Parental health, parenting behavior and externalizing behavior problems among low-income African American preschool children

Cassandra Lynn Esposito

Follow this and additional works at: https://commons.emich.edu/theses

Part of the Clinical Psychology Commons

Recommended Citation
https://commons.emich.edu/theses/744
Parental Health, Parenting Behavior and Externalizing Behavior Problems Among Low-Income African American Preschool Children

by

Cassandra L. Esposito

Dissertation

Submitted to the department of Psychology

Eastern Michigan University

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Clinical Psychology

Dissertation Committee:

Heather Janisse, Ph.D., Chair
Alissa Huth-Bocks, Ph.D.
Catherine Peterson, Ph.D.
Brittany Kohlberger, Ph.D.

June 22, 2017
Ypsilanti, Michigan
Acknowledgments

The completion of dissertation project would not have been possible without the support and assistance of so many important people in my life. First, I would like to thank Dr. Heather Janisse, who believed in me enough to assist me through this entire graduate school process. She also created an amazing research project and lab; without which this project would have never existed. I would also like to thank the rest of my committee and lab members for the successful completion of this project. I am eternally grateful.

Most importantly, I would like to thank my family and friends. To my mother, whose endless love and support helped me to believe in myself almost as much as she believed in me. To my siblings, who have endured and supported this process in my life constantly. To the rest of my friends and loved ones, some of which were truly along for this ride, I could not have done it without all of you.
Abstract

Externalizing behavior problems are highly prevalent in the preschool years. These behaviors are particularly common and problematic among children who are from low-income, minority backgrounds. There is evidence in the literature that describes parental health and parenting problems as risk factors for child externalizing behavior problems. The primary objective of this study was to better understand the relationship between parental health factors, parenting, and child behavior problems. Utilizing data from a low-income African American population, this study examined whether observed measures of parenting behaviors mediated the relationship between measures of parental health (e.g., depression, stress, and BMI) and child externalizing behavior problems. Observed measures of parenting behaviors were collected during three different parent-child interactions (i.e., snack, free play, and clean-up). Results revealed significant positive correlations between parental stress and depression and child externalizing behavior. However, path analyses showed that parental stress was the primary predictor of parental reports of child behavior problems. The current study did not find support for the hypothesis that observed parenting behaviors would mediate the relation between parental health and child behavior. These results, limitations of the present study, and future research directions are discussed.
# Table of Contents

Acknowledgments......................................................................................................................... ii

Abstract ........................................................................................................................................ iii

List of Tables .................................................................................................................................. vii

List of Figures ................................................................................................................................. viii

Parental Health, Parenting Behavior, and Externalizing Behavior Problems Among Low-Income African American Preschool Children................................................................. 1

Preschool Children’s Externalizing Behavior Problems............................................................... 4

Prevalence. ....................................................................................................................................... 6

Negative outcomes of externalizing behaviors in preschool children................................. 6

Socio-demographic risks factors related to increased externalizing behaviors in children. 8

Preschool Children’s Externalizing Behavior Problems in the Context of Maternal Health... 15

Maternal depression. ....................................................................................................................... 17

Maternal stress................................................................................................................................. 18

Maternal overweight. ....................................................................................................................... 19

The relationship between depression, stress, and BMI. .............................................................. 22

Parenting as a Mediator Between Maternal Health and Child Behavior Problems .......... 23

Maternal health and parenting........................................................................................................ 24

Parenting and externalizing behavior problems........................................................................ 26

Parenting as a mediator. ................................................................................................................ 29

Theoretical Framework for This Study....................................................................................... 31

Goals of the Current Study........................................................................................................... 32
## Preliminary Analyses

- Exploratory factor analysis ................................................................. 53
- Correlation analyses ................................................................. 56

## Path Models

- Exploratory analyses ................................................................. 69

## Discussion

- Summary of Results ................................................................. 70
- Study Strengths ................................................................. 82
- Limitations and Future Directions ................................................................. 85
- Implications of the Current Study ................................................................. 87

## Conclusion

- References ........................................................................ 90

## Appendices

- Appendix A: IRB Approval Letter ................................................................. 120
- Appendix B: Recruitment Flyer ................................................................. 121
- Appendix C: Informed Consent ................................................................. 122
- Appendix D: CBCL ........................................................................ 126
- Appendix E: PROMIS ................................................................. 128
- Appendix F: PSS ........................................................................ 129
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demographic Characteristics of Participants</td>
<td>37</td>
</tr>
<tr>
<td>2. Frequency of Parent Reported Child Externalizing Behavior Problems</td>
<td>51</td>
</tr>
<tr>
<td>3. Frequency of Parent Reported Parental Depression Symptoms</td>
<td>51</td>
</tr>
<tr>
<td>4. Mean of Parent Reported Stress Symptoms</td>
<td>52</td>
</tr>
<tr>
<td>5. Frequency of Parental BMI</td>
<td>52</td>
</tr>
<tr>
<td>7. Exploratory Factor Analysis of Observed Parenting Behaviors for Snack</td>
<td>54</td>
</tr>
<tr>
<td>8. Exploratory Factor Analysis of Observed Parenting Behaviors for Free Play</td>
<td>54</td>
</tr>
<tr>
<td>10. Associations Among Snack, Free Play, and Clean-Up Parenting Behavior Codes</td>
<td>57</td>
</tr>
<tr>
<td>11. Means, Standard Deviations, and Associations Among Snack, Free Play, and Clean-Up Total Parenting Behavior Codes</td>
<td>58</td>
</tr>
<tr>
<td>12. Zero Order Correlations Between Model Variables and Demographic Variables</td>
<td>58</td>
</tr>
<tr>
<td>13. Zero Order Correlations Among Model Variables</td>
<td>59</td>
</tr>
<tr>
<td>14. Associations Among Snack, Free Play, and Clean-Up Parenting Behavior Codes and Model Variables</td>
<td>67</td>
</tr>
<tr>
<td>15. Regression Analysis Predicting Child Externalizing Behavior from Parenting Behavior Parenting Codes On Externalizing Behavior</td>
<td>68</td>
</tr>
<tr>
<td>16. Associations Among Parenting Behavior Codes, Parenting Self-Report Measures, and Externalizing Behavior Problems</td>
<td>70</td>
</tr>
</tbody>
</table>
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mediation model with parent rated outcome of child externalizing behaviors</td>
<td>36</td>
</tr>
<tr>
<td>2.</td>
<td>Observed total positive parenting score during snack as a mediator between parental health factors and child externalizing behavior problems</td>
<td>61</td>
</tr>
<tr>
<td>3.</td>
<td>Observed total positive parenting score during snack as a mediator between parental stress and child externalizing problems controlling for parental depression</td>
<td>63</td>
</tr>
<tr>
<td>4.</td>
<td>Observed total positive parenting score during free play as a mediator between parental health factors and child externalizing behavior problems</td>
<td>64</td>
</tr>
<tr>
<td>5.</td>
<td>Observed total positive parenting score during free play as a mediator between parental stress and child externalizing behavior problems for parental depression</td>
<td>64</td>
</tr>
<tr>
<td>6.</td>
<td>Observed total positive parenting score during clean-up as a mediator between parental health factors and child externalizing behavior problems</td>
<td>66</td>
</tr>
<tr>
<td>7.</td>
<td>Unstandardized regression coefficients for the relationship between parental BMI, parental sensitivity during clean-up and child externalizing behavior problems</td>
<td>69</td>
</tr>
</tbody>
</table>
Parental Health, Parenting Behavior, and Externalizing Behavior Problems Among Low-Income African American Preschool Children

Externalizing behavior problems are the most common reason that parents of preschool children seek out psychological services (Campbell, 2002). Not only are these behavior problems persistent throughout childhood, but they also lead to later academic and social/emotional problems (Betz, 1995; Campbell, 2002; Wakschlag & Danis, 2004). Additionally, preschool children from low-income and minority backgrounds are at the highest risk for increased externalizing behavior problems (Brooks-Gunn & Duncan, 1997; Burchinal, Campbell, Brayant, Wasik, & Ramey, 1997; Petterson & Albers, 2001; McLoyd, 1998; Pungello, Kupersmidt, Burchinal, & Patterson, 1996; Walker, Greenwood, Hart, & Carta, 1994). These children are also the least likely to receive treatment for their concerning behavior problems (Thompson, 2005). In addition to poverty and minority status, young children who are overweight (hereafter referred to as child overweight) also have increased externalizing behavior problems (Anderson, He, Schoppe-Sullivan, & Must, 2010). Childhood overweight status contributes to negative self-image and increased externalizing behavior problems in preschool children and continues to be a relatively stable problem in later childhood (Anderson et al., 2010; Davison & Birch, 2001). Given that these risk factors lead to negative behaviors in early childhood and appear to be relatively stable across child development, it is important to investigate the etiologies of these behaviors as they begin in this population. A better understanding of the risks and other predictors of child behavior problems in the preschool years overall will allow for more successful interventions and prevention programs in the future.

There are additional factors outside of the child that serve as predictors of behavior problems in preschool children. One of the most common influential factors is maternal health. For example, maternal depression plays a strong role in the development of externalizing
behavior problems in preschool children (Liaw & Brooks-Gunn, 1994; Perry & Fantuzzo, 2010; Petterson & Albers, 2001) and is highly prevalent among low-income mothers (Ertel, Rich-Edwards, & Koenen, 2011). Another maternal mental health factor that negatively impacts the development of externalizing behavior problems among preschool children is maternal stress (e.g., Crnic & Low, 2002; Cummings et al., 2000, Thompson et al., 1993). Parenthood is a stressful time in a person’s life, especially for low-income families who have additional life stressors, and the impact of this stress can lead to difficulties with attachment, increased behavior problems, and difficulties in other areas of social emotional functioning (Baker, Blacher, Crnic, & Edelbrock, 2002; Hughes & Hughes, 2002; Jackson, 2000; Magyary, Brandt, McGaughey, 1992; McBride, Schoppe, & Rane, 2002). These maternal mental health factors appear to have a detrimental impact on the development of preschool children’s social emotional functioning, and therefore, this study sought to understand how these maternal factors serve to predict elevated externalizing behavior problems among a population of low-income African American preschool children.

Within the developmental psychopathology literature, maternal mental health (e.g., maternal depression) is most commonly described when referencing maternal health factors and child outcomes. Although considering mental health is an important factor in understanding developmental outcomes, what is often overlooked is the impact of maternal physical health. A mother’s physical health status may play an important role in understanding the mother’s behaviors as a parent and subsequent child outcomes. One critical, and highly prevalent, physical health variable is maternal overweight status (hereafter referred to as maternal overweight) or obesity. Despite the negative impact of maternal obesity on additional maternal physical health problems, depression, physical activity, and social support, literature examining the relation
between maternal overweight and child behavior problems is surprisingly limited. The proposed study sought to fill this gap in the literature by examining the relation between maternal overweight as one important aspect of maternal health relevant to externalizing behavior problems among preschool children.

One potential mechanism for conceptualizing the relationship between maternal health and externalizing behavior problems in preschool children is through parenting behaviors. Parenting behavior may serve as an important mediator in this relationship. More specifically, there is a relationship between maternal health factors and parenting practices, in that increased maternal depression, stress, and body mass index (BMI) have a negative impact on parenting practices (e.g., Downey & Coine, 1990; Smith et al., 2001; Turer et al., 2003). Maternal parenting practices in turn impact child behavior problems, such that an increase in negative parenting practices leads to increased externalizing behavior problems among preschool children (Ayoub et al., 2009; Downer & Pianta, 2006; Gershoff, Aber, Raver, & Lennon, 2007; Pungello, Iruka, Dotterer, Mills-Koonce, & Reznick, 2009; Waldfogel, Craigie, & Brooks-Gunn, 2010). Despite the developmental literature moving towards an understanding of the impact of parenting behaviors on child behavior outcomes, little is known about the role of parenting behaviors as a mediator between maternal health variables, including maternal overweight, and externalizing behavior problems in preschool children. Therefore, an additional purpose of this study was to examine preschool children’s externalizing behavior problems in relation to maternal health factors (including both mental and physical health) and to examine parenting behaviors as a possible mediating factor in that relation. This study contributed to the current developmental, clinical, and health literature by examining the impact of maternal overweight status, as this maternal variable has largely been unexamined. Additionally, this study examined these
relationships in a sample of urban, low-income, overweight African American preschool children. This is an under-studied population, and therefore, this study contributed to increased understanding of the mechanisms of behavior problems in an at-risk group. Additionally, African Americans are at a much higher risk of these problems, causing higher healthcare burden and treatment demand. Therefore, there is a need to understand mechanisms that may contribute to these problems.

**Preschool Children’s Externalizing Behavior Problems**

Externalizing behaviors in preschool children are characterized as disruptive, hyperactive, noncompliant, antisocial, and aggressive behaviors (Achenbach, 1991; Hinshaw, 1987). More specifically, these behaviors can typically be identified in preschool children as general noncompliance, inattention, aggression towards peers, high activity level, and poor impulse regulation (Campbell, 2002).

The nature of children’s externalizing behavior problems changes with age and developmental level. Cross-sectional and longitudinal studies indicate that normative externalizing behavior problems peak at about age 3 years and tend to decrease through the preschool years and later on in life (Coleman, Wolkind, & Ashley, 1977; Crowther et al., 1981). Typical behaviors, such as taking a toy from another child, defying a request from a parent, and tantruming, are often understood as a toddler’s natural desire to establish autonomy, test limits, and practice social skills. Therefore, some of these behaviors are understood to be normative developmental behaviors (Campbell, 1990; Crockenberg & Litman, 1990). Another reason why behavior problems begin to increase around ages 3 to 5 years is because of the introduction of the preschool environment for many children. Approximately 65% of all 3 to 5-year-old children in the U.S. participated in a preschool program in 2012 (U.S. Department of Commerce, 2013).
Therefore, this is considered a normative event. Increased behavior problems are seen in many of these children at the introduction of this new setting because the preschool environment is often quite different from the child’s home or daycare setting (e.g., an increase in same-aged children and structured activities; Belsky, 2001; Campbell, Shaw, & Gilliom, 2000; Haskins, 1985). Children at this age are often still developing a variety of skillsets (e.g., verbal and cognitive abilities, emotion regulation) that a preschool environment often challenges (Kali & Cavanaugh, 2004). Therefore, it is not uncommon for preschool children to express frustrations, disinterest, and aggression through externalizing behaviors.

Though the increase in behavior problems is normative in the preschool years, researchers often find that these behavior patterns may become more stable over time (Cole, Teti, & Zahn-Waxler, 2003; Moffitt & Caspi, 2001). Studies indicate that 50% of children with moderate to severe externalizing behavior problems continue to show these problems into grade school (Webster-Stratton, 1996; Webster-Stratton & Taylor, 2001). Therefore, better understanding of the development and maintenance of these behavior problems may lead to better interventions.

Because most preschool-aged children exhibit a number of these behaviors quite often, determining which specific behaviors are considered to be objectively “normal” versus “abnormal” is difficult (Campbell, 2002). Often, externalizing behaviors are defined as abnormal when the behaviors persevere beyond what is age and developmentally appropriate, or if the behaviors worsen over time and interfere with the development of more appropriate social and communication skills (i.e., sharing, playing cooperatively; Campbell, Shaw, Gillom, 2000). Because not any one behavior can be identified as clinically problematic, it is recommended that externalizing behaviors be looked at in the context of severity, frequency, and cluster of
symptomatic behaviors in order to determine whether these behaviors are clinically significant (Campbell, 2002).

**Prevalence.** Despite externalizing behavior problems being fairly common among non-clinical populations of preschool-aged children, these behavior problems occur even more frequently among clinical populations (Neary & Eyberg, 2002). The reported prevalence of clinically significant behavior problems among 3- to 5-year-olds ranges from 14% to 52% (Qi & Kaiser, 2003), and rates of expulsions from preschool are higher than those for children in any other grade (Gilliam, 2005). For example, Richman and colleagues (1982) indicated that as many as 15% of their sample of 3- to 4-year-old children displayed mild externalizing behavior problems, whereas another 7% displayed moderate to severe problems. In another study, mothers reported that about 5—13% of children exhibited mild to severe externalizing behavior problems (Lavigne et al., 1996). This proportion of children presenting with high levels of externalizing symptoms is even higher among low-income families (Webster-Stratton & Hammond, 1998). Therefore, it is important to intervene early on, not only to decrease the probability that these behavior problems continue but also to reduce the likelihood of other negative consequences.

**Negative outcomes of externalizing behaviors in preschool children.** Preschool externalizing behavior problems are not only distressing for families and teachers in the moment, but they also lead to other negative consequences down the road, such as later externalizing behavior problems. According to Richman, Stevenson, and Graham (1982), as many as 60% of 3-year-olds with significantly elevated scores of externalizing behaviors continue to have these difficulties in early childhood. Additionally, externalizing behaviors, if untreated, often endure throughout the lifespan and tend to worsen without treatment (Loeber, 1982; 1991).
First, elevated levels of externalizing behavior problems in preschool children are associated with clinical diagnoses of oppositional defiant disorder (ODD), attention deficit/hyperactivity disorder (ADHD), and conduct disorder (CD; Zisser & Eyberg, 2010). Recent data indicate that up to 25% of preschool children meet the diagnostic criteria for ODD, CD, or ADHD (Campbell & Ewing, 1990). In addition to the significance of these behavior problems in preschool children, about 50% of children who exhibit one of these clinical disorders during their preschool years will continue to show similar problems later in grade school (Webster-Stratton, 1996; Webster-Stratton & Taylor, 2001).

In addition to early clinical diagnoses, early externalizing behavior problems are associated with a number of other long-term negative outcomes, including antisocial behavior, peer rejection, later violent offenses, adolescent delinquency, and substance abuse (Betz, 1995; Farrington & Hawkins, 1991; Gunter, Arndt, Riggins-Caspers, Wenman, & Cadoret, 2006; Loeber, Keenan, & Zhang, 1997). For example, in a study of 754 adoptee adults with a history of early childhood disruptive behavior problems, researchers found that early childhood disruptive behavior problems were independently predictive of later adult arrests and time spent in jail (Gunter et al., 2006). Additionally, the display of early externalizing behaviors makes it difficult for children to create positive peer relationships and behave in a manner conducive to learning, which increases peer rejection, lowers social skills, and also significantly lowers achievement scores (Vaughn et al., 1992). Oftentimes, those young children who fail to learn positive, pro-social behaviors and who are rejected by peers are at a higher risk for developing negative behaviors (antisocial and criminal activity) later in life during adolescence and adulthood (Hann & Borek, 2001).
The impact of early externalizing behavior problems also has additional long-term educational consequences (Hinshaw, 1992; Metcalfe, Harvey, & Laws, 2013). One longitudinal study following 3-year-olds with externalizing behavior problems found that these early behavior problems were predictive of academic problems at 6 years of age (Metcalfe et al., 2013). This relationship was particularly pronounced for children exhibiting inattention difficulties, even when controlling for socio-economic status (SES) and family stress (Metcalfe et al., 2013). The relationship between preschool externalizing behavior problems and later difficulties continues to be seen as children continue through their grade-school years. Children with externalizing behavior problems in preschool are more likely than their peers to experience academic difficulties or school failure during their later school-aged years (McGee, Prior, Williams, Smart, & Sanson, 2002). Given the detrimental impact of preschool externalizing behaviors on the development of psychopathology and later negative outcomes, it is important to investigate the underpinnings of these behaviors as they begin in preschool children.

Socio-demographic risks factors related to increased externalizing behaviors in children. There are also a number of socio-demographic risk factors that contribute to an increase in externalizing behavior problems in preschool children. Some of these factors are within the child, such as temperament (Scaramella & Leve, 2004; Smith, Calkins, Keane, Anastopoulos, & Shelton, 2004) and child health problems (Hughes & Ensor, 2009; Spagnola & Fiese, 2010). Other factors “outside of” the child include socio-demographic and societal factors such as poor neighborhoods and poverty (Liaw & Brooks-Gunn, 1994; McLoyd, 1998; Petterson & Albers, 2001), while others factors are influenced by the child’s relationship with others (i.e., parents; LaForett & Mendez, 2010; Pike, Iervolino, Eley, Price, & Plomin, 2006). Though there are a number of risk factors that may contribute to increased behavior problems in preschool
BEHAVIOR PROBLEMS

children, a discussion of all of these risks is beyond the scope of this research project. The risk factors that will be discussed in this literature review, and examined in this study, include three socio-demographic risk factors: SES, minority status, and weight status. The study focuses on these risk factors because the relationship between these factors and preschool children’s functioning is relatively understudied, yet known to be important. An understanding of the influences on externalizing behaviors in preschool children with a combination of these risk factors may aid in future intervention and prevention efforts. It is also important to examine these factors because although poverty and minority status are highly co-occurring and increasingly prevalent, these factors are often not examined within the context of externalizing behavior problems. These risk factors will be further reviewed below.

