A PILOT STUDY OF THE EFFECTS OF A TRAUMA SUPPLEMENT INTERVENTION ON AGENCY ATTITUDES, CLASSROOM CLIMATE, HEAD START TEACHER PRACTICES, AND STUDENT TRAUMA-RELATED SYMPTOMOLOGY

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ABSTRACT

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The present study investigated the effects of the pilot implementation of a trauma

supplement intervention based on the Attachment, Self-Regulation, and Competency (ARC)

framework (Blaustein & Kinniburgh, 2010) on Head Start agency attitudes, teacher practices,

classroom climate, and social and emotional outcomes Head Start students who have

experienced trauma and their peers who have not. One hundred and six children, ages 3-4,

enrolled in Head Start preschool in the 2014 school year, their teachers (N= 5) and teacher

assistants (N=6) participated. At the trauma supplement intervention site, teachers (N=3) and

teacher assistants (N=3) participated in two, half-day trainings over the period of six weeks

regarding trauma-informed practice, based on the ARC framework and were asked to implement

specific practices within their classrooms. This was done in addition to the social emotional

curriculum, Al's Pals, already in place (i.e., trauma supplement intervention group). The

comparison site implemented the social emotional curriculum as usual (i.e., Al's Pals) but did

not receive any training on trauma-informed practices (i.e., intervention-as-usual comparison

group). Results of agency-level analyses suggests that while administrators acknowledge the

importance of trauma-informed practices, few practices were in place prior to or following the

implementation of the intervention. Teachers in the intervention group (N=3) reported positive

effects of the intervention on their knowledge regarding trauma informed care. At the individual

child level, improvements in internalizing behaviors at posttest as measured by the BASC-2 PM,

Internalizing subscale were noted among all children in the intervention group when compared with those in the comparison group. When caregiver ratings of symptom severity were considered, the greatest improvements were made by children who had experienced the most severe trauma. Practical implications of this study underline the importance of implementing trauma-informed interventions in the Head Start setting, beginning at the level of the system. Implications for further research addressing this study's limitations are presented.

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CHAPTER 1

INTRODUCTION

Research shows that young children experience emotionally traumatic events at a much higher rate than the general population. One third of childhood maltreatment victims are under the age of four (United States Department of Health and Human Services [HHS], 2009). Children in low-income and ethnic minority families will experience an even greater number of traumatic events throughout their lifetimes (HHS, 2013; Turner, Finkelhor, Ormrod & Turner, 2006). Research shows that even very young, preverbal children have the ability to encode and remember traumatic events (Kaplow, Saxe, Putnam, Pynoos, & Lieberman, 2006), and that experiencing trauma at a young age can lead to difficulties throughout development.

Traumatic experiences may prevent young children from forming secure attachments with the primary caregiver, thereby inhibiting the child's ability to trust caregivers and develop normal coping skills (Lieberman & Knorr, 2007). This is magnified by the fact that caregivers of children who have experienced trauma may also be experiencing trauma themselves. Young victims of trauma tend to exhibit more internalizing and externalizing behaviors than their older peers, leading to academic and social difficulties across development (Scheeringa, Zeanah, Myers, & Putnam, 2003). Childhood trauma also affects brain development and neural connectivity, with physical differences evident in the brains of children who have experienced trauma compared with peers (Cook, Ciorciari, Varker & Devilly, 2009). Further, child victims of trauma have a greater chance of being revictimized as adults (Classen, Palesh & Aggarwal, 2005). Sadly, many children who experience trauma will never receive intervention, as mental health workers often do not properly identify young trauma victims (Graham-Bermann, Castor, Miller, & Howell, 2012).

As an organization that reaches young children, specifically those from low-income backgrounds, Head Start preschool programs care for young children who have experienced trauma, many of which are not receiving treatment. Two studies of trauma prevalence in Head Start populations in Michigan found that between 77% (Pfenninger Saint Gilles, 2015) and 78% (Graham-Bermann & Seng, 2005) of children had been exposed to some type of traumatic event. Continuously hearing about traumatic events that their students experience also puts teachers at risk for developing secondary traumatic stress reactions (Pearson, 2012; Pianta, 2003). The prevalence of exposure to traumatic events in the local, Greater Lansing area, Head Start setting (which led to the need and importance of this study) showed that 77% of children had experienced at least one type of trauma (Pfenninger Saint Gilles, 2015). Fortunately, Head Start has the opportunity to serve as a safe environment in which victimized children can receive targeted social-emotional interventions (Bratton et al., 2013). Although these interventions can vary in nature, the basic components include practices such as securing a safe environment, providing consistency in schedule and caregivers, and allowing for opportunities to process the traumatic event. These needs can be fulfilled by Head Start classrooms through training and supporting staff (Swick, Knopf, Williams, & Fields, 2013). Due to the potential impact of trauma on children's classroom behavior and school readiness, there is an impetus for Head Start to provide trauma-informed interventions within the classroom setting (Garro, Brandwein, Calafiore, & Rittenhouse, 2011). Research shows that infusing the existing system with knowledge regarding trauma is the best way to provide child victims of trauma with appropriate services (Child Welfare Committee, National Child Traumatic Stress Network, 2008). A trauma-informed system targets all levels of the organization, including administrators, staff,

teachers, parents and students and provides them with the necessary training, consultation and referral processes to support all students, specifically those who have experienced trauma.

The Head Start Trauma Smart program has recently drawn national attention to the necessity of providing trauma-informed, systems-level interventions in Head Start programs (see Bornstein, 2014). One recent study showed positive effects of a trauma-informed, system-level intervention based on the ARC framework that was implemented in a Head Start center with a high percentage of students who had experienced complex trauma. Initial results of this study show decreases in internalizing and externalizing behaviors of children enrolled in the program, as well as high teacher satisfaction with the intervention (Holmes, Levy, Smith, Pinne, & Neese, 2014). However, Holmes and colleagues' (2014) study did not capture outcome measures of a system-level intervention, as students were only included in the study if they were part of the intensive treatment group. Additionally, the study did not include any intervention-as-usual comparison group, so it is unclear if changes were due to the intervention or to some other factor. The current study builds on the work of Holmes and colleagues (2014) by using a similar intervention framework while simultaneously addressing methodological shortcomings, specifically the lack of a system-level outcome measure and the lack of an intervention-as-usual comparison group.

Theoretical and Conceptual Orientation

This research study is grounded in two theoretical models: Bronfenbrenner's Bioecological Model (Bronfenbrenner & Ceci, 1994) and Trauma System Therapy (Saxe, 2007). Bronfenbrenner and Ceci's Bioecological Model is a contemporary version of Bronfenbrenner's Ecological System's Model (Bronfenbrenner, 1977). The Ecological Systems Model proposes that a child develops through interaction with various levels of his or her environment. These

levels include the microsystem (i.e. family, school, peers), the mesosystem (the interactions and interconnections between the microsystems), the exosystem (link between the child's cultural context and his immediate environment) and the macrosystem (cultural context). Experiencing a traumatic event can affect a child on many different levels. Following a traumatic event, a child may be triggered to re-experience the event due to reminders at home or in the community.

The Bioecological Model includes the highlighted importance of the context and environment of the Ecological System Model, but extends it to include the reciprocal influence that personal/individual factors have on development (Bronfenbrenner & Morris, 2007). The Bioecological Model is composed of four components: *process, person, context, and time.* The first, *process,* describes the ways in which organisms interact with their environment. The consistent interactions of individuals and the environment are known as *proximal processes* which is the primary mechanism contributing to human development. For example, a mother comforting her baby or children interacting on the playground would be proximal processes contributing to the development of both mother and child. *Person* characteristics, including *dispositions, resources, and demand* have the opportunity to influence the direction and power of proximal processes. *Context* reflects aspects of the environment as described in the Ecological System's Model. Specifically, the environment is divided into five interconnected systems: (1) microsystem, (2) mesosystem, (3) exosystem, (4) macrosystem, and (5) chronosystem. Development takes place within and across these systems as described previously. *Time* is the final component of the Bioecological Model and consists of three levels: micro, meso, and macro, referring to different time intervals across the lifespan. Micro-time refers to the timing during specific proximal processes. For example, how long a specific interaction between a parent and child lasts. Meso-time refers to the frequency of these episodes in the person's

environment (i.e. over the course of days, weeks, or years). Macro-time is equivalent to the chronosystem in the original Ecological Systems Model, and is the timing of proximal processes across the lifespan, and across generations.

Central to the Bioecological Model is the idea that the individual is both an "indirect producer and a product of development" (Bronfenbrenner & Morris, 2007, p. 798). This suggests that individual characteristics directly influence development. In an early paper presenting and arguing for the use of the Bioecological Model, Bronfenbrenner and Ceci (1994) propose that proximal processes actually influence heritability, which is defined as "the proportion of the total phenotypic variance that is due to additive genetic variation" (p. 569), such that the potential for heritability increases as proximal processes increase. This makes sense given the fact that proximal processes are the mechanisms by which genetic potential is realized. Therefore, the more proximal processes that are present, the greater possibility for the genetic potential to be fully realized throughout development as well.

This model influences the current study, as trauma affects both the quality and quantity of proximal processes. These interactions early in life shape the way individuals deal with stressful situations later on, suggesting that if a child's environment is not supportive of healthy development early in life, it will likely continue to affect the individual later on. It is evident that within-child and environmental factors are critical when implementing trauma-specific interventions.

This study is also based on the model of Trauma Systems Therapy. This therapy is based on the theory that a trauma system exists when: (1) a traumatized child has difficulty regulating emotional states, and 2) a social environment and/or system of care is not able to help the child to regulate these emotional states. Trauma Systems Therapy (TST) is based on creating a "fit"

between a child's capacity to regulate emotions and the ability of the system to meet these intervention needs. In order to do this, four conditions must be met: 1) treatment must be developmentally informed, (2) treatment must directly address the social ecology, (3) treatment must be compatible with systems of care, and (4) treatment must be "disseminate-able" (Saxe, 2007). This theory served as the basis for the intervention implemented.

Following from these theoretical models, the current study addresses the mechanisms of change stemming from the school environment across all levels of the child's ecology. At the macro level, the school acts as an agent for change in the community by reacting to the "trauma culture" that exists in increased frequency among certain populations. Reciprocally, through serving as a center for direct service provision, the school works to change the culture from one centered on trauma to one that prevents and treats exposure to trauma. At the community level, the school takes advantage of resources such as community mental health services and Wraparound, while the school also provides training for community members, including parents and school staff who are experiencing trauma themselves. At the school and child levels, the child's trauma symptoms affect the treatments implemented and school provides direct support for children who have experienced trauma. This theoretical model is presented in Figure 1.

Purpose of the Current Study

The purpose of this research study was to examine the pilot implementation of a trauma supplement intervention, (note: to be referred to throughout the paper as the "intervention") based on the ARC framework (Blaustein & Kinniburgh, 2012). The effects of this intervention on administrators' attitudes towards trauma-informed practices, classroom climate, teacher practices, and child social-emotional outcomes were investigated through the inclusion of an intervention-as-usual comparison group (i.e., to be referred to throughout the paper as the

"comparison group." Due to political pressures to move towards using schools as providers of mental health services (i.e., The New Freedom Commission on Mental Health and The Affordable Care Act), system-level mental health interventions are growing in number (Merrell & Buchanan, 2006). Schools, especially Head Start preschool programs, are perfectly poised to provide trauma-specific interventions, as children and parents are more likely to participate in trauma intervention when they take place in the school setting (Jaycox et al., 2010). One study showed positive clinical effects when a tiered, systems-level intervention was implemented following Hurricane Katrina (Cohen et al., 2009).

The ARC framework is a general intervention approach that has been used across settings with children who have experienced trauma, including children in the welfare system (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013) and those in an outpatient clinical setting (Arvidson et al., 2011). Results across studies show a decrease in internalizing and externalizing behaviors, and an increase in placement permanency for children in the child welfare system. Because ARC is a framework and not a specific intervention, it can be implemented appropriately in many different contexts and with different populations.

This study builds on Holmes and colleagues' (2014) investigation of the Head Start Trauma Smart program by focusing on quantifying the social and emotional outcomes of a trauma-specific, systems-level intervention in the Head Start setting. Specifically, this study will investigate whether a specific trauma supplement, an intervention based on the ARC framework, will be effective in increasing knowledge and use of trauma-informed practices by teachers, thereby increasing resiliency. See Figure 2 for a visual representation of the proposed mechanism of action of the intervention on resiliency outcomes. This study focuses on influencing staff and teacher practices, and measuring the effect that the intervention has on

ratings of student behavior and trauma symptomology among students who have experienced trauma. Research has shown that the effects of educating families and adults surrounding a child regarding the effects of trauma (specifically abuse and neglect) can help remediate children's trauma symptoms following a traumatic event (Daro & McCurdy, 2007). This study adds to the existing literature on system-level trauma interventions within Head Start settings, and empirically investigates the ARC framework within a trauma supplement intervention as a potentially effective model for this purpose.

CHAPTER 2

LITERATURE REVIEW

In order to address the need for this study, the following sections of the literature review will describe 1) the prevalence of trauma, 2) the effects of early trauma, 3) secondary trauma, 4) resilience, 5) prevalence of trauma in Head Start, 6) the school as a trauma-informed system, and 7) the ARC model.

Topics are covered in this order as to appropriately reflect the theoretical framework, focusing on both individual and systems levels. Both of these levels are represented throughout the study, reflected in both independent and dependent measures. This is due to the fact that experiencing trauma affects children and adults at many levels. The intervention that is the focus of the present study is intended to be implemented across levels of the Head Start agency (from administration to individual student level). However, the majority of the intervention is based on teaching a set of trauma-informed practices targeted at the classroom and individual levels.

Definition and Prevalence of Childhood Trauma

Trauma is defined by The Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood-Revised (DC: 0-3R) as "direct experience, witnessing, or confrontation with an event or events that involve actual or threatened death or serious injury to the child or others, or a threat to the psychological or physical integrity of the child or others" (Wieder, 1994, p.19). Whereas one event can be interpreted as traumatic for one child, it may not be traumatic for another child. Hamberg (2011) defines trauma as anything that overwhelms a child's ability to cope.

Research indicates that young children are the least able to defend themselves from the effects of trauma, but they experience traumatic events at a much higher rate than the general

population. One third of child victims of maltreatment are under the age of four (United States

Department of Health and Human Services [HHS], 2013). Children in the 0-4 age group are also

the most likely to die or be hospitalized due to unintentional injuries such as drowning, burning,

falls, suffocation, and poisoning (Grossman, 2000). In 2008, 3.7 million children in the United

States were investigated as potential victims of maltreatment, approximately 20% of which were

removed from their homes (HHS, 2013). The Adverse Childhood Experiences (ACE) study is

one of the largest studies to date on childhood trauma exposure and its correlation with

subsequent health outcomes. This retrospective study was conducted between 1995 and 1997.

Findings from this study show that 63.9% of participants recalled experiencing one or more

traumatic events prior to age 18. The most commonly experienced events were physical abuse

(28.3% of participants) and household substance abuse (26.9% of participants; Felitti et al.,

1998).

 While traumatic events can negatively impact children regardless of their environments,

other risk factors may intensify the effects of already harmful events. Environmental stressors

such as living in poverty, or living in a home that is overcrowded can magnify effects of

previously existing traumas. Approximately 20% of children in the United States live in poverty,

and almost half of children (46%) live in a stressful housing situation (Federal Interagency

Forum on Child and Family Statistics, 2013).

 Additionally, a child's ethnicity may contribute to the likelihood that he/she experiences

a traumatic event. In 2009, 60% of Head Start's preschoolers were from ethnic minority

families, all of which were living below the poverty line or on public assistance (HHS, 2013).

Research shows that children in low-income and ethnic minority families will experience a

higher number of traumatic events throughout their lifetimes (HHS, 2013; Turner, Finkelhor,

Ormrod & Turner, 2006). Specifically, 14.6 % of African American children and 8.5% of Hispanic children on the national level have experienced trauma compared with 8.1% of white children (HHS, 2013). One study found that among young children (ages 1-3), 49% of children living in poverty had experienced trauma compared with 26.3% of the full sample which included children who did and did not live in poverty (Briggs-Gowan, Ford, Fraleigh, McCarthy, & Carter, 2010).

However, trauma exposure has not received the attention it deserves due possibly to the difficulty of properly assessing trauma exposure and symptoms. Currently there is no known "gold star" of assessment for trauma affecting preschoolers such as those that exist for other things such as school readiness or social/emotional development and behavior (Graham-Bermann, Castor, Miller, & Howell, 2012). This means that oftentimes children are not identified, and even those who are do not receive the proper treatment. Regardless, some studies have taken steps towards evaluating the prevalence of traumatic events in different Head Start communities. Graham-Bermann and Seng (2005) found that 65% (N=160) of Head Start children in Michigan had been exposed to at least one incident of community violence, and 47% had been exposed to at least one incident of family violence. Seventy-eight percent had been exposed to some type of violence. The prevalence of exposure to traumatic events in the local, Greater Lansing area, Head Start setting (which led to the need and importance of this study) showed that 77% of children had experienced at least one type of trauma (Pfenninger Saint Gilles, 2015).

Effects of Early Trauma

Attachment. Attachment theory has long posited that the initial type and quality of the parent-child bond can influence children's ability to form relationships across their life course

(Bowlby, 1969; Bowlby, 1973). When healthy attachment relationships with the caregiver have formed, infants and young children are able to feel safe in uncertain or dangerous situations by moving into closer proximity with the caregiver and seeking reassurance. Healthy attachment also allows infants and young children the ability to learn and explore by moving away from their caregivers without feeling threatened by their environments (Lieberman & Knorr, 2007). Both being able to look to the caregiver for comfort and being able to venture away from the caregiver to grow and develop as an individual are essential components of development.

Authors of recent studies have proposed that experiencing trauma may disrupt the normal developmental trajectory of attachment in young children, and may have severe implications for children's future abilities to form appropriate relationships (Howe, Brandon, Hinings, & Schofield, 1999). Children who have experienced abuse and neglect early in life, specifically before the age of two, are at a higher risk for both Reactive Attachment Disorder and Disinhibited Social Engagement Disorder (Gleason et al., 2011). Reactive Attachment Disorder (RAD; previously referred to in the DSM-IV-TR as *RAD: emotionally withdrawn/inhibited subtype*) is "characterized by a pattern of markedly disturbed and developmentally inappropriate attachment behaviors, in which a child rarely or minimally turns preferentially to an attachment figure for comfort, support, protection, and nurturance." Disinhibited Social Engagement Disorder (previously referred to in the DSM-IV-TR as *RAD: indiscriminately social/disinhibited subtype*) is defined as a "pattern of behavior that involves culturally inappropriate, overly familiar behavior with relative strangers." Diagnosis of both disorders necessitates a lack of early social interaction as evidenced by inconsistent care early in life.

One study showed that children who were adopted from an orphanage in which they received little adult care and attention were more likely to demonstrate both RAD and

Disinhibited Social Engagement Disorder behaviors as they grew up. The intensity of these behaviors were related to the frequency and duration of the deprivation, such that those who had been in the orphanage longer demonstrated more severe behaviors for a longer period of time (O'Conner & Rutter, 2000). Traumatic experiences may prevent young children from forming secure attachments with the parent or caregiver. Children who are maltreated are more likely to form insecure and disorganized attachments, and are less likely to look to and rely on their caregivers for behavioral regulation (Schore, 2002). This can inhibit the child's ability to trust caregivers and develop normal coping skills, and can lead to overly self-protective behaviors such as avoidance, withdrawal, and anger both as young children and later in life (Lieberman & Knorr, 2007).

Neurological Bases of Trauma

Children's brain development is mediated by their social relationships (Cozolino, 2006). When children engage in healthy relationships with their peers and caregivers, normal attachment and development occurs. However, traumatic experiences, specifically those that are reoccurring (chronic) or complex (involving more than one type of event) can interfere with the communication between the adult and child brains (Pynoos, Steinberg, & Piacentini, 1999). This disruption in communication very often has deleterious effects on the child's development of appropriate responses to stress during the developmental period.

Physiological stress response. Children who have experienced trauma exhibit over-activation of the systems that secrete the stress hormones cortisol, epinephrine and norepinephrine. This leads to an imbalance of these hormones over time. Unfortunately, the cortisol imbalance as related to trauma can begin very early in life. Gitau, Cameron, Fisk and Glover (1998) found a direct association between maternal, fetal and newborn cortisol levels,

suggesting that high levels of stress during pregnancy can affect a child's baseline cortisol levels at birth. Between ages one and four, the HPA system generally becomes less reactive to stress, and cortisol levels are less volatile. Even though a child might experience stress, it is less likely that cortisol levels will elevate, likely because children of this age are able to turn to caregivers to help them cope with stressF and feel less frightened. However, this does not happen with children who have experienced trauma (especially events that relate to primary caregivers), as they continue to show activation of the HPA system in response to even mildly stressful events (Feldman, Singer, & Zagoory, 2010).

Brain growth and development. In addition to affecting the systems that are directly related to the stress response system, trauma seems to have a more global effect on brain development. Research suggests that exposure to trauma in the early years affects children's brain growth and development (Cook, Ciorciari, Varker & Devilly, 2009). Children with histories of trauma, specifically abuse and neglect, have smaller brains overall when compared with peers who have not experienced trauma (DeBellis et al., 1999). Although many brain regions have been found to be potentially affected by exposure to trauma (Chu & Lieberman, 2010), regions most salient for performance in school include the cerebellum (implicated in the processes of attention and language), the orbitofrontal cortex (implicated in planning, decision making, executive functioning), and the corpus callosum (responsible for transferring information between the two hemispheres).

