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The Effects of Parental Functioning and Socioeconomic Status on Initial Child Psychopathology Symptoms and Treatment Outcomes Following a Brief Trauma Focused Cognitive Behavioral Therapy Group

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LOYOLA UNIVERSITY CHICAGO

THE EFFECTS OF PARENTAL FUNCTIONING AND SOCIOECONOMIC STATUS ON
INITIAL CHILD PSYCHOPATHOLOGY SYMPTOMS AND TREATMENT OUTCOMES
FOLLOWING A BRIEF TRAUMA FOCUSED COGNITIVE BEHAVIORAL THERAPY
GROUP

A THESIS SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
MASTER OF ARTS
PROGRAM IN CLINICAL PSYCHOLOGY

BY
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CHAPTER ONE

INTRODUCTION

Extant data on community samples demonstrates that exposure to traumatic events during childhood is a phenomenon that occurs in over two-thirds of children, and may result in long term disruptions in functioning for victimized children (Copeland, Keeler, Angold, & Costello, 2007; Schilling, Aseltine & Gore, 2007). These consequences can include cognitive difficulties, behavioral changes and psychological difficulties such as posttraumatic stress disorder (PTSD) and depression (Feeny, Foa, Treadwell, & March, 2004; Davidson & Smith, 1990; Perrin, Smith & Yule, 2000). There is ample empirical support for the efficacy of short-term, trauma-focused CBT for the treatment of PTSD and depression in children (Smith et al., 2007; Feeny et al., 2004). Despite the support for this treatment, a multitude of vulnerability factors have been identified as risks for the severity of symptoms of PTSD and depression following trauma exposure. Additionally, these factors are thought to impact the effectiveness of treatment programs on symptom reduction.

A salient vulnerability factor for the development of PTSD and depression in children is the presence of a psychological disorder in parents (Laor & Wolmer, 2001). Of particular relevance is the presence of parental PTSD, as studies have demonstrated that children of parents with PTSD have elevated rates of PTSD and depressive disorders

when compared to the children of trauma survivors who did not develop PTSD (Yehuda, Bell, Bierer, & Schmeidler, 2008). Additionally, there is some evidence that a reduction in parental PTSD is associated with greater symptom reduction in children following family therapy (Laor, Wolmer, Mayes, & Gershon, 1997). Parental depression is another salient vulnerability factor for these children. In fact, children of depressed parents are 200-500% as likely to develop symptoms of mental illness as their counterparts (Pine & Cohen, 2002; Goodman et al., 2011). Moreover, maternal depression has been shown to dampen the effect of depression treatment in children (Knox, Burkhart, & Khuder, 2011; Birmaher et al., 2000), as well as increase the likelihood of child PTSD symptom relapse following treatment (Weems & Scheeringa, 2013). Furthermore, parental hostility, a pattern of hostile, angry or aggressive interactions with others, including harshness and inconsistency in parenting behaviors, has been found to increase the likelihood that children will develop internalizing symptoms (Valentino, Berkowitz, & Smith-Stover, 2010; Smith, 1992; Arbel & Stravinsky, 1991; Hudson & Rapee, 2001). Currently, it is unknown whether parental hostility dampens the effectiveness of treatment for trauma-exposed children with symptoms of PTSD, but hostility has been found to predict post-treatment symptom severity in children with other anxiety disorders (Berman, Weems, Silverman & Kurtines, 2000).

Low socioeconomic status puts children at high risk for exposure to trauma as well as negative psychological outcomes following trauma exposure (Grant et al., 2005; Grant et al., 2003; Santiago & Wadsworth, 2009). Meta-analyses have demonstrated that economically disadvantaged samples show attenuated improvement one year after the end of treatment for disruptive child behavior, regardless of initial problem severity (Leijten, Raaijmakers, de Castro,

& Matthys, 2013). Additionally, low socioeconomic status has been found to dampen the effectiveness of psychological intervention for depressed children (Conger et al., 1992). However, these effects of socioeconomic status have not been previously examined while accounting for possible parental psychopathology in these communities. Moreover, the consequences of low socioeconomic status have not been examined in the context of treatment for PTSD in children.

The present study will investigate the impact of parental psychopathology and socioeconomic status on the severity of child PTSD and depression symptoms at baseline, in addition to the impact on treatment effectiveness. First, the study will examine how the presence of parental PTSD, depression and hostility act as proximal risk factors for the baseline severity of child PTSD and depression symptoms. Further, the study will investigate how these proximal parental factors affect symptom reduction following intervention for these children. Additionally, the current study will examine how low socioeconomic status affects baseline severity of child PTSD and depression symptoms as well as its influence on symptom reduction following treatment. One important aspect of the present study is that the impact of both parental psychopathology and socioeconomic status will be examined while accounting for the effect of the other vulnerability factor.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

Prevalence of Trauma Exposure in Children and Associated PTSD and Depression

More than two-thirds of children report experiencing at least 1 traumatic event by 16 years of age, with 13.4% of those children developing elevated posttraumatic stress symptoms (Copeland et al., 2007). Children growing up in the context of poverty are at a greater risk of trauma exposure than their middle-class counterparts due to the presence of severe, chronic and uncontrollable stressors in low income urban environments, such as higher rates of crime, community violence, and separation from family members (Emery & Laumann-Billings, 1998; Landis et al., 2007; Henrich, Schwab-Stone, Fanti, Jones & Ruchkin, 2004; Mohammad, Shapiro, Wainwright, & Carter, 2015). In fact, a survey of low income, ethnic minority urban adolescents revealed that 49% of individuals had witnessed a shooting, 44% had witnessed a stabbing, and 17% had witnessed an attack that resulted in death (Grant et al., 2005). Moreover, in their survey of racial and ethnic differences in exposure to trauma, Roberts and colleagues found that Latinos are at significantly greater risk for maltreatment and exposure to domestic violence during childhood when compared to their White and Asian American counterparts (Roberts, Gilman, Breslau, Breslau & Koenen, 2011).

Children growing up in families of low socioeconomic status are at greatest risk for negative psychological outcomes following trauma exposure, such as the development of posttraumatic stress disorder and depression (Grant et al., 2005; Grant et al., 2003; Santiago & Wadsworth, 2009). A prior review of the literature suggests that chronic, ongoing traumatic events that lead to long-term disruptions in the child's social environment, such as chronic violence exposure, a sick family member, or the arrest and imprisonment of a parent, are particularly damaging for children and are more likely to be experienced in low SES contexts (Pine & Cohen, 2002). The combination of elevated trauma exposure risk as well as elevated risk for negative psychological consequences of trauma exposure makes children of low socioeconomic status a particularly vulnerable population for the development of PTSD and depression following a traumatic event.

The impact of trauma exposure for young children can be robust. Research focusing on youth trajectories following exposure to trauma have demonstrated diffuse effects on the social, behavioral and psychological adjustment of children later in life (Osofsky, 1995). Exposure to violence can impact children's world view, affect their expectations for the future (Garbarino et al., 1991) and predict declines in school attendance, increases in grade failures, and more school behavior problems (Bowen & Bowen, 1999; Caudillo & Torche, 2014). In addition, adolescents who have been victims of or witnesses to community violence have demonstrated elevated levels of sleep problems, which were associated with impairments in mental health, physical well-being and cognitive functioning (Kliwer & Lepore, 2015). These negative consequences of trauma exposure may occur in tandem with a number of deficits in psychological functioning, and some children who experience traumatic events will go on to develop a diagnosable disorder.

Posttraumatic stress disorder is one psychological disorder that can occur following exposure to trauma in children, and can involve repetitive and intrusive thoughts of the trauma, cognitive difficulties such as difficulties in concentration and memory, a sense of foreshortened future, avoidance of stimuli related to the trauma, hypervigilance, and symptoms of re-experiencing the traumatic event (Feeny et al., 2004; Davidson & Smith, 1990; Perrin et al., 2000). This disorder is different from the majority of disorders in the DSM 5 (American Psychiatric Association, 2013) because the criteria include an etiological agent, the traumatic event, which is a necessary but not sufficient incident for the diagnosis of PTSD (Perrin et al., 2000). In terms of overall rates, the majority of individuals exposed to trauma will not develop PTSD; studies among adults suggest that approximately 25% of individuals exposed to acute trauma will develop symptoms of PTSD (Pine & Cohen, 2002; Ruchkin et al., 2007). Current literature suggests that African Americans are more likely to develop PTSD in response to exposure to trauma than Latinos, Whites, and Asian Americans, but all ethnic minority groups are less likely to receive treatment for PTSD than whites (Roberts et al., 2011). Additionally, literature reviews have displayed great variability in estimates for the development of PTSD in children and adolescents, due to many factors, including the severity of the stressor and length of time separating the trauma from the assessment (Chan & Yeung, 2009; Pynoos, Steinberg, & Wraith, 1995; Mohammad et al., 2015). For children who do develop PTSD in response to trauma, their symptoms may interfere with daily functioning in a number of ways. In school-age children, the associated difficulties with attention and concentration, as well as sleep disturbances (Kliewer & Lepore, 2015; Pynoos, 1993; Osofsky, 1995), may interfere with cognitive and academic functioning. Additionally, feelings of loneliness and lack of enjoyment

in activities may cause a disruption in social functioning in children with PTSD (Chan & Yeung, 2009).

Depression is another common psychological disorder that sometimes occurs following the experience of a traumatic event and is often comorbid with PTSD (O'Donnell, Creamer & Pattison, 2004). Depressive symptoms are strongly associated with a range of traumatic experiences, including physical or sexual abuse, exposure to violence, accidents, and natural disasters (Pine & Cohen, 2002). A study of posttraumatic stress disorder and depression among children and adolescents 3 months after an earthquake in Greece in 1999 determined that 13.9% of children had clinical depression following the incident, compared to 4.5% of children with PTSD (Roussos et al., 2005). Latino children may be particularly vulnerable to the development of depressive symptoms following trauma exposure, as meta-analyses have found that these children experience higher rates of depression when compared with their Caucasian and African American counterparts (Twenge & Nolen-Hoeksema, 2002). In all populations, trauma exposure and adverse life events in childhood may generate intense negative emotions, self-blame, and feelings of shame, which can lead to negative self-image and deficits in emotional regulation (Pynoos, 1993; Osofsky, 1993; Schilling et al., 2007). These symptoms may interfere with a child's social, emotional and academic functioning, by impacting peer relationships, performance in school, and development of identity in these youth (Sheidow, Henry, Tolan & Strachan, 2014; Pine & Cohen, 2002; Schilling et al., 2007). The present study examines how parental psychopathology factors and the context of low socioeconomic status affect initial levels of these symptoms as well as the reduction of these symptoms when children receive treatment for PTSD and depression.

Treatment of Pediatric PTSD

There is a wealth of empirical support for the efficacy of short-term, trauma-focused CBT for the treatment of pediatric PTSD that has arisen from a variety of relatively common traumatic events (Smith et al., 2007; Feeny et al., 2004). Trauma-focused cognitive behavior therapy (TF-CBT) has been shown to significantly reduce PTSD and depression symptoms in a multitude of randomized controlled trials for children exposed to trauma (Cohen, Mannarino, Perel & Staron, 2007; Cohen, Mannarino & Staron, 2006). Effective interventions for children and adolescents exposed to trauma are in high demand, but often children and families at highest risk for trauma exposure and its consequences are less likely to access care (McKay, Stoewe, McCadam, & Gonzales, 1998; Kazdin, 1993). Barriers to accessing care include limited availability of high quality services and providers, financial constraints, limited time and transportation, as well as stigma and mistrust (Santiago, Kaltman & Miranda, 2013; Miranda, Lawson, & Escobar, 2002; Copeland & Snyder, 2011). Further, even if families are able to access care, economically disadvantaged children are often assumed to benefit less from interventions than non-disadvantaged families (Garbarino, 2001; Conger et al., 2002). Given these limitations, most families do not access therapy at community clinic settings, but given the opportunity, many will accept similar services through their children's schools. For example, families with children who screened positive for PTSD symptoms following Hurricane Katrina were offered a group intervention at school or individual treatment at a mental health clinic. Participation in mental health treatment was quite uneven across intervention groups, with 98% of beginning the school intervention, compared to 37% beginning at the clinic (Jaycox et al., 2010).

