; CFI = 1.00; TLI = 1.09; RMSEA = .00 (90% CI = 0.00–0.08); and total language, $\chi^2(4) = 2.39$, $p = .66$; CFI = 1.00; TLI = 1.07; RMSEA = .00 (90% CI = 0.00–0.07) as predictors, respectively. However, slightly different patterns of significance emerged within each model. In order to control for the wider age range of children at the time of the T5 assessment, age at the time of assessment was included as a predictor of vocabulary scores at T5 but was not significant (p values ranged from .84 to .95 across the three models). Additionally, model modification indices suggested that the model fit for each analysis would be improved when PSOC at T2 and child age at T5 were correlated. In all three models, PSOC at T2 and child age at T5 were not significantly correlated (p values ranged from .13 to .14) and did not change other model effects. Therefore, this correlation remained in the final models.

Auditory comprehension. PSOC at T2 significantly predicted parenting behavior at T3 ($p < .01$). Parenting behavior at T3 significantly predicted children's auditory comprehension scores at T4 ($p < .01$) but did not significantly predict preadolescents'

vocabulary scores at T5 ($p = .08$). Children’s auditory comprehension scores at T4 significantly predicted vocabulary scores at T5 ($p < .01$). PSOC at T2 did not significantly predict children’s auditory comprehension at T4 ($p = .56$), however it did marginally predict preadolescents’ vocabulary scores at T5 ($p = .056$).

Tests of indirect effects revealed that the path from PSOC at T2 to parenting behavior at T3, to auditory comprehension at T4 was significant ($\beta = .05$, $SE = .02$, $p < .05$). Additionally, the indirect effect for the path from PSOC at T2 to vocabulary score at T5 through both parenting behaviors at T3 and auditory comprehension at T4 was small but significant ($\beta = .005$, $SE = .002$, $p < .04$).

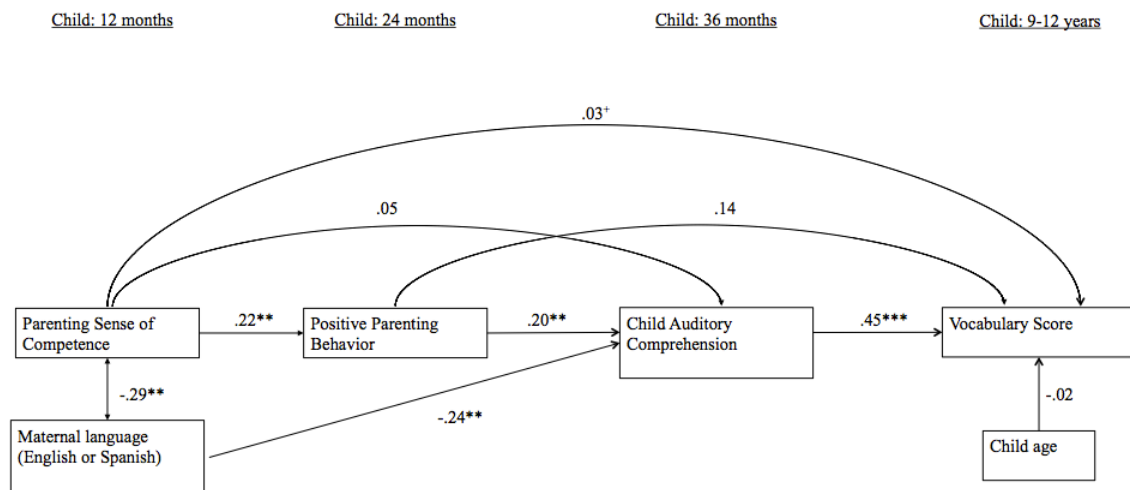


Figure 4. Path analysis of the direct and indirect effects of PSOC on children’s auditory comprehension and vocabulary, $\chi^2(4) = 2.70$, $p = .61$; CFI = 1.00; TLI = 1.05; RMSEA = .00 (90% CI = 0.00–0.08). $^+ p < .06$, $*p < .05$, $**p < .01$, $***p < .001$.

Expressive language. PSOC at T2 significantly predicted parenting behavior at T3 ($p < .01$). Parenting behavior at T3 did not significantly predict children’s expressive language scores at T4 ($p = .18$) but did significantly predict preadolescents’ vocabulary scores at T5 ($p < .05$). Children’s expressive language scores at T4 significantly predicted vocabulary scores at T5 ($p < .05$). PSOC at T2 did not significantly predict children’s

expressive language scores at T4 ($p = .20$). However, PSOC did marginally predict preadolescents' vocabulary scores at T5 ($p = .053$).

Tests of indirect effects revealed that the indirect path from PSOC at T2 to parenting behavior at T3, to expressive language at T4 was not significant ($\beta = .02$, $SE = .02$, $p = .22$). Similarly, the indirect effect for the path from PSOC at T2 to vocabulary scores at T5 through both parenting behaviors at T3 and expressive language at T4 was not significant ($\beta = .002$, $SE = .001$, $p = .24$).

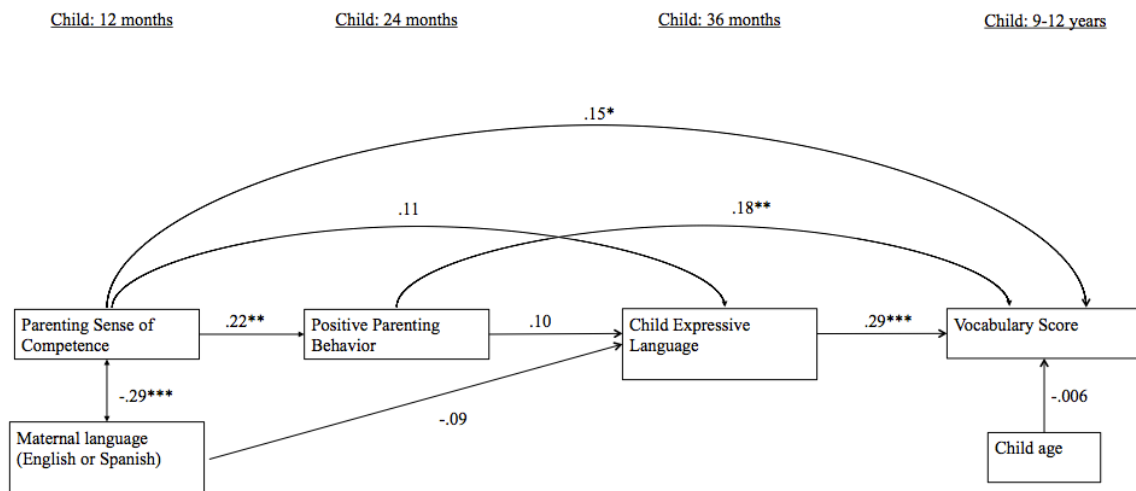


Figure 5. Path analysis of the direct and indirect effects of PSOC on children's expressive language and vocabulary, $\chi^2(4) = 2.75$, $p = .60$; CFI = 1.00; TLI = 1.09; RMSEA = .00 (90% CI = 0.00–0.08). + $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$

Total language. PSOC at T2 significantly predicted parenting behavior at T3 ($p < .01$). Parenting behavior at T3 significantly predicted children's total language scores at T4 ($p < .05$) as well as preadolescents' vocabulary scores at T5 ($p < .05$). Children's total language scores at T4 also predicted vocabulary scores at T5 ($p < .01$). PSOC at T2 did not significantly predict preadolescents' vocabulary scores at T5 ($p = .12$). Tests of indirect effects revealed that the indirect path from PSOC at T2 to parenting behavior at T3, to total language scores was trending towards significant ($\beta = .04$, $SE = .02$, $p = .07$).

Additionally, the indirect effect for the path, PSOC at T2 to parenting behavior at T3 to total language scores at T4, to vocabulary scores at T5 was not significant ($\beta = .004$, $SE = .002$, $p = .09$).

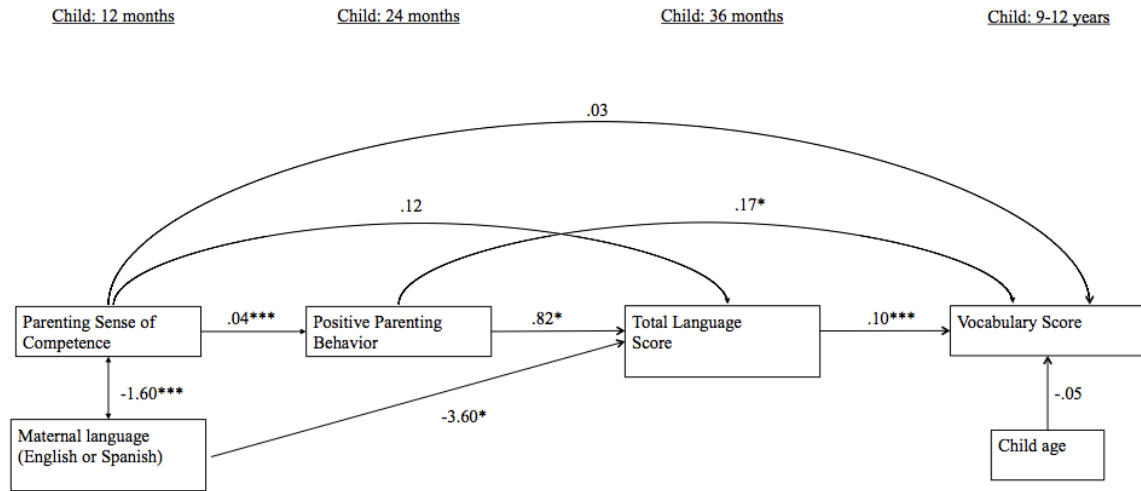


Figure 6. Path analysis of the direct and indirect effects of PSOC on children’s total language score and vocabulary, $\chi^2(4) = 2.39$, $p = .66$; CFI = 1.00; TLI = 1.07; RMSEA = .00 (90% CI = 0.00–0.07). ⁺ $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Associations with mothers’ language. Due to the correlations between mothers’ use of language and children’s language outcomes, mothers use of language was included as a predictor of language outcomes at T4 in all of the models. Mothers’ language was significantly associated with children’s auditory comprehension at T4 ($\beta = -.24$, $SE = .07$, $p < .01$) and with children’s total language scores at T4 ($\beta = -3.60$, $SE = 1.73$, $p < .05$). However, mothers’ language use did not significantly predict expressive communication at T4 ($\beta = -.09$, $SE = .08$, $p = .25$). Mothers who spoke Spanish during at least one of the assessment time points had children who with significantly lower auditory comprehension and total language scores on the PLS-3 than mothers who only spoke English. While the estimates for the effect of mothers’ language use on PSOC at T2 slightly varied across the three models, in all three instances, mothers’ language was

significantly associated with self-reported PSOC at T2, such that mothers who spoke Spanish reported significantly lower PSOC at T2 ($p < .01$).

Discussion

Previous research on PSOC, parenting, and child developmental outcomes have focused on child social-emotional development and broad measures of academic achievement such as internalizing and externalizing symptoms, grades, and behavioral adjustment in school (e.g., Côté et al., 2009; Jones & Prinz, 2005; Peacock-Chambers et al., 2017; Shumow & Lomax 2002; Steca et al., 2011; Wilson et al., 2014). An aim of this study was to advance the existing research by directly exploring the relationships between parenting sense of competence, parenting behaviors, and child language development within a sample of low-income mother-child dyads. In this fully prospective longitudinal study, the following hypotheses were examined: (1) Mothers' self-reported PSOC when children were 12 months would predict child language outcomes when children were 36 months old and their vocabulary at preadolescence; (2) The relationship between PSOC and child language development at 26 months would be mediated through positive parenting behaviors when children were 24 months of age; and (3) The relationship between PSOC and vocabulary in adolescence would be mediated by both parenting behaviors at 24 months and language development at 36 months.

In contrast to other studies that support the first study hypothesis, mothers' PSOC when children were 12 months was not significantly related to children's language development at 36 months. Additionally, mothers' PSOC was not strongly related to children's vocabulary scores in preadolescence. However, when children's expressive language abilities were included in the path analysis, there was an observed direct effect

of PSOC on children's vocabulary scores, though the amount of variance in vocabulary scores predicted by PSOC was small. When children's auditory comprehension was included in the model, the direct effect of PSOC on preadolescents' vocabulary was marginally significant.

There is very little research on the association between PSOC and child language development. One identified study found that mothers' ratings of their self-efficacy when their children were 2 months of age were significantly related to their expressive language, auditory comprehension, and total language scores on the PLS-4 when children were 18 months of age (Albarran & Reich, 2014). The authors additionally found that the rate in which mothers' self-efficacy increased from when their children were 2 to 18 months significantly predicted auditory comprehension but not expressive language or total language scores. Results from the present study are not consistent with the findings reported by Albarran & Reich (2014). It is possible that this discrepancy may be due to the amount of time between the PSOC assessment and the measurement of children's language development. Albarran & Reich (2014) compared the impact of PSOC on child language development after 16 months, whereas the present study explored the effect of PSOC on child language development when assessed 24 months apart. However, differences due to timing would not account for the marginal effects of PSOC on vocabulary scores when assessed 8-11 years apart.

Partial support was found for the second study hypothesis. While PSOC when children were 12 months did not have significant direct effects on child language development at 36 months, PSOC did have a significant effect on positive parenting behaviors when children were 24 months. Consistent with previous research, parents that

reported higher levels of PSOC demonstrated more positive parenting behaviors one year later (Coleman & Karraker, 2003; Hoover-Dempsey et al., 1992; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017). Furthermore, more positive parenting behaviors when children were 24 months significantly predicted higher auditory comprehension and total language scores when children were 36 months. Results from the present study indicated that the indirect path between PSOC and child auditory comprehension through positive parenting behaviors was significant, suggesting that mothers' PSOC may have important implications for child language outcomes due to the influence of PSOC on parenting behaviors. These findings did not hold for children's expressive language or total language scores.

Interestingly, positive parenting behaviors did not significantly predict children's expressive language scores at 36 months. This finding is inconsistent with the study hypotheses and existing literature. A variety of factors may explain this finding, such as the possibility that other factors or third variables not used in the present study explain more of the variability in expressive language than in total language or auditory comprehension. For example, child care was not a variable in this study. Expressive language at 36 months may be explained, in part, by amount of time the child is in out-of-home care. Additionally, previous research has specifically looked at shared book reading and other home learning activities in relation to vocabulary development and expressive language. It is important to consider the possibility that these specific activities in which parents use language may be more predictive of expressive language whereas more general parenting behaviors such as responsiveness and sensitivity may be more predictive of receptive language and less predictive of expressive language.

Positive parenting behaviors when children were 24 months significantly predicted preadolescents' vocabulary scores, but only when expressive language and total language scores were included in the model. Previous research supports this finding (Bradley & Corwyn, 2002; NICHD Early Childcare Network, 2000; Hudson et al., 2015; Masur et al., 2005; Raviv et al., 2004; Tamis-LeMonda et al., 2004). The relationship between positive parenting behaviors and vocabulary scores was not significant when auditory comprehension was included. This finding is inconsistent with the literature but may be due to slightly more of the variance being explained by PSOC.

Minimal support was found for the third hypothesis assessing the indirect effect between the relationship of mothers' PSOC at 12 months and vocabulary in preadolescence through parenting behaviors at 24 months and language development at 36 months. The indirect effect tested in the model was only significant when including auditory comprehension as the language predictor at 36 months. In this model, higher levels of PSOC were associated with better vocabulary scores in preadolescence both directly and indirectly through more positive parenting behaviors and higher auditory comprehension scores. Again, the small amount of variance explained by these pathways contributes to minimal support for this hypothesis.

It is unclear why PSOC influenced child language outcomes when including receptive language abilities, as opposed to expressive language or total language scores. Albarran & Reich (2014) identified that the rate of increase in mothers reported PSOC from when their children were 2 months to 18 months significantly predicted children' receptive but not expressive language or total language abilities. These authors suggested that the increase in positive parenting behaviors as a result of higher PSOC may have a

stronger relationship with receptive language. In early childhood, children tend to have better receptive than expressive language which could introduce a timing of measurement effect such that a relationship between PSOC and expressive language may be observable when children are older. It is possible that during early childhood receptive language is more sensitive to caregiver behavior and PSOC than expressive language (Albarran & Reich, 2014).

Consistent with the literature, children whose mothers chose to speak Spanish during the assessments demonstrated significantly poorer performance on receptive language and total language abilities at 36 months of age (Hoff et al., 2012; Hoff et al., 2014; Oller et al., 2007; Pearson & Fernandez, 1994; Thordardottir et al., 2006). As was previously discussed, mothers' language preferences were not related to children's expressive language scores at 36 months. Recently, researchers have sought to understand the importance of the quality and quantity of language input, as well as the impact of responsive parenting on language development in children raised in bilingual environments (Feng et al., 2014; Hammer et al., 2012; Marchman et al., 2017; Quiroz et al., 2010; Song et al., 2012). Information on how much the children in the study were exposed to English and Spanish in their homes was not available, but should be considered in future research that includes children in both monolingual and bilingual environments.

An unexpected finding was that mothers who chose to speak Spanish during the assessment reported significantly lower PSOC than mothers who spoke English. Several studies have identified similar relationships between PSOC and parenting behaviors across culturally diverse samples (Dumka, Gonzales, Wheeler & Millsap, 2010; Dumka,

Stoerzinger, Jackson, & Roosa; 1996; MacPhee et al., 1996). For example, Dumka et al. (2010) similarly found that higher PSOC in Mexican American families was positively related to positive parenting behaviors and was associated with fewer adolescent behavior problems. The authors concluded that their findings support the cross-cultural applicability of PSOC as an important indicator of parenting behaviors and child outcomes. While some research has found that in ethnically diverse samples, parents report similar levels of PSOC (Ardelt & Eccles, 2001; Elder, Eccles, Ardel, & Lord, 1995) there was a dearth of research specifically related to this topic.

The sample for the original study that this data was obtained from was selected based upon psychosocial risk. Increased stress and psychosocial risk have been associated with lower levels of PSOC (Caldwell, Shaver, Li, & Minzenberg, 2011; Hughes & Cossar, 2016; Kohlhoff & Barnett, 2013; Merrifield & Gamble, 2012). One possible explanation for these findings is that mothers in this study who chose to speak Spanish may also have had higher levels of psychosocial stress compared to mothers who chose to speak in English. Future research should explore the relationship between mothers' language preferences and levels of psychosocial risk. Additionally, Spanish speaking mothers living in poverty may have had different cultural values around interacting with and speaking to their children than English speaking mothers, and these differences may have implications for children's' language learning. For example, Mexican American mothers may hold different beliefs and values related to parenting and home literacy practices compared to Caucasian families (Bridges et al., 2015; Fuller, Bein, Kim, & Rabe-Hasketh, 2015; Gonzalez et al., 2017; Winsler et al., 2014).

Implications for Intervention

Although there was limited evidence to suggest that PSOC had direct effects on child language scores in the present study, PSOC was strongly predictive of positive parenting behaviors. Furthermore, in most instances, these positive parenting behaviors predicted children's short and long-term language outcomes. Additionally, study results presented some evidence for indirect effects of PSOC on child language outcomes through positive parenting behaviors. The observed indirect path is consistent with Ardelit & Eccles' (2001) parenting self-efficacy theory, an adaptation of Bandura's (1989) self-efficacy theory, in which increasing parents' beliefs and confidence in their parenting skills is likely to increase the amount of positive parenting behaviors, leading to better child developmental outcomes. Therefore, specifically targeting parents' PSOC in parenting interventions may help ameliorate negative child outcomes.

Individuals with a greater sense of competence during a task tend to devote more attention and energy to that task (Bandura, 1989). Furthermore, direct successful experiences help develop and maintain a sense of self-efficacy, and the ratio of perceived successes and failures is important for helping reappraise a sense of competence. Thus, focusing on parenting successes may be an important route through which to improve mothers' sense of competence and subsequently parenting behaviors and child language outcomes. Despite early recognition of the potential benefit of targeting PSOC directly, few parenting interventions have incorporated such an approach.

Limitations and Future Directions

Some limitations of the present study should be noted. This sample was ethnically diverse, and just less than half of the mothers chose to conduct some or all of the assessment in Spanish. As previously discussed, being raised in a bilingual environment

has important implications for children's English language learning. While the language mothers chose to use was included as a variable in this study, little information was provided as to the amount to which mothers spoke English or Spanish in the home. It is also unknown how much English children were exposed to in other settings such as daycare. As a result, the influence of parents' chosen language on PSOC and child language scores may have reduced the ability to detect effects of PSOC and parenting behaviors on child language development. Future research conducted with a sample of children in both monolingual and bilingual environments should incorporate more detailed information on the quality and quantity of both English and Spanish language exposure. Furthermore, as there are very few existing studies that explore the influence of PSOC on child language development, research addressing this question in monolingual English and speakers of other languages should be conducted.

Although the analysis indicated that data were missing at random for the families who chose to participate in the follow-up visit during preadolescence, it is possible that unknown or unmeasured factors may have contributed to the attrition and influenced the results. Therefore, the study findings should be interpreted with caution. In addition, the measure of positive parenting behaviors used in this study was developed from available observed items. While the parenting behavior variable demonstrated strong reliability, it is not a validated measure of parenting behavior. Future research is needed using validated and more extensive measures of parenting behaviors to further understand associations between PSOC, parenting, and child language outcomes.

Although using a fully prospective longitudinal design allowed for the relationship between PSOC, parenting behaviors, and child language outcomes to be

explored, temporal precedence alone does not allow for strong conclusions regarding causality. Mothers' PSOC and observations of parenting behaviors were not available at every study time point, and therefore it was not possible to make strong claims regarding the directionality of the relationships between the study variables. Replication will be needed in order to gain a more thorough understanding of the specific causal relationship between the variables of interest. Despite this limitation, the fully prospective longitudinal design with temporal order allowed for the testing of specific questions regarding how PSOC and parenting behaviors influence child language outcomes.

Conclusion

Nonetheless, the results from the present study offer important preliminary evidence about the influence of PSOC on positive parenting behaviors and child language development. More specifically, these findings provide evidence that mothers' beliefs and attitudes about their own parenting abilities are important predictors of positive parenting behaviors one year later and that there are both short and long term impacts of PSOC and positive parenting on measurements of child language development. This suggests that targeting mothers' sense of competence in early interventions may have significant beneficial effects on parenting behaviors and long-term effects on children's language development, which could help reduce the language and academic achievement gap observed in low-income families.

CHAPTER III

STUDY 2: PARENTING SENSE OF COMPETENCE, POSITIVE PARENTING BEHAVIOR, AND CHILD SOCIAL-EMOTIONAL DEVELOPMENT

This study is the second of a series of three independent studies that aimed to explore relations between parenting sense of competence (PSOC), parenting behaviors, and early language and social-emotional development within families living in poverty. The first paper assessed the longitudinal relationship between PSOC, parenting behaviors, and child language development spanning from one-year post-partum to preadolescence. Results provided partial support for the hypothesis that PSOC when children are one year of age is positively predictive of child language development when children are three years and at preadolescence. Results indicated that there was a small, indirect effect of PSOC on child receptive language development which was mediated through positive parenting behaviors. These findings are notable due to their implications for identifying intervention targets to bolster language development that can begin when children are 1-year-old with the aim of increasing later academic achievement, thereby reducing the academic achievement gap.

The present paper examines PSOC, positive parenting behaviors, and their link to social-emotional development in early childhood. This paper contributes to this series first by suggesting a model that identifies the role of positive parenting behaviors as a mediator between PSOC and children's social-emotional development; and second, by expanding the conversation about factors which support academic achievement to include social-emotional development and the importance of considering the role that parents play in supporting academic achievement through their early caregiving behaviors.

Introduction

Social-Emotional Development and Academic Achievement

Within the past two decades, empirical evidence has demonstrated the connection between social-emotional competence and academic achievement (e.g., Blair & Raver, 2015; Graziano, Reavis, Keane, & Calkins, 2007; Jones, Greenberg & Crowley, 2015; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). Social-emotional skills such as those that contribute to self-regulation and positive peer interactions contribute to students' success in formal learning environments (Domitrovich, Durlak, Staley, & Weissberg, 2017; Howse et al., 2003; Graziano et al., 2007; Breslau et al., 2017). In fact, the Council of Distinguished Scientists National Commission on Social, Emotional, and Academic Development published substantial evidence for the role of emotion regulation, attention, and positive relations with peers and adults in supporting learning (Jones & Kahn, 2017). This consensus statement draws a strong conclusion that social-emotional skills contribute to academic success and underscores the notion that integrating social-emotional development with academic instruction is foundational for the success of young students (Jones & Kahn, 2017). Although this study does not directly address educational outcomes, social-emotional development has been associated with positive outcomes.

Emotional and behavioral regulation and academic achievement. Formal learning environments require children to be able to demonstrate sufficient self-regulation in order to engage in goal directed behaviors such as following rules and remaining seated for extended periods of time (Campbell & von Stauffenburg, 2008). Self-regulation supports children in being able to engage in classroom activities and maintain

their attention, further contributing to academic success (Breslau et al., 2017; Domitrovich et al., 2017; Graziano et al., 2007; Howse et al., 2003; McClelland et al., 2000). Research has supported the importance of emotion regulation on academic success. Graziano et al. (2007) found students' emotion regulation was positively related to teacher reported academic success and productivity, in a sample of 325 kindergarteners.

Self-regulation contributes to children's ability to follow directions. However, in this way, children with limited regulatory abilities are more likely to demonstrate externalizing and or disruptive behaviors in the classroom, which in turn impacts academic achievement (Breslau et al., 2017; Hinshaw, 1992; Posner & Rothbart, 2000; Rothbart et al., 2000). For example, Breslau et al., (2017) found that teacher ratings of participants' attention, and internalizing and externalizing behavior problems when they were 6 years of age significantly predicted math and reading scores at 17 years of age.

Social competence and academic achievement. Social-emotional development as it pertains directly to social competence and teacher and peer interactions is also known to have an impact on academic achievement (e.g., Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Hammer, Melhuish, & Howard, 2017; Jones et al., 2015). Coolahan et al. (2000) found that teachers' reports of children's peer play interactions during free time were significantly related to learning behaviors. Better interactions with peers were related to higher engagement in classroom activities, motivation, attention, and persistence.

In further support of the long-term impact of social competence on academic achievement, Jones et al. (2015) conducted a longitudinal study exploring social-

emotional functioning in kindergarten and academic and social success 13-19 years later. Teachers' ratings of students' social competence in kindergarten were significantly related to graduating high school on time, completing a college degree, and having stable and full time employment by the age of 25.

