The Play Behaviors of Young Children Exposed to a Traumatic Event

Erica Lynne Smith, LCSW

Submitted in partial fulfillment of the
Requirements for the degree
of Doctor of Philosophy
in the Graduate School of Arts and Sciences
COLUMBIA UNIVERSITY
2011
Copyright © 2011 Erica Lynne Smith
All rights reserved
ABSTRACT

PLAY BEHAVIORS OF YOUNG CHILDREN EXPOSED TO A TRAUMATIC EVENT
ERICA LYNNE SMITH, LCSW

This study examined the relationship between exposures to a traumatic event and play behaviors of child witnesses to the World Trade Center terrorist attacks in 2001, using a subsample of 71 children from the NYC Young Children’s Project (NYCYCP) interviewed 9-12 months after the event.

Child Behavior Checklist broadband scales revealed little disturbance in the total sample. As expected, a larger percentage of children met alternative PTSD diagnostic criteria than DSM-IV diagnostic criteria. Through level of change in observed play behaviors in the exposed children, this study explored impact of a traumatic event. Analysis of the change in child play behavior in Pre-WTC mention and Post-WTC mention segments of the videotaped interviews revealed common themes in the play behaviors seen in other studies of trauma exposed children, such as aggression, anxiety, generalized fears, and event specific fears.

This study describes strategies of self-soothing and self-regulation used by the children as they recounted their experience. The findings suggest that through play behaviors, young children are able to supplement verbal report and provide self-reported complex internalized affective experiences when impacted by traumatic experiences. Additionally, the study reveals that the children were impacted by their experience of the event 9-12 months later.
TABLE OF CONTENTS

Chapter One: Introduction ............................................................................................... 1
  Study Aims .................................................................................................................. 4

Chapter Two: Theoretical Orientation .......................................................................... 9
  Ecological-transactional Theory .................................................................................... 11
  Developmental Theory .................................................................................................. 11
  Developmental Psychopathology ................................................................................... 14

Chapter Three: Risk & Protective Factors: Family, Exposure & Demographics ............ 16

Chapter Four: Trauma Research: Symptoms, Impact & Diagnosis in Children .......... 26
  Diagnostic and Statistical Manual - IV .......................................................................... 30
  Alternative PTSD Criteria for Children ....................................................................... 31

Chapter Five: Typical & Problematic Play .................................................................... 34

Chapter Six: Methods and Procedures ........................................................................ 40
  Study Sample ............................................................................................................... 40
  Protocol ......................................................................................................................... 41
  Operational Definition of Variables ............................................................................ 41
  Subscale Items .............................................................................................................. 45
  Coding Method ............................................................................................................ 45

Chapter Seven: Child Demographic Data .................................................................... 47
  Chronological and Developmental Age ........................................................................ 47
  Gender ......................................................................................................................... 49
  Race/Ethnicity ............................................................................................................. 50
  Parent Demographic Data ........................................................................................... 50

Chapter Eight: Type of Exposure, Degree of Exposure, and Proximity to Event .......... 53

Chapter Nine: Symptom Measurement with the Child Behavior Checklist .................... 60
  Exposure ....................................................................................................................... 62
  Developmental Age ..................................................................................................... 63
  Gender .......................................................................................................................... 64

Chapter Ten: Play Behavior Observation Checklist ....................................................... 67
  Change in Mean Pre to Post-WTC mention Scores ...................................................... 70
  Exposure ....................................................................................................................... 72
  Gender .......................................................................................................................... 73

Chapter Eleven: Child Excerpts .................................................................................... 75
Discussion .......................................................................................................................................83
Conclusion .....................................................................................................................................90
References .....................................................................................................................................94
Appendices ...................................................................................................................................128
  Appendix A: New York City Young Children’s Project Study ..................................................128
  Appendix B: Diagnostic Criteria PTSD - DSM- IV-TR ...............................................................134
  Appendix C: Alternative PTSD Criteria for Children ...............................................................136
  Appendix D: Zero to Three DC: 0-3R – 100. Posttraumatic Stress Disorder ..........................138
  Appendix E: Developmental Trauma Disorder ........................................................................140
  Appendix F: Code Definitions .....................................................................................................141
  Appendix G: PRE-WTC MENTION CODER RECORD ..........................................................150
  Appendix H: POST-WTC MENTION CODER RECORD .........................................................151
  Appendix I: Frequencies of Alternative PTSD Criteria Symptoms in Total Sample and Alternative PTSD Sample .................................................................152
LIST OF TABLES