The Cognitive Behavioral Intervention for Trauma in Schools (CBITS), a brief group trauma-focused cognitive behavioral therapy administered in a school setting, has been effective in significantly reducing PTSD and depression symptoms (Kataoka et al., 2003; Stein et al., 2003; Jaycox, 2003). This treatment has been repeatedly shown to reduce symptoms in children exposed to trauma, but was developed for middle school students between 5th and 10th grade (Jaycox, 2003; Stein et al., 2003). In response to the unmet need for school-based trauma interventions targeting a younger population, the Bounce Back program was developed. Bounce Back is a trauma focused cognitive behavioral intervention that was developed as a developmentally modified version of CBITS, and is targeted toward children in Kindergarten through 5th grade who have experienced a traumatic event (Langley, Santiago, Rodriguez & Zelaya, 2013). This ten week skill-building CBT group therapy program was developed with community partners to be culturally relevant to low income Latino youth, and has demonstrated preliminary effectiveness in a pilot evaluation (Langley, Gonzalez, Sugar, Solis & Jaycox, 2015). The current study will examine the impact of parental psychopathology and socioeconomic status on treatment effectiveness for participants of the Bounce Back intervention.

Impact of Parental PTSD

Parental PTSD and child PTSD symptoms. When parents are trauma-exposed and displaying symptoms of PTSD, it may increase risk for symptom development and severity among children (Yehuda et al., 2008; Roberts et al., 2012; Sack et al., 1995). Children whose parents have PTSD have greater rates of PTSD and depressive disorders when compared to the children of trauma survivors who did not develop posttraumatic stress disorder (Yehuda et al.,

2008). It has been suggested that parental PTSD, rather than parental trauma exposure, is a more consequential variable in relation to child PTSD symptoms (Yehuda et al., 2001). Although the precise pathways through which parental PTSD affects child PTSD symptoms remain unclear, it is likely that parental psychopathology affects children through a combination of genetic vulnerabilities and changes in environment due to parental symptoms. A notable feature of a diagnosis of PTSD is that it is dependent upon an etiological agent—exposure to a traumatic event. Despite that, PTSD has been found to cluster in families. A study of Cambodian refugees in the United States found that even when controlling for environmental factors, such as war-related trauma, PTSD is significantly related across parent-child generations (Sack et al., 1995). A study comparing samples of Holocaust survivors and their children with demographically similar Jewish families that did not experience such trauma have found that the presence of maternal PTSD is related to increased risk for the development of PTSD in reaction to trauma in offspring (Yehuda et al., 2008). Associations between PTSD development in mothers and children have also been found in non-clinical population based samples. For example, one study that examined the relationship between maternal and child PTSD in two longitudinal cohorts found that risk for PTSD was transmitted intergenerationally and appeared to involve a dose-response relationship where women who had experienced high levels of PTSD symptoms over their lifespan had children at higher risk of PTSD development compared to mothers with lower levels of PTSD symptoms (Roberts et al., 2012). Evidence suggests that there is an association between parental PTSD and child PTSD, and it is currently understood that the presence of parental PTSD is associated with more severe PTSD symptoms in children. However, this has not yet been examined concurrently with symptomatic children and parents or with Latino

populations. The present study will examine whether such an association exists in a predominantly Latino population before children begin treatment for their symptoms.

Parental PTSD and child depression symptoms. In addition to the association between parental PTSD symptoms and child PTSD symptoms, parental PTSD elevates risk for the development of depression in children (Yehuda et al, 2001; Yehuda et al, 2008; Valentino et al.,2010; Leen-Feldner et al., 2013). A recent literature review analyzing the prevalence of internalizing symptoms among offspring of parents with PTSD found that parental symptoms of posttraumatic stress disorder are related to depression in offspring after accounting for a number of demographic and clinical factors (Leen-Feldner et al., 2013). In one example, even after controlling for a personal history of trauma, elevated levels of depressive disorders were prevalent among the offspring of Holocaust survivors with PTSD (Yehuda et al., 2001). Furthermore, a study conducted using data from the National Comorbidity Survey-Replication found that offspring depression was elevated among parents with PTSD when compared to those without the condition (Leen-Feldner, Feldner, Bunaciu, & Blumenthal, 2011). One proposed theory states that changes in parenting behavior due to symptoms of PTSD may impact children negatively and increase the risk for the development of depression. A notable finding supporting this theory is that emotional abuse was found to be more common in families where a parent had diagnosis PTSD when compared with families who did not (Yehuda et al., 2001). Another theory posits that genes that are associated with a vulnerability for the development of depression also function to make an individual vulnerable to anxiety disorders such as PTSD (Yehuda et al., 2001). Current evidence demonstrates that the offspring of parents with posttraumatic stress

disorder are particularly vulnerable to the development and severity of depression and posttraumatic stress disorder.

Parental PTSD and child treatment. Although broadly, parental psychopathology is thought to have a negative effect on child treatment effects (Pine & Cohen, 2002; Laor & Wolmer 2001; Patterson & Chamberlain, 1994), there is a dearth of evidence that the presence of parental PTSD symptoms dampens the treatment effects of TF-CBT for children with PTSD or depression. However, reductions in parental trauma-related symptoms during treatment have been found to predict lower levels of PTSD symptoms in children after family therapy (Pine & Cohen, 2002; Laor et al., 1997). Children and parents who have been exposed to the same traumatic event may develop patterns of not discussing the event in order to avoid upsetting one another, and families who cannot discuss trauma in this way during treatment tend to exhibit worse psychological outcomes than families who may effectively communicate (MacFarlane, 1987; Smith et al., 1999). This phenomenon is similar to attenuated treatment response among anxious children with parents exhibiting similar symptoms of anxiety. Due to this trend, Podell and Kendall (2011) have suggested that family CBT is preferable when attempting to treat children whose parents also have anxiety. This is thought to be beneficial because parents with anxiety disorders may inadvertently reinforce the child's anxiety and communicate to the child that the world is a dangerous place (Podell & Kendall, 2011). The same principle likely applies to parents with PTSD who may have trouble coping with their own symptoms, and model avoidant behaviors for their symptomatic children. However, very few studies have examined the impact on untreated parental PTSD on the effectiveness of evidence-based interventions for children suffering from PTSD and depression following trauma, particularly in Latino

populations. The current study would fill this gap in the literature by examining whether parental PTSD symptoms attenuate treatment response in children with symptoms of PTSD and symptoms of depression.

Impact of Parental Depression

Parental depression and child PTSD. Children of depressed parents are two to five times as likely to develop psychopathology as their counterparts (Pine & Cohen, 2002; Goodman et al., 2011). In their review, Pine and Cohen (2002) demonstrate that parental depression and associated functional impairment was a powerful risk factor for both the development and severity of depressive and posttraumatic symptoms in children following a traumatic event (Pine & Cohen, 2002). This association was also found in a study of Israeli preschool children and their mothers who had been exposed to missile attacks during the Gulf war, which found that the severity of posttraumatic symptoms of the displaced children correlated with maternal depression symptoms (Laor & Wolmer 2001). Furthermore, a study examining Palestinian mothers and children that had been exposed to war trauma found that the children of mothers with depression had more severe posttraumatic stress symptoms than similarly exposed youth with healthy mothers (Quota, Punamaki, & Sarraj, 2005). Another study conducted with a sample of urban, ethnic minority youth exposed to community violence found that parental depressive symptoms were the most strongly associated factor with adolescent PTSD and depression, suggesting that adolescent children of parents with depression and other mental disorders are at heightened risk for psychological sequelae following exposure to trauma (Self-Brown et al., 2006). There are multiple proposed pathways for the psychological vulnerability of children affected by parental

depression (Barker, Copeland, Maughan, Jaffee, & Uher, 2012). One current theory is that the presence of parental depression is a vulnerability factor because of the effects of the psychopathology itself as well as environmental factors that increase risk of the development of parental depression, such as such as poverty, single motherhood, teen motherhood and unemployment (Grant et al., 2005; Barker et al., 2012). Another theory posits that because depression decreases the ability for parents to be consistently warm and responsive in their parenting, the parenting style of symptomatic parents puts children at a greater risk for the development of psychopathology (Self-Brown et al., 2006). In addition to these parenting factors, the aforementioned contextual factors are known to increase the likelihood of trauma exposure for children, as well as the development and severity of PTSD and depression (Barker et al., 2012).

Parental depression and child depression. Risk for the development of depression in the children of depressed parents is a phenomenon that has been studied in a variety of social contexts. One study examining child outcomes for children of depressed mothers found that maternal depression was associated with increased diagnoses of internalizing and externalizing disorders in children (Barker et al., 2012). Moreover, a longitudinal study of 815 youth and their mothers recruited from an Australian community-based sample found that maternal depression had a significant total indirect effect on youth depression mediated by poor social functioning and poor childhood physical health (Raposa, Hammen, Brennan & Najman, 2014). One study investigating economic pressure and maternal depression in Latino families found that maternal depression mediated the relationship between maternal economic pressure and child adjustment, suggesting that the relation between parent and child depression may be particularly salient for

low income Latino populations (Dennis, Parke, Coltrane, Blacher & Borthwick-Duffy, 2003). Transmission of risk for the development of depression in offspring of depressed parents also operates genetically; one study found that up to 37% of children born to depressed parents will develop depression, regardless of the environment in which they grow up (Sullivan et al., 2000). It is likely that all of these genetic and environmental factors play a role in the development of psychological sequelae in the children of parents with depression. The association between maternal depression and child depression extends to trauma-exposed youth; a study of family mental health risk in adolescents following a Tsunami in Sri Lanka found that maternal depression was a reliable predictor of PTSD as well as depression symptoms in adolescents (Wikrama & Kaspar, 2006). This study supports a substantial body of literature that maternal depression is a consequential risk factor for the development symptoms of PTSD and depression in children, especially in the presence of an accumulation of risk factors commonly associated with maternal depression.

Parental depression and child treatment. In addition to findings that parental depression increases risk for offspring to develop psychopathology, parental depression is also implicated in smaller treatment gains for children suffering from psychopathology (Weems & Scheeringa, 2013). Although there is a treatment gap on the effect of concurrent parental symptoms of depression and symptom reduction for children in treatment for PTSD, there is some evidence that untreated maternal depression is a consistent predictor of poorer treatment response in children receiving cognitive behavioral treatments for generalized anxiety disorders (Berman et al. 2000; Southam-Gerow et al., 2001). Further, in a study of child treatment for PTSD, maternal depression was associated with greater initial PTSD symptoms and child PTSD

symptom relapse after treatment (Weems & Scheeringa, 2013). The presence of parental depression has repeatedly been found to be associated with fewer treatment gains for depressed children (Brent et al., 1998; Birmaher et al., 2000). For example, one randomized controlled trial assessing the effectiveness of a cognitive behavioral prevention program for the children of depressed parents found that in both the cognitive behavioral condition and treatment as usual conditions, current parental depression was associated with poorer response to treatment (Birmaher et al., 2000). Moreover, a study identifying predictors of treatment efficacy in a clinical trial of CBT for adolescent depression found that when the patient's mother had depression, the likelihood that the patient's symptoms of depression would remit with treatment was significantly higher than children with healthy mothers (Brent et al., 1998). Further, a recent systematic review found that improvements in parental depression are associated with improvements in children's symptoms of psychopathology across mood and conduct disorders (Gunlicks & Weissman, 2008). It is hypothesized that parental depression may attenuate child treatment effects due to inconsistent parenting behaviors, reduced displays of affect, and exposure to environmental stressors such as marital and family conflict (Gunlicks & Weissman, 2008). However, there is a paucity of research conducted with low income, urban Latino populations on the effects of parental depression on child treatment outcomes for trauma exposed youth. The current study will investigate whether these children are at an increased risk of attenuated treatment response as well as symptom relapse after intervention for depression and PTSD.