**Preschool children in poverty.** Over the last few decades, researchers have concluded that poverty is a risk factor for negative child cognitive and behavioral development, such as academic failure in children and increased externalizing behavior problems (Brooks-Gunn & Duncan, 1997; Burchinal et al., 1997; Petterson & Albers, 2001; Pungello et al., 1996; Walker et al., 1994). Children who live in poverty are more likely to experience poor and unsafe neighborhood conditions, inadequate nutrition, and have fewer learning experiences in the home, increasing behavior problems (Brooks-Gunn & Duncan, 1997; Burchinal et al., 1997). Additionally, the stress associated with economic hardship often influences parenting behaviors, such as lowering supportive parenting practices and parental warmth, which in turn also lead to elevated levels of externalizing behavior problems (Ayoub et al., 2009; Gershoff et al., 2007; Pungello et al., 2009). Low-income children are not only more likely to suffer from behavior problems than non-poor children (Brooks-Gunn & Duncan, 1997), but the impact of persistent poverty is even more detrimental for the development and maintenance of externalizing behavior
problems in young children (McLoyd, 1998). One study of 895 5-year-olds from the Infant Health and Development Program (IHDP) dataset reported that children in poor families displayed more externalizing behaviors than children who did not experience poverty (Duncan, Brooks-Gunn, & Klebanov, 1994). Additionally, this study provided evidence to support the idea that persistent poverty (poverty for at least 4 years) has more negative effects on preschool children’s externalizing behaviors than short-term poverty (experiencing poverty for 1 year). However, the impact of any poverty was far more detrimental than not experiencing poverty at all.

Researchers argue that income alone is confounded by many variables; therefore, constructs like material hardship should also be examined (Gershoff et al., 2007). For example, studies have reported links between low-income status and material hardship to parental stress and impaired parent behaviors, which then resulted in increased child externalizing behavior problems (Mistry et al., 2002; Yeung et al., 2002). Additionally, ethnicity and poverty are confounded, where 40% of African American children currently live in poverty, compared to 14% of Caucasian children (U.S. Bureau of the Census, 2013). African American children are the most represented group in poverty in the U.S., leading to higher levels of externalizing behaviors among African American children. Because poverty is not the only factor that contributes to increased externalizing behavior problems in preschool children, a better understanding of the developmental processes among low-income children is needed.

Minority populations. As stated above, research indicates that minority children are at a higher risk for experiencing social-emotional problems, such as disruptive behavior problems, than their Caucasian counterparts (McLoyd, 1998). As a result, minority children with externalizing behavior problems also experience more difficulties with family, peer, and school
functioning than their Caucasian peers (Ezpeleta, Keeler, Erkanli, Costello, & Angold, 2001). As previously mentioned, part of this risk may be confounded with low-income status. For example, children born to adolescent, low-income, minority mothers are at a higher risk of developing externalizing behavior problems than same-aged peers (Borkowski et al., 2007; Coley & Chase-Lansdale, 1998; Furstenburg, Brooks-Gunn, & Morgan, 1987; Pogarsky, Thornberry, & Lizotte, 2006). However, what is additionally important to consider is that young minority children are less likely to receive treatment for externalizing behavior problems in comparison to Caucasian children (Thompson, 2005). This finding is often because children from diverse racial backgrounds are inadequately screened for behavior problems and there is a lack of quality/quantity of treatment in high minority population areas (Eiraldi, Mazzuca, Clarke, & Power, 2006). For example, in a study examining preschool children’s emotional and behavioral adjustment, researchers found that out of 831 low-income, primarily African American preschool children, 13% of these children exhibited at least one emotional or behavioral problem. However, only 1.2% of these children were actually identified as currently having a behavior problem and were receiving mental health services (Fantuzzo, Bulotsky, McDermott, Mosca, & Lutz, 2003). This highlights the lack of awareness, availability, and utilization of services available for low-income, minority preschool children, placing them at a higher risk of maintenance of externalizing behavior problems throughout their school years and into later childhood.

Another important consideration in relation to minority populations is that different cultural beliefs and values about childrearing and appropriate child behaviors influence parental behaviors and the child-parent relationship (Parke & Buriel, 1998). Within the United States, there are a number of cultural or ethnic groups that vary considerably in their values, opinions,
and practices regarding what is effective and appropriate parenting and discipline (Campbell, 2002). Additionally, ecological factors also serve to influence cultural values and beliefs on parenting styles. For example, for children in dangerous, inner city neighborhoods, there is evidence to support the utility of stricter use of limit setting and control, as protective factors (Deater-Deckard, Dodge, Bates, & Pettit, 1996). This is especially true when this strictness is paired with high levels of parental warmth (McLoyd, 1998). Because of these findings, it is important to look at the relationship between parenting practices on child behavior in varied populations.

**Childhood overweight and obesity.** In addition to the risk factors discussed above, childhood overweight and obesity is an increasing risk factor for the development of externalizing behavior problems in preschool children. In the past 30 years, the rates of obesity among children have more than doubled (Berkowitz & Stunkard, 2002). Recent national data suggest that roughly 26.7% of preschool-aged children are overweight (Ogedn, Carroll, Kit, & Flegal, 2012). These numbers are even higher among low-income minority families, where approximately 33.3% of preschool-aged children are overweight (Dalenius, Borland, Smith, Polhamus, & Grummer-Strawn, 2012; Edmunds et al., 2006; Lumeng et al., 2006). Part of the increase in overweight status and obesity for most American families is the current development of a more sedentary lifestyle and increased portion sizes (FRAC, 2010). There are also additional barriers related to low-income status that increase the risk of obesity. For example, it is often the case that low-income neighborhoods lack access to a full-service grocery store with healthy and well-rounded food options (Beaulac, Kristjansson, & Cummins, 2009; Larson, Story, & Nelson, 2009). As a result, many low-income families are unable to access healthy foods in their neighborhood, and often without needed transportation, may be unable to attain food at larger
grocery stores. Instead, these families may resort to food shopping at local convenience stores that do not offer fresh, quality produce and healthy options (Andreyeva, Blumenthal, Schwartz, Long, & Brownell, 2008; Drewnowski, 2010; Larson et al., 2009). Greater access to fast food restaurants also contributes to weight issues (Fleischhacker, Evenson, Rodriguez, & Ammerman, 2011; Larson et al., 2009). In concurrence with the lack of quality food resources, families in low-income neighborhoods and schools have less access to physical activity resources (e.g., safe and working parks, greeneries, bike paths, recreational facilities) and are more likely to live in unsafe neighborhoods where outside activity is less accessible (Duke et al., 2003; Neckerman et al., 2009; Powell, Slater, & Chaloupka, 2004). The lack of access to these resources and increased crime in neighborhoods is associated with greater levels of dormant activities (e.g., watching TV, video games), and therefore higher rates of obesity (Duncan, Johnson, Molnar, & Azrael, 2009; Lumeng et al., 2006; Sallis & Glanz, 2009; Singh et al., 2010).

As mentioned above, because income and minority status are confounded, minority populations are more likely to be overweight at least in part due to poverty related risk factors (Holtby et al., 2006; Ogden, Caroll, Curtin, Lamb, & Flegal, 2010) with 26.0% of African American children being overweight and 11.4% being obese (Ogden et al., 2010). Research indicates that neighborhoods comprised of primarily African Americans are at the most limited in their access to healthier foods and full-service grocery stores (Morland, Wing, & Diez Roux, 2002). Additionally, African Americans are most frequently marketed to buy fast food restaurants providing high-calorie, non-nutritious food options (Yancey et al., 2009). Outdoor advertisements, such as billboards, promoting foods of low nutritional value are 13 times more prevalent in neighborhoods that are predominantly African American, relative to White neighborhoods (Yancey et al., 2009). Such advertising strongly influences the food preferences
and purchases of the children and population targeted in these ads (Institute of Medicine, 2006; Institute of Medicine, 2013). Lastly, African American parents of young children report more barriers to increasing their child’s physical activity than their White counterparts. These barriers include lack of transportation, concerns about neighborhood safety, and availability of activity opportunities for their child (Duke, Huhman, & Heitzler, 2003). As a result of these barriers and increased advertising, African American children are at a particularly high risk for increased levels of obesity.

Early childhood obesity results in a number of negative physical and mental health outcomes. For example, overweight and obese children are at risk for higher rates of high blood pressure, high cholesterol, type 2 diabetes, asthma, and sleep apnea (CDC, 2007). There are also associations between overweight status in childhood and increased levels of psychological distress and increased internalizing and externalizing behavior problems (Anderson, He, Schoppe-Sullivan, & Must, 2010; Bradley et al., 2008; Braet, Mervielde, & Vandereycken 1997; Datar & Sturm, 2004; DeJong & Kleck 1986; Lumeng, Gannon, Cabral, Frank, & Zuckerman, 2003; Oh, Ahn, Chang, Kang, & Oh, 2013). For example, child overweight status is associated with increased externalizing behavior problems in children as young as 2 years old (Anderson et al., 2010). The relationship between increased BMI and externalizing behavior problems, along with negative perceptions of oneself, is also seen in children at 5 years of age (Anderson et al., 2010; Davison & Birch, 2001). Additionally, because of the psychological distress and strain caused by increased BMI, higher rates of aggressive behaviors and conduct problems are reported among children with higher weight status (Bin, Hong-Bo, & Gang, 2005; Datar & Sturm, 2005; Israel & Shaprio, 1985; Lawlor et al., 2005; Mustillo et al., 2003). The relationship between child overweight status and externalizing behavior problems is not only seen in
preschool-aged children (e.g., Datar & Sturm, 2004), but is present in school-aged children as well (e.g., Bradley et al., 2008; Lumeng et al., 2003). This suggests that the impact of child overweight and obesity is not only negatively affecting externalizing behavior problems, but that it can become a long-term issue. As a result, it is important to examine other factors that might also influence the increase or decrease of externalizing behavior problems among overweight or obese children.

In sum, for preschool children, experiencing poverty, being a part of a minority group, and being overweight are all risk factors for increased rates of externalizing behavior problems. Additionally, because these risks are highly interrelated, it is likely that many preschool children are experiencing all of these risks at the same time. It is important to consider how these risk factors, along with parental predictors, influence child behavior in this specific population. In addition to examining the impact of these risks on increased behavior problems, it is also important to examine other predictors in order to have a more comprehensive understanding of the relationship between socio-demographic risks and maternal predictors of increased externalizing behavior problems in preschool children.

**Preschool Children’s Externalizing Behavior Problems in the Context of Maternal Health**

As referenced above, in addition to socio-demographic risk factors, there are also maternal health predictors that play an important role in the increased display of externalizing behavior problems among preschool children. Due to parents’ strong influence on child social and emotional development, maternal health factors are important predictors to examine when understanding the presence of externalizing behavior problems in preschool children. Maternal mental health problems are highly prevalent among parents of preschool children (Ertel et al., 2011; LaForett & Mendez, 2010; Leadbeater, Bishop, & Raver, 1996). Even more common for
children, is having a parent with a physical illness or health problem (Barkmann, Romer, Watson, & Schulte-Markwort, 2007; Currie, 2005). Results from one study indicated that the rate of having a mother with a physical illness is twice as common as having a parent with a mental illness (Barkmann et al., 2007). The prevalence rates of both mental and physical health problems among mothers is even higher among low-income populations (Kahn, Wise, Kennedy, & Kawachi, 2000). There are several factors that encompass both maternal mental and physical health (e.g., maternal depression, stress, anxiety, diabetes, obesity, HIV/AIDS, severe illness) that, as a result, negatively impact the development and maintenance of increased child behavior problems (Anderson & Hammen, 1993; Barkmann et al., 2007; Forehand, Biggar, & Kotchick, 1998; Liaw & Brooks-Gunn, 1994; McBride et al., 2002; Perry & Fantuzzo, 2010; Petterson & Albers, 2001; Pike et al., 2006). One of the most commonly studied maternal health factors in relation to child behavior outcomes is maternal depression (Whittaker, Harden, See, Meisch, & Westbrook, 2011). Previous research has also examined the relationship between maternal stress and increased child externalizing behavior problems; however, the relation is not as well established as that between maternal depression and child externalizing behavior problems (McBride et al., 2002). Lastly, though the presence of maternal physical illness is quite high, the impact of maternal physical health factors in relation to child externalizing behaviors is far less studied (Forehand et al., 1998). The present study examined one aspect of maternal physical illness and maternal overweight/obesity due to its ever growing prevalence rates in society and the lack of literature examining its influence on children’s externalizing behavior problems (Van Lieshout, Robinson, & Boyle, 2013). Because mothers play a significant role in shaping child behaviors, this study sought to expand on the literature examining the associations of maternal mental and physical health factors (maternal depression, maternal stress, and maternal
overweight/obesity) with externalizing behavior problems in preschool children. A review of these individual maternal factors will be discussed below.

**Maternal depression.** Maternal depression is a common psychological disorder among women with preschool children, with a 12-month prevalence rate of 1 in 10 for mothers (Ertel et al., 2011). Symptoms include feeling sad, guilty, irritable, and unable to make decisions or attend work (Leadbeater & Linares, 1992). Maternal depression symptoms are relatively stable among low-income mothers of preschool children, with roughly 75% of mothers having the same depression status across the first 4 years of their child’s life (Alpern & Lyons-Ruth, 1993; Leadbeater & Linares, 1992; Wolkind, Zajicek-Coleman, & Ghodsian, 1980). LaForett and Mendez (2010) found that 40% of mothers reported being sometimes or chronically depressed over the course of the year that their child was enrolled in a Head Start program. Maternal depression not only impacts the mother’s ability to cope with stressful situations within her life and provide responsive parenting (Leadbeater & Linares, 1992; Leadbeater, 1996), it also impacts children’s outcomes, such as overweight status (McConley et al., 2011; Surkan, Kawachi, & Peterson, 2008; Wang, et al., 2013), behavior problems, and cognitive development (Liaw & Brooks-Gunn, 1994; Perry & Fantuzzo, 2010; Petterson & Albers, 2001).

More specifically, parents’ own psychological distress is related to externalizing behavior problems in young children (Liaw & Brooks-Gunn, 1994; Perry & Fantuzzo, 2010; Petterson & Albers, 2001). Among preschool and school-aged children, parent psychological distress is significantly related to an increase in externalizing behaviors in those children (Bauman, Camacho, Silver, Hudis, & Draim, 2002). One study reported that children’s exposure to chronic maternal depression accounted for the most variance in children’s externalizing behavior problems (Perry & Fantuzzo, 2010). Additionally, chronic maternal depression (experienced
while the child is in preschool and through their grade school years) also contributes to an increased likelihood that children with externalizing behavior problems in preschool will continue to show these problems in early elementary school (Egeland, Kalkoske, Gottesman, & Erickson, 1990). One possible pathway to understanding the development of child behavior problems in the context of a depressed parent is that depressed parents may have impaired parenting skills (Downey & Coyne, 1990). For example, depressed mothers may be more likely to utilize corrective techniques to manage children’s behavior rather than positive warm techniques, which then leads to the development of externalizing behaviors in children (Downey & Coyne, 1990). These findings highlight the effects of maternal psychological-wellbeing on children’s development, especially in the population of interest in this study, low-income families.

**Maternal stress.** All adults experience stress, and therefore, it is not surprising that parents experience increased stress as a result of childrearing (Baker et al., 1997; Crnic, Friedrich, & Greenberg, 1983; Fidler, Hodapp, & Dykens, 2000; Minnes, 1988; Orr, Cameron, Dobson, & Day, 1993). Additionally, the daily hassles of parenting, accompanied by general and major life stressors, are relatively stable for families during the preschool period (Crnic, Gaze, & Hoffman, 2005). From a family systems perspective, family stress plays an important role in the development of children’s behavior problems, and the result of stress can sometimes impact children’s development of externalizing behavior problems through parenting practices (Crnic & Low, 2002; Deater-Deckard, 1998; McLoyd, 1990). For example, parents who experience high levels of stress tend to be less responsive and less affectionate parents and, in turn, utilize more authoritarian parenting techniques (McLoyd, 1990).
Maternal stress also negatively impacts aspects of child development, including insecure attachment and behavior problems (Crnic & Low, 2002; Cummings et al., 2000; Jarvis & Creasy, 1991; Pett et al., 1994; Thompson et al., 1993). More specifically, maternal stress is strongly related to children’s behavior problems during the preschool years (Baker et al., 2002; Jackson, 2000; McBride et al., 2002). Parents’ own level of stress can have an impact on the long-term psychosocial adjustment in children as well. For example, in one study, mothers’ perception of perceived stress during their child’s first year was a significant predictor of the child’s adjustment during their preschool years (Abidin, Jenkins, & McGaughey, 1992) and of social-emotional functioning when children were 8 years old (Magyary, Brandt, Hammond, & Barnard, 1992). The relationship between maternal stress and child behavior problems also appears to be quite reciprocal, meaning that maternal stress tends to increase the presence of child behavior problems, and the presence of behavior problems in the child then maintains, or in some cases increases, the presence of stress in the parent (Baker et al., 2002; Jackson, 2000; Mash & Johnston, 1983). Better understanding the pathways in which maternal stress serves to increase child behavior problems is needed and will be explored in this study.

**Maternal overweight.** Although maternal mental health, like depression and stress, have been studied more commonly in relation to child behavior problems, less is known about the impact of physical health problems on child behavior. Maternal overweight or obesity represents a relatively common health issue experienced by women with children and may be important in understanding child outcomes. Additionally, the risk of being overweight or obese is even higher for new mothers than in the general population (Rossner & Ohlin, 1995). According to the National Health and Nutrition Examination Survey, women who recently gave birth to a child increased their risk of becoming overweight by 60% and obese by 110% (Williamson et al.,
Although obesity is a problem for all groups of women, it is particularly a problem for African American women for whom obesity prevalence is over 52.9% compared to 21% of White women (Ogden, 2009; Walcott-McQuigg, 1995; Williamson, 1993; Wing, 1992). Part of weight retention in early motherhood may be due to the new, time-consuming responsibility of parenthood. Previous research indicates that women are less likely to engage in health-benefiting behaviors (e.g., exercise) when those behaviors interfere with family responsibilities (Henderson, 1990; Walcott-McQuigg, 1995). Obesity is also associated with increased risk for many health-related illnesses, including hypertension, type 2 diabetes, heart disease, stroke, some types of cancer, and early mortality (Ogden & Caroll, 2010). Not only are there negative health effects of obesity, but also negative psychological and psychosocial consequences. For example, women who are overweight are at increased risk for lower social support (Harris, Ellison, & Clement, 1999; Pendersen et al., 2011; Walker, 1997), they have been found to be less physically active (Oken et al., 2007), and they are more likely to experience depression and stress more often than their non-overweight counterparts (Carter, Baker, & Brownell, 2000; Herring et al., 2008; Pendersen et al., 2011; Penedo & Dahn, 2005; Walker, 1997).

The literature relating maternal health problems to children’s behavior problems is surprisingly limited, in particular, as it relates to mothers’ overweight status (e.g., Bergmann et al., 2016; Van Lieshout, Robinson, & Boyle, 2013). Given the national and international focus on issues of overweight and obesity and the high prevalence rates of obesity, it is unknown why this gap in the literature exists. In a review of the literature, a few studies found support for a link between pre-pregnancy and pregnancy BMI and later ADHD and other externalizing behavior problems in children (Brion et al., 2011; Buss et al., 2012; Rodriguez, 2010; Rodriguez et al., 2008; Van Lieshout et al., 2012; 2013). For example, in a sample of 3,933 mother-child pairs,
researchers found positive associations between maternal pre-pregnancy overweight and externalizing behavior problems in 3-year-old children (Brion et al., 2011). Another study found significant associations between maternal pre-pregnancy BMI and the presence of ADHD in 7-year-old children (Buss et al., 2012). However, across this literature, it is not clear if the relationship between maternal pre-pregnancy weight and behavior problems in children is due to direct intrauterine development or other confounding variables (Van Lieshout et al., 2013). One longitudinal study, examining 2,785 mother child-pairs in Western Australia, found a link between high maternal pre-pregnancy BMI and increased child externalizing behavior problems, which were stably detected between the ages of 5 and 17 years (Van Lieshout et al., 2013). This relationship was found even when controlling for a number of confounds (e.g., treatment of maternal psychopathology, prenatal stress, SES, substance use during pregnancy, and diabetes before or during pregnancy). However, this relationship did not account for several confounding variables that may influence the development of children’s externalizing behaviors in the current environment, such as maternal depression, stress, childhood obesity, or even the mother’s current weight status. To date, there has only been one study that has examined the direct impact of maternal overweight and increased child behavior problems (Bergmann et al., 2016). The current study sought to fill this gap in the literature by examining the impact of current maternal BMI on externalizing behavior problems when the child is preschool age.

