

A Cumulative Risk Model of Low-Income Families in a Behavioral Parent Training Pilot Study

An Honors Thesis Proposal completed in Partial Fulfillment of the requirements for the Honors

Distinction in Psychology

Sarah Pittman

The University of North Carolina at Chapel Hill

Committee:

Margaret Anton, M.A.

Deborah J. Jones, Ph.D., Chair

Mitch Prinstein, Ph.D.

Abstract

Cumulative risk or the presence of multiple risk factors that can lead to negative life outcomes is linked to the development of early onset behavior problems (e.g. noncompliance, oppositionality, aggression) in young children (Conger et al., 1999; Reno et al., 2006; Shelleby et al., 2014).

This study extends this work by examining the link between cumulative risk and treatment outcome in low-income families with a child with clinically significant behavior problems, as well as the extent to which increasing family's support, competence, and, in turn, autonomy via technology between sessions mitigates risk. Low-income families ($N = 22$) enrolled in a pilot study that compared a standard treatment program, Helping the Noncompliant Child (HNC; McMahon & Forehand, 2003) with a technology-enhanced version (TE-HNC), which yielded higher levels of treatment engagement and, in turn, boosted treatment outcome (Jones et al., 2014). Contrary to study hypotheses, a relatively high number of barriers did not predict families dropping out of treatment, the effect size of a relatively high number of barriers compared to a relatively low number of barriers on treatment outcomes was small, and families with more barriers took fewer, rather than more, sessions to complete treatment. Consistent with hypotheses, however, families with low (rather than high) barriers randomized to the TE-HNC (rather than HNC) had the lowest ECBI intensity and problems scores at post-treatment. Findings and future directions are discussed.

Keywords: Cumulative risk, Behavioral Parent Training, Technology enhancement, externalizing problems, low-income

A Cumulative Risk Model of Low-Income Families in a Behavioral Parent Training Pilot Study

Early onset externalizing problems, including behaviors characteristic of oppositional defiant disorder and conduct disorder (which tend to co-occur with attention deficit hyperactivity disorder) are among the most common reasons for the referral of young children (3 to 8) to mental health services (e.g., Egger & Angold, 2006; Lundahl, Risser, & Lovejoy, 2006; Zisser & Eyberg, 2010). Low socioeconomic status (SES) families have higher rates of children exhibiting externalizing problems relative to families in other SES groups (Gonzalez, Jones, Kinkaid, & Cuellar, 2012; Shelleby et al., 2014). Behavioral Parent Training (BPT) is the standard of care for early onset externalizing problems, with a robust literature documenting statistically and clinically significant post-treatment improvements in the parent-child relationship and, in turn, child disruptive behaviors, including aggression, noncompliance, and oppositionality (e.g., Chorpita et al., 2011; Eyberg, Nelson, & Boggs, 2008; McMahon, Wells, & Kotler, 2006). Although low SES families benefit from BPT, they are less likely to seek and finish treatment than families of higher SES (Lavigne et al. 2010; MacKenzie, Fite & Bates, 2004; Reyno & McGarth, 2006). Given literature to suggest that early onset externalizing behaviors is linked to delinquency in adolescence, antisocial behavior in adulthood, substance and alcohol use, low educational attainment, employment instability, and chronic health problems, yielding in excess of \$70,000 in education, health, and criminal justice costs in 7 years alone or as much as a ten-fold increase in costs before the age of 30, understanding how variability within low income families predicts treatment outcome is a public health imperative (e.g., Pelham, Foster, & Robb, 2007; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009). This study, in turn, aims to address this gap in the literature by exploring how variability in the accumulation of risk affects BPT outcomes among low-income families of young children with externalizing problems.

Accordingly, this paper will first review the current literature of child externalizing problems in low SES families, including different factors that can contribute to the development and maintenance of these behaviors. The focus will then shift to a discussion of cumulative risk and how cumulative risk models may be an ideal approach for conceptualizing the impact of variability in barriers within a high-risk, low SES sample. Finally, the goals and hypothesis of the current study will be highlighted.

Growing up in a low SES family elevates children's risk for many negative outcomes, including externalizing problems (e.g., noncompliance, oppositionality, aggression). Parents are unable to manage these behaviors, and might unintentionally reinforce them by giving attention to these undesirable behaviors. Behaviors intensify, and parents continue to mismanage child behavior, and this coercive cycle continues (Keenan & Shaw, 1995; Patterson, 2002). It is important to note here that the parent is not being blamed for the development of externalizing problems, just that the parenting style might not be a good fit for the child behaviors. Without treatment, externalizing problems developing in early childhood are associated with problems later in life, including antisocial behavior, poor school outcomes, and delinquency (Plybon & Kliever, 2001; Reyno & McGarth, 2006; Scaramella, Neppl, Ontai, & Conger, 2008).

In recent years, economic changes in the United States in particular as a result of recession and slow recovery have resulted in 22% of children in the United State living in poverty and 45% of children living in a low-income household (National Center for Children in Poverty, 2014). The Family Stress Theory (Conger, Rueter, & Conger, 1999; Kohen, Leventhal, Dahinten, & McIntosh, 2008; Westbrook, & Harden, 2010) offers one explanation regarding why growing up in a low SES family increases a child's risk for developing externalizing problems at an early age (e.g. Anton, Jones, & Youngstrom, 2014; Reyno & McGarth, 2006; Shelleby et al.,

2014). According to the theory, low SES families are at a high risk for experiencing multiple stressors, such as a layoff at work, working multiple jobs, and financial difficulties due to their income status. These stressors can compromise parenting and, therefore, have negative influences on the child (Reyno & McGarth, 2006; Shelleby et al., 2014). In particular, parental stress can contribute to harsher parenting, which can, in turn, influence children to act out and parents to respond even more harshly (Goodrum et al., 2012; Reyno & McGarth, 2006). This can turn into a cycle of a child acting out and parents, due to other stressors, not handling the situation in an adaptive manner.

Many studies have assessed the risks through which the Family Stress Theory operates in order to exacerbate externalizing problems in young children in low SES families (e.g. Anton et al., 2014; Reyno & McGarth, 2006; Shelleby et al., 2014). Although the field is still developing, several risks have been studied, including parental mental illness, harsh parenting, negative or inconsistent parenting, parent emotion regulation, which are indeed interrelated (e.g. Crandall, Deater-Deckard, & Riley, 2015; Lorber, 2012; Maliken & Katz, 2013); young age of the mother at the time of child birth (e.g. Assini-Meytin, & Green, 2015; Hudgins, Erickson, & Walker, 2014); callous and unemotional traits (CU traits) in the child; and compromises in the parent-coparent relationship (e.g. Conger, Schofield, Neppl, & Merrick, 2013; Reyno & McGarth, 2006; Waller et al., 2012). It is important to note here that although ‘parent’ could mean either a biological or adoptive mother or father, or other male or female caregivers (e.g. grandparent) female caregivers are often the primary caregivers and sometimes the only caregiver included in these studies and, therefore, will be the primary focus in the subsequent sections (Panter-Brick et al., 2014; Tiano, & McNeil, 2005; Williams Coplin, & Houts, 1991).

One factor that can contribute to the development of early onset externalizing problems is parental psychopathology. Maternal depressive symptoms in particular have been correlated with child externalizing problems (Connors-Burrow, Swindle, McKelvey, & Bokony, 2015; Shelleby et al., 2014). Reyno and McGarth (2006) also found that children of mothers with depressive symptoms had poorer outcomes in treatment studies than those who had mothers without psychopathology. This suggests that maternal psychopathology acts not only as a contributor to externalizing problems, but can also be a barrier to treatment and improvement. Low SES parents are at an increased risk for developing psychopathology, such as depressive symptoms, because of the financial burden, which with they often struggle (Shelleby et al., 2014). Parental depressive symptoms can, in turn, contribute to child externalizing problems through the parent-child relationship, including factors such as parental warmth, parental harshness, and chaos in the home (Connors-Burrow et al., 2015; Goodrum et al., 2012; Shelleby et al., 2014; Reyno & McGarth, 2006). Externalizing problem displayed by children can further stress a parent, exacerbating parental mental illness and creating a continuous cycle.