Table 1: Child Demographics .................................................................................................................48
Table 2: Parent Demographics ..................................................................................................................51
Table 3: Parent Reported Number of Child Exposures for Total Sample and Alternative PTSD Criteria Sample ......................................................................................................................54
Table 4: Number of Parent Exposures for Total Sample and Alternative PTSD Criteria Sample ........................................................................................................................................56
Table 5: Child Proximity to World Trade Center Collapse .......................................................................58
Table 6: Child Behavior Checklist (CBCL) Normalized Non-clinic Mean Scores Compared to Total Sample and Alternative PTSD Criteria Sample CBCL Mean Scores ........................................................................................................................................61
Table 7: Child Behavior Checklist (CBCL) Normalized Non-clinic Mean Scores by Number of Child Exposures .....................................................................................................................................................62
Table 8: Child Behavior Checklist (CBCL) Normalized Non-clinic Mean Scores by Age on 9/11 and Age at Interview .................................................................................................................................63
Table 9: Child Behavior Checklist (CBCL) Normalized Non-clinic Male Sample Mean Scores compared to Total Sample Males and Alternative PTSD Sample Males CBCL Mean Scores ........................................................................................................................................64
Table 10: Child Behavior Checklist (CBCL) Normalized Non-clinic Female Sample Mean Scores compared to Total Sample Female and Alternative PTSD Sample Female CBCL Mean Scores .....................................................................................................................................................65
Table 11: Direction and Presence of Change on Play Behavior Observation Checklist (PBOC) Scores for Total Sample and Alternative PTSD Criteria Sample ........................................................................69
Table 12: Number of Changes in Play Behavior Observation Checklist Scores for Total Sample and Alternative PTSD Criteria Sample ........................................................................................................................................70
Table 13: Mean Change Scores from Pre-Post Mention Play Behavior Observation Checklist (PBOC) for Total Sample and Alternative PTSD Criteria Sample ................................................................................71
Table 14: Mean Change Scores from Pre-Post Mention Play Behavior Observation Checklist (PBOC) by Number of Exposures ........................................................................................................................................73
Table 15: Mean Change Scores from Pre-Post Mention Play Behavior Observation Checklist (PBOC) by Gender .....................................................................................................................................................75
Table 16: Frequencies of Alternative PTSD Criteria Symptoms in Total Sample and Alternative PTSD Criteria Sample

..........................................................152
LIST OF FIGURES

Figure 1: Number of Exposures Experienced by Total Sample ...........................................53
ACKNOWLEDGEMENTS

This dissertation is dedicated to all young children struggling to make their voices heard. I would like to thank Drs. Ellen DeVoe and Tovah Klein for allowing access to the stories of these young children and the parents that were brave enough to let their children speak of their experiences.

Special thanks to all of you that provided unwavering emotional support during this journey. Thank you for your single minded purpose, especially in the early morning hours, which motivated me to complete this chapter in my life.
CHAPTER ONE
Introduction

The estimated lifetime exposure to traumatic events in the general population of children and adolescents is 40% to 70% (Briggs-Gowan, Carter, Moye-Skuban & McCue-Horwitz, 2001; Giaconia, Reinherz, Silverman, Pakiz, Frost & Cohen, 1995; Miller, Enlow, Reich & Saxe, 2009; Schneiderman, Ironson & Siegel, 2005; Stover & Berkowitz, 2005). While the literature illustrates the deleterious effects of trauma exposure in school-aged, adolescent, and adult populations, knowledge regarding the specific ways trauma affects children under 6-years-old remains minimal (Green, Crenshaw & Kolos, 2010; La Greca, Silverman, Vernberg & Roberts, 2002; Meiser-Stedman, Smith, Gluckman, Yule & Dalgleish, 2007; Pine, Costello & Masten, 2005; Stover & Berkowitz, 2005). Few studies identify or describe the ways preschool children communicate or express their experience of trauma, adaptive or maladaptive, presenting basic problems with assessment of traumatized children (Cohen, Chazan, Lerner & Maimon, 2010; Meiser-Stedman, Smith et al., 2007; Scheeringa, 2006; Silverman & LaGreca, 2002). Although the adult literature has demonstrated the effect of untreated trauma, empirical research on young children has not established patterns of the short- and long-term outcomes of untreated trauma and associated distress (Briggs-Gowan et al., 2001; Green, Crenshaw & Kolos, 2010; Lavigne, Arend, Rosenbaum, Binns, Christoffel & Gibbons, 1998; Pfefferbaum, DeVoe, Stuber, Schiff, Klein & Fairbrother, 2004; Salmon & Bryant, 2002; Terr, 1990, 1991). Much of the available research focuses narrowly upon specific traumatic events, utilizes inconsistent or weak methodologies, only examines dysfunctional or abnormal outcomes associated with trauma, or ignores
contextual, historical, and normative factors (Carter, Briggs-Gowan & Davis, 2004; Sameroff, 2000; Sameroff, Conner-Smith, Saltzman, Thomsen & Wadsworth, 2001).