Additional literature has established that children of mothers with other physical health problems are at an increased risk of behavioral maladjustment (Bauman et al., 2002). For example, in a sample of mothers with HIV/AIDS, maternal physical health was related to child mental health and behavioral adjustment (Bauman et al., 2002). However, what is important about this study’s findings was that the aspect of mothers’ health that was the significant
predictor of child adjustment was maternal activity restrictions. Mothers who, because of their illness, were less active and less able to engage with their child had children who were more likely to display increased behavior problems (Bauman et al., 2002). Because overweight status often results in activity restrictiveness (Oken et al., 2007), one may infer that, for many overweight mothers, their activity levels and physical engagement with their child may be more restricted than for those mothers who are not overweight. This could then potentially lead to an increase in behavior problems in children of overweight mothers. Some health-related literature that is in partial support of this hypothesis was reported in a study of high-risk preschoolers and overweight mothers. Researchers found that overweight mothers were less physically active, which in turn decreased their physical engagement with their child, resulting in less physically active children (Turer et al., 2013). Because there is only a small amount of literature examining the relationship between maternal overweight and externalizing behavior problems in children, this relationship needs to be further explored. One aim of this current study was to further understand the relationship between maternal overweight and child behavior outcomes.

The relationship between depression, stress, and BMI. Research has documented that maternal depression, maternal stress, and maternal overweight are all interrelated, and it is difficult to parcel out which of these variables may have come first in any given situation. When examining the literature, maternal stress and depression are often found to coincide with one another, in that if a mother is experiencing depression, she is more likely to also experience stress, and vice versa (Bynum & Brody, 2005; Livneh & Wilson, 2003; Mash & Johnston, 1983; Murray, Fiori-Cowley, & Hooper, 1996; Venkatesh, Phipps, Triche, & Zlotnick, 2014). Additional research reports that factors such as stress and depression negatively influence poor eating behavior, weight gain, and obesity (Ganley, 1988; 1989; Penedo & Dahn, 2005). For
example, there is a positive correlation between increased body weight and stress, meaning that women who were more overweight reported experiencing more stress (Walcott-McQuigg, 1995; Whitaker, Young-Hyman, Vernon, & Wilcox, 2014). Within one sample, more than 50% of overweight women reported that stress functioned to maintain their weight status because it negatively impacted their weight control behavior (Walcott-McQuigg, 1995). In another study, the impact of physical health problems (activity restrictiveness) was increased by maternal depression and, in turn, increased the likelihood of child behavior problems (Bauman et al., 2002). This study highlighted the impact of decreased maternal activity as a result of a health problem on increased child behavior problems, the impact of which was worsened with higher levels of maternal depression. Because these maternal health problems are interrelated, it will be important to examine how these factors uniquely contribute to elevated levels of children’s externalizing behavior problems.

**Parenting as a Mediator Between Maternal Health and Child Behavior Problems**

As reviewed thus far in this paper, the child development literature has established a link between many maternal health factors and increased externalizing behavior problems in preschool children (e.g., Crnic & Low, 2002; Cummings et al., 2000; Liaw & Brooks-Gunn, 1994; Perry & Fantuzzo, 2010). Additionally, there is literature to support the relationship between maternal health factors and parenting practices, in that an increase in maternal stress, depression, and overweight status negatively impacts parenting practices (e.g., Downey & Coine, 1990; Graczyk, O’hare, & Neuman, 2000; Smith et al., 2001; Turer et al., 2013). Negative parenting practices then lead to increased externalizing behavior problems among preschool-aged children (Ayoub et al., 2009; Downer & Pianta, 2006; Gershoff et al., 2007; Harden & Whittaker, 2011; McGroder, 2000; McLoyd, 1998; Pungello et al., 2009; Waldfogel et al., 2010).
Given this demonstrated association of maternal parenting behaviors with both maternal physical health and child externalizing behaviors, the exploration of a potential mediating role of parenting behaviors on the relationship between maternal health and child behavior is warranted. Established links in the literature between each of these pathways will be discussed below.

**Maternal health and parenting.** The relationship between the child and the parent plays a critical role in the child’s overall development and, as we understand it, in the development of behavior problems in children (Bronfenbrenner, 1979). The existing literature shows that one important mechanism by which maternal health affects child externalizing behavior problems is through parenting practices. For example, a review of the developmental literature has concluded that maternal depression relates to a range of difficulties related to parenting behavior (Downey & Coyne, 1990; Rutter, 1990; Lovejoy, Graczyk, O’Hare, & Neuman, 2000). Maternal depression impacts the way mothers perceive the role of being a parent and the way they interact with their child (Cohn, Campbell, Matias, & Hopkins, 1990; Field, Healy, Goldstein, & Guthertz, 1990; Goodman & Brumley, 1990; Gordon et al., 1989; Lovejoy, 1991; Lovejoy et al., 2000; Lyons-Ruth, 1992; Weissman & Paykel, 1974; Weissman, Paykel, & Klerman, 1972). More specifically, mothers who are depressed perceive the parenting role to be more difficult (Weissman & Paykel, 1974; Weissman, Paykel, & Klerman, 1972), and become more emotionally unavailable and withdrawn (Goodman & Brumley, 1990). Additionally, maternal depression is associated with parenting difficulties including increased hostile, coercive, and intrusive behaviors (Goodman & Brumley, 1990; Gordon et al., 1989; Lovejoy, 1991; Lovejoy et al., 2000; Lyons-Ruth, 1992), higher rates of negative interactions and fewer positive interactions, detachment, irritability, and less responsive and effective communication with their child (Cohn et al., 1990; Field et al., 1990; Goodman & Brumley, 1990). In one meta-analysis,
researchers found that among preschool-aged children, one of the most common parenting behaviors exhibited by depressed mothers was disengaged parenting behaviors with their child (Lovejoy et al., 2000). Maternal depression also impacts health-related parenting practices such as lower rates of health promotion activities, well-child visits, vaccinations, irregular mealtimes and nap/bedtime (McLearn, Minkovitz, Strobino, Marks & Hou, 2006; Sills et al., 2007; Witt et al., 2006).

Similar to maternal depression, increased parental stress also contributes to negative parenting practices. Parenting stress is associated with lower rates of overall parental well-being, increased negative parenting attitudes, decreased satisfaction with parenting, and higher rates of negative parenting behaviors (Crnic & Greenberg, 1990; Crnic & Low, 2002; Deater-Deckard & Scarr, 1996; Hauser-Cram et al., 2001; Roach et al., 1999; Smith et al., 2001; Thompson et al., 1993). For example, parents who report higher levels of parenting stress have a more authoritarian parenting style, are less involved, and experience more negative parent-child interactions (Belsky et al., 1996b; Bolger et al., 1989; Deater-Deckard and Scarr, 1996; McBride and Mills, 1994). In addition to a more authoritarian parenting style, parenting stress also influences punitive parenting and discipline practices (Crnic & Greenberg, 1987; McLoyd, Jayaratne, Ceballo, & Borquez, 1994; Patterson, 1986; Pinderhughes, Dodge, Zelli, Bates, & Pettit, 2000). In one study, researchers found that low-income parents were more likely to experience stress, and in turn, utilized harsher discipline methods (e.g., spanking; Pinderhughes et al., 2000). This increase in harsh discipline methods was also related to higher levels of child aggression, thus highlighting the mediating relationship of parenting practices on the association between parenting stress and child behavior problems.
Though less studied, there is some research to indicate a link between maternal overweight on parenting practices as well (Turer et al., 2013). Within the realm of health related literature, researchers have found that overweight mothers were less likely to follow nutritional parenting guidelines related to their preschooler’s health (e.g., increasing nutritious foods and exercise habits, and decreasing sugary beverages and screen time; Turer et al., 2013), showing a relationship between maternal overweight status and parenting practices. Currently, within the literature there is little information about the relationship between maternal overweight status and child externalizing behavior problems; however, one mechanism explaining the association between the two may be parenting practices (Van Lieshout et al., 2013). This study sought to further explore this hypothesis by examining the impact of maternal BMI on parenting practices and child externalizing behavior problems.

**Parenting and externalizing behavior problems.** After examining the relationship between maternal health factors and parenting practices, it is important to understand the relationship between parenting practices and the development of child externalizing behavior problems. For one, the developmental literature has established that parenting style and the home environment strongly influence the development of externalizing behavior problems in preschool children (Ayoub et al., 2009; Downer & Pianta, 2006; Gershoff et al., 2007; Harden & Whittaker, 2011; McGroder, 2000; McLoyd, 1998; Pungello et al., 2009; Waldfogel et al., 2010). With the experience of suboptimal parenting, children are at risk for developing externalizing behavior problems due to a lack of positive and attentive care (Patterson, 1982). Additionally, child development literature indicates that negative parenting behaviors play a critical role in the development of preschool children’s externalizing behavior problems (Barnett & Scaramella, 2013; Koblinsky, Kuvalanka, & Randolph, 2006). Characteristics of negative and ineffective
parenting include harsh and inconsistent discipline, inadequate supervision, under-involvement, unresponsiveness, lack of sensitivity, and unnecessary or excessive restrictiveness (Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986; Shaw & Bell, 1993) and, in extreme cases, psychological neglect (Dubowitz, Papas, Black, & Starr, 2002). These behaviors, in particular overly harsh and physically punishing parenting, have associations with early externalizing behavior problems (Dodge, Pettit, & Bates, 1994; Dubowitz et al., 2002; Gershoff, 2004; Patterson, 2002). Additionally, a parenting style classified as “Aggravated but Nurturant” (defined as high in aggravation and stress in parenting, but also high in maternal warmth and responsiveness) results in lower scores of school readiness and higher levels of externalizing behavior symptoms in preschool children (McGroder, 2000).

Conversely, a decrease in externalizing behavior problems is also thought to be a result of parents’ display of responsive, supportive discipline; a reduction in reacting to negative behaviors; and a greater display of sensitivity towards their child’s emotional problems and needs (Koblinsky et al., 2006). The relationship between negative parenting behaviors and an increased display of externalizing behavior problems in preschool children is seen consistently across many cultural backgrounds, including American, Chinese, and Japanese cultures (Alizadeh, Abu Talib, Abdullah, & Mansor, 2011; Olson et al., 2011), indicating that parenting styles play a very critical role in the increased presence of externalizing behavior problems across many different cultures.

A specific way to examine parenting and its impact on the development of behavior problems in children is through mother and child interactions. More specifically, mother-child interactions during shared activities (i.e., free play or a problem-solving activity) tend to be predictive of child behavior and adjustment concurrently, later on in childhood, and into
adulthood (Denham, Renwick, & Holt, 1991; National Institute of Child Health and Human Development, 2003; Weinfeld, Ogawa, & Egland, 2002). For example, a lack of engagement during mother-child interactions and conflict in mother-child interactions can result in increased child behavior problems (Leadbeater, Bishop, & Raver, 1996; Galboda-Liyanage, Princ, & Scott, 2003). Conversely, the increase of engagement in mother-child interactions during a shared activity, paired with expressions of warmth and affection, leads to a decrease in child behavior problems (Deater-Deckard, Atzaba-Poria, & Pike, 2004; Gauvain & Perez, 2008). Mothers who are more attuned to their child’s signals and are cognitively stimulating (i.e., promote learning and comprehension) are also less likely to have children with behavior problems (Gauvain & Perez, 2008; Hirsh-Pasek, & Burchinal, 2006; Lunkenheimer, Olson, Hollenstein, Sameroff, & Winter, 2011; National Institute of Child Health and Human Development, 2003), whereas mothers with poorer quality parenting and mother-child interactions that lack warmth, attunement to signals, and cognitive stimulation are more likely to have children with increased behavior problems (Campbell, Morgan-Lopez, Cox, & McLoyd, 2009; Combs-Ronto, Olson, Lynkenheimer, & Sameroff, 2009; Garstein & Fagot, 2003; Goldsmith & Rogoff 1995;1997).

Within the developmental literature, there is evidence to suggest that certain parent-child interactions, such as the absence of parental positivity and low levels of parental engagement, lead to the development of externalizing behavior problems in children (Chisholm, Gonzalez, Atkinson, 2014; Deater-Deckard et al., 2004; Foster, Garber, & Durlak, 2008), therefore it is important to further understand specific maternal factors that may influence said parenting practices.

One way that maternal-child interactions and parenting behaviors described above have been studied is through observational methods (e.g., Ainsworth et al., 1987). Utilizing an
observational rather than a parental self-report method of assessing parenting behaviors allows for the potential to capture a more accurate picture of the complex parenting practices each parent displays (Lyons-Ruth et al., 1999; Hesse & Main, 2006). Observed parent-child interactions can range in scenario depending on the developmental level of the child and the type of parenting behaviors that need to be elicited. For example, a parent and child can be instructed to have a “free play” interaction that allows for more natural play interactions between the child and the parent. Additionally, the parent and child could be instructed to perform an undesirable task, such as cleaning up toys, in order to elicit stress on the mother and child, as well as pull for different parenting behaviors during that task (Ainsworth et al., 1987). These kinds of tasks are designed to elicit ecologically valid behaviors between the parent and child. Some of the most well-known parenting dimensions that researchers have examined in the past and that have been shown to relate to child behavior include sensitivity-insensitivity, acceptance-rejection, accessibility-ignoring, responsiveness, affective tone, intrusiveness, controlling behavior, positive and negative affect, parallel play, relational touching, and compliance (Ainsworth et al., 1978; Belsky, 1981; 1984; Crittenden, 1981; 1988; Crnic, 1983; Crnic, Greenberg, & Slough, 1986; Lyons-Ruth, Connell, Zoll, & Stahl, 1987). This study expanded on the current literature by incorporating observational measures to assess parent-child interactions.

**Parenting as a mediator.** There is existing literature that has begun to delineate the role of parenting in the development of child externalizing behavior problems. A number of research studies indicate that positive parenting practices (e.g., providing warmth, responsiveness, consistency, and control) have served as protective factors against multiple risks, such as poverty and adverse family and social environments, and against the development of externalizing behavior problems (Bornstein, 1989; Jones et al., 2008; Koblinsky, Kuvalanka, & Randolph,
BEHAVIOR PROBLEMS

2006; Whittaker, Harder, See, Meisch, & Westbrook, 2011). For example, in a study examining the impact of poverty on low-income African American preschool children, researchers found that children who were exposed to more positive parenting practices had lower levels of externalizing behavior problems (Koblinsky et al., 2006). Children in this study not only had lower rates of behavior problems when they had parents who practiced more positive parenting, but they also exhibited higher levels of social skills, self-control, and more cooperative behaviors, thus demonstrating the role parenting can play in moderating the impact of poverty on the development of child behavior problems.

However, some research has begun to examine parenting practices as a mediator between child behavior problems and maternal mental health factors, such as depression and stress (Belsky et al., 2007; Chisholm, Gonzalez, & Atkinson, 2014; Cole & Zahn-Waxler, 1992; Downey & Coyne, 1990; Foster et al., 2008; Gelfand & Teti, 1990; Gershoff, Aber, Raver, & Lennon, 2007; Hammen et al., 1990; Leadbeater, Bishop, & Raver, 1996; McLoyd, 1990; Rutter, 1990; Mistry, Vandewater, Huston, & McLoyd, 2002). For example, in one study of depressed mothers, researchers found that maternal interpersonal engagement mediated the relationship between maternal affective state and child externalizing behaviors (Chisholm et al., 2014). To date, only one known study has examined the influence of parenting as a mediator between both maternal depression and stress on children’s externalizing behaviors. In this study, the researchers found links between both depression and parental stress on maternal sensitivity (positive parenting practices) and externalizing behavior outcomes among low-income preschool children. Additionally, the results of this study found the link between maternal stress, parental sensitivity, and externalizing behaviors to be surprisingly stronger than the relationship between maternal depression on those outcomes (Whittaker et al., 2011). Though this study was able to
examine the relationship between maternal mental health factors, parenting, and child behavior outcomes, this study did not examine the impact of any physical health factors. Additionally, the study only examined the influence of certain parenting behaviors (sensitivity) on children’s social-emotional functioning. The proposed study intends to expand on the current literature by examining multiple parenting practices as possible mediators between both maternal mental and physical health problems and externalizing problems in preschool children.

Theoretical Framework for This Study

One way to better understand child development, and child externalizing behaviors specifically, is through a theoretical perspective such as the ecological systems theory (Bronfenbrenner, 1979). The ecological systems theory (EST) posits that behavior is influenced by the interactions one has between different environments, or systems, throughout his/her life (Bronfenbrenner, 1979). This theory addresses the multiple systems that either directly or indirectly impact children’s development, which include the microsystem, mesosystem, exosystem, and macrosystem. Through the interaction of multiple, layered systems, this theory helps to explain how individual or child characteristics, parental relationships and behaviors, and a myriad of environmental conditions can impact a child’s overall development. Within this model, the child is in the center. However, research has confirmed that more than just individual child factors influence development.

An EST framework can be used to help understand the complexity of the development and maintenance of externalizing behavior problems. Individual child characteristics that can impact externalizing behavior include factors like gender, age, ethnicity and obesity. The microsystem is the next closest context to the individual. It represents the relationship between children and their immediate settings in home or school (and those in it, like parents and
teachers). Within this system, parent characteristics and behaviors can impact child behavior directly. The mesosystem is the next system to impact the child, and this encompasses the relationships between the microsystems, such as the relationship between a child’s parents, or between the family environment and the school environment. The next system of influence is the exosystem, which does not directly involve the individual, but nonetheless impacts the child either directly or indirectly through its influence on more proximal systems (e.g., family poverty). The last system is the macrosystem, which encompasses the broader cultural environment that influences the child, such as policies and cultural ideology about general child rearing practices and the concern for preschool children with externalizing behavior problems.

As described above, there are a number of different layers within this system that can impede the development of positive, pro-social behaviors and increase the development of externalizing behaviors for preschool children. Therefore, EST is a useful conceptual framework for understanding the relationship between child individual characteristics, parental variables, and the severity of externalizing behaviors in young children. Because young children’s primary interactions are with their family, in particular their parents, it is not surprising that research suggests that the microsystem has the biggest impact on development (Bronfenbrenner, 1979). Therefore, the current study applied this perspective with a particular focus on the microsystem in understanding the hypothesized relationship between study variables.

Goals of the Current Study

The purpose of this study was to add to the understanding of the role of maternal health in influencing child behavior problems in a high-risk population. This study sought to address significant limitations of past research and to fill current gaps in the literature by examining a
number of unique and understudied constructs. Therefore, the study’s primary goals are described below.

The first goal was to better understand the multiple predictors of child externalizing behaviors in preschool children due to the importance of this outcome. Because preschool externalizing behavior problems are a well-documented, pervasive issue within the developmental psychology literature (Campbell, 2002), it is important to understand the factors that may contribute to the development of child externalizing behaviors.

Another goal was to examine both maternal mental and physical health predictors, as few studies have examined maternal health as a predictor of child outcomes. Though there is literature that links maternal mental health (i.e., maternal depression and stress) with increased child behavior problems (Baker et al., 2002; Jackson, 2000; McBride et al., 2002; Perry & Fantuzzo, 2010), there is a lack of exploration between maternal physical health (maternal overweight) and child social-emotional development (Bergmann et al., 2016). This study addressed this limitation in the literature by examining the impact of maternal overweight status on the presence of child externalizing behavior problems in addition to maternal depression and stress.

The third goal was to utilize observational measures of parenting practices, as few studies have utilized observed measures of parenting (e.g., Field, 1990; Goodman & Brumley, 1990; Hamilton, Jones, & Hammen, 1993). Additionally, within this literature many of these studies have only looked at maternal depression and stress and direct predictors of parenting behaviors, and very few have examined parenting as a possible mediator between maternal health and child outcomes (Paulussen-Hoogeboom et al., 2008). The current study sought to expand on this literature by examining the impact of observed positive parenting behaviors as a mediator.
between maternal health variables (both physical and mental health) and preschool children’s externalizing behaviors.