Related to parental depressive symptoms, but also a focus of research in its own right, maladaptive and/or harsh parenting can impact child externalizing problems. Children exposed to harsh parenting such as spanking show higher rates of externalizing behaviors, particularly at young ages (this category of parenting does not include abuse) (Callahan, Scaramella, Laird, & Sohr-Preston, 2011; MacKenzie, Nicklas, Brooks-Gunn, & Waldfogel, 2014; Scott, 2012). Permissive and disengaged parenting styles, where parent(s) are moderate or low on measures of parental warmth and monitoring/knowledge have a small association with SES, with optimal parenting practices decreasing when SES decreases (Anton et al., 2014). One study showed that neighborhood danger moderated the relationship between harsh parenting and child internalizing

problems (Callahan et al., 2011). This can add another barrier for low SES families, since many low SES neighborhoods also have high rates of crime and danger. Dangerous neighborhoods might influence parenting styles, and this relationship should be investigated in future research. Harsh parenting can become a cycle, particularly for low SES families. One study found that adolescents of low SES families were more likely to become harsh parents, and in turn, have children with higher rates of externalizing problems (Scaramella et al., 2008). These children with higher rates of externalizing problems appeared to exacerbate their parent's harsh parenting in later data collection (Scaramella et al., 2008). Several other studies have found similar cycles across generations and throughout early childhood (e.g. Conger et al., 2013; Waller et al., 2012).

Emotion regulation, or an individual's ability to control his or her own experience and expression of emotion, is a factor related to parental psychopathology and parenting that can predict child externalizing behaviors (Rutherford, Wallace, Laurent, & Mayes, 2015). Parents that have difficulties regulating their emotions have a greater risk of developing psychopathologies, including depression, and engaging in patterns of negative parenting (e.g. overreactivity) (Crandall et al., 2015; Lorber, 2012; Maliken & Katz, 2013). Negative parental emotion expression can contribute to the development of externalizing problems in young children, which can in turn reinforce the parents' maladaptive emotion regulation (Duncombe et al., 2012; Rutherford et al., 2015). Low SES and the chaos associated with living in a stressful low SES environment can diminish parents' emotion regulation abilities (Crandall et al., 2015). Difficulties in emotion regulation can make it challenging for parents in BPT programs to inhibit their normal, negative reactions to child behavior (Maliken & Katz, 2013). Parenting interventions that target parent emotion regulation result in greater improvements in child behavior (Havighurst et al., 2013).

In addition, as well as related to, the parental mental health factors described above, having a child at a relatively young age puts both the young mother and child at risk for a range of negative life outcomes (Hudgins et al., 2014). Young mothers are more likely to engage in negative and abusive parenting styles due to a lack of warmth and knowledge about child needs (Hudgins et al., 2014). As previously discussed, harsher parenting styles can lead to child externalizing behaviors. Young mothers are more likely to have lower educational achievement, be unemployed, be single parents, and therefore more likely to be economically disadvantaged and be low SES later in life than relatively older mothers (Assini-Meytin, & Green, 2015; Hudgins et al., 2014; SmithBattle, 2007). As discussed earlier, being low SES puts families at risk for stress, which can compromise parenting and exacerbate externalizing problems.

In terms of child factors, having callous and unemotional (CU) traits, including a lack of empathy and caring for others, is a child factor that is correlated with early onset behavioral problems. Children who display CU traits are a subset of children with externalizing problems who typically have poorer outcomes and are less likely to benefit from treatment (Markowitz, Ryan, & Marsh, 2014; Phillips, 2004). Studies suggest that CU traits that appear early in childhood remain stable throughout childhood (Waller et al., 2012). Harsh parenting has been correlated with increases in CU traits in children (Waller et al., 2012). This suggests a cycle, as discussed in previous sections of this paper. Data suggest that these children do not respond well to treatment, and even children with more severe behavioral problems at the beginning of treatment have higher dropout rates and overall poorer treatment outcomes than those with less severe behavior (Reyno & McGarth, 2006). Low SES families are already at a disadvantage for benefiting from treatment, as discussed in later sections, and a child displaying CU traits adds an extra layer of difficulty for these families. As previously discussed, harsh parenting a low SES

are correlated. This harsh parenting could be a moderator of the relationship between CU traits and SES, although some studies suggest that CU traits are equally detrimental to children across SES (Markowitz et al., 2014).

At a broader family level, poor parent-coparent relationship quality has also been linked to higher rates of externalizing problems in children. The presence of a coparent, or another adult, regardless of marital or relationship status, who assists in child raising, can provide support to parents (McHale et al., 2002; McHale, & Lindahl, 2011), which is why this relationship has been investigated in previous studies (e.g. Goodrum et al., 2012, Shook et al., 2010). For the purpose of this study, coparent can mean marital partner or any other adult who is actively involved in daily caregiving for the child. Low SES parents are often strained in their relationship with a coparent from the stress of everyday life (Conger et al., 1999). Studies have found that elevated levels of parent-coparent conflict are correlated with elevated levels of child externalizing problems (Goodrum et al., 2012; Shook et al., 2010). Conflict with the coparent can compromise parenting, which can contribute to the development and exacerbation of child problem behavior, as well as strain the parent-child relationship (Conger et al., 1999; Goodrum et al., 2012; Shook et al., 2010).

Finally, beyond parent, child, and family characteristics, household overcrowding is one contextual factor that can contribute to the development and maintenance of externalizing problems in early childhood. Overcrowding is typically defined as more people residing in a household than rooms, excluding bathrooms and hallways (Northerner, Trentacosta, & McLear, 2016). Household overcrowding can add to household chaos, contributing in turn to an accumulation of stress for parents (Northerner et al., 2016). Home chaos has been linked to harsher and less consistent parenting and discipline techniques (Dumas et al., 2005). Not only

can household chaos compromise parenting, it can also contribute to the development and maintenance of externalizing behaviors in and of itself by creating an inconsistent and disorganized context for development (Coldwell, Pike, & Dunn, 2006; Dumas et al., 2005; Pike et al., 2006).

Given the number of risk factors that characterize low-income families and the link between these risks and externalizing problems, it is important to consider the extent to which low-income families have access to and benefit from treatment. Behavioral Parent Training (BPT) is considered the standard of care for early onset behavior problems (Chorpita et al., 2011). BPT programs involve teaching parents skills to effectively manage and decrease child externalizing behavior (Eyberg, Nelson, & Boggs, 2008; Reitman & McMahon, 2012). Low SES families are less likely to engage in and more likely to dropout of BPT than families from other SES groups (Lavigne et al. 2010; MacKenzie, Fite & Bates, 2004; Reyno & McGarth, 2006). These trends are largely attributed to the same risk factors described above which increase vulnerability for externalizing problems; however, in the case of treatment such risks may also be conceptualized as barriers. Yet, the variability in these barriers among low SES treatment seeking families and how this variability is associated with treatment outcome is less well understood. Accordingly, this study aims to address this gap in the literature by examining the accumulation of barriers among low SES families seeking BPT for children's externalizing problems, as well as the link between barriers and treatment engagement and outcomes.

Previous research has used a cumulative risk model to evaluate how multiple risk factors contribute to the development of externalizing behaviors in young children (Atzaba-Portia, Pike, & Deater-Deckard, 2004; Evans, Li, & Whipple, 2013; Jones et al., 2002). A cumulative risk model is a way to measure the impact of multiple risk factors by dichotomizing each factor (0 =

no risk, 1 = risk) and summing the scores (Evans et al., 2013). There are several advantages in using a cumulative risk model over other models (Evans et al., 2013). First, cumulative risk models fit well with many of the underlying theoretical models. For example, Bronfenbrenner's, (1979) Ecological Model proposes that children can experience risk factors across different ecological levels, and cumulative risk models are a way of measuring how children react to an accumulation of these risks across and within levels. In addition, cumulative risk models provide a way to account for multiple and nuanced risk factors affecting families in a relatively parsimonious way. For example, Atzaba-Portia and colleagues (2004) found a significant positive correlation between the number of risk factors children experienced, and the amount of externalizing problems they displayed. Finally, cumulative risk models are statistically sensitive to even small samples because they have high statistical power (Evans et al., 2013). Studies utilizing cumulative risk models have found that an accumulation of barriers across multiple levels of the child's environment can contribute to the development of early onset externalizing behaviors, as well as problems later in life (Atzaba-Portia et al., 2004; Evans et al., 2013).