Poverty and Academic Achievement

Children raised in low-income families are at disproportionate risk for poor academic achievement resulting in lower performance on state testing and higher rates of eligibility for special education services (e.g., Blair & Raver, 2016; Risi et al., 2003; Potter & Roksa, 2013; Sharkins et al., 2017). While many factors contribute to this academic achievement gap, the impact that living in a low-income family has on children's social-emotional development is an important contributor to this disparity. There is strong evidence that low SES has sufficient negative consequences on children's social-emotional development, which as noted above, can have an impact on academic achievement (Essex et al., 2006; Huang, Sherraden, Kim, & Clancy, 2014; Lengua, Honorado, & Bush, 2007; McCoy, Connors, Morris, Yoshikawa, & Friedman-Kraus, 2015; McEwen & McEwen, 2017; Treanor, 2016).

Poverty and social-emotional development. Low socioeconomic status has been identified to negatively impact children's social-emotional functioning (Briggs et al., 2001; Evans & Kim, 2013; Essex et al., 2006; Hughes & Kwok, 2006; Kaiser et al., 2000; McCoy et al., 2015; Lengua et al., 2007). Children raised in lower-income households are more likely to demonstrate externalizing symptoms and disruptive behavior at home and in school (Briggs et al., 2001; Kaiser et al., 2000; McCoy et al., 2015; Piotrowska, Stride, Croft, & Rowe, 2015). Often this behavioral dysregulation leads to social impairments

and continued severity of internalizing and externalizing symptoms as children get older (Essex et al., 2006).

Poverty has also been associated with decreased self-regulation abilities and lower social competence (Hughes & Kwok, 2006; Kaiser et al., 2000; Lengua et al., 2007).

Huang et al. (2014) took a unique approach to understanding the impact that poverty and income have on children's social-emotional development by examining the impact of a statewide financial experiment on a sample of 2,704 infants born within a 3-month period in Oklahoma. The study examined whether Child Development Accounts, state provided lifelong savings accounts provided to these infants, could promote long-term social-emotional well-being. Findings indicated that by 4 years of age, the Child Development Accounts had a positive effect on participants' social-emotional functioning as measured by the Ages and Stages Questionnaire: Social-Emotional. Moreover, the improved social-emotional functioning of children by age 4 years was strongest for families in low-income households (Huang et al., 2014).

Poverty, Parenting Behaviors, and Social-Emotional Development

Poverty does not impact child development due to a sheer lack of resources but rather, impacts the broader family environment. Of significant importance is the large role parenting practices play in supporting the development of social-emotional skills, and the susceptibility of these parenting practices in the context of poverty (Coplan et al., 2008; Healy, Sanders, & Iver, 2015; Hill & Bush, 2001; Kim et al., 2015; Kochanska et al., 2000; Pauli-Pott, Schlob, & Becker, 2017; Salari et al., 2014; van der Voort, Juffer, & Bakermans-Kranenburg, 2014; Zeytinoglu et al., 2017).

Parental responsiveness, responding in a contingent and developmentally supportive manner to infant and child cues, is a positive parenting behavior related to positive child outcomes, including social-emotional functioning (Kim et al., 2015; Kim & Kochanska, 2015; Pauli-Pott et al., 2017). Kim et al. (2015) identified that parental responsiveness significantly predicted children's ratings of their attachment security with their parents when they were 8 years of age such that more responsiveness was associated with a greater sense of security which is known to have a positive impact on children's social-emotional development (Belsky & Fearon, 2002; Groh et al., 2014; van der Voort et al., 2014). Additionally, responsiveness significantly predicted teacher report of peer acceptance or rejection, social isolation, as well as school engagement (Kim et al., 2015). Maternal sensitivity, such as being sensitive to infant/child needs and having a supportive presence, has also been linked to children's social-emotional development (Laible, Carlo, Davis, & Karahuta, 2016; Russel et al., 2016; van der Voort et al., 2014; Wang, Christ, Mills-Koonce, Garrett-Peters, & Cox, 2013).

Numerous researchers have highlighted how poverty negatively impacts parenting behaviors (Brody et al., 2002; Ellingsen et al., 2014; Guo & Harris, 2000; Linver et al., 2002; Strohschein & Gauthier, 2017). For instance, parents raising children in poverty are more likely to be less responsive and sensitive to their children (Brody et al., 2002; Guo & Harris, 2000; Linver et al., 2002). Ellingsen et al. (2014) found that higher SES when children were 5 years of age significantly predicted a latent construct of positive parenting comprised of more positive affect, sensitivity, and cognitively stimulating behaviors as coded from videotaped mother-child interactions when children were 5 and 8 years of age.

While the above literature reviewed the impact of observable parenting behaviors on child social-emotional development, parent's cognitive processes and internal beliefs and attitudes towards parenting have also been found to be associated with parenting behaviors and children's social-emotional development (Benzies & Mychasiuk, 2009; Coleman & Karraker, 2005; Orthner et al., 2004). A plethora of research has examined the impact of negative subjective experiences reported by parents, such as examining parenting related stress and maternal depression on parenting behaviors and child development (e.g. Apter-Levi et al., 2016; Feldman et al., 2009; Gross et al., 2009; Korja et al., 2017; Mackler et al., 2015; Olino et al., 2016). However, research related to the impact of positive subjective experiences such as mothers' beliefs about their ability to competently raise and meet their child's needs has been less prominent within the past decade.

PSOC, Parenting Behaviors, and Social-Emotional Development

PSOC and parenting behaviors. Research has demonstrated that parents who report higher levels of PSOC demonstrate more of the positive parenting behaviors known to contribute to children's social-emotional development (Ardelt & Eccles, 2001; Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002). PSOC has been reported to be associated with parenting behaviors as early as infancy (Ponomartchouk, 2015). Ponomartchouk (2015) found that mothers' ratings of their PSOC were significantly related to the amount of leisure activities they engaged in with their newborn infants. Higher PSOC was associated with more time spent engaged in

these activities. The impact of PSOC on parenting behaviors also extends into early and late childhood (Peacock-Chambers et al., 2017; Glatz & Buchanan, 2015).

PSOC and social-emotional development. PSOC is not only associated with parenting behaviors, but has also been directly linked to children's social-emotional development (Glatz & Buchanan, 2015; Heerman et al., 2017; Jones & Prinz, 2005; Matthies et al., 2017; Salari et al., 2014; Steca et al., 2011). Additionally, findings span from infancy and early childhood (Matthies et al., 2017) to adolescence (e.g. Steca et al., 2011). Matthies et al. (2017) found that across three time points from mothers' third trimester through four months postpartum, there was a transactional relationship between maternal ratings of PSOC and infant regulation. Mothers who demonstrated higher PSOC reported that their infants had a greater ability to demonstrate self-regulatory behaviors with regard to crying, feeding, and sleeping. In an earlier study, Steca et al. (2011) explored similar associations in adolescents and found that parents who self-reported higher PSOC when their children were young teenagers had teenagers who reported higher sense of competence in their academic abilities as well as less depressive symptoms, fewer behavioral problems, and greater life satisfaction four years later.

Recently, several studies have assessed the causal relationship between PSOC, parenting behavior, and child social-emotional development (e.g., Moutan & Roskam, 2015; Roskam et al., 2015). In a quasi-experimental study, mothers were randomly assigned to either the experimental condition where the examiners aimed to manipulate mothers PSOC by providing positive feedback or to a control condition (Moutan & Roskam, 2015). Mothers who received the positive feedback demonstrated more positive behaviors and their children demonstrated more positive affect than the dyads in the

comparison group (Moutan & Roskam, 2015). In a related study, Roskam et al. (2015) recruited parents with preschool-aged children. Half of these parents were randomly assigned to a self-efficacy intervention group in which video feedback was used in order to increase parents' sense of parenting self-efficacy. Children of parents in the intervention group showed a significantly greater decrease in aggressive behavior and non-compliance than children of parents in the control condition, and these findings were associated with a significantly greater improvement in parental self-efficacy.

These recent findings lend support for Ardel and Eccles (2001) adaptation of Bandura's self-efficacy theory, in which parents' beliefs about their ability to successfully raise their children result in more positive and developmentally supportive parenting behaviors and contribute to better social-emotional development. Yet the vast majority of research examining PSOC, parenting behavior, and child social-emotional outcomes has been correlational and research on the directional relationship between PSOC and parenting behaviors have produced conflicting findings. For example, Slagt et al. (2012) conducted a longitudinal study exploring associations between parents' PSOC and children's externalizing behavior problems. The authors utilized structural equation modeling in order to gain a better picture of the directional effects. They found that PSOC did not predict externalizing behaviors, but rather children's externalizing behavior when they were 6-9 years of age significantly predicted PSOC six years later. These findings contradict the parenting specific self-efficacy theory adapted from Bandura's more general self-efficacy theory (Ardelt & Eccles, 2001). Additionally, a majority of recent research on PSOC and parenting behaviors have utilized parent and/or parent and child reports of parenting behaviors rather than observed parenting, which

may result in biased responses (Ardelt & Eccles, 2001; Glatz & Buchanan, 2015; Meunier et al., 2010; Peacock-chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002).

The Present Study

The primary aim of the present study was to examine the relationship between PSOC, parenting behaviors, and social-emotional outcomes for children living in poverty in order to provide empirical evidence that in low-income mothers, positive parenting behavior mediates the relationship between PSOC and child social-emotional development (see Figure 2). Children living in poverty are at a disproportionate risk for poor social-emotional development and academic achievement and therefore research that is aimed to identify specific intervention targets within low-income families is imperative. Consistent with Ardel & Eccles (2001) parental self-efficacy theory, this research aims to identify whether parenting behaviors partly mediate the relationship between PSOC and social-emotional development.

In order to determine positive parenting behaviors, this study utilized a brief assessment of positive parenting behavior using a global rating system for videotaped free-play interactions between mother-child dyads. Measuring observed rather than self-reported parenting behaviors may more accurately identify the way in which PSOC influences parenting behavior. Additionally, child social and emotional behavior was examined through a brief screening tool designed to identify parent reported concerns in this area of their child's development. A potential benefit of using the selected brief assessment measures of both parenting behaviors and children's social-emotional

development is that if they are sensitive to these relationships, the measures used in research can be easily translated to clinical and practical use.

In this study it was hypothesized that mothers' self-reported PSOC would be positively correlated with observed parenting behaviors and child social-emotional development in a sample of mothers and young children living in poverty. It was further hypothesized that positive parenting behaviors would mediate the relationship between PSOC and child social-emotional development such that parents with greater levels of PSOC would demonstrate more positive parenting behaviors and account for better child social-emotional development.

Methods

Participants

Participants ($N = 50$) were recruited from a small metropolitan area on the West Coast through free advertisements on an electronic messaging board and flyers that were posted in the community. Interested parents contacted research staff ($N = 83$) through the advertisement to gain more study information and be assessed for eligibility. To assess eligibility for the study, interested mothers completed a brief phone screening. To be included, mothers had to report a household income below the Federal Income Poverty Guidelines, be over the age of 19, have at least one biological child under the age of 4 years, and be fluent in English. Exclusion criteria included being left handed, having a history of epilepsy or seizures, currently having an open head wound or head lice, having an open case with child welfare, being uncomfortable being separated from their child for 15-minute increments, or not being comfortable abstaining from breast feeding for the first hour of the assessment. Exclusion criteria were developed to ensure that all

participants were eligible to participate in all study tasks, including tasks not discussed in full in this dissertation (e.g., EEG data collection and saliva collection for Oxytocin.) A total of 29 participants contacted the research team with interest in involvement but were not eligible for inclusion. Two participants met inclusion criteria but were not interested in participating upon hearing more about the study. Two participants initially expressed interest and were scheduled but dropped participation prior to informed consent.

Data were collected between February 2015 and September 2015. Sample characteristics are summarized in Table 3. A sample of 50 mothers were enrolled in the study, ranging in age from 19 years to 47 years ($M = 28.66$, $SD = 6.77$). Children in this study (48% male) ranged in age from 2 months to 42 months ($M = 21.63$, $SD = 12.05$). Sample characteristics are summarized below in Table 3.

Procedure

All study procedures were reviewed and approved by the Institutional Review Board at the University of Oregon. Informed consent was obtained in person during the first laboratory visit and compensation was provided for the research assessments at the end of each laboratory visit. Parents received a total of \$100 for complete participation. Participants in this study visited the research laboratory for two assessment visits, each lasting approximately two hours in length. Analyses for the current study utilize data from a larger study which included Oxytocin and EEG data collection. Due to the scope of the current paper, the procedures for the Oxytocin and EEG data collection will be briefly mentioned but not discussed in detail.

Table 3. Demographic data and descriptive statistics for sample in study 2.

	Percentage	<i>M(SD)</i>	Range
Mother Age (years)		28.66 (6.77)	19-47
Education			
No High School Degree	14		
High School Diploma/GED	34		
Some College/Associates Degree	22		
Bachelor's Degree	24		
Graduate Coursework	6		
Household annual income			
\$0-\$14,000	50		
\$14,001-\$24,000	36		
\$24,001-49,000	14		
Hispanic or Latina Ethnicity	12		
Euro-American/Caucasian/White*	86		
Relationship Status			
Married	30		
Not Married but lives with partner	32		
Separated	6		
Divorced	6		
Never Married	26		
Number of children			
One child	62		
Two children	22		
Three children	10		
Four children	6		
Child age months		21.63 (12.05)	2-42
Child gender Female	52		

*14% Native American/American Indian or Alaska Native, 2% Asian, 2% Native Hawaiian or Pacific Islander, 14% "other."

Visit 1. During the first visit, mothers and their children visited the lab together.

A research assessor oriented the mother-child dyad to the space and reviewed and obtained informed consent. The child then transitioned to child care with a staff member while the mother completed demographic questionnaires. During this first visit mothers provided saliva samples in order to assay for Oxytocin. Mothers provided their first saliva sample and then engaged in a 15-minute task with their child in which they were asked to

sit together in a comfortable chair and relax or snuggle. Books and small toys were provided. After the 15 minutes, the child transitioned back to child care while the mother participated in a brief interview about their service utilization. Mothers then provided a second saliva sample, and completed the interviews. The first part of the interview included the Infant Parent Daily Report in which parents reported on the presence or absence of a list of behaviors that their child may have demonstrated within the previous 24 hours. The second half of the interview was an open-ended interview, the Expressed Emotion Interview, in which mothers were asked broad questions about their child. Mothers then completed self-report questionnaires on a computer. Finally, the mother-child dyad participated in a filmed free play and clean up task in which mothers were given a box filled with a variety of age appropriate toys and were told to play with their child as they normally would. After 10 minutes a research assessor knocked on the door signaling that it was time to clean up the toys by placing them back into the box.

Visit 2. During the second laboratory visit, the mother was asked to visit the laboratory without her child. During this visit, the mother participated in the brief Infant Parent Daily Report Interview, and then engaged in several Electroencephalogram tasks.

In between visit 1 and visit 2 participants completed a 30-45-minute phone interview which consisted of the Infant Parent Daily Report and several questionnaires about adverse experiences the mother may have experienced prior to the age of 18 years.

Measures

Maternal positive parenting. Positive parenting was measured using the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO; Roggman, Cook, Innocenti, Norman, & Christiansen, 2013), a tool to code

10-minute video clips of a free-play interaction between the mother-child dyads. PICCOLO is a checklist of 29 observable behaviors that can be categorized into four domains: affection, responsiveness, encouragement, and teaching. Trained research assistants rated the items on a 3-point scale: 0 (*absent*), 1 (*barely*), and 2 (*clearly*). Higher scores indicate higher levels of the domain. Data were missing from 6 participants due to technical difficulties with the video recordings. Twenty percent of the films were coded by two research assistants to establish inter-rater reliability. Cohen's Kappa for the total scale as well as for each domain ranged from .80-.85 and can be considered adequate. The affection domain consists of 7 items including "speaks in a warm tone of voice" and "shows emotional warmth." Scores ranged from 2 to 14 ($M = 11.23$, $SD = 2.60$) with adequate internal reliability (Cronbach's alpha = .73). The 7-item responsiveness domain consists of items such as, "pays attention to what child is doing" and "follows what child is trying to do." Scores ranged from 0 to 14 ($M = 11.82$, $SD = 3.23$) with good internal reliability (Chronbach's alpha = .87). The encouragement domain also consists of 7 items which include, "encourages child to handle toys" and "offers suggestions to help child." Scores ranged from 0 to 14 ($M = 11.00$, $SD = 3.29$) with good internal reliability (Chronbach's alpha = .83). The teaching domain consists of 8 items such as "labels objects or actions for child" and "asks child for information." The teaching domain scores ranged from 0 to 14 ($M = 6.91$, $SD = 3.83$) and demonstrated adequate internal reliability (Chronbach's alpha = .77). Total PICCOLO scores ranged from 3 to 56 ($M = 40.95$, $SD = 9.97$) and had strong internal reliability within this sample (Chronbach's alpha = .90).

Maternal PSOC. Maternal parenting sense of competence was assessed using an adapted version of the Parenting Sense of Competence Scale (PSOC; Johnston & Mash,

1989). This version was adapted to make the wording of questions clearer and a question, “I do a good job caring for my child” was added. The PSOC Scale is a 18-item self-report questionnaire that measures parents’ perception of their own abilities to successfully parent their child with questions such as “I have all the skills to be a good parent.” Mothers responded to the items using a 6-point likert scale from 1 (*Strongly disagree*) to 4 (*Strongly agree*). A total score was computed by calculating a sum of the 18 items. Higher scores indicate a greater sense of parenting competence. Scores ranged from 38 to 70 ($M = 53.74$, $SD = 7.53$) and the PSOC scale demonstrated good internal reliability within this sample (Chronbach’s alpha = .89).

Child social-emotional development. Child social-emotional development was assessed with the Ages and Stages Questionnaire: Social-Emotional (ASQ:SE; Squires et al., 2002). The ASQ:SE is an age-normed parent-report screening measure used to identify whether a child is considered to be at-risk for social-emotional problems. The ASQ:SE has strong reliability (overall Chronbach’s alpha = .82), test-retest reliability (.89) and has been demonstrated to have strong concurrent validity (Squires, Bricker, Heo, & Twombly, 2001). Due to the child age range in our sample, seven versions of the ASQ:SE were used. Within each version, scores were calculated and compared to the normed cut-off score used to determine whether a child is considered to be at risk for social emotional problems. A score of 0 ($n = 41$) indicates that a child fell below the cut-off and the parent did not identify social-emotional concerns. A score of 1 ($n = 7$) indicates social-emotional concerns. Complete data was missing from 1 participant. Standardized scores were also calculated to be able to use a continuous variable in analyses and scores ranged from -1.25 to 2.09 ($M = 0$, $SD = .94$). Lower scores indicate

fewer social-emotional concerns. While the ASQ:SE was developed to assess children with regard to falling either above or below the cut-off score, several recent studies have been published using raw or standardized scores (e.g. Briggs et al., 2014; Folger et al., 2017; Huang et al., 2014; Sharkins et al., 2017).

Analysis Plan

Data analysis was conducted with the Statistical Package for Social Sciences (SPSS) and MPlus. Descriptive statistics were first calculated followed by regression analyses to determine how parenting sense of competence and positive parenting behaviors predict child development outcomes. Tests of mediation were conducted in Mplus using the bootstrap sampling method to test the significance of the indirect path (Shrout & Bolger, 2002). The bootstrap method does not assume a normal distribution and is recommended for small to moderate sample sizes.

Results

Preliminary Analyses

Prior to analyses, frequency distributions and plots were examined for all study variables to assess for outliers or unusual distributions. One participant was identified as an outlier across all of the parenting behavior measures and was excluded from analyses. Distributions for the Affection, Responsiveness, and Encouragement subscales of the PICCOLO demonstrated negative distributions, yet skewness statistics did not indicate a rationale for transforming the variables (George & Mallery, 2010).

Means, standard deviations, and bivariate associations between primary study variables are presented in Table 4. Mothers' scores on the PSOC were not significantly associated with falling below or above the ASQ:SE cutoff score.

Table 4. Correlations between study 2 primary variables.

Measure	1	2	3	4	5	6	7	8	<i>M</i>	<i>SD</i>
1. Maternal sense of competence									53.74	7.53
2. Total PICCOLO Score	-.19								40.95	9.97
3. Maternal Affection	-.13	.66**							11.23	2.60
4. Maternal Responsiveness	-.21	.86**	.58**						11.82	3.23
5. Maternal Encouragement	-.13	.85**	.45**	.68**					11.00	3.29
6. Maternal Teaching	-.12	.69**	.12	.41**	.43**				6.91	3.83
7. ASQ: SE score z score	-.323*	-.05	-.04	-.02	-.10	.02			0	.94
8. ASQ: SE Range	-.09	-.09	-.06	-.19	.00	-.05				

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

However, the PSOC was significantly correlated with standardized scores on the ASQ:SE ($r(47) = -.32, p < .05$; Figure 7) such that a greater parenting sense of competence was associated with mothers reporting less concern about their children's social-emotional development. PSOC was not correlated with the total PICCOLO score or any of the PICCOLO domains. Furthermore, PICCOLO scores were not correlated with the ASQ:SE standard scores. In order to test a mediation, there needs to be a significant association between the predictor (PSOC) and mediator (PICCOLO) as well as the mediator and the outcome variable (ASQ:SE). These associations were not observed within this sample and therefore a test of the second hypothesis is not indicated.

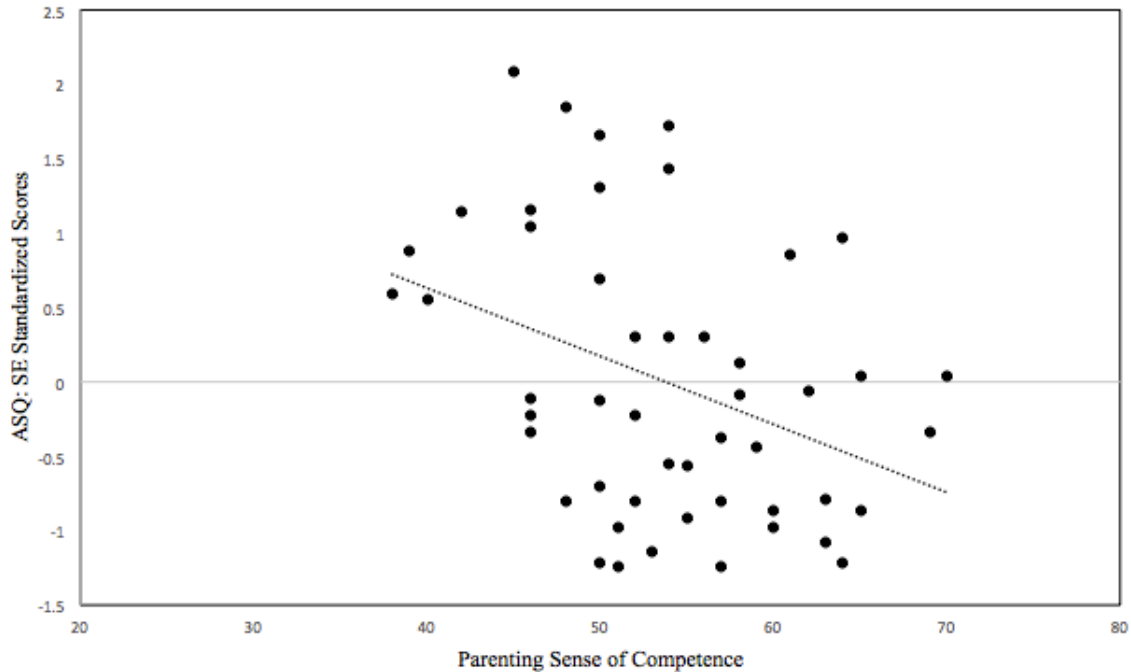


Figure 7. Correlation between PSOC and ASQ:SE standardized scores.

Post-Hoc Analyses

While skewness statistics did not indicate a rationale for transforming the variables, the negative skew of the affection, responsiveness, and encouragement scores on the PICCOLO may prohibit detecting significant associations between these parenting measures and other study variables. In post-hoc analyses, a median split of these subscales was calculated in order to identify groups of mothers demonstrating high vs. low amounts of affection, responsiveness, and encouragement relative to this sample. Independent sample t-tests were then conducted in order to assess whether PSOC and ASQ:SE scores significantly differed between mothers demonstrating low vs. high amounts of positive parenting behaviors. Mean scores on the PSOC did not significantly differ as a result of low vs. high affection ($t(41) = 1.03$, ns), responsiveness ($t(41) = 1.37$, ns), or encouragement ($t(41) = .59$, ns). Similarly, standardized ASQ:SE scores did

not significantly differ as a result of low vs. high affection ($t(41) = -.61$, ns), responsiveness ($t(41) = -.4$, ns), or encouragement ($t(41) = .79$, ns).

Discussion

In this study, it was hypothesized that mothers' self-reported PSOC would significantly predict observed parenting behaviors and child social-emotional development in a sample of mothers and young children living in poverty. Additionally, it was hypothesized that positive parenting behaviors would mediate the relationship between PSOC and child social-emotional development such that parents with greater levels of PSOC would demonstrate more positive parenting behaviors which would then account for better child social-emotional development.

Within this sample, mothers' ratings of PSOC were significantly related to their report of children's social-emotional development. Mothers with higher ratings of PSOC were significantly more likely to report fewer social-emotional concerns on the ASQ:SE than mothers with lower self-reported PSOC. This finding is consistent with previous literature which has identified that higher levels of PSOC are associated with better child social-emotional outcomes such as self-regulatory behaviors in infants as well as confidence in academic abilities, fewer depressive symptoms, and fewer behavioral problems in adolescents (Boyce et al., 2017; Glatz & Buchanan, 2015; Heerman et al., 2017; Jones & Prinz, 2005; Matthies et al., 2017; Steca et al., 2011).

Contrary to the study hypothesis and previous research, PSOC was not significantly associated with observed parenting behaviors in this sample. Previous studies have found that parents who report higher levels of PSOC demonstrate more positive parenting behaviors such as warmth, responsiveness, and engaging in leisure and

home learning activities such as reading (Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002). While PSOC did not relate to observed parenting behaviors as measured by the PICCOLO using video-taped free-play interactions collected in the laboratory, it is possible that that mothers who rated higher PSOC demonstrated more positive parenting behaviors in the home than parents with lower PSOC. In addition, parents with lower PSOC may have demonstrated more positive parenting behaviors in the laboratory setting than they would at home.

Additionally, a few previous studies did not find a significant relationship between PSOC and parenting behaviors (Bohlin & Hagekull, 1987; Brody et al., 1999; Corapci & Wachs, 2002). For example, Brody et al. (1999) did not find significant direct effects of PSOC on parenting practices in a sample of rural single-parent African American families with school aged children. Instead they found an indirect effect such that parents who reported higher PSOC were more likely to report having developmental goals for their children which in turn was associated with better parenting practices. This finding highlights that other third variables such as developmental goals, may mediate the relationship between PSOC and parenting behaviors.