Research detailing the specific ways in which each of these regions is altered by experiencing trauma is beyond the scope of this literature review. However, both structural and functional differences in the cerebellum, the orbitofrontal cortex, and the corpus callosum highlight the fragility of the developmental period to brain development and its susceptibility to

the influences of trauma. All of those structures are intricately connected to mediating or moderating the traumatic response and are yet some of the most susceptible to outside influences during the developmental period, therefore making the experiencing of a trauma at an early age even more likely to persist across the lifespan.

School performance. Experiencing trauma at a young age can put children at risk for negative academic outcomes. Children who have experienced trauma have lower scores on standardized reading, math and science measures when compared with their peers who have not experienced trauma. Exposure to trauma also increases the odds that a child will receive special education services through an Individualized Education Program (IEP; Goodman, Miller, & West-Olatunji, 2012). The ways in which the effects of trauma impact children at school are numerous and can be examined from both cognitive and psychosocial perspectives.

Cognitive implications. It is evident that children's early experiences shape their biological development which in turn shapes the ways in which they interact with and experience their environments.   Experiencing trauma has cognitive implications for children. Children who experience trauma have been found to have lower general cognitive abilities as quantified by the Full Scale Intelligence Quotient (FSIQ). There is some evidence that the lower IQ is related directly to the experiencing of trauma (specifically domestic violence), as opposed to other factors known to influence cognitive ability such as genetics (Koenen, Moffitt, Caspi, Taylor, & Purcell, 2003). Further, lower intellectual functioning was found to be associated with higher rates of PTSD symptoms, specifically re-experiencing, greater severity of symptoms and higher frequency of traumatic events (Sullivan, Bennett, Carpenter, & Lewis, 2008).

The explanation of differences in cognitive ability in children who have experienced trauma and their typical peers is likely related to the continuous re-experiencing of symptoms

along with a difficulty attending to task stimuli. Children who have experienced trauma often

have flashbacks of traumatic events as well as nightmares and other behavioral manifestations of

the traumatic memory that cannot be suppressed. More specific studies of cognitive measures

show that the digit span task, a task that requires children to remember lists of numbers and

recite them back to the examiner, is much more difficult for children who have experienced

trauma, as they preferentially attend to negative as opposed to neutral stimuli (e.g. digits from the

digit span task) and are continuously distracted by intrusive trauma thoughts (De Bellis, Hooper,

Spratt, & Woolley, 2009).

Arguably, the most important and encompassing aspect of cognition that is directly

connected to children's learning at school is executive functioning. Executive functioning

includes the ability to direct attention, manage information in working memory, and self-monitor

behavior. Research shows that children who are exposed to trauma, specifically *interpersonal* or

familial trauma (including physical abuse, sexual abuse, and/or witnessing domestic violence)

have poorer executive functioning as compared with those who have not experienced trauma

(DePrince et al., 2009). Executive functioning has both academic and social implications for

children at school. Children with impairments in executive functioning may appear inattentive in

the classroom and may have trouble integrating information that they learn to novel situations.

Due to poor working memory and self-monitoring skills, they may also exhibit disruptive

behaviors in the classroom. These deficits have social implications as well. Children who have

experienced trauma may have difficulty ignoring neutral stimuli, and are likely to instead

interpret stimuli as threatening (DePrince & Freyd, 1999). Combined with impairments in

executive functioning, this may lead to increased aggression towards peers and difficulty making

friends.

Social and emotional functioning and behavior control. In thinking about the ways in which children's learning is affected by trauma, we might say that cognitive and neurobiological processes prime a child for experiencing the school environment. Once a child is at school, and is expected to perform according to school expectations, an additional set of psychological, behavioral and social issues may arise. Experiencing trauma puts children at risk for experiencing both internalizing and externalizing symptoms at a higher rate than their peers (Ford, Gagnon, Connor, & Pearson, 2011). Although both genders display both internalizing and externalizing symptoms (often comorbidly) as responses to trauma, girls are more likely to display internalizing symptoms (Costello, Mustillo, Erkanli, Keeler & Angold, 2003) and boys externalizing symptoms (Card, Stucky, Sawalani & Little, 2008).

Internalizing symptoms may or may not be obvious to school personnel, but they have the ability to seriously affect learning and socialization. Depression is at least 3 to 5 times more common in individuals with histories of child maltreatment. Anxiety, specifically in social settings, is also more likely to occur in children who have experienced trauma (Edwards, Holden, Felitti, & Anda, 2003). The development of depression may be related to the alteration of a person's worldview following a traumatic event (Lilly, Valdez, & Graham-Bermann, 2011). Whereas people who have not experienced trauma tend to believe that the world is a just place and others are generally benevolent, trauma may cause the victim to explain the traumatic event through altering this worldview and thinking that the world is unsafe and unjust. In school, young children may appear sad, defiant, or may report that they are frequently ill although there is nothing medically wrong (termed somatization). Older children may seem sad, defiant, or very tired and may struggle with attendance. Anxiety can be manifested in many ways in the school setting including social withdrawal, the inability to feel safe at school, and a

preoccupation with the location of certain adults (i.e., a parent or teacher). Both anxiety and depression may hinder children's ability to form relationships with peers and participate in classroom activities. They may also result in increased numbers of absences which can consequently lead to academic disengagement and failure.

While internalizing behaviors are quite serious, externalizing behaviors tend to receive more attention in schools due to their more disruptive nature. Ford, Gagnon, Connor and Pearson (2011) found that experiencing interpersonal trauma was correlated with elevated externalizing behavior scores on the Child Behavior Checklist (CBCL). These behaviors which include impulsivity, aggression, defiance and irritability may be due to consistently higher-than-normal levels of cortisol present in trauma victims, which may lead to constant vigilance (always ready for a "fight or flight response"; DeBellis & Thomas, 2003). Increased externalizing behaviors may set children up for increased discipline referrals and more frequent in and out of school suspensions than their peers.

The combination of behavioral and psychological difficulties often makes it challenging for children who have experienced trauma to make and maintain friendships at school. Peers may reject children who show high levels of impulsivity and aggression, and school staff may become frustrated with repeated internalizing and externalizing behavior problems combined with apparent difficulty learning academic material (Mkami, Reuland, Swaim & Jia, 2013). Children who have high levels of anxiety or depression may not feel capable of entering into social situations. Additionally, children who have experienced trauma may experience lower self-efficacy, defined as the belief that they are capable of reaching goals and completing tasks that they set out to do. By ages 6-8 children who have been victims of maltreatment begin to report that they feel less competent and less accepted compared with reports of their peers who have not

experienced trauma (Cicchetti, Beeghly, Carlson & Toth, 1990). This lack of self-efficacy can manifest itself in many different ways at school, but is often seen as an inability to engage with the environment.

Secondary Trauma

In viewing trauma as a system-level issue, it is necessary to address it not only in children, but in caregivers as well (i.e., teachers within the school setting). Addressing secondary trauma through the ARC Model is an integral part of a trauma-systems training. In fact, the first building block, *caregiver affect management*, is placed prior to subsequent building blocks, as caregivers are highlighted as children's primary support. In order to ensure that caregivers are responding effectively to their children's needs, they must first address their own mental health and wellbeing. Caregivers and teachers, those who spend extended periods of time with child victims of trauma, are at risk for feeling the effects of trauma even if they have never experienced a traumatic event themselves. This is generally termed secondary or vicarious trauma. Figley (1995) described the effects of secondary exposure to extreme traumatic stress, or to moderate traumatic stress over time are similar to those effects of trauma experienced by the primary victim including flashbacks, nightmares, and intrusive thoughts. These symptoms can affect individuals on a personal level, influencing feelings of safety and self-actualization. Experiencing secondary trauma can influence the quality of services that caregivers provide and can lead to burnout (Pearson, 2012). This is especially relevant for teachers, as the student/teacher relationship influences many student outcomes. A teacher who is experiencing secondary trauma is less likely to be emotionally available for students, and less able to support them in their social emotional and academic development (Pianta, 2003).

Secondary trauma in the educational field has been scarcely researched, but existing educational studies support the wider literature from the mental health arena. A study of secondary traumatic stress of mental health workers responding to the terrorist attacks of September 11, 2001 found that spending more time with trauma victims, having less professional experience, and working with children all contributed to the increased development of trauma symptoms (Creamer & Liddle, 2005). While this study was specific to mental health workers following a large-scale traumatic event, there is some support that teachers face similar issues. Alisic, Bus, Dulack, Pennings, and Splinter (2012) found weak evidence for the fact that more teaching experience, attendance at a trauma-focused training, and being responsible for fewer children that had experienced trauma were all variables that contributed to reporting less secondary traumatic stress. This study was a first attempt at quantitatively investigating teachers' ability to deal with traumatic stress responses in their students. Although the effect size was small, additional qualitative data suggested that half of teachers interviewed (N=382) stated that their own emotional reactions prevented them from engaging appropriately with their students.

Secondary trauma has also been reported among educators who work with youth in the juvenile justice system (Hatcher, Bride, Oh, King, & Catrett, 2011). While no research exists regarding secondary trauma for those working with young children, it is hypothesized that the key variables mentioned above, including professional experience, availability of trauma training, the number of hours spent working, and the number of children who have experienced trauma in the individual's care, will influence the teacher' or caregiver's development of secondary trauma. Pianta and colleagues (2008) demonstrated that the interactions between teachers and students who have experienced trauma can be improved by appropriately designed

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professional development.   Ideally this professional development would be consistent across the

school year and focused on the interactions of students and teachers, as well as on the

interactions between adults in the classroom environment. This may take the form of modeling

effective interactions, and providing consistent and effective feedback about classroom practices.

Trauma-Related Resilience

Traumatic events occur frequently in the lives of both children and their caregivers.

However, there is substantial evidence for the positive outcomes of building resilience in both

parties. Resilience theory recognizes that negative life events occur and focuses on how to

prevent negative sequelae from those events from happening (Rutter, 1987). Resilience is

separate from mental health, but is dependent on one's mental state, existing in the presence or

absence of a mental disorder (Zautra, Hall, & Murray, 2010). Rutter acknowledges four

variables that contribute to developing childhood resilience, and these same factors have been

applied to professional resilience as well. The first is risk reduction, a way to minimize overall

exposure to stressful events before they occur. Secondly, the idea of avoiding negative chain

reactions. This idea stems from the fact that the initial event does not always cause negative

effects, but subsequent events do. For example, witnessing a domestic dispute between a child's

parents may be mildly upsetting, whereas being taken out of the home may cause more severe

trauma. Third, Rutter identified the development of self-esteem and finally openness to life

opportunities. Horwitz (1998) emphasizes the importance of these factors in the building of

resilience in both children and adults that work closely with children.

Historically, "resiliency" has been defined by how individuals cope based on their

positive thinking or other within-person factors (Masten, 1994). However, more recent research

suggests an environmental perspective of resilience is more appropriate. Ungar (2013) through

his work on traumatic stress, resilience and culture argues that "nurture trumps nature when coping with trauma" (p. 258), coming to the conclusion that "recovery from trauma is not an individual capacity alone but a function of the individual's social ecology to facilitate recovery and growth" (p. 258) That is, context and culture are largely responsible for how children cope with adverse situations. Regardless of individual differences, a supportive environment can promote healthy development even in the face of trauma. Some widely accepted characteristics of supportive environments include social cohesion of schools and neighborhoods, trust in neighbors, access to and positive attitude towards the use of services that promote wellbeing, and a relatively shared sense of purpose among community members. However, the specific ways in which the environment interacts with the individual depends on both individual and broader cultural factors. For example, in HIV-positive South African mothers, resilience has been found to be partly attributed to the practice of these mothers physically and emotionally distancing themselves from their children prior to the mothers' death. Culture, including values, beliefs, and everyday practices, affects how individuals cope with adversity. Therefore, which specific factors are found to be protective in the environment will be specific to that culture. However, Ungar's conclusions regarding the importance of the child's environment in fostering resilience are universal.

When thinking specifically about resilience among caregivers of individuals who have experienced trauma, self-efficacy regarding caregivers' ability to cope with the trauma has been found to positively influence trauma symptomology (Luszczynska, Benight, & Cieslak, 2009; (Prati, Pietrantoni, & Cicognani, 2010; Bonach & Heckert, 2012). High levels of self-efficacy can give caregivers control over their environment if they feel as though they can master the demands of dealing with stressful events and their aftermath (Bandura, 1997). More recent

research suggests that beliefs about one's ability to cope with demands following a traumatic event may actually be related to his or her ability to recover (Benight & Bandura, 2004), and a recent review of the literature shows negative associations between negative consequences of traumatic stress and self-efficacy (Luszczynska, Benight, & Cieslak, 2009). Among individuals who are at risk for various exposure to trauma, high self-efficacy is correlated with improved quality of life (Prati, Pietrantoni, & Cicognani, 2010), and lower levels of overall secondary traumatic stress (Bonach & Heckert, 2012). Self- efficacy may also be correlated with negative thoughts about the self and the world based on indirect exposure to trauma (Cieslak et al., 2013).

The School as a Trauma-informed System

Literature on the school as a trauma-informed system is based on the model of the child welfare system. According to the National Child Traumatic Stress Network (NCTSN), a group of treatment and research centers funded by the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration (SAMHSA), a trauma-informed child welfare system

> *is one in which all parties involved recognize and respond to the varying impact of traumatic stress on children, caregivers, families, and those who have contact with the system. Programs and organizations within the system infuse this knowledge, awareness, and skills into their organizational cultures, policies, and practices. They act in collaboration, using the best available science, to facilitate and support resiliency and recovery (*Chadwick Trauma-Informed Systems Dissemination and Implementation Project National Advisory Committee, 2011, p.1).

Hopper, Bassuk, and Olivet (2009) offer another consensus-based definition of trauma-informed care as a "strengths-based framework that is grounded in an understanding of and responsiveness to the impact of trauma, that emphasizes physical, psychological, and emotional safety for both providers and survivors, and that creates opportunities for survivors to rebuild a sense of control and empowerment" (p.133).

Practices similar to those represented in the child welfare model are beginning to be implemented in schools. Models that facilitate the provision of mental health services in schools, specifically those that focus on prevention and early intervention, are becoming increasingly popular. Of children who receive mental health services, the majority of them do so in schools (Rones & Hoagwood, 2000). The New Freedom Commission on Mental Health, commissioned by President Bush (2003) determined that services for mental health disorders are often implemented too late. The Affordable Care Act has proportioned funds for increased identification and treatment of mental health disorders in schools (Smith, 2013). While the types of services that can be provided in school settings vary from those that are offered in clinical settings, services offered in schools are more likely to be taken advantage of by students and their families. One study randomized children to receive a therapy intervention either in school or in the clinic. Results showed that 98% of children in the school-based intervention actually began the intervention, whereas only 37% of those in the clinic-based intervention attended their intake session (Jaycox et al., 2010). It is evident that the best place to reach children and families is at school.

As laws are implemented that reflect the changing needs of society, a public health model of service delivery has become the most practical way to provide services. Within this model, services are provided systematically in a tiered framework (Merrell & Buchanan, 2006; see Figure 3). This system addresses students' needs specifically and systematically, providing students with the amount of support that they require. Students who are not served appropriately at the universal level are able to access more intensive remediation services.

Evidence for effective mental health interventions within the school setting supports the school as a forum for mental health service provision. Effective interventions can take place at

the classroom, school, and system levels. At the classroom level, mental health interventions are often implemented as curricula designed to focus on one aspect of need specific to students. Examples of such curricula include Al's Pals (Geller, 1999), a curriculum to build social emotional skills in young children, and Conscious Discipline (Bailey, 1994). Small group interventions, such as Cognitive Behavior Therapy for Trauma in Schools (C-BITS; Jaycox, Kataoka, Stein, Langley, & Wong, 2012) can also be implemented at the classroom level. In many schools, especially Head Start preschools, a primary mode of school-wide mental health service provision is that of the mental health consultant. This individual is typically a psychologist or social worker that checks in with teachers on a regular basis and coaches them on how to handle certain issues. This model allows schools to effectively handle mental health issues in a more individualized way while still accessing all students (Crusto et al., 2013). The system level goes above the school level and includes all building staff in addition to parents, administrators, and other individuals that interact with the student on a regular basis. Providing mental health services at the level of the system tends to be more difficult, as it involves more planning and participation. One example of an intervention program that can be implemented at the level of the school system is The Incredible Years (IY; Webster-Stratton, 2001). The Incredible Years is a training program for parents, teachers and children. Through a series of trainings, participants learn ways in which to reduce challenging behaviors and increase children's social-emotional and self-control skills. Research on the Incredible Years program shows that it is effective as a treatment program for children (ages 3-8) diagnosed with oppositional defiant disorder and Attention Deficit Hyperactivity Disorders (ADHD; Webster-Stratton, Reid, & Beauchaine, 2011). Regardless of the level at which the intervention takes

place, it is apparent that the school is a place for the prevention of later mental health disorders, the promotion of well-being, and mental health intervention.

Schools have been shown to effectively deliver trauma-specific interventions, as the school environment can potentially fulfill children's need for safety, attachment, and consistency, three of the most important components for children recovering from trauma (Swick, Knopf, Williams, & Fields, 2013). However, literature on specific systems-level, trauma-specific interventions in schools is still scarce. Cohen and colleagues (2009) implemented a tiered intervention, or "stepped trauma pathway" called Project Fleu-de-Lis (PFDL), following Hurricane Katrina. PFDL was designed as a school-based mental health service model for children who have experienced large-scale disasters, both natural and man-made. After Hurricane Katrina, PFDL sought to provide both intermediate and long-term school-based mental health services. In order to do that PFDL linked local social service agencies, schools, researchers, and school-based clinicians with the goals of (1) implementing school-based intervention services to children exposed to trauma, (2) Providing school-based screening and assessment along with referral for those students that could not be served within the school setting, (3) working with leaders at the national level to improve access to mental health care and trauma-informed treatments within schools, and (4) providing evidence for the effectiveness of the three-tiered model of service provision. All children, pending parental consent, were screened for trauma symptomology following the hurricane. All classrooms were then provided with mental health consultation services as a first tier intervention. These services also served as triage, so students could be provided with the most relevant treatment to their needs. Classroom-based Intervention (CBI; Macy, Macy, Gross, & Brighton., 2006) was also being implemented in many classrooms and served as an additional tier 1 intervention. Students

who still needed additional support were provided with a group intervention (tier 2), which was Cognitive Behavioral Intervention for Trauma in Schools (CBITS; Jaycox, Kataoka, Stein, Langley, & Wong, 2012), or an individual intervention (tier 3; Trauma-focused Cognitive Behavioral Therapy [TF-CBT], Cohen et al., [2006]), depending on their needs. This study showed an example of a seemingly effective way to provide mental health services to a large number of students (22,000 students were under PFDL's "umbrella of care") following a natural disaster. However, it is not apparent which portions of the intervention were effective or whether or not students were provided with the correct services, as quantitative outcome measures were not presented.

The Attachment, Self-Regulation, Competency (ARC) Model

One model that has been adapted and implemented across contexts to create trauma-informed systems is the Attachment, Self-Regulation, Competency Model (ARC; Blaustein & Kinniburgh, 2010; Kinniburgh et al., 2005) framework. The ARC Model takes a behavioral definition of trauma, defining the "trauma response" as the physiological and behavioral responses which fulfill children's needs to seek safety in the face of danger. Working from this behavioral definition, ARC strives to strengthen skills across three domains: (1) attachment, (2) self-regulation, and (3) competency both in children and families who have experienced trauma as well as systems that work with clients who have experienced trauma. Within these three domains, there are ten additional "building blocks" or components of intervention which are: (1) caregiver affect management, (2) attunement, (3) consistent response, (4) routines and rituals, (5) affect identification, (6) modulation, (7) affect expression, (8) executive functions, (9) self-development and identity, and (10) trauma experience integration (Blaustein & Kinniburgh,

2010). The tenth "building block," *trauma experience integration,* emphasizes the importance of

integrating skills learned across the 9 building blocks to help children and caregivers create an

integrated understanding of self. The inclusion of each of the building blocks is based on those

factors which promote resilience and competency throughout development (e.g., Cicchetti &

Curtis, 2007; Masten, 2001). The nine building blocks are explained in further detail in Table 3

along with the corresponding outcome measures of the present study. Each building block is

also described in depth below. Descriptions are based on Blaustein & Kinniburgh's (2010)

review of each area. For additional research support of the clinical utility of each building block,

please refer to above literature review.

Caregiver affect management. The purpose of caregiver management of affect is to

support the child's caregiving system (parents or professionals) in dealing with their own

emotional responses so that they are therefore able to support the children for whom they care.

This building block serves as the foundation for all other building blocks, as when a caregiver is

able to modulate his or her affect, he or she is more able to attune to the child, respond

consistently, and foster competency in the child. Children who have experienced trauma often

struggle to express emotions appropriately, and struggle with forming relationships. Some

specific behaviors and ways of interacting that may make it challenging for caregivers to respond

consistently and appropriately are (1) a child's triggered responses to caregiver, (2) anger and

opposition, (3) demand for attention, (4) patterns of approach and rejection, and (5) extreme

emotional responses to stressors. Caregivers may respond to these behaviors by feeling rejected,

frustrated, or incompetent. He or she may feel guilty regarding the experiences of the child or

even angry at the child for his or her inability to control his or her emotions. When intervening

with caregivers regarding their affect management, the goal is to normalize the caregiver experience, and provide support for the caregiving system so that the child can be supported.

Attunement. Attunement is the practice of supporting the child's caregiving system in learning to appropriately respond to children's actions, communications, needs, and feelings. As a result, it is often the case that children become more able to accurately read caregiver responses and react appropriately. Children who have experienced trauma often have trouble communicating needs and/or coping with emotions. Therefore, they often communicate needs and wants with behaviors instead of with words. An important component of attunement is training caregivers to interpret the function behind their child's behavior and therefore enable them to respond more effectively. Triggers, or environmental cues that remind children of a previous trauma, also need to be effectively identified by caregivers. Intervention efforts in the area of attunement are focused on (1) understanding the role of child vigilance to caregiver expression, which may lead to moments of misunderstanding between caregiver and child, (2) understanding triggers, (3) building a repertoire for understanding children's communication, (4) reflective listening skills, and (5) putting it all together by creating a plan for what to do when a child becomes triggered.