Barriers linked to low SES can also compromise treatment success in families that seek treatment for their children with externalizing problems (Bagner & Graziano, 2012; MacKenzie, Fite, & Bates, 2004; Reyno & McGarth, 2006). For example, Bagner and Graziano (2012) found that families with three or more barriers were more likely to drop out of a BPT treatment and have a diminished treatment response in both child behavior and parenting skills. Researchers currently believe that one risk factor or, in the case of treatment seeking and outcomes, one "barrier", normally will not significantly affect child development, but the presence of multiple barriers can significantly impact a child's development (Evans et al., 2013). Few studies, however, have looked within low SES samples to compare the effects of few versus many

barriers on treatment outcomes, as well as strategies to mitigate the effect of barriers. As such, this study aims to extend the literature on barriers to treatment by comparing an accumulation of barriers within a low SES sample on treatment outcomes as well as the extent to which technology-enhanced treatment can diminish the effects of these barriers. First, it is predicted that low-income families with relatively more barriers will be more likely to drop out of BPT than families with relatively fewer barriers. This hypothesis is based on the idea that low SES families are more likely to drop out of treatment, particularly ones with more barriers or risks (Lavigne et al., 2010; MacKenzie et al., 2004; Reyno & McGarth, 2006).

Second, it is expected that of the families who complete BPT, those with more barriers, compared to fewer barriers, will benefit less from treatment. Families with multiple barriers have more difficulty engaging in treatment, such as practicing skills, when compared to families with fewer barriers. In turn, it is probable that lower level of treatment engagement results in less child behavior improvement.

Third, it is hypothesized that families with more barriers will take longer to complete BPT than those with less cumulative risk. This is also based on the idea suggesting that families with more barriers are less engaged in treatment. With less engagement (e.g. less skill practice), parents could take longer to master skills, thereby increasing the number of sessions required to complete the program.

Finally, it was predicted that among families who completed BPT, families with relatively higher cumulative risk will benefit more from and take fewer sessions if randomized to the technology-enhanced BPT arm of the intervention, rather than the standard BPT arm. One promising way of increasing treatment engagement and benefits in low SES families is technology-enhanced treatments. Smart phones in particular show promise for enhancing BPT

for low SES families (Jones et al., 2013; Jones et al., 2015) by providing increased support from and connection to treatment and, in turn, increasing the family's competence using the skills in the context of everyday life outside of therapy. Therefore, it is predicted that smartphone enhancements may provide extra support to families navigating a higher number of barriers than families experiencing fewer barriers.

Methods

Overview

This study will conduct secondary data analyses using pre-treatment and post-treatment data from a pilot study of a randomized control trial comparing one example of standard BPT program, *Helping the Noncompliant Child*, (HNC; McMahon & Forehand, 2003), to a technology-enhanced version (TE-HNC). HNC teaches parents skills to ignore minor not ok behavior, attend to and reward good behavior, give clear instructions, and use time-out when the child fails to comply (Eyberg et al., 2008; McMahon & Forehand, 2003; Reitman & McMahon, 2012). Prior findings revealed TE-HNC group compared to normal HNC group was more engaged in treatment, had a larger effect size of behavior improvement, and completed treatment in fewer sessions, suggesting the cost-effectiveness of the enhanced treatment (Jones et al, 2014), as well as that almost every family in the technology group had a full response to treatment, and families that used the technology more improved more by the end of treatment (Anton et al., in press). The current study extended these previously published analyses on the sample by examining the aforementioned hypothesis.

Participants

Participants in this study were low-income families (i.e. adjusted gross income does not exceed 150% of the federal poverty limit) with a child 3-8 years of age (the age range HNC was

developed for) with disruptive behaviors in the clinical range based on the *Eyberg Child Behavior Inventory* (ECBI; Eyberg & Pincus, 1999). Families were excluded from the study if the participating child had developmental or physical disabilities that precluded the use of HNC skills; the caregiver had a current diagnosis of substance abuse/dependence, mood or psychotic disorder; or the family had involvement with Department of Social Services related to abuse or neglect.

Twenty-two families enrolled in the study and were randomized into TE-HNC ($n=11$) and HNC ($n=11$). Three cases (2 for TE-HNC, 1 for HNC) were used as practice cases; 19 families were included in data analysis for the current study (TE-HNC $n=9$; HNC $n=10$). Participating children were on average 5.7 years old ($SD = 1.58$); caregivers were on average 35.9 years ($SD = 8.74$).

Procedure

Families were recruited from central North Carolina (NC) through advertisements (e.g. university emails, brochures, bus advertisements), agencies (e.g. churches, schools, YMCA), doctors offices, and word-of-mouth. Interested families completed a brief phone screen to determine if they were eligible initially. Eligible families then completed a more extensive in-clinic baseline assessment to confirm eligibility, gain consent, and gather more data from the family. Families were then randomized into either the HNC group or the TE-HNC group.

HNC (McMahon & Forehand, 2003) has two phases where parents of children with clinically significant disruptive behavior learn effective strategies for managing child behavior from certified clinicians. In Phase I, Differential Attention, caregivers learn to increase social attention to the child and decrease competing verbal behavior. Caregivers learn “Child’s Game” (child directed play) which helps the caregiver increase positive attention; eliminate instructions,

questions and criticism; and ignore minor inappropriate behavior. Caregivers are instructed to practice Child's Game for 15 minutes each day and are encouraged to have their coparent practice as well. When caregivers meet criteria for Phase I they move on to Phase II.

In Phase II, Compliancy Training, caregivers are taught the difference between giving a clear instruction and unclear instructions, the "Clear Instruction" sequence and to use a nonphysical discipline sequence, "Time-Out", for instances of noncompliance and other inappropriate behavior that cannot be ignored. These skills are taught in the context of "Parent's game" (i.e. parent directed activities), while caregivers continue to practice Child's game to maintain skills learned in Phase I. Once caregivers meet criteria for Phase II skills, they complete the program.

The TE-HNC program was comprised of the standard HNC program with several smartphone technology enhancements: 1) daily assessment of skills practices which guided mid-week calls and sessions; 2) videorecorded in-home practice sessions for therapist review and feedback; 3) daily reminders regarding skills practices, as well as reinforcing messages regarding progress; 4) video calls with the family midweek to problem solve obstacles to skill practice and progress; and 5) skills video series to model new parenting skills.

Procedures at post-assessment were similar to procedures at the baseline assessments with a few exceptions. Caregivers and their child were compensated \$50 for their participation. The TE-HNC group also received a \$100 safe return bonus for returning the smartphone at the Post-Assessment.

Measures

Barriers. Barriers, the primary predictor variable in this study, were computed using a cumulative risk or barrier index, which included these measures administered in the parent study:

low levels of Positive Parenting, Parental Psychopathology, Parental Emotion Regulation, Callous Unemotional traits, Caregiver-Coparent Relationship, Number of People in the household, and Parent Age at birth of first child. A median split was conducted for each measure in order to divide the sample into a 'high' (1) or 'low' (0) group for each, then computed to calculate the family's total risk (Possible Range = 0 – 7).

Low levels of Positive Parenting was measured with the positive parenting subscale (7 items) of the *Alabama Parenting Questionnaire* (APQ; Shelton, Frick, & Wootton, 1996). Parents rated items about different parenting habits (e.g. “you threaten to punish your child then do not actually punish him/her) on a scale from 1 (*never*) to 5 (*always*). Previous studies have found the scale to have good internal consistency and validity, and one study resulted in a preschool revision of the APQ (Clerkin, Marks, Policaro, & Halperin, 2007; Essau, Sasagawa, Frick, 2006). The alpha for this scale was .64.

Parental Psychopathology was assessed using the *Beck Depression Inventory- II* (BDI-II; Beck, Steer, & Brown, 1996). For the purpose of this study, depressive symptoms were measured, not actual depression. The BDI-II has 21 items each with 4 statements that assess the degrees of symptoms (cognitive-affective and somatic depressive, within the past 2 weeks) on a scale from 0 to 3. The total score is the sum of all of the items, and can range from 0 to 63. Total scores ranging from 0 to 13 represent “Minimal” depression; scores ranging from 14 to 19 represent “Mild” depression; scores ranging from 20 to 28 represent “Moderate” depression; and scores ranging from 29 to 63 represent “Severe” depression. For this study, any caregiver scoring in the “severe” range was considered ineligible, given that severely depressed caregivers may have difficulties navigating child-focused treatment. The BDI-II has been validated in several

previous studies (Arnau et al., 2001; Dozois et al., 1998; Steer et al., 1998; Steer et al., 1999). The alpha for this scale was .83.

The *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) was used to measure parents' difficulties in regulating their emotions. The self-report measure has 6 domains measuring abilities to regulate emotions for a total of 36 items. In this study, the composite score across all domains was used to measure risk. Statements such as "I feel at ease with my emotions" are rated on a likert scale of 1 (*almost never*) to 5 (*almost always*). Previous studies have found the DERS to be internally consistent and reliable across different demographic groups (Fowler et al., 2014; Ritschel, Tone, Schoemann, & Lim, 2015). The alpha for this scale was .94.