Another unexpected finding counter to the study hypotheses was that observed positive parenting behaviors were not related to mothers' ratings of their child's social-emotional development. A vast body of research has identified that parenting behaviors such as responsiveness, warmth, and engaging in home learning activities such as book reading are predictive of children's social-emotional functioning (Coplan et al., 2008; Healy et al., 2015; Kim et al., 2015; Kochanska et al., 2000; van der Voort et al., 20014;

Zeytinoglu et al., 2017). Additionally, previous research has found associations between the PICCOLO ratings and child developmental outcomes (Anderson, Roggman, Innocenti, & Cook, 2013; Innocenti, Roggman, & Cook, 2013).

It is possible that the nonsignificant relationships in the present study could be explained by several factors. While PICCOLO has been observed to have strong reliability and validity (Roggman et al., 2013), it is a relatively new observational measure of parent-child interactions. PICCOLO emphasizes the presence of positive behaviors and does not include the presence of intrusive or harsh parenting. Therefore, this measure may not accurately reflect the range of parenting behaviors that are influenced by PSOC. Additionally, parents in this study all scored relatively high across the parenting domains. This limited variability may have made it difficult to detect significant results. It is also possible that the observations obtained for the present study are not as ecologically valid and are not representative of in-home interactions between the mother-child dyads.

It was hypothesized that parenting behaviors would mediate the relationship between PSOC and child social-emotional development, which would provide support for parental self-efficacy theory and social cognitive theory (Ardelt & Eccles, 2001; Bandura 1989). However, the only significant relationship observed in the present study was that PSOC was significantly correlated with children's social-emotional development. PSOC was not associated with parenting behaviors and parenting behaviors were not associated with social-emotional development. As a result, it was not possible to test this hypothesis.

In addition to the hypothesized mediation, Ardel & Eccles (2001) also suggest that there could also be a direct effect of PSOC on child social-emotional development that is not accounted for by parenting behaviors. The results from the present study support this aspect of their theory. Ardel and Eccles (2001) proposed that parents with a higher sense of efficacy serve as role models, and that their children are more likely to hold similar attitudes and beliefs about themselves regardless of parenting behavior. They then suggest that consistent with social cognitive theory (Bandura, 1989) children who have greater sense of self-efficacy are more likely to experience success in school and social settings. While some empirical evidence is in line with this theory (e.g., Dumka et al., 2010), it is difficult to find empirical evidence to connect parent's cognitions with their children's cognitions.

Limitations and Future Directions

Several limitations of this study are important to note. First, this study utilized a relatively small and homogenous sample. Families all fell below the federal poverty line, were primarily Caucasian, and were from a relatively small geographical area. Therefore, it is difficult to draw conclusions about the generalizability of these results. There may have also been a self-selection bias for the families that chose to respond to the recruitment advertisements and participate in the study. Future research with the intention of more closely examining the directional relationships between these variables should include a larger and more diverse sample.

Second, due to the pilot nature of this study, mothers were recruited with children across a wide age range (2- 42 months). It is possible that the influence of PSOC on parenting behaviors differs as a result of child's age. While research has found

associations between PSOC and parenting behaviors from birth through adolescence (Ardelt & Eccles, 2001; Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002) the effect size or mediating role of parenting behaviors on child related outcomes differs across ages. Future studies with either a narrower child age range, or a large-scale study that can explore these relationships across different age ranges are warranted.

Implications for Academic Achievement and Interventions

The present study examined social-emotional development broadly for children birth through 4 years of age with the intention of identifying potential intervention targets to support early social-emotional skills which have been linked by research to later academic achievement (Domitrovich et al., 2017; Howse et al., 2003; Graziano et al., 2007; Bresalau et al., 2017). Social-emotional competence has been increasingly recognized as a core component contributing to school readiness and academic achievement (e.g. Blair & Raver, 2015; Domitrovich et al., 2017; Graziano et al., 2007; Jones et al., 2015; Jones & Kahn, 2017). Given that children raised in poverty are at an increased risk for delays in social-emotional development and poor academic achievement, it is important to identify factors that can facilitate optimal child development at as early of an age as possible (Essex et al., 2006; Huang et al., 2014; Lengua et al., 2007; McCoy et al., 2015; McEwen & McEwen, 2017; Treanor, 2016).

Early interventions that target parenting behavior as early as infancy have the potential to help children develop the foundational skills that will support them when they are ready to enter more formal educational settings (e.g., Bierman et al., 2017;

Brooks-Gunn & Markman, 2005; Landry et al., 2011). Furthermore, interventions that focus on family and caregiver strengths while at the same time facilitate developmentally supportive parent-child interactions may be particularly important for families in poverty. Research suggests that higher levels of PSOC can serve as a protective factor for low-income families. Specifically, mothers from low-income households who report higher levels of PSOC experience less parenting stress (Raikes & Thompson, 2005). Intervention models that utilize a strengths-based approach are effective in increasing engagement in services and are capable of changing behavior (Brun & Rapp, 2001; Nese et al., 2016; Sheely-Moore & Bratton, 2010; Waters & Sun, 2016). Therefore, future interventions should consider specifically targeting PSOC as a strategy to have a positive impact on children's social-emotional development.

Conclusion

The present study lends support to the body of literature that recognizes the importance of PSOC on child social-emotional development. However, findings from the present study did not support the hypotheses that PSOC was related to positive parenting behaviors or that positive parenting behaviors as assessed by the PICCOLO were related to child social-emotional development. Therefore, it was not possible to test the mediation effect that would lend support to Ardel and Eccles' (2001) parenting self-efficacy theory. Nonetheless, this study provides important implications for the importance of assisting low-income parents develop an increased sense of confidence and ability to successfully foster their child's development. Increasing parents PSOC may be an effective strategy in improving children's social-emotional development as early as

infancy. Interventions that increase PSOC have the potential to have long-term benefits for children's academic achievement.

CHAPTER IV

STUDY 3: A PILOT STUDY OF THE FIND INTERVENTION: EXPLORING IMPLICATIONS FOR ACADEMIC ACHIEVEMENT

This is the final study in a series of three independent studies exploring the relationship between parenting sense of competence (PSOC), parenting behaviors, and child language and social-emotional development in low-income families. The first study specifically aimed to identify a longitudinal relationship between PSOC, parenting behaviors, and child language development. Results indicated a small indirect effect of PSOC when children are 12 months of age on child language development, which is mediated through positive parenting behaviors. Results were discussed with regard to implications for child academic achievement. The second study aimed to provide evidence that positive parenting behaviors partially mediated the relationship between PSOC and child social-emotional outcomes in low-income families. Results did not support the study hypotheses. Similar to the first study, results were discussed with regard to possible implications for child academic achievement and potential intervention targets were presented. The present study discusses existing interventions aimed at reducing the academic achievement gap. Limitations to existing programs are discussed and a strengths-based video coaching program is presented as a possible alternative.

Introduction

Children raised in poverty are disproportionately at risk for poor academic achievement (Horn & Packard, 1985; Potter & Roksa, 2013; Sharkins et al., 2017). The academic achievement gap for children raised in low-income families compared to their more advantaged peers has been well documented (e.g. National Center for Education

Statistics, 2009). Low-income students are at-risk for poorer kindergarten readiness, standardized test scores, grades, and school completion rates (Reardon, 2013).

Difficulties with academic achievement can contribute to a developmental trajectory of poor life outcomes including peer rejection and being at risk for developing emotional and behavioral disorders (e.g. Bennett, Brown, Boyle, Racine, & Offord, 2003).

Programs and interventions to reduce the achievement gap by the start of kindergarten have been implemented in a variety of formats and settings, including programs designed for early childhood educators, early childhood educators and parents jointly, and for parents only (Bierman et al., 2017; Domitrovich et al., 2007; Jordan, Snow, & Porche, 2000; Landry et al., 2017; Lonigan & Whitehurst, 1998; Lynch, Geller, & Schmidt, 2004; Neuman, Newman, & Dwyer, 2011; Sheridan, Knoche, Edwards, Bovaird, & Kupzyk, 2010; Sheridan et al. 2011; Shure & Spivack, 1982; Wasik & Bond, 2001; Whitehurst et al., 1994). These programs have also varied with regard to their targeted outcomes. A majority of the programs have included a heavy emphasis on early language and literacy skills due to the well-established link between early language skills and later academic achievement while an increasing number of more recent programs have included an emphasis on social-emotional skills (Catts et al., 2002; Muter et al., 2004; Nelson et al., 2010).

School-Based Programs

Many programs have been implemented within early childhood education centers with the goal of reducing the achievement gap and improving school readiness for children living in poverty (e.g., Bierman et al., 2017; Domitrovich et al., 2007; Lynch et al., 2004; Neuman et al., 2011; Shure & Spivack, 1982; Wasik & Bond, 2001). A

majority of these programs have been implemented in Head Start programs, as they are the most widely available early childhood education programs for low-income families (Lee, Zhai, Brooks-Gunn, Han, & Waldfogel, 2014).

Literacy-based programs. Several studies have examined the effectiveness of literacy-based programs to support children's academic achievement (e.g. Neuman et al., 2011; Wasik & Bond, 2001). Neuman et al. (2011) conducted a randomized controlled trial of a program called World of Words (WOW), an instructional program that is specifically geared to teaching preschoolers about words and incorporates strategies to increase the development of conceptual abilities. The program is a yearlong program. Children in Head Start classrooms who implemented the WOW program performed better on the Woodcock-Johnson Picture Vocabulary task compared to children in the control condition.

Interactive book reading is another strategy that has been systematically implemented in school settings for low-income children (Wasik & Bond, 2001). Interactive book reading involves teachers reading books to children and reinforcing the vocabulary words such as by having those specific objects in the classroom to allow children opportunities to use the words. Additionally, teachers were trained to ask open-ended questions and use other engagement strategies to increase the amount of conversation about the book and related activities. Wasik and Bond (2001) randomly assigned four teachers at a Title I early learning center to learn the intervention or to a control condition. Children who were in the intervention classrooms performed better on the Peabody Picture Vocabulary Test-III as well as on expressive and receptive language measures based off of the books in the program that the authors developed.

Social-emotional programs. Within the past decade, there has been increased acknowledgment of the additional need to support children's social-emotional development in order to support school readiness. As a result, several programs specifically designed to improve social-emotional outcomes have been implemented (e.g., Domitrovich et al., 2007; Hickey et al., 2017; Solomon et al., 2018). For example, Domitrovich et al. (2007) conducted a randomized-controlled trial of the Promoting Alternative Thinking Strategies (PATHS) program which was adapted for preschool-age children in Head Start. PATHS is a social-emotional curriculum that teachers implement in the classroom with the goal of improving social competence and reducing problem behavior in children. The PATHS curriculum was implemented over the course of 9 months. Children who received the PATHS curriculum demonstrated better scores on assessments of emotion knowledge and affective perspective-taking skills. Additionally, teachers and parents rated children as more socially competent when compared to their same age peers.

The Incredible Years Teacher Classroom Management Training Program (IYTP) is another intervention that targets children's social-emotional skills such as attention and self-regulation (Hickey et al., 2017; Reinke et al., 2014). This program is designed to train teachers how to use evidenced-based strategies to manage difficult behaviors in the classroom such as using praise and incentives and to promote child social development and problem-solving skills. Reinke et al. (2014) conducted a randomized controlled trial of the IYTP implemented as a school-based program. They found significant improvement in teachers' discipline strategies as well as improvements in children's pro-social behaviors and a decrease in disruptive behaviors. However, these results were only

significant in a subset of children considered to be most “at-risk” based upon a pre-assessment teacher-report measure of child behavior. Hickey et al. (2017) conducted another randomized controlled trial of IYTP on a sample of 22 teachers serving 445 children. Teachers in the intervention condition reported improved attitudes about and increased use of positive behavior management strategies compared to teachers in the control condition. However, observations of teacher behavior did not detect significant intervention effects. Similarly, while there were no observed intervention effects on child behavior, teachers in the intervention condition reported reduced disruptive behavior in “high-risk” children compared to lower risk children (Hickey et al., 2017).

Literacy-based and social-emotional programs. The Head Start REDI Program is another example of a specialized program aimed at increasing school readiness (Bierman et al., 2017). The REDI program targets both early literacy skills and social-emotional development. The REDI program occurs over the course of one year and involves specific lessons and activities. Additionally, unlike the other school-based programs previously mentioned, the REDI program involved sending informational materials to parents with the intention of enhancing parents’ skills in supporting their children’s language and social-emotional development. Bierman et al. (2017) found that children in the REDI program demonstrated a significantly greater improvement in their vocabulary and in their emergent literacy skills. Additionally, children in the REDI program demonstrated a greater increase in emotion identification and emotion recognition and demonstrated more competent responses on a social problem-solving task compared to children in the control condition.

While, it is important for preschool programs such as Head Start to be implementing evidence-based programs to improve school readiness for at-risk children, focusing solely on the preschool setting limits the number of opportunities the child has to practice the targeted skill, therefore reducing the potential impact of the intervention on children's language and social-emotional development. Parents are often the first and most important teachers that young children have (Britto, Brooks-Gunn, & Griffin, 2006; Reese, Sparks, & Leyva, 2010). Children's early caregiving environment and parent-child interactions shape the foundation for academic achievement through supporting the development of both social-emotional skills and early language development (Belksy & Fearon, 2002; Brophy-Herb et al., 2011; Deater-Deckard & Petrill, 2004; DeGarmo et al., 2004).

School-Based Programs with Parenting Components

Many intervention programs have been developed to include both a school-based component delivered by teachers and a parenting component implemented in the home to address the impact the caregiving environment has on school readiness and academic achievement (e.g., Jordan et al., 2000; Landry et al., 2017; Lonigan & Whitehurst, 1998; Pears et al., 2013; Pears et al., 2014; Pears et al., 2015; Sheridan et al., 2010; Sheridan et al., 2011; Wasik & Bond, 2001; Whitehurst et al., 1994). These programs specifically highlight the importance of both teacher and parent involvement as teachers and parents were both trained in intervention procedures.

For example, Whitehurst et al. (1994) expanded on the dialogic reading program implemented in preschool settings by including directions and materials to parents so that they could implement similar reading practices at home. In a randomized controlled trial,

children in the intervention condition were exposed to dialogic reading, an interactive book reading strategy designed to increase conversation during book reading, were introduced to new vocabulary, and teachers were encouraged to use questions to support comprehension. Teachers and parents implemented dialogic book reading over the course of an entire school year, using the same books at school and at home. Children in the intervention classrooms demonstrated significant increases in their writing and understanding of print compared to children in the control condition. Additionally, children who were in the intervention classrooms and whose parents participated in the at-home component demonstrated increased language abilities compared to children with parents who did not fully engage in the at-home component and children in the control condition.

In addition, project EASE (Early Access to Success in Education) is a program also designed to improve children's early literacy skills. However, instead of being directed towards preschool-age children, this program is designed for children in kindergarten (Jordan et al., 2000). Project EASE involves parent education sessions, school-based activities that parents observe, and home-based activities. The goal of the program is to increase frequency as well as quality of language interactions during book reading, and provide instruction on how to increase vocabulary and sound/letter recognition. In one randomized controlled trial, children in the intervention condition had significantly greater improvement on standardized measures of vocabulary, story comprehension, and sequencing than children in the control condition (Jordan et al., 2000).

Landry et al. (2017) recognized the potential impact of targeting broadly defined interaction styles of parents and teachers rather than focusing specifically on reading and language use. They examined the impact of combining school- and a home-based interventions targeting school readiness in a sample of at-risk children between the ages of 3 and 5 years. Specifically, they implemented the pre-existing Early Education Model (TEEM) as well as the Play and Learning Strategies (PALS) intervention, both of which aim to increase caregiver responsiveness. Teachers who received the TEEM training demonstrated improvements in their language and literacy teaching as well as increased sensitivity and responsiveness to children compared to the control condition. However, there was not a significant main effect of the TEEM program on children's language or literacy skills. Parents in the PALS condition demonstrated increased responsiveness when observed during play and book reading compared to parents who did not receive PALS. There was also a significant effect of the PALS program on children's understanding of letters, letter-sound relationships, and self-regulation (Landry et al., 2017).

The Getting Ready intervention is another program that has been identified to improve school readiness for low-income children (Sheridan et al., 2010; Sheridan et al., 2011). Unlike some of the other interventions reviewed, the Getting Ready intervention aimed to improve the quality of parent-child interactions and learning experiences throughout the day, and to create better communication and a shared sense of responsibility between parents and teachers. Therefore, teachers were taught specific strategies to help parents identify their children's strengths, discussed shared developmental goals, and worked collaboratively with parents to identify strategies to

improve children's social, cognitive, and language development. The intervention involved an average of 8.35 home visits lasting 60 minutes which occurred over the course of two years. Randomized controlled trials have identified that the Getting Ready intervention improves social-emotional outcomes for children above and beyond those seen from traditional Head Start Programs (Sheridan et al., 2010) and improves language use and early literacy skills (Sheridan et al., 2011).

In addition, Pears and colleagues (2013) developed a school readiness intervention, Kids in Transition to School (KITS), a program that starts the summer before children enter kindergarten, and continues for the first 8 weeks of school. Children participate in a total of 24 structured school readiness groups in a classroom setting. The groups are specifically designed to teach both early literacy and social-emotional skills. Additionally, parents participate in a total of eight parenting groups in which they learn strategies to get their children ready for school as well as learn positive behavior management skills. Randomized trials of the KITS program have been conducted on children in foster care and children with developmental disabilities and significant effects on school readiness and reduced behavior problems have been observed (Pears et al., 2013; Pears et al., 2015). Similarly, a pilot study of the KITS program in a sample of low-income children found that the intervention significantly contributed to improvements in children's letter naming, sound fluency, concepts about print, as well as decreased aggressiveness and improved self-regulation (Pears et al., 2014). Providing a school readiness program in a classroom setting has promising results but is not yet as common as the previously mentioned programs that occur in Head Start or other early childhood classrooms.

While school or center-based programs have several strengths, not all children are able to attend child care or preschool. For example, it is estimated that only 31% of eligible children had access to a Head Start classroom, and a mere 7% of eligible children had access to an Early Head Start classroom (National Head Start Association, 2017). Additionally, while state preschool programs are growing in numbers, there remain long waiting lists for those programs. As a result, low-income children are less likely to be enrolled in high quality child care settings (Dearing, McCartney, & Taylor, 2009). Additionally, many children are cared for in their own homes by parents. In 2016, it was estimated that 58% of 3-year-olds, 34% of 4-year-olds, and 14% of 5-year-olds did not participate in any form of pre-primary school education program (Child Trends, 2016). Given the substantial number of children who are not in quality early childhood programs, researchers have identified the need for family-based interventions to support parents of young children in developing their children's social-emotional and early language skills.

Parenting Only Programs

Several interventions have been developed with the goal of helping parents identify strategies to support children's school readiness skills such as shared book reading, increasing language use, and increasing responsiveness. In particular, these programs have been aimed at supporting parents living in poverty so as to reduce the achievement gap prior to school entry. These programs emphasize the importance of book reading, teach parents about dialogic book reading, facilitate more general engagement and learning strategies in the home, and provide parents with instruction on how to improve the language they use to talk to their children throughout the day rather

than during specified activities (e.g., Baker, Piotrkowski & Brooks-Gunn, 1998; Burgoyne, Gardner, Whiteley, Snowling, & Hulme, 2017; Leffel & Suskind, 2013; Levenstein, Levenstein, & Oliver, 2002; Reese & Cox, 1999; Suskind et al., 2016; Zuckerman & Khandekar, 2010).

Many of the programs developed for parents have centered around book reading. Often the programs involve providing parents with books to read to their children and strategies to increase engagement (Sim, Berthelsen, Walker, Nicholson, & Fieldings-Barnsley, 2013). The amount of time that parents read with their children and the ways in which parents read with their children have been strongly linked to children's language development and early literacy skills (Colmar, 2014; Reese & Cox, 1999; Sim et al., 2014, Zuckerman & Khandekar, 2010; Vally, Murray, Tomlinson, & Cooper, 2015).

Reach out and Read is a program that has been implemented in the pediatrics setting as a way to address the discrepancy in reading out loud observed in parents across socioeconomic statuses (Zuckerman & Khandekar, 2010). As a part of Reach out and Read, pediatricians gave children and their parents a book at each well-child doctor visit from 6 months to 5 years of age and provided suggestions and strategies to parents as to how best to engage their child with the book. Multiple studies have identified that parents who received this program were more likely to report that they read with their children and were observed to read more with their children (High, Hopmann, & LaGasse, & Linn 1998; Needlman, Fried, & Morley, Taylor, & Zuckerman 1991; Needlman, Toker, Dreyer, Klass, & Mendelsohn, 2005). Additionally, in some studies, the increased frequency of book reading was associated with significant improvements in children's expressive and receptive vocabulary skills assessed on standardized measures (High,

LaGasse, Becker, Ahlgreen, & Gardner, 2000; Mendelsohn et al., 2001). In a more recent study, Vally et al. (2015) conducted a randomized controlled trial of a dialogic book reading intervention in a low-income area of South Africa. The authors randomly assigned 91 mothers with children aged 14-16-months to an 8-week dialogic reading program or to a control condition. Mothers who received the intervention reported a significantly greater increase in the number of words their children could both say and understand on the MacArthur-Bates Communicative Development Inventory than did mothers in the control condition.

One of the longest standing interventions to support at-risk children is the Parent-Child Home Program (PCHP; Levenstein & Sunley, 1968). PCHP is a home-based program delivered by paraprofessionals which occurs bi-weekly over the course of two years when children are 2-3 years of age (Levenstein et al., 2002). Primary aims of PCHP include helping parents learn how to support their child's learning and helping parents to feel effective. The home visitors bring parents new toys and books at every visit and coach them in how to use language with the materials. Furthermore, the home visitors model positive interactions. In a quasi-experimental study, Levenstein (1970) found that children who received PCHP had higher IQs. Moreover, long-term follow-up studies of the original sample found that the differences in children's cognitive development were still observable when children were in the 5th and 7th grades (Lazar & Darling, 1982; Royce, Darlington, & Murray, 1983). Additionally, program participants were less likely to drop out of school and more likely to graduate high school (Levenstein, Levenstein, Shiminski, & Stolzberg, 1998). In a follow-up study of a separate replication of PCHP, Levenstein et al., (2002) found that by the time children who received PCHP were

entering first grade, they were performing at grade level on a measure of school readiness which assessed the capacity for cognitive growth, rather than performance on specific academic subjects. However, the comparison group for this study was a convenience sample of first grade students rather than a true randomized control group and therefore intervention effects but be interpreted cautiously.

The Home Instruction Program for Preschool Youngsters (HIPPY; Lombard 1981) is another long-standing home visitation program designed to support low-income parents with young children. Similar to PCHP, HIPPY involves a two-year curriculum during which paraprofessionals meet with parents bimonthly. These home visitors provide books and activities specifically designed to promote language development, as well as motor, sensory, and problem-solving skills. Parents are then instructed to engage in these specific activities with their children for 15-20 minutes a day. Much of the research evaluating HIPPY was quasi-experimental (Bradley & Gilkey, 2002; Nievar, Jacobson, Chen, Johnson, & Dier, 2011). For example, Bradley & Gilkey (2002) conducted a quasi-experimental study comparing children who received HIPPY when they were younger to children who did not receive the intervention. They found that children who received HIPPY were less likely to be suspended in 3rd and 6th grades and performed significantly better on the Reading and Language Arts components of the Stanford-8 Achievement Test battery, but not the Math component.

Many of these parenting programs are time intensive and include an emphasis on shared book reading or other engagement activities during the day. Leffel and Suskind (2013) provide a rationale and description of new parent programs specifically designed to target low SES families. Both are home based interventions delivered by coaches and

attempt to combat busy lives and lack of parental time by emphasizing the language opportunities that exist within regular daily routines. Their program, Thirty Million Words, was designed specifically for low SES families and was based on the seminal Hart & Risley (1995) study which identified that by the age of 3 years, children from low-income families heard over 30 million fewer words than children in higher income households.

Parental use of language with their infants and toddlers was one aspect of a feasibility study by Suskind et al. (2016). The researchers randomly assigned 23 mother-child dyads to either an intervention or an active control condition implementing a nutrition intervention. The intervention consisted of 8 weekly home visits, lasting an hour each. As a part of the intervention, mothers were provided with quantitative feedback about how much they talked to their children and video-modeling was used to provide mothers with strategies to increase the quality and quantity of their talk. Parents who were in the intervention condition reported increased knowledge about child language development. Additionally, the number of different word types spoken by parents and their children significantly increased 1 week after the program ended, but differences were not detectable four months later when measured in the research laboratory. When assessed in the home, adult word tokens, the number of conversational turns, and child vocalization counts increased significantly during but not after the intervention.

In addition to parenting programs designed specifically to target the way that parents talk to or engage in learning activities with their children at home, some parenting programs emphasize more general parenting behaviors such as responsiveness, nurturance, and discipline as core components, some of which also include child-directed

language as a secondary target (Brooks-Gunn & Markman, 2005). Many of these programs were traditionally theorized as general programs to improve the overall parent-child relationship in families considered to be at risk for suboptimal parenting and poorer child development (Lowell, Carter, Godoy, Paulicin, & Briggs-Gowan, 2011; Reid, Webster-Stratton & Baydar, 2004; Webster-Stratton, 1998). However, researchers have since recognized the potential for these general parenting practices to have marked impacts on the skills necessary for school readiness and academic achievement.

The PALS intervention is one intervention which focuses more broadly on general parenting behaviors (Landry, Smith, & Swank, 2008; Landry et al., 2011). PALS is a 10-session home visiting program that uses coaching and video tapes of parent-child interactions in order to increase parental responsiveness. In two randomized controlled trials of the PALS intervention, Landry and colleagues (2008) found that mothers who participated in the PALS intervention showed greater warmth, positive affect, and contingent responsiveness to their children's cues than mothers in the control conditions. Furthermore, mothers in the PALS condition demonstrated greater improvements in shared book reading behaviors such as verbal scaffolding and asking open-ended questions (Landry et al., 2011). These changes in parenting behaviors were associated with changes in children's behavior. Specifically, children in the PALS condition demonstrated more positive affect, better coordination of attention, and improved vocabulary compared to children in the control condition (Landry et al., 2008).

Limitations of Existing Interventions

While each of the interventions reviewed demonstrate some ability to improve parenting behaviors and child outcomes related to social-emotional and language

development, there are many limiting factors which prevent maximum effectiveness and reduce the scalability of the programs. As a result, despite decades of intervention development aimed to reduce the achievement gap, a disproportionate number of children living in poverty are still underperforming compared to children from more advantaged homes (Potter & Roksa, 2013; Sharkins et al., 2017). Therefore, improving upon intervention strategies and increasing the availability of such programs is a priority.