Consistent response. Support the caregiving system in exhibiting predictable, safe, and appropriate responses to children's behaviors in a way that is sensitive to the influence of past experiences on current behavioral responses. This building block is particularly important for children who have experienced trauma, because predictability of caregiver response is one of the most important aspects for children to feel safe. Many traumatic situations carry with them a great sense of unpredictability and chaos. They may attempt to feel safe and control their environments and others around them by behaving in certain ways that can actually be

maladaptive in certain environments. However, when children feel as though they can predict the responses to certain behaviors, they will begin to regain a sense of control over their environments, and will be able to relax their vigilance and control, instead focusing their energy elsewhere. Intervention efforts to build consistent caregiver responses place emphasis on creating an environment focused on consistent strategies for praise and redirection alike. Although not all strategies will work for all children, it is important that caregivers have a variety of effective strategies to choose from and implement chosen strategies consistently.

       Routines and rituals. Building routines and rituals strives to build routine and rhythm into the lives of children and families. Just as with striving to create a consistent caregiver response, building routines and rituals is important in order to infuse children's lives with a sense of predictability which translates into feeling safe. Children who have experienced trauma often have difficulty dealing with transitions and may feel the need to try to control every facet of their daily lives. When children feel vulnerable and insecure, they often live their lives focusing on survival instead of developing appropriately. Routines can be conceptualized as a "rhythm of daily life." When working with a child who has experienced trauma, the most effective routines should be centered on times that were previously associated with danger, conflict and/or fear, such as bedtime or mealtime.

       Affect identification.   Shifting from focusing on intervening with the caregiving system, affect identification focuses on working with children to build an awareness of internal experiencing, by learning to identify emotional states, and understand the underlying causes of these emotional states. Children who have experienced trauma will likely have trouble accurately identifying emotional states. They may only be able to name a few emotions, or they may say that they are "fine." Often these children will refrain completely from engaging in

discourse surrounding emotional states, instead conveying behavioral expressions of their

emotional experiences. Further, it is common for children to lack understanding regarding

emotional states and the events that cause them. For example, a child may be continuously

victimized because he does not understand that his actions are likely to elicit emotional responses

from his peers. Additionally, children who have experienced trauma often appear

"hypervigilant," as children also have difficulty identifying others' emotions. Some children

may be selectively tuned into certain experiences such as those with a high perceived threat of

danger. Intervening in this area must begin with identification of emotions in self and others.

This involves building an emotion vocabulary, connecting emotions with experiences and bodily

sensations, and contextualizing emotions both internally and externally. Once children have an

understanding of basic emotions, they can begin to understand their triggers and begin to

modulate their reactions.

Modulation. Once children are able to identify emotions, they can begin to develop

strategies to manage and regulate them, eventually enabling them to maintain a comfortable state

of arousal. This is known as modulation. When faced with stressful experiences, children are

forced to cope with high levels of arousal. Without proper modulation skills to manage this

arousal, children either do not regulate at all and are consistently aroused, or regulate their

emotions to the extent that they consistently appear "flat." Children who have experienced

trauma may also try to rely on external methods to self-regulate through substance use or self-

injurious behaviors. Enabling children to move towards controlling their emotions involves

several strategies including identifying levels of arousal, identifying changes in state (i.e. starting

to feel calmer), understanding how emotional experiences effect the body's energy and levels of

arousal, and finally identifying strategies to manage changes in state (i.e., deep breathing to feel

calmer). Children will also need to learn appropriate levels of arousal and appropriate modulation per their context. For example, an appropriate level of arousal in a classroom is likely different from that on the playground or even in the community, particularly if the community is not safe and requires a certain amount of vigilance.

Affect expression. This building block is designed to help children build skills and tolerance for sharing emotional experience with others. Basic human relationships are built on the sharing of emotional responses. An inability to do this can affect the formation of healthy attachments and the building of effective relationships. Children who have experienced trauma may not share emotional experiences with others instead saying "everything is fine" (putting up a "false front"), isolating themselves, or minimizing the experiencing of any emotion. These children are also more likely to express emotions in diverse ways such as through somatic or behavioral expressions. Other children may over communicate, sharing information indiscriminately without awareness of appropriateness or boundaries. The goal of intervention in affect expression is supporting children to fulfill their emotional and practical needs by effectively sharing emotional experience with others. Affect expression must be taught in conjunction with effective modulation, as it is easier to convey emotion when in a calm state.

Executive functions. This building block focuses on working with children to act using higher-order cognitive processes to problem solve and to make active choices that work toward achieving goals as opposed to reacting based solely on emotion. Executive functions help humans to act thoughtfully. They include skills such as delaying and inhibiting responses, active decision making, anticipating consequences, evaluating outcomes, and generating alternative solutions. In the absence of these higher-order processes, we simply act and react. Executive functions help children participate actively and predictably in their own lives. The prefrontal

cortex is considered the seat of cognitive functioning. Experiencing trauma as a young child can affect the normal development of the prefrontal cortex and therefore the typical development of executive functions. Children who have experienced trauma are more likely to exhibit fear responses as opposed to cognitively rational responses. In order to build executive functions through direct instruction in problem solving. Learning how to solve problems and subsequently learning how to apply those skills to new situations is the focus of intervention efforts.

Self-development and identity. Finally, it is important to support children in building a sense of personal identity, including identification of unique personal qualities, and support to imagine and work toward a range of future possibilities. As a part of normal development, children incorporate experiences into their sense of self. Children who are routinely abused, neglected, rejected or ignored internalize those feelings and use them to build their self-concepts. Further, children who have experienced trauma often have multiple senses of self that relate directly to emotional states. As opposed to seeing themselves as complete beings, children may have different "selves," for example, the "angry self," the "frightened self," and the "okay self." An impaired sense of self is one of the earliest signs of childhood trauma, and will continue across the lifespan if not addressed. Intervention efforts focus on encouraging children to see themselves as unique individuals by identifying personal attributes. Additionally, children are coached to begin to see their "positive self" through building the internal capability to view positive aspects of self. Finally, children are encouraged to orient themselves towards thinking about the future by setting goals and to consider links between the present and future.

Implementation of the ARC framework. The implementation of the ARC framework on the systems level has been used widely across treatment settings with children who have experienced a wide range of traumatic experiences including children in the child welfare system

and in residential treatment facilities (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013). These studies show increases in placement permanency and a drop in total T-scores of the Child Behavior Checklist (CBCL; Achenbach, 1991) indicating improvements in externalizing and internalizing behaviors. Recently, this framework has been adapted for implementation with young children in the outpatient clinical setting. Results also showed a statistically significant drop in CBCL total scores as well as increased permanency placements for children who received treatment when compared with those who did not (Arvidson et al., 2011).

The ARC framework has also been adapted for use in the Head Start preschool setting through the Head Start Trauma Smart (HSTS) program, which has been implemented widely in one state. HSTS is a cross-systems partnership that works at the system level in order to provide trauma support for children within their Head Start classrooms. The goal of HSTS is to foster social and cognitive development, decrease the stress of chronic trauma, and to create a trauma-informed culture centered on Head Start classrooms. In order to achieve this goal, HSTS involves four components. The first component is training by HSTS therapists to all people who surround the child (e.g. teachers, parents, administrators, bus drivers). These trainings are based on the 10 ARC building blocks that have been translated for implementation with a lay audience. Secondly, children who meet criteria based on measures of behavior and trauma symptomology can be referred for intensive trauma-focused interventions. These interventions are based on the ARC and TF-CBT models. Third, classroom consultation by HSTS therapists is provided to teachers and students on an as-needed basis. Finally, staff peer-based mentoring helps teachers and supervisors to support each other. Holmes and colleagues (2014) collected program evaluation for HSTS implemented on three urban Head Start programs, including 400 staff

members serving almost 1,100 children. For the purpose of the study, outcomes of 150 children who were referred for intensive services were investigated. Dependent measures included the Childhood Trust Event Survey for Caregivers (CTES), the Child Behavior Checklist (CBCL), and the Classroom Assessment Scoring System (CLASS). Results note statistically significant changes from pretest to posttest on the CBCL teacher report in the areas of attention problems, externalizing problems, attention deficit/hyperactivity problems, and oppositional defiant problems. Statistical significance for CLASS scores could not be calculated, but showed a positive trend, indicating improved classroom relationships. The present study builds from Holmes and colleagues' (2014) work as it attempts to implement a similar intervention while strengthening the study's methodology through an intervention-as-usual comparison group.

Research Questions and Hypotheses

Agency/ building level. In order to address children's exposure to trauma comprehensively, a system- level intervention approach was taken in this study. Pre and post assessment was conducted using the Trauma-Informed Agency Assessment.

Question 1: What changes are noted in the trauma supplement intervention condition from pretest to posttest regarding the agency's (i.e., director of preschool programs, mental health consultants, building supervisors) knowledge and implementation of trauma-informed practices as measured using the Trauma-Informed Agency Assessment (TIAA)?

It has been demonstrated that although Head Start agencies are aware that many students have experienced trauma, they are not prepared to support those students with interventions. This is typically due to lack of coordination of services at the building level or above (Holmes, Levy, Smith, Pinne, & Neese, 2014). The psychoeducational focus of the ARC model serves to

educate staff of the effects of and best practices as related to trauma, therefore orienting the entire system to deal with trauma exposure in a consistent way.

The nature of this question was primarily exploratory, as the TIAA was not analyzed quantitatively, but rather used to lend qualitative support from the system level to a primarily quantitative study. Specific changes were examined across six domains of trauma-informed care, ranging from physical and emotional safety to youth and family empowerment to help gauge the impact of the intervention on the entire system, in addition to the qualitative and quantitative data collected on the teacher and student levels.

Teacher and classroom level. The classroom environment plays an important role in building a trauma-informed system. Teacher ratings of self-efficacy as related to dealing with secondary traumatic stress and classroom climate were measured.

Question 2: What differences exist between pretest and posttest on emotional support, as measured by the CLASS assessment? Can these differences be explained by the intervention condition to which teachers were assigned?

The emotional support domain of the CLASS assessment includes the constructs of a) positive climate, which measures the enthusiasm, enjoyment, emotional connection between the teacher and students, and nature of peer interactions, b) negative climate, including the presence of anger, hostility, or aggression, and c) sensitivity, or how responsive the teacher is to students' needs in the classroom (Paro, Pianta, & Stuhlman, 2004). The current study used this scale to measure the effect of the trauma supplement intervention on how teachers interact with their students, as Pianta (2003) demonstrated that the student/teacher relationship is primarily responsible for a number of student outcomes.

It was hypothesized that teachers in the trauma supplement intervention condition would demonstrate higher levels of emotional support in their classrooms as measured by the CLASS emotional support domain at posttest when compared with ratings of teachers in the comparison condition. The *Attachment* domain of the ARC Model specifically addresses Caregiver Affect Management and Attunement, both of which relate to preventing secondary trauma and leveraging teachers' coping skills to attune more effectively to students. Research shows that secondary trauma can cause caregivers to experience trauma symptomology almost to the degree that the primary victim experiences it. This can lead to difficulty in reacting appropriately to the primary victim (the child), and can also lead to caregiver burnout (Pearson, 2012). However, appropriately designed professional development can improve the type and quality of teacher-student interactions (Pianta, Mashburn, Downer, Hamre, & Justice, 2008), such as those that have been affected by repeated exposure to secondary traumatic stressors.

Question 3: Do teacher ratings on the Secondary Trauma Self-Efficacy Scale (STSES) vary by intervention condition?

Self-efficacy regarding caregivers' ability to cope with the trauma has been found to positively influence trauma symptomology (Luszczynska, Benight, & Cieslak, 2009; (Prati, Pietrantoni, & Cicognani, 2010; Bonach & Heckert, 2012). Trainings based specifically on caregiver management of affect, attunement, and modulation focus specifically on teaching coping skills related to the experiencing of trauma. It was hypothesized that teachers and teacher assistants in the trauma supplement intervention condition would rate themselves as feeling more able to effectively work with children who have been traumatized at posttest and four months following the end of the intervention when compared with teachers and teacher assistants in the

comparison condition, as teachers in the intervention condition will be better equipped to deal with primary and secondary trauma responses.

Question 4a: To what degree did the two teachers, in the intervention-as-usual condition, implement the social emotional curriculum, Al's Pals, with fidelity?

Question 4b: To what degree did the three teachers, in the trauma supplement intervention condition, implement the program as intended? What conditions or aspects of the intervention promoted implementation with fidelity? What conditions or aspects of the intervention hindered implementation with fidelity?

Questions 4a and 4b are exploratory in nature, intended to lend strength and support to teacher-level quantitative analyses. The importance of implementation fidelity has been widely demonstrated within school-based academic and mental health interventions (Ty, McIntosh et al., 2013; Upah, 2008). The Follow-Up Questionnaire administered to teachers in the treatment condition will give additional insight into specific strengths and challenges related to the intervention. Specifically, which pieces of the intervention led to high implementation fidelity, and which were more challenging to implement.

Child level. Questions 5a and 5b investigate the differences between the trauma supplement intervention group and intervention-as-usual comparison groups on ratings of protective factors, behavioral concerns, and trauma symptomology. Research has demonstrated that the implementation of a trauma-informed, systems-level intervention in the Head Start setting has positively influenced teacher ratings of children's behavior in the areas of Attention Problems, Externalizing Problems, Attention Deficit/Hyperactivity Problems, and Oppositional Defiant Problems (Holmes, Levy, Smith, Pinne, & Neese, 2014). Further, Arvidson and colleagues (2011) found a statistically significant drop in CBCL total scores among those

children who received treatment based on the Attachment, Self-Regulation, and Competency (ARC) framework.

Question 5a: Among children who have experienced trauma, what are the differences between the trauma supplement intervention group and intervention-as-usual comparison group on the T-scores of the Externalizing and ADHD Problems *and* Internalizing Problems *subscales of the BASC-2 PM from pretest to posttest (i.e., 4 months)?*

Experiencing trauma is correlated with increases in externalizing and internalizing behaviors (Pearson, 2011). These behaviors which include impulsivity, aggression, defiance, irritability and anxiety may be due to consistently higher-than-normal levels of cortisol present in trauma victims, which may lead to constant vigilance (always ready for a "fight or flight response," DeBellis & Thomas, 2003). Because the trauma supplement intervention provides teachers with the knowledge necessary to address the root of these challenging behaviors, it was hypothesized that children who have experienced trauma in the trauma supplement intervention condition will show greater decreases in T-scores on the BASC-2 PM from pretest to posttest compared with those in the intervention-as-usual condition.

Question 5b: Among children who have experienced trauma, what are the differences between the trauma supplement intervention and intervention-as-usual comparison conditions on the T-scores from the TPF and BC scales of the DECA-P2 from pretest to posttest (i.e., 4 months)?

The protective factor scales on the DECA-P2 are indicators of children's abilities to cope in the face of adversity. The Total Protective Factors (TPF) scale is an overall indicator of a child's resilience. Of all of the DECA-P2 scales, the TPF scale is the most efficient way to measure a child's overall social and emotional strengths as they relate to resilience, as several resiliency-related constructs are organized into one scale (LeBuffe & Naglieri, 2012). Research

has demonstrated that children in Head Start who have experienced trauma improve in behavioral manifestations of resilience, including improved attention and decreases in externalizing behaviors when attending school in a building that had created a trauma-informed system (Holmes, Levy, Smith, Pinne, & Neese, 2014). As is consistent with the ARC framework, the TPF scale includes 18 items measuring self- regulation and attachment relationships. An additional 9 items on the scale measure social initiative. According to the culture/ context view of resilience, creating an environment that fosters the strengthening of these protective factors is essential to helping children recover from traumatic events. Increasing protective factors across time has the potential to improve developmental outcomes in those who have experienced trauma (Ungar, 2013).

While the TPF scale measures resiliency-related constructs, the Behavior Concerns (BC) scale screens (i.e., 10-items) for the behavioral manifestations of the traumatic stress reaction. There are many reasons why children who have experienced trauma tend to have more severe externalizing behavior concerns than their peers. DeBellis and Thomas (2003) suggest it is due to heightened baseline cortisol levels leading to constant hypervigilance and "fight or flight." It has also been demonstrated that children who are maltreated are more likely to form insecure and disorganized attachments, and are therefore less likely to look to and rely on their caregivers for behavioral regulation (Schore, 2002). While the BC scale does not offer insight onto the root cause of the behaviors, it will offer valuable screening information regarding the behavioral manifestations of students who have experienced trauma across the two conditions.

The ARC Model addresses ways to support each of the protective factors, thereby reducing behavior concerns in children, specifically when they have been affected by trauma. It was hypothesized that children who have experienced trauma in the trauma supplement

intervention condition will show greater increases in T-scores on the TPF scale and greater decreases in BC from pretest to posttest compared with children who have experienced trauma in the intervention-as-usual condition, as these teachers in this condition will not have received the specialized training.

Question 6: Among children who have experienced trauma, in what ways do caregiver ratings of children's PTSD symptoms on the Trauma Symptom Checklist for Children (TSCYC, Short Form) moderate *the change from pretest to posttest on behavioral outcome measures (subscales of the BASC-2 PM) for children in the trauma supplement intervention condition?*

The Trauma Symptom Checklist for Young Children (TSCYC) has successfully assessed for trauma symptomology in preschool settings (Pollio, Glover-Orr, & Wherry, 2008). While no studies to date have used the TSCYC to measure the impact of intervention based on the ARC Model, similar measures of social emotional indicators have shown improved social emotional functioning and improved resiliency following implementation of the ARC Model across settings (e.g. Holmes, Levy, Smith, Pinne, & Neese, 2014; Arvidson et al., 2011). Children who exhibit PTSD symptoms, specifically intrusion, avoidance and arousal are often misdiagnosed as having behavior disorders such as Attention Deficit Hyperactivity Disorder (ADHD) or Oppositional Defiant Disorder (ODD) due to the overlap of some symptoms (Levine & Kline, 2007). However, traditional behavioral treatments for children with PTSD often fail, as these treatments do not correctly address the etiology of the symptoms (van der Kolk, Roth, Sunday, & Spinazzola, 2005). It was hypothesized that ratings on the TSCYC, Short Form would moderate ratings of behavior, such that the more elevated the child's TSCYC score, the greater the reduction in BASC-2 PM scores.

Question 7: Is there a difference in the change in the Total Protective Factors (TPF) ratings on the DECA-P2 between pretest and posttest for children in the trauma supplement intervention condition who have experienced trauma when compared with their peers in that condition who have not experienced trauma?

Models of trauma-informed group and individual treatment, such as trauma-focused cognitive behavioral therapy (TF-CBT) imply the necessity for addressing the traumatic event directly through psychoeducation and direct treatment (Cohen, Mannarino, & Deblinger, 2006).

It was hypothesized that children who have experienced trauma and are in the trauma supplement intervention condition would benefit from being part of the intervention more than those children who have not experienced trauma. Research shows that trauma-informed systems infuse trauma education at every level of the system, therefore leading to an increased sense of permanency and safety, and increased resiliency among those who have experienced trauma (Hopper, Bassuk, and Olivet, 2009). It is therefore hypothesized that resiliency gains made and measured by the TPF scale will be greater than those made by children with no trauma background.

CHAPTER 3

METHOD

Participants

  Agency/Building level. The agency-level participants in this study, which were implicated in the trauma supplement intervention, included the Director of Preschool Programs (N=1), Mental Health Consultants (N=3), and Building Supervisor (N=1). Agency-level data was also collected through observation of building and agency policies and procedures.

  Teacher/ Classroom level. The study also included 5 teachers (N=3 intervention, N=2 comparison) and 5 teacher assistants (N=3 intervention, N=2 comparison) at their Head Start sites. Therefore, the total sample of teachers and assistants combined was 10 (6 intervention, 4 comparison). Each classroom consisted of between 15 and 20 students, and each classroom was staffed with one teacher and one teacher assistant. One classroom in the comparison condition had different students in the morning and afternoon. Classrooms in the intervention condition were all half-day programs. One classroom in the comparison condition was a half-day program, and data was collected in both the morning and afternoon classes. The other comparison classroom was a full-day program.

  Child level. Child participants in this study were 106 (N=53 intervention, N=53 comparison) preschool students and their primary caregivers (N=106; N=53 intervention, N=53 comparison), The original data set consisted of 111 children, but 5 children were excluded due to substantial missing data. Fifty-two children of the 106 included in the analysis (49%) had a reported ACE score of greater than one, placing them in the "trauma condition." Fifty- three children (50%) were in the "no trauma" condition. Trauma condition data for one child (1%) was

not provided. Table 4 provides a breakdown of trauma experience by intervention condition, and Table 5 provides demographic information for each intervention condition.

Sample size estimate. A power analysis using the Gpower computer program (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that a total sample of 107 participants would be needed to detect large effects (f=0.5) with 95% power using an ANCOVA with fixed effects, main effects, and interactions.

Preliminary comparisons between intervention and comparison conditions.

Classrooms were assigned to either an intervention-as-usual comparison (referred to as "comparison condition") or a trauma supplement intervention condition (referred to as "intervention condition"). The comparison condition consisted of the intervention-as-usual social emotional curriculum, Al's Pals, while the intervention condition consisted of Al's Pals in addition to the trauma-specific supplement intervention pilot program. Initial data analysis revealed similarities and differences between the intervention and comparison conditions across the child, teacher/classroom, and agency levels, which were controlled for within the analysis models. It is also noted that caregivers (i.e., parents) of children in the intervention and comparison conditions reported similar demographic information, as the majority of children were Black/ African American (43% of comparison condition; 40% of intervention condition) or white (25% of comparison condition; 29% of intervention condition). Caregivers from across the two conditions also reported similar educational attainment.