Callous and Unemotional traits were measured using select measures from the *Preschool Child Behavior Checklist* (Preschool CBCL; Achenbach & Rescorla 2000) for children age 3 to 5 years, and the *Child Behavior Checklist* (CBCL; Achenbach, 1991) for children over 5 years of age (appendix A). Items were chosen based on previous studies using similar methodology (Hyde et al., 2013; Kimonis, Bagner, Linares, Blake, & Rodriguez, 2014; Willoughby, Waschbusch, Moore, & Propper, 2011). Items used from the Preschool CBCL were: cruel to animals, destroys things belonging to others, doesn't feel guilty after misbehaving, punishment doesn't change behavior, seems unresponsive to affection, shows little affection towards people, shows little fear of getting hurt. Items used from the CBCL were: cruel to animals, cruelty, bullying, meanness to others, destroys things belonging to family or others, doesn't feel guilty after misbehaving, teases a lot, threatens people. The alphas for the Preschool CBCL and CBCL were .83 and .76 respectively.

The *Parenting Convergence Scale* was used to assess parent-coparent relationship in this study (PC; Ahrons, 1979). The current 11-item questionnaire was adapted from a 5-point Likert scale to a 4-point Likert scale ranging from 0 (*never*) to 3 (*often*). The scale assesses 3 areas of the caregiver-coparent relationship: Communication, Support, and Conflict. For this study, scores on the 3 subscales were summed to produce a single composite score. Previous research has found the scale to have good internal consistency for this scale (Ahrons, 1981). The alphas for the Communication, Support and Conflict subscales were .86, .19, and .75 respectively. The alpha for the scale was .80.

Number of People in the household was measured by asking participants how many people lived with them. Household numbers 5 or above were scored as a risk because it is more than the standard nuclear family (2 parents, 2 children). Given that families were low SES, it is assumed that they do not have a large living space and more members in the household can create chaos (Northerner, Trentacosta, & McLear, 2016).

Age of Parent at first childbirth was calculated by subtracting the oldest child's age from the parent's age. Parent ages at first childbirth below 20 years of age were coded as a risk given that it is likely the parent was a teenager during pregnancy.

Disruptive behavior. The primary outcome variable in this study was measured using the *Eyberg Child Behavior Inventory* (ECBI; Eyberg & Pincus, 1999), which has 2 scales, with 36 items each, measuring behaviors such as noncompliance, aggression and whining. The 2 scales are: the Intensity Scale (the frequency the child engages in each behavior; 1 to 7 Likert scale) and the Problem Scale (a binary scale asking parents "is this a problem for you"). Scores on the Intensity Scale range from 36 to 252 and scores on the Problem Scale range from 0 to 36. Children scoring at or above 131 on the Intensity Scale or 15 on the Problem Scale are

considered to be in the “clinical range” for disruptive behavior. The ECBI has demonstrated good reliability, internal consistency, and test-retest reliability (Burns & Patterson, 1990, Eyberg & Robinson, 1983; Funderburk, Eyberg, Rich, & Behar, 2003; Robinson, Eyberg, & Ross, 1980). The alphas for the Intensity Scale and Problem Scale are .859 and .757 respectively.

Number of Sessions. Number of sessions was another outcome variable for this study, and was measured by counting the number of sessions it took each family to complete the mastery-based HNC treatment program.

Analyses

There is much discussion in the literature regarding the importance of strategically capitalizing on and learning from pilot data, given the increasingly costly and time-intensive nature of randomized control trials in which the lag in study findings can exceed 5 years from subject recruitment to publication of findings (e.g., Brown et al., 2009; Ioannidids, 1998; Kumar et al., 2013). Such discussions are particularly salient in technology-enhanced services research, in which such a lag means that advances in the evolution of technology may quickly outpace the feasibility and, in turn, potential scientific or clinical contribution of the data (see Jones, 2014; Kumar et al., 2013; Mohr et al., 2015, for reviews). Accordingly, this study examined overall trends in the data, rather than statistical significance, as a critical first step in better understanding how variability in cumulative risk *within* high-risk, low-income samples shapes treatment outcome (Levine, & Hullett, 2002).

First, demographic information for this sample is reported. Alphas were also calculated to assess internal consistency and ensure that the data is not skewed and that there are no outliers. Given the pilot nature of this study and the small sample size, overall trends in the data (e.g. effect size and interactions) rather than significance were examined (Levine, & Hullett, 2002).

In addition, a one-way ANOVA was used to determine if trends towards differences between the total number of barriers for families that dropped out of treatment and those that completed treatment. This was the only analysis that included dropout families; all further analyses excluded them.

Families were then divided into groups of either ‘high barriers’ or ‘low barriers’ using a median split and based on their total barrier score in order to compare change in pre-to-post treatment behavior problems on the ECBI. An analysis of covariance (ANCOVA) was then used to compare the behavior outcome of the two groups, controlling for differences in pre-treatment measurements of behavior. This determined if the ‘low barrier’ group benefited more from BPT than the ‘high barrier’ group.

Next, an ANCOVA was used to compare the average number of sessions needed to complete HNC between the ‘high barrier’ group and the ‘low barrier’ group to determine if more barriers increased the number of sessions necessary to complete treatment.

Finally, an ANCOVA was used to assess the behavioral outcomes of the TE-HNC group compared to the HNC group. Each treatment group was further divided into ‘high barrier’ and ‘low barrier’ for a total of 4 groups. Treatment outcomes based on ECBI scores were compared to determine if there was an interaction between the number of barriers and presence or absence of technology.

Results

Demographics

Demographic information (Table 1) and total number of barriers (Figure 1) are reported.

Hypothesis 1: Is the accumulation of barriers associated with dropouts?

Results of the one-way ANOVA showed that there was no difference in number of barriers between families that dropped out of treatment ($M = 3.0, SD = 0.8$) and families that completed treatment ($M = 3.33, SD = 1.0$). A logistic regression was conducted to see if number of barriers was associated with families being more likely to drop out of treatment; however there was no effect of number of barriers on likeliness of families dropping out of treatment ($chi\ squared = 0.37, p = .54, df = 1$).

Hypothesis 2: Is the accumulation of barriers associated with treatment outcome?

There was a difference in post-treatment ECBI Intensity Scale between the high barriers group ($M = 91.48, SD = 20.5$) and the low barriers group ($M = 83.17, SD = 16.7$). Of note, the high barriers group ($M = 161.1, SD = 56.0$) had higher ECBI intensity scores at the beginning of treatment than the low barriers group ($M = 148.8, SD = 35.2$), indicating that more barriers might have been a contributing factor to the development of child externalizing behavior. The effect size for barriers on post-treatment ECBI intensity scores was small ($eta\ squared = .049$).

The ECBI Problem Scale also differed between groups at post treatment (High barriers $M = 8.75, SD = 7.5$; Low barriers $M = 6.29, SD = 6.7$) when controlling for scores at baseline. The effect size for barriers on post-treatment ECBI problem scores was also small ($eta\ squared = .042$).

Hypothesis 3: Is the accumulation of barriers associated with time to complete treatment?

There was trend toward a difference in number of sessions to program completion between the high barriers group ($M = 8.36, SD = 1.4$) and the low barriers groups ($M = 9.71, SD = 1.5$). The results were opposite of what was expected with the low barriers group taking approximately 1 more session to master skills and complete treatment than the high barriers group.

Hypothesis 4: Does technology help most when there is a greater accumulation of barriers?

An interaction was found in post-treatment ECBI intensity scores between participants in treatment groups and high versus low barriers groups (see Figure 2). Both high ($M = 87.7$, $SD = 19.2$) and low barriers ($M = 76$, $SD = 3.8$) groups in TE-HNC had lower ECBI intensity scores post-treatment compared to HNC high ($M = 94.6$, $SD = 24.3$) and low ($M = 89.2$, $SD = 21.1$) barriers group. The group with low barriers randomized to the TE-HNC had the lowest ECBI intensity ($M = 76$, $SD = 3.8$) scores post-treatment.

An interaction was found in a post-treatment ECBI problem scores and treatment group as well (Figure 3). Families in the low barriers group randomized to TE-HNC had the lowest post-treatment ECBI problem scores ($M = 4.4$, $SD = 4.7$) compared to families in the high barriers group randomized to TE-HNC ($M = 7.8$, $SD = 6.8$), and both the low barriers group ($M = 7.4$, $SD = 8.3$) and high barriers group ($M = 10.0$, $SD = 9.0$) randomized to the HNC treatment.