Although limited empirical information exists, the impact of a traumatic event on young children is not negated. Case studies, practice experience, and descriptive analysis illustrate behaviors, themes and complications that reoccur across the population of trauma exposed children (Briggs-Gowan et al., 2001; Carter et al., 2004; Green, Crenshaw & Kolos, 2010; Meiser-Stedman, Smith et al., 2007; Miller, Enlow et al., 2009; Pfefferbaum, DeVoe et al., 2004; Pfefferbaum, Pfefferbaum, Gurwitch, Nagumali, Brant, Robertson, Aceska & Saste, 2003; Pine, Costello & Masten, 2005; Salmon & Bryant, 2002; Stover & Berkowitz, 2005; Terr, 1990, 1991). The literature clearly shows that children have the capacity to experience clinical and sub-clinical levels of traumatic responses (Cohen, Chazen et al., 2010; Pine, Costello & Masten, 2005; Stover & Berkowitz, 2005). Degree and severity of traumatic responses in children exposed to a traumatic event needs to be clarified and described along a spectrum of mental health outcomes, not only psychopathology.

The literature describes trauma exposure as impacting general development, expression, regulation of fear, trust, self-awareness, and predictability in the preschool child (Briggs-Gowan et al., 2001; Carter et al., 2004; Costello, Foley & Angold, 2006; Green, Crenshaw & Kolos, 2010; Lavinge, Arend, Rosenbaum et al., 1998; Macy, Barry & Noam, 2003; Pine, Costello & Masten, 2005; Rutter, 1970; Salmon & Bryant, 2000; Scheeringa, 2008; Stormont, 2002; Stover & Berkowitz, 2005). Immature coping responses, limited language development, caregiver dependence, and accelerated developmental stages make children aged 2-6 years old particularly sensitive to traumatic
experiences in the areas of social, emotional, physical, cognitive, and psychological development (Briggs-Gowan et al., 2001; Carter et al., 2004; Costello, Erkanli, Fairbank & Angold, 2002; La Greca et al., 2002; Salmon & Bryant, 2002; Williams, Alexander, Bolsover & Bakke, 2008). In fact, Cohen, Mannarino, Murray and Ingelman (2006) propose that trauma-exposed children suffer in multiple domains, not only mental health, and many experts suggest the creation of developmentally appropriate reinterpretations of DSM-IV PTSD symptom criteria (Cohen, Mannarino, Murray & Ingelman, 2006; La Greca et al., 2002; Scheeringa, Zeanah, Myers & Putnam, 2003; Scheeringa, 2006; Silverman & La Greca, 2002; van der Kolk, Pynoos, Cicchetti, Cloitre, D’Andrea, Ford, Lieberman, Putnam, Saxe, Spinazzola, Stolbach & Teicher, 2009). Furthermore, young children exhibit, express, and cope with their feelings and problems differently from adolescents and adults. Verbal dexterity and transient behavioral stages, considered problematic for older children, may reflect different issues for young children or in fact be normative for younger cohorts (Carter et al., 2004; Sameroff, 2000; Sameroff et al., 2001; Stover & Berkowitz, 2005).

Practice wisdom suggests that any child exposed to a traumatic event experiences consequences yielded by the event, but not all children experience maladaptive traumatic responses as one of those consequences. Although children exposed to a traumatic event may not present with clinical levels of mental illness, many show symptomatic stress reactions (Laor, Wolmer, Mayes, Golomb, Silverberg, Weizman & Cohen, 1996). Accurate identification, assessment, prevention, and intervention with trauma-exposed children require a comprehensive multidimensional inventory of indicators of risk as
compared to adults and adolescents (Scheeringa, Zeanah et al., 2003; Scheeringa, 2006; Silverman & La Greca 2002; van der Kolk, Pynoos, Cicchetti et al., 2009).