Agency/Building level. Qualitative data regarding the readiness to change across levels of the system was collected at pretest using the Trauma-Informed Agency Assessment (TIAA) in both the intervention and comparison sites. Mental health and administrative staff rated low levels of awareness of what trauma is, how it affects the child's development and attachment to

caregivers at both sites. While education regarding the effects of trauma had been disseminated to mental health staff in the past, teachers were not included in this model in a systematic way according to our Head Start collaborators. Staff reported having regular team meetings, but topics of self-care were not addressed. Supervisors were reported as being accessible but not trauma informed in both conditions. There was no clear consensus within the agency overall regarding the perceived importance of adopting a trauma-informed approach, as some staff perceived it as necessary and others did not view it as a pressing issue. Teachers, administrators, and staff at both sites viewed the organizational safety plans, which detail what to do in emergency situations, as well established and universal even between buildings. In regards to awareness of trauma and readiness to change, comparison and intervention conditions were very similar on pretest measures.

Teacher/Classroom level. All teachers in the intervention and comparison conditions identified as White. Teachers in the comparison condition (N=2) had an average of 9 years (SD= 1.41) experience teaching in Head Start, and those in the intervention condition (N=3) had an average of 12 years of experience (SD=10.59). Teachers in both conditions completed the Secondary Trauma Self-Efficacy Scale (STSES), and scores were not statistically different (F[53]=0.39, p=.54) suggesting that teachers within each condition similarly rated their abilities to deal with stress caused by working with children who have experienced trauma.

Observations of the classroom environment by site supervisors (building directors) as rated by the CLASS assessment showed no differences between the intervention and comparison conditions on measures of emotional support (F[3,3]=0.89, p=.42), classroom organization (F[3,2]=1.45, p=.32), or instructional support (F[3,2]=0.52, p=.54) at pretest.

Child level. Caregivers of children in both conditions rated their children's protective factors (Total Protective Factors which involves ratings of initiative, attachment/relationships, and self-regulation) on the DECA-P2 prior to initiation of services. Pretest ratings did not differ significantly between intervention and comparison groups for the Total Protective Factors (TPF) scale of the DECA-P2, t(104)= -0.94, p=.34, the Behavior Control (BC) scale of the DECA-P2, t(105)= .34, or the BASC-2, PM Externalizing and ADHD Problems scale, t(102)= 1.99, p=.48. However, there was a significant difference between intervention and comparison conditions on the BASC-2, PM Internalizing problems scale, such that teachers in the comparison condition rated children's internalizing problems at pretest as more severe (Mean T-score=55) than teachers in the intervention condition (Mean T-score=48), t(102)=3.01, p=.00. Pretest T-scores were controlled for as covariates in the MANCOVA model.

Measures

The dependent variables for this study included variables at the agency, teacher, classroom and child levels. At the agency level, staff completed an amended version of the System of Care Trauma-Informed Agency Assessment (TIAA, qualitative review of responses) at pretest and posttest. At the teacher level they completed the following: (1) Secondary Trauma Self-Efficacy Scale (STSES, total score), (2) direct observation of teacher practices for teachers in the intervention condition (total score and qualitative review of responses), and (3) ratings of teacher satisfaction with the implementation of the trauma supplement materials and their perceptions of its utility (total score and qualitative review of responses). At the classroom level, the dependent measures were (1) the CLASS (rating on 7-point rating scale), and (2) fidelity of adherence to the social emotional curriculum, which was measured through classroom observation by the site coordinators (multiple sources) At the child level, dependent measures

were (1) teacher and caregiver ratings of child behavior using the Devereux Early Childhood Assessment Preschool Program (DECA-P2, TPF and BC Scale T-scores), (2) the Behavior Assessment Scale for Children, 2nd edition Progress Monitor (BASC-2 PM, Internalizing and ADHD/Externalizing Scale T-score), (3) the Childhood Trust Events Survey (CTES, total score), and (4) the Trauma Symptom Checklist for Young Children-Short Form (TSCYC-Short Form, total score).

System of Care Trauma-Informed Agency Assessment-Amended (TIAA- Amended).
The TIAA is a self-assessment designed for children's behavioral health agencies to evaluate current agency practices as well as to progress monitor systems-level interventions in order to gauge their impact. Agency, family, and youth report is typically included. The TIAA is designed to identify areas in which agencies are being successful and other areas in which the agency could improve. This tool has been adapted for use in the Head Start preschool setting by the researcher. The original form of the TIAA measures six elements: (1) physical and emotional safety, (2) trauma competence, (3) cultural competence, (4) commitment to trauma-informed philosophy, (5) trustworthiness, and (6) youth and family empowerment. Table 2 provides additional information regarding each of these domains. In the current study, the TIAA was used to guide structured interviews with the Director of Preschool Programs, Head Start Mental Health Consultants, site supervisors and teachers at pretest and posttest in the intervention condition.

Psychometric data on this tool is limited. Additionally, the changes made to this measure by the researcher render the psychometric properties invalid. Due to the limited availability of psychometric data, this instrument was used to provide qualitative support, regarding systems-level implementation, to a primarily quantitative study. Available psychometric data suggest that

the six domains have moderate to high internal consistency across raters, suggesting that the items in each domain hang together and measure the same concept. Cronbach alphas range from 0.82 (Family Empowerment) to 0.92 (Youth Empowerment; THRIVE Evaluation Committee, 2011). No further psychometric data was available.

Classroom Assessment Scoring System (CLASS). The Classroom Assessment Scoring System (CLASS) is an assessment used by the Federal Office of Head Start to assess the quality of relationships in the classroom environment. These relationships, or process variables, are most directly related to overall improved student outcomes (Pianta, 2003). At the preschool level, the CLASS has three domains. Each domain is further divided into dimensions, indicators, and behavioral markers. Domains follow, with correlated dimensions in parentheses: Emotional Support (positive climate, negative climate, teacher sensitivity), Classroom Organization (behavior management, productivity, instructional learning formats), and Instructional Support (concept development, quality of feedback, language modeling). Studies have shown that higher scores across dimensions of teacher-child interactions predicted achievement growth in pre-K (Howes et al., 2008; (Mashburn et al., 2008), and concurrent levels of student engagement (La Paro, Pianta, & Stuhlman, 2004).

The CLASS includes four cycles of 15-minute observations of teachers and students. Scoring of the CLASS is done through observer ratings of teacher-child interactions across the specified dimensions. Each dimension is described across a 7-point rating scale that includes specific behavioral indicators and descriptions for low, medium, and high levels of each dimension. The CLASS is meant to be used to assess classrooms and not specific children. Head Start teacher coordinators at both sites in the present study have been trained and are

certified and reliable raters. The present study compared the 7-point scale numerical ratings

across the Emotional Support and Classroom Organization dimensions.

Reliability of the CLASS was studied in a sample of Finnish kindergartener classrooms

(Pakarinen et al., 2010). Confirmatory factor analysis conducted with this sample concluded that

the thee-factor solution (Emotional Support, Classroom Organization, and Instructional Support)

explained the classroom quality well. The internal consistency of CLASS scales was high, with

Cronbach's alphas of .93, .88, and .90 for the Emotional Support, Classroom Organization, and

Instructional Support scales, respectively.   Item reliability coefficients were also high.

Validity of the CLASS measure has been established in relation to two other

observational measures: the Early Childhood Environmental Rating Scale (ECERS) and the

Snapshot. The emotional and instructional support CLASS scores were related to the ECERS

total score (r=.52, *p*<.0001, and r=.40, *p*<.0001, respectively). Overall, the CLASS constructs

were moderately related to the ECERS interactions and language reasoning subscales.

Correlations between child engagement on the Snapshot and the CLASS ranged from r=-.17 to

.41 (Paro, Pianta, & Stuhlman, 2004).

Secondary Trauma Self-Efficacy Scale (STSES). In order to measure pretest traumatic

stress of teachers as it relates directly to their work with students who have experienced trauma,

the Secondary Trauma Self-Efficacy Scale (STSES; Cieslak, Shoji, Luszczynska, Taylor,

Rogala, and Benight, 2013) will be administered to teachers and teacher assistants at pretest and

posttest with one minor adjustment. The STSES is composed of seven items all beginning with

the same stem phrase "how capable am I to..." Responses are given on a seven-point Likert –

type scale, ranging from 1 (*very incapable*) to 7 (*very capable*). For the purpose of this study, the

phrase "these people" was changed to "the children I work with." A mean score for the seven

items was computed and analyzed.

The STSES was developed through the use of structured interviews with 30 behavioral

health providers exposed to secondary traumatic stress. Three experimenters independently

developed items related to the assessment of the ability to cope with demands resulting from the

exposure to traumatic stress. Nine items were selected by all three experimenters and were

therefore included in the STSE Scale. However, seven items remain on the scale following

psychometric analysis, as two items previously include shared a large degree of variance with

other items on the scale.

Norms for the STSES were developed across two different studies with participants who

regularly came in direct contact with individuals who experienced trauma (Cieslak et al., 2013).

These individuals included clinical psychologists, counselors and social workers. The total

sample across the two studies was 746 individuals from both Poland (Study 1) and The United

States (Study 2). An original 9-item version of the STSES was tested in these studies using

principal components analysis. This analysis showed four items that were highly correlated and

relatively poor model data fit (RMSEA=.116, 90% lower and upper confidence limits [.087,

.147]; CFI=.936; and SRMR=.047). Confirmatory factor analysis conducted with the seven item

scale suggested good model data sets and therefore two items were deleted from the original

scale.

Internal consistency of the seven- item scale was found to be moderately high (α=.87). In

order to examine the validity of the STSE scale, researchers computed Pearson's correlations

among related constructs (i.e., secondary traumatic stress, social support, secondary traumatic

growth, negative cognitions). STSE was positively correlated with social support (r=.38;

p<.001) and with secondary traumatic growth (r=.16; p<.05; Cieslak et al., 2013). Test-retest

reliability estimates showed a high association between STSE scores at time 1 to time 2 (165

days later; r[191]=.65, p <.001). When compared with ratings on the Secondary Traumatic

Stress Scale (STSS), an instrument intended to measure theoretically opposite constructs from

the STSE Scale, principal component analysis with seven items from the STSS that were

randomly selected along with the seven items of the STSE scale. Researchers identified two

components that accounted for a total of 55.82% of the variance. One component consisted of

seven items of the STSE Scale (factor loadings ranging from .69 to .80), and the other

component consisted of the seven STSS items (factor loadings ranging from .51 to .84; Cieslak

et al., 2013). Further, both studies showed the participants who were exposed to trauma directly

did not differ from participants without direct trauma exposure (all Fs<1.93, ps>.168).

Trauma Condition Classroom Fidelity Checklist. Fidelity of adherence to the trauma

supplement intervention and implementation of classroom strategies that teachers learned in the

trainings was measured at four time points during the intervention using an 11-item checklist

created by the Head Start mental health team. The 11 items reflect the ARC building blocks and

the strategies that are based on the building blocks that were presented in the teacher training

sessions. The measure is scored by marking a "1" if the item was present during the observation

and a "0" if it was not present. For the purpose of analysis, the total score was calculated by

summing the number of ones. The total score was then placed into one of the following

categories: total score 0-3, low implementation fidelity, 4-6, medium implementation fidelity, 7-

11, high implementation fidelity. See Appendix 1 for a copy of this checklist.

Devereux Early Childhood Assessment Preschool Program, Second Edition (DECA-

P2). One of the objectives of the trauma supplement intervention was to increase children's

resiliency in the face of trauma so that negative long-term outcomes are prevented. In order to measure these outcomes and indicators, the Devereux Early Childhood Assessment Preschool Program, Second Edition (DECA-P2; LeBuffe, Ross, Fleming, & Naglieri, 2013) was administered to parents and teachers at the beginning and the end of the intervention period. The DECA-P2 is composed of both Protective Factors Scales (i.e., a combination of ratings on initiative, self-regulation, and attachment/relationships) and Behavior Concerns Scales. The first edition of the DECA has been proven effective for use with the Head Start population. In a study specific to children in Head Start, DECA ratings collected over a period of two years showed that children in Head Start exhibited fewer protective factors and more behavioral concerns than were present in the norming sample (Brinkman, Wigent, Tomac, Pham, & Carlson, 2007).

The specific scales of the DECA- P2 of interest in this study are the Total Protective Factors (TPF Scale; which includes all items from the Initiative [I], Self-Regulation [SR], and Attachment/Relationships [AR] Scales), and Behavior Concerns (BC Scale). The TPF scale can be used as a way to understand a child's overall social and emotional strengths as they relate to resilience. This has been proven useful in program evaluations due to its comprehensive nature and ability to summarize many constructs into one T-score (LeBuffe & Naglieri, 2012). T-scores (M=50; SD=10) were computed using computer software and will be used in place of raw scores in order to compare student ratings to performance of those students in the norming sample.

Included within the DECA-P2 TPF scale are two scales of particular interest to the present study. The SR scale is used to assess a child's ability to express emotions and effectively manage behaviors. Items on this scale inquire about the child's ability to handle frustration and negative behaviors in addition to exhibiting patience and being cooperative. The AR scale

measures the child's ability to take part in relationships with other children and adults. Children with high scores on this scale are proactive in seeking out social connections and are able to gain positive attention from them. They exhibit affection, trust, and tend to be generally happy and optimistic. Items on the BC screening scale measure a range of problem behaviors including aggression, withdrawal, attention, and emotional control (LeBuffe, Ross, Fleming, & Naglieri, 2013). Clinically, T-scores under 40 on the Total Protective Factor scale are identified as areas of need, scores between 41 and 59 are typical, and scores between 60 and 72 are strengths. On the Behavior Concerns scales, T-scores of 60 or above are identified as areas of need.

The reliability of the DECA-P2 is based on that of its individual scales. The TPF scale is considered to be the most reliable and valid overall indicator of a child's functioning, with excellent internal reliability (α=.92-.95). This scale also has high test-retest reliability (r= .88-.95) suggesting that raters tend to rate children similarly over time in the absence of a specific program or intervention. This is beneficial for the current study because it suggests that any observed change in ratings is likely due to the intervention. Consideration of the stability of TPF scores within the comparison condition lends further support to this finding. The interrater reliability of the TPF scale is low to moderate (corrected r= .51-.72), suggesting that different parents and teachers rate children differently, underscoring the importance of uniformity in raters across time points.

Validity studies suggest that the DECA-P2 has appropriate criterion and construct validity. The Total Protective Factor and Behavior Concerns scales were effective at predicting group membership for children who were diagnosed with Emotional and Behavior disorders (EBD) and typical peers (*phi* coefficient=.38). A study of construct-related validity shows that

the TPF and BC scales also have strong convergent validity with similar, clinically-oriented scales (LeBuffe & Naglieri, 2012).

LeBuffe and Naglieri (1999) also report research investigating the validity of the DECA stating that the DECA effectively discriminates between children with and without emotional and behavioral problems, demonstrating adequate criterion validity. Studies have replicated the reliability and factor structure of the DECA in diverse samples (Barbu, Levine-Donnerstein, Marx, & Yaden, 2012; Lien & Carlson, 2009).

Behavior Assessment Scale for Children, 2nd Edition, Progress Monitor: The Externalizing and ADHD Problems and Internalizing Problems Forms. The Behavior Assessment System for Children, Second Edition, Progress Monitor (BASC-2 PM; Reynolds & Kamphaus, 2009), preschool version, is a brief social emotional screening instrument for teachers and parents of children ages 2-5 to measure symptom severity. The BASC-2 PM includes forms that measure the following behaviors: Externalizing and ADHD Problems, School and ADHD Problems, Internalizing Problems, Social Withdrawal, and Adaptive Skills. These forms are intended to take less time for parents and teachers to fill out when compared with the BASC-2. They are therefore ideal for providing progress monitoring data for students across specific domains. The four different BASC-2 PM forms include 15 to 20 items that are rated on a four-point scale ranging from *never occurs* to *almost always occurs* (Reynolds & Kamphaus, 2009). This measure was ideal for use in the present study due to its sensitivity to behavior change over time. Teachers of children who were found to have experienced trauma were asked to complete only the *ADHD Problems* and *Internalizing Problems* forms.

The ADHD Problems Form focuses on behaviors associated with aggression, conduct problems, and hyperactivity. The Internalizing Problems scale examines the areas of anxiety,

depression, and somatization.   There are separate forms for parents and teachers, each of which

consist of 20-items that use a 4-point frequency scale (N, never; S, sometimes; O, often; and A,

almost always). T-scores (M=50; SD=10) for the BASC-2 PM are computed with the help of the

ASSIST scoring software.

The BASC-2 PM has strong psychometric properties. Test-retest reliability coefficients

range from .70 to .89 across parent and teacher forms. Higher reliability coefficients were found

for the teacher forms (externalizing: .87, and internalizing: .89) than for parent forms

(externalizing: .80, internalizing: .70). The internal reliability of the parent internalizing and

externalizing forms (.79-.82, and .85-..89, respectively) and the teacher internalizing and

externalizing forms (.83-.87, and .94-.95, respectively) indicate high internal consistency.

Scores on the BASC-2 PM are also highly correlated with scores on similar measures,

showing high convergent validity. Progress Monitor forms on the BASC-2 PM are highly

correlated with their respective composite scores on the full version of the BASC-2, with a

correlation between r=.91 and .97 for teacher forms and r=.85 to .95 for parent forms (Reynolds

& Kamphaus, 2009). The relationship between the BASC-2 PM and the Achenbach System of

Empirically Based Assessment (ASEBA) indicates moderate to strong convergent validity.

Externalizing forms have a stronger correlation between .76 and .86 and internalizing forms have

a moderate correlation between .60 and .77.

Childhood Trust Events Survey (CTES) with Embedded Adverse Childhood Events

(ACE) Items. The Childhood Trust Events Survey (CTES; Pearl et al., 2012) is a 26-item,

publicly available, parent-report screener to assess a child's exposure to traumatic events. The

survey has been used in the clinical setting to measure the implementation of caregiver-child

trauma interventions (Pearl et al., 2012). This measure is also used by the Head Start Trauma

Smart program in order to provide children with appropriate services based on their exposure to traumatic events (Holmes, Levy, Smith, Pinne, & Neese, 2014). Some items on the CTES were derived from the Traumatic Events Screening Inventory (TESI; Ghosh-Ippen et al., 2002) and the UCLA PTSD Index (Pynoos, Steinberg, & Rodriguez, 1999). As the CTES is a simple index for self-report of traumatic events and not intended for diagnosis or treatment planning, reliability and validity have not been reported (as noted by Pearl et al., 2012).

Embedded within the CTES are the 13 items that have been identified as the events that have the greatest and longest-lasting impact on children and are referred to as Adverse Childhood Events (ACEs). These items are based on ongoing research from the Centers for Disease Control and Prevention, and include events in the categories of Abuse, Neglect and Household Dysfunction (Felitti et al., 1998). The ACE model suggests that there is a correlation among having adverse childhood experiences, adapting high-risk behaviors, developing disease and experiencing an early death. While the ACE scale is not a comprehensive or exhaustive list of all potential traumatic events (Finkelhor, Shattuck, Turner, & Hamby, 2013), the scale and dataset has been used widely. Studies associated with the ACE data set have shown that early trauma exposure effects a range of health issues later in life ranging from health-related quality of life (Edwards, Anda, Felitti, & Dube, 2004) to alcohol abuse (Dube et al., 2006) to depression (Chapman et al., 2004).

The current study used the CTES that includes ACE items as a screener for all children and caregivers enrolled in order to assess exposure to trauma. It was conducted at the beginning of the intervention period. In order to sort child participants into appropriate conditions (trauma exposure or no trauma exposure), the ACE items were pulled from the CTES screener and a total ACE score was calculated by summing all ACE items. Those children whose caregivers

reported an ACE score of one or greater were a part of the *trauma condition*, and those whose caregivers report an ACE score of less than one were part of the *no trauma* condition. Due to the cumulative effects of complex trauma, a child with an ACE score of five is at greater risk for negative consequences than a child with an ACE score of one. However, Dong and colleagues (2004) investigated the interrelatedness of ACE items and found that they were highly interrelated such that experiencing one meant that an individual was two to 18 times more likely to experience another when compared with someone who had not reported any ACEs. This suggests that experiencing just one ACE item puts the child at heightened risk compared to a child who has not experienced trauma. The remaining items on the CTES survey that are not ACE items were anecdotally in trainings as well as for the purposes of defining the sample.

Psychometric properties for the 13 ACE survey items have been investigated, but it is important to note that the majority of investigation with the ACE dataset has been done with adult raters of childhood events, as opposed to parent or child raters of recently occurred events. In a study of test-retest reliability, Dube, Williamson, Thompson, Felitti, and Anda (2004) found moderate to high reliability for scale items in addition to the total score. Scale items ranged from kappa=0.41 ("Did a household member attempt suicide?") to kappa= 0.86 ("Were your parents ever separated or divorced?"). The test-retest reliability of the ACEs total score was kappa= 0.64). There was no significant differences in reliability by age, sex or level of education. Increased ratings of trauma according to the ACEs total score were proven predictive of a wide range of health risk factors and health problems later in life including diabetes, heart disease, and mental health disorders among others (i.e., Felitti et al., 1998). This effect has been widely demonstrated across birth cohorts (Dube, Felitti, Dong, Giles, & Anda, 2003). Information regarding the validity of the scale has not been reported.