Discussion

This study examined the interrelationship of an accumulation of barriers and variability in treatment outcomes within a low-income sample of families of young children with clinically significant externalizing behaviors. Contrary to the first hypothesis, there was not a pattern to suggest that a higher number barriers predicted families dropping out of treatment. There are several things to consider with this null finding. First, only 4 families dropped out of treatment, making it difficult to identify patterns in barriers. Second, the analysis might not have captured the barriers highly correlated with dropping out. For example, anecdotally we know that families that dropped out of treatment did so following significant life events (e.g. needing an organ transplant, divorce, department of social service involvement, psychiatric hospitalization of another child). Low SES families are more likely to experience these types of significant life

events (Schnirer & Stack-Cutler, 2012). These life events can accumulate as stress that leads to a literal “tipping point” that becomes unmanageable, preventing them from continuing to participate in treatment. It is possible, however that other families in the study also experienced a significant life event during the course of the study, and were able to complete treatment; this is unknown due to significant life events not being measured in the current study, which would be important to capture in and examine in future studies.

In analyses associated with hypothesis 2, there was a small effect size of barriers on post treatment outcomes, which provides preliminary data to suggest that the families with more barriers may not benefit from treatment as much as families with fewer barriers. As hypothesized, stress caused by relatively higher levels of barriers may have interfered with participant’s ability to fully engage in the treatment process, and in turn, benefit as much at post-treatment. Of note, families with high barriers also had higher ECBI scores at baseline assessment. Families with high barriers could have experienced more stress in their lives, compromising parenting and contributing to more child externalizing problems, which would be consistent with previous research (e.g. Conger et al., 1999; Reyno & McGarth, 2006; Shelleby et al., 2014).

Contrary to hypothesis three, families with relatively higher barriers completed treatment on average 1 session sooner, rather than later, than families with relatively lower barriers. Although this was contrary to what was expected, it is important to note that both groups fell within the range (8 to 12 sessions) that is average for the completion of the HNC program (McMahon & Forehand, 2003). As such, neither the high nor low barriers group is taking substantively longer than families, including relatively higher income families, on average. That said, several possibilities should be considered. First, it is plausible that families with relatively

more barriers may have expressed to therapists the need to complete treatment sooner due to life stress and therapists accommodating families to prevent drop-out. Although HNC is a mastery-based program, suggesting that all families met program mastery before completion, it will be interesting for example to examine whether the sessions were relatively longer on average with higher relative to lower barrier families. Similarly, it would be interesting in future research to examine whether families with relatively more barriers took more weeks to complete the same or even fewer sessions, due to the need to missed or cancelled and rescheduled sessions.

Finally, as predicted in hypothesis four, both high and low barriers TE-HNC families benefited from treatment more than both of the groups in the HNC treatment, which suggests that the technology enhancement did help mitigate some of the barriers and stress associated with low SES and helped these families engage in and benefit from treatment. Since the high barriers group with the technology enhancement had lower treatment outcomes than the low barriers group, the technology was not able to protect against all stress families experienced from encountering more barriers, which is consistent with discussions in the technology-enhanced services literature more broadly (Jones, 2014). That is, enhancing treatment content between sessions with skills videos, videoconference check-ins, text reminders regarding appointments and practice may help families be more mindful of the importance of using BPT at home and between sessions; however, technology will not necessarily help families to cope with the myriad range of chronic and acute stressors that they encounter routinely

As with all research, this study had some limitations. First, the pilot study was not intended to measure an accumulation of barriers; therefore, measures included in this study might not capture the full range of risk families experienced in their daily lives. As mentioned earlier, for example, significant life events were not measured in the current study, and it is

possible that families experienced a range of barriers in addition to the ones included in the current cumulative risk model. Similarly, several exclusion factors (e.g. maltreatment history, severe parent psychopathology) could have restricted the range of barriers within this low-income sample. Second, due to the pilot nature of the parent study, these analyses relied heavily on dichotomous variables, including both to create the risk index, as well as to examine low versus high risks within a low income sample. While such an approach represented a theoretical and practical first step in examining the proposed trends within this at-risk and underserved sample of low income families, dichotomous data by definition loses some of the richness in the variability of the data. As such, trends should be interpreted with caution and viewed as a first step in a plan of research that will be replicated with larger sample sizes.

This study also had its strengths. First, as noted earlier, this study represents an important step in disentangling how an accumulation of stressors may affect treatment outcome within low-income samples. In addition, it expands on prior research on both the effect of stress and risk factors low SES families experience and strategies to minimize stress and assist families in completing treatments. Relative to other studies of this nature with low SES population (e.g. Lavinge et al., 2010), this study had a lower dropout rate, which could be due to technology enhancements alleviating some stress from barriers for participating families. Relieving some of caregivers' stress may have helped them focus on learning skills and engaging in treatment, which contributed to higher benefits of treatment.

In summary, this line of research will be important to continue with larger sample sizes, potentially greater assessment time points, and a more rounded assessment of the range of stressors, including significant life events, common among low income families. Such works will continue to contribute to our understanding of improving treatments for low SES families to

alleviate some of the stress they experience from having multiple barriers in their lives, and in turn, allow them to more optimally benefit from services. Strategies and programs that help mitigate stress or the effects of stress in caregivers' lives and thereby increasing adaptive parenting styles before externalizing behaviors develop are also necessary areas of research.

Acknowledgements

Funding and support for this project are provided by the National Institute for Mental Health (NIMH; R34MH082956; R01MH100377). I would like to extend my gratitude to the families and therapists who participated in this project for their time and contributions. In addition, I would like to thank Drs. Beth Kurtz Costes and Don Baucom for their valuable feedback and support in the Honors Thesis course, as well as the members of my committee and members of the Tantrum Tamers research lab for their valuable time and feedback.

References

- Achenbach, T. M. (1991). Manual for Child Behavior Checklist 4–18 and 1991 profile.
- Achenbach, T. M., & Rescorla, L. A. (2000). Manual for the ASEBA Preschool Forms & Profiles. Burlington: VT: University of Vermont, Research Center for Children, Youth, and Families. Burlington: University of Vermont, Department of Psychiatry.
- Ahrons, C. (1979). The binuclear family: Two households, one family. *Alternative Lifestyles*, 2(4), 499-515. DOI: 10.1007/BF01082682
- Ahrons, C. (1981). The continuing coparental relationship between divorced spouses. *American Journal of Orthopsychiatry*, 51(3), 415-428. DOI: 10.1111/j.1939-0025.1981.tb01390.x
- Anton, M.T., Jones, D.J., Newey, G.A., Cuellar, J., Gonzalez, M., Forehand, R., Honeycutt, A., Khavjou, O., Jacobs, M., Edwards, A., & Pittman, S. (in press). Caregiver use of the core components of technology-enhanced HNC: A case series analysis of low-income families. *Cognitive Behavioral Practice*. DOI: 10.1016/j.cbpra.2015.04.005
- Anton, M., Jones, D. J., & Youngstrom (2015). Socioeconomic Status, Parenting, and Externalizing Problems in African American Single Mother Homes: A Person-Oriented Approach. *Journal of Family Psychology*, 29(3), 405-415. DOI: 10.1037/fam0000086
- Arnau, R., Meagher, M., Norris, M., & Bramson, R. (2001). Psychometric evaluation of the Beck Depression Inventory-II with primary care medical patients. *Health Psychology*, 20(2), 112–119. DOI: 10.1037//0278-6133.20.2.112
- Arnold, D. S., O’Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment*, 5(2), 137-144. DOI: 10.1037/1040-3590.5.2.137