Impact of Parental Hostility

Parental hostility and child PTSD. Parental hostility can be defined as a pattern of hostile, angry, or aggressive interactions with others, including, but not limited to, one's own children (Smith, 1992). A hostile parent may exhibit greater harshness and inconsistency in parenting behaviors (Kim et al., 2003), and parental hostility is known to increase the likelihood that children will develop internalizing symptoms (Valentino et al., 2010; Smith, 1992; Arbel & Stravinsky, 1991; Hudson & Rapee, 2001). Despite a gap in the literature regarding the influence of parental hostility on the development of posttraumatic symptoms in children, one recent study of youth who had experienced a traumatic event found that hostile parenting styles were a strong predictor of elevated PTSD and internalizing symptoms in children (Valentino et al., 2010). Extant studies using behavioral observation and questionnaire data have established that high levels of maternal criticism and rejecting parenting styles are correlated with symptoms of anxiety in children (Arbel & Stravinsky, 1991; Hudson & Rapee, 2001). Thus, the relationship between hostile parenting and anxiety may extend to an association between hostile parenting and symptoms of PTSD in a trauma-exposed sample.

Parental hostility and child depression. In addition to the effects of parental hostility on children's symptoms of PTSD and anxiety, maternal hostility has been found to correlate with symptoms of depression in children of both European and Mexican origin (Hill, Bush, & Roosa, 2003). Furthermore, a study of 897 African American children and their primary caregivers found that parental hostility, as well as harsh and inconsistent discipline, predicted whether children met diagnostic criteria for depression (Kim et al., 2003). These findings indicate that a

hostile parenting style can exacerbate child psychopathology and affect symptom expression. One theory about the influence of hostile parenting on the development or worsening of internalizing symptoms in children proposes that the absence of a positive parent–child relationship does not allow children’s attachment security to develop, a factor which is associated with adaptive regulation of emotion and constructive coping (Brock & Kochanska, 2015; DeKlyen & Greenberg 2008). The absence of these coping strategies puts children at a greater risk for the development of internalizing symptoms. Currently, there is a dearth of literature examining the link between hostility in parents and child depression in a trauma-exposed sample, specifically. This gap extends to research on hostility in Latino samples, as well. The present study aims to examine whether such an association exists in a sample of Latino youth who have been exposed to trauma.

Parental hostility and child treatment. There is limited research on the effects of parental hostility on child PTSD and depression treatment outcomes, and no known research has examined this effect in Latino populations. However, some studies point to parental hostility as a risk factor for persistent symptom severity in children treated for anxiety disorders (Birmaher et al., 2000; Green et al., 2001). For example, parental hostility predicted post-treatment symptom severity among children receiving exposure-based cognitive behavioral therapy for anxiety (Berman, Weems, Silverman & Kurtines, 2000). This finding may be relevant in the treatment of PTSD using a trauma-focused cognitive behavioral therapy for PTSD, although no known studies examine the effects of parental hostility on treatment in this clinical population. Parental hostility has, however, been shown to dampen the effects of cognitive behavioral therapy for children and adolescents with depression. A randomized controlled trial examining symptom

reduction in children with depression following cognitive behavioral interventions or family therapy found that the presence of self-reported parent-child conflict at baseline predicted lack of recovery, chronicity and recurrence of symptoms of depression in children (Birmaher et al., 2000). Another study conducted with a clinical sample of children attending inpatient psychiatric treatment found that parent's reports of poor alliance with treatment correlated with staff ratings of observed parental hostility towards children, suggesting parental hostility may translate to poor child treatment outcomes through poor parental attitudes toward treatment (Green et al., 2001). As parental hostility has been found to dampen the effects of various treatments for internalizing symptoms in children, the current study aims to expand understanding of how parental hostility affects treatment effectiveness for child PTSD and depression symptom reduction following a trauma-focused CBT intervention.

Impact of Socioeconomic Status

Impact of SES on child symptoms. Children and adolescents living in the context of poverty are more likely to be overwhelmed by stressful life events than youth who are not living in the context poverty (McLoyd, 1990; Wadsworth, Raviv, Compas, & Connor-Smith, 2005). Not only are these children more likely to be exposed to trauma (Cunradi, Caetano & Schaefer, 2002), these children are at increased risk for a variety of negative outcomes following exposure to trauma, such as the development of PTSD and depression. One longitudinal study of the development of posttraumatic stress disorder found that cohort members from low SES families had over a 200% increase in the odds of developing PTSD when compared to cohort members from high SES families (Koenen, Moffitt, Poulton, Martin & Caspi, 2007). Moreover, a different

longitudinal birth cohort study found that participants who grew up in lower SES backgrounds had nearly twice the risk for major depression compared to those from the highest SES background, independent of other childhood sociodemographic factors, family history of mental illness, and adult SES (Gilman, Kawachi, Fitzmaurice, & Buka, 2002). Latino youth in the United States are particularly vulnerable to this impact, as they are three times more likely than their Caucasian counterparts to live in poverty (National Center for Children in Poverty, 2002).

Low SES increases risk for psychopathology in large part due chronic stressors that accompany poverty, such as poor parental mental health, social isolation, food insecurity, and higher levels of crime (Leijten, Raaijmakers, de Castro, & Matthys, 2013). SES also appears to increase risk for transmission of psychopathology across generations, as a recent meta-analysis examining maternal depression and child outcomes found that effect sizes for associations between depression in mothers and children's internalizing and externalizing problems were stronger for studies that sampled families in poverty relative to studies of families in higher or mixed-income levels (Goodman et al., 2011). The negative impact of parental psychopathology often occurs in a low SES environment, which may further exacerbate child symptoms. Low socioeconomic status in addition to parental hostility may also influence the risk of symptom development; one study found that the presence of parental hostility in addition to economic stress increased internalizing symptoms in children, suggesting that the cumulative effects of poverty related stress may be exacerbated by parental tendencies toward hostility (Conger et al., 1994; McLoyd, 1998).

Impact of SES on child treatment. Socially and economically disadvantaged families are assumed to benefit less from parent training programs than non-disadvantaged families, due to ongoing financial, psychological, and social stressors (Conger et al., 1992). In fact, a meta-analysis of parent interventions on disruptive child behaviors demonstrated that low income samples show less improvement 1 year after the end of treatment, regardless of initial problem severity (Leijten, Raaijmakers, de Castro, & Matthys, 2013). Moreover, low socioeconomic status has been found to dampen the positive effects of psychological intervention for depressed children (Conger et al., 1992). These findings suggest that economically disadvantaged samples experience more trouble maintaining positive treatment outcomes than do their more affluent counterparts. Presently, there is a gap in the literature regarding the impact of socioeconomic status on PTSD treatment effectiveness for children, as well as the effect of SES on treatment in Latino populations. However, a study examining outcomes and attrition across three treatments for depression in adults found that lower SES as measured by the Hollingshead Index of Social Position, was associated with less improvement across all treatments for depression. Interestingly, contrary to the researcher's hypothesis, lower SES was not associated with higher rates of attrition from treatment. These findings suggest that symptom reduction may be attenuated in the use of empirically validated treatments with lower SES patients, as their improvement rates may be less than those of middle or high SES patients treated by the same modalities (Falconnier, 2009).

Limitations of Previous Research and the Current Study

The present study examines the association between parental psychopathology (PTSD, depression, hostility) and SES with baseline symptoms of PTSD and depression among children

eligible for the Bounce Back program. Further, this study examines the impact of parental psychopathology and SES on treatment response in a predominantly Latino population. Low socioeconomic status has been linked to poorer child functioning, however, the effects of individual proximal factors like parental PTSD, depression and hostility on child symptoms is not currently well understood above and beyond the effects of the context of poverty. Extant evidence examining parental psychopathology as an indirect pathway suggests that the effects of poverty on adolescent mental health may be filtered through the effects of poverty on parents (Grant et al., 2005; Garbarino, 2001; Evans & Kim, 2013). The current study will examine these individual parental factors while controlling for socioeconomic status to reveal how each of these risk factors contribute to the severity of initial levels of child PTSD and depression as well as treatment response.

Although researchers have established that vulnerability factors like parental psychopathology and low socioeconomic status impact the severity of a child's symptoms of PTSD and depression, very few studies have examined the effects of these factors on evidence-based treatments or with Latino populations. The current study aims to examine the effects of these risk factors on treatment response to a short-term, trauma-focused cognitive behavioral therapy. Understanding the potential moderating effects of parental psychopathology and SES on treatment effectiveness will help identify additional intervention targets and areas for modification. These conclusions will help to illuminate extant challenges for effectively treating children who have been exposed to trauma and may inform future interventions.

Specific Aims and Hypotheses

Specific Aim 1: The first aim of this study is to determine whether higher levels of parental psychopathology are associated with higher levels of child symptoms at baseline.

Hypothesis 1a: It is hypothesized that higher levels of parent PTSD symptoms will be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline.

Hypothesis 1b: It is hypothesized that higher levels of parent depression symptoms will be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline.

Hypothesis 1c: It is hypothesized that higher levels of parent hostility will be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline.

Specific Aim 2: The second aim of this study is to determine whether higher levels of parental psychopathology moderate treatment effects among children receiving Bounce Back.

Hypothesis 2a: It is hypothesized that higher levels of parent PTSD symptoms will attenuate treatment effects.

Hypothesis 2b: It is hypothesized that higher levels of parent depression symptoms will attenuate treatment effects.

Hypothesis 2c: It is hypothesized that higher levels of parent hostility will attenuate treatment effects.

Specific Aim 3: The third aim of the study is to investigate whether lower socioeconomic status is associated with elevated child symptoms at baseline and lower levels of symptom reduction following intervention for children.

Hypothesis 3a: It is hypothesized that lower socioeconomic status will be associated with elevated child symptoms at baseline.

Hypothesis 3b: It is hypothesized that lower socioeconomic status will attenuate treatment effects.

CHAPTER THREE

RESEARCH METHODS

This research was approved and conducted in compliance with the Loyola University Chicago's Institutional Review Board and the school district's research review committee.

Participants

Participants were recruited from a local school district, which serves a low income Latino population in a large Midwestern city. School records indicated that this district serves predominantly low income students (93%) and Hispanic students (93%), 58% of whom are classified as English Language Learners (Illinois State Board of Education, 2013). Elementary students in Kindergarten through fourth grade were identified by school social workers and screened for trauma exposure and PTSD symptoms across 8 participating elementary schools. If children met inclusion criteria, primary caregivers were then contacted by research assistants with an invitation to participate in the Bounce Back program. Out of the 52 students identified, 51 students (mean age =7.76 years, 61% male, 88% Latino) were given services, due to one student moving away from the district. At baseline, children reported a mean of 6.9 lifetime traumatic events, and caregivers reported experiencing a mean of 7.46 traumatic incidents.

Many families (59%) had a yearly pretax income of \$24,999 or less, with a mean of 3.77 individuals supported by the household income. Overall, a substantial portion of families (24.1%) reported a yearly pretax income that meant that they were living in deep poverty, meaning that they made less than half of the federal poverty guidelines for a family of their size. Most participating caregivers were parents (88%), but grandparents (8.2%) and step-grandparents (4%) also participated. The majority of participants' mothers were identified as Latinx (88%), as were 84% of fathers and 88% of children participating. Additionally, 96% of the students were born in the United States, while 47% of their mothers and 68% of their fathers were born outside of the United States, most commonly in Mexico and the Dominican Republic.

Procedures

Research design. This study used a block randomized controlled trial to assess treatment effectiveness. Students were identified through a “usual care” referral process within the school. Referrals from teachers, other school personnel, and parents were passed along to the school-based mental health clinicians, who were responsible for meeting with the student to screen them, using a brief paper and pencil self-report survey (the Traumatic Events Screening Inventory (TESI) and the UCLA PTSD Reaction Index) to assess their exposure to traumatic events as well as current psychological reactions and behavioral problems. The clinician administered the screening instruments in an interview format. Inclusion criteria consisted of exposure to trauma (e.g., community violence, interpersonal violence, accident, natural or man-made disaster), current emotional or behavioral symptoms that impacted school functioning as demonstrated by a score of 25 or higher on the UCLA PTSD reaction index, and ability to participate in a small-group mental health intervention as determined by school-based personnel.