Trauma Symptom Checklist for Young Children- Short Form (TSCYC-Short

Form). A Short Form of the Trauma Symptom Checklist for Young Children (TSCYC-Short

Form; Wherry, Corson & Hunsaker, 2013) is a caregiver report instrument that was used in this

study to assess potential Post Traumatic Stress Disorder (PTSD) symptomology in children

whose caregivers rated as experiencing significant traumatic events as defined by the ACEs on

the CTES. This instrument is based on the Trauma Symptom Checklist for Young Children

(TSCYC; Briere, 2005) which is composed of the following eight clinical scales: Anxiety,

Depression, Anger/Aggression, Posttraumatic Stress-Intrusion, Posttraumatic Stress-Avoidance,

Posttraumatic Stress-Arousal, Dissociation, and Sexual Concerns. The instrument also provides a

summative total PTSD score, two reporter validity scales, and an item assessing how many hours

per week the caregiver is in contact with the child. The TSCYC has moderate convergent and

discriminant validity, specifically on the anxiety, depression, anger, dissociation, and sexual

concerns scales, in comparison to the Trauma Symptom Checklist for Children (TSCC). The

TSCC is the child-report version of the TSCYC designed for children and adolescents over the

age of 8. This suggests that, at least for children over the age of 8, child and caregiver

perceptions of the same symptomology tend to be similar (Lanktree et al., 2008). However,

another study showed this connection to be weak, suggesting the need for multiple raters when

possible (Wherry, Graves, & Rhodes King, 2008). Internal consistency for the clinical scales has

been shown to be moderate to high, ranging from *alpha*=.81 (Sexual Concerns) to *alpha*=.93

(PTSD Total; Briere et al., 2001). The measure also has good convergent validity with other

caregiver ratings such as the Child Behavior Checklist, and the University of California at Los

Angeles Post-Traumatic Stress Disorder Reaction Index possible (Wherry, Graves, & Rhodes

King, 2008).

The TSCYC has been proven successful in the clinical setting for correctly classifying the presence or absence of PTSD in children ages 4-12 (Pollio, Glover-Orr, & Wherry, 2008). Within the preschool setting, the TSCYC was used to assess for trauma history and symptomology to determine inclusion in a research study (Becker-Blease, Freyd, & Pears, 2004). Validity of this instrument has been demonstrated in several studies. Wherry, Graves and King (2008) showed moderate convergent validity for sexual concerns with the Child Behavior Checklist's Sexual Problems subscale (CBCL; Achenbach, 1991). Overall, there was moderate convergent validity with other parent report measures such as the Child Behavior Checklist, the Child Sexual Behavior Inventory, and the University of California at Los Angeles Post-Traumatic Stress Disorder Reaction Index (UCLA PTSD Index). When compared with the Trauma Symptom Checklist for Children, a relatively similar measure, there was modest convergent validity of the TSCYC for the Anger, Anxious, Depressed, and Dissociative scales. However, the correlations accounted for a small amount of variance. In a study of 339 abused children, Gilbert (2004) found the internal consistency ranged from an alpha of .81 to .92. The convergent validity, which was examined through comparisons to the CBCL, was generally moderate. Specifically, the correlations are as follows: TSCYC Anxiety and CBCL Anxious/Depressed (r=.59, p<.01), TSCYC Depression and CBCL Anxious/Depressed (r=.73, p<.01), TSCYC Anger/Aggression and CBCL Aggressive (r=.81, p <.01), and TSCYC Sexual Concerns and CBCL Sex Problems (r=.55, p<.01). Other studies have shown acceptable internal consistency in the Spanish version of the TSCYC (Gale, 2008), and among Swedish children (Nilsson, Gustafsson, & Svedin, 2012).

The Short Form of the TSCYC (TSCYC-SF) was derived from the 90 items of the TSCYC by exploratory factor analysis followed by confirmatory factor analysis. Support was

found for an 8-factor, 32-item model. The short form is more practical for the Head Start setting, as caregiver participation is often cited as a barrier to implementation and data collection in this population (Smith, 2014). The psychometrics for the TSCYC-SF were obtained by Wherry and colleagues (2013) in a study of 295 child clients in an outpatient mental health facility. This study found non-significant correlation coefficients (with the exception of anger scales ($r = .26$, $p < .01$) when comparing raw scores from the TSCC, the CBCL, and the TSCTC-SF.   However, this is not surprising, as the literature has demonstrated differences between parent and child report across measures. When compared with parent ratings from the Child Behavior Checklist, the Child Sexual Behavior Inventory, and the University of California at Los Angeles Post-traumatic Stress Disorder Reaction Index (UCLA PTSD RI), moderate to high convergent validity was reported, just as with the complete TSCYC. The instrument also showed acceptable discriminant and divergent validity as well, making it an acceptable choice for use in a setting where brevity of instruments is important. Items are rated on a 4-point scale from 1 = "Not at all" to 4 = "Very Often" referring to events that have occurred in the previous month. Scoring is done by hand. Total raw scores are calculated by summing scores on all items. Raw scores are then converted to T-scores. T-scores of 70 and above are considered clinically elevated, and scores between 65 and 70 are subclinical areas of concern.

Procedures

Recruitment. The two Head Start sites (one comparison and one intervention) in this study were initially targeted for participation based on the agency's Mental Health Consultants' identification of the sites as those that had a similar demographic composition and could both benefit from intervention due to the known rates of trauma exposure among students within those sites, as well as the teachers' need for support in regards to responding effectively to those

students. It should be noted that the differences between Mental Health Consultants' and teachers' perceptions of need for the intervention differ at times throughout the intervention. This difference is explored more extensively through data collected on teachers' ratings of satisfaction with the intervention prior to and throughout the intervention period. The site that was chosen for the intervention condition was chosen due to the site coordinator's willingness to participate in a research study as well as the perceived prevalence of students who had experienced trauma due to the location of the site in a particularly low-income area. Teachers were recruited for this study in the building that was designated as the intervention condition. Beginning in the 2015 spring semester, mental health staff members attended teacher team meetings to describe the study and to answer questions regarding participation. Teachers who were interested in participating were directed to speak with the site coordinator. Participation was voluntary, and participants were made aware that they would be compensated (i.e., $40 per training session including completion of survey measures) above their normal salary for participation, even though trainings occurred during work hours. Teachers within the comparison condition were approached directly by their supervisors and asked if they would like to participate. They were then directed to the study coordinator/ Head Start mental health team member and provided the opportunity to ask questions and provide informed consent. Teachers within the comparison condition were compensated in cash at pretest and posttest data collection time points.

Pretest data collection phase. Pre-treatment data collection began three weeks prior to the first training session. Teachers sent an introductory letter home to parents explaining that some teachers were taking part in a research study and they would be asked to fill out information regarding their child at two time points. Some parents were presented with this

information at parent-teacher conferences and some received the packet through their child's

home-school folder. Attached to this letter were (a) a demographic survey, (b) the Trauma

Symptom Checklist for Young Children, and (c) the Childhood Trust Events Survey- Caregiver

Version. At that time, teachers were also asked to fill out the Devereux Early Childhood

Assessment- Preschool Program (DECA-P2) for all of their students. Teachers also completed

Behavior Assessment System for Children-Second Edition Progress Monitor (BASC-P2) ratings

of those students whose caregivers rated them as having elevated scores (ACE score >/= 1) on

the Childhood Trust Events Survey. Finally, teachers rated their own perceived self-efficacy for

effectively working with children who have experienced trauma on the Secondary Trauma Self-

Efficacy Scale.

Data, including DECA-P2 caregiver ratings and Classroom Assessment Scoring System

(CLASS) ratings, had already been collected previous to this data collection and was considered

as part of the initial data collection. The DECA-P2 caregiver ratings were completed during the

first month of school. Due to the length of the measure and the predicted response rate, the

DECA-P2 was not re-administered to caregivers during the pretest data collection phase. Instead

teacher ratings were collected in order to compare to caregiver ratings at both pretest and post-

treatment. CLASS ratings are done monthly by site supervisors within this program. Finally, the

System of Care Trauma-Informed Agency Assessment (TIAA) was completed by an external

evaluator (intern) during the pretest and posttest phases to add qualitative data to a primarily

quantitative study. This instrument was completed by interviewing various stakeholders,

including administrators (N=1), mental health staff (N=3), teachers (N=3), and teacher aids

(N=2), within the intervention sites regarding their knowledge and implementation of trauma-

informed practices within the agency. The evaluator also made two site observations prior to and

two following the implementation of the intervention in order to complete the TIAA.

Intervention phase. The intervention phase of the pilot program began after the pre-

treatment data collection was completed. The entire intervention phase lasted six weeks.

Trauma supplement intervention condition: Teacher training. During the six-week

intervention phase, teachers and teacher assistants in the intervention condition took part in two

half-day (four hour) trainings completed three weeks apart. These trainings were based on the

ARC framework (Blaustein & Kinniburgh, 2010) that was adapted for the Head Start setting.

The ARC framework includes content to strengthen skills across three domains: (1) attachment,

(2) self-regulation, and (3) competency both in children and families who have experienced

trauma and within systems that work with clients who have experienced trauma. Within these

three domains, there are ten additional "building blocks" or components of intervention which

are: (1) caregiver affect management, (2) attunement, (3) consistent response, (4) routines and

rituals, (5) affect identification, (6) modulation, (7) affect expression, (8) executive functions, (9)

self-development and identity, and (10) trauma experience integration (Blaustein & Kinniburgh,

2010).

Training sessions were conducted by Head Start's Mental Health Consultants along with

a graduate-level intern. The first training session focused on attachment and self-regulation and

included material covering the building blocks (a) caregiver management of affect, (b)

attunement, (c) consistent caregiver response, (d) building routines and rituals, (e) affect

identification, (f) modulation, and (g) affect expression. Teachers and assistants engaged in

conversation, wrote in personal journals, listened to lecture and worked through case examples

related to the days' building blocks. Each building block was structured in the same way,

beginning with psychoeducation about the effects of trauma on the building block, then an assessment of participants' attitudes and thoughts towards the topic, and finally teaching of content. For example, the presentation of attunement began with a discussion of trauma behaviors that affect attunement, including the difficulty of communicating feelings, putting up "fronts" towards caregivers, and being easily triggered. Participants were then given the opportunity to assess their personal level of attunement, and how they conceptualized child behaviors that challenge attunement. Finally, participants were taught to appropriately interpret child vigilance, understand triggers, and what to do when a child becomes triggered. The second training session included the building blocks under the domain of competency, including (a) strengthening executive functions, (b) self-development and identity, and (c) trauma experience integration. This session was formatted in the same way as the first session.

Implementation of classroom-based strategies. Within the training sessions, teachers and assistants also learned specific strategies to help themselves and their students cope with trauma symptoms. Teachers were required to implement three classroom-based strategies. These strategies were decided during the first training session from a set of strategies detailed in the ARC framework. Although none of the strategies were new to teachers, mental health staff in the buildings noted that none were being implemented with consistency and fidelity. During the training sessions, teachers were given the opportunity to choose from a few strategies, voting on the three that they would feel most comfortable implementing. Finally, teachers and teacher assistants were given time during the sessions to work on incorporating strategies into their daily routines.

(1) The use of teacher/ assistant self-care strategies both in the moment and long-term/ ongoing with signed self-care plan in place,

(2) the use of a feelings toolbox and feelings poster, and

(3) incorporating movement and muscle relaxation into the daily routine

All intervention teachers (N=3) were expected to use all three of these strategies throughout the intervention period. Throughout the intervention period, the graduate intern made four fidelity checks on the use of the presented strategies using a checklist created by the agency tailored to the content learned in the trainings. Teachers and assistants also rated their satisfaction with the training sessions and with the implemented strategies.

Intervention-as-usual: Al's Pals Social Emotional Curriculum. The trauma supplement intervention was implemented in addition to the existing social emotional curriculum, Al's Pals. Al's Pals is a classroom curriculum and teacher training program that teaches social emotional skills in children, ages 3-8 years old. Al's Pals aims to help children learn self-regulation, teach conflict resolution and problem solving, and build coping skills, indirectly creating a caring, cooperative and respectful classroom climate. The specific goals of the Al's Pals curriculum, as stated by the program developers are:

> Goal 1: To increase the protective factor of social-emotional competence in
> young children (aged three through eight) through a 46-lesson resiliency-
> based prevention curriculum implemented by trained teachers in a variety of
> settings including preschools, child care centers, other early childhood
> classrooms, and after-school programs.
>
> Goal 2: To decrease the risk factor of early and persistent antisocial or
> aggressive behavior by preventing the development of increased aggression
> and antisocial behaviors in young children over the course of a typical school

year, through implementation of the preventive intervention referenced in

Goal 1 (Lynch, Geller & Schmidt, 2004).

Al's Pals was designed to be introduced with a 2-day teacher training session and then

implemented over a 23-week period, with instructional sessions lasting between 15 and 20

minutes.

To date, one paper has outlined previous efforts to research the effectiveness of the Al's

Pals curriculum, making the research base for the curriculum extremely limited. Following a

series of pilot experiments completed in Lansing-area Head Start centers in the early 1990s that

qualitatively examined the effectiveness of the Al's Pals curriculum, one study in the early 2000s

followed up with quantitative data. This study found statistically significant improvement in

Social Independence and Problem Solving Skills, and improvements in prosocial behaviors at

posttest, when compared with classrooms that had no social-emotional curriculum (these studies

outlined in Lynch, Geller, and Schmidt, 2004)

Training in the implementation of the Al's Pals curriculum is offered yearly to all

teachers, either online or in person.   The training is mandatory for new teachers, although all

teachers are welcome to attend. Two teachers (one intervention condition teacher referred to as

the trauma supplement group, and one comparison condition teacher, referred to as the

intervention-as-usual group) in the present study took part in an online training at the beginning

of the school year. Continuing implementation support was provided for teachers by mental

health consultants, and site supervisors held teachers accountable for teaching Al's Pals lessons.

The Al's Pals program provides users with instruments to measure implementation

fidelity. However, none of these instruments were used by the sites involved in this study. Some

aspects of implementation were captured through the CLASS assessment which measured classroom climate. However, this was not a curriculum-specific assessment.

Study Design and Data Analysis

Data was collected between February and May of 2015 by a tri-county Head Start program. The researcher served as an intern and assisted in data collection and implementation of a pilot teacher-training program. The program was led by the mental health consultants in conjunction with Head Start site supervisors. Teachers, teacher assistants and mental health staff attended the trainings. This program was the first step in a larger-scale, multi-site trauma initiative set to launch in the fall of 2015. De-identified data was provided to this researcher/intern to address all research questions.

A quasi-experimental study design was employed to address the research questions. This study does not represent a true experimental design, as student and classrooms were not randomly assigned to conditions. Teachers and their students were assigned either to a trauma supplement intervention group or an intervention-as-usual comparison group. The intervention group received the trauma supplement (trainings, classroom strategies as described above) in addition to the social emotional curriculum (i.e., Al's Pals). The comparison group received the social emotional curriculum only. Within each condition are children who have experienced trauma, and those who have not. Head Start mental health staff in conjunction with the researcher identified three classrooms as intervention classrooms based on their willingness to participate and the known presence of trauma among students and families. The comparison classrooms were chosen in the same way. Within the intervention conditions, students were identified as having experienced trauma or not based on their scores on the Childhood Trust Events Survey, Adverse Childhood Experiences (ACE) items. Figure 4 summarizes the data

collection process with relevant measures, while Table 3 includes a connection between the variables of interest and relevant dependent measures.

This design was used in order to clarify which component had the most influence on outcomes that are most frequently influenced by experiencing trauma. The intervention-as-usual group served as a comparison group to investigate the effects of a social-emotional curriculum (i.e., Al's Pals) on children who have experienced traumatic life events, without being specifically trauma-focused. Data was collected before and after intervention following a pre- and posttest design. Data was collected through structured interviews, teacher and caregiver ratings, and classroom observations.

Data Analysis.

Question 1. Data from the System of Care Trauma-Informed Agency Assessment (TIAA) was analyzed qualitatively at both pretest and posttest to better understand the successes and challenges of the implementation of the trauma-informed systems-level intervention. Analysis of a supplemental, in-depth interview with the Director of the Head Start agency was completed to better understanding an administrative perspective of trauma-informed care.

Question 2. Due to insufficient power in the teacher- level sample to answer this question through quantitative comparative analyses, this classroom-level question was analyzed through examination of descriptive statistics. The dependent variable, CLASS ES, and its composite constructs, was measured two times, at pre and posttest, and was examined across the levels of intervention condition (*intervention* or *comparison*).

Question 3. Due to an insufficient sample size of teacher-level data points (N=6 intervention; N=4 comparison), to answer this question using statistical analyses to compare teacher responses across conditions, quantitative data was presented descriptively through

examination of means, ranges and standard deviations. Additionally, teacher responses were

examined qualitatively. A paired samples t-test was performed using mean teacher ratings on the

STSES across both intervention conditions (N=5) measured at posttest and again at four months

following the intervention period to better understand the stability of STSES ratings four months

following the intervention period.

Question 4. Question 4a was discussed qualitatively, integrating informal ratings done by

Head Start site supervisors as well as integrating existing qualitative analyses done using the

CLASS assessment in Question 2. Question 4b, examining the implementation fidelity of the

trauma intervention, was analyzed using data from the Classroom Fidelity Checklist supported

by qualitative analyses of items on the scale. Teacher satisfaction ratings of trainings were

examined as well as the follow-up questionnaire that teachers filled out the fall following the

intervention implementation.

Questions 5 and 6. In order to reduce type I error, research questions 5 and 6 were

addressed together through a Multivariate Analysis of Covariance (MANCOVA) model followed

by Step-Down Analysis (Roy-Bergmann analysis). The general model used was:

Overall effects (dependent measures) = intervention condition +trauma condition+

covariates

The model was constructed with the following dependent variables: (1) DECA-P2 TPF

Scale at Posttest, (2) DECA-P2 BC scale at posttest, (3) BASC-2 PM, Externalizing and ADHD

Problems at posttest, and (4) BASC-2, PM Internalizing Problems at posttest, among the two

levels of the two independent variables, (1) intervention condition (intervention and comparison)

and (2) trauma experience (trauma experiencers and non-trauma experiencers). Covariates that

will be controlled for in omnibus the model are (1) number of years of teaching experience by

classroom teachers, (2) number of hours students spend at school, and (3) pretest scores on each of the child-level dependent measures, and (4) ratings on the TSCYC-SF. Assumptions of normality, homogeneity of variance, linearity, homogeneity of regression, and multicollinearity will be met prior to computation of the model.

Moderation of trauma symptoms measured by the TSCYC-SF (question 6) will be tested by evaluating the strength of the initial model as proposed above. The model will then be re-run with the TSCYC-SF as an interaction term (with BASC-2 PM) change scores. If this model is stronger than the base model, it will be evident that an interaction has taken place.

If the MANCOVA is found to be statistically significant for an independent variable, the Roy-Bargmann test/ step-down analysis (Roy & Bargmann, 1958) will allow the prioritization of the variables in order to investigate individual effects related to each research question. This test treats each variable as a dependent variable in an ANOVA, while subsequent variables serve as covariates, therefore elucidating effects of individual variables. Mudholkar and Subbaiah (1980) cited several advantages to using the step-down procedure as a follow-up to a MANOVA test, including (a) its simplicity, (b) detailed results for each group, (c) useful with small samples, and (d) control that the test affords the researcher. Variables will be prioritized in the following way: (1) BASC-2PM, Internalizing Problems, (2) BASC-2 PM, Externalizing and ADHD Problems (3) DECA-P2 TPF Scale, (4) DECA-P2 BC scale. This order is due to the fact that the BASC-2PM is prioritized due to its sensitivity to detect change as a progress monitor. Further, the intervention is designed to enhance adaptive coping skills, so the TPF scale is prioritized over the Behavior Concerns Scale of the DECA-P2.

Question 7. The effect of the independent variable, trauma condition, on the dependent variable, TPF DECA-P2 ratings, was investigated among those children in the intervention

condition using a repeated measures ANCOVA. This test was used to see if mean differences

exist on the DECA-P2 TPF scale across time between the two levels of the trauma condition.

The dependent variable, DECA-P2 TPF was measured two times, at pre and posttest. The other

within-subjects factor, trauma condition is binary (*trauma* condition or *no trauma* condition).

Covariates included in the model: (1) number of years of teaching experience by classroom

teachers, (2) number of hours students spend at school, and (3) pretest scores on the DECA-P2

TPF scale. Pairwise comparisons were done to assess specific differences. Initial assumptions

were met through an investigation of normal distribution (skewness and kurtosis) and sphericity,

which was tested through a Mauchly's Test of Sphericity.

CHAPTER 4

RESULTS

Prior to the investigation of results, missing data were analyzed. Across all variables in the data set, there were 12 instances of missing data within the outcome measures. Missing data were replaced using the series mean. This strategy involves replacing the missing value with the mean value for the variable when taking into account the entire data set. The independent variable, ACE Score, that was responsible for grouping children into the trauma condition was not recoded. There was one case of missing data for this variable, and it was left blank.

Prior to conducting the analyses, it was necessary to explore one potential confound with the proposed moderating variable, the TSCYC. Due to challenges with data collection, this measure was collected over a period of three weeks, with approximately one third of forms (N=37) being completed in the week following the first intervention training session. In order to justify this measure as a modifier within the model, and to ensure that those ratings that were completed following the first training session were not significantly affected by the intervention, two tests were conducted. First, a t-test was completed in order to compare the means of the ratings done prior to the first training session, and those done after the first training session. This comparison revealed no significant difference between the two groups, $t(101, 100) = 1.53$, $p = .129$. Next, an ANCOVA model, with the TSCYC variable as the outcome variable and intervention condition, hours children spend at school, teachers' years of experience, DECAP2-TPF at pretest, DECAP2-BC at pretest, BASC-2PM Internalizing at pretest, and BASC-2PM Externalizing at pretest as predictor variables was conducted to investigate the potential prediction of the ratings on the TSCYC by intervention condition. This model was significant overall $F(2,27) = 11.75$, $p < .01$, suggesting that the model overall predicted scores on the TSCYC.