- Assini-Meytin, L. C., & Green, K. M. (2015). Long-Term Consequences of Adolescent Parenthood Among African-American Urban Youth: A Propensity Score Matching Approach. *Journal of Adolescent Health, 56*(5), 529-535.
- Atzaba-Portia, N., Pike, A., & Deater-Deckard, K. (2004). Do risk factors for problem behaviour act in a cumulative manner? An examination of ethnic minority and majority children through an ecological perspective. *Journal of Child Psychology and Psychiatry, 45*(4), 707-718. DOI: 10.1111/j.1469-7610.2004.00265.x
- Bagner, D. M., & Graziano, P. A. (2012). Barriers to success in parent training for young children with developmental delay: The role of cumulative risk. *Behavior Modification, 37*(3), 356-377. DOI: 10.1177/0145445512465307
- Beck, A.T., Steer, R. A., & Brown, G. K. (1996). Manual for the Beck Depression Inventory–II. San Antonio, TX: Psychological Corporation.
- Brown, C. H., Ten Have, T. R., Jo, B., Dagne, G., Wyman, P. A., Muthén, B., & Gibbons, R. D. (2009). Adaptive designs for randomized trials in public health. *Annual review of public health, 30*, 1-25.
- Burns, G.L., & Patterson, D.R. (1990). Conduct problem behaviors in a stratified random sample of children and adolescents: New standardization data on the Eyberg Child Behavior Inventory. *Psychological Assessment, 2*(4), 391–397. DOI: 10.1037/1040-3590.2.4.391
- Callahan, K. L., Scaramella, L. V., Laird, R. D., & Sohr-Preston, S., L. (2011). Neighborhood disadvantage as a moderator of the association between harsh parenting and toddler-aged children’s internalizing and externalizing problems. *Journal of Family Psychology, 25*(1), 68-76. DOI: 10.1037/a0022448

- Chorpita, B. F., Daleiden, E. L., Ebesutani, C., Young, J., Becker, K. D., Nakamura, B. J., Phillips, L., Ward, A., Lynch, R., Trent, L., Smith, R. L., Okamura, K. & Starace, N. (2011). Evidence-Based Treatments for Children and Adolescents: An Updated Review of Indicators of Efficacy and Effectiveness. *Clinical Psychology: Science and Practice*, 18(2), 154–172. DOI: 10.1111/j.1468-2850.2011.01247.x
- Clerkin, S.M., Marks, D.J., Policaro, K.L., & Halperin, J.M. (2007). Psychometric properties of the Alabama Parenting Questionnaire-preschool revision. *Journal of Clinical Child & Adolescent Psychology*, 36(1), 19-28. DOI: 10.1007/s10826-013-9730-5
- Coldwell, J., Pike, A., & Dunn, J. (2006). Household chaos—links with parenting and child behaviour. *Journal of Child Psychology and Psychiatry*, 47(11), 1116-1122. doi:10.1111/j.1469-7610.2006.01655.x
- Conger, K. J., Rueter, M. A., & Conger, R. A. (1999). The role of economic pressure in the lives of parents and their adolescents: The Family Stress Model. In L. J. Crockett & R. K. Silbereisen (Eds.), *Negotiating adolescence in times of social change* (pp. 201-223). Cambridge, UK: Cambridge University Press.
- Conger, R. D., Schofield, T. J., Neppel, T. K., & Merrick, M. T. (2013). Disrupting intergenerational continuity in harsh and abusive parenting: the importance of a nurturing relationship with a romantic partner. *Journal of Adolescent Health*, 53(4), S11-S17. DOI: 10.1016/j.jadohealth.2013.03.014
- Connors-Burrow, N. A., Swindle, T., McKelvey, L., & Bokony, P. (2015). A little bit of the blues: Low-level symptoms of maternal depression and classroom behavior problems in preschool children. *Early Education and Development*, 26(2), 230-244. DOI: 10.1080/10409289.2015.979725

- Crandall, A., Deater-Deckard, K., & Riley, A. W. (2015). Maternal emotion and cognitive control capacities and parenting: A conceptual framework. *Developmental Review, 36*, 105-126.
- Dozois, D., Dobson, K., & Ahnberg, J. (1998). A psychometric evaluation of the Beck Depression Inventory–II. *Psychological Assessment, 10*(2), 83–89. DOI: 10.1037/1040-3590.10.2.83
- Dumas, J. E., Nissley, J., Nordstrom, A., Smith, E. P., Prinz, R. J., & Levine, D. W. (2005). Home chaos: Sociodemographic, parenting, interactional, and child correlates. *Journal of Clinical Child and Adolescent Psychology, 34*(1), 93-104. DOI: 10.1207/s15374424jccp3401_9
- Duncombe, M. E., Havighurst, S. S., Holland, K. A., & Frankling, E. J. (2012). The contribution of parenting practices and parent emotion factors in children at risk for disruptive behavior disorders. *Child Psychiatry & Human Development, 43*(5), 715-733.
- Egger, H. L., & Angold, A. (2006). Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *Journal Of Child Psychology And Psychiatry, 47*(3-4), 313-337. DOI: 10.1111/j.1469-7610.2006.01618.x
- Essau, C.A., Sasagawa, S., Frick, P.J. (2006b). Psychometric properties of the Alabama Parenting Questionnaire. *Journal of Child and Family Studies, 15*(5), 597-616. doi: 10.1007/s10826-006-9036-y
- Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development. *Psychological Bulletin, 139* (6), 1342-1396. DOI: 10.1037/a0031808

- Eyberg, S. M., Nelson, M. M., & Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal Of Clinical Child And Adolescent Psychology, 37*(1), 215-237. DOI: 10.1080/15374410701820117
- Eyberg, S. M., & Pincus, D. (1999). *Eyberg child behavior inventory and Stutter-Eyberg student behavior inventory*: Professional manual. Odessa, FL: Psychological assessment resources.
- Eyberg, S.M., & Robinson, E.A. (1983). Conduct problem behavior: Standardization of a behavioral rating scale with adolescents. *Journal of Clinical Child Psychology, 12*(3), 347–357. DOI: 10.1207/s15374424jccp1203_19
- Fowler, J. C., Charak, R., Elhai, J. D., Allen, J. G., Frueh, B. C., & Oldham, J. M. (2014). Construct validity and factor structure of the difficulties in emotion regulation scale among adults with severe mental illness. *Journal of psychiatric research, 58*, 175-180.
- Freeman, K. A., & DeCoursey, W. (2007). Further analysis of the discriminate validity of the Parenting Scale. *Journal of Psychopathology and Behavioral Assessment, 29*(3), 169-176. DOI: 10.1007/s10862-006-9040-y
- Funderburk, B.W., Eyberg, S., Rich, B.A., & Behar, L. (2003). Further psychometric evaluation of the Eyberg and Behar rating scales for parents and teachers of preschoolers. *Early Education & Development, 14*(1), 67–81. DOI: 10.1207/s15566935eed1401_5
- Gonzalez, M., Jones, D. J., Kinkaid, C. Y., & Cuellar, J. (2012). Neighborhood context and adjustment in African American youths from single mother homes: The intervening role of hopelessness. *Cultural Diversity and Ethnic Minority Psychology, 18*(2), 109-117. DOI: 10.1037/a0026846

- Goodrum, N. M., Jones, D. J., Kincaid, C. Y., Cuellar, J., & Parent, J. M. (2012). Youth externalizing problems in African American single-mother families: A culturally relevant model. *Couple and Family Psychology: Research and Practice, 1*(4), 294-305. DOI: 10.1037/a0029421
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26*, 41-54.
- Havighurst, S. S., Wilson, K. R., Harley, A. E., Kehoe, C., Efron, D., & Prior, M. R. (2013). "Tuning into Kids": Reducing Young Children's Behavior Problems Using an Emotion Coaching Parenting Program. *Child Psychiatry & Human Development, 44*(2), 247-264.
- Hudgins, R., Erickson, S., & Walker, D. (2014). Everyone Deserves a Second Chance: A Decade of Supports for Teenage Mothers. *Health & social work, 39*(2), 101-108.
- Hyde, L. W., Shaw, D. S., Gardner, F., Cheong, J., Dishion, T. J., & Wilson, M. (2013). Dimensions of callousness in early childhood: Links to problem behavior and family intervention effectiveness. *Development and Psychopathology, 25*(02), 347-363.
- Ioannidis, J. P. (1998). Effect of the statistical significance of results on the time to completion and publication of randomized efficacy trials. *Jama, 279*(4), 281-286.
- Jones, D. J., Forehand, R., Brody, G., Armistead, L. (2002). Psychosocial adjustment of African American children in single-mother families: A test of three risk models. *Journal of Marriage and Family, 64*(1), 105-115.
- Jones, D. J., Forehand, R., Cuellar, J., Kincaid, C., Parent, J., Fenton, N., & Goodrum, N. (2013). Harnessing innovative technologies to advance children's mental health: Behavioral