Programs that are implemented in school or child care settings are less primed to leverage the impact that parents have on supporting the development of important skills that contribute to school readiness and academic achievement. Not all children attend quality early childhood programs. While the number of children attending preschool has been increasing since the 1990s, there are still a large number of children who do not attend organized group care, and low-income families have the highest rates of children not enrolled in preschool (Magnuson & Duncan, 2016). Therefore, it is integral to support parents in preparing their children for kindergarten in order to serve children who may not have access to the school-based programs and close the learning gap that begins prior to school entry. Although efforts should be made to increase access to high quality child care for low-income students, it is also important to strengthen programs for parents. Parents are children's most important teachers. For example, in the Bierman et al. (2017) study of an enriched Head Start program, the home visiting component contributed most to improved academic achievement outcomes in the second grade as opposed to the Head Start classroom component. In addition to increasing access to high quality pre-primary education programs, implementing programs designed specifically for parents allows parents to better support social-emotional and language skills from as early as infancy.

Overall, it has been recognized that early intervention efforts have a dramatic economic advantage with regard to providing necessary resources to families and children (Heckman, 2011).

Many of the home visiting programs that have been implemented to support low-income families are costly. They are expensive to implement and occur over a long period of time. Furthermore, many of the research studies that support the intervention effects are quasi-experimental and the intervention effects in randomized controlled trials are often small (Gomby, 2005; Magnuson & Duncan, 2016). Interventions that aim to decrease the achievement gap tend to fall within two general categories: (1) those that take an instructional approach and provide parents with information about how to increase language use around their children; or (2) those that emphasize parental engagement in specific language-based activities (Lonigan et al., 2008).

In general, these programs are directive and didactic in nature. They aim to provide resources and information to parents about how to interact with their children and encourage parents to dedicate specific amounts of time a day to engaging in specific learning activities, rather than leveraging the natural environment in which the child learns. Leffel and Suskind (2013) attempted to address this concern when developing the 30 Million Word Project. They recognized the need to help parents identify strategies to support their children's language abilities which could be implemented throughout the course of daily events rather than during specified activities. However, their program still incorporates a directive and instructional approach (Suskind et al., 2016). Increasing evidence suggests that instructional interventions in general are not as effective as interventions that utilize video-feedback (Juffer & Steele, 2014).

Programs designed to instruct and teach parents how to interact with, speak to, or read with their children may not be targeting the right parenting components. Increasingly, researchers and intervention developers are thinking more theoretically about core components of how children learn and develop their early language and social-emotional skills. Responsiveness is one such parenting component that has been strongly linked to numerous beneficial child outcomes such as parent-child attachment, social-emotional development, and language development (e.g., Birmingham et al., 2017; Bridgett et al., 2013; Brophy-Herb et al., 2011; Dodici et al., 2003; Kochanska et al., 2000; Landry et al., 1997; Morales et al., 2000). Additionally, responsive parenting is negatively impacted by poverty and has been widely hypothesized to be one of the mediating factors between low socio-economic status and poor academic achievement in children (Bradley & Corwyn, 2002; Conger et al, 1994; McLeod& Shanahan, 1996; Neppl et al, 2015). Therefore, targeting responsiveness as a core intervention component and using video-feedback to help parents recognize when they are responding responsively to their children throughout the course of a typical day may address many of the limitations discussed above.

In thinking about how to move the field forward in this area, it is important to consider two dimensions. First, there is a need to intervene within the natural ecology of a family's home. Second, there is a need to build upon existing caregiver behaviors in order to maximize intervention effectiveness for busy parents. One possibility for considering alternative means to intervene is to look at interventions that have employed the natural ecology of the home environment to facilitate language development. One such example is the PALS intervention (Landry et al., 2008). PALS demonstrated

promising results with regard to increasing parents' responsiveness to their children and improving child language abilities (Landry et al., 2008; Landry et al., 2011). However, this intervention does not target the second domain of building upon parents' already existing skills in order to maximize intervention effectiveness. The current study will contribute to moving the field forward by exploring the efficacy of a strength-based video-coaching program that both targets the natural ecology of families' homes and builds upon parents' natural abilities to support children's development.

The Present Study

The Filming Interactions to Nurture Development (FIND) program is specifically designed to address these two abovementioned dimensions. The FIND program, described in greater detail in the method section, involves capturing videos of the parent and child interacting in naturalistic settings such as during a meal or while playing. The films are edited to show parents play-by-play examples of times in which they are responding to their child in a developmentally supportive manner. The emphasis is on showing examples in which parents respond to their children, or "serve and return" interactions. When parents are able to appropriately respond to what their child is interested in, there is a richer canvas on which to use language and a greater sense of the parent accurately identifying their child's needs and interests. This intervention strays from the traditional direct instruction approach in that it does not directly target language use or other parenting strategies to specifically improve children's school readiness. However, research suggests that interactions that are in response to children's cues are more powerful in building brain architecture to support language use and learning (Center on the Developing Child, 2011).

Several unique characteristics of FIND fulfill the urgent need for time and cost sensitive interventions that can help close the achievement gap for children raised in poverty. First, FIND is ideal for parents living in poverty because it provides a richer canvas for how to use language and support social-emotional development in the home, rather than being limited to reading or to specific parent-directed tasks. Parents living in poverty are often busy and FIND helps parents identify the naturally occurring occasions to provide high quality responses to their children within their everyday routines. Second, FIND is a brief intervention which occurs over the course of 10 weekly sessions and is designed such that it can be implemented by paraprofessionals. Evidence suggests that this brief format for video-coaching interventions is effective (Fukkink, 2008). Third, FIND takes advantage of the increased evidence that video-coaching is an effective strategy for reducing the potential negative outcomes that result from sub-optimal parenting or high risk conditions such as poverty (e.g. Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2005; Fukkink, 2008). Information provided through video feedback is thought to be particularly salient for parents because they are seeing examples of their own behavior (Fukkink, 2008).

Finally, FIND may be particularly well suited for low-income families because builds upon parents' own strengths rather than highlighting deficits in parenting. This strengths-based model is likely to increase desired parenting behaviors as well as increase engagement with the intervention. Due to the strengths-based approach, it is expected that FIND will increase parents' parenting sense of competence (PSOC). Mothers with low PSOC engage in less responsive and less sensitive parenting behaviors (Ardelt & Eccles, 2001; Coleman & Karraker, 2003; Leahy-Warren & McCarthy, 2011; Meunier et al.,

2010; Peacock-Chambers et al., 2017; Ponomartchouk, 2015; Shumow & Lomax, 2002).

According to the parenting self-efficacy theory outlined by Ardel & Eccles (2001), parents that believe in their parenting abilities are more likely to demonstrate positive parenting behaviors, which in turn is more likely to relate to better child outcomes.

Furthermore, they propose that higher levels of PSOC may directly relate to child social-emotional outcomes through the parents' modeling of positive attitudes and beliefs.

Therefore, the FIND program is expected to improve maternal responsiveness directly through the intervention strategies as well as through increasing mother's PSOC.

The present study has several aims: (a) to identify the extent to which a strength-based video coaching intervention is effective in improving mothers' parenting sense of competence, responsive parenting, and quality of maternal use of language; (b) to identify whether improvements in parenting sense of competence mediates the intervention effects on responsive parenting and quality of maternal use of language; (c) to identify whether change in responsive parenting and quality of maternal use of language is associated with improvements in child language and social-emotional development. A conceptual model is provided in Figure 3.

It is hypothesized that: (1) Parents who receive the intervention will have a greater increase in their PSOC compared to parents in the control condition; (2) Parents who receive the intervention will have a greater increase in their responsive parenting and quality of language compared to parents in the control condition; (3) Changes in responsive parenting and quality of language as a result of the intervention will be partially mediated through changes in PSOC; (4) Changes in child language and social-

emotional development as a result of the intervention will be mediated through the identified changes in responsive parenting behavior and quality of maternal language.

Methods

Participants

Participants for the current study were recruited from a small metropolitan area on the West Coast through a variety of methods including electronic advertisements via Craigslist and Facebook, classified ads in a local newspaper, flyers posted in the community, and in person at public parks. To assess for study eligibility, all interested mothers completed a brief phone screening. To be included, mothers had to be 18 years of age or older, have a child between the ages of 12 and 48 months, report a household income that met the federal guidelines for qualifying for free or reduced lunch in 2016, and be fluent in English. Exclusion criteria included having an open case with Child Welfare, being left handed, having a history of a seizure or epilepsy, having a current open head wound or head lice, being uncomfortable with separating from the child to complete questionnaires, either parent or child having any other physical or medical condition that would make completing the 2-hour laboratory visits impossible, or being concurrently enrolled in another research project that included a parenting program.

The target sample size for this study was 50 mother-child dyads. A total of 443 individuals made initial contact with research staff expressing interest in participating. Of these 443 individuals, 147 were screened but did not meet eligibility criteria, 32 mothers were screened but decided they were either not interested in or comfortable with the study procedures, and 173 mothers did not respond to research staff attempts to contact them for screening. Seventy-one mothers were eligible for study enrollment and

scheduled an initial laboratory visit, 17 of these mothers never attended their scheduled visits and did not sign study consent forms. Fifty-four mothers attended at least one study visit, signed consent forms, and were randomized into study conditions. Of these 54 participants, 28 were randomly assigned to the FIND group and 26 were randomly assigned to the waitlist control group. A total of 10 participants withdrew from the study after signing consent, 8 who were assigned to FIND and 2 who were assigned to the waitlist group. Of the families that withdrew from the study, 5 families were non-responsive to research staff to schedule further assessment visits, 4 families let us know that they were too busy and wished to discontinue, and 1 family needed to reschedule their visit but was not able to schedule before the project ended. Pre- and post-assessment data were collected from a total of 44 participants. Recruitment, enrollment, and randomization flow are shown in Figure 8. A Mann-Whitney U test for independent samples indicated that mothers who remained in the study were significantly older ($M = 30.39$, $SD = 5.4$) than mothers who withdrew from the study ($M = 26.00$, $SD = 4.35$; $U = 120.5$, $p < .04$). However, no other differences in study variables were observed at pre-assessment for the participants who completed the study compared to participants who withdrew.

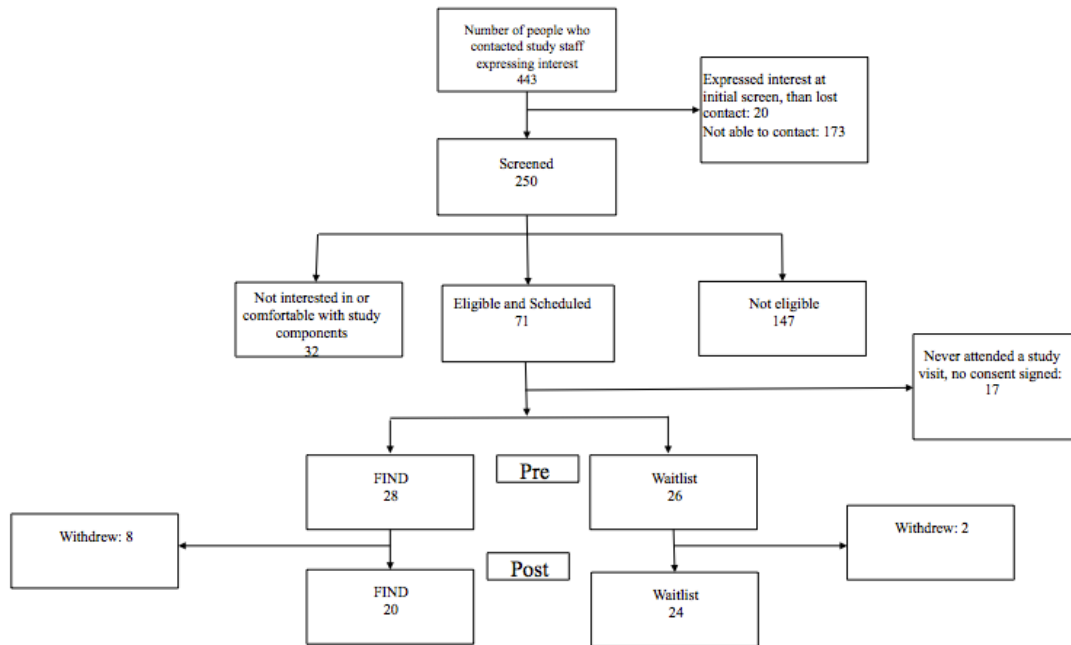


Figure 8. Study 3 recruitment, enrollment, and randomization.

Data were collected between January 2016 and August 2017. Within the 54 participants who initially enrolled in the study and signed consent, mothers ranged in age from 19 years to 45 years ($M = 29.57$, $SD = 5.53$). Children (54% male) ranged in age from 12 months to 36 months ($M = 23.65$, $SD = 8.88$). The sample was primarily Caucasian (88.6%), with 2.3% reporting their race as Asian, 2.3% reporting as African American, 4.5% as Latina, and 2.3% as mixed race. Mother’s level of educational attainment varied: 4.5% did not graduate from high school, 36.4% had a high school diploma or obtained a GED, 34.1% had some college credits or obtained an associate’s degree, 15.9% held bachelor degrees, and 9.1% had an advanced graduate degree. More than half of the mother’s enrolled in this study were either married or not married but living with their partner (63.6%). Demographic information by study condition is presented in Table 5. Significantly more mothers in the waitlist condition were either

married or living with a partner compared to mothers in the FIND condition ($\chi^2(1) = 5.50, p = <.05$). No other significant differences by study condition were observed.

Table 5. Study 3 sample characteristics by condition.

	<i>M (SD)/frequency (%)</i>		<i>t/ χ^2</i>
	FIND (<i>n</i> = 20)	Waitlist (<i>n</i> = 24)	
Mother's age (years)	30.40(5.14)	30.38(5.87)	<i>t</i> (42) = .015, <i>p</i> = .99
Mother's highest level of education			<i>t</i> (42) = .37, <i>p</i> = .72
No High School Diploma	0(0%)	2(8.3%)	
High School Diploma	9(45%)	7(29.2%)	
Some College/Associates	5(25%)	10(41.7%)	
Bachelors	4(20%)	3(12.5%)	
Graduate Education	2(10%)	2(8.3%)	
Mother's ethnicity			<i>t</i> (42) = .25, <i>p</i> = .81
Caucasian	18(90%)	21(87.5%)	
Asian	0(0%)	1(4.2%)	
African American	1(5%)	0(0%)	
Latina	0(0%)	2(8.3%)	
Mixed	1(5%)	0(0%)	
Child age (months)	23.60(9.97)	27.46(12.35)	<i>t</i> (42) = -1.13, <i>p</i> = .27
Child sex			$\chi^2(1) = .12, p = .74$
Male	11(55%)	12(50%)	
Female	9(45%)	12(50%)	

Procedure

All study procedures were reviewed and approved by the Institutional Review Board at the University of Oregon. Informed consent was obtained in person during the first laboratory visit. Families were randomly assigned either to receive the strength-based video coaching intervention (FIND) immediately or to receive it later via a waitlist comparison condition. They were informed of their study condition after signing informed consent. Compensation was provided for the research assessments at the end of each laboratory visit. Participants received up to \$245 for completing all of the study

components. Participants in this study visited the research laboratory for four assessment visits, each lasting between 1.5-2 hours and were compensated \$35 per visit. Parents were provided an extra \$15 for two of the research visits which required them to attend without their children present. Parents also were compensated \$15 for completing approximately an hour-long phone interview, and \$30 for completing pre and post audio recording sessions in their home upon returning the audio recording device. Analyses for the current paper utilize a subset of the data collected from the larger study. Due to the scope of the current paper, general procedures for the full assessment battery will be briefly mentioned but not discussed in detail.

Visit 1. During the first visit, mothers and their children visited the research laboratory together. A research assistant introduced the dyad to the laboratory space and obtained informed consent. The research assistant then informed the mother which study condition she was randomly assigned to. The mother-child dyad then engaged in a 10-minute filmed free play and clean-up task in which mothers were given a box filled with a variety of age appropriate toys and told to play with their child as they normally would. After 10 minutes, a research assistant knocked on the door signaling that it was time to clean up the toys by placing them back in the box. The child then transitioned to child care with a trained staff member, while the mother completed an interview with a research assistant. The interview consisted of demographic information, a service utilization questionnaire, and a brief parent interview asking mothers to report on the presence or absence of a list of behaviors that their child may have demonstrated within the previous 24 hours, called the Infant Parent Daily Report. Mother-child dyads then participated in a brief, 5-minute book reading task in which they were asked to sit in a

comfortable chair together and read from a selection of books. Parents then completed several questionnaires on the computer while their child returned to child care. When parents completed the questionnaires, the research assistant reviewed how to complete the at home audio recording.

Visit 2. During the second laboratory visit, mothers were asked to visit the lab without their children. During this visit, the mother participated in the brief Infant Parent Daily Report interview and then engaged in several electroencephalogram tasks. Research assistants also used this session to either obtain the audio recording device if mothers had completed their recordings, or helped parents identify when they would complete the recordings.

Visit 3. The third laboratory visit occurred once participants had completed the FIND intervention or completed their waiting period if assigned to the control condition. This laboratory visit was similar to the first visit. Mother-child dyads visited the lab together. The dyads first participated in the filmed free play and clean-up task. Then mothers completed the brief Parent Infant Daily Report interview and filled out two short questionnaires on the computer. Mother-child dyads then read books together in a comfortable chair for approximately 5 minutes before the child returned to child care and mothers completed the rest of the questionnaires on the computer. Following, a research assistant reviewed the audio recording procedures with mothers for the second collection.

Visit 4. During the fourth and final laboratory visit, mothers participated in the Infant Parent Daily Report interview and then completed the same electroencephalogram tasks as in the second visit. Research assistants provided the final compensation for

completing all study components if parents returned the audio recording devices during this visit.

Phone interviews. After their first laboratory visit, participants completed a 30-45-minute phone interview which consisted of the Infant Daily report and several questionnaires about adverse experiences the mother may have experienced prior to the age of 18 years. After the third laboratory visit, participants completed a short phone interview which included only the Infant Parent Daily Report.

In-home audio recordings. After the first and third laboratory visits, mothers were provided with a small digital audio recording device called LENA to take home with them. Mothers were instructed to turn on the device for as much of the day as possible across 2 days when they were home with their child, and their child was awake. Research assistants were trained to help mothers identify and schedule at least 4-5 hours during the day when they could keep the audio recorder on, with the goal of obtaining 8 hours of recording. The LENA device fit into a custom vest that was worn by the child.

Study Conditions

FIND condition. The FIND intervention occurred over 10 consecutive weekly home visits ranging from 30 minutes to 1 hour in length. Throughout the intervention, the coach discussed the concept of "Serve and Return" with the parents as the basis of child-directed, developmentally supportive interactions. "Serve and Return" is a metaphor to explain parenting behaviors that are in a direct response to a child's bid for attention. At the first session, and then at every other session subsequently, FIND coaches collected 10-15 minutes of film capturing mother-child interactions. These films were then edited in the interim week to find examples of a specific type of developmentally supportive

behavior referred to as the FIND elements. The resulting edited film contained very short (i.e., 3 – 25 second) film clips of the mother engaging in the FIND element associated with that week. During the film review sessions, the FIND coach first introduced that week's element, described how it contributed to serve and return interactions, and discussed the ways in which the element supported healthy child development. Then, the coach presented the film in order to show parents when they were demonstrating that week's element. The films were structured such that the caregiver first saw a still image of themselves with their child. Then the three video clips were inserted with a text description beforehand that explained the interaction. The FIND coach and the caregiver watched each clip three times. First, they watched the clip in its entirety. Then, they watched the clip again and the coach provided a frame-by-frame description of the specific FIND element which was specifically designed to fit within the serve and return model. The coach and caregiver then watched the clip all the way through. At the end of the three clips, another still image of the caregiver-child dyad was presented. The FIND elements include: (1) Sharing your Child's Focus of Attention, (2) Supporting and Encouraging, (3) Naming, (4) Back and Forth, and (5) Endings and Beginnings (see Fisher, Frankel, Noll, Berry, & Yockelson, 2016 for more information).

Comparison condition. Participants randomly assigned to the waitlist condition were offered the FIND program after completion of all assessment visits. Mothers were instructed that after the completion of their pre-assessment activities they would have approximately 10-12 weeks during which they could continue to receive any services that they were already receiving and would not be restricted from engaging with new services. After completion of the research study, participants in the comparison condition were

offered a group version of the FIND program and were informed that participation was optional and not considered part of their research involvement.

Measures

Demographics. Basic demographic information and service utilization was assessed with two questionnaires adapted from previous studies conducted in the Stress Neurobiology and Prevention lab at the University of Oregon.

Maternal PSOC. Maternal PSOC was measured using a 18-item self-report questionnaire which measures parents' perceptions of their own ability to effectively parent their children. Specifically, this study used an adapted version of the PSOC (Johnston & Mash, 1989). This version was adapted to make the wording of questions clearer and a question, "I do a good job caring for my child" was added. Mothers responded to the items using a 6-point likert scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*). A total score was computed by calculating a sum of the 18 items. Higher scores indicate a greater sense of parenting competence. Pre-assessment scores ranged from 40 to 72 ($M = 53.70$, $SD = 6.88$) and Post-assessment scores ranged from 41-72 ($M = 54.20$, $SD = 6.63$). The PSOC scale demonstrated good internal reliability within this sample at pre and post assessment (Chronbach's $\alpha = .84$).

Maternal positive parenting. Positive parenting was measured using the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO, Roggman et al., 2013) coding tool to code 10-minute video clips of a free play interaction between the mother-child dyads. PICCOLO is a checklist of 29 observable behaviors that can be categorized into four domains: affection, responsiveness, encouragement, and teaching. Trained research assistants rated the items

on a 3-point scale: 0 (*absent*), 1 (*barely*), and 2 (*clearly*). Higher scores indicate higher levels of the domain. Data were missing from 6 participants due to technical difficulties with the video recordings. Twenty percent of the films were coded by two research assistants to establish inter-rater reliability. SPSS statistical package version 23 was used to calculate ICC estimates based on absolute agreement, 2-way mixed-effects model. The single measure inter-rater reliability for the affection, responsiveness, and teaching domains was adequate, ranging from .72-.85. Inter-rater reliability on the encouragement domain was poor (ICC = .43). Overall, the total PICCOLO scale in this sample had moderate inter-rater reliability (ICC = .69).

The affection domain consists of 7 items including “speaks in a warm tone of voice” and “shows emotional warmth. Pre-assessment scores ranged from 7 to 12 ($M = 10.02$, $SD = 1.44$). Variability was limited and resulted in poor reliability (Chronbach’s $\alpha = .10$). Post-assessment scores ranged from 6-12 ($M = 9.90$, $SD = 1.69$) and demonstrated poor reliability within this sample (Chronbach’s $\alpha = .37$). The 7-item responsiveness domain consists of items such as, “pays attention to what child is doing” and “follows what child is trying to do.” Pre-assessment scores ranged from to 5-10 ($M = 9.33$, $SD = 1.21$) and demonstrated adequate reliability (Chronbach’s $\alpha = .71$). Post-assessment scores range from 8-10 ($M = 9.51$, $SD = .81$) and had poor reliability (Chronbach’s $\alpha = .37$). The encouragement domain also consists of 7 items which include, “encourages child to handle toys” and “offers suggestions to help child.” Pre-assessment scores ranged from 5 to 12 ($M = 10.30$, $SD = 1.74$) and post-assessment scores ranged from 7-12 ($M = 10.56$, $SD = 1.42$). The encouragement subdomain demonstrated poor reliability at both pre- and post-assessment (Chronbach’s $\alpha = .57$

and .43, respectively). The teaching domain consists of 8 items such as “labels objects or actions for child” and “asks child for information.” The pre-assessment teaching domain scores ranged from 1 to 13 ($M = 8.07$, $SD = 2.56$) and post-assessment scores ranged from 3-13 ($M = 8.44$, $SD = 2.10$). The teaching subdomain also demonstrated poor reliability at pre- and post-assessment (Chronbach’s alpha = .59 and .19, respectively).

Total PICCOLO scores at pre-assessment ranged from 19 to 45 ($M = 37.73$, $SD = 4.83$) and post-assessment scores ranged from 28-43 ($M = 38.41$, $SD = 3.46$). The pre-assessment total PICCOLO score had adequate internal reliability within this sample (Chronbach’s alpha = .75) however the post-assessment scores had poor reliability (Chronbach’s alpha = .43). The PICCOLO scores have previously demonstrated strong reliability and validity (Roggman et al., 2013). Only the total PICCOLO scores and responsiveness domain scores will be used in analyses, as these scores seem to reflect the best scale reliability as well as inter-rater reliability. Furthermore, responsiveness as a parenting domain has been particularly well studied with regard to influencing child development. However, results must be interpreted with caution (Kim et al., 2015; Kim & Kochanska, 2015; Pauli-Pott et al., 2017).

Quality of maternal use of language. Quality of maternal use of language in the current study was operationalized as the number of conversational turns which occurred between the mother and child during at-home interactions. The LENA device was used to capture audio recordings of the mother and study child while they were at home with the intention of using the LENA software to automatically calculate the number of conversational turns (Gilkerson & Richards, 2009). In order for the LENA software to work reliably, mothers needed to have the recorder on uninterrupted for at least 4 hours

(Xu, Yapanel, & Gray, 2009). A majority of the mothers in this study were not able to have the recorder on for that duration due to other adult women being present in the home or due to school and work schedules. As a result, it was not possible to use the LENA estimates of conversational turns. In order to estimate conversational turns, the audio files were split into 5-minute segments which were each coded to identify whether the child and mother were both present within that 5 minutes. A random number generator was then used to randomly select 12, 5-minute segments. Two coders listened to the 5-minute segments to count conversational turns. A conversational turn was defined as when either the mother or child made a vocalization and the other responded within 5-seconds. Within the full sample, the number of conversational turns varied widely at both pre- and post-assessment. Pre-assessment counts ranged from 10 to 1,103 ($M = 400.83$, $SD = 252.05$) and post-assessment counts ranged from 20 to 951 ($M = 413.61$, $SD = 246.23$). Twenty percent of the files were double coded and demonstrated adequate inter-rater reliability ($ICC = .71$).