However, the model revealed no effects of intervention condition on TSCYC, assuming that the other predictors were held constant, t(.913)= -.565, p=.574.   These two tests taken together suggest that it likely that there was no effect of the intervention on the ratings of children's behavior using the TSCYC. Therefore, the measure was used as a moderating variable.

Question 1. The Trauma Informed Agency Assessment (TIAA) was used as a guide to qualitatively describe the Head Start agency's knowledge and implementation of trauma-informed practices. The TIAA organizes evaluation of the organization into six domains: Physical and Emotional Safety; Youth and Family Empowerment, Choice and Collaboration; Trauma Competence; Trustworthiness; Commitment to Trauma-Informed Philosophy; and Cultural Populations and Trauma. Data was collected prior to the first intervention session by the researcher, both through observation of the Head Start Center, review of policies and procedures, and structured interviews with the Director of Preschool Programs, Head Start Mental Health Consultants, and teachers.

Physical and emotional safety. The commitment to ensuring students' and staff members' physical safety was evident at pretest and at posttest. Private spaces were available for conferences between mental health staff, family advocates and family members. There was an appropriate process for incident reporting in place.   The processes ensuring emotional safety of students were less uniform at pretest. Although record keeping surrounding students' social and emotional history was in place, the agency did not have a uniform way to understand children's trauma histories and document it in enough detail for staff to understand the role of trauma in influencing the child's behaviors. Further, there was no formal plan in place for creating trauma-informed safety plans. At posttest, procedures had not changed. However, upper level

administrators were receptive to taking into assessing and documenting children's trauma histories in a uniform fashion.

Youth and family empowerment, choice and collaboration. At pretest, the agency's attempts to empower youth and families through choice and collaboration were strong. Social and emotional data collection was primarily strengths-based, and the intervention-as-usual social and emotional curriculum also focused on building on students' strengths to build skills. Family advocates within the organization worked with families to connect them with community resources, including food and housing assistance, adult education programs and mental health services. Mental health workers are also made available to students and families on an as-needed basis. Families and caregivers are encouraged to attend family events at their child's Head Start center, and are compensated using a point system for hours of involvement. However, interviews with classroom teachers and family advocates revealed a historically low turnout of families and caregivers, especially those caregivers of children who are most at risk for negative social and emotional outcomes. These findings remained constant at posttest.

Trauma training and competence. Low levels of agency-wide training focused on increasing staff's overall competency in trauma-informed practices were noted at pretest. No trauma-specific training was available for new or existing staff. At posttest, staff who had taken part in the intervention condition had received training. Through the completion of the TIAA, upper level mental health staff and administrative staff identified several barriers to implementing trauma competency training on a broader scale across the agency. Practically, funding constraints make it difficult to find time for staff to take part in trainings, as it is difficult to find and fund additional time beyond staff's normally contracted hours. If trainings were to take place during teachers' normal hours, the issue of hiring substitute teachers to cover classes

arises. In addition to the cost of hiring substitutes, the concern was that teachers and teacher assistants would be repeatedly taken from classrooms in which children have high emotional and academic needs. Secondly, some teachers and administrators viewed trauma competency training as competing with other initiatives that Head Start staff was taking part in. According to administers, teachers, family advocates and mental health staff are tasked with collecting many types of data and taking part of different trainings across the course of the year. This leaves staff often feeling overworked and "burnt out."

In addition to the practical issues raised through the administration of the TIAA, administrative staff voiced the desire to focus on the positive, as the goal of the Head Start agency is to build resiliency as opposed to respond to trauma through trauma-focused training. Staff, as well as administrators, also identified the unclear link between understanding the developmental impacts of trauma and building resiliency in children (i.e. why it is useful to understand the impacts of trauma). Finally, administrators were unsure about the ways in which trauma competency training could potentially interplay with the developmental progress tool that teachers are required to use (Teaching Strategies Gold). They were concerned that a focus on trauma competency training may detract from the implementation of this tool.

How the agency responds to staff members' secondary trauma exposure is also an important piece of the *trauma competency* domain. At pretest, the agency did not have significant supports in place for dealing with secondary trauma exposure by staff. However, they did offer peer to peer mentoring among teachers, and occasional stress reduction training implemented by mental health consultants. At posttest, administrative staff identified being more aware of the impact of secondary trauma, and the necessity of providing supports for staff. However, no additional supports (i.e., therapeutic time off, recreational or wellness activities,

systematic referrals to therapy) had been put in place. The greatest barrier to implementation cited by the Director of Preschool Programs as well as mental health staff was lack of financial resources to fund these initiatives.

Trustworthiness. No change was noted between pretest and posttest in regards to the way in which the Head Start organization maintained trust of staff, families, and children. However, the agency did work to ensure trustworthiness at pretest and posttest. This included providing families with informed consent regarding data collection efforts and implementation of new social emotional curricula. The agency also strives to provide consistent communication with families, through take home folders, contact made by teachers at the beginning of the year, and family advocates. One concern that continues to impede the agency's work with families surrounding the impact of trauma is a clear description of what the agency plans to do with information regarding trauma exposure. In trauma assessment data gathered in the present study, families were wary of providing detailed information regarding their child's exposure to trauma, as they were concerned that the information may be used to incriminate them through a referral to Child Protective Services.

Commitment to trauma-informed philosophy. At pretest, no formal commitment to trauma-informed practices was noted. Specifically, the agency had no written procedures as related to trauma-informed policy or practice. Although isolated efforts to address children's trauma exposure were apparent, no systematic approach was evident. At posttest, the agency had begun to recognize the benefit of trauma-informed practice, and was taking steps towards implementing these practices across the agency. However, at posttest, the agency still lacked routine trauma screening, and a clear way to treat children identified as needing additional support. Some children were treated through the implementation of a "Trauma and Loss" group

therapy session. However, children were referred to the group by teachers and mental health staff, not by routine screening.

At posttest, the researcher met with mental health consultants and agency administrative staff for the purpose of creating a "trauma task force" which would create a trauma-informed development plan that would carry the agency forward into systematically implementing trauma-informed practices. However, this development plan has yet to be formalized, as other initiatives have been prioritized. Further, fidelity of implementation of practices continues to be an issue within the organization. Although the structure of the organization permits checks of fidelity for trauma-informed practices (potentially through the "trauma task force"), this has been slow to develop.

Cultural populations and trauma. The Head Start agency promotes a commitment to culturally responsive practices. Translation services are considered, and many family advocates are multilingual. Although the agency is connected to some community agencies (e.g., WIC), they often do not include community resources, specifically ethnic and faith-based organizations into treatment planning.

Question 2. The CLASS assessment was used to measure the Emotional Support domain across intervention conditions at both pretest and posttest. Table 6 shows mean scores for the constructs on the Emotional Support domain across intervention condition measured at pretest and posttest. Teachers in both the intervention and comparison conditions were rated moderately on the Emotional Support Domain of the CLASS both at pretest (intervention M=4.79 [0.26]; comparison M=5.65 [0.45]) and posttest (intervention M=5.78 [0.50]; comparison M=5.51 [0.35]). Although the low sample size prohibited statistical comparative analyses, ratings appear similar across intervention conditions and from pretest to posttest. At posttest, teachers were

consistently rated as having low levels of *negative climate* (i.e., including the presence of anger, hostility, or aggression; M= 1.03 (0.7), range 0.17), and moderate *positive climate* (i.e., enthusiasm, enjoyment, emotional connection between the teacher and students, and nature of peer interactions; M= 5.97 (0.37), range= 1.17). *Teacher sensitivity* (i.e., how responsive the teacher is to students' needs in the classroom) was rated in the low/moderate range at posttest (M=4.69 [0.40], range=1.00).

Question 3. Teacher ratings on the STSES indicated that across time points, teachers in both conditions rated themselves as generally able to cope with the secondary traumatic stress resulting from their work with children who have experienced trauma (Overall M= 5.77, SD=.48, Range 4.90-6.57). Teachers in both conditions endorsed feeling *very capable* of "dealing with my emotions about working with children" and "control recurring distressing thoughts or images about the children I work with." Teachers in the intervention condition endorsed feeling *capable* or *very capable* of "finding some meaning in what had happened to the children I work with" (M=6), where teachers in the comparison condition endorsed feeling between *neither incapable nor capable* and *somewhat capable* (M=4.5) of doing this. Teachers in both conditions rated both at pretest and posttest feeling between *somewhat incapable* and *neither incapable nor capable* (M=3.7) of "getting help from others to better handle working with my students." Means at posttest for both groups indicated relatively high levels of self-efficacy as related to dealing with trauma (comparison M=5.43 [0.25], intervention M=6.14 [0.38], on a scale ranging from 1 to 7). Ratings at posttest ranged from 5.14 to 6.57. However, mean STSES ratings across conditions at posttest were significantly lower four months following the end of the intervention (M=5.59 [.54]) than at posttest (M=5.79]), t(5)=3.07, p<.05.

Question 4a. The fidelity of adherence to the Al's Pals curriculum was measured informally in two ways. First, it was measured by coordinators at each Head Start site at several time points throughout the year. At pretest, all teachers and teacher assistants had curriculum materials in the classrooms and reported using the curriculum. All teachers had also been trained on the curriculum, although the extent of the training varied, with the minimum being completion of online modules and the maximum an initial training followed by in-person follow up training. Site supervisors at both sites also reported observing lessons being taught. Three out of three classrooms in the intervention condition had Al's Pals curriculum material (i.e. calm down chair) present for students whereas zero out of two classrooms in the comparison condition had the materials present during the three independent observations. However, the comparison classrooms did have other materials present such as a poster detailing the "calm down steps." During two of the observations, staff in both of the comparison condition classrooms were observed using language to help students name their emotions to help solve conflicts. Two of the teachers in the comparison condition used sensory exercises (i.e. play dough) to help children calm down, while this was not observed in the intervention condition classrooms. Taken together, these observations suggest a relatively uniform yet diverse implementation of the Al's Pals social emotional curriculum. The level of implementation was relatively uniform across the semester. Over the course of the intervention period, teachers in the intervention condition reported teaching two to three lessons per week, while teachers in the intervention condition reported teaching one to two lessons per week.

Secondly, aspects of implementation were measured by the CLASS assessment. One of the teachers in the comparison condition consistently met the benchmark set for all three subscales of the CLASS assessment used in this study: *positive classroom climate, negative*

classroom climate, and *behavior management.* The other teacher in the comparison condition consistently was rated more highly in the *negative climate* domain. Two of the teachers in the intervention condition were consistently rated at benchmark across domains, while the other teacher was rated below benchmark on *positive climate* and *behavior management.*

Question 4b. Teachers' fidelity of adherence to and attitudes toward the intervention were analyzed using three different measures. The first measure was the *classroom fidelity checklist.* This checklist was used to observe teachers within the intervention condition at four time points throughout the intervention period. Each teacher had a unique profile of implementation fidelity across the observation period. Table 7 details the implementation fidelity ratings across the four time points. The first teacher had medium to high ratings of fidelity. The second teacher had consistently low levels of implementation, while the third teacher had medium to high levels of implementation. The majority of teachers responded consistently to children, set routines and rituals that were supportive of children, and helped children identify a range of emotions (mad was the emotion most frequently identified). Some observations revealed teachers helping children to modulate responses, and teachers making mention of the "future self." Only one observation observed the teacher incorporating muscle relaxation into the routine. No teachers referred to the feelings toolbox (as was implemented during the first training session) during observations, nor did they refer to the feelings poster. However, teachers did report throughout the intervention period that certain students did benefit from materials in the feelings toolbox, and that it was an easy strategy to add to their usual repertoire of teaching coping skills. It is most likely that the fidelity observations missed the application of these skills specifically, even though they were used throughout the intervention.

The second way in which fidelity and satisfaction were measured was through a measure of satisfaction with the session that immediately followed the two trainings. This measure asked teachers to rate their reactions to the trainings across five different areas on a scale from 1 (strongly disagree) to 5 (strongly agree). Across all scales, teachers endorsed a mean rating of 4 (Agree). The question toward which teachers and teacher assistants reacted most favorably was "I can use strategies that I learned today" (M=4.50 [0.55]). The question that teachers and assistants reacted least favorably was "I am more confident in my skills as a result of this training" (M=3.83 [0.41]). Comments received on the feedback forms were generally positive. Teachers indicated that they enjoyed the interactive nature of the trainings, and they felt that they could implement strategies in their classrooms based on the content of the trainings. Teachers also indicated that they thought that the psychoeducation regarding the neurodevelopmental effects of trauma on the brain was not as useful as the practical aspects training. Three teachers/assistants indicated that they did not enjoy the team building aspects of the training.

Finally, teachers were interviewed using a follow-up questionnaire in the fall following the spring training sessions. Teachers were asked to reflect on the training sessions from the previous school year. Teachers rated that they enjoyed learning about the effects of trauma on their students' development, and they enjoyed learning ways to incorporate relaxation into their daily routines. When asked what they did not enjoy about the sessions they stated that it was an additional commitment that they had to make, and they felt as though they already had a lot of paperwork to do.

In terms of changes that teachers would make in their classrooms as a result of the trainings, one teacher disclosed that she was planning to use short yoga videos as part of her morning routine. Another teacher commented that she had already been doing a lot of the

strategies that were presented, although she may not be using them consistently, and therefore was not planning on making any changes to her classroom besides brining greater consistency to her practices. The third teacher cited her gratitude for the trainings, as she saw the importance of being "trauma informed," because many of her students recently have been experiencing high levels of trauma. However, she expressed that she felt as though she still did not understand enough to truly make changes to her teaching style. She also expressed the importance of educating caregivers, as she felt as though a lot of "damage" (re-traumatization) was done at home when the children were not at school.

All of the teachers noted that this program was different than the intervention-as-usual social emotional curriculum, because these trainings focused more on the "why" of challenging behaviors as opposed to the "how." One teacher made the point that she appreciated understanding why challenging behaviors occur is important, but she felt as though she did not have enough time to truly understand the effects of trauma and integrate that into her teaching and classroom management. They appreciated that it was not "just another curriculum." Two teachers mentioned that they thought it fit theoretically with the Al's Pals curriculum. Two out of three teachers said that they would take part in more trauma-focused training if they were given the opportunity to, as they continue to have students in their classes who have experienced trauma and loss of loved ones. The third teacher said that she would if she was given more time to commit to the initiative and if she was given support for dealing with the students with the most challenging behaviors.

Questions 5-7. The final two research questions examined the interaction of children who had experienced an elevated rate of trauma (ACE score $>/= 1$; N= 52) across the two intervention

conditions (treatment and comparison). In order to do this, a Multivariate Analysis of

Covariance model was constructed and tested.

The model assumptions were met as follows:

     Independent random sampling. The sample was created according to the procedures

outlined in the Methods section. Although the intervention and comparison groups were not

selected at random, the analysis involves the matching of the two intervention groups at pretest,

demonstrating that the two groups were not statistically different across several measures. This

helps support that changes were likely due to the trauma supplement intervention as opposed to

other factors.

     Absence of multicollinearity. The dependent variables from the proposed MANCOVA

model were not highly correlated. The highest correlation between the BASC-2 PM Internal and

BASC-2 PM Externalizing and ADHD problems was r=.58, well below the r=.90 limit suggested

by Tabachnick & Fidell (2012).

     Normality. Normality was investigated for each dependent variable as if it was a

univariate case. A probability-probability (P-P) plot show data from the four dependent variables

to be distributed close to the ideal diagonal. Visual inspection of the skewness and kurtosis of

the four dependent variables show the data to be distributed close to the normal curve. Due to the

relatively large sample size, a significance test of skewedness and kurtosis was not done due to

the high probability of detecting a significant data skew, even though it is not practically

significant.

     Homogeneity of variance. Levene's F-test for the homogeneity of variance identified

equal variance for children in the intervention and comparison conditions for the DECA-P2 TPF

$F(1,102)= 2.89$, *ns*, the BASC-2 PM Internalizing, $F(1,102)=3.40$, ns, and the BASC-2 PM

Externalizing and ADHD problems $F(1,102)= 0.16$, *ns.* The variance of the DECA-P2 BC was not homogenous at the .05 level of significance, but it was at the .01 level, $F(1,102)=6.67$, p<.05. However, Box's M test was significant (F [1.49, 30]= 1.49, p< .05), indicating that the covariance matrices of the dependent variables were not equal across groups. Although this assumption is apparently violated, the validity of this test is unclear (Hakstian, Roed, & Lind, 1979) as the sample sizes are equal.

Overall, the MANCOVA model was significant, suggesting that there were significant differences between the intervention and comparison conditions when including students who have experienced trauma and those who have not across the dependent variables tested in the model, V=0.15, F (4,88)= 3.72, p<.01. It should be noted that Pillai's Trace was used for determining significance, as it has been demonstrated to be the most robust when sample sizes are similar or equal (Field, 2009). The remainder of this section outlines univariate tests and interaction analyses as related to each research question. Refer to Table 8 for descriptive statistics for independent and dependent variables in the model, and Table 9 for a description of univariate tests.

Questions 5a and 5b. In order to answer these questions, an interaction term, trauma condition by intervention condition, was constructed and tested within the MANCOVA model. There was no effect of the interaction term on the dependent variables (F [4,88]= 0.37, p=.83). Children in the trauma condition (N= 52) had similar T-scores on the Externalizing and ADHD Problems and Internalizing Problems subscales of the BASC-2 PM as well as on the TPF and BC scales of the DECA-P2 at posttest controlling for the differences in means of scores on these measures at pretest. Table 8 details these differences in T-scores per group. As there were no effects of the model on either dependent variable, it was proposed that the TPF scale may not be the most

efficient way to measure the constructs of attachment and self-regulation. In order to fully investigate the question, the model was run again, with the Attachment and Self-Regulation scales of the DECA-P2 taking the place of the TPF scale. It is noted that the TPF scale is comprised of the Attachment, Self-Regulation and Initiative subscales. Again, when this model was run there was no effect of the interaction term on the dependent measures $F(5,86)=.31$, $p=.91$. This lends support to the decision to use the TPF scale as an appropriate way to measure the constructs of attachment and self-regulation that were of interest in this study.

Question 6. In order to investigate the potential moderation of severity of reported trauma symptomology (TSCYC T-scores) on the effect of the intervention on children who have experienced trauma, a second interaction term (TSCYC Scores X Intervention Condition) was added to the model. In order to test the effects of the interaction term, its strength was compared with that of its composite individual variables. The main effect of intervention condition was significant $V=0.15$, $F(4,88)=3.72$, $p<.01$. However, the main effect of the TSCYC T-score was not $V=0.04$, $F(4,88)=0.81$, $p=.52$. When the interaction term was created, its main effects on the model were significant, $V=0.16$, $F(4,88)=0.24$, $p<.01$. Estimates of effect sizes were also calculated for the main effect of intervention (Partial $\eta^2=.15$), and the main effect of the interaction of intervention and TSCYC-SF T-score (Partial $\eta^2=.16$). These estimates show similarly moderate effect sizes, lending evidence to the strength of the interaction and the efficacy of the model.

This effect was further investigated to see if the most severe cases as rated on the TSCYC-SF were, as hypothesized, influenced more by the intervention than those cases that were rated as less severe. This was done by creating a binary variable, specifically comparing those cases that were rated as being the top one third in terms of severity on the TSCYC-SF with

those that were in the bottom two thirds within the model. This effect was not significant $F_{(4,90)}=2.23$, p=.069, although a general trend was noted. Given the strength of the original interaction, it is likely that moderation is taking place in the model. However, future studies may wish to investigate this relationship in more detail.

As with many multivariate tests, it is likely that the relationships between the dependent measures have an effect on the model. Discriminant Function Analysis allows for the investigation of the nature of these relationships. The discriminant analysis revealed one discriminant function, which explained 100% of the variance, canonical R^2= .12. This discriminant function significantly differentiated the intervention condition from the comparison condition Λ=.89, $X^2(1)$=11.90, p<.01. The correlations between outcomes and the discriminant functions revealed that the BASC-2 Internalizing Symptoms loaded the most highly on the function (*r=.90*), followed by the DECAP2 Behavior Concerns (*r=.66*), the DECAP2 Total Protective Factors (*r=-.65*) and the BASC-2- PM Externalizing Problems (*r=.59*).

Univariate analyses were also conducted to better delineate the significant effect of the interaction of intervention condition and TSCYC score. An ANOVA showed the intervention condition to be a significant predictor of differences in BASC-2 PM Internalizing scale at posttest, $F_{(1)}= 10.73$, p<.01. A follow-up t-test including only children in the trauma condition noted a significant difference between intervention (T= 45.78 [6.84]) and comparison conditions (T=54.35 [11.43]) on the BASC-2 PM, Internalizing scale at posttest, $F_{(50,38.63)}=8.89$, p<.01. The interaction term produced a similar difference between intervention and comparison conditions on the BASC-2 PM, Internalizing scale at posttest, $F_{(1)}= 11.52$, p<.01. The measure of effect size was similar for the interaction term (**Partial** η^2= 0.11) when compared with the effect size of the intervention term alone (**Partial** η^2= 0.10). The fact that the interaction term

was a significant predictor of scores on the BASC-2 PM, Internalizing scale, but the TSCYC

alone was not a significant predictor (F [4,88]=0.81, p=.50) suggests that the TSCYC intensified

the effect of the intervention condition, specifically lower scores on the BASC-2 PM,

Internalizing scale.

Question 7. Minor differences in posttest DECA-P2 TPF T-test scores were noted between

children in the intervention condition who had experienced trauma (T=55.89) and those who had

not experienced trauma (T=53.13), controlling for differences in T-scores on this measure at

pretest. However, as noted previously, the interaction between trauma condition and intervention

condition was not significant in the original model. Therefore, these values are not statistically

different, nor are they clinically significant, with both values in the typical range for the TPF

scale.