Lastly, an additional goal of the study was to examine these variables in a high-risk, low-income African American population, which is an understudied population. Within this body of literature, there is a lack of understanding between many of the variables described above as it applies to low-income African American families.

Because of the previous findings and limitations in the literature, the broad aim of the current study was to better understand the relationship between maternal health, parenting behaviors, and externalizing behavior problems among low-income African American preschool children. More specifically, the purpose was to examine the mediating role of parenting behaviors between maternal health problems and child externalizing behavior problems. To date, few studies have examined this relationship, and no known study has examined these associations while including maternal overweight as a maternal health factor. Therefore, the current study sought to fill this gap in the literature. Based on the literature review above, the study hypotheses are given below.

**Hypotheses**

1. Parental health problems will be positively related to preschool children’s externalizing behavior problems.
   a. Parental depression will be positively related to higher levels of externalizing behavior problems.
   b. Parental stress will be positively related to higher levels of externalizing behavior problems.
c. Parental BMI will be positively related to higher levels of externalizing behavior problems.

2. Positive parenting behavior will be negatively associated with child externalizing behavior.

3. Positive parenting behaviors will partially mediate the relationship between parental health problems and preschool children’s externalizing behavior problems. Figure 1 depicts this hypothesized mediation model.
   a. Positive parenting behaviors will partially mediate the relationship between parental depression and preschool children’s externalizing behavior problems.
   b. Positive parenting behaviors will partially mediate the relationship between parental stress and preschool children’s externalizing behavior problems.
   c. Positive parenting behaviors will partially mediate the relationship between parental BMI and preschool children’s externalizing behavior problems.

4. Exploratory analyses were done to examine the relationship between parental health, specific aspects of parenting behavior, and child externalizing behavior. In particular, parental sensitivity, positive engagement, and interference will be examined as possible pathways between depression, stress, BMI and child behavior. These are considered exploratory, in part, due to the small sample size in the present study. Associations between parental BMI, parenting, and child externalizing behavior are considered exploratory due to the limited literature that exists on these relationships.
Methods

Participants

The sample for the current study was drawn from a larger study of caregivers (mostly mothers) and children enrolled in urban Head Start preschool centers in Detroit, Michigan. This grant-funded study (P.I. Heather Janisse, Ph.D., Study: Parent Focused Nutrition and Activity Intervention for Head Start Preschoolers) examined the effectiveness of a nutrition and activity program in improving health behaviors of a high-risk sample of overweight urban preschool children. Participants for the larger study were recruited based on particular eligibility criteria. First, the child’s BMI must have been at or above the 85th percentile, placing the child at the “overweight” or “obese” category. Second, the child must have also be enrolled in Head Start at the time of recruitment; as such, children were between the ages of 3 and 5 years old.

The sample for the current study consisted of 56 primarily parent-child dyads. In this sample, though it was expected to be primarily mothers, not all primary caregivers were mothers (90% were mothers). Therefore, participants will hereafter be referred to as parents in this study.
Parent’s age ranged from 21 to 66 years (mean age = 30, SD = 7.8). The majority of the sample was African American (96%; 2% Multiracial/other; 2% White). In terms of educational attainment, 59% reported having a high school degree, and 41% of participants reported some college or more. The majority of these parents were single (71.4%), while 12.5% reported living with a partner, and 16.1% were married. The number of biological children that parents reported having ranged between 1 and 8 ($M = 2.4, SD = 1.4$). The majority (82%) of the sample reported making less than $15,000 a year, with 39% of all participants making less than $5,000 a year. Further demographic characteristic of the sample are listed in Table 1.

Table 1

Demographic Characteristics of Participants

| Parent’s Relationship to the Child (Note: all were identified as primary caregivers) | 90% Mothers  
4% Fathers  
2% Grandmothers  
4% Aunts/Uncles |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent’s Age</td>
<td>$M = 30.4$ years, $SD = 7.8$, Range = 21-66 years</td>
</tr>
<tr>
<td>Target Child’s Age</td>
<td>$M = 49$ months, $SD = 6.4$ months, Range = 3-5 years</td>
</tr>
</tbody>
</table>
| Child’s Gender | 56% Boys  
44% Girls |
| Child’s Race | 96% African American  
4% Multiracial |
| Parent’s Race | 96% African American  
2% Multiracial/Other  
2% White |
| Parent’s Education | 59% High School Degree  
41% College or Higher |
| Marital Status | 71.4% Single  
16.1% Married  
12.5% Single living with romantic partner |
| Number of Biological Children | 30% One Child  
28% Two Children  
25% Three Children  
11% Four Children  
4% Five Children  
2% Eight Children |
Table 1 continued

| Total Number of Children Living in the Home | 31% One Child  
|                                           | 31% Two Children  
|                                           | 20% Three Children  
|                                           | 12% Four Children  
|                                           | 4% Five Children  
|                                           | 2% Six Children  
| Number of Adults living in the home | 41% One Adult  
|                                          | 37% Two Adults  
|                                          | 12% Three Adults  
|                                          | 5% Four Adults  
|                                          | 2% Five Adults  
|                                          | 3% Six Adults  
| Parental Employment Status | 34% Full-Time  
|                             | 36% Part-Time  
|                             | 30% Unemployed  
| Annual Income | 39% < $5,000  
|               | 22% $5,000 - $9,999  
|               | 20% $10,000 - $14,999  
|               | 4% $15,000 - $19,999  
|               | 11% $20,000 - $29,000  
|               | 4% $30,000-$49,999  
| Type of Residence | 73% Single Family Home  
|                       | 10% Multi-Family Home  
|                       | 13% Apartment  
|                       | 4% Condominium/Townhouse  
| Receiving Government Public Financial Assistance (e.g., food stamps, money, TANF or SSI) | 66% Yes  
|                                               | 34% No  

Procedures

Data for this study were drawn from a larger randomized clinical trial designed to examine the effectiveness of a nutrition and activity intervention for preschool children who were overweight. For the purposes of the current study, only baseline data were utilized and represent data collected before participants were randomized to receive any intervention. Participants for the study were recruited from two Head Start Agencies in Detroit, Michigan:
United Children and Family Head Start and New St. Paul Head Start. Both agencies serve families in the Detroit area who are low-income and primarily African American descent.

**Recruitment.** Participants for the larger study were first identified by the Head Start nutrition coordinator at each agency. The nutrition coordinator identified children who met the BMI criteria for the larger study. Once identified, potential participants were given a recruitment flyer, which was sent home with the child from their classroom teacher (see Appendix B). If no objection to being reached was made to Head Start staff, then potential participants were contacted via telephone calls in order to directly recruit them. Over the phone, participants were given a brief overview of the larger study and home visit appointments were made to complete the consent process and baseline data collection.

**Data collection procedures.** Data collection took place in the home of the participants and lasted approximately 2—2.5 hours. A two-person team of one graduate student research assistant (RA) and one undergraduate student RA completed the home baseline assessment. At the start of each home visit, the consent process was completed (See Appendix B). The consent form was orally explained and participants were given the opportunity to ask questions. The primary caregiver gave consent on behalf of him/herself and the target preschool-age child. During baseline data collection, parents completed a number of measures, only some of which were used in the current investigation. Parents completed questionnaires that included demographic information; parent and child nutrition and activity habits; parental measures of depression, anxiety, stress, and parenting; and a report of child behavior. Participants primarily completed questionnaires on their own. However, RA assistance was available to help explain the measures, answer questions, or read surveys as needed. Height, weight, waist circumference, and blood pressure data were also collected for both the mother and child. Additionally, during
baseline data collection, a video recorded interaction paradigm occurred. At the end of the data collection visit, accelerometers were given to the families to monitor the child’s activity levels over a 4-day period. Although these accelerometer data were not relevant to the current study, they pertained to the compensation schedule for participants. Parents were given a total of $50 for completion of baseline data collection. Parents were paid $30 immediately after completion of the home data collection visit and then received an additional $20 after the accelerometers were picked up from the participants about a week later.

**Research assistant (RA) training.** Graduate level RAs were trained on study procedures by the principal investigator of the larger study. Procedures for recruiting participants, collecting consent and completing assessments were covered during group meetings. Procedures were also put into an operating manual for future reference. Graduate level RAs were responsible for training undergraduate RAs. All RAs were trained on general human subjects procedures by way of completing the online Collaborative Institutional Training Initiative “CITI” program.

**Measures**

**Child externalizing behavior problems.** Child externalizing behavior problems were measured by the Child Behavior Checklist for Ages 1½ to 5 (CBCL; Achenbach & Rescorla, 2000; see Appendix C). The CBCL is a 100-item scale measuring emotional and behavior problems in preschool children. Parents rated the frequency of behaviors over the last 2 months on a 3-point Likert scale (0 = *Not true [as far as you know]*, 1 = *Somewhat or Sometimes True*, 2 = *Very true or Often True*). The form took approximately 15 minutes to complete and was written at a fifth-grade comprehension level. From the parent ratings, six subscales were calculated: aggressive behaviors, destructive behaviors, anxious/depressed, withdrawn, sleep problems, and somatic problems. The Externalizing Behavior Index score was calculated from
the Attention Problems and Aggressive Behavior subscales. *T*-scores on this index range from 30 to 100, with higher scores indicating increased presence of problem behaviors. The clinically significant cutoff score is a *T*-score of 67 or higher. This measure can be both age and gender normed (Achenbach & Rescorla, 2010). The CBCL has good internal consistency (*α* = .96; Achenbach & Rescorla, 2000) and inter-rater reliability between raters such as mother and father reports are about .79. The CBCL Externalizing Behaviors Index also has good convergent validity with other measures of externalizing behaviors, such as the BASC-2 Externalizing Index (*r* = .80).

**Parental Health Factors**

**Depression.** Parental depression was assessed using the Patient-Reported Outcomes Measurement Information System Depression Short Form (PROMIS-D-8; Cella et al., 2007; see Appendix D). The PROMIS Depression instrument is an 8-item instrument developed to assess self-reported depression symptoms such as negative mood (e.g., sadness, guilt) and negative views of self (e.g., self-criticism, worthlessness). The PROMIS-D seeks to avoid potential confounds of any physical conditions experienced by the person and therefore, does not assess somatic symptoms (e.g., sleep problems, appetite disturbances). Parents were asked to rate the presence and severity of their depression symptoms over the past 7 days. Responses were reported on a 5-point Likert scale (1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Most of the time*, 5 = *Always*). Total scores on this measure can range between 8 and 40, with higher scores indicating a greater severity of depression symptoms. Item raw scores were then translated into *T*-Scores (*M* = 50, *SD* = 10). *T*-scores of 60 are one standard deviation worse than average, suggesting some level of clinical significance. Adequate test-retest reliability has also been established and ranges from *r* = .66 to .78 after 14 days between the two testing periods (Narrow
et al., 2013). This scale has strong convergent validity with other depression scales such as the PHQ-9 \((r = .73)\) and the CESD-10 \((r = .80;\) Amtmann et al., 2014).

**Stress.** Parental stress was assessed using the Perceived Stress Scale, 10-item version (PSS-10; Cohen & Williamson, 1988; see Appendix E). Items on the PSS-10 measure the degree to which someone perceives different life situations to be uncontrollable, unpredictable, and overwhelming (Cohen, Kamarck, & Mermelstein, 1983). Parents were asked questions intended to evaluate current stress levels and rated how often they have had certain thoughts or feelings in the past month (e.g., “in the last month, how often have you been upset because something happened unexpectedly?”). The measure uses a 5-point scale from \((0 = Never; 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often)\). An average score was created for each participant as long as at least 9 of the 10 items were completed on this measure. The PSS-10 has good reported predictive and discriminant validity (Cohen, Doyle, & Skoner, 1999). Measure reliability estimates (Cronbach’s \(\alpha\)) range between 0.85 and 0.91 (Cohen & Janicki-Deverts, 2010).

**Parental overweight.** Parental measures of height and weight were collected by researchers at the time of baseline data collection. Weight was collected with a Seca 869 2-Piece Remote Display Scale w/BMI. To obtain an accurate measurement of weight, parents were asked to remove their shoes and any outer clothing (e.g., heavy sweaters, sweat shirts, coats) and step onto the center of the scale. Weight was recorded to the nearest 0.1 kg. Two measures of weight were recorded. If the two measurements differed by more than 0.5 kg, two more measurements of weight were taken. To accurately measure participant height, a Seca Stadiometer was be used. Participants were again asked to remove shoes and any bulky outer clothing, as well as any hats or buns on the top of their head (if participants were willing and able to). Participants were asked
to stand on the stadiometer, and height measurement was taken after participants were properly positioned (e.g., there is a perpendicular 90° mid-axillary line from the height board where the person is standing, and the Frankford horizontal plane is parallel to the ground). Height was measured to the nearest 0.1 cm. A measure of height was taken two times; if the difference between the first and second measurement was greater than 0.5 cm, then two more measurements were taken. Parental BMI was calculated by dividing the weight (kg) by height (m) squared. Parents were considered overweight if their BMI is greater than or equal to 25 kg/m² (CDC, 2015).

**Observational-Rating Measure of Parenting**

**Parenting video procedures.** Parenting behaviors were assessed using a video recorded parent-child interaction observation during the baseline data collection in the participants’ homes. The parent-child interaction took place over a 12-minute time period, including three different interactions. There was an approximately 4-minute snack time interaction where the parent and child were given a healthy snack (apples and grapes). The snack was followed by approximately 6 minutes of free play. The parent-child dyad was provided toys to play with during this portion of the interaction (a standard set of novel developmentally appropriate toys that allowed for unstructured play, e.g., play food, toy drums and other child musical instruments). Finally, the interaction ended with a 2-minute “clean up” period where the mother and child were instructed to put away the toys. At the beginning of the interaction, parents were given these instructions:

“Now we’d like to videotape you and your child eating a snack and playing together with some of the toys that we brought along. Please feel free to play and interact with your child as you normally would. Go ahead and have a seat behind the toys and facing us. If possible, please try to keep your child around this area and these toys for the next 12 minutes. You will start by enjoying a snack together. Once you are done, or after 4 minutes (whichever comes first), we’ll let you know that it is time to stop eating and begin playing with the toys we brought. At that
time, we will provide you with the basket of toys. After another 5-6 minutes, we’ll let you know that there’s about 2 more minutes left and then you and your child can clean up the toys by putting them back in the bucket. One of us will make sure the camera is working, and the other will just be sitting aside organizing paperwork. Ready to begin?”

After 10 minutes total elapsed, parents were then be instructed:

“Okay, there are about 2 minutes left. Please stop playing with the toys and begin to put them back in the basket.”

These video data were used to rate parents on a series of parenting behaviors of interest for the current study. A description of the parenting variables, the procedure for development of the coding system, and the rater training procedures are described below.

**Parenting behaviors.** Four behavior scales were included in the present study to examine parenting behaviors. Parental *sensitivity* measured the mother’s ability to accurately interpret their child’s verbal and non-verbal communication, and respond both appropriately and promptly (Ainsworth et al., 1978). Parental *positive engagement* was defined as the degree of involvement and connection the parent has with their child during the video interaction. Parental *verbal interference/intrusiveness/hostility* (further known as verbal interference) included the extent to which a mother controlled the interaction with her child via verbal interruptions and negative comments. Parental *physical interference/intrusiveness/hostility* (further known as physical interference) included the extent to which a mother controlled the interaction with her child via physical interruptions and interference (Ainsworth et al., 1978; 1981; Belsky et al., 1991; & Lyons-Ruth, 1983). The coding system was created by the PI of the current study and was adapted from previously developed coding systems (Ainsworth, Blehar, Wasters & Wall, 1978; Crittenden 1981; Gallagher et al., 2011). Codes were adapted to the age of the child, the current sample demographic characteristics, and the type of interaction (e.g., adding a snack interaction). The coding system was reviewed by two experts in the field of child
clinical/developmental psychology. A 5-point behavioral rating scale system was developed, with higher scores indicating higher prevalence of the respective behaviors observed in the video (1 = none, 5 = very much). Trained coders viewed the video recorded parent-child interactions and provided parental behavioral ratings according to a coding system. Coders viewed the 4-minute snack segment, the 6-minute free-play segment, and the 2-minute clean up segment, and rated separate parental behaviors for each task.

As described, the coding system allowed for individual scores of sensitivity, positive engagement, verbal interference, and physical interference across the snack, free play and clean up time for each parent. However, due to inter-scale correlations for the purposes of some of the study analyses, scales were combined (with verbal and physical interference reverse scored) to create an overall parenting score for each observed interaction (snack, free play and clean up). Parents with higher scores displayed higher levels of positive parenting practices and lower levels of interference. Parents with lower overall parenting scores showed less positive parenting practices (sensitivity and positive engagement) and higher levels of interference.

**Video coding training procedures.** Coders for this study consisted of one graduate student and two undergraduate students. Coders were trained to code parental behaviors based on viewing an initial random selection of 21 parent-child interaction tapes from the study (7 videos from each video interaction, snack, free play, and clean-up). Weekly training meetings were conducted with the PI and all coders for about 2 hours each for approximately four weeks. During these meetings, each behavior code was described in detail and a number of parent-child interactions including snack, free play, and clean-up interactions, were observed to illustrate the coding system. Coders practiced reviewing videos and coding in the training sessions to become more familiar with the coding procedure. The coders then practiced coding the snack, free play,
and clean-up videos separately, to simulate the coding procedures for the study. Initial training meetings continued until the investigator and coders felt comfortable with the coding system and understood the coding procedures.

Following the initial training, each individual coder worked to establish reliability with the PI for the snack, free play, and clean-up tasks by using a random subset of mother child interaction tapes in the present study \((n = 11\), approximately 20\%). Throughout the reliability coding period, which lasted approximately six weeks (coding two snack, two free play, and two clean-up videos per week), 1 hour weekly meetings were held with all coders to provide feedback on reliability codes and discuss discrepancies on individual codes. In order for coders to be acceptably reliable, coders needed to have intra-class correlation coefficients (ICC) of .60 or higher based on previous literature (Cicchetti, 1994). Reliability for each coder was examined using ICCs, which ranged from .62 to .90 for Sensitivity; .64 to .82 for Positive Engagement; .60 to .98 for Verbal Interference; and .62 to .96 for Physical Interference.

After establishing inter-rater reliability for the snack, free play, and clean-up videos, each of the three coders were randomly assigned approximately 11—12 snack, free play, and clean-up videos each to code over a 6-week period. An effort was made to assign different coders to code the snack, free play, and clean-up videos for the same participant in order to reduce bias in coding the different segments. Additionally, video interactions were chosen at random and coded by the PI. The coders did not know which videos would be double coded. Each week, the PI double coded at least one video interaction for each coder (approximately seven additional tapes per coder total). Coders received feedback on their codes each week and any discrepancies were discussed. Disagreements were resolved via consensus. Final reliabilities reflect a combination of the initial and ongoing reliability calculations. Final ICCs, ranged from .63 to .95 for
Sensitivity; .70 to .90 for Positive Engagement; .60 to .98 for Verbal Interference; and .85 to .97 for Physical Interference.

**Self-Report Measure of Parenting**

**Perception of parenting.** For the purpose of exploratory analyses, self-report of parenting behaviors was measured by the Parenting Sense of Competence (PSOC; Johnston & Mash, 1989). The PSOC is a 17-item scale measuring parenting self-esteem and perceived competence for parenting. Parents and caregivers answered items related to parenting self-esteem on a 6-point scale (1 = *Strongly Disagree*, 6 = *Strongly Agree*). Examples of questions include; “*Being a parent is manageable, and any problems are easily solved.*” Total summed scores for this measure can range between 17 and 102, with higher total scores indicating higher levels of parenting sense of competence. The original authors (Johnston & Mash, 1989) found a 2-factor structure that makes up the PSOC, Satisfaction (e.g., the person’s liking of the parenting role) and Efficacy (e.g., the persons perceived competence in the parenting role). The presence of these subscales has been confirmed in additional studies (Ohan, Leung, & Jonhston, 2000). The PSOC has good internal consistency (range .75—.88; Johnston & Mash, 1989; Lovejoy, Verda, & Hays, 1997; Ohan et al., 2000).