In the current study, data describing play behaviors of children exposed to trauma offer the field an added dimension to accurate identification, assessment, prevention, and intervention. One unique aspect of the study data is the child report portion of the interview on the videotapes from the New York City Young Children’s Project (NYCYCP) study. In other studies parents, teachers, or other caregivers provide observations and interpretations of the child’s experience, not the preschool child. This study postulates that play takes on many roles and functions as a multi-dimensional tool for assessment, as a critical domain in PTSD, and as a natural form of communication for all children (Carter et al., 2004; Cattanach, 2003; Lederer, 2002; Nader, Pynoos, Fairbanks & Frederick, 1990; Scheeringa, 2006; Westby, 1991). Play has multiple functions in the life of the child and is a tool to help them work through problems, understand the world, and express complex thoughts and feelings they cannot otherwise verbalize (Carter et al., 2004; Cattanach, 2003; Green, Crenshaw & Kolos, 2010; Lederer, 2002; Scheeringa, 2006).

**STUDY AIMS**

1. What types of play behaviors do children exhibit after a traumatic event? What do these play behaviors look like? Are there common patterns, themes, and behaviors seen in the play of children exposed to any traumatic event? Are there common patterns, themes, and behaviors seen in the play of children exposed to the same traumatic event?

2. How do 2- to 5-year-old children exposed to a traumatic event express thoughts, feelings, and emotions through play? Are the play behaviors exhibited correlated to the mental health status of a traumatized child?
This study describes basic play behaviors indicative of trauma exposure to inform evaluation. As observed by numerous experts, the play behavior of traumatized children can look distinctly different from that of non-traumatized children (Cohen, Mannarino et al., 2006; Dripchak, 2007; La Greca et al., 2002; Scheeringa, 2006; Scheeringa, Zeanah et al., 2003; Silverman & La Greca, 2002; Stover & Berkowitz, 2005; Terr, 1983a, 1983b 1984, 1990, 1991).

Examination of the systems that exert the most influence on the experiences of the child provides the most comprehensive understanding of the social-emotional development of a child (Cowen, Work, Wyman, Parker, Wannon & Gribble, 1992; Cowen, Wyman, Work, Kim, Fagen & Magnus, 1997; Cox & Paley, 2003; Garmezy, 1983, 1985; Garmezy & Rutter, 1983; Grizenko & Pawliuk, 1994; Luthar & Cicchetti, 2000; Luthar, Cicchetti & Becker, 2000; Rutter, 1979, 1983, 1985; Smith & Prior, 1995). Experts suggest that assessment of young children include the caregiver relationship as well as contextual factors such as community, family, and culture (Briggs-Gowan, Carter, Irwin, Wachtel & Cicchetti, 2004; Briggs-Gowan et al., 2001; Carter et al., 2004; Luthar, Cicchetti & Becker, 2000; Pine, Costello & Masten, 2005; Sameroff, 2000).

Research on social-emotional development offers valuable insight into the complexities of behavior when viewing the family as a dynamic, multilayered system. Cox and Paley (2003) discuss the use of a “systems metaphor” to understand families and provide the study framework to explain the dynamic interchanges that influence childhood development.

Using the trauma literature to identify domains reflecting symptoms of traumatic play in children, this paper reviews the literature and available studies of play behavior
and young children in order to distinguish normal play from post-traumatic play behaviors in a group of children exposed to the same traumatic event. Degree of trauma is explored through level of change in observed behavior between pre-WTC mention, considered baseline, as compared to post-WTC mention during the videotaped semi-structured child interview conducted during the NYCYCP study (see Appendix A). A review of the literature identified theoretical constructs related to the impact of trauma on young children, play, and instruments designed for use in research and assessment of children. Observations of the play of traumatized children by experts in the field formulate the basis for codes developed and used in this study.

In the methodology section, a clear differentiation of the NYCYCP study and unique aspects of this study (‘the current study’) are presented, including description of methods and procedures involved in the creation, development, justification, and implementation of coding measures for play behavior. Included is the rationale for the use of the NYCYCP study measurement data as part of the current study. The methodology section also provides a full account of the underlying principles used for the selection of anchors and development of global play behavior codes that informed the study description of play behaviors. The NYCYCP study gathered data using validated and reliable measurement tools to distinguish children meeting diagnostic criteria for trauma from the group. The NYCYCP study employed tools to measure the impact of the event on caregivers and address changes to the environment of the child pre and post 9/11.