Child social-emotional development. Child social-emotional development was measured with the Brief Infant Toddler Social Emotional Assessment (BITSEA; Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2002). The BITSEA consists of 42 questions and measures both social-emotional problems and competencies. Responses are on a 3-point likert scale that range from 0 (“not true/rarely”), 1 (“Somewhat true/sometimes”), and 2 (“Very true/often”). The Problem scale includes items such as “worries a lot or is very serious” and “has trouble adjusting to changes.” Higher scores indicate the presence of more social-emotional problems. Pre-assessment scores on the BITSEA Problem scale ranged from 0-30 ($M = 11.16$, $SD = 6.69$) and post-assessment scores ranged from 1-30

($M = 10.07$, $SD = 6.47$). The scale demonstrated acceptable internal reliability at pre and post-assessment (Chronbach's alpha = .81 and .83, respectively). The Competence scale includes items such as "follows rules" and "is affectionate with loved ones." Higher scores indicate greater social-emotional competence. Pre-assessment scores on the BITSEA Competence scale ranged from 10-22 ($M = 18.00$, $SD = 2.95$) and post-assessment scores ranged from 13-22 ($M = 18.55$, $SD = 2.48$). The Competence scale demonstrated acceptable to questionable reliability at pre and post-assessment (Chronbach's alpha = .76 and .67, respectively). The BITSEA scales have demonstrated adequate predictive validity in ethnically and socioeconomically diverse children (Briggs-Gowan & Carter, 2008). Although the reliability for the Competence scale was questionable at post-assessment, the scale was used in analyses due to the previously established criterion and predictive validity (Briggs-Gowan & Carter, 2008).

Child language development. In the present study, children's vocabulary development was used as the measure of child language development. Vocabulary was assessed using the MacArthur Communicative Development Inventory (MCDI; Fenson, et al., 2000). Given the large age range in this study, three versions of the MCDI were administered. Each version included a parent completed checklist of vocabulary words in which parents report the words their child currently produce. Percentile scores were calculated for all study participants using the gender and age norms provided in the technical manual. The MCDI has previously shown strong concurrent and predictive validity (Fenson et al., 2007). Of the 44 participants who completed data collection, complete MCDI data were missing for 4 participants due to either the child being outside of the age range for the MCDI by post-assessment or as a result of having completed the

wrong questionnaire. At pre-assessment, complete MCDI data were available for 40 participants. At pre-assessment, percentile scores ranged from 5-90 ($M = 44.23$, $SD = 25.59$) and at post-assessment, percentile scores ranged from 5-95 ($M = 47.88$, $SD = 30.92$).

Analysis Plan

Statistical analysis was completed in SPSS statistical package version 23. First, descriptive statistics were conducted on all measures in order to assess assumptions of normality and to identify whether there were significant group differences at pre-assessment. Repeated Measure ANOVAS were conducted in order to test the hypothesis that parents in the FIND condition would show greater increases in PSOC, positive parenting behavior, and conversational turns compared to parents in the waitlist condition. Similarly, repeated Measure ANOVAs were conducted to test the hypothesis that parents in the FIND condition would report significantly greater improvements in their children's vocabulary and social-emotional development compared to those in the waitlist condition.

Results

Frequency distributions and box-plots were examined for all study variables to assess for unusual distributions and outliers. As was previously noted, it was identified that one study participant did not meet inclusion criteria and was therefore excluded from analyses. All study variables were within acceptable parameters for normalcy and no outliers were observed. Independent group t-tests revealed that at pre-test, mothers in the FIND condition reported significantly higher PSOC compared to mothers in the waitlist condition ($t(41) = 2.46$, $p < .05$). No other group differences were observed on primary

study variables at pre-assessment. Means and standard deviations by study condition and time point are presented in Table 6.

Maternal age and education level was not significantly correlated with any study variables. Furthermore, the number of children that mothers reported having was not significantly correlated with study variables. Child age was significantly correlated with mother's reported PSOC at pre-assessment ($r(41) = -.30, p < .05$) such that mothers with younger children were more likely to report significantly higher levels of PSOC. Child age was also significantly correlated to the number of conversational turns between the mother-child dyad at both pre- ($r(39) = .42, p < .01$) and post-assessment ($r(39) = .45, p < .01$). More conversational turns occurred in dyads with older children. Child age was therefore included as a covariate in study analyses.

Table 6. Study 3 means and standard deviations by condition and time point.

	<i>M (SD)</i>			
	Pre		Post	
	FIND	Waitlist	FIND	Waitlist
Parenting Sense of Competence	56.45 (6.18)	51.42 (6.71)	55.65 (6.23)	53.00 (6.83)
PICCOLO Total	64.60 (5.47)	66.70 (4.07)	66.15 (4.49)	66.67 (2.15)
PICCOLO Affection	16.85 (1.42)	17.17 (1.47)	17.10 (1.97)	16.71 (1.39)
PICCOLO Responsiveness	15.35 (1.35)	15.30 (1.11)	15.60 (.74)	15.43 (.87)
PICCOLO Encouragement	17.10 (1.89)	17.48 (1.62)	17.30 (1.66)	17.81 (1.12)
PICCOLO Teaching	15.30 (2.36)	16.74 (2.58)	16.15 (2.41)	16.71 (1.76)
Conversational Turns	370.89 (187.32)	426.68 (299.04)	427.84 (228.84)	401.32 (265.06)
BITSEA Problem Behaviors	11.20 (7.54)	11.13 (6.06)	10.70 (7.51)	9.54 (5.58)
BITSEA Competence	18.70 (2.89)	17.42 (2.93)	18.95 (2.37)	18.21 (2.48)
MCDI Percentile	40.26 (23.06)	48.00 (27.83)	40.56 (31.20)	53.86 (30.92)

A series of 2x2 repeated measures ANOVAs were conducted on each parenting and child outcome. Study condition was included as the between-subjects factor and the time of data collection (pre- or post-assessment) was included as the within-subjects factor. Age of child at pre-assessment was included as a covariate. A summary of the repeated measure ANOVA results for the parenting outcomes are presented in Table 7 and for the child outcomes in Table 8. Statistics on the covariate effects are also provided in the study tables.

Intervention Effects on Parenting Outcomes

PSOC. The repeated measures ANOVA, controlling for child age and number of children, revealed that there was not a significant main effect of time on PSOC ($F(1,40) = .17, ns$) nor was there a significant main effect of study condition on PSOC scores ($F(1,40) = 2.58, ns$.) However, there was a significant time by study condition interaction ($F(1,40) = 4.57, p < .05, \eta^2 = .13$; Figure 9.). Simple effects tests revealed that contrary to study hypotheses, mothers in the control condition demonstrated a significant increase in their PSOC scores from pre-assessment ($M = 51.42, SD = 6.71$) to post-assessment ($M = 53.00, SD = 6.83; F(1, 40) = 6.96, p < .05$). However, there was not a significant change in PSOC scores from pre- to post-assessment for mothers in the FIND condition ($F(1, 40) = 3.01, ns$).

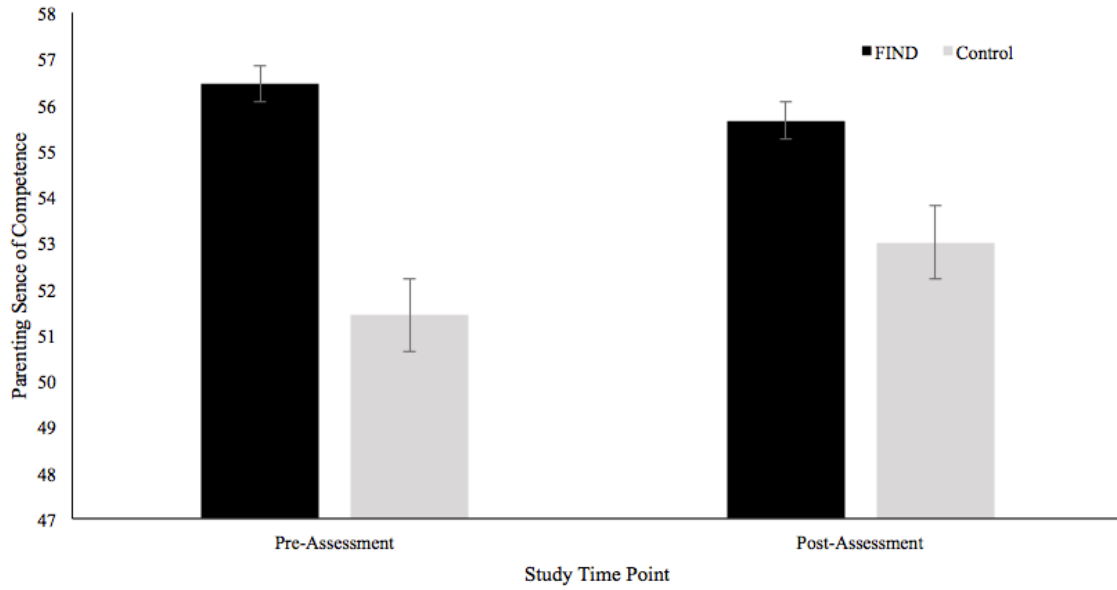


Figure 9. Time by condition interaction on PSOC in study 3.

Positive parenting behaviors. To test the hypothesis that mothers in the FIND condition would demonstrate significantly greater positive parenting behaviors at post-assessment compared to mothers in the control condition, repeated measure ANOVAs were conducted with both total PICCOLO scores and responsiveness scores as dependent variables, including child age as a covariate. There was no time ($F(1, 37) = 3.53, ns$), study condition ($F(1, 37) = .75, ns$), or time by condition interaction effect ($F(1, 37) = .78, ns$) on total PICCOLO scores. Additionally, there was no time ($F(1, 37) = 1.49, ns$), study condition ($F(1, 37) = .28, ns$), or time by condition interaction effect ($F(1, 37) = .22, ns$) on total PICCOLO responsiveness scores.

Conversational turns. A similar repeated measure ANOVA with child age as a covariate was conducted to test the hypothesis that the FIND intervention would have a significant effect on the amount of conversational turns between the mother-child dyads compared to the control condition. There was a main effect of age on the number of conversational turns, such that at both pre- and post-assessment and across study

conditions, when children were older, a significantly greater amount of conversational turns occurred than when children were younger, $F(1, 37) = 10.56, p < .01$. There was no significant main effect of time ($F(1,37) = .03, ns$) or study condition ($F(1, 37) = .05, ns$) on the number of conversational turns. The interaction between time and study condition was also not significant ($F(1, 37) = 2.15, ns$).

Intervention Effects on Child Outcomes

Vocabulary percentile score. First, the hypothesis that children whose mothers participated in the FIND intervention would demonstrate a significantly greater increase in their vocabulary scores compared to children whose mothers were in the control condition was tested. The repeated measure ANOVA revealed that there was no significant effect of time ($F(1,34) = .01, ns$), study condition ($F(1, 34) = 2.04, ns$), or their interaction ($F(1, 34) = 1.25, ns$) on children's percentile scores on the MCDI.

Social-emotional development. Finally, repeated measure ANOVAs were conducted to test the hypothesis that the FIND intervention would have a significant positive effect on children's social-emotional development, relative to the control condition. First, BITSEA problem behavior scores were entered as the dependent variable. There was no effect of time ($F(1, 40) = .36, ns$) or study condition ($F(1, 340) = .02, ns$) on mothers' reports of child social-emotional problems. Additionally, the interaction between time and study condition was not significant ($F(1, 40) = .64, ns$). The same pattern of findings was found when BITSEA competence scores were entered as the dependent variable. There was no time ($F(1, 40) = 1.16, ns$), study condition ($F(1, 40) = 2.12, ns$), or time by condition interaction ($F(1, 40) = 1.34, ns$) on mothers' reporting of their child's social competencies.

Table 7. Repeated measures ANOVAs for parenting outcomes in study 3.

Outcome	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	Partial η^2
PSOC	Between subjects					
	Child age	(1,40)	173.87	2.61	.14	.05
	Study condition	(1,40)	198.05	2.58	.12	.06
	Within subjects					
	Time	(1,40)	1.09	.17	.69	.04
	Time x condition	(1,40)	30.00	4.57	.04*	.13
PICCOLO-Total	Time x child age	(1,40)	.4.50	.69	.41	.02
	Between subjects					
	Child age	(1,37)	39.29	1.60	.21	.04
	Study condition	(1,37)	18.52	.75	.40	.02
	Within subjects					
	Time	(1,37)	35.35	3.53	.07	.09
PICCOLO-Responsiveness	Time x condition	(1,37)	7.82	.78	.38	.02
	Time x child age	(1,37)	27.80	2.77	.10	.07
	Between subjects					
	Child age	(1,37)	1.53	1.12	.30	.03
	Study condition	(1,37)	.38	.28	.60	.007
	Within subjects					
Conversational Turns	Time	(1,37)	.90	1.49	.23	.04
	Time x condition	(1,37)	.13	.22	.65	.006
	Time x child age	(1,37)	.63	1.04	.32	.03
	Between subjects					
	Child age	(1,38)	930199.29	10.56	.002	.22
	Study condition	(1,38)	4717.96	.05	.82	.001
Conversational Turns	Within subjects					
	Time	(1,38)	433.57	.03	.87	.004
	Time x condition	(1,38)	36666.38	2.15	.15	.05
	Time x child age	(1,38)	2870.52	.17	.68	.004

Table 8. Repeated measures ANOVAs for child outcomes in study 3.

Outcome	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	Partial η^2
MCDI Percentile Score	Between subjects					
	Child age	(1,34)	2589.19	2.05	.16	.06
	Study condition	(1,34)	2582.95	2.04	.16	.06
	Within subjects					
	Time	(1,34)	.01	.000	.99	.000
	Time x condition	(1,34)	279.47	1.25	.27	.04
BITSEA Problem	Between subjects					
	Child age	(1,40)	10.40	.12	.73	.003
	Study condition	(1,40)	1.32	.02	.90	.000
	Within subjects					
	Time	(1,40)	2.70	.36	.55	.01
	Time x condition	(1,40)	4.78	.64	.43	.02
BITSEA Competence	Between subjects					
	Child age	(1,40)	16.73	1.26	.27	.03
	Study condition	(1,40)	28.10	2.12	.15	.05
	Within subjects					
	Time	(1,40)	1.88	1.16	.29	.03
	Time x condition	(1,40)	2.18	1.34	.25	.03
	Time x child age	(1,40)	.14	.09	.77	.002

Discussion

The present study examined the extent to which a strength-based video coaching intervention was effective in improving mothers' PSOC, responsive parenting, and quality of maternal use of language. Additionally, this study examined whether improvements in PSOC would mediate the intervention effects on responsive parenting and quality of maternal use of language, and whether change in responsive parenting and quality of maternal use of language was associated with improvements in child language and social-emotional development.

Contrary to study hypotheses, the FIND intervention did not have a significant effect on mothers PSOC, parenting behaviors, or quality of language. Mothers in the FIND condition did not have a significant change in their PSOC after completing the intervention. Interestingly, mothers in the waitlist condition demonstrated a significant increase in their PSOC scores at post-assessment. Mothers in the FIND condition started with significantly higher PSOC scores than mothers in the waitlist condition and overall PSOC scores were relatively high at pre-assessment across conditions. It is possible that intervention effects were not observed in part due to the families already feeling confident in their parenting abilities, thus resulting in ceiling effects.

Additionally, intervention effects were not observed for positive parenting behaviors. Ceiling effects may also have contributed to these results. Overall, mothers demonstrated high levels of positive parenting behaviors. As was discussed in the methods section, the scale reliability of the responsiveness domain and total PICCOLO measure at post-assessment were below what would be considered acceptable. These two measurements from the PICCOLO were selected to be included in analyses as they demonstrated better scale reliability overall than those observed for the other parenting domains of the PICCOLO and have previously demonstrated strong reliability as well as validity (Roggman et al., 2013). It is possible that at post-assessment in particular, these scores were not reliably capturing positive parenting behaviors in a manner consistent with the pre-assessment scores.

PICCOLO is still a relatively new measure of parenting behaviors and few studies have used PICCOLO to measure intervention effects (e.g. Boyce et al., 2017; Chazan-Cohen, 2013; Schindler, Fisher, & Shonkoff, 2017). Boyce et al. (2017) looked only at

the teaching domain but did not find significant intervention effects or associations with their other study variables. Interestingly, Schindler et al. (2017) used a version of the PICCOLO adapted to be more appropriate for fathers to measure changes in parenting behaviors in a pilot study of the FIND intervention with fathers. In the quasi-experimental study, fathers demonstrated a significantly greater amount of positive parenting behaviors on the PICCOLO after participating in the FIND program. It is important to note that both pre- and post-test means in their sample were significantly lower than the means in the present sample, lending some potential support to the idea that ceiling effects may have been present.

Similar to the previous findings, and contrary to study hypotheses, the FIND program did not have a significant effect on the amount of conversational turns that occurred between mother-child dyads. Previous research has found that parenting interventions can be effective in increasing the amount of conversational turns that occur in mother-child dyads (Suskind et al., 2016). Mothers in this study, overall, had a difficult time collecting uninterrupted durations of audio recordings and instead often recorded 1 to 3 hours at a time. As a result, the LENA software was not able to be used to automatically generate a reliable estimate of conversational turns (Xu et al., 2009). Therefore, conversational turns were counted during randomly selected time segments of the audio recording, adding up to 1 hour. It is possible that these counts were not representative of children's home language environments. Furthermore, qualitative information about the day of recording was not collected such as whether recording occurred on a typical weekday, or whether something was different about the recording day such as the child being home sick. Families also engage in many different activities

throughout the day, and it was not possible to account for these activities and the impact that they might have on the frequency of conversational turns. For example, there may have been differences in conversational turns during meal times, before bed, bath time, book reading, or when children were watching television.

Researchers are becoming increasingly interested in understanding the nuances of mothers' use of language in supporting child language development. This interest includes better understanding factors such as time of day in which parents speak more around their children or differences by type of activity. For example, Gilkerson, Richards, and Topping (2017) found that counts of conversational turns were much higher during times when parents were reading to their children than times when they were engaged in other activities. Furthermore, the amount of time that children spend watching television negatively impacts the amount of time they are engaged in book reading with their parents and reduces the amount of child-directed language used by parents as well as parent-child interactions (Anderson & Hanson, 2017; Khan, Purtell, Logan, Ansari, & Justice, 2017).

Additionally, while conversational turns assume more interaction and child directed language than adult word counts alone, they still provide a quantitative measure of children's language environments and do not take into account qualitative aspects such as tone and complexity (Gilkerson et al., 2017). Regardless, research suggests that conversational turns are associated with important language outcomes for children including positive expressive and receptive language skills as well as increased neural activity in brain regions associated with language (e.g., Romeo et al., 2018; Zimmerman et al., 2009).

The second set of hypotheses evaluated in this study included whether the FIND intervention had significant positive effects on child language and social-emotional development relative to the waitlist control condition. No significant intervention effects were observed on children's percentile score of vocabulary words produced. Similarly, intervention effects were not observed for either the behavior problems or social competence scales of the BITSEA. Although it was possible for FIND to have significant effects on child outcomes despite nonsignificant effects on the parenting outcomes included in this study, the results were unsurprising in the context of the study hypothesis that changes in PSOC and positive parenting behaviors would account for intervention effects on child outcomes. It is also possible that the FIND intervention does not result in immediately identifiable changes in child outcomes. The FIND program supports parents in recognizing their behaviors that contribute to "serve and return" interactions and encourages parents to find naturally occurring opportunities throughout their week to engage in more of these interactions. While it would be expected that the FIND intervention results in more immediate changes in mothers' PSOC and positive parenting behaviors, it is possible that the hypothesized benefits on child development would occur more distally. In fact, many parenting interventions tend to observe more outcomes related to parenting or the parent-child relationship as opposed to immediate child outcomes (Gewirtz, DeGarmo, & Zamir, 2018; National Center for Parent, Family, and Community Engagement, 2015; Shah, Kennedy, Clark, Bauer, & Schwartz, 2016).

Limitations and Future Directions

There are several limitations of the current study. Data for this study came from a pilot randomized-controlled trial of the FIND intervention. Therefore, the sample utilized

is relatively small with limited demographic diversity, which reduces generalizability and may have limited the likelihood of observing intervention effects. Furthermore, while the inclusion criteria required families to meet the federal guidelines for qualifying for free and reduced lunch, this sample varied greatly in terms of mothers' highest obtained level of education. Notably, 25% of the mothers in this study had a bachelor's degree or higher. The FIND intervention was hypothesized to be salient for low-income families, however it is possible that the families in this sample differ from the broader population of low-income families across the United States. Additionally, due to the pilot nature of this study, child age varied greatly. While it is theorized that the FIND intervention has the potential to benefit caregivers with children from infancy to early childhood (Fisher et al., 2016), it is possible that intervention effects could differ across different developmental stages. For example, it is plausible that FIND could be more effective in younger infants or older children depending on the specific context.

In the current study, it was hypothesized that the FIND program could be an effective parenting program with important implications for academic achievement by increasing responsive parenting and “serve and return” interactions that lead to optimal child language and social-emotional development. However, this study did not address all components of the theory of change which suggests specific mechanisms through which the FIND intervention may be effective (Fisher et al., 2016). For example, the FIND theory of change identifies that neurocognitive capabilities of caregivers such as executive functioning skills serve as underlying mechanisms and contribute to intervention effects on parenting behaviors, beliefs, and attitudes. The present study did not include measures of mothers' executive function abilities. It is possible that changes

in mothers' executive function abilities may be identifiable immediately post-intervention and would then support more longer-term changes in parenting and child outcomes. Further research on the FIND program, and specifically the hypothesized theory of change is needed.

Shonkoff and Fisher (2013) discussed the need for a shift in intervention research and development in order to address the need for a more nuanced understanding of intervention effectiveness. Specifically, rather than asking whether an intervention works, they propose that researchers ask: who do interventions work for, in what contexts, and why do they work? Schindler et al. (2017) provided an example of how this work can be conducted in a process that they call *rapid cycle iterative learning*. This iterative process encourages researchers to work closely with an interdisciplinary team including practitioners as well as community members in order to collaboratively develop research questions and make changes to how interventions are designed and implemented to meet the needs of specific communities. While this method poses a shift in traditional intervention research, it presents the possibility of more small-scale trials to be implemented in a manner which reduces the time for evidence to be gathered and for a program to be implemented at a larger scale. Furthermore, given the collaboration with community agencies and practitioners, it is more likely that the intervention design will be effective in the given community and that it was designed in a manner that is sustainable for the agency (Schindler et al., 2017; Shonkoff & Fisher, 2013). Future research should prioritize this rapid-cycling iterative process in order to identify specific groups of caregivers who could benefit the most from the FIND intervention and the contexts in which this intervention would be most advantageous.

Conclusion

The current study hypothesized that the FIND intervention may be an effective, scalable program to bolster children's academic achievement by supporting parents in engaging in more positive parenting to promote child language and social-emotional development. Language and social-emotional skills are integral to children's later academic achievement and can be facilitated at a young age through positive interactions with caregivers (Coplan et al., 2008; Kim et al., 2015; Zeytinoglu et al., 2017). As was previously reviewed, a large number of interventions have been developed to target the academic achievement gap. However, these interventions primarily take an instructional approach consistent with a deficit model or encourage parents to increase the amount of time they spend engaged in specific language-based activities (Lonigan et al., 2008). Furthermore, they are often expensive and require a large time investment from parents and the practitioner (Gomby 2005; Magnuson & Duncan, 2016).

While the current study did not identify intervention effects, it is still imperative to identify scalable programs. Evidence suggests that brief video-coaching programs are effective in improving parenting behaviors in at-risk families (e.g. Bakermans-Kranenburg et al., 2005; Fukkink, 2008). Furthermore, research has identified that strength-based intervention approaches are particularly effective in changing behavior (Brun & Rapp, 2001; Nese et al., 2016; Schindler et al., 2017; Waters & Sun, 2016). Continued research using the rapid-cycling iterative approach above may be a promising model for identifying whether FIND is a candidate program to meet this need.

CHAPTER V

CONCLUDING SUMMARY

The aims of this dissertation were broadly to examine the relationships between parenting sense of competence (PSOC) and parenting behaviors in relation to child development skills that are critical for successful academic achievement. The first study explored the relationship between PSOC, parenting behaviors, and language development whereas the second study focused on social-emotional development. The third study evaluated whether a strengths-based video coaching program was effective in increasing PSOC, positive parenting behaviors, and child language and social-emotional development.

Study 1 Summary

The first study utilized a fully prospective-longitudinal design to test the hypothesis that PSOC assessed in infancy would be positively related to child language development in early childhood, and that this association would be partially mediated by parenting behaviors. These hypotheses were partially supported. Consistent with previous research, mothers' PSOC was positively associated with parenting behaviors (Coleman & Karraker, 2003; Hoover-Dempsey et al., 1992; Leahy-Warren & McCarthy, 2011; Meunier et al., 2010; Peacock-Chambers et al., 2017). Furthermore, positive parenting behaviors were associated with higher receptive language and total language scores. This result was not found for expressive language. The association between parenting and language is consistent with previous findings (Bradley & Corwyn, 2005; NICHD Early Childcare Network, 2000; Hudson et al., 2015; Masur et al., 2005; Raviv et al., 2004; Tamis-LeMonda et al., 2004).

In addition, the results presented in the first study (Chapter II) also identified a significant indirect effect such that mothers' PSOC at 12 months of age had an effect on auditory comprehension at 36 months through positive parenting behaviors at 24 months. Furthermore, there was a significant indirect effect from PSOC to vocabulary scores at preadolescence through both positive parenting behaviors at 24 months and child auditory comprehension at 36 months. This same pattern of results was not observed when expressive language and total language scores were included in the model.

While the observed effect size was small, results from the first study provide support that PSOC has implications for child language development, suggesting that supporting parents in increasing their PSOC when their children are young may impact children's developmental trajectory. Only one study was found that has demonstrated a similar relationship between PSOC and child language development (Albarran & Reich, 2014) and no known previous studies have explored whether parenting behaviors mediate the relationship between PSOC and child language development. Therefore, more research is warranted to explore the relations between PSOC, parenting behaviors, and child language development.

Study 2 Summary

The second study proposed a mediation model suggesting that positive parenting behaviors partially mediate the relationship between PSOC and child social-emotional development. Consistent with extant literature, parents with higher PSOC were more likely to report more positive child social-emotional development. However, within the current sample, PSOC was not associated with the observed parenting behaviors. In addition, results indicated parenting behaviors were not associated with child social-

emotional development. Therefore, the mediation was not further examined. It is unclear in this study whether the nonsignificant findings suggest that the relationships between PSOC, parenting behaviors, and social-emotional development are not as strong as predicted or generalizable as the literature base suggests. Further limitations were discussed in Chapter III.