- parent training as an example. *Clinical Psychology Review*, 33(2), 241-252. DOI: 10.1016/j.cpr.2012.11.003
- Jones, D. J., Forehand, R., Cuellar, J., Parent, J., Honeycutt, A., Khavjou, O., Gonzalez, M., Anton M., & Newey G. A. (2014) Technology-enhanced program for child disruptive behavior disorders: Development and pilot randomized control trial, *Journal of Clinical Child & Adolescent Psychology*, 43(1), 88-101, DOI: 10.1080/15374416.2013.822308
- Jones, D. J., Anton, M., Gonzalez, M., Honeycutt, A., Khavjou, O., Forehand, R., & Parent, J. (2015). Incorporating mobile phone technologies to expand evidence-based care. *Cognitive and Behavioral Practice*, 22(3), 281-290. DOI: 10.1016/j.cbpra.2014.06.002
- Keenan, K., & Shaw, D. S. (1995). The development of coercive family processes: The interaction between aversive toddler behavior and parenting factors. In J. McCord (Ed.), *Coercion and punishment in long-term perspectives* (pp. 165–180). New York: Cambridge University Press
- Kimonis, E. R., Bagner, D. M., Linares, D., Blake, C. A., & Rodriguez, G. (2014). Parent training outcomes among young children with callous–unemotional conduct problems with or at risk for developmental delay. *Journal of child and family studies*, 23(2), 437-448.
- Kohen, D. E., Leventhal, T., Dahinten, V. S., & McIntosh, C. N. (2008). Neighborhood disadvantage: Pathways of effects for young children. *Child development*, 79(1), 156-169.
- Kumar, S., Nilsen, W. J., Abernethy, A., Atienza, A., Patrick, K., Pavel, M., ... & Hedeker, D. (2013). Mobile health technology evaluation: the mHealth evidence workshop. *American journal of preventive medicine*, 45(2), 228-236.

- Lavigne J. V., LeBailly S. A., Gouze K. A., Binns H. J., Keller J., & Pate, L. (2010). Predictors and correlates of completing behavioral parent training for the treatment of oppositional defiant disorder in pediatric primary care. *Behavior Therapy, 41*(2), 198-211. DOI: 10.1016/j.beth.2009.02.006
- Levine, T. R., & Hullett, C. R. (2002). Eta squared, partial eta squared, and misreporting of effect size in communication research. *Human Communication Research, 28*(4), 612-625.
- Lorber, M. F. (2012). The role of maternal emotion regulation in overreactive and lax discipline. *Journal of family psychology, 26*(4), 642.
- Lorber, M. F., Xu, S., Smith Slep A. M., Bulling, L., & O'Leary, S. G. (2014) A new look at the psychometrics of the Parenting Scale through the lens of Item Response Theory, *Journal of Clinical Child & Adolescent Psychology, 43*(4), 613-626. DOI: 10.1080/15374416.2014.900717
- Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review, 26*(1), 86-104. DOI: 10.1016/j.cpr.2005.07.004
- MacKenzie, E. P., Fite, P. J., & Bates, J. E. (2004). Predicting outcome in Behavioral Parent Training: expected and unexpected results. *Child and Family Therapy, 26*(2) 37-53. DOI: 10.1300/J019v26n02_03
- MacKenzie, M. J., Nicklas, E., Brooks-Gunn, J., & Waldfogel, J. (2014). Repeated exposure to high-frequency spanking and child externalizing behavior across the first decade: A moderating role for cumulative risk. *Child Abuse & Neglect, 38*(12), 1895-1901. DOI: 10.1016/j.chiabu.2014.11.004

- Maliken, A. C., & Katz, L. F. (2013). Exploring the impact of parental psychopathology and emotion regulation on evidence-based parenting interventions: A transdiagnostic approach to improving treatment effectiveness. *Clinical child and family psychology review, 16*(2), 173-186.
- Markowitz, A. J., Ryan, R. M., & Marsh, A. A. (2014). Neighborhood income and the expression of callous–unemotional traits. *European Child and Adolescent Psychiatry, 23*(12), 1103-1118. DOI: 10.1007/s00787-014-0663-3
- McHale, J., Khazan, I., Erera, P., Rotman, T., DeCoursey, W., & McConnell, M. (2002). Coparenting in diverse family systems. In: M. Bornstein (Ed.) *Handbook of parenting: Vol.3: Being and becoming a parent* (2nd ed, pp. 75–107). Mahwah, NJ: Lawrence Erlbaum Associates
- McHale, J. P., & Lindahl, K. M. (2011). *Coparenting: A conceptual and clinical examination of family systems*. American Psychological Association.
- McMahon R. J., Forehand R. L. (2003). *Helping the noncompliant child: Family-based treatment for oppositional behavior*. New York, NY: Guilford Press.
- McMahon R. J., Wells K. C., Kotler J. S. Conduct problems. In: Mash E. J., Barkley R. A. (Eds). *Treatment of childhood disorders*. 3rd ed. New York: Guilford Press; 2006. pp. 137–268.
- National Center for Children in Poverty. 2014. *Child Poverty*. Retrieved from:
<http://www.nccp.org/topics/childpoverty.html>
- Northerner, L. M., Trentacosta, C. J., & McLear, C. M. (2016). Negative Affectivity Moderates Associations Between Cumulative Risk and At-Risk Toddlers' Behavior Problems. *Journal of Child and Family Studies, 25*(2), 691-699. DOI 10.1007/s10826-015-0248-x

- Panter-Brick, C., Burgess, A., Eggerman, M., McAllister, F., Pruett, K., & Leckman, J. F. (2014). Practitioner Review: Engaging fathers—recommendations for a game change in parenting interventions based on a systematic review of the global evidence. *Journal of Child Psychology and Psychiatry*, *55*(11), 1187-1212. doi:10.1111/jcpp.12280
- Patterson, G. R. (2002). The early development of coercive family process. In J. B. Reid, G. R. Patterson, J. Snyder, J. B. Reid, G. R. Patterson, J. Snyder (Eds.) , *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention* (pp. 25-44). Washington, DC, US: American Psychological Association. doi:10.1037/10468-002
- Pelham, W. E., Foster, E. M., & Robb, J. A. (2007). The economic impact of attention-deficit/hyperactivity disorder in children and adolescents. *Ambulatory Pediatrics*, *7*(1), 121-131.
- Phillips, D. M. 2004. *Development pathways for children with disruptive behavior disorders* (Doctoral Dissertation). University of New Orleans.
- Pike, A., Iervolino, A. C., Eley, T. C., Price, T. S., & Plomin, R. (2006). Environmental risk and young children's cognitive and behavioral development. *International Journal of Behavioral Development*, *30*(1), 55-66. DOI: 10.1177/0165025406062124
- Piquero, A. R., Farrington, D. P., Welsh, B. C., Tremblay, R., & Jennings, W. G. (2009). Effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, *5*(2), 83-120.
- Plybon, L. E., & Kliewer, W. (2001). Neighborhood types and externalizing behavior in urban school-age children: Tests of direct, mediated, and moderated effects. *Journal Of Child And Family Studies*, *10*(4), 419-437. DOI: 10.1023/A:1016781611114

- Reitman D., McMahon R. J. (2012). Constance “Connie” Hanf (1917-2002): The mentor and the model. *Cognitive and Behavioral Practices, 20*(1), 106-116. DOI: 10.1016/j.cbpra.2012.02.005
- Reyno, S. M., & McGarth, P. J. (2006). Predictors of parent training efficacy for child externalizing problems- a meta-analytic review. *Journal of Child Psychology & Psychiatry, 46*(1), 99-111. DOI: 10.1111/j.1469-7610.2005.01544.x
- Ritschel, L. A., Tone, E. B., Schoemann, A. M., & Lim, N. E. (2015). Psychometric properties of the Difficulties in Emotion Regulation Scale across demographic groups. *Psychological assessment, 27*(3), 944.
- Robinson, E.A., Eyberg, S.M., & Ross, A.W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child Psychology, 9*(1), 22–29. DOI: 10.1080/15374418009532938
- Rutherford, H. J., Wallace, N. S., Laurent, H. K., & Mayes, L. C. (2015). Emotion regulation in parenthood. *Developmental Review, 36*, 1-14.
- Scaramella, L. V., Neppl, T. N., Ontai, L. L., & Conger, R. D. (2008). Consequences of socioeconomic disadvantage across three generations: parenting behavior and child externalizing problems. *Journal of Family Psychology, 22*(5), 725-733. DOI: 10.1037/a0013190
- Schnirer, L., & Stack-Cutler, H. (2012). *Recruitment and engagement of low-income populations: service provider and researcher perspectives*. Community-University Partnership for the Study of Children, Youth, and Families.