**Data Analysis**

**Preliminary analyses.** Prior to hypothesis testing, data screening, missing data analysis and descriptive and correlational analyses of model variables and participant demographic data were conducted using SPSS 21 (SPSS Inc., 2012). Additionally, analyses of the observational parenting variables were conducted in order to create composite variables for parenting behavior. Exploratory factor analyses (EFAs) were conducted to examine the factor structure of the observed parenting behaviors in order to create a composite score for parsimony.
Primary analyses. Statistical analyses were conducted using SPSS 21 (SPSS Inc., 2012) and Mplus 5.21 computer software (Muthén & Muthén, 2009). The hypothesized models were tested through Mplus software utilizing path analysis (PA). Path analysis is a special case of structural equation modeling (SEM), which analyzes structural models that contain only observed variables. PA provides information on model fit of the hypothesized model relative to the data. PA aims to explain correlation patterns among variables, and explain the variance within the specified model. As such, the basic statistic of PA is covariance. PA has advantages for mediation analysis over more traditional methods; for example, it has the ability to analyze more complicated models and use multiple outcome variables.

Assumptions of PA. When using SEM techniques, it is important to consider the sample size because it relates to the stability of the parameter estimates. Though there is no exact rule for sample size, there is a general consensus that 10 participants per estimated parameter is preferable (Schreiber, Stage, King, Nora, & Barlow, 2006). For the hypothesized model in the present study, up to seven parameters for mediation models were estimated in any one analysis. Therefore, a sample of 70 participants was needed to run one complete model based on the 10 participants per parameter criterion. However, because the current study had 56 participants, each observed positive parenting composite (for the three different tasks) was examined separately, instead of in one model.

Additionally, when using PA as a confirmatory technique, the full model must be specified a priori to the analysis. Also, the number of parameters needed to estimate the model must be known. The estimation techniques used in SEM (e.g., maximum likelihood) requires multivariate normality. As a result, the data were examined for univariate and multivariate outliers prior to analysis.
PA of the present study. Separate path analyses were conducted for each positive parenting score (snack, free play, and clean-up) due to sample size limitations. In order to test Hypotheses 1—3, multiple path analyses were conducted to examine the relationships between parental health variables, overall positive parenting scores during different video interactions, and child externalizing behavior. For these models, maximum likelihood estimation was used to estimate parameters. Maximum likelihood is the predominant estimation method utilized in SEM (Anderson & Gerbing, 1988) and it is the default estimation method of Mplus. Missing data were handled with the maximum likelihood robust (MLR) estimation technique (see below for more details). The chi-squared test of model fit ($\chi^2$), comparative fit index (CFI), tucker-lewis fit index (TLI; Tucker & Lewis, 1973), and root mean squared error of approximation (RMSEA) were used to estimate goodness of fit. When the $\chi^2$ is small and non-significant, it suggests that the model fits the data, whereas large and statistically significant $\chi^2$ indicates poor model fit. Additionally, because the $\chi^2$ is sensitive to sample size, it must also be considered alongside other incremental and error variance statistics; therefore, the CFI, TLI, and RMSEA were considered in order to assess model fit. For the CFI and TLI, the suggested value for acceptable fit is .90 or higher (Bentler, 1990). For the RMSEA, the suggested value for good fit is .08 or lower (MacCallum, Brown, & Sugawara, 1996). Significant parameter estimates and small standard errors indicate good fit as well. In order to test Hypothesis 4, bivariate correlations were run between the separate observed parenting behaviors and the model variables.

After examination of fit indexes and parameter estimates, model modification was also conducted for exploratory purposes when theoretically sensible. Modifying the model involves adjusting the specified and estimated model. This is done by freeing formerly fixed parameters...
BEHAVIOR PROBLEMS

and/or fixing formerly free parameters (Hoyle, 1995). Model modification allows for the development of the most parsimonious model that fit the data.

Results

Preliminary Analyses

Prior to the primary hypothesis testing, individual variables were screened for normality using SPSS Frequencies and Explore. Scatterplots were generated between independent and dependent variables to screen for multiple regression assumption of linearity. Results indicated univariate outliers on three of the model variables. Parental depression (PROMIS) had two outliers, BMI had two outliers, and child externalizing behaviors (CBCL) had one outlier. All univariate outliers were Winsorized. Additionally, Mahalanobis $D^2$ was used to test for multivariate outliers. There were no multivariate outliers present in the data set. Means and frequency analysis of model variables was conducted post Winsorizing of outliers and are shown in the Tables 2—5 below. Table 2 shows that only a small percent of participants reported the frequency of their child’s behavior in the clinically significant range (7.3%). Parental reports of clinically significant depression were also relatively low, with only 5.8% of the sample reporting depressive symptoms in the clinically significant range. Because depression was significantly skewed with many participants reporting no to very low depressive symptoms, the depression variable was dichotomized at the mean for later analyses. There was more variability in parental reports of stress, with 46.4% of the sample reporting stress in the moderate range. However, no participants reported stress in the high range. Lastly, in this sample, 82.1% of the sample had BMIs in the clinically significant overweight range.

Missing data were found for a number of model variables. Specifically, for the parent self-report of depression, two participants did not complete the measure. Those same two
participants did not complete the measure of stress (PSS). For the majority of the participants, one item of the PSS was missing from the survey. As stated in the method’s section, a mean score for the PSS was computed as long as at least nine items were complete. Therefore, all but two participants had a score for the PSS. One parent did not complete the parent rated child externalizing behavior scale (CBCL). Additionally, there were four parents that did not complete the video interaction. Additionally, one participant did not complete the snack interaction and one did not complete the clean-up interaction on video. Missing data were handled in Mplus with full information maximum-likelihood estimation (FIML; Muthén & Muthén, 2009).

Table 2

*Frequency of Parent Reported Child Externalizing Behavior Problems*

<table>
<thead>
<tr>
<th>CBCL Externalizing Scale T-Score (M = 46.60, SD = 8.49)</th>
<th>n</th>
<th>Percent</th>
<th>Descriptive Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-score = &lt; 60</td>
<td>51</td>
<td>92.7%</td>
<td>Normal Range</td>
</tr>
<tr>
<td>T-Score = ≥ 60</td>
<td>4</td>
<td>7.3%</td>
<td>Clinically Significant Range</td>
</tr>
</tbody>
</table>

Table 3

*Frequency of Parent Reported Depression Symptoms*

<table>
<thead>
<tr>
<th>PROMIS Scale T-Score (M = 45.41, SD = 7.93)</th>
<th>n</th>
<th>Percent</th>
<th>Descriptive Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-score = &lt; 60</td>
<td>49</td>
<td>94.2%</td>
<td>Normal Range</td>
</tr>
<tr>
<td>T-Score = ≥ 60</td>
<td>3</td>
<td>5.8%</td>
<td>Clinically Significant Range</td>
</tr>
</tbody>
</table>
Table 4

**Mean of Parent Reported Stress Symptoms**

<table>
<thead>
<tr>
<th>PSS Total Score (M = 1.3, SD = .62)</th>
<th>n</th>
<th>Percent</th>
<th>Descriptive Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score &lt; 1.4</td>
<td>29</td>
<td>53.7%</td>
<td>Normal Range</td>
</tr>
<tr>
<td>Total Score ≥ 1.4 - ≤ 2.6</td>
<td>25</td>
<td>46.3%</td>
<td>Moderate Range</td>
</tr>
<tr>
<td>Total Score ≥ 2.7</td>
<td>0</td>
<td>0.0%</td>
<td>High Range</td>
</tr>
</tbody>
</table>

Table 5

**Frequency of Parental BMI**

<table>
<thead>
<tr>
<th>BMI (M = 34.66, SD = 9.4)</th>
<th>n</th>
<th>Percent</th>
<th>Descriptive Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI ≤ 25</td>
<td>10</td>
<td>17.9%</td>
<td>Normal Weight Range</td>
</tr>
<tr>
<td>BMI ≥ 26</td>
<td>46</td>
<td>82.1%</td>
<td>Overweight</td>
</tr>
</tbody>
</table>

With respect to the hypothesized mediating variable of parenting behavior, parenting scores were generally in the moderate range. More specifically, positive parenting scores during the snack were moderately low (Sensitivity, M = 2.63; Positive Engagement, M = 2.49). Additionally, during the snack portion of the video interaction, there were relatively low reports of negative parenting behaviors (Verbal Interference, M = 2.71; Physical Interference, M = 1.92). Positive parenting scores during the free play interaction were also moderate (Sensitivity, M = 2.55; Positive Engagement, M = 2.88). Additionally, during the free portion of the video interaction, there were moderate rates of negative parenting behaviors (Verbal Interference, M = 3.19; Physical Interference, M = 2.42). Similarly, the positive parenting scores in the clean-up interaction were moderately low (Sensitivity, M = 2.53; Positive Engagement, M = 2.37). Additionally, there were low to moderately low rates of negative parenting behaviors during the clean-up video interaction (Verbal Interference, M = 2.74; Physical Interference, M = 1.63). See Table 6 for complete parenting descriptive statistics.
Table 6

*Means and Standard Deviations of Observed Parenting Scores*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snack Sensitivity</td>
<td>2.63</td>
<td>0.77</td>
<td>1-4</td>
</tr>
<tr>
<td>Snack Positive Engagement</td>
<td>2.49</td>
<td>0.8</td>
<td>1-4</td>
</tr>
<tr>
<td>Snack Verbal Interference</td>
<td>2.71</td>
<td>1.1</td>
<td>1-5</td>
</tr>
<tr>
<td>Snack Physical Interference</td>
<td>1.92</td>
<td>1.09</td>
<td>1-5</td>
</tr>
<tr>
<td>Free Play Sensitivity</td>
<td>2.55</td>
<td>0.69</td>
<td>1-4</td>
</tr>
<tr>
<td>Free Play Positive Engagement</td>
<td>2.88</td>
<td>0.94</td>
<td>1-5</td>
</tr>
<tr>
<td>Free Play Verbal Interference</td>
<td>3.19</td>
<td>1.20</td>
<td>1-5</td>
</tr>
<tr>
<td>Free Play Physical Interference</td>
<td>2.42</td>
<td>1.14</td>
<td>1-5</td>
</tr>
<tr>
<td>Clean-up Sensitivity</td>
<td>2.53</td>
<td>0.92</td>
<td>1-5</td>
</tr>
<tr>
<td>Clean-up Positive Engagement</td>
<td>2.37</td>
<td>0.96</td>
<td>1-5</td>
</tr>
<tr>
<td>Clean-up Verbal Interference</td>
<td>2.74</td>
<td>1.28</td>
<td>1-5</td>
</tr>
<tr>
<td>Clean-up Physical Interference</td>
<td>1.69</td>
<td>0.98</td>
<td>1-5</td>
</tr>
</tbody>
</table>

**Exploratory factor analysis.** Exploratory factor analyses (EFAs) were conducted using SPSS to examine the factor structure of the observed parenting behaviors with the intention of creating a composite parenting score to be used in further analyses. Sensitivity, Positive Engagement, Verbal Interference reversed, and Physical Interference reversed total scores were examined to determine whether creating one positive parenting composite from these behaviors, for each type of video interaction (e.g., snack, free play, & clean-up), was statistically supported. In theory, conceptually related parenting behavior should load onto similar factors. Additionally, due the sample size, results of EFAs should be interpreted with caution.

The first EFA was conducted to examine the four observed parenting behavior scores obtained during the snack video interaction. Principal axis factoring method was used to examine these items. Results produced a one-factor solution, which explained 62.3% of the variance. Factor loadings ranged from .42 to .94. This means that the four parenting scores for the snack
interaction were conceptually related. Therefore, a composite for observed positive parenting was justified (see Table 7).

Table 7

| Exploratory Factor Analysis of Observed Parenting Behaviors for Snack |
|-------------------------------|-------------------------|
| Scale                         | Factor 1                |
| Sensitivity                   | 0.95                    |
| Positive Engagement           | 0.62                    |
| Verbal Interference           | 0.54                    |
| Physical Interference         | 0.42                    |

Next, EFA was conducted on the four items that comprised the parenting behavior codes for free play. Principal axis factoring was initially used to examine these items; however, under principal axis factoring, a factor was unable to be extracted. Because principal axis factoring often does not work well when there are unequal factor loadings, maximum likelihood was computed instead (Winter & Dodou, 2012). Results produced a one-factor solution, which explained 55.9% of the variance. Factor loadings ranged from .43 to .99. This means that the four parenting scores for the free play interaction were conceptually related. Therefore, a composite for observed positive parenting was justified (see Table 8).

Table 8

| Exploratory Factor Analysis of Observed Parenting Behaviors for Free Play |
|-------------------------------|-------------------------|
| Scale                         | Factor 1                |
| Sensitivity                   | 0.99                    |
| Positive Engagement           | 0.70                    |
| Verbal Interference           | 0.46                    |
| Physical Interference         | 0.43                    |

Finally, EFA was conducted on the four items that comprised the parenting codes for the clean-up task. Principal axis factoring method was used to examine these items. Results
produced a one-factor solution, which explained 60.9% of the total variable. Factor loadings ranged from .36 to .94. This means that the four parenting scores for the clean-up interaction were conceptually related. Therefore, a composite for observed positive parenting was justified (see Table 9).

Table 9

<table>
<thead>
<tr>
<th>Scale</th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>0.95</td>
</tr>
<tr>
<td>Positive Engagement</td>
<td>0.75</td>
</tr>
<tr>
<td>Verbal Interference</td>
<td>0.54</td>
</tr>
<tr>
<td>Physical Interference</td>
<td>0.36</td>
</tr>
</tbody>
</table>

In this study, snack, free play, and clean-up codes were considered separate indicators of parenting behaviors, as the activities may elicit different types of parenting demands (e.g., some parents have more rules about their child’s table manners, free play may be considered a less demanding and more unstructured task than having to clean up, etc.). Pearson’s inter-correlations were examined between the snack, free play, and clean up composites to examine the degree of relationship between parenting behaviors across these different interaction contexts. Results indicated that the relation between the individual snack, free play, and clean up composites varied greatly, with the majority of behaviors being unrelated across coding context ($p > .05$), while others were significant (see Table 10). Furthermore, when total positive parenting across coding contexts was examined (see Table 11), only free play and clean up were significantly related ($p < .01$). Therefore, for subsequent analyses, snack, free play, and clean up composites were examined separately to allow for the exploration of differential relationships between variables across parenting context.
**Correlation analyses.** Next, bivariate correlations were run to look at associations between all of the model variables along with various demographic characteristics. Demographic characteristics that were theoretically relevant, such as parents’ age, education level, employment status, annual household income, and child’s gender, were examined as possible covariates (See Table 12). Upon examination of these variables, two variables appeared to be possible covariates due to their correlations with study measures: parental age and annual household income.

Parental age was positively correlated with the total positive parenting score during the clean-up video interaction ($r = .30, p < .05$). More specifically as parent’s age increased so did their total positive parenting score during the clean-up video interaction. Thus, older parents were viewed as having more positive parenting skills and interactions with their child during a task in which they were instructed to clean up toys. Annual household income was negatively related to parental reports of their own stress ($r = -.38, p < .01$) and depression ($r = -.35, p < .05$). As parents reported lower levels of income, their reports of depression and stress symptoms increased. Therefore, parents who were more financially strained were more likely to report increased stress levels. Annual household income was also correlated with the total positive parenting score during the free play video interaction ($r = .34, p < .05$). As household annual income increased, so did parents’ total parenting score during the free play video interaction. Because these demographic characteristics were related to total positive parenting scores, they were controlled for and added to the tested path models. No other demographic variables were related to any model predictors or the outcome variable.
Table 10

**Associations Among Snack, Free Play, and Clean-Up Parenting Behavior Codes**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Snack Sen</th>
<th>Snack Positive Eng</th>
<th>Snack Verbal Inter</th>
<th>Snack Physical Inter</th>
<th>Free Play Sen</th>
<th>Free Play Positive Eng</th>
<th>Free Play Verbal Inter</th>
<th>Free Play Physical Inter</th>
<th>Clean-Up Sen</th>
<th>Clean-Up Positive Eng</th>
<th>Clean-Up Verbal Inter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snack Positive Eng</td>
<td></td>
<td>.65**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack Verbal Int</td>
<td></td>
<td>-.48**</td>
<td>-.26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack Physical Int</td>
<td>-.34*</td>
<td>-.20</td>
<td>.40**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Play Sen</td>
<td>.19</td>
<td>.01</td>
<td>-.05</td>
<td>-.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Play Positive Eng</td>
<td>.26</td>
<td>.24</td>
<td>.06</td>
<td>-.17</td>
<td>.69**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Play Verbal Inter</td>
<td>.04</td>
<td>.18</td>
<td>.21</td>
<td>-.02</td>
<td>-.45**</td>
<td>-.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Play Physical Inter</td>
<td>.06</td>
<td>.32*</td>
<td>.28*</td>
<td>.30*</td>
<td>-.43**</td>
<td>-.18</td>
<td>.45**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean-Up Sen</td>
<td>.06</td>
<td>.03</td>
<td>-.18</td>
<td>-.13</td>
<td>.33*</td>
<td>.23</td>
<td>-.16</td>
<td>-.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean-Up Positive Eng</td>
<td>.17</td>
<td>.21</td>
<td>-.08</td>
<td>.02</td>
<td>.27</td>
<td>.33*</td>
<td>.01</td>
<td>-.12</td>
<td>.77**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean-Up Verbal Inter</td>
<td>-.14</td>
<td>-.17</td>
<td>.26</td>
<td>.17</td>
<td>-.29*</td>
<td>-.06</td>
<td>.46**</td>
<td>.41**</td>
<td>-.48**</td>
<td>-.33*</td>
<td></td>
</tr>
<tr>
<td>Clean-Up Physical Inter</td>
<td>.09</td>
<td>-.09</td>
<td>.05</td>
<td>-.07</td>
<td>-.04</td>
<td>.04</td>
<td>.24</td>
<td>.35*</td>
<td>-.26</td>
<td>-.21</td>
<td>.42**</td>
</tr>
</tbody>
</table>

** = $p < .01$
* = $p < .05$
Table 11

Means, Standard Deviations, and Associations Among Snack, Free Play, and Clean-Up Total Positive Parenting Behavior Codes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
<th>Snack Total</th>
<th>Free Play Total</th>
<th>Clean Up Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Positive Parenting Score-Snack</td>
<td>12.49</td>
<td>2.77</td>
<td>5—17</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Positive Parenting Score-Free Play</td>
<td>11.83</td>
<td>2.93</td>
<td>6—18</td>
<td>.14</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Total Positive Parenting Score-Clean-Up</td>
<td>12.53</td>
<td>3.09</td>
<td>4—20</td>
<td>.20</td>
<td>.41**</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**= p < .01

Table 12

Zero Order Correlations Between Model Variables and Demographic Variables

<table>
<thead>
<tr>
<th></th>
<th>BMI</th>
<th>Parental Stress</th>
<th>Parental Depression</th>
<th>Child Externalizing Behavior Problems</th>
<th>Positive Parenting Total Score-Snack</th>
<th>Positive Parenting Total Score-Free Play</th>
<th>Positive Parenting Total Score-Clean-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent age</td>
<td>.15</td>
<td>.11</td>
<td>.19</td>
<td>.07</td>
<td>.06</td>
<td>.16</td>
<td>.30*</td>
</tr>
<tr>
<td>Parent education</td>
<td>.09</td>
<td>-.09</td>
<td>-.07</td>
<td>-.09</td>
<td>-.06</td>
<td>-.12</td>
<td>-.12</td>
</tr>
<tr>
<td>Parent employment</td>
<td>-.02</td>
<td>.14</td>
<td>.15</td>
<td>.03</td>
<td>-.02</td>
<td>-.10</td>
<td>.04</td>
</tr>
<tr>
<td>Annual household income</td>
<td>.15</td>
<td>-.38**</td>
<td>-.35*</td>
<td>-.07</td>
<td>.04</td>
<td>.34*</td>
<td>.23</td>
</tr>
<tr>
<td>Child gender</td>
<td>.02</td>
<td>-.16</td>
<td>.25</td>
<td>.05</td>
<td>.22</td>
<td>.11</td>
<td>.23</td>
</tr>
</tbody>
</table>

**= p < .01
* = p < .05

Zero-order correlations were also run between the model variables (see Table 13). Two parental health predictors, parental depression, and parental stress were significantly correlated. Parents who reported higher rates of depression symptoms were more likely to report higher levels of stress (r = .45, p < .01). Two parental health predictors were found to be related to child externalizing behaviors: parental stress and parental depression. As parental reports of stress increased, parents’ reports of child externalizing behavior problems increased (r = .42, p < .01).
Similarly, as parental reports of depression increased, parents’ reports of their child’s externalizing behavior problems increased ($r = .35, p < .05$). Therefore, parents with increased levels of stress and depression tended to report higher levels of externalizing behavior problems in their preschool-aged children. Lastly, one of the mediating variables was found to be significantly correlated with child externalizing behavior problems. Higher scores of positive parenting behaviors during the snack video interaction were found to be related to higher reports of child externalizing behavior problems ($r = .30, p < .05$). Though the direction of this relationship was unexpected, the results indicate that parents who were observed having more positive parenting behaviors during the snack video interaction reported higher levels of externalizing behavior problems in their preschool-aged children.