In the results section, statistical analysis of data depicts patterns of play behaviors and play behavior codes are compared with standardized measures of behavior including
the Child Behavior Checklist (CBCL) and Alternative PTSD diagnostic criteria for children (Scheeringa, 2006). Descriptive analysis of the association between play behavior and level of exposure of the child to the event (from parent ratings), with parent PTSD symptoms and parent measures to assess extent to which play behavior is a function of direct exposure of the child to the event, indirect exposure through parent stress, or interactions between the two. The use of the global codes measured the effect of mentioning the WTC event on the play behaviors of the child participants. Analysis of these data reveals associations between pre/post WTC mention and the play behaviors of the child. This change is marked by documenting the effect of recalling the WTC disaster on the child’s play behavior as well as between play behavior change and other measures of child and parent behaviors. Narrative excerpts from the videotaped interviews are used to further explicate the data findings.

This study explores the differences in play behaviors in children exposed to the terrorist attacks on the World Trade Center on September 11, 2001. These attacks resulted in the death of over 3,000 individuals, the collapse of iconic buildings representative of the New York City skyline, the incapacitation of one of the largest metropolitan cities in the United States, and the disruption of the daily lives of thousands of families in the New York metro area. While all the participants in this study were exposed to an adverse event, not all the children were traumatized by the event. In general, researchers interested in the experiences of young children have turned to the study of children’s play behaviors as the most complete form of expression for children (Cohen, Chazan et al., 2010; Gitlin-Weiner, Sandgrund & Schaefer, 2000; Pine, Costello & Masten, 2005). Finally, contributions and limitations of the study are explored,
including the development of a systematic measurement of traumatic play behaviors, associations with mental health and trauma, and a description of how children express their experience of an extraordinary, overwhelming, and terrible event.
CHAPTER TWO
Theoretical Orientation

This study draws upon three theoretical constructs in the development of the protocol and analysis of the data. Experts emphasize the importance of understanding the mechanisms that disrupt child development and create anomalies in their behavior (Buckner, Mezzacapa & Beardslee, 2003; Cicchetti & Cohen, 1995a, 1995b; Cicchetti & Sroufe, 2000; Pine & Cohen, 2002; Sameroff, 2000). Ecological-transactional theory comprehensively integrates the concept of multiple levels of bidirectional influence that transact over time and impact child development – a fundamental component to understanding the consequences of traumatic events upon children (Pine & Cohen, 2002; Sameroff, 2000; Sameroff & MacKenzie, 2003; Scheeringa, 2008). Developmental theory provides an understanding of typical child development (Briggs-Gowan et al., 2004; Briggs-Gowan et al., 2001; Bronfenbrenner, 2005; Piaget, 2000) and developmental psychopathology explores the processes through which individuals are effected by, cope with, and adapt to a traumatic event (Benard, 1991; Buckner, Mezzacapa & Beardslee, 2003; Cicchetti & Cohen, 1995a, 1995b; Cicchetti & Sroufe, 2000; Cowen, Wyman et al., 1997; Grizenko & Pawlink, 1994; Keller, Spieker & Gilchrist, 2005; Luthar, Cicchetti & Becker, 2000; Luther & Cicchetti, 2000; Masten, 2001; Masten, Hubbard, Gest, Tellegen, Garmezy & Ramirez, 2000; Rutter & Stroufe, 2000).

Closely linked to typical development of cognitive, language, social, and even academic outcomes in children, play and development are intimately related domains and have a transactional relationship (Bratton, Ray, Rhine & Jones, 2005; Carter et al., 2004; Cattanach, 2003; Lederer, 2002; Kreppner, O’Connor, Dunn & Anderson-Wood, 1999;
Trad, 1989; Vondra & Belsky, 1991). Influenced by mental health or trauma symptoms experienced by the child, play functions as a proxy for multiple developmental milestones and reveals the impact of the trauma that a child may not be equipped to verbalize. Simultaneously, mental health status/traumatic symptoms influence the types and styles of play behaviors exhibited by the child. As demonstrated by Cohen, Chazan, Lerner & Maimon’s (2010) study exploring the concept of post-traumatic play in Israeli children exposed to terrorism, the less traumatized a child, the fewer traumatic play behaviors seen. Knowledge of child development, psychopathology, and play provides access to the subjective emotional and the objective factual experience of trauma by young children.

This study utilized developmental psychology to instruct the creation of the play analysis tool (Play Behavior Observation Checklist) and guide interpretation of observed play in the video interviews of the children collected by the NYCYCP study. Each coder for this study understood typical child development along with generally accepted milestones and age-appropriate behaviors as dictated by the literature and implemented this knowledge while rating the video data. Because this sample does not have pre-event data for the children, the current study relies upon typical child behavior and the pre-WTC mention data as baseline for comparison of the study participants. Concepts of resilience from the developmental psychopathology literature provide a perspective in which observed play behaviors in the children of this study are interpreted. The current study focuses upon the play behaviors of children exposed to the 2001 terrorist attacks on the World Trade Center and the variables that influence these behaviors – including correlations between parent mental health symptoms resulting from exposure to a
traumatic event. This study utilized alternative criteria for PTSD (Scheeringa, 2006) and other studies of young children in order to develop a coding method for the play behaviors observed on the videotaped interviews.