Parents of eligible students were contacted by the clinician to explain the program and ask permission for the research team to follow up with them. Parent consent and child assent were required for inclusion in the treatment, though parents and students could opt out of the research assessments. Schools were randomly assigned to either provide the Bounce Back program immediately (immediate treatment) or after 3 months (delayed treatment).

Data was collected from students, parents, and teachers at baseline and then at 3- and 6-months post baseline. Questionnaires included measures of trauma exposure and emotional and behavioral symptoms for both children and caregivers. Caregivers were additionally asked to provide demographic information, as well as report on their own functioning. Graduate and post-baccalaureate research assistants administered questionnaires in an interview format to children. Caregivers were given the option to complete questionnaires on their own using a paper and pencil measurement or in an interview format. Each caregiver was compensated for their participation in the study; they were given a \$15 Target gift card for completion of the questionnaire at each time point and a bonus \$15 Target gift card upon completion of all three time points.

The 3-month assessment point represents “post-intervention” data for students at schools randomized to immediate treatment, and is a second “pre-intervention” timepoint for students at schools randomized to delayed treatment. The 6-month assessment represents 3-month follow-up data for students at schools randomized to immediate treatment and “post-intervention” data for students at schools randomized to delayed treatment. School-based social workers completed fidelity monitoring forms after each session of BB, to self-report on the degree to which they were able to cover the key components of each session, and provided quantitative and qualitative

feedback on their satisfaction with the program and their ability to implement BB at their schools at the conclusion of the intervention.

Figure 1. Bounce Back Intervention Timeline

OCT/NOV	NOV-JAN	FEB	FEB-APRIL	APRIL/MAY
Baseline Assessment	BB Intervention	Post-Assessment	3 Month Wait Time	3 Month Follow Up Assessment
Baseline Assessment	3 Month Wait Time	Repeat Baseline Assessment	BB Intervention	Post-Assessment

Intervention. The Bounce Back intervention consists of 10 skill-building group sessions for students in kindergarten through 4th grade, led by the school social worker during school hours. These sessions used trauma focused cognitive behavioral therapy to teach the participants coping skills, such as relaxation and problem solving. These skills are taught and reinforced through age-appropriate lessons on breathing exercises, identifying and naming feelings, the CBT triangle, and social support. The treatment also involves the development of an in vivo exposure hierarchy called the “I Can Do It Ladder,” where clinicians explain avoidance and work with students to identify steps to combat avoidance after the traumatic incident. The intervention also provided 3 individual sessions between the child and the social worker, where the traumatic incident was processed and a trauma narrative was constructed and shared with a caregiver. Caregivers were also invited to participate in up to 3 psychoeducational sessions with the social worker. These sessions introduce the parent to information on the prevalence of trauma exposure, review skills that were taught in student group sessions, and symptoms of PTSD that children may experience, such as avoidance.

Measures

Demographic information. The caregivers reported on demographic information, including gender, age, parent(s) the child lives with, country of origin for the child and the parents, and race/ethnicity of both parents and child.

Socioeconomic Status. Socioeconomic status was determined using questionnaire data on household pretax income as well as number of individuals supported by the household income. An income-to-needs ratio was calculated by comparing reported family income to federal guidelines for poverty for families of the same size. This ratio was used to represent socioeconomic status.

Parental PTSD. Parental symptoms of posttraumatic stress disorder were assessed using the PTSD Symptom Scale (PSS; Foa, Riggs, Dancu & Rothbaum, 1993). This 17-item scale assesses PTSD symptoms according to DSM IV- TR criteria, and assesses the severity of these symptoms. Parents rated each symptom on a scale of 0 (Not at all) to 3 (3 to 5 or more times per week/ very much/ almost always). One sample item is: Experiencing physical reactions when reminded of the traumatic event (sweating, increased heart rate). Cronbach's alphas in the present sample were .93.

Parental depression and hostility. Parental symptoms of depression were assessed using the depression subscale of the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1993). The BSI is a measure that assesses psychological distress and disorders in adults through a 53-item self-report, and measures 12 dimensions of psychological distress, including depression and hostility. Parents rated each symptom on a 5 point Likert scale that ranges from 0 (Not at all) to 4 (Extremely). One sample item from the depression subscale of the BSI is: Feeling no interest in

things. Parental symptoms of hostility were assessed using the hostility subscale of the BSI. A sample item from the hostility subscale of the BSI is: Having urges to beat, injure, or harm others. Cronbach's alphas in the present sample for parent depression and hostility were .91 and .77, respectively.

Child PTSD. Child symptoms of posttraumatic stress disorder were assessed using the UCLA PTSD Reaction Index-Child Version (UCLA-RI; Rodriguez, Steinberg & Pynoos, 1998). The UCLA-RI is a 20-item screening instrument for the assessment of the presence and severity of posttraumatic stress symptoms among children and adolescents. Children were asked to rate how often each symptom affects them on a Likert scale of 0 (None) to 4 (Most of the time). Parent report of the UCLA-RI was also collected at each timepoint. An example of a symptom measured on the UCLA-RI is: I have upsetting thoughts, pictures, or sounds of what happened come into my mind when I do not want them to. Cronbach's alphas for parent report in this sample were 0.92, whereas for child report they were 0.74.

Child depression. Child symptoms of depression were assessed using the Child Depression Inventory (CDI; Kovacs, 1978). The CDI is a 27 item measure that assesses the presence and severity of depressive symptoms in children. Children are asked to select the sentence that best describes their thoughts and feelings in the past two weeks out of three possible sentences. Additionally, parents reported on their child's symptoms by completing a parent version of the CDI at each timepoint. A sample prompt from the CDI is: I do most things O.K; I do many things wrong; I do everything wrong. Cronbach's alphas for parent report in this sample were 0.93, whereas for child report they were 0.85.

Analytic Strategy

Preliminary analyses. Preliminary analyses included examining descriptive statistics and correlations as well as checking data for skewness, kurtosis, or extreme outliers. Additionally, demographic variables such as gender and age were explored in order to determine if they were related to the primary variables included in this study and whether they needed to be controlled for in the present analyses.

Primary analyses. Multiple regressions were used to examine the relationship between parental symptoms of psychopathology (PTSD, depression and hostility) and child symptoms of depression and PTSD at baseline. Repeated measures ANOVAs were used to examine whether parental psychopathology attenuates treatment effects (testing for a three-way Time X Treatment Group X Parent Psychopathology interaction). Continuous ratings for parental psychopathology and socioeconomic status were used for multiple regression. These ratings functioned as categorical variables for ANOVAs, a median split was employed to determine high and low status.

Aim 1, Hypotheses 1a, 1b, & 1c. To examine the association between parental psychopathology and child symptoms at baseline, six multiple regressions were performed. These regressions were repeated while accounting for variance due to socioeconomic status. Hypothesis 1a, that higher levels of parent PTSD symptoms would be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was tested with four linear multiple regression analyses. Child PTSD symptoms at Time 1 was the dependent variable in the first regression, while child depression symptoms at Time 1 was the dependent variable in the second regression. Parent PTSD symptoms at Time 1 was the independent variable in both

regressions. These analyses were repeated with parent report of child symptoms as the dependent variable. Hypothesis 1b, that higher levels of parent depression symptoms would be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was tested using four multiple regression analyses. Child PTSD symptoms at Time 1 was the dependent variable in the first regression, while child depression symptoms at Time 1 was the dependent variable in the second regression. Parent depression symptoms at Time 1 was the independent variable in both regressions. These analyses were repeated with parent report of child symptoms as the dependent variable. Hypothesis 1c, that higher levels of parent hostility would be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was tested with four linear multiple regression analyses. Child PTSD symptoms at Time 1 was the dependent variable in the first regression, while child depression symptoms at Time 1 was the dependent variable in the second regression. Parent hostility symptoms at Time 1 was the independent variable in both regressions. These analyses were repeated with parent report of child symptoms as the dependent variable.

Exploratory combined model. An exploratory combined model including all three forms parent psychopathology (parent PTSD, parent depression, parent hostility) and SES was conducted to examine the effects of each variable while accounting for the others on child PTSD and child depression. This analysis is considered exploratory due to limited power.

Aim 2, Hypotheses 2a, 2b, & 2c. To examine the effects of higher severity of parental psychopathology on treatment gains among children receiving Bounce Back, repeated measures ANOVAS were conducted. Parent symptoms (low vs. high) and treatment group were entered as between-subjects factors, while time was entered as a within-subjects factor. In order to test

hypothesis 2a, that high parent PTSD symptoms would attenuate child treatment effects, two repeated measures ANOVAS were conducted: one with child PTSD as the dependent variable and one with child depression symptoms as the dependent variable. Parental PTSD symptoms (low vs. high) and treatment group were entered as between-subjects factors, while time is a within-subjects factor. We tested for a significant Time X Group X Parent PTSD Symptoms interaction. These analyses were repeated with parent report of child symptoms as the dependent variable. In order to test hypothesis 2b, that high parent depression symptoms would attenuate child treatment effects, two repeated measures ANOVAS were conducted: one with child PTSD as the dependent variable and one with child depression symptoms as the dependent variable. Parental depression symptoms (low vs. high) and treatment group were entered as between-subjects factors, while time is a within-subjects factor. We tested for a significant Time X Group X Parent Depression Symptoms interaction. These were analyses repeated with parent report of child symptoms as the dependent variable.

In order to test hypothesis 2c, that high parent hostility symptoms would attenuate child treatment effects two repeated measures ANOVAS were conducted: one with child PTSD as the dependent variable and one with child depression symptoms as the dependent variable. Parental hostility symptoms (low vs. high) and treatment group were entered as between-subjects factors, while time was entered as within-subjects factor. We tested for a significant Time X Group X Parent Hostility Symptoms interaction. These analyses were repeated with parent report of child symptoms as the dependent variable.

Exploratory Hierarchical Linear Models. Because trends emerged in the ANOVA analyses, but power remained too low to detect small effect sizes, hierarchical linear modeling

was utilized to further explore trends. Using only the immediate treatment group, time was nested within persons (children) in these analyses capitalizing on three repeated measurements. Each parental psychopathology variable was entered as baseline Level 2 independent variables. Time as the Level 1 independent variable, and child PTSD and depression symptoms were used as the Level 1 dependent variable (with 3 repeated measurements).

Aim 3, Hypothesis 3a. To examine the association between socioeconomic status and child symptoms at baseline, two multiple regressions were performed. Child PTSD symptoms at Time 1 was the dependent variable in the first regression, while child depression symptoms at Time 1 was the dependent variable in the second regression. Socioeconomic status at Time 1 was used as the independent variable in both regressions. These analyses were repeated with parent report of child symptoms as the dependent variable.

Aim 3, Hypothesis 3b. In order to test hypothesis 3b, that low SES would attenuate child treatment effects, two repeated measures ANOVAS were conducted: one with child PTSD as the dependent variable and one with child depression symptoms as the dependent variable. Socioeconomic status (low vs. high) and treatment group were entered as between-subjects factors, while time was a within-subjects factor. We tested for a significant Time X Group X SES interaction. These analyses were repeated with parent report of child symptoms as the dependent variable.

Exploratory Hierarchical Linear Models. Because trends emerged in the ANOVA analyses, but power remained too low to detect small effect sizes, hierarchical linear modeling was utilized to further explore trends. Time was nested within persons (children) in these analyses, capitalizing on three repeated measurements. Income-to-needs was entered as baseline

Level 2 independent variables. Time was the Level 1 independent variable, and child PTSD and depression symptoms were each used as the Level 1 dependent variable (with 3 repeated measurements).

Power Analysis. A power analysis was conducted using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) to determine power for the proposed analyses. With an estimated sample size of 53, the multiple regressions would be slightly underpowered (.79) to detect a medium effect and adequately powered to detect a large effect (.95) when parent psychopathology and SES are tested separately. When controlling for SES in the same regression model, analyses are underpowered (.69) for a medium effect, though adequately powered to detect a large effect (.90). The repeated measures ANOVAs capitalize on repeated measurements and would be adequately powered to detect a medium effect at pre- and post-treatment intervals (.95) as well as across all three timepoints (.98).