- Scott, S. (2012). Parenting quality and children's mental health: biological mechanisms and psychological interventions. *Current Opinion in Psychiatry*, 25(4), 301-306. DOI: 10.1097/YCO.0b013e328354a1c5
- Shelleby, E. C., Votruba-Drzal, E., Shaw, D. S., Dishon, T. J., Wilson, M. N., & Gardner, F. (2014). Income and children's behavioral functioning: A sequential mediation analysis. *Journal of Family Psychology*, 28(6), 936-946. DOI: 10.1037/fam0000035
- Shelton, K.K., Frick, P.J., & Wootton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology*, 25(3), 317-329. DOI: 10.1207/s15374424jccp2503_8
- Shook, S. E., Jones, D. J., Forehand, R., Dorsey, S., & Brody, G. (2010). The mother-coparent relationship and youth adjustment: A study of African-American single mother families. *Journal of Family Psychology*, 24(3), 243-251. DOI: 10.1037/a0019630
- SmithBattle, L. (2007). Legacies of advantage and disadvantage: The case of teen mothers. *Public Health Nursing*, 24(5), 409-420. DOI: 10.1111/j.1525-1446.2007.00651.x
- Steer R, Kumar G, Ranieri W, & Beck, A. (1998). Use of the Beck Depression Inventory-II with adolescent psychiatric outpatients. *Journal of Psychopathology and Behavioral Assessment*, 20(2), 127–137. DOI: 10.1023/A:1023091529735
- Steer, R., Ball, R., Ranieri, W., & Beck, A. (1999). Dimensions of the Beck Depression Inventory-II in clinically depressed outpatients. *Journal of Clinical Psychology*, 55(1), 117–128. DOI: 10.1002/(SICI)1097-4679(199901)55:1<117::AID-JCLP12>3.0.CO;2-A

- Tiano, J. D., & McNeil, C. B. (2005). The inclusion of fathers in behavioral parent training: A critical evaluation. *Child & Family Behavior Therapy, 27*(4), 1-28. DOI: 10.1300/J019v27n04_01
- Waller, R., Gardner, F., Hyde, L. W., Shaw, D. S., Dishion, T. J. & Wilson, M. N. (2012). Do harsh and positive parenting predict parent reports of deceitful-callous behavior in early childhood? *Journal of Child Psychology and Psychiatry, 53*(9), 946–953. DOI: 10.1111/j.1469-7610.2012.02550.x
- Williams Coplin, J., & Houts, A. C. (1991). Father involvement in parent training for oppositional child behavior: Progress or stagnation?. *Child & Family Behavior Therapy, 13*(2), 29-51. DOI: 10.1300/J019v13n02_03
- Westbrook, T. P. R., & Harden, B. J. (2010). Pathways among exposure to violence, maternal depression, family structure, and child outcomes through parenting: A multigroup analysis. *American Journal of Orthopsychiatry, 80*(3), 386-400.
- Willoughby, M. T., Waschbusch, D. A., Moore, G. A., & Propper, C. B. (2011). Using the ASEBA to Screen for Callous Unemotional Traits in Early Childhood: Factor Structure, Temporal Stability, and Utility. *Journal of Psychopathology and Behavioral Assessment, 33*(1), 19–30. <http://doi.org/10.1007/s10862-010-9195-4>
- Zisser, A., & Eyberg, S.M. (2010). Treating oppositional behavior in children using parent-child interaction therapy. In A.E. Kazdin & J.R. Weisz (Eds.), *Evidence-based psychotherapies for children and adolescents* (2nd ed.)(pp. 179-193). New York: Guilford

Table 1

Demographic Information

Group	<i>N</i>	Percent
Caregivers		
Female	17	89.5%
Hispanic/Latino	2	10.5%
Black/African American	5	26.3%
White/Caucasian	13	68.4%
Hawaiian/Pacific Islander	1	5.3%
Children		
Female	10	52.6%
Hispanic/Latino	3	15.8%
Black/African American	6	31.6%
White/Caucasian	10	52.6%
Black and White	2	10.5%
Multiracial	1	5.3%

Figure 1

Frequencies of Barriers

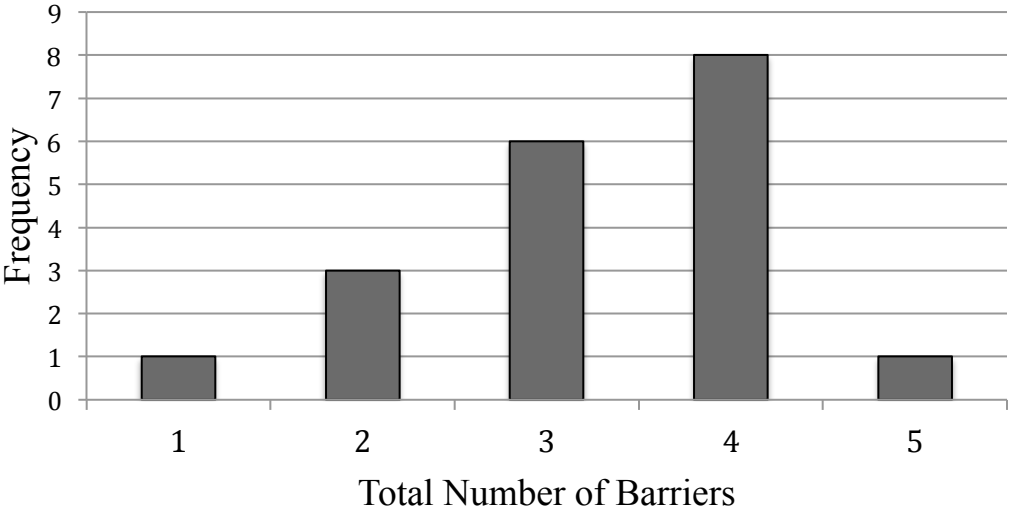


Figure 2

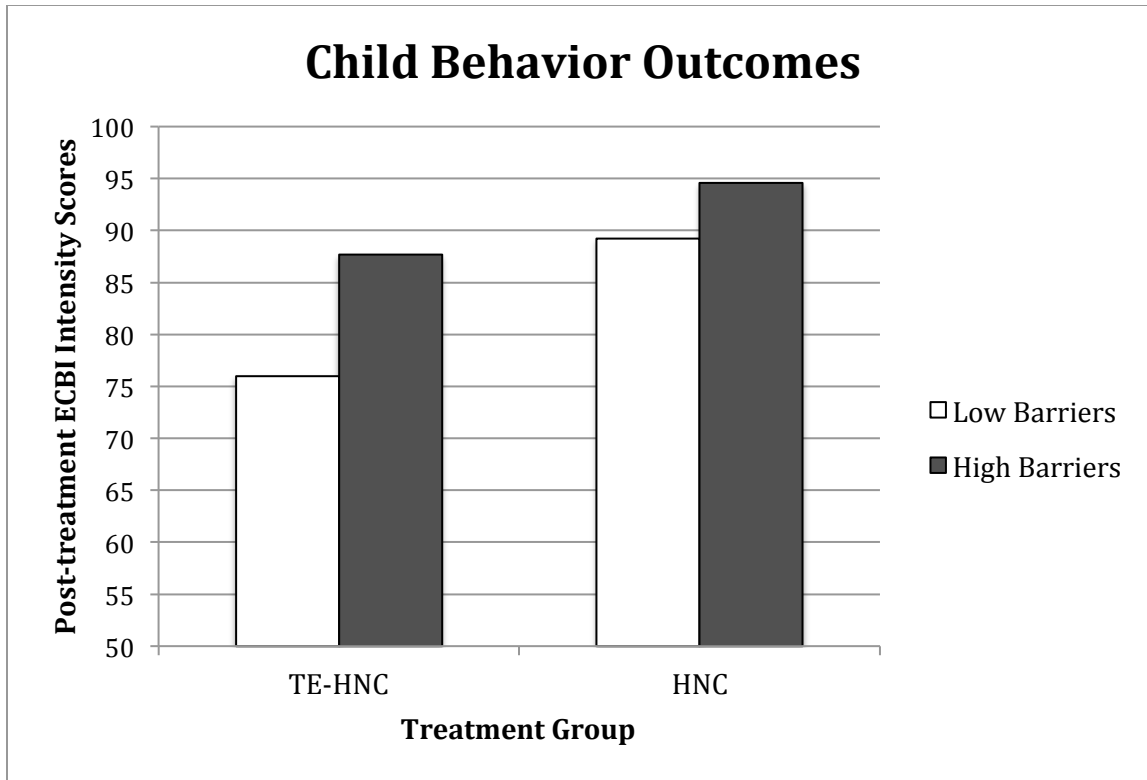


Figure 3