**Ecological-Transactional Theory**

Ecological-transactional theory illustrates the reciprocal relationship between the individual and the environment in that both influence and change the other (Sameroff, 2000; Sameroff & MacKenzie, 2003). As a heuristic device for operationalizing internalized symptoms in children exposed to trauma, the ecological-transactional perspective serves as a comprehensive viewpoint for conceptualizing the interplay between individual and contextual factors in the analysis of play behaviors observed in this study. The independent variable (trauma exposure) is expected to affect both mental health symptoms (child and parent) and play behaviors. Interactions between individual, parent, and event related factors are anticipated to account for differences in play behaviors for the children observed in this study. In the analysis of the data, factors such as child exposure, child chronological and developmental age during and after the event, child gender, family demographics, parental impact, functioning, and symptoms are examined.

**Developmental Theory**

Multiple theories emphasize early points in the developmental trajectory from which future cognitive, emotional, and physical capacities unfold throughout childhood (Briggs-Gowan et al., 2004; Briggs-Gowan et al., 2001; Bronfenbrenner, 2005; Frost, Worthman & Reifel, 2007; Piaget, 2000). Some theories consider development a process of subtle incremental changes over time, some focus on stages of development building
upon each preceding stage, while others look to external factors as facilitating
development (Briggs-Gowan et al., 2004; Briggs-Gowan et al., 2001; Bronfenbrenner,
2005; Piaget, 1971; Turner & Helms, 1991; Vygotsky, 1986). In all perspectives, typical
development is reliant upon the completion of environmentally defined tasks necessary
salient milestones to progress to the following stage or level of competency in the course
of a typical developmental trajectory (Lewis & Carpendale, 2002; Piaget, 1971, 2003).
Both Piaget and Vygotsky studied young children and the role of cognition in their
successful development (Frost et al., 2007; Specht & Craig, 2006). While Piaget focused
on independently motivated sensory motor development initiating cognitive
development, Vygotsky emphasized socially mediated cognitive development (Piaget,
1971, 2003; Vasta, Miller & Ellis, 2003; Vygotsky, 1986). The theories of Piaget and
Vygotsky provide a foundation for many developmental theories and define a common
language from which to understand child development as used in this study.

Piaget asserted that mental processes structure behavioral responses that comprise
development and lead to mastery (Frost et al., 2007; Piaget, 1972). Piaget proposed four
stages of development – sensorimotor, preoperational, concrete operational, and formal
operational – to mark the achievement of specific cognitive abilities in the child and link
the development of cognitive process to developmental milestones (Frost et al., 2007;
Specht & Craig, 2006). In the sensorimotor period, a child explores the environment
through the senses (Frost et al., 2007; Piaget, 1972; Specht & Craig, 1987, 2006). The
preoperational stage refers to the capacity of the child to perform mental processes (Frost
et al., 2007; Piaget, 1972; Specht & Craig, 1987, 2006). At this stage, the child begins to
utilize simplistic symbolic language to represent objects (Piaget, 1971, 2000, 2003; Turner & Helms, 1991). In the concrete operational stage, the child develops a capacity for logic, but thinking remains literal (Frost et al., 2007; Piaget, 1972; Specht & Craig, 1987, 2006). Finally, during the formal operational stage, the child develops the ability to utilize conceptual skills and abstraction (Frost et al., 2007; Piaget, 1972; Specht & Craig, 1987, 2006). If a child does not meet these milestones, successful attainment of future coping, adaptation and competency is impaired, therefore disrupting the progress of the child (Briggs-Gowan et al., 2001; Piaget, 2003, 2000).