CHAPTER FOUR

RESULTS

Preliminary Analyses

All independent and dependent variables were tested for skewness. Results indicated that income-to-needs, parent depression, hostility and PTSD, and child PTSD and depression were not highly skewed. Specifically, baseline skewness values of income-to-needs, parent depression, hostility and PTSD, and child PTSD and depression ranged from -.51 to 1.25. Thus, it was not necessary to transform these variables in order to conduct analyses. All variables were also tested for kurtosis. Results revealed that the income-to-needs variable, parent depression, hostility and PTSD, and child PTSD and depression were not highly platykurtic or leptokurtic. Kurtosis values for the baseline variables of the income-to-needs variable, parent depression, hostility and PTSD, and child PTSD and depression ranged from -.02 to -.967.

Descriptive statistics and correlations for variables included in this study's primary baseline analyses can be found in Table 1. Preliminary analyses included an examination of the degree of association between child self-reported symptoms and parent report of child symptoms. This test found that parent and child report of child PTSD symptoms were not significantly correlated with one another ($r = 0.16, p = .300$).

However, parent and child report of child depression symptoms were significantly correlated, ($r = 0.38, p = .012$), but a composite was not created because this correlation coefficient was not high enough to meet the pre-determined cutoff ($r = 0.40$). Missing data analyses were conducted in order to examine whether individuals with missing parent psychopathology data at baseline differed from individuals who were not missing data. Out of the sample of 51 students, 7 had missing parent psychopathology data at baseline. This was because 3 parents did not consent to completing parent report questionnaires, and 4 parents consented to Bounce Back after Time 1 data collection had ended for other families, and as a result they only contributed data at time 2 and 3. Analyses indicated that these participants did not differ significantly on child PTSD ($t = 1.61, p = .114$) or depression ($t = 0.71, p = .482$) at baseline. Demographic variables for individuals with baseline data missing at time 1 did not differ significantly for child gender ($t = 1.87, p = .067$), child age ($t = -1.68, p = .100$), child ethnicity ($t = -.76, p = .446$), parent work status ($t = .17, p = .868$), parent education ($t = .73, p = .469$), or income-to-needs ($t = -.10, p = .921$). Attrition analyses were also conducted with participants who had missing parent report at time 2 and 3 to assess if they differed significantly on child reported PTSD and depression.

Participants missing parent report at time 2 did not differ on PTSD symptoms ($t = -.55, p = .587$) or depression symptoms ($t = -1.22, p = .230$). Additionally, participants with missing parent report at time 3 did not differ on PTSD symptoms ($t = 1.68, p = .100$) or depression symptoms ($t = .83, p = .410$).

Table 1. Descriptive Statistics and Correlations among Demographic and Study Variables

	<i>n</i>	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Child Age	49	7.76	0.88	-										
2. Child Gender	49	-	-	-0.21	-									
3. Child Report of Child PTSD	51	34.69	1.62	0.15	0.06	-								
4. Child Report of Child Depression	46	1.51	0.05	-0.25	-0.16	0.24	-							
5. Parent Report of Child PTSD	45	23.74	13.80	-0.23	-0.24	0.16	0.34*	--						
6. Parent Report of Child Depression	45	1.43	0.33	0.00	-0.36*	-0.03	0.38*	0.68***	--					
7. Parent Self Report of PTSD	45	14.16	12.62	-0.30	-0.11	-0.11	0.28	0.46**	0.51***	--				
8. Parent Self Report of Depression	45	0.84	0.95	-0.27	-0.21	-0.10	0.22	0.51***	0.60***	0.84***	--			
9. Parent Self Report of Hostility	45	0.66	0.75	-0.29	-0.15	-0.10	0.16	0.49**	0.54***	0.68***	0.73***	--		
10. Family Income-to-needs	49	0.71	0.74	-0.11	0.19	0.08	0.12	0.16	0.17	-0.18	-0.03	-0.08	--	
11. Family Pretax Income Category	49	3.39	1.67	-0.16	-0.03	-0.05	0.08	0.07	0.29	0.04	0.13	0.0	0.72***	--
12. Parent Self Report Education	49	11.06	3.02	0.10	0.10	0.25	-0.19	-0.09	0.41	-0.27	-0.35	0.0	0.25	0.14

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$

The degree of association between participant reports of caregiver education and income-to-needs ratio was examined in order to determine whether these variables should be included in one socioeconomic status composite. These two variables were not found to be significantly correlated ($r = 0.25$, $p = .081$) and thus, the analyses were conducted using only income-to-needs. Further analyses examined the degree of association between child gender, child age, and outcome variables. Child age was not found to be significantly correlated with any outcome variables, however, gender was significantly correlated with parent report of child depression symptoms ($r = -.36$, $p = .016$). Thus, all primary analyses and models were repeated with gender as a covariate. Results did not vary when gender was included in the model and therefore, models without gender are presented in order to conserve power.

Children reported experiencing a mean of 6.9 lifetime traumas at baseline, while parents reported experiencing a mean of 7.46 lifetime traumas. At time 2, 24% of children reported experiencing a new traumatic event since the previous timepoint, while 23% of parents reported a new traumatic incident. At time 3, 20% of children reported experiencing a new traumatic event since time 2, while 22% of parents reported a new traumatic incident since the previous

timepoint. Correlations were performed to compare new occurrence of trauma with symptoms at time 2 and time 3, and results indicated that only T3 child report of a new traumatic event was correlated with T3 child reported PTSD symptoms ($r = .32, p = .025$). T2 child report of a new traumatic event was not significantly correlated with T2 child PTSD or depression, and T3 child report of a new trauma was not correlated with child depression.

Descriptive statistics regarding percentages of parents and children that met clinical cutoffs for PTSD, depression and hostility are presented in Table 2. Paired samples t-tests were conducted to compare means at time 1 and time 3 for parent symptoms, and these tests revealed that there was a significant reduction in mean parent depression over the course of the study ($t = 3.45, p = .001$). However, no such reduction was present for parent PTSD symptoms or hostility. Repeated measures ANOVAs were conducted to assess treatment effect on child PTSD and depression symptoms, using both child and parent report. These analyses revealed a significant Time X Group interaction for child reported PTSD symptoms ($F = 4.55, p = .02, \eta^2 = 0.10$). However, no other significant Time X Group interactions were found for child symptoms.

Table 2. Percentage of Participants Meeting Clinical Cutoffs

<i>Percentages of Participants Meeting Clinical Cutoffs</i>						
	Clinical Elevations at Time 1		Clinical Elevations at Time 2		Clinical Elevations at Time 3	
2. Child Report of Child PTSD	100.0% ^{IT}	100.0% ^{DT}	20.0% ^{IT}	50.0% ^{DT}	36.4% ^{IT}	32.0% ^{DT}
3. Child Report of Child Depression	16.0% ^{IT}	28.6% ^{DT}	8.1% ^{IT}	25.0% ^{DT}	8.1% ^{IT}	12.0% ^{DT}
4. Parent Report of Child PTSD	58.3% ^{IT}	28.6% ^{DT}	50.0% ^{IT}	21.7% ^{DT}	42.1% ^{IT}	28.6% ^{DT}
5. Parent Report of Child Depression	16.7% ^{IT}	19.0% ^{DT}	8.3% ^{IT}	13.0% ^{DT}	15.8% ^{IT}	10.0% ^{DT}
6. Parent PTSD	40%		25.5%		40%	
7. Parent Depression	28.9%		14.9%		17.1%	
8. Parent Hostility	24.4%		25.5%		22%	
Notes: IT = Immediate Treatment, DT = Delay Treatment						

Results

Baseline Multiple Regressions (Hypothesis 1a, 1b, 1c, & 3a)

Multiple regressions were used to examine the relationship between parental symptoms of psychopathology (PTSD, depression and hostility) and child symptoms of depression and PTSD at baseline, while controlling for SES using income-to-needs. Results are summarized in Table 3. These analyses were conducted with both parent and child report of outcomes (see Table 3).

Hypothesis 1a, that higher levels of parent PTSD symptoms would be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was tested with linear multiple regression analyses. Parent PTSD symptoms was found to be associated with parent report of child PTSD symptoms ($\beta = .51, p < .001$). Additionally, parent PTSD symptoms was associated with parent report of child depression symptoms ($\beta = .57, p < .001$). These analyses were also conducted using child report of PTSD and depression symptoms as the outcome. Parent PTSD symptoms was not found to be associated with child report of child PTSD symptoms, but parent PTSD symptoms was associated with child report of child depression symptoms ($\beta = .31, p = .047$).

Hypothesis 1b, that higher levels of parent depression symptoms would be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was also tested using linear multiple regression analyses. Parent depression symptoms was associated with parent report of child PTSD symptoms ($\beta = .52, p < .001$). Additionally, parent depression symptoms was found to be associated with parent report of child depression symptoms ($\beta = .50,$

$p < .001$). These analyses were also conducted using child report of PTSD and depression symptoms as the outcome, and those results were non-significant.

Hypothesis 1c, that higher levels of parent hostility will be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was tested with linear multiple regression analyses. Parent hostility was found to be associated with parent report of child PTSD symptoms ($\beta = .50, p < .001$). Additionally, parent hostility was associated with parent report of child depression symptoms ($\beta = .56, p < .001$). These analyses were also conducted using child report of PTSD and depression symptoms as the outcome, and those results were non-significant.

Hypothesis 3a, that lower socioeconomic status will be associated with higher levels of child PTSD symptoms and child depression symptoms at baseline, was tested with linear multiple regression analyses. Income-to-needs was not significantly associated with parent report of child PTSD symptoms or parent report of child depression symptoms. These analyses were also conducted using child report of PTSD and depression symptoms as the outcome, and those results were also non-significant.

Table 3. Baseline Symptom Regression Analyses

<i>Baseline Symptom Regression Analyses</i>												
	Parent Report of Child PTSD			Parent Report of Child Depression			Child Report of Child PTSD			Child Report of Child Depression		
	B (SE)	β	t	B (SE)	B	t	B (SE)	β	t	B (SE)	β	t
Parent PTSD	0.55 (0.14)	0.51	3.79***	0.39(0.09)	0.57	4.43***	-0.12 (0.15)	-0.12	-0.80	0.01 (0.00)	0.31	2.05*
Income-to-needs	4.81 (2.53)	0.25	1.90+	3.25 (1.52)	0.27	2.14*	-1.01 (2.53)	-0.06	-0.40	0.08 (0.07)	0.17	1.12
Parent Depression	7.49 (1.88)	0.52	3.99***	5.48(1.09)	0.60	5.02***	-1.20 (1.91)	-0.10	-0.63	0.08 (0.05)	0.22	1.45
Income-to-needs	3.37 (2.46)	0.18	1.37	2.25(1.43)	0.19	1.58	-0.70 (2.50)	-0.04	-0.28	0.05 (0.07)	0.12	0.79
Parent Hostility	9.26 (2.44)	0.50	3.80***	6.45(1.46)	0.56	4.42***	-1.64 (2.44)	-0.10	-0.67	0.07 (0.07)	0.17	1.10
Income-to-needs	3.86(2.50)	0.20	1.54	2.58(1.50)	0.22	1.72+	-0.79 (2.50)	-0.05	-0.31	0.06 (0.07)	0.13	0.83
Income-to-needs	3.12(2.86)	0.16	1.09	0.08(0.07)	0.17	1.16	-0.82 (2.31)	-0.05	-0.35	0.04 (0.07)	0.08	0.52

Notes: + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Exploratory Combined Regression Models

Exploratory combined models including all three parent factors (parent PTSD, parent depression, parent hostility) and income-to-needs were conducted to examine the effects of each variable while accounting for the others on child PTSD and child depression. These analyses are considered exploratory due to limited power. Four regressions were used to test these exploratory combined models, and the results of these models can be found in Table 4. All independent variables were non-significant in these models, though income-to-needs was marginally significant in the model examining parent-report of child depression ($p = .089$). However, these models had unacceptable levels of multicollinearity, or shared variance among the independent variables. The variance inflation factors in these analyses ranged from 1.09 (income-to-needs), and 4.34 (parent depression), suggesting that these results should not be interpreted (Bowerman & Connell, 1990).