CHAPTER 5

DISCUSSION

This study examined the pilot implementation of a supplemental trauma intervention based on the Attachment, Self-Regulation, and Competency framework (ARC Blaustein & Kinniburgh, 2012) implemented in the Head Start preschool setting. The effects of this intervention on agency attitudes, teacher practices, classroom climate, and child social-emotional outcomes were examined.

Analysis of the results of the present study are presented and discussed in accordance with Bronfenbrenner and Morris's (2007) Bioecological Model in conjunction with a treatment approach referred to as Trauma Systems Therapy (Saxe, 2007). The Bioecological Model highlights the importance of the interaction of child characteristics and levels of the child environment. Children experience traumatic events across levels of their environment (i.e., parent incarceration, lack of community resources). However, each child's experience in relation to the experiencing of trauma is highly individualized. For this reason, it is important to examine individual child characteristics (e.g., emotional dysregulation) together with the environmental factors. The implemented intervention was based on the Trauma Systems Therapy model, which suggests that a system is not responsive to trauma when: (1) a traumatized child has difficulty regulating emotional states, and 2) a social environment and/or system of care is not able to help the child to regulate these emotional states. Reflective of these models, results are presented at the level of (a) the child, (b) the classroom, and (b) the larger system, which in this case reflects the addition of the administration, mental health consultants, and family advocates.

Agency level

Trauma Systems Therapy highlights the importance of the child's system of care in helping the child regulate his or her emotional state. When a child has difficulty regulating his or her emotional states, it is the job of individuals in the child's environment to respond accordingly to support the child. The results of the agency-level assessment are perhaps the most indicative of continued "roadblocks" in the successful implementation of agency-wide trauma-informed practices that strive to support children's emotional regulation following experiencing trauma. As noted in Chafouleas and colleagues' (2016) article outlining a blueprint for evidence-based interventions for children who had experienced trauma within the school setting, the most successful interventions were those that could fit within a multi-tiered framework that had been adopted at the level of the school or district. Further, Overstreet and Chafouleas (2016) review of implementation science research suggests that providing systems with awareness of a problem and suggesting ways to solve it will likely not lead to long-term success. Instead, it likely is necessary to first foster organizational change prior to engaging in direct intervention. While the intervention in the present study attempted to engage all levels of the system, assessment of the system using the Trauma Informed Agency Assessment (TIAA) at pretest and posttest revealed few changes. It is important to note that true organizational change takes a minimum of three years (e.g., Nersesian, Todd, Lehmann & Watson, 2000). Therefore, the purpose of this study is not to criticize the inability of the system to change, but rather to acknowledge the importance of this change eventually and to suggest that more work must be done at the level of system administrators prior to engaging in further intervention at the level of the classroom in order to ensure long-lasting change at the levels of the classroom and child.

Further, specific concerns were raised in the domain of *trauma competence* on the TIAA. Upper level administrators recognized that their students' exposure to trauma is a concern. However, at pretest they had not yet taken specific steps to address this. The director of the organization expressed concerns regarding funding and staffing related to engaging in another set of trainings. The other main concern raised was wanting to "focus on the positive" (building resiliency) instead of focusing on the experiencing of trauma ("the negative"). Both of these concerns point to a fundamental misunderstanding regarding the purpose of creating a trauma-informed system. As previously mentioned, SAMHSA's (2014) key assumptions of trauma-informed approaches are: "(a) a realization of the widespread prevalence and impact of trauma, a recognition of the signs of traumatic exposure and (c) a response grounded in evidence-based practices that (d) resists re-traumatization of individuals." Further, the National Child Traumatic Stress Network (NCTSN) defined a trauma-informed child welfare system as

> one in which all parties involved recognize and respond to the varying impact of
> traumatic stress on children, caregivers, families, and those who have contact with the
> system. Programs and organizations within the system infuse this knowledge, awareness,
> and skills into their organizational cultures, policies, and practices. They act in
> collaboration, using the best available science, to facilitate and support resiliency and
> recovery *(*Chadwick Trauma-Informed Systems Dissemination and Implementation
> Project National Advisory Committee, 2011, p.1).

As can be seen from the combination of these sources, just focusing on building resiliency is important, but fails to take into account the first steps in both models, which include recognizing children's exposure to trauma, their responses and then responding accordingly. Without

acknowledging that children have experienced trauma, there is no guarantee that everyone within the system will react in a way that will avoid re-traumatization of children and families.

Across intervention conditions, teachers rated their capacities to cope with secondary traumatic stress as relatively high. However, there was no effect of the intervention condition for changes in ratings from pretest to posttest. Being able to effectively cope with secondary traumatic stress is part of the foundation of working effectively with children who have experienced trauma. Experiencing secondary trauma can influence the quality of services that caregivers provide and can lead to burnout (Pearson, 2012), yet among individuals who are at risk for various exposure to trauma, high self-efficacy is correlated with improved quality of life (Prati, Pietrantoni, & Cicognani, 2010), and lower levels of overall secondary traumatic stress (Bonach & Heckert, 2012). At the base of Attachment, Self-Regulation and Competency (ARC) framework are the *caregiver affect management, attunement, consistent response,* and *routines and rituals* building blocks. These building blocks are all focused on supporting caregivers to in turn be able to support the children that they work with. It is therefore very important to continue to address secondary trauma as part of continued intervention. Finally, although ratings of secondary trauma self-efficacy were generally high, the lowest mean endorsement was for the item measuring teachers' rating of how easily they were *able to get* h*elp from others to better handle working with my students.* This continues to point to the necessity of the Head Start agency to support teachers in learning about and appropriately addressing teachers' own mental health as well systematically supporting teachers in addressing the mental health of their students.

Classroom level

Although the present study's sample size did not allow for statistical comparison of quantitative data between the intervention and comparison conditions, descriptive and qualitative data collected both lend support to child level analyses. Additionally, analysis of teachers' feedback is an important piece of this pilot study that offers important information for further research and practice. As Head Start programs work to modify this and similar interventions for future implementation, information regarding teacher satisfaction with and implementation fidelity of both the trauma supplement intervention and intervention-as-usual programs is useful.

Teachers in both intervention and comparison conditions rated their abilities to cope with secondary trauma as high. This is important, as experiencing secondary trauma can influence the quality of services that caregivers provide and can lead to burnout (Pearson, 2012). For teachers, experiencing secondary trauma means that he or she will be less emotionally available for students, and less able to support them in their social emotional and academic development (Pianta, 2003). It is unclear why teachers tended to endorse such high feelings of self-efficacy, while they consistently rated low levels of knowledge of trauma-informed practices. It is possible that teachers may not have felt comfortable truthfully rating the items that directly reflected their ability to regulate their own emotional reactions such as their ability to "control their emotions" or "control recurring distressing thoughts," for fear of being criticized or identified as being unable to do their jobs. Although it was not within the scope of the present study, a private, structured interview with teachers regarding their perceived self-efficacy and strengths and weaknesses may more effectively capture a more accurate picture of teachers' abilities to cope. Across both intervention and comparison conditions, the lowest ratings on the STSES were on the item "getting help from others to better handle working with my students." When taken in conjunction with the Trauma Informed Agency Assessment (TIAA), it was clear

that even though teachers report that they are dealing well with secondary trauma, there are actually relatively few supports in place to help them cope with the effects of working with traumatized children. The fact that teachers feel this lack of support, even though they endorse feeling capable of coping speaks even further to the need to provide staff with the appropriate supports to process secondary traumatic stress. One possible reason that they have endorsed being able to cope is that they have not had an outlet to begin to learn about and truly explore the stress that they face. Providing a forum (i.e., therapy services) for teachers would help teachers reflect on and provide accurate feedback regarding their secondary trauma self-efficacy.

Another classroom-level finding was related to teachers' fidelity of adherence to the intervention. Although the general adherence to the intervention was described as "moderate," there was a great deal of variability in ratings both between teachers and across the observations. The lack of consistently high levels of intervention implementation fidelity in the present study is likely related to the reasons outlined by Baweja (2016), which include what teachers express as (1) the perceived need for the program, (2) concerns regarding their ability to balance their students social and emotional needs with their academic needs, and (3) the need for more psychoeducation about trauma. Specifically, teachers in the intervention condition expressed the perceived need for the program overall, but two of them expressed that they did not have as many concerns with students currently during the time of the intervention as they had had during previous years. Therefore, the exact degree to which teachers perceived the need for the program at the time it was taking place in the intervention was not clear. However, Mental Health Consultants had perceived a great need for the teachers to participate in the intervention. This further indicates the need for systematic psychoeducation surrounding the effects of trauma for all staff, including teachers. Secondly, teachers repeatedly reported having a need for the

program but not having time to balance other initiatives with the program. In this case those initiatives are not purely academic as was demonstrated in the Baweja study, but the idea that many programs are competing for a relatively small amount of time is reflective of the present study. Teachers in the present study reported that they appreciated learning "why" challenging behaviors can occur when children have experienced trauma, as this was a difference noted between the trauma supplement intervention and the comparison, Al's Pals. However, on the post-training session rating forms, teachers reacted least favorably toward the item, "I am more confident in my skills as a result of this training (Mean rating of 3.83 out of 5)." This favorability rating was a relative weakness in relation to other items on the scale (mean rating of 4 out of 5 overall). Teachers also indicated that they thought that the practical aspects of the training were more useful than the psychoeducation. This points to the continued need for training and education around this topic. As noted by the Substance Abuse and Mental Health Services Administration's (SAMHSA; 2014) key assumptions underlying trauma-informed approaches, understanding how trauma affects the brain is the first step in preventing re-traumatization of individuals. Understanding how to consistently apply this information through effective intervention comes much later. The fact that teachers did not feel as though the psychoeducation regarding trauma (the "first step") was useful indicates that further training should work to integrate this information so that everyone can truly have an understanding and appreciation of what trauma is and why it is important to understand when implementing interventions.

Child level

The Trauma System Therapeutic model underlines the importance of preparing the child's environment to respond to the needs of the child. The quantitative effects of the present

intervention on the administration and classroom/teacher levels were minimal. However, teacher feedback regarding the favorability and perceived effectiveness of the intervention was useful for future implementation. At the level of the child, this study attempted to clarify differences between the effects of having teachers participate in the pilot implementation of a trauma-specific training program in addition to the intervention-as-usual implementation of the social emotional curriculum, Al's Pals. Several differences were observed at the child level between students (ages 3-4) whose teachers had taken part in the trauma-specific intervention and those whose teachers that had not. Overall, significant differences were observed between children in the intervention and comparison conditions on the combination of students' protective factors, behavior concerns, and internalizing and externalizing behaviors at posttest, when controlling for ratings of these measures at pretest. These effects were evident when including both children who had experienced trauma and those who had not experienced trauma in the analysis. This result is encouraging, as it lends support to the idea that the intervention condition was intended to benefit all children, not just those who had experienced trauma. This finding adds to the work of Holmes and colleagues' (2014) study of the implementation of the ARC framework in the Head Start setting, as that study only included children who had experienced trauma and were displaying post-traumatic stress symptoms. The fact that the framework is potentially beneficial in building social emotional skills for students who have experienced trauma as well as those who have not is reassuring for future implementation.

Specifically among children who had experienced an elevated rate of trauma at pretest, analyses showed mixed results regarding differences in outcome measures at posttest between intervention and comparison conditions. When *not* taking into account the severity of symptoms as rated using the TSCYC-SF, results showed children who had experienced trauma were no

more likely to benefit from the intervention than children who had not experienced trauma. However, the addition of a moderation term to the model produced an important finding: that the child's level of trauma symptomology at pretest was an important factor in considering the response to the intervention. When a further indicator of the severity of children's reaction to traumatic events, the Trauma Symptom Checklist for Young Children (TSCYC) was introduced into the model, its effects were shown to moderate the effect of the intervention on children who had experienced trauma. Specifically, children who had experienced trauma and whose teachers had taken part in the trauma training program showed significantly fewer concerns (T-score= 45.78) on the BASC-2-Progress Monitor, Internalizing problems scale, a measure of children's anxiety, depression, and somatization, when compared with children who had experienced trauma but whose teachers had not taken part in the trauma-specific training (T-score= 54.50). It should be noted that this moderation is likely. However, further research should be done to more thoroughly investigate the influence of symptom severity on the effects of trauma-specific intervention.

Interventions based on the ARC model have been demonstrated to be effective in decreasing trauma-related symptomology and increasing protective factors and resiliency among children who have experienced trauma (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013; Arvidson et al., 2011) in the adolescent residential treatment setting, as well as in Head Start preschool programs (Holmes, Levy, Smith, Pinne, & Neese, 2014). The present study replicate some of those changes. Although both internalizing and externalizing behaviors were explored in the study, the only differences between intervention and comparison conditions were noted on the measure of internalizing behaviors. One reason for this may be that externalizing behaviors are typically noted as more disruptive within the school setting, and

therefore receive more attention. It is likely that children with highly disruptive behaviors were already receiving a higher level of support in order to actively manage these behaviors in both the intervention and comparison condition prior to the implementation of the intervention, such that minor adjustments in teacher attitudes and practices as were conveyed through the trauma supplement intervention would not be likely to further influence externalizing behaviors. However, internalizing behaviors tend not to warrant initially high levels of intervention, and may therefore be more sensitive to changes in classroom environment.

Conclusion

The present study was based on both the Bioecological and Trauma Systems Therapy models. Both of these models highlight the importance of considering both individual characteristics and environmental factors that influence the child's ability to cope with traumatic experiences. While it is crucial to attempt to create a school environment that is supportive of all children, specifically those who have experienced trauma, it cannot be ignored that experiencing trauma is highly individualized (Perry,1995). Classifying children based on the number of traumatic events they have experienced was necessary for the purposes of this study, but it fails somewhat to honor that child's individual experiencing of the event. As Head Start preschools work to create environments that are sensitive to and supportive of children who have experienced trauma, it is important to remember that every child experiences and responds to traumatic events differently. Having systems in place to systematically identify and treat all child victims of trauma is crucial to the academic and emotional development of young children in Head Start preschool programs.

Future Directions

The present study provides results of a pilot implementation of a trauma-informed intervention. Results were presented separately at the level of the agency/building, teacher/classroom, and child. However, recent literature regarding school-based trauma interventions point to the importance of the systematic integration of these levels. Working towards this goal, several logical "next steps" arise for future implementation of the intervention within the current setting.

First, as is suggested by Chafouleas and colleagues (2016), it is critical to implement interventions within the existing structure of the school. Although many Head Start centers do not use a tiered model of service delivery, it is still important to work within the existing framework. Nadeem and Ringle (2016) examined reasons for de-adoption of a group level trauma intervention (CBITS) administered by master's and PhD- level clinicians in elementary, middle and high school settings. Reasons cited for discontinuing the intervention included not seeing students make behavioral progress, and not having school or district-level support. For the current setting, it is necessary to work to continue to insure a commitment to trauma informed philosophy and secure support at the level of the administration prior to moving on with further intervention at the classroom level.

Second, classroom and teacher-level analyses are critical pieces of measuring the effects of this type of intervention on the Head Start system. The present study did not allow for comparative quantitative analyses due to low sample size of classrooms and teachers. Future studies should focus on the direct effects of the intervention through qualitative and quantitative comparisons. As the CLASS assessment is completed in all Head Start sites, this should

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continue to be analyzed in addition to other measures measuring classroom climate and teacher practices.

Third, two teachers in the intervention condition expressed following the first training session that while they had had trauma-related concerns for students in their classes in previous years, they did not presently have these concerns for any of their students. This statement suggests a discrepancy, as data from this study shows approximately 52% of children in the intervention condition had experienced an elevated level of trauma exposure. This means that teachers were left with the difficult task of identifying children whom they believe have experienced trauma, and referring them individually for treatment. This approach can be time consuming and also risks missing identifying children who may truly need services but whose behaviors may not be as distracting in a classroom setting (Ford, Gagnon, Connor and Pearson, 2011). Gonzalez and colleagues (2015) discuss the importance of universal screening for trauma exposure and symptomology, especially among at-risk populations. Although the present study focused on intervention, effective and systematic assessment for all children that the agency serves would be an important and logical next step.

Finally, regarding the intervention, the current pilot study showed mixed effects across levels of the intervention. Some behavioral improvements with moderate effect sizes were noted at the child level for children in the intervention condition, including children in the intervention condition that had experienced trauma. Satisfaction with the intervention was generally high, but implementation fidelity was generally low. While the effectiveness of the intervention-as-usual curriculum, Al's Pals, was not a central focus of the present study, the low degree of implementation fidelity of the curriculum, coupled with its limited research base calls into question its effectiveness for all children, especially those with complex trauma backgrounds.

Further intervention implementation should focus on consistency and fidelity of implementation of whichever social emotional curriculum is used. However, a more trauma-informed, research-based curriculum, or a research-based social emotional curriculum with a trauma supplement, similar to the one used in this study would likely produce the greatest outcomes for all students, including those who have experienced trauma.

Limitations

The level at which the intervention-as-usual comparison curriculum (Al's Pals) was implemented likely contributed to the lack of significant differences noted between the intervention and comparison conditions. Although Al's Pals curriculum materials were observed in all the classrooms, there was no accurate measurement of the fidelity of implementation of this curriculum. While fidelity checklists exist, they were not used in this study. Further, Al's Pals has very limited empirical support, even when it is being implemented with fidelity. Because of this, it is difficult to gauge the full effect of the trauma supplement intervention when compared with the comparison group. Although there are some measurable gains being made, because the social emotional curriculum is not implemented uniformly, children are likely to "miss" certain skills. Data from this study indicate an improvement in internalizing symptoms as measured by the BASC-2 PM, Internalizing scale in the intervention condition. This suggests that children with internalizing symptoms (common amongst children who have experienced trauma) may not be benefitting fully from the social emotional curriculum, Al's Pals, as it is currently being implemented.

Additionally, the trauma supplement intervention was not implemented consistently with fidelity. It is likely that this would have been easier to measure with more teachers taking part in the intervention. As discussed in the previous section, greater dedication of members of the

administration would likely have led to higher implementation fidelity. It is also likely that the low number of training sessions, and the limited duration of the intervention (two 4- hour training sessions across six weeks) influenced both the lack of implementation fidelity and the lack of change demonstrated due to the intervention. While a few behavioral changes were noted among children who had experienced trauma, it is likely that the low intensity of the intervention and the short intervention period was not enough to produce numerous quantifiable behavioral changes among these children. Further research should continue to examine the effects of the ARC framework in the Head Start setting with particular focus on intervention intensity and implementation fidelity.

Another set of limitations exists with the nature of the data collection methods for the study. First, the intervention site was chosen partially based on the site coordinator's willingness to participate in the study. It is possible that this type of selection may have skewed results, as this coordinator was in general highly motivated to carry out the intervention, which may have led to more positive results of the intervention that may be ordinarily expected. Secondly, because teachers were not blinded to condition (intervention or comparison), it is possible that the child-level results were partially due to the rater bias such that teachers in the intervention condition rated their students as having made greater behavioral improvements than those in the comparison condition. Teachers were, however, blinded to trauma condition, as the measure indicating whether or not children had experienced trauma was completed by caregivers. Further studies using a more rigorous experimental design in which participants are blinded to intervention condition and multiple methods are used to measure dependent variables would further expand the literature base.

Data collection measures and procedures at pretest and posttest were selected to elicit the best response rate from caregivers and teachers, while simultaneously respecting the amount of time it takes to fill out rating scales. Due to the length of the measure, the DECA-P2 was not re-administered to caregivers during the pretest data collection phase, instead analyses rely on ratings of behavior during the first two months of the school year. While this is potentially troublesome, studies of the DECA-P2's test/retest reliability have shown the scales to be stable across time. It is therefore likely that changes noted can be attributed to the intervention and not to maturation over the several-month period prior to beginning the intervention.

At the time of the data collection, no norm-referenced scale existed to measure system-level attitudes towards trauma, so the Trauma Informed Agency Assessment (TIAA) was used to systematically collect qualitative data across levels of the system. Future studies should consider incorporating a psychometrically sound measure that investigates staff's attitudes and assesses readiness to change surrounding incorporating trauma-informed care. One such measure, the Attitudes Related to Trauma-Informed Care (ARTIC) Scale (Baker, Brown, Wilcox, Overstreet, & Arora, 2015) currently exists and would likely be appropriate for future studies.