Vygotsky attributed cognitive development to the transactional relationship between the child and the social context in which the child lives (Vasta, Miller & Ellis, 2003). He determined that the infant develops higher mental function through the process of scaffolding; a process in which a child gains knowledge and understanding of social functions as they are guided by a capable adult (Karpov, 2005; Vasta, Miller & Ellis, 2003). The child becomes more competent in established social constructs, language, and thinking, through assistance from the adult (Vasta, Miller & Ellis, 2003). Throughout this exchange, the degree of support provided by the adult is adjusted as the competencies and achievement levels of the child grow (Lewis & Carpendale, 2002). Vygotsky defined the gap between independence and need for assistance in a child’s ability to perform tasks as the zone of proximal development (Lewis & Carpendale, 2002; Vasta, Miller & Ellis, 2003). Through this process of scaffolding, the child builds mastery, and as a result the child develops the independence to function without guidance. As the need for guidance decreases, the zone of proximal development decreases. The child develops a socially constructed cadre of skills and applies them
appropriately (Lewis & Carpendale, 2002), assuming that the competencies of the adult have not been compromised. Within the Vygotskian paradigm, without the transactional relationship between the capable adult and the infant, the infant will not develop higher mental function or cognitive mediation which is closely tied to self-regulation (Karpov, 2005).

*Developmental Psychopathology*

Developmental psychopathology explores the pathways leading to deviations from typical behavior in young children (Cicchetti & Cohen, 1995a, 1995b; Luthar & Cicchetti, 2000; Rutter, 1979). Three groups of factors influence child development: normative age factors, moment-in-time related factors, and unanticipated experiences (Beardslee, 1989; Benard, 1991; Cicchetti & Cohen, 1995a, 1995b; Cicchetti & Rogosch, 2009; Cicchetti & Toth, 2009; Cowan, Wyman *et al.*, 1997; Dawson-McClure, Sandler, Wolchik & Milsap, 2004; Garmezy, 1985; Grizenko & Pawlink, 1994; Luthar & Cicchetti, 2000; Masten, 2001; Masten, Best & Garmezy, 1990; Rutter, 1979, 1983; Smith & Prior, 1995; Turner & Helms, 1991). Developmental psychopathology seeks to understand affect regulation, attention, cognition and perception through the study of interpersonal trauma and disruption of care giving through examination of mechanisms that promote positive outcomes in individuals, despite negative circumstances (Cicchetti & Cohen, 1995a, 1995b; Garmezy, 1985; Luthar & Cicchetti, 2000; Pine, Costello & Masten, 2005; Masten, 2001; Masten, Best & Garmezy, 1990; Rutter, 1979, 1983). This difference shifts the perspective from typical development towards examination of the processes that produce both positive (normal) and negative (abnormal) outcomes because of exposure to a detrimental event (Buckner *et al.*, 2003; Luthar, Cicchetti & Becker,
2000; Rutter & Sroufe, 2000). What appear to cause significant variation in resilient functioning are the interaction between risk and protective factors and their combined influence on future functioning (Buckner et al., 2003; Luthar, Cicchetti & Becker, 2000; Rutter & Sroufe, 2000).
Numerous acute and chronic stressors influence development of trauma symptoms including environmental, social, familial, biological, and psychological (Buckner et al., 2003; Cicchetti & Sroufe, 2000; De Bellis & Van Dillen, 2005; Grant, Compas, Thurn, McMahon, Gipson, Campbell, Krochock & Westerholm, 2006; Koenen, Moffitt, Poulon, Martin & Caspi, 2007; Luthar, Cicchetti & Becker, 2000; Masten & Curtis, 2000; Rutter & Sroufe, 2000). Risk factors associated with trauma symptom development in children include proximity to event, parental response and symptoms, economic hardship or stress, displacement or evacuation, and perceived or actual threat to overall well being (Grant et al., 2006; Hizli, Taskintuna, Isikli, Kilic, Zileli, 2009; Khamis, 2004; Otto, Henin, Hirsfeld-Beker, Pollack, Beiderman & Rosenbaum, 2007; Perrin, Smith & Yule, 2000; Thabet, Shivram, Winter & Vostaris, 2009; Vanderbilt-Adriance & Shaw, 2008).

Children are entirely dependent upon others for survival in the early years of life making them vulnerable to anything that compromises stable and predictable care giving (Carter et al., 2004; Carter, Garrity-Rokous, Chazan-Cohen, Little & Briggs-Gowan, 2001). Stability in lifestyle and predictability in care giving establishes safety for a child; events compromising homeostasis for a child in standard of living or way of life induces a stress response in children (Grant et al., 2006; Pfefferbaum, Seale, McDonald, Brandt, Rainwater, Maynard, Meierhoffer & Miller, 2000; Schneiderman, Ironson & Siegel, 2005; Thabet et al., 2009). Although child factors play a role due to interaction between the child and the family or environment, the child is acted upon by the family and the