While analyses in the second study did not support Ardel and Eccle's (2001) parenting self-efficacy theory, future research should still work to address this question. For example, Glatz and Buchanan (2015) more closely defined processes that contribute to or expand upon the original Ardel and Eccles (2001) theory. Specifically, these authors proposed that a feedback loop occurs when increased PSOC leads to increased positive parenting behavior that supports positive child developmental outcomes, which then increases parents' PSOC. While the present study utilized a PSOC-driven approach in which PSOC is the initiator of the feedback loop, Glatz and Buchanan (2015) also proposed a parent-behavior driven process as the starting point for the feedback loop in which parenting behaviors serve as the antecedent and predict PSOC as well as a child-driven process. Furthermore, Glatz & Buchanan (2015) provided support for a PSOC-driven process during early adolescence, but their results also suggest that this process may be more parent behavior-driven or child-driven depending on the developmental period. Their research was limited to early, middle, and late adolescence and therefore provides limited information on how these variables relate in infancy and early childhood.

Study 3 Summary

The third study in this series addressed existing limitations of childhood programs and interventions that are specifically aimed at reducing the achievement gap in children raised in poverty. Current interventions targeting academic achievement tend to take place in early childhood education settings such as Head Start and are time intensive (Bierman et al., 2017; Lynch et al., 2004; Neuman et al., 2011; Shure & Spivack, 1982; Wasik & Bond, 2001). As was discussed in Chapter IV, this is concerning given the high percentage of children who do not attend preschool or daycare (58% of 3-year-old children; Child trends, 2016). Additionally, while parenting-based interventions have demonstrated promising results, they tend to focus on teaching parents new skills, are directive in nature, tend to occur over a long span of time, and are expensive (e.g., Baker et al., 1998; Burgoyne et al., 2017; Gomby, 2005; Leffel & Suskind, 2013; Levenstein et al., 2002; Magnuson & Duncan, 2016). Despite these intervention efforts, the achievement gap persists and a new avenue for change is needed (Potter & Roksa, 2013; Sharkins et al., 2017).

Filming Interactions to Nurture Development (FIND) is an intervention that was developed in part due to these existing limitations. FIND utilizes a strengths-based approach to move away from a deficit model in order to highlight and increase the frequency of parents' existing skills. FIND was hypothesized to be a beneficial program for low-income families due to the short duration and strengths-based approach. The “serve and return” interactions are considered to be particularly important for children's brain development and support skills critical for academic achievement such as social-emotional skills and language development (National Scientific Council on the

Developing Child, 2012). Therefore, the third study aimed to identify the extent to which a strengths-based video coaching intervention, FIND, was effective in increasing mothers' PSOC and supportive parenting behaviors. A second aim was to identify whether PSOC mediated the effect of FIND on positive parenting behaviors. The third aim was to identify the effectiveness of FIND to improve children's language and social-emotional development and whether these changes would be mediated by increased positive parenting behavior.

Results from the third study did not support these hypotheses and no intervention effects on parenting behaviors or on child outcomes were observed. Overall, the findings from this series of studies provided minimal evidence to support whether parenting behaviors mediate the relationship between PSOC and child development outcomes associated with academic achievement. While the first study found evidence consistent with past literature showing that PSOC is associated with positive parenting behaviors, results only partially supported the hypothesis that PSOC is associated with child language development. The second study, on the other hand, found support for the relationship between PSOC and child social-emotional development, but did not find evidence for the relationship between PSOC and positive parenting behaviors. Finally, the third study did not provide evidence for the effectiveness of a strengths-based video coaching program to increase PSOC, positive parenting behaviors, and child language and social-emotional development. Refer to Chapters II, II, and IV for a discussion of each study regarding factors that may have contributed to the nonsignificant findings.

Practice and Policy Implications

Children raised in low-income families are at a disproportionate risk for poor academic outcomes such as lower scores on standardized testing, lower grades, and lower levels of educational attainment (Sharkins et al., 2017). Furthermore, children who demonstrate poor academic achievement at school entry are more likely to continue having poor outcomes including school drop-out, peer rejection, and emotional and behavioral disorders (Horn & Packard, 1985; Bennett et al., 2003). Center- and home-based parenting interventions have been implemented nationwide in an effort to reduce this achievement gap. However, they are often long-term and expensive, thus limiting the number of families that can benefit from such programs and decreasing the likelihood that low-income families can remain engaged (Goerge et al., 2007; Scanlon & Devine, 2001).

While previous research has investigated how early childhood programs reduce the long-term costs associated with poverty, funding for these programs is not consistent (Heckman, 2006; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010). In addition, cost-benefit analyses have been shown to have a positive influence on policy decisions, but there are existing barriers that often prevent policymakers from making decisions based upon these analyses. Of significant note, policy makers often have to make decisions that balance conflicting priorities, and the need for immediate results frequently takes priority (The Pew Charitable Trusts, 2013).

Identifying short-term interventions that are cost effective and can be widely implemented is one way to support as many families as possible for children at as early of an age as possible. Despite the unexpected findings in this dissertation, the theoretical

support in the literature maintains that supportive and strengths-based video coaching programs, such as FIND, may be effective in increasing parental engagement in services, PSOC, and positive parenting behaviors consistent with the parenting self-efficacy theory (Fukkink, 2008; Kempe et al., 2014; Ardelt & Eccles, 2001).

Although traditional intervention research is expensive and time consuming, future research is needed to support the development of these programs. Shonkoff and Fisher (2013) provide a framework through which innovative intervention strategies can be more quickly developed, researched, and implemented to scale within communities. Their frameworks call for increased collaboration between researchers, policy makers, and practitioners in order to collaboratively identify strategies to support families and young children while balancing conflicting priorities. Additionally, Shonkoff and Fisher (2013) call for a shift in the current research and practice atmosphere towards a model that privileges *rapid cycle iterative learning* (Schindler et al., 2017). This iterative process involves implementing small scale intervention studies that are collaboratively developed by researchers, practitioners, and policymakers, and then by sharing results in an ongoing process that continuously refines programs to better meet the needs of families. Schindler and colleagues (2017) provide a detailed example of such a process, using the FIND intervention.

Conclusion

The studies presented in this dissertation identify the potential importance of PSOC in supporting children's academic achievement through specifically influencing language and social-emotional skills. Despite inconsistent findings, the wealth of existing research suggests that interventions and programs aimed at increasing PSOC have the

potential to increase positive parenting behaviors and support positive child language and social-emotional development. However, future research will yield a greater understanding of how PSOC contributes to child language development and clarify the causal relationships between PSOC and parenting behaviors.

The research presented in this dissertation also identifies the need for further research on short-term, cost-effective parenting interventions that can be implemented when children are young in order to support children's academic skills prior to school entry. In particular, collaboration between researchers, policy makers, and practitioners in developing and researching these programs will likely lead programs to be implemented on a larger scale. With this in mind, programs that support parents to engage in more positive parenting behaviors hold the promise of making large steps towards reducing the academic achievement gap.

REFERENCES CITED

- Albarran, A. S., & Reich, S. M. (2014). Using baby books to increase new mothers' self-efficacy and improve toddler language development. *Infant and Child Development, 23*, 374–387.
- Anderson D.R., & Hanson K.G. (2017). Screen media and parent–child interactions. In R. Barr, & D. Linebarger (Eds.), *Media exposure during infancy and early childhood*. Cham, Switzerland: Springer International Publishing.
- Anderson, S., Roggman, L. A., Innocenti, M. S., & Cook, G. A. (2013). Dad's parenting interactions with children: Checklist of observations linked to outcomes (PICCOLO-D). *Infant Mental Health Journal, 34*(4), 339–351.
- Apter-Levi, Y., Pratt, M., Vakart, A., Feldman, M., Zagoory-Sharon, O., & Feldman, R. (2016). Maternal depression across the first years of life compromises child psychosocial adjustment: Relations to child HPA-axis functioning. *Psychoneuroendocrinology, 64*, 47–56.
- Aram, D. (2008). Parent – child interaction and early literacy development. *Early Education and Development, 19*, 1–6.
<https://doi.org/10.1080/10409280701838421>
- Ardelt, M., & Eccles, J. S. (2001). Effects of mothers' parental efficacy beliefs and promotive parenting strategies on inner-city youth. *Journal of Family Issues, 22*, 944–972.
- Arriaga, R. I., Fenson, L., Cronan, T., & Pethick, S. J. (1998). Scores on the MacArthur Communicative Development Inventory of children from low and middle-income families. *Applied Psycholinguistics, 19*(2), 209-223.
- Baker, A. L., Piotrowski, C. S., & Brooks-Gunn, J. (1998). The effects of the home instruction program for preschool youngsters (HIPPO) on children's school performance at the end of the program and one year later. *Early Childhood Research Quarterly, 588*(4), 571–588.
- Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2005). Disorganized infant attachment and preventive interventions: A review and meta-analysis. *Infant Mental Health Journal, 26*(3), 191-216.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191.
- Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*(5), 729–735.

- Bandura, A. (2018). Toward a psychology of human agency: Pathways and reflections. *Perspectives on Psychological Science, 13*(2), 130–136. <https://doi.org/10.1177/1745691617699280>
- Barnard, K. E. (1994). Nursing child assessment satellite training: Caregiver/parent-child interaction feeding manual. *Seattle, WA*.
- Belsky, J. A. Y., & Fearon, R. P. (2002). Infant–mother attachment security, contextual risk, and early development: A moderational analysis. *Development and psychopathology, 14*(2), 293–310.
- Bennett, K. J., Brown, K. S., Boyle, M., Racine, Y., & Offord, D. (2003). Does low reading achievement at school entry cause conduct problems? *Social Science & Medicine, 56*(12), 2443–2448.
- Benzies, K., & Mychasiuk, R. (2009). Fostering family resiliency: A review of the key protective factors. *Child & Family Social Work, 14*, 103–114. <https://doi.org/10.1111/j.1365-2206.2008.00586.x>
- Bierman, K. L., Heinrichs, B. S., Welsh, J. A., Nix, R. L., & Gest, S. D. (2017). Enriching preschool classrooms and home visits with evidence-based programming: Sustained benefits for low-income children. *The Journal of Child Psychology and Psychiatry, 58*(2), 129–137. <https://doi.org/10.1111/jcpp.12618>
- Birmingham, R. S., Bub, K. L., & Vaughn, B. E. (2017). Parenting in infancy and self-regulation in preschool: An investigation of the role of attachment history. *Attachment & Human Development, 19*(2), 107–129. <https://doi.org/10.1080/14616734.2016.1259335>
- Blaire, C., & Diamond, A. (2008). Biological processes in prevention and intervention: The promotion of self-regulation as a means of preventing school failure. *Development and Psychopathology, 20*(3), 899–911.
- Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual Review of Psychology, 66*, 711–731. <https://doi.org/10.1146/annurev-psych-010814-015221>
- Blair, C., & Raver, C. C. (2016). Poverty, stress, and brain development: New directions for prevention and intervention. *Academic Pediatrics, 16*(3), S30–S36. <https://doi.org/10.1016/j.acap.2016.01.010>
- Bohlin, G., & Hagekull, B. (1987). “Good mothering”: Maternal attitudes and mother-infant interaction. *Infant Mental Health Journal*. <https://doi.org/10.1002/1097-0355>

- Bornstein, M. H., Tamis-LeMonda, C. S., & Haynes, O. M. (1999). First words in the second year: Continuity, stability, and models of concurrent and predictive correspondence in vocabulary and verbal responsiveness across age and context. *Infant Behavior and Development, 22*, 65-85.
- Boyce, L. K., Seedall, R. B., Innocenti, M. S., Roggman, L. A., Cook, G. A., Hagman, A. M., & Norman, V. K. J. (2017). Influence of a parent–child interaction focused bookmaking approach on maternal parenting self-efficacy. *Infants & Young Children, 30*, 76–93. <https://doi.org/10.1097/IYC.0000000000000085>
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*(1), 371-399.
- Bradley, R. H., & Gilkey, B. (2002). The impact of the home instructional program for preschool youngsters (HIPPY) on school performance in 3rd and 6th grades. *Early Education and Development, 13*(2), 301–212. <https://doi.org/10.1207/s15566935eed1303>
- Breslau, J., Miller, E., Breslau, N., Bohnert, K., Lucia, V., & Schweitzer, J. (2009). The impact of early behavior disturbances on academic achievement in high school. *Pediatrics, 123*, 1472–1476. <https://doi.org/10.1542/peds.2008-1406>
- Bridges, M., Cohen, S. R., Scott, L., Fuller, B., Anguiano, R., & Livas-Dlott, A. (2015). Home activities of Mexican American children: Structuring early socialization and cognitive engagement. *Cultural Diversity and Ethnic Minority Psychology, 21*(2), 181–190.
- Bridgett, D. J., Laake, L. M., Gartstein, M. A., & Dorn, D. (2013). Development of infant positive emotionality: The contribution of maternal characteristics and effects on subsequent parenting. *Infant and Child Development, 22*(4), 362-382.
- Briggs, R. D., Silver, E. J., Krug, L. M., Mason, Z. S., Schrag, R. D. A., Chinitz, S., & Racine, A. D. (2014). Healthy steps as a moderator: The impact of maternal trauma on child social-emotional development. *Clinical Practice in Pediatric Psychology, 2*(2), 166–175.
- Briggs-Gowan, M. J., & Carter, A. S. (2008). Social-emotional screening status in early childhood predicts elementary school outcomes. *Pediatrics, 121*(5), 957-962.
- Briggs-Gowan, M. J., Carter, A. S., Irwin, J. R., Wachtel, K., & Cicchetti, D. V. (2002). Brief Infant-Toddler Social and Emotional Assessment (BITSEA) manual, version 2.0.
- Briggs-Gowan, M. J., Carter, A. S., Skuban, E. M., & Horwitz, S. M. (2001). Prevalence of social-emotional and behavioral problems in a community sample of 1-and 2-

- year-old children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(7), 811-819.
- Britto, P. R., Brooks-Gunn, J., & Griffin, T. (2006). Story readers and story tellers: Stylistic differences in low income, young, African-American mothers' reading styles. *Reading Research Quarterly*, 41, 68-89.
- Brody, G. H., Flor, D. L., & Gibson, N. M. (1999). Linking maternal efficacy beliefs, developmental goals, parenting practices, and child competence in rural single-parent African American families. *Child Development*, 70(5), 1197-1208.
- Brody, G. H., Murry, V. M., Kim, S., & Brown, A. C. (2002). Longitudinal pathways to competence and psychological adjustment among African American children living in rural single-parent households. *Child Development*, 73(5), 1505-1516.
- Brooks-Gunn, J., & Markman, L. B. (2005). The contribution of parenting to ethnic and racial gaps in school readiness. *The Future of Children*, 15, 139-168.
- Brophy-Herb, H. E., Schiffman, R. F., Bocknek, E. L., Dupuis, S. B., Fitzgerald, H. E., Horodyski, M., ... & Hillaker, B. (2011). Toddlers' social-emotional competence in the contexts of maternal emotion socialization and contingent responsiveness in a low-income sample. *Social Development*, 20(1), 73-92.
- Brun, C., & Rapp, R. C. (2001). Strengths-based case management: Individuals' perspectives on strengths and the case manager relationship. *Social Work*, 46(3), 278-288.
- Burchinal, M. R., Campbell, F. A., Bryant, D. M., Wasik, B. H., & Ramey, C. T. (1997). Early intervention and mediating processes in intellectual development among low-income African American children. *Child Development*, 68, 935-954.
- Burgoyne, K., Gardner, R., Whiteley, H., Snowling, M. J., & Hulme, C. (2018). Evaluation of a parent-delivered early language enrichment programme: Evidence from a randomised controlled trial. *The Journal of Child Psychology and Psychiatry*, 59(5), 545-555. <https://doi.org/10.1111/jcpp.12819>
- Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65(1), 1-21.
- Caldwell, J. G., Shaver, P. R., Li, C., & Minzenberg, M. J. (2011). Childhood maltreatment, adult attachment, and depression as predictors of parental self-efficacy in at-risk mothers. *Journal of Aggression, Maltreatment, & Trauma*, 20, 595-616. <https://doi.org/10.1080/10926771.2011.595763>
- Campbell, S. B., & von Stauffenberg, C. (2008). Child characteristics and family

- processes that predict behavioral readiness for school. In A. Booth, & A.C. Crouter (Eds.), *Early disparities in school readiness: How families contribute to transitions into school*, 225-258, London: Psychology Press Ltd.
- Cartmill, E. A., Armstrong III, B. F., Gleitman, L. R., Goldin-Meadow, S., Medina, T. N., & Trueswell, J. C. (2013). Quality of early parent input predicts child vocabulary 3 years later. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(28), 11278–11283. <https://doi.org/10.1073/pnas.1309518110>
- Catts, H. W., Fey, M. E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research*, *45*, 1142–1157.
- Center on the Developing Child at Harvard University. (2011). Building the brain’s “air traffic control” system: How early experiences shape the development of executive function. Working paper No. 11. Retrieved from: www.developingchild.harvard.edu
- Chazan-cohen, R. (2013). Striking a positive note with the PICCOLO. *Infant Mental Health Journal*, *34*(4), 363–366. <https://doi.org/10.1002/imhj>.
- Child trends. (2016). Child care: Indicators of child and youth well-being. Retrieved from: https://www.childtrends.org/wp-content/uploads/2016/05/21_Child_Care-1.pdf
- Christakis, D. A., Gilkerson, J., Richards, J. A., Zimmerman, F. J., Garrison, M. M., Xu, D., ... Yapanel, U. (2009). Audible television and decreased adult words, infant vocalizations, and conversational turns. *Archives of Pediatrics & Adolescent Medicine*, *163*(6), 554. <https://doi.org/10.1001/archpediatrics.2009.61>
- Clegg, J., Law, J., Rush, R., Peters, T. J., & Roulstone, S. (2015). The contribution of early language development to children's emotional and behavioural functioning at 6 years: An analysis of data from the Children in Focus sample from the ALSPAC birth cohort. *Journal of Child Psychology and Psychiatry*, *56*(1), 67-75.
- Coleman, P. K., & Karraker, K. H. (2003). Maternal self-efficacy beliefs, competence in parenting, and toddlers’ behavior and developmental status. *Infant Mental Health Journal*, *24*(2), 126–148. <https://doi.org/10.1002/imhj.10048>
- Colmar, S. H. (2014). A parent-based book-reading intervention for disadvantaged children with language difficulties. *Child Language Teaching and Therapy*, *30*, 79–90. <https://doi.org/10.1177/0265659013507296>
- Conger, R. D., & Conger, K. J. (2002). Resilience in Midwestern families: Selected findings from the first decade of a prospective, longitudinal study. *Journal of*

- Marriage and Family*, 64(2), 361-373.
- Conger, R. D., Ge, X., Elder, G. H., Lorenz, F. O., & Simons, R. L. (1994). Economic stress, coercive family process, and developmental problems of adolescents. *Child development*, 65(2), 541-561.
- Conti, G., & Heckman, J. J. (2013). The developmental approach to child and adult health. *Pediatrics*, 131(Supplement 2), S133-S141.
- Conway, A. M., & McDonough, S. C. (2006). Emotional resilience in early childhood. *Annals of the New York Academy of Sciences*, 1094(1), 272-277.
- Coolahan, K., Fantuzzo, J., Mendez, J., & Mcdermott, P. (2000). Preschool peer interactions and readiness to learn: Relationships between classroom peer play and learning behaviors and conduct. *Journal of Educational Psychology*, 92(3), 458-465.
- Cooper, D. H., & Farran, D. C. (1988). Behavioral risk factors in kindergarten. *Early Childhood Research Quarterly*, 3(1), 1-19.
- Copeland, D. B., & Harbaugh, B. L. (2017). Comprehensive child and adolescent nursing early maternal-efficacy and competence in first-time, low-income mothers. *Comprehensive Child and Adolescent Nursing*, 40(1), 6-28. <https://doi.org/10.1080/24694193.2016.1200695>
- Coplan, R. J., Arbeau, K. A., & Mandana, A. (2008). Don't fret, be supportive! Maternal characteristics linking child shyness to psychosocial and school adjustment in kindergarten. *Journal of Abnormal Child Psychology*, 36, 359-371.
- Corapci, F., & Wachs, T. D. (2002). Does parental mood or efficacy mediate the influence of environmental chaos upon parenting behavior? *Merrill-Palmer Quarterly*, 48(2), 182-201.
- Côté, S. M., Boivin, M., Liu, X., Nagin, D. S., Zoccolillo, M., & Tremblay, R. E. (2009). Depression and anxiety symptoms: Onset, developmental course and risk factors during early childhood. *Journal of Child Psychology and Psychiatry*, 50(10), 1201-1208.
- Daro, D. A., & Harding, K. A. (1999). Healthy families America: Using research to enhance practice. *The Future of Children*, 152-176.
- Dearing, E., McCartney, K., & Taylor, B. (2009). Does higher quality early child care promote low-income children's math and reading achievement in middle childhood? *Child Development*, 80(5), 1329-1349.
- Deater-Deckard, K., & Petrill, S. A. (2004). Parent-child dyadic mutuality and child

- behavior problems: An investigation of gene–environment processes. *Journal of Psychology and Psychiatry*, 45(6), 1171-1179.
- DeGarmo, D. S., Patterson, G. R., & Forgatch, M. S. (2004). How do outcomes in a specified parent training intervention maintain or wane over time? *Prevention Science*, 5(2), 73-89.
- Delker, B. C., Noll, L. K., Kim, H. K., & Fisher, P. A. (2014). Maternal abuse history and self-regulation difficulties in preadolescence. *Child abuse & Neglect*, 38(12), 2033-2043.
- Dickinson, D. K., & Tabors, P. O. (2001). *Beginning literacy with language: Young children learning at home and school*. Baltimore, MD: Paul H Brookes Publishing.
- Dodici, B. J., Draper, D. C., & Peterson, C. A. (2003). Early parent—child interactions and early literacy development. *Topics in Early Childhood Special Education*, 23(3), 124-136.
- Dollaghan, C. A., Campbell, T. F., Paradise, J. L., Feldman, H. M., Janosky, J. E., Pitcairn, D. N., & Kurs-Lasky, M. (1999). Maternal education and measures of early speech and language. *Journal of Speech, Language, and Hearing Research*, 42(6), 1432-1443.
- Domitrovich, C. E., Cortes, R. C., & Greenberg, M. T. (2007). Improving young children’s social and emotional competence: A randomized trial of the preschool “ PATHS ” Curriculum. *The Journal of Primary Prevention*, 28(2), 67–91. <https://doi.org/10.1007/s10935-007-0081-0>
- Domitrovich, C. E., Durlak, J. A., Staley, K. C., & Weissberg, R. P. (2017). Social-emotional competence: An essential factor for promoting positive adjustment and reducing risk in school children. *Child Development*, 88(2), 408–416. <https://doi.org/10.1111/cdev.12739>
- Donovan, W. L., Leavitt, L. A., & Walsh, R. O. (1990). Maternal self-efficacy: Illusory control and its effect on susceptibility to learned helplessness. *Child Development*, 61(5), 1638-1647.
- Dumka, L. E., Gonzales, N. A., Wheeler, L. A., & Millsap, R. E. (2010). Parenting self-efficacy and parenting practices over time in Mexican American families. *Journal of Family Psychology*, 24(5), 522–531. <https://doi.org/10.1037/a0020833>
- Dumka, L. E., Stoerzinger, H. D., Jackson, K. M., & Roosa, M. W. (1996). Examination of the cross-cultural and cross-language equivalence of the parenting self-agency measure. *Family Relations*, 216-222.

- Duncan, G. J. & Magnuson, K. (2011). The nature and impact of early achievement skills, attention skills, and behavior problems. In G.J. Duncan & R.J Murnane (Eds.), *Whither Opportunity: Rising Inequality, Schools, and Children's Life Chances*, New York: Russell Sage.
- Durham, R. E., Farkas, G., Scheffner, C., Tomblin, J. B., & Catts, H. W. (2007). Kindergarten oral language skill: A key variable in the intergenerational transmission of socioeconomic status. *Research in Social Stratification and Mobility*, 25, 294–305. <https://doi.org/10.1016/j.rssm.2007.03.001>
- Elder Jr, G. H., Eccles, J. S., Ardel, M., & Lord, S. (1995). Inner-city parents under economic pressure: Perspectives on the strategies of parenting. *Journal of Marriage and the Family*, 57(3), 771-784.
- Ellingsen, R., Baker, B. L., Blacher, J., & Crnic, K. (2014). Resilient parenting of children at developmental risk across middle childhood. *Research in Developmental Disabilities*, 35, 1364–1374. <https://doi.org/10.1016/j.ridd.2014.03.016>
- Essex, M. J., Kraemer, H. C., Armstrong, Jeffrey, M., Boyce, W. T., Goldsmith, H. H., Klein, M. H., ... Kupfer, D. J. (2006). Exploring risk factors for the emergence of children's mental health problems. *Archives of General Psychiatry*, 63(11), 1246–1256.
- Evans, G. W., & Kim, P. (2013). Childhood poverty, chronic stress, self-regulation, and coping. *Child Development Perspectives*, 7(1), 43-48.
- Fantuzzo, J., Bulotsky-Shearer, R., McDermott, P., Mcwayne, C., & Frye, D. (2007). Investigation of dimensions of social-emotional classroom behavior and school readiness for low-income urban preschool children. *School Psychology Review*, 36, 44–62.
- Farkas, C., & Valdés, N. (2010). Maternal stress and perceptions of self-efficacy in socioeconomically disadvantaged mothers: An explicative model. *Infant Behavior and Development*, 33, 654–662. <https://doi.org/10.1016/j.infbeh.2010.09.001>
- Feldman, R., Granat, A., Pariente, C., Kanety, H., Kuint, J., & Gilboa-Schechtman, E. (2009). Maternal depression and anxiety across the postpartum year and infant social engagement, fear regulation, and stress reactivity. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(9), 919-927.
- Feng, L., Gai, Y., & Chen, X. (2014). Family learning environment and early literacy: A comparison of bilingual and monolingual children. *Economics of Education Review*, 39, 110–130. <https://doi.org/10.1016/j.econedurev.2013.12.005>
- Fenson, L., Marchman, V., Thal, D.J., Dale, P.S., Reznick, J.S., & Bates, E. (2007).