Table 4. Exploratory Combined Regression Analyses

<i>Exploratory Combined Regression Analyses</i>												
	Parent Report of Child PTSD			Parent Report of Child Depression			Child Report of Child PTSD			Child Report of Child Depression		
	B (SE)	β	t	B (SE)	β	t	B (SE)	β	t	B (SE)	β	t
Parent PTSD	0.17 (0.28)	0.16	0.63	0.00 (0.01)	0.10	0.41	-0.13 (0.29)	-0.14	-0.44	0.01 (0.01)	0.44	1.48
Parent Depression	3.00 (3.90)	0.21	0.77	0.12 (0.09)	0.35	1.40	0.70 (4.05)	-0.06	0.17	-0.04 (0.11)	-0.12	-0.39
Parent Hostility	4.46 (3.57)	0.24	1.25	0.10 (0.08)	0.23	1.31	-0.83 (3.70)	-0.05	-0.22	-0.02 (0.10)	-0.04	-0.17
Income-to-needs	4.11 (2.56)	0.22	1.60	0.10 (0.06)	0.22	1.74 ⁺	-1.09 (2.66)	-0.07	-0.41	0.08 (0.07)	0.19	1.17

Notes: ⁺p<.10, *p<.05, **p<.01, ***p<.001

Repeated Measures ANOVAs (Hypothesis 2a, 2b, 2c and 3b)

In order to test hypotheses 2a, 2b, 2c and 3b, that parent psychopathology and low SES would attenuate treatment effects, repeated measures ANOVAs were conducted using both parent report of child symptoms and child self-report at Time 2 as the dependent variable. Results of these ANOVAs and others can be found in Tables 5-8. The Time X Group X Parent PTSD interaction was found to be nonsignificant for both child PTSD and depression across both parent and child report. Similarly, the Time X Group X Parent Depression interaction was found to be nonsignificant for both child PTSD and depression symptoms across both parent and child report. Additionally, the Time X Group X Parent Hostility interaction was found to be nonsignificant for both child PTSD and depression symptoms across both parent and child report. The Time X Group X SES interaction was found to be marginally significant for parent-reported child PTSD symptoms ($F = 3.59, p = .066, \eta^2 = 0.08$), as well as for parent-reported child depression symptoms ($F = 2.95, p = .094, \eta^2 = .07$), such that children of parents reporting a low income-to-needs ratio had marginally significant attenuated treatment effects for both PTSD and depression symptoms. These analyses were also conducted with child self-reported

outcomes. The Time X Group X SES interaction was found to be marginally significant for child PTSD symptoms, such that children of parents reporting a reporting a low income-to-needs ratio had marginally significant attenuated treatment effects for PTSD symptoms ($F = 2.86, p = .098, \eta^2 = .06$), but no such effect was found for child depression symptoms ($F = 0.11, p = .739, \eta^2 = .00$).

Table 5. Repeated Measures ANOVA Examining Parent PTSD

<i>Repeated Measures ANOVA Examining Parent PTSD</i>												
	Parent Report of Child PTSD Symptoms			Parent Report of Child Depression Symptoms			Child Report of Child PTSD Symptoms			Child Report of Child Depression Symptoms		
	F	(df)	η^2	F	(df)	η^2	F	(df)	η^2	F	(df)	η^2
<i>(Within Subjects)</i>												
Time	0.47	(1,39)	0.01	5.46*	(1,39)	0.12	42.43***	(1, 34)	.555	7.71**	(1,33)	0.19
Time x Group	0.33	(1,39)	0.01	1.09	(1,39)	0.03	0.73	(1, 34)	0.02	0.21	(1,33)	0.01
<i>(Between Subjects)</i>												
Group	2.41	(1,39)	0.06	0.05	(1,39)	0.00	0.17	(1, 34)	0.01	0.45	(1,33)	0.01
PTSD	9.40**	(1,39)	0.19	4.33*	(1,39)	0.10	1.04	(1, 34)	0.03	0.08	(1,33)	0.00
Group x PTSD	0.07	(1,39)	0.00	0.01	(1,39)	0.00	0.99	(1, 34)	0.03	4.77*	(1,33)	0.13
Time x Group x PTSD	0.04	(1,39)	0.00	2.74	(1,39)	0.07	1.97	(1, 34)	0.06	0.04	(1,33)	0.00

Notes: +p<.10, *p<.05, **p<.01, ***p<.001; for small effect $\eta^2 = 0.01$, for medium effect $\eta^2 = 0.09$, for large effect $\eta^2 = 0.25$

Table 6. Repeated Measures ANOVA Examining Parent Depression

<i>Repeated Measures ANOVA Examining Parent Depression</i>												
	Parent Report of Child PTSD Symptoms			Parent Report of Child Depression Symptoms			Child Report of Child PTSD Symptoms			Child Report of Child Depression Symptoms		
	F	(df)	η	F	(df)	η	F	(df)	η	F	(df)	η
<i>(Within Subjects)</i>												
Time	0.41	(1,39)	0.01	3.59+	(1,39)	0.08	36.04***	(1, 34)	0.52	7.15*	(1,33)	0.18
Time x Group	0.34	(1,39)	0.01	0.71	(1,39)	0.02	0.33	(1, 34)	0.01	0.23	(1,33)	0.01
<i>(Between Subjects)</i>												
Group	0.93	(1,39)	0.02	0.13	(1,39)	0.00	0.02	(1, 34)	0.00	0.06	(1,33)	0.00
Depression	2.67	(1,39)	0.06	4.79*	(1,39)	0.11	6.63*	(1, 34)	0.16	0.41	(1,33)	0.01
Group x Depression	0.00	(1,39)	0.00	0.37	(1,39)	0.01	1.08	(1, 34)	0.31	8.46**	(1,33)	0.20
Time x Group x Depression	0.70	(1,39)	0.02	1.92	(1,39)	0.05	0.08	(1, 34)	0.00	0.64	(1,33)	0.02

Notes: +p<.10, *p<.05, **p<.01, ***p<.001; for small effect $\eta^2 = 0.01$, for medium effect $\eta^2 = 0.09$, for large effect $\eta^2 = 0.25$

Table 7. Repeated Measures ANOVA Examining Parent Hostility

<i>Repeated Measures ANOVA Examining Parent Hostility</i>												
	Parent Report of Child PTSD Symptoms			Parent Report of Child Depression Symptoms			Child Report of Child PTSD Symptoms			Child Report of Child Depression Symptoms		
	F	(df)	η	F	(df)	η	F	(df)	η	F	(df)	η
<i>(Within Subjects)</i>												
Time	0.60	(1,39)	0.02	5.67*	(1,39)	0.13	36.42***	(1, 34)	0.52	10.09**	(1,33)	0.23
Time x Group	0.56	(1,39)	0.01	1.14	(1,39)	0.03	0.62	(1, 34)	0.02	0.44	(1,33)	0.01
<i>(Between Subjects)</i>												
Group	0.54	(1,39)	0.01	0.31	(1,39)	0.01	0.11	(1, 34)	0.00	0.14	(1,33)	0.00
Hostility	7.85**	(1,39)	0.17	5.70*	(1,39)	0.13	0.03	(1, 34)	0.00	1.18	(1,33)	0.04
Group x Hostility	1.13	(1,39)	0.03	0.06	(1,39)	0.00	0.01	(1, 34)	0.00	0.03	(1,33)	0.00
Time x Group x Hostility	0.07	(1,39)	0.00	2.57	(1,39)	0.06	0.00	(1, 34)	0.00	1.86	(1,33)	0.05

Notes: +p<.10, *p<.05, **p<.01, ***p<.001; for small effect $\eta^2 = 0.01$, for medium effect $\eta^2 = 0.09$, for large effect $\eta^2 = 0.25$

Table 8. Repeated Measures ANOVA Examining Income-to-Needs

<i>Repeated Measures ANOVA Examining Income-to-Needs</i>												
	Parent Report of Child PTSD Symptoms			Parent Report of Child Depression Symptoms			Child Report of Child PTSD Symptoms			Child Report of Child Depression Symptoms		
	F	(df)	η	F	(df)	η	F	(df)	η	F	(df)	η
<i>(Within Subjects)</i>												
Time	0.01	(1,39)	0.00	2.52	(1,39)	0.06	39.23***	(1,41)	0.47	5.11*	(1,41)	0.11
Time x Group	0.03	(1,39)	0.00	0.38	(1,39)	0.01	4.11*	(1,41)	0.09	0.08	(1,41)	0.00
<i>(Between Subjects)</i>												
Group	1.41	(1,39)	0.04	0.06	(1,39)	0.00	0.87	(1,41)	0.02	0.08	(1,41)	0.00
Income-to-needs	0.24	(1,39)	0.01	0.20	(1,39)	0.01	0.72	(1,41)	0.02	1.57	(1,41)	0.04
Group x Income-to-needs	0.33	(1,39)	0.01	1.83	(1,39)	0.05	0.39	(1,41)	0.01	1.46	(1,41)	0.03
Time x Group x Income-to-needs	3.59+	(1,39)	0.08	2.95+	(1,39)	0.07	2.86+	(1,41)	0.06	0.11	(1,41)	0.00

Notes: +p<.10, *p<.05, **p<.01, ***p<.001; for small effect $\eta^2 = 0.01$, for medium effect $\eta^2 = 0.09$, for large effect $\eta^2 = 0.25$

Exploratory Hierarchical Linear Models (Hypothesis 2a, 2b, 2c and 3b)

In order to further examine hypotheses 2a, 2b, 2c, and 3b, that treatment effects would be attenuated by parent psychopathology and socioeconomic status, hierarchical linear modeling was conducted with the immediate treatment group only. Time was nested within persons (children) in these analyses capitalizing on three repeated measurements. Income-to-needs and each parental psychopathology variable were entered as baseline Level 2 independent variables.

Time was the Level 1 independent variable, and child PTSD and depression symptoms were each used as the Level 1 dependent variable (with 3 repeated measurements). Results revealed significant main effects of time, but no significant main effects of parent PTSD, depression, and hostility on parent-reported child PTSD symptoms. However, a marginally significant main effect of parent PTSD emerged that suggested that children of parents with more severe parent PTSD symptoms were found to have marginally greater reductions in PTSD symptoms than children whose parents had lower PTSD symptomatology, likely because these individuals had significantly higher symptoms at baseline. A similar marginally significant finding was present for both parent depression and parent hostility on parent-reported child depression symptoms, finding that children of parents with more severe symptoms of depression and hostility had marginally greater treatment gains than children of parents with lower symptomatology. Importantly, children of parents with high depression and hostility began treatment with more severe symptoms as well.

These HLM analyses were also conducted using child self-reported symptoms as the Level 1 dependent variable (with 3 repeated measurements). The child self-reported HLMs yielded a significant main effect of time, but no significant main effects of parent PTSD, depression, and hostility on child PTSD or depression symptoms (see tables 9-12). Finally, the relation between socioeconomic status and treatment gains was tested using a hierarchical linear model with income-to-needs as the baseline Level 2 independent variable. Time was the Level 1 independent variable, and child PTSD and depression symptoms were each used as the Level 1 outcome. There was a significant interaction between time and income-to-needs on parent report of child PTSD ($t = -2.15, p = .035$) and depression ($t = -2.97, p = .004$),

suggesting that low income status attenuated treatment effects. In order to probe this significant effect, simple intercepts, simple slopes, and the region of significance were calculated using an online calculator (<http://www.quantpsy.org/interact/hlm2.htm>; Bauer & Curran, 2004). For PTSD symptoms, simple slope analyses (Preacher et al., 2006) revealed that the slope for children of low income-to-needs families was not significantly different from zero (-1SD; simple slope = .9979 (1.281), $t = .79$, $p = .438$), while the slope for children of higher income-to-needs families was significantly different from zero (+1SD; simple slope = -3.003 (1.3552), $t = 2.22$, $p = .030$; see figure 1), such that higher income children showed decreases in symptoms over time, while low income children did not show significant reductions in symptoms. Similarly, for depression symptoms, simple slope analyses revealed that the slope for children of low income-to-needs families was not significantly different from zero (-1SD; simple slope = -.1849 (.2932), $t = -.63$, $p = .530$), while the slope for children of higher income-to-needs families was significantly different from zero (+1SD; simple slope = -1.7936 (.279), $t = 6.43$, $p < .001$; see figure 2). These simple slope analyses reveal that such that children of low-income-to-needs families did not have significant reductions in their depression symptoms with treatment, whereas the higher income-to-needs children did experience significant reductions in depression symptoms.