Table 13

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BMI</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Parental Stress</td>
<td>-.12</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Parental Depression</td>
<td>.06</td>
<td>.45**</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. External Behavior Problem</td>
<td>.01</td>
<td>.42**</td>
<td>.35*</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Positive Parenting Total Score-Snack Play</td>
<td>.25</td>
<td>-.14</td>
<td>.20</td>
<td>.30*</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Positive Parenting Total Score-Free Play</td>
<td>.16</td>
<td>-.11</td>
<td>-.03</td>
<td>-.03</td>
<td>.14</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>7. Positive Parenting Total Score-Clean Up</td>
<td>.20</td>
<td>-.12</td>
<td>.05</td>
<td>-.12</td>
<td>.20</td>
<td>.41**</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*** = $p < .001$ level
** = $p < .01$
* = $p < .05$

Path Models

Mplus 5.21 computer software (Muthén & Muthén, 2009) was used to test hypotheses 1, 2, and 3. Hypothesis 1 posited that parental health problems would be positively related to preschool children’s externalizing behavior problems. Hypothesis 2 stated that positive parenting behavior would be negatively associated with child externalizing behavior. Lastly, Hypothesis 3
posited that positive parenting behaviors would partially mediate the relationship between parental health problems and preschool children’s externalizing behavior problems. To test all three hypotheses, three separate path models were run. Each model examined the impact of all three parental predictors (depression, stress, and BMI) and one of the measures of positive parenting (e.g., positive parenting at snack, free play, and clean-up) as possible mediators for child externalizing behavior problems. Because parental depression and stress were highly correlated, the models allowed for parental depression and stress to be correlated and examined as separate paths to child externalizing behavior problems. Although bivariate correlations revealed that parents’ age and income were correlated with some predictor variables, no demographic variables were significantly related to the outcome of child behavior problems in this study. Therefore, due to the limited sample size in the current study, no covariates were included in the path models.

The first hypothesized path model examined positive parenting during snack as a possible mediator between all parental health factors (stress, depression, and BMI) and child externalizing behaviors (see Figure 2). This model had good fit overall, $\chi^2 (2) = 2.68, p = ns$, CFI = 1.00, TLI = 1.05, RMSEA = 0.00. This model was significant in predicting externalizing behaviors in preschool children, $R^2 = .34, p < .01$. In this model, there was a significant direct path from parental stress to child externalizing behaviors ($\beta = .46, p < .001$). This suggests that parents who reported higher levels of stress also reported higher levels of externalizing behaviors in their child. The paths from depression and BMI to child externalizing behavior were not significant, suggesting that among this sample, parental depression and BMI do not predict child externalizing behaviors. This means that Hypothesis 1, which posited that parental health
problems were positively related to preschool children’s externalizing behavior problems, was only partially supported in this model.

Additionally, in this hypothesized model, there was a significant direct path from total positive parenting score during snack to child externalizing behaviors ($\beta = .39, p < .01$). Surprisingly, this relationship was in a positive direction, meaning that parents with increased scores of positive parenting during snack reported higher levels of externalizing behaviors in their child. This indicates that Hypothesis 2, which stated that positive parenting behavior will be negatively associated with child externalizing behavior, was not supported in this model.

$\chi^2 (2) = 1.68, p = ns, CFI = 1.00, TLI = 1.05, RMSEA = 0.00$

$R^2 = .34, p < .01$

*** = $p < .001$, ** = $p < .01$, * = $p < .05$

*Figure 2*: Observed total positive parenting score during snack as a mediator between parental health factors and child externalizing behavior problems.
Lastly, the indirect paths from parental health to child behavior through parenting behavior were not found to be significant. The paths from parental health to parenting behavior were not significant. As a result, Hypothesis 3, which posited that positive parenting behaviors will partially mediate the relationship between parental health problems and preschool children’s externalizing behavior problems, was not supported in this model. Please see figure 2 for standardized coefficients from the hypothesized model. As can also be seen in this model, parental depression and stress were significantly, positively correlated. As parental reports of depressive symptoms increased, so did their reports of stress.

In the interest of parsimony, model modifications were made to the hypothesized model based on theoretical considerations and evaluation of non-significant paths. Non-significant paths were removed in an iterative process in order to evaluate model fit and path coefficient changes at each step. The final, reduced model for parenting during snack time is shown in Figure 3. This model had excellent fit, $\chi^2 (5) = 5.11, p = ns$, CFI = 1.00, TLI = .00, RMSEA = 0.02. The overall model was significant in predicting externalizing behaviors in preschool children, $R^2 = .33, p < .01$. In this model, stress and parenting remained as significant predictors of externalizing behavior ($\beta = .48, p < .001$). Parental depression and stress remained in the model as predictors of parenting. However, only stress was marginally related to parenting in the model ($p < .10$). There was a trend for parents who reported more stress to exhibit poorer parenting behavior during snack. The indirect effect of parental health on child externalizing behavior through parenting still remained non-significant. See Figure 3 for further details.

In the next PA, total positive parenting during free play was examined as a mediator between parental health variables and child externalizing behavior problems. They hypothesized model can be seen in Figure 4. This model had good fit, $\chi^2 (2) = 1.46, p = ns$, CFI = 1.00, TLI =
1.28, RMSEA = 0.00. The overall model was significant in predicting externalizing behaviors in preschool children, $R^2 = .21, p < .05$. In this model, there was a significant direct path from parental stress to child externalizing behavior problems ($\beta = .36, p < .01$). Depression and BMI were not significant predictors of externalizing behavior. Therefore, in this model Hypothesis 1 was partially supported.

The path from positive parenting during free play to child externalizing behavior problems was not significant, and therefore Hypothesis 2 was not supported. The indirect path from parental stress to the child behavior outcome was also not significant. Hypothesis 3 was not supported in this model, indicating that positive parenting practices during free play do not predict increased child externalizing behaviors.

In interest of parsimony, model modifications were made to the hypothesized model. Theoretical considerations and evaluation of non-significant paths guided model changes. The final, reduced model for parenting during free play is shown in Figure 5.

$\chi^2 (5) = 5.11, p = ns$, CFI = 1.00, TLI = .99, RMSEA = 0.02

$R^2 = .33, p < .01$

*** = $p < .001$, † = $p < .10$

Figure 3: Observed total positive parenting score during snack as a mediator between parental stress and child externalizing behavior problems controlling for parental depression.
$\chi^2 (2) = 1.46, p = ns, CFI = 1.00, TLI = 1.28, RMSEA = 0.00$

$R^2 = .21, p < .05$

*** $= p < .001$, ** $= p < .01$

*Figure 4:* Observed total positive parenting score during free play as a mediator between paternal health factors and child externalizing behavior problems.

$\chi^2 (6) = 4.07, p = ns, CFI = 1.00, TLI = 1.19, RMSEA = 0.00$

$R^2 = .18, p < .05$

*** $= p < .01$

*Figure 5:* Observed total positive parenting score during free play as a mediator between parental stress and child externalizing behavior problems controlling for parental depression.
This model had good fit, $\chi^2(6) = 4.07, p = ns, CFI = 1.00, TLI = 1.19, RMSEA = 0.00$. The overall model was also significant in predicting externalizing behaviors in preschool children, $R^2 = .18, p < .01$. The relationship between parental stress and child behavior problems became stronger ($\beta = .34, p < .01$) and stress and depression remained significant correlated. However, the indirect effect between stress and behavior problems through parenting remained non-significant.

Next, for the final hypothesized model, total positive parenting during clean-up was examined as the mediator between parental health variables and child externalizing behavior problems. This model can be seen in Figure 6. The hypothesized model had good fit, $\chi^2(2) = 1.45, p = ns, CFI = 1.00, TLI = 1.22, RMSEA = 0.00$. The overall model was significant in predicting externalizing behaviors in preschool children, $R^2 = .21, p < .05$. There was a significant direct path between parental stress and child externalizing behavior problems ($\beta = .35, p < .001$). As reports of stress increased, so did reports of behavior problems. However, the paths between depression and externalizing behavior and BMI and externalizing behavior were not significant. Therefore, Hypothesis 1 was only partially supported.

The relationship between positive parenting during clean up and child externalizing behaviors was not significant, indicating that Hypothesis 2 was not supported. The indirect paths from parental health to child behavior through parenting behavior were not found to be significant. The paths from parental health to parenting behavior were not significant. Therefore, Hypothesis 3 was not supported. As with the previous path models, model modification was explored. However, for this model, no changes or deletion of non-significant paths improved the model fit or changed any variable relationships. Therefore, no trimmed model is proposed here.
Hypothesis 4 proposed that exploratory analyses would be conducted to examine the relationship between parental health, specific aspects of parenting behavior and child externalizing behavior. To explore these relationships, bivariate correlations were run between parental health, the separate measures of observed parenting behaviors (sensitivity, positive engagement, verbal interference, physical interference), and child behavior problems (See Table 14). A number of the parenting behaviors were not correlated with any of the model variables. However, observed parental sensitivity during clean-up was significantly correlated with parental BMI and child externalizing behavior problems. There was a significant positive correlation between parental sensitivity during the clean-up interaction and parental BMI ($r = .33, p < .05$).
This indicates that parents who were observed to be more sensitive during the clean-up interaction tended to have higher BMIs. Lastly, parental sensitivity during clean-up had a significant negative correlation with child externalizing behavior problems ($r = -.29, p < .05$). This means that as parents displayed higher levels of parental sensitivity, their reports of child externalizing behavior problems decreased. Additionally, observed parental positive engagement during the snack interaction was significantly correlated with child externalizing behavior problems ($r = .31, p < .05$). This indicates that the parents who were observed to have higher rates of positive engagement with their child during the snack interaction also reported higher levels of child externalizing behavior problems. No other significant relationships were identified in these analyses. Because multiple correlations were run as part of these exploratory analyses, results should be interpreted with caution.

Table 14

*Associations Among Snack, Free Play, and Clean-Up Parenting Behavior Codes and Model Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parental BMI</th>
<th>Parental Stress</th>
<th>Parental Depression</th>
<th>Child Externalizing Behavior Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snack Sensitivity</td>
<td>.15</td>
<td>-.09</td>
<td>.27</td>
<td>.26</td>
</tr>
<tr>
<td>Snack Positive Engagement</td>
<td>.07</td>
<td>-.00</td>
<td>.15</td>
<td>.31*</td>
</tr>
<tr>
<td>Snack Verbal Interference</td>
<td>.23</td>
<td>.22</td>
<td>-.01</td>
<td>.25</td>
</tr>
<tr>
<td>Snack Physical Interference</td>
<td>.24</td>
<td>-.01</td>
<td>-.18</td>
<td>.07</td>
</tr>
<tr>
<td>Free Play Sensitivity</td>
<td>.19</td>
<td>.02</td>
<td>-.03</td>
<td>-.001</td>
</tr>
<tr>
<td>Free Play Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>.13</td>
<td>.08</td>
<td>.07</td>
<td>.01</td>
</tr>
<tr>
<td>Free Play Verbal</td>
<td>.04</td>
<td>.03</td>
<td>.04</td>
<td>-.02</td>
</tr>
<tr>
<td>Physical Interference</td>
<td>.15</td>
<td>-.01</td>
<td>.06</td>
<td>-.08</td>
</tr>
<tr>
<td>Clean-Up Sensitivity</td>
<td>.33*</td>
<td>.01</td>
<td>-.17</td>
<td>-.29*</td>
</tr>
<tr>
<td>Clean-Up Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>.19</td>
<td>-.03</td>
<td>-.13</td>
<td>-.09</td>
</tr>
<tr>
<td>Clean-Up Verbal</td>
<td>.14</td>
<td>.04</td>
<td>-.04</td>
<td>.91</td>
</tr>
<tr>
<td>Physical Interference</td>
<td>.03</td>
<td>-.08</td>
<td>-.09</td>
<td>-.15</td>
</tr>
</tbody>
</table>

* $*= p < .05$
Because positive engagement during snack and sensitivity during clean up were the only parenting codes correlated with child externalizing behavior problems, they were examined as independent predictors. A regression analysis was completed to examine the relationship between the two parenting codes and preschool externalizing behaviors. Both parenting codes were found to contribute to a significant amount of variance in child externalizing behavior problems, $R^2 = .17$, $F(2, 46) = 4.77, p < .05$. In this analysis, positive engagement during snack was a positive predictor of child externalizing behavior problems ($\beta = .31, p < .05$). In contrast, sensitivity during clean-up was a negative predictor of child externalizing behavior problems ($\beta = -.28, p < .05$). See Table 15.

Table 15

| Regression Analysis Predicting Child Externalizing Behavior from Parenting Behavior |
|-----------------------------------|---|---|---|
|                                    | $B$ | $SE$ | $\beta$ |
| **Step 1, [F (2,46)=4.77, p<.05, R^2 =.17]** | | | |
| Snack Positive Engagement          | 3.20 | 1.37 | .31* |
| Clean-Up Sensitivity               | -2.55 | 1.23 | -.28* |

*p < .05

Because clean-up sensitivity was found to be a significant direct predictor of child externalizing behaviors, and because it was also correlated with parental BMI, it was examined as a possible mediator between the two. Process for SPSS (Hayes, 2013) was implemented to test this model. Results indicated that there was not a significant indirect effect of parental BMI on child externalizing behaviors, *indirect effect* = -.06, Boot CI [-.16, .01]. This indicates that parental sensitivity during the clean-up interaction was not a significant mediator between parental BMI and child externalizing behaviors. Therefore, Hypothesis 4 was not supported in regression mediation models. See Figure 7.
** = \( p < .01 \)

*Figure 7:* Unstandardized regression coefficients for the relationship between parental BMI, parental sensitivity during clean-up and child externalizing behavior problems.

**Exploratory analyses.** Lastly, because the primary hypotheses were largely unsupported and the relationship between positive parenting during the snack time and child behavior problems was in an unexpected direction, further exploratory analyses were conducted in an attempt to better understand these relationships. Correlations between the observational parenting codes, externalizing behaviors, and parent self-report of parenting (Parenting Sense of Competence; PSOC) were run. As shown in Table 16, parent self-report measures of parenting were highly correlated with parental reports of child externalizing behaviors, parental depression and parental stress. Total parenting sense of competence was significantly correlated with decreased reports of parental stress \( (r = -.59, p < .01) \) and child externalizing behavior problems \( (r = -.30, p < .05) \). Parents who reported higher levels of parental efficacy reported less stress \( (r = -.29, p < .05) \). Additionally, satisfaction with parenting was also significantly correlated with decreased levels of parental depression \( (r = -.32, p < .05) \) and stress \( (r = -.63, p < .01) \). Higher rates of parenting satisfaction were also significantly correlated with lower parental rates of child externalizing behavior problems \( (r = -.38, p < .01) \). Overall parental self-reports of parenting were not correlated with observed parenting codes (see Table 16).
Table 16

**Associations Among Parenting Behavior Codes, Parenting Self-Report Measures, and Externalizing Behavior Problems**

<table>
<thead>
<tr>
<th>Variable</th>
<th>PSOC Total</th>
<th>PSOC-Efficacy</th>
<th>PSOC-Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Externalizing Behavior</td>
<td>-.30*</td>
<td>-.09</td>
<td>-.38**</td>
</tr>
<tr>
<td>Parental Depression</td>
<td>-.25</td>
<td>-.11</td>
<td>-.32*</td>
</tr>
<tr>
<td>Parental Stress</td>
<td>-.59**</td>
<td>-.29*</td>
<td>-.63**</td>
</tr>
<tr>
<td>Parental BMI</td>
<td>-.08</td>
<td>-.23</td>
<td>.08</td>
</tr>
<tr>
<td>Total Positive Parenting: Snack</td>
<td>.01</td>
<td>.13</td>
<td>-.04</td>
</tr>
<tr>
<td>Total Positive Parenting: Free Play</td>
<td>-.002</td>
<td>-.05</td>
<td>.01</td>
</tr>
<tr>
<td>Total Positive Parenting: Clean-Up</td>
<td>.13</td>
<td>-.20</td>
<td>.01</td>
</tr>
</tbody>
</table>

** = p < .01
** = p < .05

**Discussion**

**Summary of Results**

The purpose of this study was to examine preschool children’s externalizing behavior problems in relation to parental health factors (including both mental and physical health) and to examine parenting behaviors as a possible mediating factor in that relationship. More specifically, this study examined the impact of parental stress, depression, and overweight status on child externalizing behavior problems, and examined observed parenting practices during different parent-child interactions as possible mediators. This study contributed to the current developmental, clinical, and health literature by examining the impact of parental overweight status on preschoolers’ behavioral functioning, as this parental variable has largely been unexamined in relation to child behavioral outcomes. Additionally, this study examined these relationships in a sample of urban, low-income, African American, parents and preschool children who were primarily overweight, which is also an understudied population.

Initial zero-order correlations showed few relationships between model variables. Parental depression and stress were correlated with each other, which is consistent with previous
literature showing that parents who are depressed are highly likely to also report high levels of stress (Bynum & Brody, 2005; Livneh & Wilson, 2003; Mash & Johnston, 1983; Murray, Fiori-Cowley, & Hooper, 1996; Venkatesh, Phipps, Triche, & Zlotnick, 2014). Parental stress and depression were also the two parent health variables that were significantly related to parent-reported child externalizing behavior problems, with higher reports of parental stress and depression associated with more child externalizing behavior problems. This is also consistent with the developmental literature, which states that maternal stress and depression is highly related to child behavior problems, particularly during the preschool years (Baker et al., 2002; Jackson, 2000; McBride et al., 2002). Replicating these relationships in the current sample offers further support for the important role feelings of stress and depression have on parents’ reports of child behavior.

Correlations further revealed that none of the parental health variables were significantly related to observed parenting. Furthermore, the total positive parenting composite during snack was the only observed parenting score to significantly correlate with reports of child externalizing behaviors. However, this relationship was not in the expected direction, such that higher levels of positive parenting during snack were correlated with higher levels of reported child externalizing behavior problems. Speculation about this unexpected association will be explored further in the discussion.

Path analyses were utilized to test Hypotheses 1, 2, and 3, which tested mediation models with parental health predicting parenting and parenting predicting child behavior. Models with parenting during snack time, free play, and clean up time were explored individually. The first three hypotheses will be discussed within the results of all three parenting context models. The first hypothesis, which posited that parental health problems would be positively related to
preschool children’s externalizing behavior problems, was partially supported in all three models. Parental stress was positively related to increased reports of externalizing behavior problems in all three models, with this relationship being the strongest in the model with positive parenting during snack. This relationship was in the expected direction, in that greater parental stress was related to higher levels of externalizing behavior problems in their child. As stated previously, this finding is consistent with the previous literature that has reported a strong relationship between parental stress and increased children’s behavior problems (Crnic & Low, 2002; Cummings et al., 2000; Jarvis & Creasy, 1991; Pett et al., 1994; Thompson et al., 1993), especially during the preschool years (Baker et al., 2002; Jackson, 2000; McBride et al., 2002).

Parental depression and BMI were, unexpectedly, not found to be predictive of child externalizing behavior problems in the path models. Therefore, hypothesis 1 was only partially supported.

The lack of relationship between parental depression and child externalizing behavior problems was surprising given the significant body of literature in support of this relationship (Bauman et al., 2002; Liaw & Brooks-Gunn, 1994; Perry & Fantuzzo, 2010; Petterson & Albers, 2001). Models did reveal that parental stress and depression were significantly correlated with one another. Although it was hypothesized that they would each, uniquely help to explain externalizing behavior, these models suggest that stress is the more important predictor in parental reports of child behavior in this sample. As previously stated, the zero-order correlation between depression and externalizing behavior was significant; therefore, the relationship between depression and stress was an important factor in predicting behavior problems.