- Communicative development inventories*. Baltimore, MD: Brookes.
- Fenson, L., Pethick, S., Renda, C., Cox, J. L., Dale, P. S., & Reznick, J. S. (2000). Short-form versions of the MacArthur communicative development inventories. *Applied Psycholinguistics*, *21*(1), 95-116.
- Fernald, A., Marchman, V. A., & Weisleder, A. (2013). SES differences in language processing skill and vocabulary are evident at 18 months. *Developmental Science*, *16*(2), 234–248. <https://doi.org/10.1111/desc.12019>
- Fisher, P. A., Frenkel, T. I., Noll, L. K., Berry, M., & Yockelson, M. (2016). Promoting healthy child development via a two-generation translational neuroscience framework: The Filming Interactions to Nurture Development video coaching program. *Child Development Perspectives*, *10*(4), 251–256. <https://doi.org/10.1111/cdep.12195>
- Folger, A. T., Putnam, K. T., Putnam, F. W., Peugh, J. L., Eismann, E. A., Sa, T., ... Ammerman, T. (2017). Maternal interpersonal trauma and child social-emotional development: An intergenerational effect. *Pediatric and Perinatal Epidemiology*, *31*, 99–107. <https://doi.org/10.1111/ppe.12341>
- Fukkink, R. G. (2008). Video feedback in widescreen: A meta-analysis of family programs. *Clinical Psychology Review*, *28*(6), 904-916.
- Fuller, B., Bein, E., Kim, Y., & Rabe-Hesketh, S. (2015). Differing cognitive trajectories of Mexican American toddlers: The role of class, nativity, and maternal practices. *Hispanic Journal of Behavioral Sciences*, *37*, 139–169. <https://doi.org/10.1177/0739986315571113>
- Furstenberg, F. F., Cook, T. D., Eccles, J., Elder, G. H. J., & Sameroff, A. (1999). *Managing to make it: Urban families and successful youth*. Chicago, IL: The University of Chicago Press
- Gardner, F., Burton, J., & Klimes, I. (2006). Randomised controlled trial of a parenting intervention in the voluntary sector for reducing child conduct problems: outcomes and mechanisms of change. *Journal of child psychology and psychiatry*, *47*(11), 1123-1132.
- George, D., & Mallery, M. (2010). *SPSS for windows step by step: A simple guide and reference* (10 edition). Boston, MA: Pearson.
- Gewirtz, A. H., Degarmo, D. S., & Zamir, O. (2018). After deployment, adaptive parenting tools: 1-year outcomes of an evidence-based parenting program for military families following deployment. *Prevention Science*, *19*, 589–599. <https://doi.org/10.1007/s11121-017-0839-4>

- Gilkerson, J., & Richards, J. A. (2009). *The LENA Natural Language Study. LENA Foundation Technical Report*. Boulder, CO. Retrieved from: https://www.lena.org/wp-content/uploads/2016/07/LTR-02-2_Natural_Language_Study.pdf
- Gilkerson, J., Richards, J. A., & Topping, K. J. (2017). The impact of book reading in the early years on parent – child language interaction. *Journal of Early Childhood Literacy, 17*, 92–110. <https://doi.org/10.1177/1468798415608907>
- Gilkerson, J., Richards, J. A., Warren, S. F., Montgomery, J. K., Greenwood, C. R., Oller, D. K., ... Paul, T. D. (2017). Mapping the early language environment using all-day recordings and automated analysis. *American Journal of Speech-Language Pathology, 26*, 248–266.
- Glatz, T., & Buchanan, C. M. (2015). Over-time associations among parental self-efficacy, promotive parenting practices, and adolescents’ externalizing behaviors. *Journal of Family Psychology, 29*(3), 427–437.
- Goerge, R. M., Dilts, J., Yang, D-H., Wasserman, M., & Clary, A. (2007). Chicago children and youth 1990-2010: Changing population trends and their implications for services. Chicago, IL: Chapin Hall at the University of Chicago. Retrieved from: <https://eric.ed.gov/?id=ED496739>
- Gomby, D. S. (2005). Home visitation in 2005: Outcomes for children and parents. Invest in Kids Working Paper No. 7. Retrieved from: <http://legis.wisconsin.gov/lc/committees/study/2008/SFAM08/files/GombyHVoutcomes2005.pdf>
- Gonzalez, J. E., Acosta, S., Davis, H., Pollard-Durodola, S., Saenz, L., Soares, D., ... Zhu, L. (2017). Latino maternal literacy beliefs and practices mediating socioeconomic status and maternal education effects in predicting child receptive vocabulary. *Early Education and Development, 28*, 78–95. <https://doi.org/10.1080/10409289.2016.1185885>
- Graziano, P. A., Reavis, R. D., Keane, S. P., & Calkins, S. D. (2007). The role of emotion regulation in children’s early academic success. *Journal of School Psychology, 45*, 3–19. <https://doi.org/10.1016/j.jsp.2006.09.002>
- Groh, A. M., Fearon, R. P., Bakermans-kranenburg, M. J., van IJendoorn, M. H., Steele, R. D., & Roisman, G. I. (2014). The significance of attachment security for children’s social competence with peers: A meta-analytic study. *Attachment & Human Development, 16*(2), 103–136.
- Gross, H. E., Shaw, D. S., Burwell, R. A., & Nagin, D. S. (2009). Transactional processes in child disruptive behavior and maternal depression: A longitudinal study from early childhood to adolescence. *Development and psychopathology, 21*(1), 139-

- Grusec, J. E., Rudy, D., & Martini, T. (1997). Parenting cognitions and child outcomes: An overview and implications for children's internalization of values. In J. E. Grusec & L. Kuczynski (Eds.), *Parenting and children's internalization of values: A handbook of contemporary theory*. Hoboken, NJ, US: John Wiley & Sons Inc.
- Guo, G., & Harris, K. M. (2003). The mechanisms mediating the effects of poverty on children's intellectual development. *Demography*, *37*(4), 431–447.
- Hammer, C. S., Komaroff, E., Rodriguez, B. L., Lopez, L. M., Scarpino, Shelley, E., & Goldstein, B. (2012). Predicting Spanish-English bilingual children's language abilities. *Journal of Speech, Language, and Hearing Research*, *55*, 1251–1264.
- Hammer, D., Melhuish, E., & Howard, S. J. (2017). Do aspects of social, emotional and behavioural development in the pre-school period predict later cognitive and academic attainment? *Australian Journal of Education*, *61*(3), 270–287.
<https://doi.org/10.1177/0004944117729514>
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Publishing.
- Hawaii Family Stress Center. (1994). Early identification training materials: Healthy Families America. Honolulu, HI.
- Hawkins, J. D., Herrenkohl, T. I., Farrington, D. P., Brewer, D., Catalano, R. F., Harachi, T. W., & Cothorn, L. (2000). Predictors of youth violence. *Juvenile Justice Bulletin*, 2–12.
- Healy, K. L., Sanders, M. R., & Iyer, A. (2015). Facilitative parenting and children's social, emotional and behavioral adjustment. *Journal of Child and Family Studies*, *24*, 1762–1779. <https://doi.org/10.1007/s10826-014-9980-x>
- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, *312*, 1900–1902.
- Heckman, J. J. (2011). The economics of inequality: The value of early childhood education. *American Educator*, *35*(1), 31.
- Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P. A., & Yavitz, A. (2010). The rate of return to the HighScope Perry Preschool Program. *Journal of public Economics*, *94*(1-2), 114-128.
- Heerman, W. J., Taylor, J. L., Wallston, K. A., & Barkin, S. L. (2017). Parenting self-efficacy, parent depression, and healthy childhood behaviors in a low-income

- minority population: A cross-sectional analysis. *Maternal and Child Health Journal*, 21(5), 1156–1165. <https://doi.org/10.1007/s10995-016-2214-7>
- Hickey, G., McGilloway, S., Hyland, L., Leckey, Y., Kelly, P., Bywater, T., ... Neill, D. O. (2017). Exploring the effects of a universal classroom management training programme on teacher and child behaviour: A group randomised controlled trial and cost analysis. *Journal of Early Childhood Research*, 15(2), 174–194. <https://doi.org/10.1177/1476718X15579747>
- High, P., Hopmann, M., Lagasse, L., & Linn, H. (1998). Evaluation of a clinic-based program to promote book sharing and bedtime routines among low-income urban families with young children. *Archives of Pediatrics & Adolescent Medicine*, 152(5), 459–465.
- High, P. C., LaGasse, L., Becker, S., Ahlgren I., & Gardner, A. (2000). Literacy promotion in primary care pediatrics: Can we make a difference? *Pediatrics*, 105, 927-934.
- Hill, J. (2002). Biological, psychological and social processes in the conduct disorders. *Journal of Child Psychology and Psychiatry*, 43, 133–164.
- Hill, N. E., & Bush, K. R. (2001). Relationships between parenting environment and children's mental health among African American and European American mothers and children. *Journal of Marriage and Family*, 63(4), 954-966.
- Hinshaw, S. P. (1992). Externalizing behavior problems and academic underachievement in childhood and adolescence: Causal relationships and underlying mechanisms. *Psychological bulletin*, 111(1), 127.
- Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., ... Suma, K. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science*, 26(7), 1071–1083. <https://doi.org/10.1177/0956797615581493>
- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26, 55–88. <https://doi.org/10.1016/j.dr.2005.11.002>
- Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, 74(5), 1368–1378.
- Hoff, E. (2013). Interpreting the early language trajectories of children from low-SES and language minority homes: Implications for closing achievement gaps. *Developmental Psychology*, 49, 4–14. <https://doi.org/10.1037/a0027238>

- Hoff, E., Core, C., Place, S., Rumiche, R., Señor, M., & Parra, M. (2012). Dual language exposure and early bilingual development. *Journal of Child Language*, *39*(1), 1-27.
- Hoff, E., Rumiche, R., Burridge, A., Ribot, K. M., & Welsh, S. N. (2014). Expressive vocabulary development in children from bilingual and monolingual homes: A longitudinal study from two to four years. *Early childhood research quarterly*, *29*(4), 433-444.
- Hoff-Ginsberg, E. (1998). The relation of birth order and socioeconomic status to children's language experience and language development. *Applied Psycholinguistics*, *19*(4), 603–629.
- Hoover-Dempsey, K. V, Bassler, O. C., & Brissie, J. S. (1992). Explorations in parent-school relations. *The Journal of Educational Research*, *85*(5), 287–294. <https://doi.org/10.1080/00220671.1992.9941128>
- Hoover-Dempsey, K. V, Battiato, A. C., Walker, J. M. T., Reed, R. P., Dejong, J. M., & Jones, K. P. (2001). Parental involvement in homework. *Educational Psychologist*, *36*(3), 195–209. <https://doi.org/10.1207/S15326985EP3603>
- Horn, W. F., & Packard, T. (1985). Early identification of learning problems: A meta-analysis. *Journal of Educational Psychology*, *77*(5), 597.
- Howse, B. R. B., Calkins, S. D., Anastopoulos, A. D., Keane, S. P., & Terri, L. (2003). Regulatory Contributors to children's Kindergarten achievement. *Early Education and Development*, *14*, 101–119.
- Huang, J., Sherraden, M., Kim, Y., & Clancy, M. (2014). Effects of child development accounts on early social-emotional development an experimental test. *JAMA Pediatrics*, *168*(3), 265–271. <https://doi.org/10.1001/jamapediatrics.2013.4643>
- Hudson, S., Levickis, P., Down, K., Nicholls, R., & Wake, M. (2015). Maternal responsiveness predicts child language at ages 3 and 4 in a community-based sample of slow-to-talk toddlers. *International Journal of Language and Communication Disorders*, *50*, 136–142. <https://doi.org/10.1111/1460-6984.12129>
- Hughes, J. N., & Kwok, O. (2006). Classroom engagement mediates the effect of teacher–student support on elementary students' peer acceptance: A prospective analysis. *Journal of School Psychology*, *43*, 465–480. <https://doi.org/10.1016/j.jsp.2005.10.001>
- Hughes, M., & Cossar, J. (2016). The relationship between maternal childhood emotional abuse/neglect and parenting outcomes: A systematic review. *Child Abuse Review*, *25*, 31–45. <https://doi.org/10.1002/car>

- Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M., & Lyons, T. (1991). Early vocabulary growth: Relation to language input and gender. *Developmental Psychology, 27*(2), 236–248.
- Huttenlocher, J., Waterfall, H., Vasilyeva, M., Vevea, J., & Hedges, L. V. (2010). Sources of variability in children's language growth. *Cognitive Psychology, 61*, 343–365. <https://doi.org/10.1016/j.cogpsych.2010.08.002>
- Innocenti, M. S., Roggman, L. A., & Cook, G. A. (2013). Using the PICCOLO with parents of children with a disability. *Infant Mental Health Journal, 34*(4), 307–318. <https://doi.org/10.1002/imhj>.
- Ispa, J. M., Fine, M. A., Halgunseth, L. C., Harper, S., Robinson, J., Boyce, L., ... & Brady-Smith, C. (2004). Maternal intrusiveness, maternal warmth, and mother–toddler relationship outcomes: Variations across low-income ethnic and acculturation groups. *Child Development, 75*(6), 1613–1631.
- Isabella, R. A., Belsky, J., & von Eye, A. (1989). Origins of infant-mother attachment: An examination of interactional synchrony during the infant's first year. *Developmental Psychology, 25*(1), 12.
- Izzo, C., Weiss, L., Shanahan, T., & Rodriguez-Brown, F. (2000). Parental self-efficacy and social support as predictors of parenting practices and children's socioemotional adjustment in Mexican immigrant families. *Journal of Prevention & Intervention in the Community, 20*(1-2), 197–213.
- Jeon, S., & Neppl, T. K. (2016). Intergenerational continuity in economic hardship, parental positivity, and positive parenting: The association with child behavior. *Journal of Family Psychology, 30*, 22–32.
- Jiang, Y., Granja, M. R., & Koball, H. (2017a). Basic facts about low-income children: Children under 18 Years, 2015. Fact Sheet. National Center for Children in Poverty. Retrieved from: http://www.nccp.org/publications/pdf/text_1170.pdf
- Jiang, Y., Granja, M. R., & Koball, H. (2017b). Basic facts about low-income children: Children 6 through 11 Years, 2015. Fact Sheet. National Center for Children in Poverty. Retrieved from: http://www.nccp.org/publications/pdf/text_1173.pdf
- Johnson, C. J., Beitchman, J. H., Young, A., Escobar, M., Atkinson, L., Wilson, B., ... Wang, M. (1999). Fourteen-year follow-up of children with and without speech/language impairments: Speech/language stability and outcomes. *Journal of Speech, Language, and Hearing Research, 42*, 744–760.
- Johnston, C., & Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology, 18*(2), 167–175.

- Jones, D. E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health, 105*(11), 2283–2290.
<https://doi.org/10.2105/AJPH.2015.302630>
- Jones, S. M., & Kahn, J. (2017). The evidence base of how we learn: Supporting student's social, emotional, and academic development. *The WERA Educational Journal, 10*(1), 5–20.
- Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical Psychology Review, 25*, 341–363.
<https://doi.org/10.1016/j.cpr.2004.12.004>
- Jordan, G. E., Snow, C. E., & Porche, M. V. (2000). Project EASE: The effect of a family literacy project on kindergarten students' early literacy skill. *Reading Research Quarterly, 35*(4), 524–546.
- Juffer, F., & Steele, M. (2014). What words cannot say: The telling story of video in attachment-based interventions. *Attachment & Human Development, 16*(4), 307–314.
- Kaiser, A. P., Hancock, T. B., Cai, X., Foster, E. M., & Hester, P. P. (2000). Parent-reported behavioral problems and language delays in boys and girls enrolled in Head Start classrooms. *Behavioral Disorders, 26*, 26–41.
- Kemp, S. P., Marcenko, M. O., Lyons, S. J., & Kruzich, J. M. (2014). Strength-based practice and parental engagement in child welfare services: An empirical examination. *Children and Youth Services Review, 47*, 27–35.
<https://doi.org/10.1016/j.childyouth.2013.11.001>
- Kempe, R., & Kempe, C. H. (1976). Assessing family pathology. In R. E. Helfer & C. H. Kempe (Eds.), *Child abuse and neglect*. Cambridge, MA: Ballinger
- Khan, K. S., Purtell, K. M., Logan, J., Ansari, A., & Justice, L. M. (2017). Association between television viewing and parent-child reading in the early home environment. *Journal of Developmental and Behavioral Pediatrics, 38*(7), 521–527.
- Kim, S., Boldt, L. J., & Kochanska, G. (2015). From parent-child mutuality to security to socialization outcomes: Developmental cascade toward positive adaptation in preadolescence. *Attachment & Human Development, 17*(5), 472–491.
- Kim, S., & Kochanska, G. (2015). Mothers' power assertion; children's negative, adversarial orientation; and future behavior problems in low-income families: Early maternal responsiveness as a moderator of the developmental cascade. *Journal of Family Psychology, 29*, 1–9.

- Knoche, L. L., Givens, J. E., & Sheridan, S. M. (2007). Risk and protective factors for children of adolescents: maternal depression and parental sense of competence. *Journal of Child and Family Studies, 16*, 684–695. <https://doi.org/10.1007/s10826-006-9116-z>
- Kochanska, G., & Murray, K. T. (2000). Mother–child mutually responsive orientation and conscience development: From toddler to early school age. *Child Development, 71*(2), 417–431.
- Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology, 36*(2), 220–232.
- Kohlhoff, J., & Barnett, B. (2013). Parenting self-efficacy: Links with maternal depression, infant behaviour and adult attachment. *Early Human Development, 89*, 249–256. <https://doi.org/10.1016/j.earlhumdev.2013.01.008>
- Korja, R., Nolvi, S., Grant, K. A., McMahon, C. (2017). The relations between maternal prenatal anxiety or stress and child’s early negative reactivity or self-regulation: A systematic review. *Child Psychiatry & Human Development, 48*, 851–869. <https://doi.org/10.1007/s10578-017-0709-0>
- Laible, D., Carlo, G., Davis, A. N., & Karahuta, E. (2016). Maternal sensitivity and effortful control in early childhood as predictors of adolescents’ adjustment: The mediating roles of peer group affiliation and social behaviors. *Developmental Psychology, 52*(6), 922–932.
- Landry, S. H., Smith, K. E., Miller-Loncar, C. L., & Swank, P. R. (1997). Predicting cognitive-language and social growth curves from early maternal behaviors in children at varying degrees of biological risk. *Developmental Psychology, 33*(6), 1040.
- Landry, S.H., Smith, K.E., Swank, P.R., & Guttentag, C. (2008). A responsive parenting intervention: The optimal timing across early childhood for impacting maternal behaviors and child outcomes. *Developmental Psychology, 44*, 1335-1353.
- Landry, S. H., Smith, K. E., Swank, P. R., Zucker, T., Crawford, A. D., & Solari, E. F. (2011). The effects of a responsive parenting intervention on parent–child interactions during shared book reading. *Developmental Psychology, 48*(4), 969.
- Landry, S. H., Zucker, T. A., Williams, J. M., Merz, E. C., Guttentag, C. L., & Taylor, H. B. (2017). Improving school readiness of high-risk preschoolers: Combining high quality instructional strategies with responsive training for teachers and parents. *Early Childhood Research Quarterly, 40*, 38–51. <https://doi.org/10.1016/j.ecresq.2016.12.001>

- Landsverk, J., Carrilio, T., Connelly, C. D., Ganger, W. C., & Slymen, D. J. (2002). Healthy Families San Diego clinical trial: Technical report. San Diego, CA: San Diego Children's Hospital and Health Center, Child and Adolescent Services Research Center.
- Lazar, I., & Darlington, R. (1982). Lasting effects of early education: A report from the Consortium for Longitudinal Studies. *Monographs of the Society for Research in Child Development*, 47(2-3).
- Leahy-Warren, P., & McCarthy, G. (2011). Maternal parental self-efficacy in the postpartum period. *Midwifery*, 27, 802–810.
<https://doi.org/10.1016/j.midw.2010.07.008>
- Lee, R., Zhai, F., Brooks-Gunn, J., Han, W.-J., & Waldfogel, J. (2014). Head Start Participation and school readiness: Evidence from the early childhood longitudinal study–birth cohort. *Developmental Psychology*, 50, 202–215.
<https://doi.org/10.1037/a0032280>
- Leffel, K., & Suskind, D. (2013). Parent-directed approaches to enrich the early language environments of children living in poverty. *Seminars in Speech and Language*, 34(4), 267–277.
- Lengua, L. J., Honorado, E., & Bush, N. R. (2007). Contextual risk and parenting as predictors of effortful control and social competence in preschool children. *Journal of Applied Developmental Psychology*, 28, 40–55.
<https://doi.org/10.1016/j.appdev.2006.10.001>
- Levenstein, P. (1970). Cognitive growth in preschoolers through verbal interaction with mothers. *American Journal of Orthopsychiatry*, 40(3), 426.
- Levenstein, P., Levenstein, S., & Oliver, D. (2002). First grade school readiness of former child participants in a South Carolina replication of the Parent–Child Home Program. *Applied Developmental Psychology*, 23, 331–353.
- Levenstein, P., Levenstein, S., Shiminski, J. A., & Stolzberg, J. E. (1998). Long-term impact of a verbal interaction program for at-risk toddlers: An exploratory study of high school outcomes in a replication of the mother-child home program. *Journal of Applied Developmental Psychology*, 19(2), 267–285.
- Levenstein, P., & Sunley, R. (1968). Stimulation of verbal interaction between disadvantaged mothers and children. *American Journal of Orthopsychiatry*, 38, 116–121.
- Lindsey, E. W., Cremeens, P. R., Colwell, M. J., & Caldera, Y. M. (2009). The structure of parent–child dyadic synchrony in toddlerhood and children's communication competence and Self-control. *Social Development*, 18(2), 375–396.

- Linver, M. R., Brooks-Gunn, J., & Kohen, D. E. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology, 38*(5), 719–734. <https://doi.org/10.1037//0012-1649.38.5.719>
- Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198–1202.
- Lombard, A. (1981). *Success begins at home: Educational foundations for preschools*. Boston, MA: Lexington Books.
- Lonigan, C. J., Schatschneider, C., & Westberg, L. (2008). Identification of children's skills and abilities linked to later outcomes in reading, writing, and spelling. Developing Early Literacy: Report of the National Early Literacy Panel, 55-106. Retrieved from: https://www.researchgate.net/profile/Laura_Westberg/publication/285723598_Identification_of_children%27s_skills_and_abilities_linked_to_later_outcomes_in_reading_writing_and_spelling/links/5995cf9c458515017ea5f569/Identification-of-childrens-skills-and-abilities-linked-to-later-outcomes-in-reading-writing-and-spelling.pdf?origin=publication_detail
- Lonigan, C., & Whitehurst, G. J. (1998). Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly, 13*(2), 263–290.
- Lowell, D. I., Carter, A. S., Godoy, L., Paulicin, B., & Briggs-Gowan, M. J. (2011). A randomized controlled trial of child FIRST: A comprehensive home-based intervention translating research into early childhood practice. *Child Development, 82*(1), 193–208. <https://doi.org/10.1111/j>
- Lynch, K. B., Geller, S. R., & Schmidt, M. G. (2004). Multi-year evaluation of the effectiveness of a resilience-based prevention program for young children. *The Journal of Primary Prevention, 24*(3), 335–353.
- Machida, S., Taylor, A. R., & Kim, J. (2002). The role of maternal beliefs in predicting home learning activities in head start families. *Family Relations, 51*(2), 176–184.
- Mackler, J. S., Kelleher, R. T., Shanahan, L., Keane, S. P., & O'Brien, M. (2015). Parenting stress, parental reactions, and externalizing behavior from ages 4 to 10. *Journal of Marriage and Family, 77*(2), 388–406. <https://doi.org/10.1111/jomf.12163>.Parenting
- Macphee, D., Fritz, J., & Miller-Heyl, J. (1996). Ethnic variations in personal social networks and Parenting. *Child Development, 67*(6), 3278–3295.

- Magnuson, K., & Duncan, G. J. (2016). Can early childhood interventions decrease inequality of economic opportunity? *The Russell Sage Foundation Journal of the Social Sciences*, 2(2), 123–141.
- Marchman, V. A., Martinez, L. Z., Hurtado, N., Gruter, T., & Fernald, A. (2017). Caregiver talk to young Spanish-English bilinguals: Comparing direct observation and parent-report measures of dual-language exposure. *Developmental Science*, 20, 1–13. <https://doi.org/10.1111/desc.12425>
- Martin, C. G., Bruce, J., & Fisher, P. A. (2012). Racial and ethnic differences in diurnal cortisol rhythms in preadolescents: the role of parental psychosocial risk and monitoring. *Hormones and Behavior*, 61(5), 661–668.
- Martin, C. G., Kim, H. K., Bruce, J., & Fisher, P. A. (2014). Child diurnal cortisol rhythms, parenting quality, and externalizing behaviors in preadolescence. *Psychoneuroendocrinology*, 40, 170–180.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradovic, J., Riley, J. R., ... Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, 41(5), 733–746. <https://doi.org/10.1037/0012-1649.41.5.733>
- Masur, E. F., Flynn, V., & Eichorst, D. L. (2005). Maternal responsive and directive behaviours and utterances as predictors of children's lexical development. *Journal of Child Language*, 32, 63–91. <https://doi.org/10.1017/S0305000904006634>
- Matthies, L. M., Wallwiener, S., Müller, M., Doster, A., Plewniok, K., Feller, S., ... Reck, C. (2017). Maternal self-confidence during the first four months postpartum and its association with anxiety and early infant regulatory problems. *Infant Behavior and Development*, 49, 228–237. <https://doi.org/10.1016/j.infbeh.2017.09.011>
- McClelland, M. M., Morrison, F. J., & Holmes, D. L. (2000). Children at risk for early academic problems: The role of learning-related social skills. *Early Childhood Research Quarterly*, 15(3), 307–329. [https://doi.org/10.1016/S0885-2006\(00\)00069-7](https://doi.org/10.1016/S0885-2006(00)00069-7)
- McLeod, J. D., & Shanahan, M. J. (1996). Trajectories of poverty and children's mental health. *Journal of Health and Social Behavior*, 37, 207–220.
- McCoy, D. C., Connors, M. C., Morris, P. A., Yoshikawa, H., & Friedman-Krauss, A. H. (2015). Neighborhood economic disadvantage and children's cognitive and social-emotional development: Exploring Head Start classroom quality as a mediating mechanism. *Early Childhood Research Quarterly*, 32, 150–159. <https://doi.org/10.1016/j.ecresq.2015.04.003>

- McCubbin, M. A., & McCubbin, H. I. (1996). Resiliency in families: A conceptual model of family adjustment and adaptation in response to stress and crises. *Family Assessment: Resiliency, Coping and Adaptation: Inventories for Research and Practice*, 1-64.
- McEwen, C. A., & McEwen, B. S. (2017). Social structure, adversity, toxic stress, and intergenerational poverty: An early childhood model. *Annual Review of Sociology*, 43, 445–472.
- Mendelsohn, A. L., Mogilner, L. N., Dreyer, B. P., Forman, J. A., Weinstein, S. C., Broderick, M., ... Napier, C. (2001). The impact of a clinic-based literacy intervention on language development in inner-city preschool children. *Pediatrics*, 107, 130–134.
- Menting, B., van Lier, P. A., & Koot, H. M. (2011). Language skills, peer rejection, and the development of externalizing behavior from kindergarten to fourth grade. *The Journal of Child Psychology and Psychiatry*, 52, 72–79. <https://doi.org/10.1111/j.1469-7610.2010.02279.x>
- Merrifield, K. A., & Gamble, W. C. (2012). Associations among marital qualities, supportive and undermining coparenting, and parenting self-efficacy: Testing spillover and processes. *Journal of Family Issues*, 34(4), 510–533. <https://doi.org/10.1177/0192513X12445561>
- Meunier, J. C., Roskam, I., & Browne, D. T. (2010). Relations between parenting and child behavior: Exploring the child's personality and parental self-efficacy as third variables. *International Journal of Behavioral Development*, 35, 246–259. <https://doi.org/10.1177/0165025410382950>
- Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology*, 13, 355–375.
- Morales, M., Mundy, P., Delgado, C. E. F., Yale, M., Messinger, D., Neal, R., & Schwartz, H. K. (2000). Responding to joint attention across the 6- through 24-month age period and early language acquisition. *Journal of Applied Developmental Psychology*, 21(3), 283–298.
- Mouton, B., & Roskam, I. (2015). Confident mothers, easier children: A quasi-experimental manipulation of mothers' self-efficacy. *Journal of Child and Family Studies*, 24, 2485–2495. <https://doi.org/10.1007/s10826-014-0051-0>
- Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: evidence from a longitudinal study. *Developmental Psychology*, 40(5), 665.

- Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide (7th ed.)*. Los Angeles, CA: Muthén & Muthén.
- National Center for Education Statistics. (2009). The nations report card: Reading 2009 (NCES 2010-458). Washington, DC: Institute of Education Sciences. Retrieved from: <https://nces.ed.gov/nationsreportcard/pdf/main2009/2010458.pdf>
- National Center for Parent, Family and Community Engagement. (2015). *Compendium of parenting interventions*. Washington, DC: National Center on Parent, Family, and Community Engagement, Office of Head Start, U.S. Department of Health & Human Services. Retrieved from: https://www.acf.hhs.gov/sites/default/files/ece/compendium_of_parenting_interventions_911_508.pdf
- National Head Start Association. (2017). 2017 Head Start Profile. Retrieved from https://www.nhsa.org/files/resources/2017-fact-sheet_national.pdf
- National Scientific Council on the Developing Child. (2012). The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain: Working Paper 12. Retrieved from: <http://www.developingchild.harvard.edu>
- Needlman, R., Fried, L. E., Morley, D. S., Taylor, S., & Zuckerman, B. (1991). Clinic-based intervention to promote literacy: A pilot study. *Educational Intervention, 145*, 881–884.
- Needlman, R., Toker, K. H., Dreyer, B. P., Klass, P., & Mendelsohn, A. L. (2005). Effectiveness of a primary care intervention to support reading aloud: A multicenter evaluation. *Ambulatory Pediatrics, 5*, 209–215.
- Nelson, K. E., Welsh, J. A., Vance Trup, E. M., & Greenberg, M. T. (2010). Language delays of impoverished preschool children in relation to early academic and emotion recognition skills. *First Language, 31*(2), 164–194. <https://doi.org/10.1177/0142723710391887>
- Neppl, T. K., Jeon, S., Shofield, T. J., & Donnellan, M. (2015). The impact of economic pressure on parent positivity, parenting, and adolescent positivity into emerging adulthood. *Family Relations, 64*, 80–92.
- Nese, R. N., Anderson, C. M., Ruppert, T., & Fisher, P. A. (2016). Effects of a video feedback parent training program during child welfare visitation. *Children and Youth Services Review, 71*, 266-276.
- Neuman, S. B., Newman, E. H., & Dwyer, J. (2011). Educational effects of a vocabulary intervention on preschoolers' word knowledge and conceptual development. *Reading Research Quarterly, 46*(3), 249–272.

- Newman, R. S., Rowe, M. L., & Ratner, N. B. (2016). Input and uptake at 7 months predicts toddler vocabulary: The role of child-directed speech and infant processing skills in language development. *Journal of Child Language*, *43*(5), 1158-1173.
- NICHD Early Child Care Research Network. (2000). The relation of child care to cognitive and language development. *Child Development*, *71*, 960–980.
- Nievar, M. A., Jacobson, A., Chen, Q., Johnson, U., & Dier, S. (2011). Impact of HIPPY on home learning environments of Latino families. *Early Childhood Research Quarterly*, *26*, 268–277. <https://doi.org/10.1016/j.ecresq.2011.01.002>
- O'Connor, T. G., Matias, C., Futh, A., Tantam, G., & Scott, S. (2013). Social learning theory parenting intervention promotes attachment-based caregiving in young children: Randomized clinical trial. *Journal of Clinical Child & Adolescent Psychology*, *42*(3), 358-370.
- Olino, T. M., McMakin, D. L., Nicely, T. A., Forbes, E. E., Dahl, R. E., & Silk, J. S. (2016). Maternal depression, parenting, and youth depressive symptoms: Mediation and moderation in a short-term longitudinal study. *Journal of Clinical Child and Adolescent Psychology*, *45*(3), 279–290. <https://doi.org/10.1080/15374416.2014.971456>
- Oller, D. K., Pearson, B. Z., & Cobo-Lewis, A. B. (2007). Profile effects in early bilingual language and literacy. *Applied Psycholinguistics*, *28*(2), 191-230.
- Orthner, D. K., Jones-Sanpei, H., & Williamson, S. (2004). The resilience and strengths of low-income families. *Family relations*, *53*(2), 159-167.
- Paradis, J., & Genesee, F. (1996). Syntactic acquisition in bilingual children: Autonomous or interdependent? *Studies in second language acquisition*, *18*(1), 1-25.
- Pauli-Pott, U., Schloß, S., & Becker, K. (2017). Maternal responsiveness as a predictor of self-regulation development and Attention-Deficit / Hyperactivity symptoms across preschool ages. *Child Psychiatry & Human Development*, *49*, 42–52. <https://doi.org/10.1007/s10578-017-0726-z>
- Peacock-Chambers, E., Martin, J. T., Necastro, K. A., Cabral, H. J., & Bair-Merritt, M. (2017). The influence of parental self-efficacy and perceived control on the home learning environment of young children. *American Pediatrics*, *17*, 176–183.
- Pears, K. C., Fisher, P. A., Kim, H. K., Healey, C. V., & Yoerger, K. (2013). Immediate effects of a school readiness intervention for children in foster care. *Early Education & Development*, *24*(6), 771–791. <https://doi.org/10.1080/10409289.2013.736037>.Immediate

- Pears, K. C., Healey, C. V, Fisher, P. A., Braun, D., Gill, C., Conte, H. M., ... Ticer, S. (2014). Immediate effects of a program to promote school readiness in low-income children: Results of a pilot study. *Education and Treatment of Children*, 37(3), 431–460.
- Pears, K. C., Kim, H. K., Healey, C. V, Yoerger, K., & Fisher, P. A. (2015). Improving child self-regulation and parenting in families of pre-kindergarten children with developmental disabilities and behavioral difficulties. *Prevention Science*, 16, 222–232. <https://doi.org/10.1007/s11121-014-0482-2>
- Pearson, B. Z., & Fernandez, S. C. (1994). Patterns of interaction in the lexical growth in two languages of bilingual infants and toddlers. *Language Learning*, 44(4), 617-653.
- Petitto, L. A., Katerelos, M., Levy, B. G., Gauna, K., Tetreault, K., & Ferraro, V. (2001). Bilingual signed and spoken language acquisition from birth: Implications for the mechanisms underlying early bilingual language acquisition. *Journal of Child Language*, 28(2), 453-496.
- Piotrowska, P. J., Stride, C. B., Croft, S. E., & Rowe, R. (2015). Socioeconomic status and antisocial behaviour among children and adolescents: A systematic review and meta-analysis. *Clinical Psychology Review*, 35, 47–55. <https://doi.org/10.1016/j.cpr.2014.11.003>
- Ponomartchouk, D., & Bouchard, G. (2015). New mothers' sense of competence: Predictors and outcomes. *Journal of Child and Family Studies*, 24, 1977–1986. <https://doi.org/10.1007/s10826-014-9997-1>
- Posner, M. I., & Rothbart, M. K. (2000). Developing mechanisms of self-regulation. *Development and Psychopathology*, 12(3), 427-441.
- Potter, D., & Roksa, J. (2013). Accumulating advantages over time: Family experiences and social class inequality in academic achievement. *Social science research*, 42(4), 1018-1032.
- Pungello, E. P., Iruka, I. U., Dotterer, A. M., Mills-Koonce, R., & Reznick, J. S. (2009). The effects of socioeconomic status, race, and parenting on language development in early childhood. *Developmental Psychology*, 45(2), 544–557. <https://doi.org/10.1037/a0013917>
- Quiroz, B. G., Snow, C. E., & Zhao, J. (2010). Vocabulary skills of Spanish—English bilinguals: Impact of mother—child language interactions and home language and literacy support. *International Journal of Bilingualism*, 14(4), 379-399.

- Raikes, H. A., & Thompson, R. A. (2005). Efficacy and social support as predictors of parenting stress among families in poverty. *Infant Mental Health Journal, 26*(3), 177-190.
- Raver, C. C. (1996). Relations between social contingency in mother-child interaction and 2-year-olds' social competence. *Developmental Psychology, 32*(5), 850.
- Raviv, T., Kessenich, M., & Morrison, F. J. (2004). A mediational model of the association between socioeconomic status and three-year-old language abilities: The role of parenting factors. *Early Childhood Research Quarterly, 19*(4), 528-547.
- Reardon, S. F. (2013). The widening income achievement gap. *Educational Leadership, 70*(8), 10-16.
- Reese, E., & Cox, A. (1999). Quality of adult book reading affects children's emergent literacy. *Developmental Psychology, 35*, 20-28.
- Reese, E., Sparks, A., & Leyva, D. (2010). A review of parent interventions for preschool children's language and emergent literacy. *Journal of Early Childhood Literacy, 10*, 97-117. <https://doi.org/10.1177/1468798409356987>
- Reich, M. S., Bickman, L., Saville, B. R., & Alvarez, J. A. (2010). The effectiveness of baby books for providing pediatric anticipatory guidance to new mothers' pediatrics. *Pediatrics, 5*(5), 997-1003.
- Reid, M. J., Webster-Stratton, C., & Baydar, N. (2004). Halting the development of conduct problems in head start children: The effects of parent training. *Journal of Clinical Child and Adolescent Psychology, 33*(2), 279-291.
- Reid, M. J., Webster-Stratton, C., & Beauchaine, T. P. (2001). Parent training in Head Start: A comparison of program response among African American, Asian American, Caucasian, and Hispanic mothers. *Prevention Science, 2*(4), 209-227.
- Reinke, W. M., Stormont, M., Herman, K. C., Wang, Z., Newcomer, L., & King, K. (2014). Use of coaching and behavior support planning for students with disruptive behavior within a universal classroom management program. *Journal of Emotional and Behavioral Disorders, 22*(2), 74-82. <https://doi.org/10.1177/1063426613519820>
- Rescorla, L., & Alley, A. (2001). Validation of the Language Development Survey (LDS): A parent report tool for identifying language delay in toddlers. *Journal of Speech, Language, and Hearing Research, 44*(2), 434-445.
- Risi, S., Gerhardstein, R., & Kistner, J. (2003). Children's classroom peer relationships and subsequent educational outcomes. *Journal of Clinical Child and Adolescent*

- Psychology*, 32(3), 351-361.
- Roggman, L. A., Cook, G. A., Innocenti, M. S., Norman, V. J., & Christiansen, K. (2013). Parenting interactions with children: Checklist of observations linked to outcomes (PICCOLO) in diverse ethnic groups. *Infant Mental Health Journal*, 34(4), 290–306. <https://doi.org/10.1002/imhj>.
- Roskam, I., Brassart, E., Loop, L., Mouton, B., & Schelstraete, M. A. (2015). Stimulating parents' self-efficacy beliefs or verbal responsiveness: Which is the best way to decrease children's externalizing behaviors? *Behaviour research and therapy*, 72, 38-48.
- Romeo, R. R., Leonard, J. A., Robinson, S. T., West, M. R., Mackey, A. P., Rowe, M. L., & Gabrieli, J. D. E. (2018). Beyond the 30-million-word gap: Children's conversational exposure is associated with language-related brain function. *Psychological Science*, 29(5), 700–710. <https://doi.org/10.1177/0956797617742725>
- Roth, F. P., Speece, D. L., & Cooper, D. H. (2002). A longitudinal analysis of the connection between oral language and early reading. *The Journal of Educational Research*, 95(5), 259-272.
- Rowe, M. L. (2008). Child-directed speech: Relation to socioeconomic status, knowledge of child development and child vocabulary skill. *Journal of Child Language*, 35, 185–205. <https://doi.org/10.1017/S0305000907008343>
- Rowe, M. L. (2012). A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development. *Child Development*, 83(5), 1762–1774. <https://doi.org/10.1111/j.1467-8624.2012.01805.x>
- Royce, J. M., Darlington, R. B., & Murray, H. W. (1983). Pooled analyses: Findings across studies. In *As the twig is bent: Lasting effects of preschool programs*, 411-459. Hillsdale, NJ: Erlbaum.
- Runyan, D. K., Hunter, W. M., Socolar, R. R., Amaya-Jackson, L., English, D., Landsverk, J., ... & Mathew, R. M. (1998). Children who prosper in unfavorable environments: The relationship to social capital. *Pediatrics*, 101(1), 12-18.
- Russell, B. S., Lee, J. O., Spieker, S., & Oxford, M. L. (2016). Parenting and preschool self-regulation as predictors of social emotional competence in 1st grade parenting and preschool self-regulation as predictors of social. *Journal of Research in Childhood Education*, 30(2), 153–169. <https://doi.org/10.1080/02568543.2016.1143414>
- Salari, R., Wells, M. B., & Sarkadi, A. (2014). Child behaviour problems, parenting behaviours and parental adjustment in mothers and fathers in Sweden.

- Scandinavian Journal of Public Health*, 42, 547–553.
<https://doi.org/10.1177/1403494814541595>
- Scanlon, E., & Devine, K. (2001). Residential mobility and youth well-being: Research, policy, and practice issues. *Journal of Sociology & Social Welfare*, 28, 119–138.
- Schindler, H. S., Fisher, P. A., & Shonkoff, J. P. (2017). From innovation to impact at scale: lessons learned from a cluster of research–community partnerships. *Child Development*, 88(5), 1435–1446. <https://doi.org/10.1111/cdev.12904>
- Schwab, J. F., & Lew-Williams, C. (2016). Language learning, socioeconomic status, and child-directed speech. *WIREs Cognitive Science*, 7, 264–275.
<https://doi.org/10.1002/wcs.1393>
- Seguin, J. R., Parent, S., Tremblay, R. E., & Zelazo, P. D. (2009). Different neurocognitive functions regulating physical aggression and hyperactivity in early childhood. *The Journal of Child Psychology and Psychiatry*, 50(6), 679–687.
<https://doi.org/10.1111/j.1469-7610.2008.02030.x>
- Shah, R., Kennedy, S., Clark, M. D., Bauer, S. C., & Schwartz, A. (2016). Primary care–based interventions to promote positive parenting behaviors: A meta-analysis. *Pediatrics*, 137(5), 1–14.
- Sharkins, K. A., Leger, S. E., & Ernest, J. M. (2017). Examining effects of poverty, maternal depression, and children’s self-regulation abilities on the development of language and cognition in early childhood: An early head start perspective. *Early Childhood Education Journal*, 45(4), 493–498. <https://doi.org/10.1007/s10643-016-0787-9>
- Sheely-Moore, A. I., & Bratton, S. C. (2010). A strengths-based parenting intervention with low-income African American families. *Professional School Counseling*, 13(3), 175–183.
- Sheridan, S. M., Knoche, L. L., Edwards, C. P., Bovaird, J. A., & Kupzyk, K. A. (2010). Parent engagement and school readiness: Effects of the getting ready intervention on preschool children’s social-emotional competencies. *Early Education and Development*, 21(1), 125–156.
<https://doi.org/10.1080/10409280902783517>.Parent
- Sheridan, S. M., Knoche, L. L., Kupzyk, K. A., Edwards, C. P., & Marvin, C. A. (2011). A randomized trial examining the effects of parent engagement on early language and literacy: The Getting Ready intervention. *Journal of School Psychology*, 49(3), 361–383. <https://doi.org/10.1016/j.jsp.2011.03.001>
- Shonkoff, J. P., & Fisher, P. A. (2013). Rethinking evidence-based practice and two-generation programs to create the future of early childhood policy. *Development*

- and Psychopathology*, 25, 1635–1653.
<https://doi.org/10.1017/S0954579413000813>
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7(4), 422.
- Shumow, L., & Lomax, R. (2002). Parental efficacy: Predictor of parenting behavior and adolescent outcomes. *Parenting: Science and Practice*, 2, 127-150.
https://doi.org/10.1207/S15327922PAR0202_03
- Shure, M. B., & Spivack, G. (1982). Interpersonal problem-solving in young children: A cognitive approach to prevention. *American Journal of Community Psychology*, 10(3), 341-356.
- Sim, S., Berthelsen, D. C., Walker, S., Nicholson, J., & Field-Barnsley, R. (2013). A shared reading intervention with parents to enhance young children's early literacy skills. *Early Child Development and Care*, 184, 1531–1549.
<https://doi.org/10.1080/03004430.2013.862532>
- Slagt, M., Deković, M., de Haan, A. D., van den Akker, A. L., & Prinzie, P. (2012). Longitudinal associations between mothers' and fathers' sense of competence and children's externalizing problems: the mediating role of parenting. *Developmental Psychology*, 48(6), 1554–1562. <https://doi.org/10.1037/a0027719>
- Snow, C. E., Burns, M. S., & Griffin, P. (1998). Preventing reading difficulties in young children committee on the prevention of reading difficulties in young children. Washington, DC: The National Academics Press.
<https://doi.org/10.17226/6023>.
- Solomon, T., Plamondon, A., O'Hara, A., Finch, H., Goco, G., Chaban, P., ... Tannock, R. (2018). A cluster randomized-controlled trial of the impact of the tools of the mind curriculum on self-regulation in Canadian preschoolers. *Frontiers in Psychology*, 8, 1–18. <https://doi.org/10.3389/fpsyg.2017.02366>
- Song, L., Tamis-Lemonda, C. S., Yoshikawa, H., Kahana-Kalman, R., & Wu, I. (2012). Language experiences and vocabulary development in Dominican and Mexican infants across the first 2 years. *Developmental Psychology*, 48(4), 1106–1123.
<https://doi.org/10.1037/a0026401>
- Spackman, M. P., Fujiki, M., Brinton, B., Nelson, D., & Allen, J. (2005). The ability of children with language impairment to recognize emotion conveyed by facial expression and music. *Communication Disorders Quarterly*, 26(3), 131–143.

- Squires, J., Bricker, D., Heo, K., & Twombly, E. (2001). Identification of social-emotional problems in young children using a parent-completed screening measure. *Early Childhood Research Quarterly, 16*, 405–419.
- Squires, J., Bricker, D., & Twombly, E. (2002). *Ages & stages questionnaires: Social-emotional*. Baltimore, MD: Paul H. Brookes Publishing Company.
- Steca, P., Bassi, M., Caprara, G. V., & Fave, A. D. (2011). Parents' self-efficacy beliefs and their children's psychosocial adaptation during adolescence. *Journal of Youth and Adolescence, 40*, 320–331. <https://doi.org/10.1007/s10964-010-9514-9>
- Stein, A., Malmberg, L. E., Sylva, K., Barnes, J., Leach, P., & Team, F. C. C. C. (2008). The influence of maternal depression, caregiving, and socioeconomic status in the post-natal year on children's language development. *Child: Care, Health and Development, 34*(5), 603–612. <https://doi.org/10.1111/j.1365-2214.2008.00837.x>
- Stormshak, E. A., Bierman, K. L., McMahon, R. J., & Lengua, L. J. (2000). Parenting practices and child disruptive behavior problems in early elementary school. *Journal of Clinical Child Psychology, 29*(1), 17-29.
- Strohschein, L., & Gauthier, A. H. (2017). Poverty dynamics, parenting, and child mental health in Canada. *Society and Mental Health, 1–17*. <https://doi.org/10.1177/2156869317731603>
- Suskind, D. L., Leffel, K. R., Graf, E., Hernandez, M. W., Gunderson, E. A., Sapolich, S. G., ... & Levine, S. C. (2016). A parent-directed language intervention for children of low socioeconomic status: A randomized controlled pilot study. *Journal of Child Language, 43*(2), 366-406.
- Tamis-LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal responsiveness and children's achievement of language milestones. *Child Development, 72*(3), 748-767.
- Tamis-LeMonda, C. S., Kuchirko, Y., & Song, L. (2014). Why is infant language learning facilitated by parental responsiveness? *Current Directions in Psychological Science, 23*(2), 121-126.
- Tamis-LeMonda, C. S., Shannon, J. D., Cabrera, N. J., & Lamb, M. E. (2004). Fathers and mothers at play with their 2-and 3-year-olds: Contributions to language and cognitive development. *Child development, 75*(6), 1806-1820.
- The Pew Charitable Trusts (2013). States' use of cost-benefit analysis: Improving results for taxpayers. Retrieved May, 2018 from http://www.pewtrusts.org/~media/legacy/uploadedfiles/pes_assets/2013/pewresultfirst50statereportpdf.pdf

- Teti, D. M., & Gelfand, D. M. (1991). Behavioral competence among mothers of infants in the first year: The mediational role of maternal self-efficacy. *Child Development, 62*(5), 918–929.
- Thordardottir, E., Rothenberg, A., Rivard, M. E., & Naves, R. (2006). Bilingual assessment: Can overall proficiency be estimated from separate measurement of two languages? *Journal of Multilingual Communication Disorders, 4*(1), 1-21.
- Tomasello, M., & Farrar, M. J. (1986). Joint attention and early language. *Child development, 1454-1463*.
- Treanor, M. (2016). Social assets, low income and child social, emotional and behavioural wellbeing. *Families, Relationships and Societies, 5*, 209–228.
- Valiente, C., Lemery-Chalfant, K., Swanson, J., & Reiser, M. (2008). Prediction of children's academic prediction of children's academic competence from their effortful control, relationships, and classroom participation. *Journal of Educational Psychology, 100*(1), 67–77. <https://doi.org/10.1037/0022-0663.100.1.67>
- Vally, Z., Murray, L., Tomlinson, M., & Cooper, P. J. (2015). The impact of dialogic book-sharing training on infant language and attention: A randomized controlled trial in a deprived South African community. *The Journal of Child Psychology and Psychiatry, 56*, 865–873. <https://doi.org/10.1111/jcpp.12352>
- van der Voort, A., Juffer, F., & Bakermans-Kranenburg, M. J. (2014). Sensitive parenting is the foundation for secure attachment relationships and positive social-emotional development of children. *Journal of Children's Services, 9*(2), 165–176. <https://doi.org/10.1108/JCS-12-2013-0038>
- Vernon-Feagans, L., Garrett-Peters, P., Willoughby, M., Mills-Koonce, R., & The Family Life Project Key Investigators (2012). Chaos, poverty, and parenting: Predictors of early language development. *Early Childhood Research Quarterly, 27*(3), 339-351.
- Wang, F., Christ, S. L., Mills-Koonce, W. R., Garrett-Peters, P., & Cox, M. J. (2013). Association between maternal sensitivity and externalizing behavior from preschool to preadolescence. *Journal of Applied Developmental Psychology, 34*(2), 89-100.
- Wasik, B. A., & Bond, M. A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of Educational Psychology, 93*(2), 243–250. <https://doi.org/10.1037/0022-0663.93.2.243>

- Waters, L., & Sun, J. (2016). Can a brief strength-based parenting intervention boost self-efficacy and positive emotions in parents? *International Journal of Applied Positive Psychology*, (2016), 41–56. <https://doi.org/10.1007/s41042-017-0007-x>
- Webster-Stratton, C. (1998). Preventing conduct problems in head start children: strengthening parenting competencies. *Journal of Counseling and Clinical Psychology*, 66(5), 715–730.
- Wechsler, D. (2003). *Wechsler intelligence scale for children-WISC-IV*. Psychological Corporation.
- Weisleder, A., & Fernald, A. (2013). Talking to children matters: early language experience strengthens processing and builds vocabulary. *Psychological Science*, 24, 2143–2152. <https://doi.org/10.1177/0956797613488145>
- Whitehurst, G. J., Epstein, J. N., Angell, A. L., Payne, A. C., Crone, D. A., & Fischel, J. E. (1994). Outcomes of an emergent literacy intervention in Head Start. *Journal of Educational Psychology*, 86(4), 542–555.
- Wilson, S. R., Gettings, P. E., Guntzviller, L. M., & Munz, E. A. (2014). Parental self-efficacy and sensitivity during playtime interactions with young children: Unpacking the curvilinear association. *Journal of Applied Communication Research*, 42(4), 409-431.
- Winsler, A., Burchinal, M. R., Tien, H., Peisner-Feinberg, E., Espinosa, L., Castro, D. C., ... De Feyter, J. (2014). Early development among dual language learners: The roles of language use at home, maternal immigration, country of origin, and socio-demographic variables. *Early Childhood Research Quarterly*, 29(4), 750–764. <https://doi.org/10.1016/j.ecresq.2014.02.008>
- Xu, D., Yapanel, U., & Gray, S. (2009). Reliability of the LENA™ language environment analysis system in young children’s natural home environment. *Boulder, CO: LENA Foundation*, 1–16. <https://doi.org/xu>
- Yoshikawa, H., Aber, J. L., & Beardslee, W. R. (2012). The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention. *American Psychologist*, 67(4), 272.
- Zeytinoglu, S., Calkins, S. D., Swingler, M. M., & Leerkes, E. M. (2017). Pathways from maternal effortful control to child self-regulation: The role of maternal emotional support. *Journal of Family Psychology*, 31(2), 170.
- Zimmerman, F. J., Gilkerson, J., Richards, J. A., Christakis, D. A., Xu, D., Gray, S., & Yapanel, U. (2009). Teaching by listening: The importance of adult-child conversations to language development. *Pediatrics*, 124, 342–349. <https://doi.org/10.1542/peds.2008-2267>

Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (1992). *PLS-3: Preschool language scale-3*. London: Psychological Corporation.

Zuckerman, B., & Khandekar, A. (2010). Reach Out and Read: Evidence based approach to promoting early child development. *Current Opinion in Pediatrics*, 22, 1–6.
<https://doi.org/10.1097/MOP.0b013e32833a4673>