Table 9. Hierarchical Linear Combined Model with Parent PTSD and Income-to-needs ratio:
Coefficients and Statistical Tests

<i>Hierarchical Linear Combined with Parent PTSD and Income-to-needs ratio: Coefficients and Statistical Tests</i>												
	Parent Report of Child PTSD			Parent Report of Child Depression			Child Report of Child PTSD			Child Report of Child Depression		
	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio
Intercept	29.92 (2.90)	21	10.13***	38.52 (1.66)	21	23.07***	39.36 (3.34)	21	11.79***	40.73 (1.78)	64	22.84***
Time	-2.99 (1.25)	40	-2.58*	-1.05 (0.35)	40	-2.96**	-6.24 (1.86)	43	-3.36**	-1.61 (0.72)	64	-2.24*
Income-to-needs	-1.15 (2.69)	21	-0.43	1.38 (1.80)	21	0.763	-1.33 (2.60)	21	-0.51	2.31 (1.53)	64	1.51
Parent PTSD	0.19 (0.18)	21	1.06	0.32 (0.13)	21	2.49*	-0.14 (0.27)	21	-0.53	0.16 (0.17)	64	0.96
Parent PTSD x Time	0.12 (0.08)	40	1.59	-0.05 (0.03)	40	-1.77+	0.06 (0.15)	43	0.40	0.01 (0.06)	64	0.22

Notes: +p<.10, *p<.05, **p<.01, ***p<.001

Table 10. Hierarchical Linear Combined Model with Parent Depression and Income-to-needs ratio: Coefficients and Statistical Tests

<i>Hierarchical Linear Combined with Parent Depression and Income-to-needs ratio: Coefficients and Statistical Tests</i>												
	Parent Report of Child PTSD			Parent Report of Child Depression			Child Report of Child PTSD			Child Report of Child Depression		
	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio
Intercept	29.85 (2.83)	21	10.56***	38.50 (1.49)	21	25.75***	39.34 (3.31)	21	11.88***	40.75 (11.77)	64	16.73***
Time	-2.92 (1.18)	40	-2.47*	-1.03 (0.34)	40	-3.03**	-6.23 (1.83)	43	-3.41***	-1.62 (0.71)	64	-2.28*
Income-to-needs	-1.85 (2.52)	21	-0.73	0.73 (1.23)	21	0.59	-1.02 (2.86)	21	-0.36	2.11 (1.60)	64	1.32
Parent Depression	4.61 (3.38)	21	1.36	5.42 (1.53)	21	3.52**	0.35 (2.94)	21	0.12	1.70 (1.76)	64	0.97
Parent Depression x Time	-0.07 (1.11)	40	-0.07	-0.77 (0.39)	40	-1.94+	-1.31 (1.51)	43	-0.87	-0.21 (0.71)	64	-0.30

Notes: +p<.10, *p<.05, **p<.01, ***p<.001

Table 11. Hierarchical Linear Combined Model with Parent Hostility and Income-to-needs ratio: Coefficients and Statistical Tests

<i>Hierarchical Linear Combined with Parent Hostility and Income-to-needs ratio: Coefficients and Statistical Tests</i>												
	Parent Report of Child PTSD			Parent Report of Child Depression			Child Report of Child PTSD			Child Report of Child Depression		
	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio
Intercept	29.75 (2.96)	21	10.06***	38.55 (1.68)	21	22.92***	39.43 (3.32)	21	11.87***	40.76 (1.80)	64	22.71***
Time	-2.85 (1.18)	40	-2.42*	-1.07 (0.35)	40	-3.06**	-6.29 (1.82)	43	-3.46**	-1.63 (0.69)	64	-2.37*
Income-to-needs	-1.55 (2.88)	21	-0.54	1.06 (1.76)	21	0.60	-0.94 (2.68)	21	-0.35	2.38 (1.81)	64	1.32
Parent Hostility	3.34 (6.29)	21	0.53	5.59 (2.90)	21	1.93+	-1.09 (3.73)	21	-0.29	0.28 (2.61)	64	0.11
Parent Hostility x Time	0.93 (1.96)	40	0.48	-0.96 (0.53)	40	-1.82+	-1.81 (1.97)	43	-0.92	-0.54 (0.80)	64	-0.68

Notes: +p<.10, *p<.05, **p<.01, ***p<.001

Table 12. Hierarchical Linear Combined Model with Income-to-needs ratio: Coefficients and Statistical Tests

<i>Hierarchical Linear Combined with Income-to-Needs: Coefficients and Statistical Tests</i>												
	Parent Report of Child PTSD			Parent Report of Child Depression			Child Report of Child PTSD			Child Report of Child Depression		
	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio	Coefficient (SE)	df	t-ratio
Intercept	24.62 (2.52)	43	9.79***	37.88 (1.41)	43	26.78***	39.44 (3.21)	22	12.29***	40.73 (1.79)	65	22.71***
Time	-1.00 (0.93)	78	-1.07	-0.99 (0.29)	78	-3.37**	-6.30 (1.79)	43	-3.53**	-1.61 (0.70)	65	-2.30*
Income-to-needs	4.25 (3.61)	43	1.18	2.91 (1.99)	43	1.46	-7.34 (4.51)	22	-1.63	3.82 (2.44)	65	1.57
Income-to-needs x Time	-2.70 (1.26)	78	-2.15*	-1.09 (0.37)	78	-2.97**	3.03 (2.60)	43	1.17	-0.76 (0.70)	65	-1.09

Notes: +p<.10, *p<.05, **p<.01, ***p<.001

Figure 2: Hierarchical Linear Model: Interaction between Time and Income on Parent Report of Child PTSD Symptoms

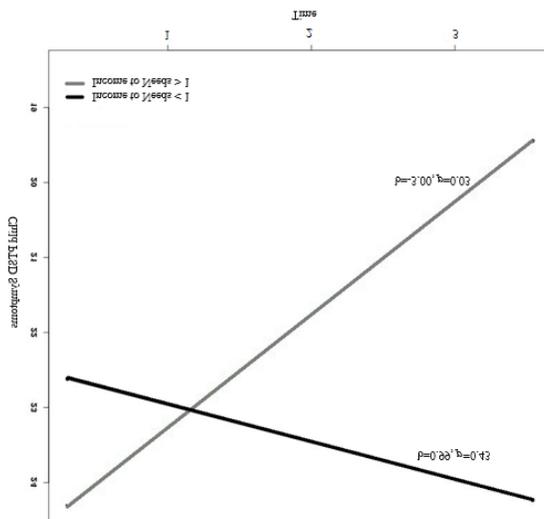
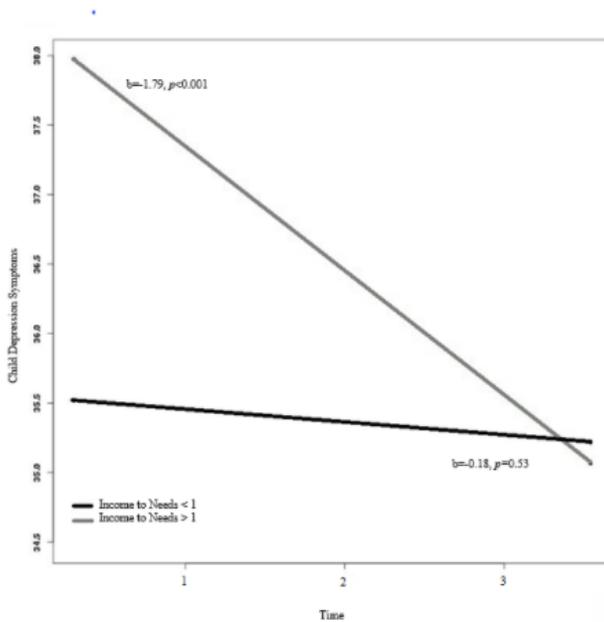


Figure 3: Hierarchical Linear Model: Interaction between Time and Income on Parent Report of Child Depression Symptoms



CHAPTER FIVE

DISCUSSION

The current study revealed several findings regarding associations between parent psychopathology and SES with initial symptom severity and treatment gains among children who had met eligibility for the Bounce Back treatment. Elevations in parent symptoms of PTSD, depression and hostility were associated with elevations in child PTSD and depression symptoms at baseline, however, no such association was found for income-to-needs. Conversely, parent psychopathology was not found to attenuate treatment gains for children, while low income-to-needs was found to dampen treatment effects.

Parental Psychopathology and Child Symptoms at Baseline: Hypotheses 1a, 1b, & 1c

Parent PTSD. Parent PTSD was strongly linked to parent report of child PTSD and depression symptoms. The present study contributes to a robust body of literature, which highlights the association between the severity of parental PTSD symptoms and PTSD symptom development and severity among children. PTSD has been found to cluster in families despite the fact that the diagnosis of PTSD is dependent upon an etiological agent (Sack et al., 1995). Moreover, evidence suggests that a dose-response relationship exists between maternal and offspring PTSD symptoms such that women who experience more PTSD symptoms over their lifespan have children with a higher

risk of PTSD development when compared with mothers who experience PTSD symptoms to a lesser degree (Roberts et al., 2012). This association is likely due to multiple factors, including a shared genetic vulnerability to the development of PTSD, as well as possible disruptions in parental care following the development of PTSD symptoms in parents. In addition to these gene-by-environment interactions, epigenetics researchers Yehuda & Bierer (2009) propose that etiological events involved in the development of PTSD may permanently alter gene expression in parents, which can be passed down to future offspring. This theory could explain how parents that exhibit symptoms of PTSD before having children may transmit risk through changes in gene expression to increase vulnerability of the development of PTSD symptoms in children following exposure to trauma.

Higher levels of parent PTSD were also associated with higher child depression symptoms across both parent and child report. The observed association supports prior research investigating the relationship between parental PTSD and child depression in samples of both trauma-exposed children and children that had no personal history of trauma. Parents with PTSD may exhibit emotional numbing and avoidance, increasing the potential for the development of depression in children. In fact, a recent review of relational patterns between parents with PTSD and their children demonstrated that parents with symptoms of PTSD are more withdrawn and avoidant and less sensitive and responsive within parent–child interactions than parents without PTSD (van Ee, Kleber, & Jongmans, 2016).

Parent depression. Parent depression was also linked to child PTSD and depression, though only with parent report of child symptoms. These findings support various studies that have concluded that children of depressed parents are at a heightened risk for increased severity

of psychological sequelae following a trauma (Self-Brown et al., 2006). Specifically, Pine and Cohen's 2002 review identified disrupted social support as a factor that consistently related to the development of PTSD in children following trauma exposure. Further, Foy and colleagues have posited that parental distress acts as a mediating factor in the development of PTSD symptoms in children exposed to trauma (Foy, Madvig, Pynoos, & Camilleri, 1996). Disruptions in social support and distress due to parental symptoms of depression likely play a large role in the association found between parental depression and child PTSD and depression symptoms. Our finding supports a substantial body of research that demonstrates the presence of shared familial vulnerabilities for depression (Sullivan et al., 2000). This association is thought to be higher when children live in a context of accumulated stress and exposure to trauma (Wikrama & Kaspar, 2006). Moreover, the findings of the current study suggest that for children exposed to trauma, parental depression may additionally increase vulnerability for PTSD symptom severity in children exposed to traumatic events.