APPENDICES

Appendix A

Tables and Figures

Table 1:

Internal Reliability Coefficients for the DECA-P2 Scales by Rater for Scales Used in this Study

	Raters	
Scales	Parents	Teachers
Total Protective Factors	.92	.95
Self-Regulation	.90	.94
Attachment/Regulation	.79	.85
Behavioral Concerns	.80	.86

Table 2:

Definitions of Key Domains of the Trauma-Informed Agency Assessment (TIAA)

Domain	Definition
Physical and Emotional Safety	The organization promotes a sense of safety based on the physical layout of the building as well as organizational daily routines and processes
Trauma Competence	The extent to which the organization serves the unique needs of individuals who have experienced trauma
Cultural Competence	The extent to which the organization accommodates the cultural beliefs of consumers
Commitment to Trauma-informed Philosophy	The extent to which all agency staff with consumer contact integrate trauma-informed practices into their daily duties
Trustworthiness	Whether factors such as consistency, availability of staff, and interpersonal boundaries foster a sense of trust between the agency and the consumer
Youth and Family Empowerment	Whether policies and practices empower clients through participation and community-based partnerships

Table 3:

Building Blocks of the Attachment, Self-Regulation, and Competency Framework and Corresponding Measures

| Trauma Experience Integration | | | | | |
| Attachment | | Self-Regulation | | Competency | |
Building Block	**Corresponding Measure**	**Building Block**	**Corresponding Measure**	**Building Block**	**Corresponding Measure**
Caregiver Management of Affect	• Classroom Assessment Scoring System • Direct Observation • Secondary Trauma Self-Efficacy Scale	Affect Identification	• Devereux Early Childhood Assessment Preschool Program, 2nd Edition	Executive Functions	• Devereux Early Childhood Assessment Preschool Program, 2nd Edition
Attunement	• Classroom Assessment Scoring System, • Direct Observation, • Devereux Early Childhood Assessment Preschool Program, 2nd Edition • Secondary Trauma Self-Efficacy Scale	Modulation	• Devereux Early Childhood Assessment Preschool Program, 2nd Edition • Behavior Assessment System for Children, 2nd Edition	Self-development and identity	• Devereux Early Childhood Assessment Preschool Program, 2nd Edition • Behavior Assessment System for Children, 2nd Edition
Consistent Response	• Classroom Assessment Scoring System • Direct Observation	Affect Expression	Devereux Early Childhood Assessment Preschool Program, 2nd Edition	Trauma Experience Integration	• Trauma Symptom Checklist for Young Children-Short Form • Trauma-Informed Agency Assessment
Routines and Rituals	• Classroom Assessment Scoring System • Direct Observation				

Table 4:

Trauma Exposure by Intervention Condition

	Trauma intervention Condition	*Comparison Condition*	*Total*
Trauma Exposure	27	25	**52**
No Trauma Exposure	25	28	**53**
Total	**52**	**53**	**105** **Missing: 1**

Table 5:

Demographic Information by Intervention Condition

	Trauma Intervention Condition (N, % of condition)	Comparison Condition (N, % of condition)	Total Sample (N, % of total sample)
Race			
Black/African American	21 (40.4%)	23 (43.4%)	44 (41.9%)
White	15 (28.8 %)	13 (24.5%)	28 (26.7%)
Mixed Race	7 (13.5%)	11 (20.8%)	18 (17.1%)
Hispanic/Latino	8 (15.4%)	3 (5.7%)	11 (10.5%)
Asian	1 (1.9%)	1 (1.9%)	2 (1.9%)
Other	0 (0.0%)	2 (3.8%)	2 (1.9%)
Size of Household			
1-2	11 (21.2%)	9 (17.0%)	19 (18.1%)
3-5	21 (40.4%)	30 (56.6%)	51 (48.6%)
>5	20 (38.5%)	14 (26.4%)	34 (32.4%)
Family Income (yearly)			
< $5,000	13 (25.0%)	14 (26.4%)	27 (25.7%)
<$10,000	21 (40.4%)	9 (17.0%)	30 (28.6%)
<$20,000	11 (21.2%)	14 (26.4%)	25 (23.8%)
<$30,000	7 (13.5%)	10 (18.9%)	17 (16.2%)
<$50,000	0 (0.0%)	4)7.5%)	4 (3.8%)
>$50,000	0 (0.0%)	2 (3.8%)	2 (1.9%)
Caregiver Educational Attainment	12 (23.1%)	12 (22.6%)	24 (22.9%)
No Diploma	19 (36.5)	22 (41.5%)	41 (39.0%)
High School Diploma	13 (25.0%)	10 (18.9%)	23 (21.9%)
Some College	6 (11.5%)	7 (13.2%)	13 (12.4%)
Associates Degree	2 (3.8%)	0 (0.0%)	2 (1.9%)
Bachelor's Degree	0 (0.0%)	2 (3.8%)	2 (1.9%)
Graduate/ Professional Degree			
Homeless or Hungry in the past 6 months	3 (5.8%)	4 (7.5%)	7 (6.7%)

Table 6:

Ratings of Classroom Climate from the Classroom Assessment Scoring System (CLASS)

	Pretest		Posttest	
	Intervention	Comparison	Intervention	Comparison
Emotional Support Domain	4.79 (0.26)	5.65 (0.45)	5.78 (0.50)	5.51 (0.35)
Positive Climate	5.50 (1.30)	5.78 (0.19)	5.94 (0.59)	6.00 (0.00)
Negative Climate	1.00 (0.00)	1.06 (0.10)	1.22 (0.39)	1.22 (0.39)
Sensitivity	4.78 (0.79)	4.78 (0.79)	4.61 (0.35)	4.77 (0.51)

Note. Scores based on a 1 (low) to 7 (high) scale.

Table 7:

Level of Fidelity of Intervention Implementation

	Time 1	Time 2	Time 3	Time 4
Teacher 1	Medium	High	Medium	Medium
Teacher 2	Low	Low	Low	Low
Teacher 3	Low	Medium	Low	Medium

Note. Scores based on 11-point checklist. Low: 0-3/11, Medium: 4-6/11, High 7-11/11

Table 8:

Multivariate Analysis of Variance Model, Descriptive Statistics

	Treatment M (SD)			Comparison M (SD)		
Outcome Measure	Trauma	No Trauma	Total	Trauma	No Trauma	Total
DECAP2-TPF, post test	55.89 (6.29)	53.13 (9.70)	54.63 (8.04)	47.75 (8.52)	51.00 (12.05)	49.50 (10.60)
DECAP2-BC, post test	40.63 (9.76)	47.96 (10.51)	44.48 (10.96)	51.96 (9.32)	48.93 (9.31)	50.34 (9.35)
BASC-2 PM, Internalizing, post test	45.78 (6.83)	48.58 (8.35)	47.06 (7.57)	54.50 (11.65)	54.14 (12.15)	54.30 (11.80)
BASC-2 PM, Externalizing, post test	51.70 (7.40)	51.89 (8.05)	51.94 (7.65)	56.75 (8.25)	54.53 (9.16)	55.55 (8.74)

Note. DECAP2-TPF= Devereux Early Childhood Assessment Preschool Program, 2nd edition-Total Protective Factors; DECAP2-BC= Devereux Early Childhood Assessment Preschool Program, 2nd edition- Behavior Concerns; BASC-2 PM Behavior Assessment Scale for Children, 2nd Edition- Progress Monitor

Table 9:

Multivariate Analysis of Covariance, Univariate Analyses

	Dependent Variables			
	DECAP2 TPF, post test F	DECAP2 BC, post test F	BASC-2PM Internalizing, post test F	BASC-2PM Externalizing, post test F
Independent Variables				
Intervention Condition	0.35	2.40	10.73**	0.29
Trauma Condition	0.07	0.43	0.18	0.06
Covariates				
Hours at School	0.40	0.19	0.17	5.25*
Teachers' Years of Experience	5.75*	17.16**	0.00	2.64
DECAP2- TPF, pretest	5.08*	2.10	8.82**	1.80
DECAP2BC, pretest	0.10	0.06	4.07*	1.70
BASC-2 PM Internalizing, pretest	2.43	2.62	43.04**	1.19
BASC-2 PM Externalizing, pretest	3.52	23.50**	14.94**	191.26**
TSCYC	0.06	1.74	0.49	0.94
Interactions				
Intervention Condition X TSCYC Score	0.44	2.64	11.52**	0.27
Intervention Condition X Trauma Condition	0.07	0.75	0.38	0.28

Note. *Significant at the $p<.05$ level; **Significant at the $p<.01$ level; DECAP2-TPF= Devereux Early Childhood Assessment Preschool Program, 2nd edition- Total Protective Factors; DECAP2-BC= Devereux Early Childhood Assessment Preschool Program, 2nd edition- Behavior Concerns; BASC-2 PM Behavior Assessment Scale for Children, 2nd Edition- Progress Monitor; TSCYC= Trauma Symptom Checklist for Young Children
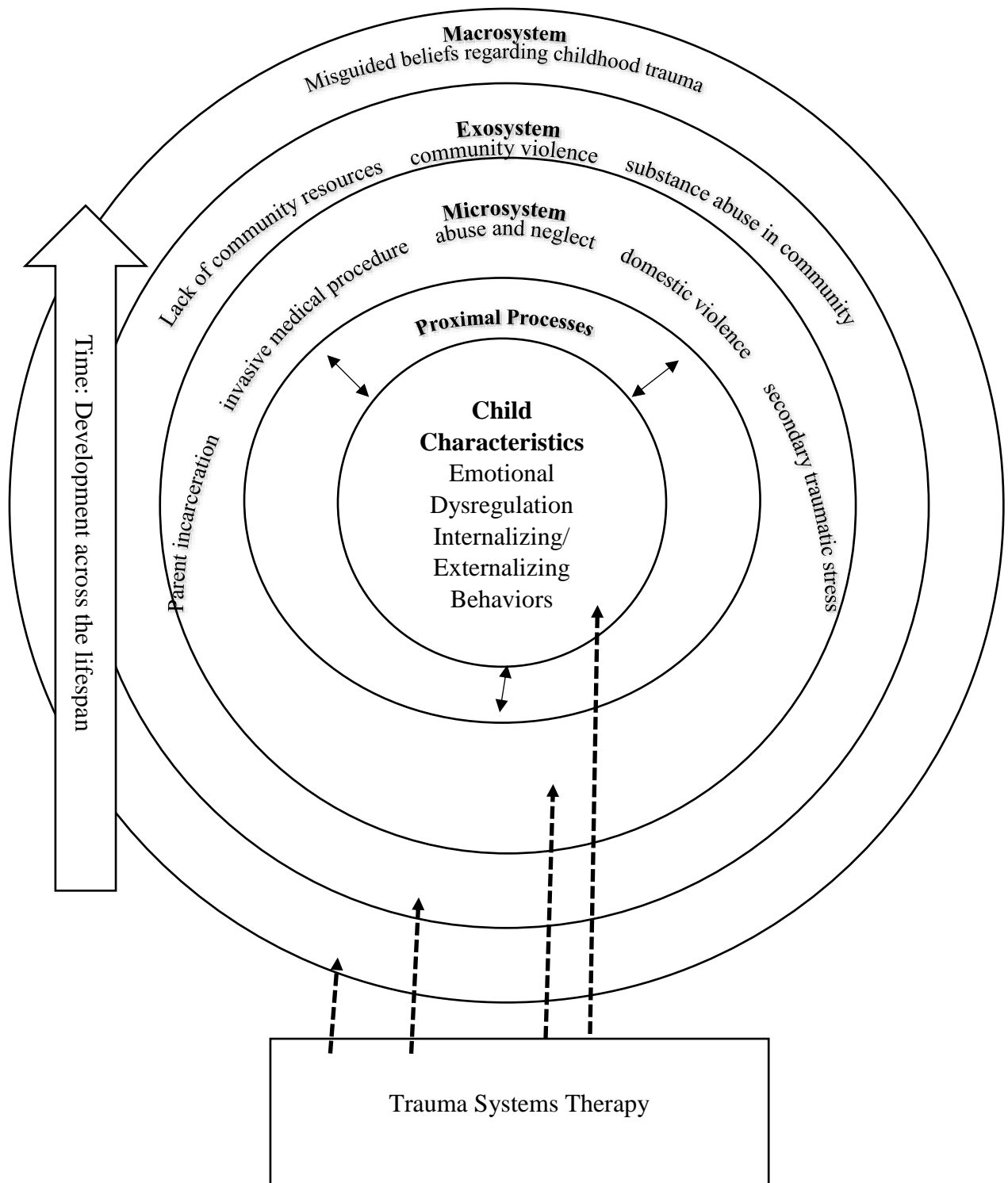
Figure 1: *Theoretical framework: Integration of the effects of trauma on the Bioecological Model (Bronfenbrenner & Morris, 2007) and Trauma Systems Therapy (Saxe, 2007)*
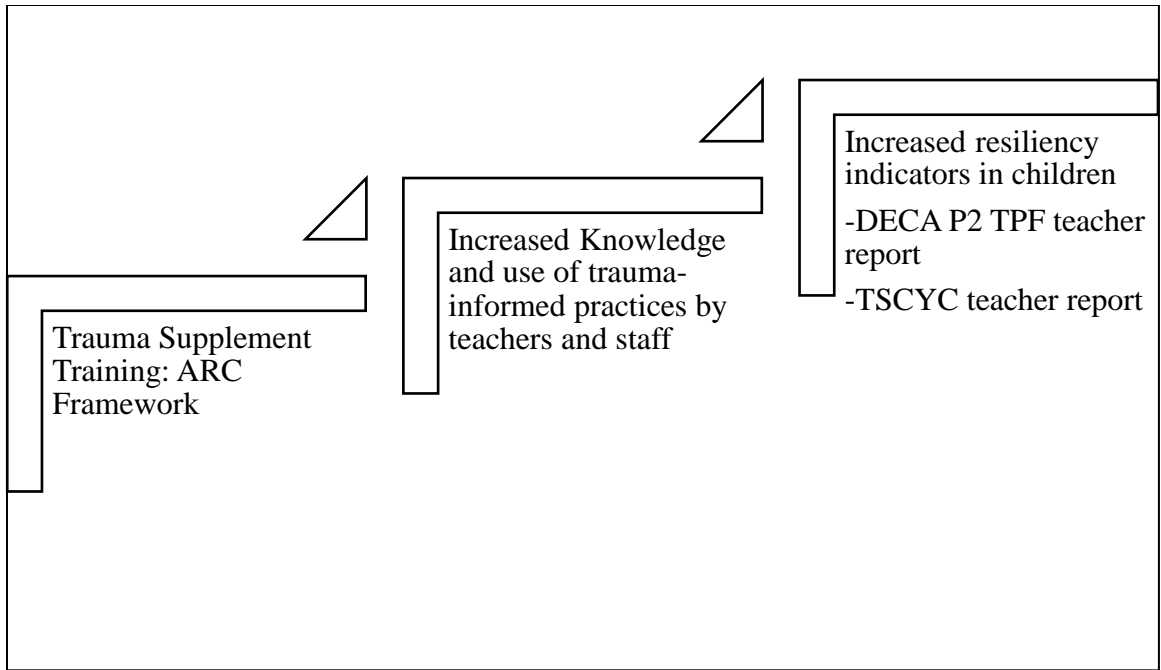
Figure 2: *Mechanism of Action of Training Model on Resiliency Indicators*
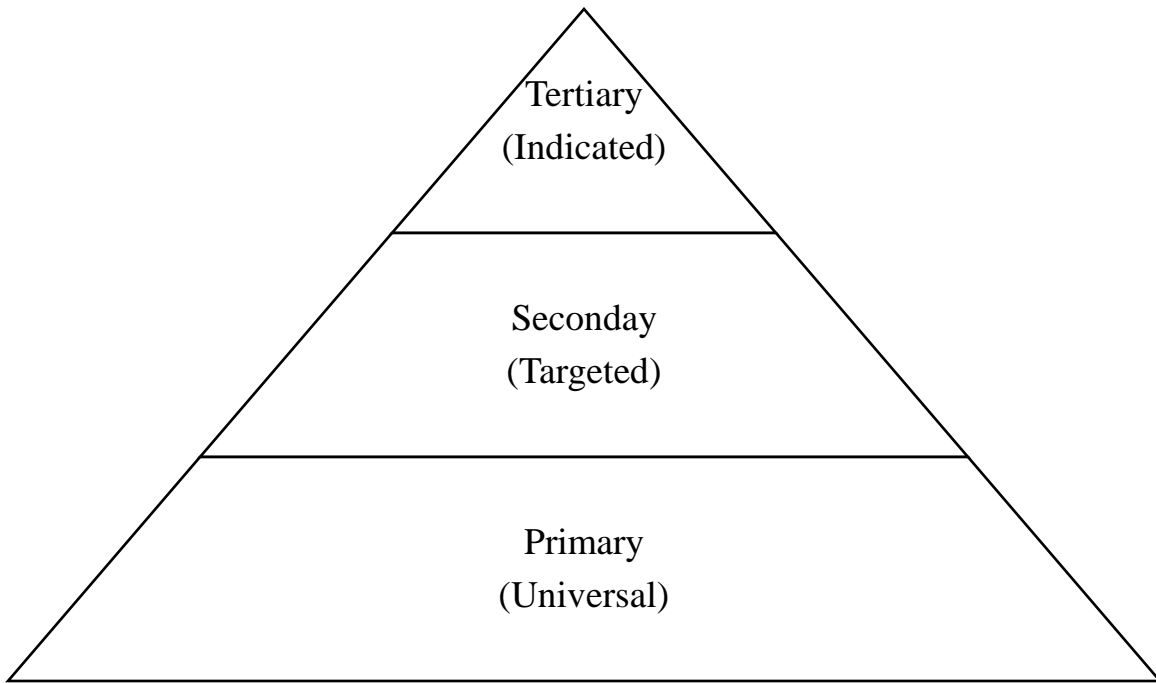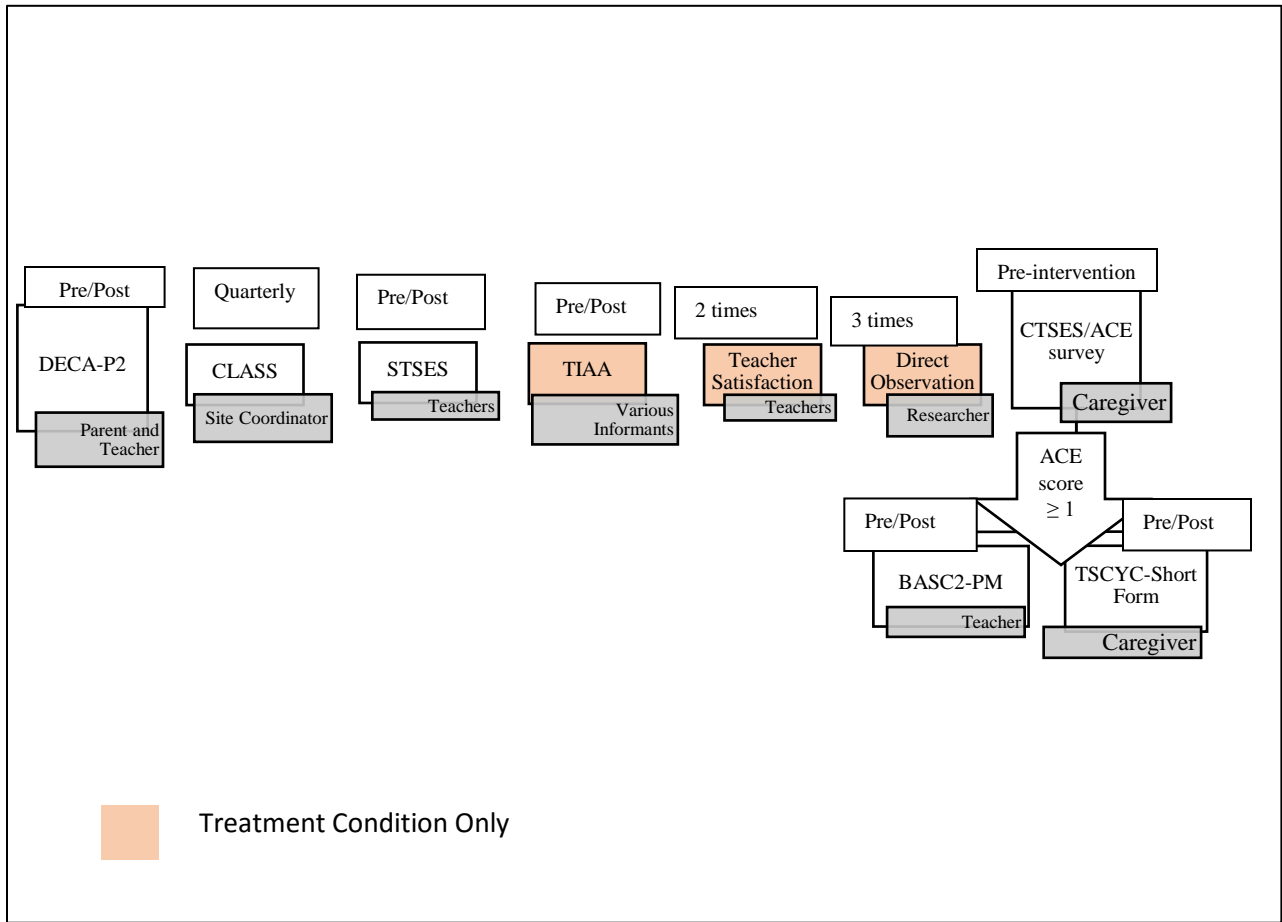
Figure 3: *A Public Health Model of Service Delivery*

Figure 4: *Data Collection Procedure*

Appendix B

Classroom Fidelity Checklist

Classroom:_____

Date/Time:_____

Observer:_____

Mark "1" if present, Mark "0" if absent.

1) Caregivers refer to the feelings poster
2) Caregivers refer to the feelings toolbox
3) Caregivers incorporate movement or relaxation into routine
4) Teachers make mention of the "future self"
5) Caregivers maintain controlled affect
6) Caregivers are attuned to children's needs and emotions
7) Caregivers respond consistently to children
8) Caregivers have set routines and rituals that are supportive of all children
9) Caregivers help children with identifying a range of emotions
10) Caregivers help children modulate their emotional responses
11) Caregivers help children express their emotions effectively.

Appendix C

Follow-up Qualitative Measures

Questions for teachers who participated in the intervention condition

Describe what you enjoyed about the trauma training sessions

_____
_____
_____
_____

Describe what you did not enjoy about the trauma training sessions

_____
_____
_____
_____

Describe how the training sessions contributed to your professional development.

_____
_____
_____
_____

Do you feel that it is important to integrate trauma-informed practices into your teaching?
Describe why or why not.

_____
_____
_____
_____

What did you change in your classroom as a result of the trainings? If your answer is "nothing,"
please comment on why not.

_____
_____
_____
_____

What was different about this program compared with Al's Pals?

_____
_____

_____
_____

If you could participate in more trauma-focused training, would you? Why or why not?

_____
_____
_____
_____

Questions for the Head Start director

- What does "trauma informed practice" mean to you?
- How important is it for Head Start to implement trauma-informed practices? Why?
- In comparison with other initiatives how does trauma-informed practice rank in terms of importance to agency administrators?
- What does Head Start do to address secondary trauma and toxic stress of employees including mental health staff and teachers?
- How is trauma already integrated into Head Start Policies and procedures?
- What sort of support at the agency level is necessary going forward to ensure that trauma-informed practices continue to be integrated into Head Start framework?

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