One reason why this relationship between parental depression and child behavior outcomes was not significant in the model that included stress could be due to the limited
variability of the parental depression variable. In this sample, only three parents (6%) reported depression symptoms in the clinically significant range. The rest of the parents had reported depression levels in the normal range and many reported no to low symptoms. It is possible that the PROMIS measure used in the current study was not valid in assessing depressive symptomology in this population. Although the PROMIS measure is increasingly being used by National Institutes of Health studies with medical populations, little is known about its utility with low-income, African American populations (Amtmann et al., 2014; Kim et al., 2015). Furthermore, it has been argued that self-report measures provide researchers with information on what an individual knows about themselves, but that it may be limited to one’s insight and willingness to communicate about themselves openly (Ganellen, 2007). It may be that in this study, parents were able to access their feelings of stress more readily than feelings of depression. Additionally, there is speculation that for urban African Americans depression is seen as a sign of weakness, where feelings of sadness and crying are frowned upon (Alang, 2016). In this sample, it may have been that parents were more comfortable endorsing symptoms of stress, which are more socially acceptable to experience than depressive symptoms. Indeed, there was much more variability in reports of stress, with much higher rates in the moderate or higher stress range.

Additionally, there is a body of literature that supports the idea that the presentation of depression in African American’s looks slightly different than in other populations (Ayalon & Young, 2003; Payne, 2012; Heurtin-Roberts et al., 1997; Jones-Webb & Snowden, 1993; Robins & Regier, 1991; Snowden, 1999). Specifically, African Americans present more physical and somatic symptoms, such as loss of sleep, “lump in throat,” or chest pains (Payne, 2012; Jones-Webb & Snowden, 1993; Snowden, 1999). In the current study, the measure of depression
did not include somatic or physical symptoms. It may have been that the lack of presence of these questions in the depression measure reduced the identification of depressive symptoms. Future studies would benefit from looking at parents’ level of defensiveness and openness in reporting their own difficulties and include measures of physical and somatic symptoms in the assessment of depression.

The relationship between parental overweight and child behavior problems is understudied (Bergmann et al., 2016; Brion et al., 2011; Buss et al., 2012; Rodriguez, 2010; Rodriguez et al., 2008; Van Lieshout et al., 2012; 2013). Only a few studies have examined the relationship between parental overweight and child externalizing behavior problems and the majority of those researchers have examined maternal overweight during pre-pregnancy (e.g. Biron et al., 2011; Van Lieshout et al., 2012; 2013). Bergman and colleagues (2016) are the only known researchers who have reported significant findings between maternal BMI post-pregnancy and elevated child externalizing behavior problems in a sample of children between the ages of 5 and 45 months. Therefore, the hypothesis that was made in this study regarding BMI was somewhat exploratory. Although a relationship was not found in our study between parental BMI and child behavior problems in this slightly older sample than the Bergman study, it is still a noteworthy contribution to the literature as we begin to further expand the literature on this association. A potential issue with examining parental BMI in the current study was that there was relatively low variability on BMI. This may have contributed to difficulty finding relations with BMI across model variables.

In this sample, 82% of the sample was overweight, with relatively few parents in the healthy weight range. This may not be surprising considering the population in this study for two reasons. First, this finding is consistent with previous literature finding higher levels of maternal
overweight in African American women (Ogden, 2009; Walcott-McQuigg, 1995; Williamson, 1993; Wing, 1992). Second, the current study was intentionally overrepresented by children who had a high BMI, which increases the likelihood that a parent would also be overweight. Because parental overweight is a strong predictor of child overweight (Fogelholm et al., 1999), it was highly likely that a number of parents in this sample would be overweight as well. Future studies would benefit from getting a broader representation of caregiver weight status.

Additionally, with regard to the lack of relation between parental BMI and parenting, it was expected that BMI might affect how involved or active parents were with their children during parenting activities. However, in this study, the observational measure of parenting did not require the parent to be very active. Parents could sit on the floor and share a snack, play, etc. In fact, they were instructed to so do. It may be the case that these specific parenting contexts used in this study did not tap into the deficits that BMI may cause with regards to parenting behavior.

Although parental BMI was not a significant predictor in the current study, there is literature to support the relationship between other parental physical health problems and child externalizing behavior problems via maternal activity restrictions (Bauman et al., 2002; Oken et al., 2007). In addition to the need to continue to look at BMI in a sample with more variability and in different parenting contexts, it may also be that other physical health issues, illnesses, or overall health reports may be a better predictor of parenting behaviors and child behavior problems (Anderson & Hammen, 1993; Barkmann et al., 2007; Pike et al., 2006). In this sample, it may have been more beneficial to assess for multiple health issues that were impacting parents as possible predictors of parenting and child behavior problems.
Hypothesis 2, which stated that positive parenting behavior would be negatively associated with child externalizing behavior, was not supported in the three models. In the first model, positive parenting during snack was found to be significantly related to child externalizing behaviors, but in a positive direction. In this model, higher levels of positive parenting behaviors during the snack interaction resulted in higher reports of child externalizing behavior problems. In the other two models, positive parenting during free play and clean-up were not predictive of child externalizing behavior problems. The first association was unexpected, given the relationship between parenting practices and child externalizing behaviors discussed in the literature (Ayoub et al., 2009; Downer & Pianta, 2006; Gershoff et al., 2007; Harden & Whittaker, 2011; McGroder, 2000; McLoyd, 1998; Pungello et al., 2009; Waldfogel at al., 2010).

Examining parenting behavior during a snack sharing context was novel. Therefore, making sense of the unexpected relationship between parenting during snack and parental reports of behavior problems is difficult. It could be that traditional parental behaviors that are often looked at in other contexts, like sensitivity and engagement, may not show up in the same ways or mean the same thing during a snack. During the snack observation, parents were instructed to have a snack with their child and they were given a small bag of fruit. This was a very structured activity, particularly as compared to the free-play or clean-up activities. This structure may have affected how parents behaved in ways that did not accurately reflect their typical parenting behaviors. For example, some parent-child dyads sat and ate quietly. That kind of behavior may have been observed as less engaged or sensitive, but may simply be reflective of the kind of eating behavior a parent may have with a well-behaved child (Costanzo & Woody, 1985; Fischer & Birch, 1999).
Another important consideration about the snack context was that it was the first segment of the parenting observation. Although there was a brief introductory period before the snack began, parents may be most nervous when a video observation first begins (Kazdin, 2003). So, parents may have been engaging in behaviors they don’t typically do or may have been on their “best behavior.” Along those lines, it may be that parents, especially those who perceive their children to have behavior problems, were able to be more positively engaging in their interactions with their child in the short, structured activity of having a snack with their child. It could even be that a parent who believed their child had behavior problems tried to engage with the child as much as possible at the start of the interaction in the hopes to promote their child’s best behavior. In a previous study, researchers found that parents showed higher levels of sensitive behaviors if they rated their child higher on negative emotionality (Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2008). Though this finding was surprising in the previous study, it may help explain what happened during the snack portion of the video interaction. Free play and clean up may have been too unstructured (or required too much instructional control in the case of clean-up) for parents to maintain positive engagement with their child. To date, most studies examining parenting behaviors during food interactions have only occurred across lengthy mealtimes (e.g., Cousins, Power, & Olvera-Ezzell, 1993; Farrow et al., 2011; Haycraft & Blissett, 2008; Hughes et al., 2011) and no known studies have examined parenting behaviors during snack. As a result, this study sheds some light on the unique interaction that may occur during a shorter, snack interaction.

The lack of relation between the free-play, clean-up and externalizing behaviors was also unexpected. Finding associations between parenting behaviors and child behaviors in these types of contexts is more established (e.g., Field, 1990; Hamilton, Jones, & Hammen, 1993; Lyons-
Ruth, 1986). In this study, during the play portion of the video interaction toys are dumped out around the parent and child, and the parent and child are given permission to play with the toys until it is time to clean up. The play interaction is also a lot longer than the snack portion of the video. The length of the interaction, coupled with the potential ambiguity of non-structured play, may cause less positive engagement over time. Additionally, during play some parents begin to have higher levels of verbal interference in a possible effort to create more structure, and therefore, tend to have less total positive engagement with their child. It also might be that though parents can “hold it together” during the beginning of the video interaction, more authentic parent-child interactions are seen later.

Hypothesis 3 posited that positive parenting behaviors would partially mediate the relationship between parental health problems and preschool children’s externalizing behavior problems. This hypothesis was not supported. In all three models, positive parenting behaviors were not found to be mediators between parental health variables and child externalizing behaviors. Although some literature has found support for parenting as a mediator between parental health and child behavior problems (Belsky et al., 2007; Chisholm et al., 2014; Cole & Zahn-Waxler, 1992; Foster et al., 2008; Gelfand & Teti, 1990; Gershoff et al., 2007; Hammen et al., 1990; Leadbeater et al., 1996; McLoyd, 1990; Rutter, 1990; Mistry et al., 2002), some researchers have made the argument that factors like parental stress have a direct, rather than indirect, impact on child behavior problems (Assel et al., 2002; Baker et al., 2002; Jackson, 2000; McBride et al., 2002). For example, in a study examining the impact of a mediating relationship of warmth and responsive parenting behaviors on maternal stress and children’s behavioral outcomes, Assel and colleagues (2002) found that stress had a significant direct relationship on child outcomes, whereas there was no significant indirect relationship. This
finding, along with the finding of the current study, suggests that it may be that parental stress plays a more direct role on child behavior problems than an indirect role. It is, of course, important to acknowledge that in this study both stress and child behavior were based on parent report. Although this study offers further support for the relation between stress and child behavior problems, it does not explicate whether or not parent stress helps to create behavior problems in some way or whether it simply affects how parents perceive their child’s behavior.

Exploratory analyses were utilized in Hypothesis 4 to better understand the relationship between the observed, individual parenting behaviors and other study variables. Individual dimensions of parenting were examined. These analyses revealed that parental positive engagement during snack and sensitivity during clean-up were both found to be correlated with child externalizing behavior problems. When run in a regression model, they were both found to be significant predictors of child externalizing behavior problems. Specifically, increased parental positive engagement during snack was related to increased child externalizing behavior problems. Therefore, the association between positive engagement and externalizing behavior problems seems to be responsible for the relationship between the total positive parenting score during snack and behavior problems. Conversely, higher levels of parenting sensitivity during clean-up were related to fewer child externalizing behavior problems. This relationship was the only association between parenting behavior and child behavior that was consistent with the previous literature (Ainsworth et al., 1978; Belsky, 1981; 1984; Koblinsky et al., 2006; Whittaker et al., 2011) and in the expected direction. However, no mediation between parental health, parenting and child behavior was found in these exploratory analyses, which was consistent with the main path models. These analyses further revealed, in general, that the observed parenting variables in this study were largely unrelated to parental health variables and child behavior.
In order to try to understand this lack of relation between parenting behavior and other model variables in the current study, further exploratory analyses were done to examine the relationship between variables using self-report parenting versus observed parenting behaviors. As shown in the results, parental self-report measures of parenting were highly correlated with the parental self-report measures used in the study to assess parental health and child externalizing behavior problems. Furthermore, these self-report parenting scores were not correlated with the observed measures (BMI and the observed parenting codes). This is an important finding, as it may be that parents’ perceptions of their own behaviors and of their child are different from what more “objective” assessment show. Throughout previous research, there has been debate about the utility of self-report verses observational ratings (Gorber, Tremblay, Moher, & Gorber, 2007; Hilarius, Kloeg, Detmar, Muller, & Aaronson, 2006; Meyer & Kurtz, 2006; Nilsen & Campbell, 1993; Norton & Hope, 2001). The discrepancy between self-report and observer ratings is often seen in mental and physical health reports (Gorber et al., 2007; Norton & Hope, 2001). As a result, there is a strong argument for utilizing multiple types of measures during data collection when measuring parent health, parenting practices, and reports of child behavior as different methods suggest different types of findings.

In addition to the points made above, there are additional considerations that might help explain why many of the hypothesized relationships were non-significant. It is possible that many of the path models were unsupported partially due to the fact that children in this sample had relatively low levels of behavior problems according to parent report of their childrens’ behaviors. Ninety-three percent of parents in this study reported child externalizing behavior problems in the normal range. This finding is surprising giving what is known in the literature related to this sample of low-income, overweight African American preschool children and the
likelihood of elevated behavior problems (Anderson et al., 2010; Bradley et al., 2008; Datar & Stern, 2004; DeJong & Kleck 1986; Lumeng et al., 2003; Oh et al., 2013). It may be that this sample in fact had a very low rate of behavior problems, but it may also speak to a larger problem of under-reporting which may occur for a variety of reasons.

Parent perceptions on several model variables may have been affected by underreporting of symptoms and behaviors. First, raters are often influenced by a number of factors, such as developmental knowledge, their own tolerance for misbehavior and stress, their own pathology, and reluctance to acknowledge behavior problems (Briggs-Gowan, Carter, & Schwab-Stone, 1996; Fantuzzo et al., 2003; Hay et al., 1999). Additionally, there is research to support the idea that different racial groups have different perceptions, expectancies, and tolerances for child behavior (Deater-Deckard, Dodge, Bates, & Pettit, 1996; Livingston, 1999). There is a reported perception among African American families that behavioral issues are a result of poor or inappropriate discipline and parenting practices (Omolara et al., 2007), which might make parents more reluctant to report behavior problems. For example, one study found that African American parents reported lower levels of child behaviors despite their children having more behavior problem symptoms than their Caucasian counterparts (Miller, Nigg, & Miller, 2008). It was hypothesized that African American parents may also report lower levels of behavior problems to researchers and medical professionals because they may prefer community-based supports, may turn to family and friends rather than medicalized treatments, and may have poorer views of treatment providers (Guevara et al., 2005; Richardson, 2001; Scheffler & Miller, 1989). Consistent with this literature, it may be that in the current study African American parents were less likely to perceive their child’s behaviors to be problematic, or that even if they did, they might not have felt comfortable reporting them.
Some research also indicates that parents who have physical illnesses tend to underreport their children’s behavior problems, as measured by the CBCL, compared to the child’s own report of their behavior difficulties or the report of other caregivers (Birenbaum, Yancey, Phillips, et al., 1999; Lewandowski, 1996; Welch, Wadsworth, & Compas, 1995). Because this sample had parents who were primarily overweight, and thus at a higher risk for health problems, this bias in reporting may have occurred. This association is also seen in relation to maternal depression and child externalizing behavior problems. Mothers with higher levels of depression have been found to indicate significantly higher levels of behavior problems in their children than non-depressed mothers (Webster-Stratton & Hammond, 1988). Because parents in this sample reported lower levels of depression symptoms, they may have not perceived many of their child’s behaviors to be problematic. Additionally, parents are prone to rate behaviors differently based on their own forms of bias (e.g., being more critical or lenient) based on other environmental factors, like how they feel about the child in the moment (e.g., at the beginning of the day, or right after the child threw toys; Chafouleas et al., 2007). In summary, the use of parental self-report for behavior problems may have created a significant limitation in the ability to predict behavior, particularly with objective measures.

**Study Strengths**

This study has a number of strengths that should be noted. First, this study utilized observational measures to capture parenting behaviors in multiple parent-child interactions. This is important because often parent self-report of parenting practices may be biased, as described above (Hesse & Main, 2006). Additionally, the video coding system was adapted for a population of preschool children and their parents. Most studies utilized video coding systems with parents and infants (Ainsworth et al., 1987; Lyons-Ruth et al., 1999; Hesse & Main, 2006).
The video observations also included a snack, free play and clean up observation. The inclusion of a snack observation is especially new to the literature on parenting. The development of this coding system helps to expand the video coding literature to represent a wider population and broader context, with the consideration of developmentally appropriate behaviors for parents of preschool-aged children including those who are overweight or obese.

Additionally, this study added to the literature by utilizing observed parenting behaviors in a setting that has not been studied before, during a snack interaction. Observed parenting videos have been observed typically during free play interactions or a full mealtime interaction, and little to no studies have observed parenting behaviors during a snack interaction (e.g., Cousins, Power, & Olvera-Ezzell, 1993; Farrow et al., 2011; Haycraft & Blissett, 2008; Hughes et al., 2011). Previous literature examining parent-child interactions involving meals often examine parent feeding styles, such as authoritarian control, on children’s feeding behaviors (e.g., Cousins et al., 1993; Moens, Braet, & Soetens, 2007; Patrick et al., 2005). Based on a meta-analysis, other aims of observed mealtime interactions have looked at obesity status, food preferences, food consumption style, and have not really looked at the quality of the parent-child interaction or parenting sensitivity on child behavior problems (Bergmeier, Skouteris, & Hetherington, 2015). As a result, the current study adds even further to the literature examining parent behaviors during a short meal, as it looks the relationship between the parent-child integration on child externalizing behaviors. Future studies should keep in mind the utility of observed measures of parenting to obtain more objective findings beyond self-report measures of parenting practices.

This study sought to fill current gaps in the literature related to the mental health and parenting behaviors of low-income African American preschool children by including both
mental and physical health variables. More specifically, the study included a sample of parents and children who were primarily physically overweight. Though many of the hypotheses were not fully supported, findings demonstrated the impact of parental stress on greater externalizing behavior problems in preschool children who were overweight. Literature on child and parental health factors, and how those factors relate to child behavioral outcomes, is limited (Turer et al., 2013; Van Lieshout et al., 2013). Very few studies have examined the relationship between parental physical health and child outcomes, let alone how parental physical health may be related to parenting. Though several of these results were not significant, it provides useful information to contribute to the literature. In this study, we found that parental mental health factors more strongly predicted child externalizing behavior problems than parental physical health. This provides further information on significant factors related to child behavior problems and may be useful for the development of future interventions.

It is also notable that this study provides further information on a population of low-income, overweight African American preschool children and their parents, which is a population that is not only less studied but difficult to study. In this study, we were able to go into the homes of families to collect self-report, observational, and health-related measures for both a child in Head Start and their parent. Low-income minority families have higher levels of household stability and material hardship, making it harder to access the necessary resources to participate in this study (Gershoff et al., 2007). Being able to collect such rich data in order to better understand a population that is generally understudied, yet needs better interventions, is another strength of the current study.
Limitations and Future Directions

Despite the number of strengths in this study, there are limitations that should be noted and addressed in future studies. First, because of the sample size, some of the analyses were underpowered. Because of that, some of the parenting behavior measures had to be examined in separate models. Additionally, as a possible result of sample size, there was less variability in the data as it related to some of the parental health variables and child externalizing behaviors. Future studies with larger sample sizes should replicate these analyses to see how increased power and variability may more accurately represent the variable relationships within this population.

Another limitation of this study was the lack of objective, non-self-report measures of parents’ mental health and child behavior problems. It is possible that parents’ report of their own mental health and their children’s behavior problems in this study were not completely accurate, and instead, biased by individual factors (e.g., Grober et al., 2007; Hilarius et al., 2006; Meyer & Kurtz, 2006; Norton & Hope, 2001). Additionally, the self-report measures were all highly correlated with each other, but not with the objective or observational measures. This pattern may be due to all of the self-report information coming from the same reporter. Future studies should obtain multiple raters (e.g., teachers) and utilize multiple forms of assessment of child and parent behaviors. Additionally, a clinical interview or other objective measures could help to better capture depressive symptoms among parents. Furthermore, observed child behaviors and their relationship to their parents’ behaviors and responses were not captured in this study. Future studies should examine the child’s behaviors during observed parent-child interactions to better assess for behavior problems and the role of the child in the quality of the parent-child interaction.
Additionally, there were limited video coding variables that related to parental health variables and child behavioral outcomes. Though this may be due to the use of self-report measures, as described above, it is possible that there are more complex parenting behaviors that were not coded in these video interactions that may be better representations of critical parenting behaviors. Future studies could examine other parent behaviors, especially as they relate to the parent-child interaction during snack, which is a more structured activity. Additionally, since there is limited literature on the impact of positive parenting behaviors, as opposed to negative parenting behaviors (e.g., Barnett & Scaramella, 2013; Koblinsky et al., 2006), future studies should continue to examine the impact that positive and negative parenting behaviors have on the parent-child relationship and other child physical and social-emotional outcomes.