Parent hostility. In addition to parent PTSD and depression, parental hostility, a pattern of aggressive interaction with others, was also found to be associated with child PTSD and depression per parent report. This finding fills a gap in the literature regarding the role of parental hostility in the development and severity of posttraumatic symptoms in children. Additionally, this result is consistent with previous studies that have used behavioral observation as well as questionnaire data to find associations between hostile parenting styles and elevations in anxiety symptoms in children (Hudson & Rapee, 2001). Parental hostility may serve to exacerbate symptoms of PTSD in children as coercive parenting behaviors may prohibit the development of adaptive emotional regulation and healthy coping in children following exposure

to a traumatic event (Brock & Kochanska, 2015). Likewise, parental hostility may be linked to child depression due to the absence of a positive parent-child relationship, which can result in a dearth of coping strategies and emotional support for children in these families. This phenomenon may be particularly detrimental following trauma exposure, when children are vulnerable to dysfunctional beliefs about the world around them. It is possible that parents who exhibit more hostile attitudes and behaviors toward others are less able to model positive coping and provide emotional support to children following trauma exposure, which may result in higher PTSD and depression symptom severity for children.

Exploratory Combined Model. An exploratory combined model including income-to-needs and three forms parent psychopathology was conducted in order to examine the effects of each variable while accounting for the others on child PTSD and child depression. Results demonstrated that when combined, none of the aforementioned variables were significantly associated with child symptoms at baseline. Multicollinearity analyses determined that the independent variables were highly related, and thus, these results should not be interpreted.

Impact of Parental Psychopathology on Treatment Gains among Children: Hypotheses 2a, 2b, & 2c

Findings of the current study indicated that parental psychopathology in the forms of parental PTSD and depression symptoms, as well as parental hostility, did not significantly attenuate treatment for youth in the Bounce Back program. This finding was unexpected, as previous literature has suggested that untreated parental psychopathology is a consistent predictor of poorer treatment response in children receiving cognitive behavioral treatments for mood disorders (Birmaher et al., 2000; Southam-Gerow et al., 2001). One possible explanation

for this null finding could be that this sample has demonstrated a large effect size for reduction of child PTSD symptoms (using child report), but null findings for all other reported treatment gains. These null findings may be representative of an effect that is too small to detect, which makes an attenuation of these effects impossible to find (see table 2 for clinical ranges across treatment). Further, the effect size of parental psychopathology on PTSD treatment gains was likely small, and our analyses were underpowered to detect small effects within our sample.

However, analyses conducted with HLM, which capitalized on repeated measurements, revealed a marginally significant interaction showing that children of parents with high PTSD, depression, and hostility symptoms had marginally better treatment outcomes. This finding is in the opposite direction of hypotheses and as it is marginal, should be interpreted with caution. It is possible that features such as the school-based setting and delivery of treatment within the school day allowed for children of parents with psychopathology to overcome traditional barriers to accessing treatment, and thus parental psychopathology did not affect treatment gains in the expected direction.

Further, research suggests that parent psychopathology often predicts chronicity and symptom recurrence following treatment, so it possible that in the long-term, children of parents with higher psychopathology may experience a greater rebound effect following treatment than children whose parents have lower symptoms (Birmaher et al., 2000).

Another explanation for the finding that parental psychopathology did not dampen treatment effects would be that the parent involvement in treatment had a therapeutic effect on parents, such that parental symptoms reduced with treatment. In fact, parents in this sample reported significantly lower symptoms of depression at Time 3 than they had reported at Time 1. It is

possible that the parent sessions, which involved general psychoeducation regarding trauma exposure and cognitive behavioral therapy, as well as the presentation of the child's trauma narrative, had some therapeutic effect on parents in addition to children, such that parental symptoms were also reduced following the Bounce Back treatment.

Impact of Income-to-Needs on Baseline Symptoms and Treatment Gains among Children:

Hypotheses 3a & 3b

The current study found that family income-to-needs did not have a significant effect on baseline symptom severity for children. This finding was surprising, as previous studies have found that children of low socioeconomic status are more vulnerable to develop severe depression and PTSD following exposure to trauma. One explanation for this finding is that the majority of these studies examine whether or not children develop PTSD and depression in community samples, and a requirement of children in the current study was that they would have developed clinically significant PTSD symptoms. It is possible that children of low socioeconomic status are more likely to develop psychopathology following exposure to trauma but their reported symptoms are not necessarily more severe than their middle-class counterparts. Additionally, in this sample, income-to-needs was not significantly correlated with parent psychopathology symptoms at baseline, which seems to be atypical when compared with previous literature examining these relationships. It is possible that associations between depression in mothers and children's internalizing and externalizing problems are accounting for some of the variance found in studies that have concluded that low socioeconomic status is related to higher symptom severity in children before treatment (e.g. Goodman et al., 2011).

Regardless of the null finding that family income-to-needs did not have a significant effect on baseline symptom severity for children, low income youth are believed to be disproportionately vulnerable to the adverse effects of trauma in the long term because they experience significantly more trauma and have insufficient access to mental healthcare (Kataoka, Zhang, & Wells, 2002). In the present study, hierarchical linear modeling analyses showed that even for youth who are able to access trauma-focused cognitive behavior treatment in schools, for those with low income-to-needs, treatment gains were attenuated for both depression and PTSD symptoms. This finding is important because school-based interventions are thought to be preferable for this population, as they increase access to mental health services to students who typically do not access these resources due to financial, logistical, and attitudinal barriers (Jaycox et al., 2010; Santiago, Kaltman, & Miranda, 2013). However, low income families exposed to trauma do not only face the negative effects of exposure, but they additionally must contend with poverty-related stressors, such as discrimination, economic stress, family conflict, and frequent moves and transitions (Wadsworth et al., 2008). Discrimination is a poverty-related stressor that may be particularly relevant to this population, as the vast majority of participants were Latino, and low-income Latino youth experience high levels of discrimination, a factor that is known to predict depressive symptoms (Umana-Taylor & Updegraff, 2007). Another explanation for the attenuation of treatment effectiveness is that the context of urban poverty increases the likelihood that children will experience chronic or repeated traumas. Resilience to trauma has previously been associated with the relative absence of current and previous life stress (Bonanno, Galea, Bucciarelli, & Vlahov, 2007); so it is possible that children whose families are experiencing

chronic poverty-related stress experience more robust and long-lasting effects even with treatment.

Additionally, extant literature suggests that coping strategies for families living in poverty tend to be reactive or avoidant and that these families display a greater degree of hopelessness. It is possible that the effects of trauma for these families, who are simultaneously experiencing poverty-related stressors, are so robust that short-term group treatment is insufficient for children who experience trauma in a context of poverty. This is especially true in families that earn less than half of the federal poverty guideline in a given year, a threshold that has been commonly defined as “deep poverty”. Children are especially vulnerable to the effects of deep poverty, according to Census Bureau Data, a larger percentage of children younger than 18 live in deep poverty than adults in any other age group (DeNavas-Walt, Proctor, & Smith, 2015). The stressors that accompany deep poverty are thought to be particularly damaging to child development, and these stressors in addition to trauma may impact these youths’ readiness to improve with a brief group CBT treatment.

Summary of Findings

The current study found that parent PTSD, depression, and hostility symptoms were associated with initial PTSD and depression symptom severity for children in the Bounce Back program. Hence, parent psychopathology symptoms may have a significant effect on the severity of psychological sequelae for children following exposure to a traumatic event. Despite the effect on initial severity, parental psychopathology was not found to attenuate treatment gains for children in the study. Conversely, socioeconomic status was not found to have a significant effect on initial symptom severity for children in this sample, but was found to significantly

attenuate treatment gains. These findings indicate that parent psychopathology may be associated with more severe symptoms prior to treatment, but income-to-needs status may attenuate treatment gains for school-aged youth in trauma-focused cognitive behavioral group therapy.

Limitations

Despite the novel findings of the current study, there are several limitations that are important to discuss. First, the results could have been impacted by the small sample size and therefore, did not have enough power to detect small effects. Although HLM allows for greater power and capacity to detect significant results due to its capitalization on repeated measurements, the ANOVAs were underpowered to detect small to medium effect sizes. Additionally, all variables in the study were assessed via self-report measures, making the study susceptible to reporter bias. For example, reports of primary variables (such as parent psychopathology and income-to-needs) were not substantiated by reports by other family members. Further, many significant effects were found using parent reports of child symptoms, which may have been influenced by shared method variance. There are a few explanations for the lack of significant findings with child report. First, the mean age of the children in this study was quite young ($M = 7.76$). Although the UCLA PTSD index has been deemed appropriate for use with children 6 and above, and the CDI has been normed for children 7 and above, it is possible that children in this sample may have had difficulty understanding the questionnaires, especially given the high percentage of English Language Learners in the district. Additionally, all children were administered the questionnaires in an interview format with a research assistant, while parents and guardians were given the option to complete questionnaires privately using

paper and pencil. This may have resulted in higher measurement bias for children than parents if children were reluctant to give interviewers answers that they considered socially unacceptable. Another limitation of this study is that randomization took place at the school level instead of the individual level. This design compromise was made in order to work within the school system effectively, as school social workers were unable to conduct both an immediate treatment group and a delayed treatment group within each school. Future research may replicate the study while randomizing at an individual level to control for group differences among schools. This study was also unable to control for a number of factors such as face-to-face versus phone contact with parents or clinician bias. Further, the difference in timing of the intervention groups (fall vs. spring) could have biased the results. Additionally, assessments beyond pre- to post-treatment would allow for more thorough examination of effects. Future research should include a more longitudinal examination of the effects of parental psychopathology and income-to-needs on child functioning.

Finally, this research aimed to describe the risk for symptom severity as well as treatment gains within a school district that serves mainly a low income, Latino population of urban youth. However, this sample may limit the generalizability of the findings. Future research should continue to examine the role of parent psychopathology and socioeconomic status in a diverse population with differing ethnicities, ages, and school settings.

Implications

Despite the current study's limitations, the findings contribute to expanding the field's understanding of the role of parent psychopathology and socioeconomic status on symptom severity and treatment effectiveness for school-aged youth who have experienced trauma. This

research may bolster efforts to identify students and implement evidence-based and culturally-sensitive prevention and intervention efforts for populations with a high prevalence of parent psychopathology. Further, the current study underscores the importance of tailoring effective interventions for individuals from low socioeconomic backgrounds, as these individuals are particularly vulnerable to the negative psychological consequences of exposure to trauma, and have been shown to benefit less from evidence-based interventions (Kataoka, Zhang, & Wells, 2002).

Given that children of parents exhibiting symptoms of PTSD, depression and hostility are at increased risk for the development of severe PTSD and depression symptoms following exposure to trauma, it is important to identify these children for possible prevention and intervention services. Additionally, this finding highlights the importance of prevention and intervention efforts targeting parents of young children who may have experienced trauma themselves. One way to approach this might be to develop and implement a parent component for Bounce Back. Preliminary evaluations of a family component for CBITS, an efficacious trauma-focused group CBT program for middle and high-school aged children, suggest that a family component may increase positive coping, closeness, and positive parenting behaviors that could result in long-term improvement in parent functioning (Santiago et al., 2013). Future research can focus on developing and piloting a similar family component for the Bounce Back program to attempt to mitigate the impact of parent psychopathology on child functioning.

Income-to-needs did not affect baseline child psychopathology symptoms, but it was found to attenuate treatment effects for children whose families did not have sufficient financial support to meet their needs, based on federal poverty guidelines. This finding underscores the

importance of tailoring interventions for children who may be experiencing the burden of economic stress in addition to exposure to trauma. Although Bounce Back allowed these children to access evidence-based treatment despite potential barriers (e.g. cost, transportation), children from these families did not experience a decline in symptoms to the same degree as children from higher SES backgrounds. Future studies may utilize focus group data from social workers implementing Bounce Back in order to investigate what other barriers to symptom reduction are at play for low SES children, and what possible accommodations may be developed to make Bounce Back more beneficial for low SES populations. Additionally, future research may investigate resilience factors in this population, so that interventions may be tailored to capitalize on strengths for youth and families living below the poverty line.

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