Another way to study parenting behavior is to better understand how physical health impacts parenting. In this study, the majority of parents were overweight, which was not shown to be related to many study variables. It is important to have a better understanding of how physical health problems, such as perceived energy, mobility, chronic pain, restricted activity, significant illnesses, and other disabilities, may contribute to both parent mental health and parenting practices (Anderson & Hammen, 1993; Barkmann et al., 2007; Pike et al., 2006). This study did not capture these health problems beyond BMI, and future studies should take into consideration the complexity of physical health when examining how parental physical health impacts parenting practices and their child’s social emotional development.

Finally, all of the data for this study were collected at one time point. Because the literature suggests that many of these risk factors have long term effects, it would be beneficial to see how parental health and parenting behaviors impact children’s behaviors over time.
Longitudinal studies should seek to examine how these risk factors impact children’s social and emotional development throughout the preschool years and beyond.

**Implications of the Current Study**

This study has a number of clinical implications for low-income, African American preschool children and families. Overall, it appears that parents with increased stress levels report that their children have higher levels of externalizing behavior problems. Additionally, study results found a marginal relation between parents with higher levels of stress having less positive parenting behaviors during the snack interaction. This is particularly important since parental stress is associated with insecure attachment, child behavior problems, and later school adjustment (Baker et al., 2002; Crnic & Low, 2002; Cummings et al., 2000; Jackson, 2000; Jarvis & Creasy, 1991; McBride et al., 2002; Pett et al., 1994; Thompson et al., 1993). While it is important to directly assist children with behavior problems, it may be more effective to focus on factors that impact children at the microsystem level (Bronfenbrenner, 1979), such as targeting parental emotional stability and stress reduction. Policy and intervention efforts should aim to provide parents with access to resources and supports that may aid in the reduction of stress in low-income African American parents. Additionally, when looking at interventions for preschool children who are overweight and at risk for developing other health and behavior problems, it is important to consider what parental factors may be contributing to the child’s difficulties. Though parental health is important for the long-term outcomes of the child and family, based on the results of this study, it may be more important to focus on helping parents with their own mental health, particularly with reducing stress levels, in order to reduce the likelihood of future behavior problems for their child.
Additionally, because the participants in this study were all recruited from Head Start, it is important to consider how Head Start programs can also help with interventions that may reduce parental stress and therefore reduce child behavior difficulties. Historically, Head Start programs have worked to reduce child behavior problems by enhancing emotional and social competence in preschool children environment (Domitrovich, Cortes, & Greenberg, 2007; Roepke et al., 2011; Walker et al., 1997). The reason behind this focus is because preschool children’s emotion regulation skills and general emotional competence are not only linked to the development of externalizing behaviors but to later academic success (Denham, 2006; Eisenberg et al., 2005; Hastings et al., 2000; Ramey & Ramey, 2004). Though some of these programs have been shown to reduce behavior problems among low-income minority populations (Brown, Jimerson, Dowdy, Gonzalez, & Stewart, 2012), very few have any parent involvement. In addition to classroom interventions, Head Start offers a number of programs to families of children in Head Start, including emergency assistance, continuing education, and mental health education (Schumacher, 2003). Future interventions at Head Start should continue to offer support services to parents, in particular with an emphasis on services that will reduce parental stress, which could include financial, family, and parenting stress. In addition to the many services that Head Start offers to support families, a focus on stress reduction could have an even better impact on child behavior outcomes.

For future researchers that are hoping to better prevent or intervene with preschool children’s behavior problems, it is recommended that future studies continue to examine the impact of all types of parenting behaviors. Though the results of this study in relation to positive parenting behaviors were primarily insignificant or contrary to expectations, there is something unique about the parenting interaction that impacts child externalizing behavior, especially
during more structured tasks like snack. Future studies should continue to examine the potential impact of parenting behaviors, via multiple methods, during different parent-child interactions that may be more representative of the parent-child relationship.

**Conclusion**

The hypotheses for this study were minimally supported. However, in this sample of low-income African American preschool children and their parents, parental stress was a significant predictor of higher child externalizing behavior problems. Observed parenting behaviors during short videotaped parent-child interactions appeared to have limited associations with child externalizing behavior problems, with the exception of positive parenting during the snack interaction. Though there are shortcomings in this study, it does show the utility of an observational rating system for parenting behaviors in a sample of preschool-aged children. Additionally, findings support the notion that parent mental health impacts child outcomes, and should continue to be studied in underrepresented samples such as the type of sample in this present study. Future studies should continue to examine these relationships.
References


Assessed in the strange situation and at home. Hillsdale, NJ: Erlbaum.


doi:10.1080/104092809029


doi:10.1007/s10995-014-1470-7

doi:10.1016/j.ecresq.2010.04.007


Appendix A: IRB Approval Letter

RESEARCH @ EMU

UHSRC Determination: EXEMPT

DATE: December 21, 2016

TO: Cassandra Esposito, M.S.
Department of Psychology
Eastern Michigan University

Re: UHSRC: #899507-1
Category: Exempt category 4
Approval Date: December 21, 2016

Title: Maternal Health, Parenting Behavior and Externalizing Behavior Problems Among Low-Income African American Preschool Children

Your research project, entitled Maternal Health, Parenting Behavior and Externalizing Behavior Problems Among Low-Income African American Preschool Children, has been determined Exempt in accordance with federal regulation 45 CFR 46.102. UHSRC policy states that you, as the Principal Investigator, are responsible for protecting the rights and welfare of your research subjects and conducting your research as described in your protocol.

Renewals: Exempt protocols do not need to be renewed. When the project is completed, please submit the Human Subjects Study Completion Form (access through IRBNet on the UHSRC website).

Modifications: You may make minor changes (e.g., study staff changes, sample size changes, contact information changes, etc.) without submitting for review. However, if you plan to make changes that alter study design or any study instruments, you must submit a Human Subjects Approval Request Form and obtain approval prior to implementation. The form is available through IRBNet on the UHSRC website.

Problems: All major deviations from the reviewed protocol, unanticipated problems, adverse events, subject complaints, or other problems that may increase the risk to human subjects or change the category of review must be reported to the UHSRC via an Event Report form, available through IRBNet on the UHSRC website.

Follow-up: If your Exempt project is not completed and closed after three years, the UHSRC office will contact you regarding the status of the project.

Please use the UHSRC number listed above on any forms submitted that relate to this project, or on any correspondence with the UHSRC office.

Good luck in your research. If we can be of further assistance, please contact us at 734-487-3090 or via e-mail at human.subjects@emich.edu. Thank you for your cooperation.

Sincerely,

Alissa Huth-Bocks, Ph.D.
Chair
CAS Human Subjects Review Committee
Dear Head Start Parent,

New St. Paul Head Start is actively participating in a nutrition and health program through Eastern Michigan University called the Parents for Healthy Kids Project.

This program is free and your family may be eligible to participate. By participating in this program, you will also have the opportunity to receive up to $200.

Parents for Healthy Kids Project coordinators will begin to contact eligible families starting in the next few weeks. Please let your Head Start coordinator know if you do not wish to be contacted. If you do not let your Head Start coordinator know that you do not wish to be contacted, you may receive a call in the near future.

Thank You!
Parents for Health Kids Team
(734) 487-1691
Appendix C: Informed Consent

RESEARCH @ EMU

!" $%'( )$"'", $% & !

! Study Title: Parent Focused Nutrition and Activity Intervention for Head Start Preschoolers

Principal Investigator (PI): Dr. Heather Janisse, Ph.D.
Psychology Department, Eastern Michigan University
(734) 487-0096; hjanisse@emich.edu

Funding Source: The National Institute of Diabetes and Digestive and Kidney Diseases

. /$%$ & $% " $% / (2)
You and your child are being asked to take part in a research study that examines the effectiveness of a nutrition and activity intervention program designed to improve the health behaviors and outcomes of Head Start parents and children. Your child has been selected because their current weight is above the recommended weight for their age. This study is being conducted at Eastern Michigan University. The maximum number of study participants to be enrolled in the study is 100. Please read this form and ask any questions you may have before agreeing to be in the study.

The purpose of this study is to determine which program is better at helping Head Start parents improve their child’s nutrition and physical activity behaviors: a home-based program that addresses the motivation of parents or a support program that offers newsletters and telephone calls.

! 3, (2) $%' /$% &
If you take part in the study, study personnel will meet you at your home or Head Start Center and you will complete questionnaires. These questionnaires will ask about you and your child’s current nutrition and activity behaviors, your parenting behaviors, your motivation for health behavior change, and your child’s behavior. These questionnaires will take you approximately 2 hours to complete. We will also take a measure of you and your child’s height, weight and blood pressure and we will ask you to have your child wear an activity measuring device on their clothes for four days (called an accelerometer). This device hooks on the clothes or belt loop. We will also take a brief video of you and your child interacting during a snack time.

Next, you and your child will be randomly assigned to receive either a home-based program or a newsletter with support program. Random assignment means that you/your child will be assigned by chance (like the flip of a coin) to receive the home-based program or the newsletter with support program.

If you are assigned to the home based program, sessions targeting improving your knowledge and your motivation for changing nutrition and activity behaviors will be provided in your home at a time convenient for your family. A community health worker will come to your home and program sessions will last about 1-1 hours. There will be a total of 8 sessions provided over approximately a 4-month time period (resulting in 1 session about every other week). These home sessions will focus on a variety of topics including, understanding current nutrition and activity recommendations for your preschool age child, parenting approaches to increase healthy behaviors of your child, skills building, problem
solving and increasing motivation for health behavior change. The importance of connecting with your child’s primary care doctor will be discussed.

If you are assigned to the newsletter with support program, there will be just one home visit at the beginning of the program scheduled at a time convenient for your family. This visit will emphasize the importance of healthy nutrition and activity for your child and family and the importance of connecting with your primary care doctor will be discussed. Following this session, you will receive 7 newsletters over a 4-month time period that will include information on nutrition, physical activity, parenting behavior and community resources. You will also receive one monthly phone call for 4-months designed to review newsletter content and answer questions you may have (4 phone calls in total). Some of the sessions or phone calls will be audiotaped. The purpose of taping the sessions is to be certain that the community health workers provide the best quality program to your family. Audiotapes will be destroyed upon completion of the study.

Right after the program you participated in is complete and again six and twelve months later, study research personnel will call you to schedule a time for you and your child to complete the same measures you competed at the start of the study over again. This includes questionnaires about you and your child’s nutrition and activity behaviors, your parenting behaviors, your motivation for health behavior change and your child’s behavior. We will take another measure of you and your child’s height, weight and blood pressure and we will ask you to have your child wear the accelerometer on their clothes for four days. We will also take a video of you and your child interacting during a snack time. Half way through the program, you will receive one phone call to see if you or child has experienced any problems or concerns since being in the program. The total length of participation in the study is 16 months.

The possible benefits to you and your child for taking part in this study are that you may improve your health behavior knowledge and you and your child’s dietary intake and physical activity. This may result in a healthier weight status for your child. However, there are no guarantees that this will occur. Additionally, the information from this study may benefit other children/families now or in the future.

By taking part in this study, you or your child may experience the following risks:

- Although behavioral programs such as the ones described in this form are generally expected to reduce distress and therefore be of minimal risk, behavior change can be difficult. Therefore, risks include the possibility of temporary increased distress during the program intervention.

- You or your child may become tired from completing questionnaires or study measures. You could also become upset from answering personal questions. You or your child may decline to answer any questions during your participation.

- Although no discomfort from wearing the physical activity monitor is expected, your child may express a dislike for wearing the monitor or may experience some discomfort or irritation. Wearing the device on the outside of the clothes and taking it off during sleep should reduce this risk.

- We are required by law to report to the appropriate authorities if at any time during the study there is concern that child abuse has possibly occurred.

Approved by the Eastern Michigan University Human Subjects Review Committee
UHSRC Protocol Number: 738343-1
Study Approval Dates: 4/16/15 – 4/15/16
There may also be risks involved from taking part in this study that are not known to researchers at this time. In the unlikely event that distressing personal concerns arise during or after your participation in this study, please let us know and we will provide you with information on who you can contact for assistance. You may contact the Principal Investigator for this study at 734.487.0096 or you may contact the following Detroit/Wayne County service provider: 24-Hour Crisis, Information & Referral Line for Detroit, MI (313) 224-7000 or (800) 241-4949.

\( 9_0 \cdot 9_0 \cdot 6' + \) 
If you choose not to be in this study there are other options available that you can talk about with your doctor, who can assist you or provide you with more resources. Some other options include attending nutrition education classes or getting counseling for your child in your community. Head Start staff may also be able to provide you with community resources.

\( * 5' \{1', 6:62 \} \) 
All information collected about you and your child from this study will remain confidential. You and your child will be identified in the research records by a code number. Information that identifies you and your child personally will not be released without your written permission. Only the staff involved in this project will have access to the information we collect and all information will be kept in a locked office and on password protected computers and files. However, the study sponsor and the Institutional Review Board (IRB) at Eastern Michigan University may review your records.

Information we obtain may be reported in scholarly publications and presentations. When the results of this research are published or discussed in conferences, no information will be included that would reveal you or your child’s identity. We will primarily report summarized results. If any individual comments are reported, we will not disclose any information that can be identified with you. Audio and video recordings will be destroyed upon completion of the study.

\( 3_0 \cdot (2') 5 \) 
Participation in this study will be of no cost to you.

\( * 6' \{0', +, 6' \} \) 
For taking part in this research study, you will be paid for your time and inconvenience. You will receive $30 immediately after each data collection visit you and your child complete and another $20 after your child has worn the activity monitor and it is returned, for a total of $50. Because there are 4 data collection visits, you have the potential to earn $200 if you complete all four. In addition, participants who are assigned to the home based program may receive additional incentives like cookbooks or food products.

\( =5'; /'' ; 93); 9640; ; 6' \) 
Taking part in this study is voluntary. You may choose not to take part in this study, or if you decide to take part, you can change your mind later and withdraw from the study. You are free to refuse to answer any question(s) or withdraw at any time. Your decision about participation will have no effect on the services you receive from Head Start or any other service agency. Your decision will not change any present or future relationships with Eastern Michigan University or its affiliates or other services you are entitled to receive. If any new information comes up that would possibly change your willingness to participate in this study, we will let you know.

Approved by the Eastern Michigan University Human Subjects Review Committee
UHSRC Protocol Number: 738343-1
Study Approval Dates: 4/16/15 – 4/15/16
If you have any questions about the research, you can contact the Principal Investigator, Dr. Heather Janisse, at hjanisse@emich.edu or by phone at 734-487-0096. For questions about your rights as a research participant, contact the Eastern Michigan University Human Subjects Review Committee at human.subjects@emich.edu or by phone at 734-487-3090.

To voluntarily agree to have you and your child take part in this study, you must sign on the line below. If you choose to take part in this study, you may withdraw at any time. You are not giving up any legal rights by signing this form. Your signature below indicates that you have read, or had read to you, this entire consent form, including the risks and benefits, and have had all of your questions answered. You will be given a copy of this consent form.

Name of Participant

Signature of Participant

Date

By signing below you are giving the researcher permission to access the results of the routine assessments given to your child at Head Start (The Brigance and the CORE). This additional information will allow us to look at whether our program influences these outcomes for your child.

Signature of Participant

Date

I have explained the research to the participant and answered all his/her questions. I will give a copy of the signed consent form to the participant.

Name of Person Obtaining Consent

Signature

Date

Approved by the Eastern Michigan University Human Subjects Review Committee
UHSRC Protocol Number: 738343-1
Study Approval Dates: 4/16/15 – 4/15/16
# Appendix D: CBCL

## Child Behavior Checklist for Ages 1½-5

Please fill out this form to reflect your view of the child's behavior even if other people might not agree. Feel free to write additional comments beside each item and in the space provided on page 2. Be sure to answer all items.

Below is a list of items that describe children. For each item that describes the child now or within the past 2 months, please circle the 2 if the item is **very true or often true** of the child. Circle the 1 if the item is **somewhat or sometimes true** of the child. If the item is not true of the child, circle the 0. Please answer all items as well as you can, even if some do not seem to apply to the child.

### 0 = Not True (as far as you know)

<table>
<thead>
<tr>
<th>Item</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aches or pains (without medical cause; do not include stomach or headaches)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acts too young for age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afraid to try new things</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoids looking others in the eye</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can't concentrate, can't pay attention for long</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can't sit still, restless, or hyperactive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can't stand having things out of place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can't stand waiting; wants everything now</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chews on things that aren't edible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clings to adults or too dependent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constantly seeks help</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constipated, doesn't move bowels (when not sick)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cries a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cruel to animals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defiant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demands must be met immediately</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destroys his/her own things</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destroys things belonging to his/her family or other children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrhea or loose bowels (when not sick)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disobedient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disturbed by any change in routine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't want to sleep alone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't answer when people talk to him/her</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't eat well (describe: _)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't get along with other children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't know how to have fun; acts like a little adult</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't seem to feel guilty after misbehaving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn't want to go out of home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easily frustrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easily jealous</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eats or drinks things that are not food—don't include sweets (describe:)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fears certain animals, situations, or places (describe:)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feelings are easily hurt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gets hurt a lot, accident-prone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gets in many fights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gets into everything</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gets too upset when separated from parents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has trouble getting to sleep</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headaches (without medical cause)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hits others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holds his/her breath</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hurts animals or people without meaning to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Looks unhappy without good reason</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angry moods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neasea, feels sick (without medical cause)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervous movements or twitching (describe:)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervous, highstrung, or tense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nightmares</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overeating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overtried</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shows panic for no good reason</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painful bowel movements (without medical cause)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physically attacks people</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picks nose, skin, or other parts of body (describe:)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Be sure you answered all items. Then see other side.

---

**Parents' usual type of work,** even if not working now. Please be specific—for examples, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.

**Father's type of work:**

**Mother's type of work:**

Your relationship to child:

- [ ] Mother
- [ ] Father
- [ ] Other (specify):

---

**Child's full name:**

**Child's gender:**

- [ ] Boy
- [ ] Girl

**Child's age:**

**Child's ethnic group or race:**

**Today's date:**

Mo. ___ Day ___ Year ___

**Child's birthdate:**

Mo. ___ Day ___ Year ___

---

**This form filled out by:** (print your full name)

---

<table>
<thead>
<tr>
<th>Child's First Name</th>
<th>Middle Name</th>
<th>Last Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**© 2000 T. Achenbach & L. Rescorla**

ASEBA, University of Vermont, 1 South Prospect St., Burlington, VT 05401-3456

www.ASEBA.org

UNAUTHORIZED COPYING IS ILLEGAL

7-28-00 Edition
**BEHAVIOR PROBLEMS**

Please print your answers. Be sure to answer all items.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>0 = Not True (as far as you know)</th>
<th>1 = Somewhat or Sometimes True</th>
<th>2 = Very True or Often True</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>55. Plays with own sex parts too much</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>60. Selfish or won't share</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>61. Shows little affection toward people</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>62. Shows too little fear of getting hurt</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>63. Too shy or timid</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>64. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>65. Sleeps less than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>66. Screams a lot</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>67. Seeks unresponsive to affection</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>68. Self-conscious or easily embarrassed</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>69. Shows too little fear of getting hurt</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>70. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>71. Shows too little fear of getting hurt</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>72. Sleeps less than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>73. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>74. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>75. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>76. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>77. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>78. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>79. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>80. Sleeps more than most kids during day and/or night (describe):</td>
<td>0</td>
</tr>
</tbody>
</table>

Does the child have any illness or disability (either physical or mental)?

- [ ] No
- [ ] Yes—Please describe:

What concerns you most about the child?

Please describe the best things about the child:
Appendix E: PROMIS

Patient-Reported Outcomes Measurement Information System Depression Short Form

Instructions: Please respond to each question or statement by marking one box per row ✔️ Thank You

<table>
<thead>
<tr>
<th>In the past 7 days…</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I felt worthless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I felt helpless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I felt depressed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I felt hopeless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I felt like a failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I felt unhappy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I felt that I had nothing to look forward to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I felt that nothing could cheer me up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F: PSS

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate with a check ☐ how often you felt or thought a certain way.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Fairly Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the last month, how often have you been upset because of something that happened unexpectedly?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. In the last month, how often have you felt that you were unable to control the important things in your life?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. In the last month, how often have you felt nervous or “stressed”?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. In the last month, how often have you felt confident about your ability to handle your personal problems?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. In the last month, how often have you felt that things were going your way?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. In the last month, how often have you found that you could not cope with all the things that you had to do?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. In the last month, how often have you been able to control irritations in your life?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. In the last month, how often have you felt that you were on top of things?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9. In the last month, how often have you been angered because of things that were outside of your control?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>