Family based variables appear to mediate the relationship between stress and psychopathology and facilitate opportunities for the child to adapt and cope with change (Grant et al., 2006; Sroufe, Carlson, Levy & Egeland, 1999; Thabet et al., 2009; Vanderbilt-Adriance & Shaw, 2008). Parents function as social agents and mediators to distress in children (Kliwer, Parrish, Taylor, Jackson, Walker & Shivy, 2006; Pine,
Costello & Masten, 2005). Two major domains associated with positive outcomes that emerge within the context of these relationships - sense of safety and internal locus of control – both rely upon the response of the attachment figure (Mathiesen & Sanson, 2000; Pine, Costello & Masten, 2005; Shaver & Mikulincer, 2005). With well known sequelae of trauma exposure in adults, any traumatic stress response experienced by a parent has potential to impact the quality of care giving, indirectly impacting the development of the child. Pine, Costello and Masten (2005) note that few family based studies examining the direct associations with parent psychopathology and child symptom development exist.

Characteristics of the first relationship in the life of a child, the infant-caregiver relationship has strong influence upon later behavior patterns of a child and the development of secure-attachment is required for the completion of early developmental milestones (Bowlby, 1988; Frost et al., 2007; Kinniburgh, Blaustein, Spinazzola & van der Kolk, 2005; Gunnar & Davis, 2003; Piaget, 2003; Shonk & Cicchetti, 2001; Leve, Kim & Pears, 2001; Mills-Koonce et al., 2007; Vanderbilt-Adriance & Shaw, 2008). This dependent relationship influences the way in which the child matures, survives, and develops an emotional identity (Frost et al., 2007; Green, Crenshaw & Kolos, 2010; Shaver & Mikulincer, 2005; Specht & Craig, 1987). Schore (2001) discusses the attachment relationship as impacting the development of the young brain because it is experience-dependent. Essentially, the caregiver and the infant co-create the development of social, emotional, and schematic competences in the child. Through exploration, the child acquires knowledge and gains understanding of his or her influence and control upon the environment and thus greater self-confidence and mastery develop
(Green, Crenshaw & Kolos, 2010; Piaget, 1971; Shaver & Mikulincer, 2005; van der Kolk et al., 2005; Vygotsky, 1986). Assuming that the needs of the child are fulfilled, the infant confidently explores and experiences the world, all the time knowing the caregiver is close and responsive (Frost et al., 2007; Piaget, 1971; Shaver & Mikulincer, 2005; Specht & Craig, 1987). The quality and strength of the child-caregiver bond affects the development of secure-attachment and qualitatively transforms multiple aspects of subsequent stage evolution (Bowlby, 1988; Frost et al., 2007; Leve et al., 2001; Mills-Koonce et al., 2007; Vanderbilt-Adriance & Shaw, 2008). Any disruption in the way in which a child organizes the world challenges a child’s sense of mastery (Bandura, 1997, 2002; Bandura, Capara, Barbaranelli, Gerbino & Pastorelli, 2003; Beardslee, 1989; Haizlip & Corder, 1996). Secure attachment has been linked to the development of self-regulatory capacities in the child and as a result, events with direct influence on the quality of care for the child have the most impact on child wellbeing, including threatened or perceived loss of a caregiver (Pearlman & Courtois, 2005; Smith, 2004; Sroufe, Carlson et al., 1999; Thabet et al., 2009; van der Kolk et al., 2009). When affected by trauma, long term artifacts from this damaged relationship can be seen in the response patterns of traumatized children (Schore, 2001a, 2001b).

Van Bakel and Riksen-Walraven (2002) present ego-resiliency in parenting, referring to the ability of the parent to respond to caregiver stress, as the largest factor in determining child outcomes. As described by Beskly’s (1984) model of parental influence, characteristics of parents, sources of stress and support available to parents, and child characteristics determine quality of parenting. Ineffective or unresponsive care giving requires the child to compensate and adapt to an inattentive environment,
conveying doubt in the child as to his or her ability to access basic need fulfillment (Macy, Barry & Noam, 2003; Mathienson & Sanson, 2000; Piaget, 1971; Shaver & Mikulincer, 2005; Susman, Schmeelk, Ponirakis & Gariepy, 2001). The literature indicates that subjective experience of the child along with a sense of foreboding, level of danger or degree of loss of caregiver show the greatest predicative ability for PTSD symptoms in children (Hizli et al., 2009; Klein, DeVoe, Miranda-Julien & Linas, 2009; Lengua, Long, Smith & Meltzoff, 2006; Pfefferbaum, Doughty, Reddy, Patel, Gurwitch, Nixon & Tivis, 2002; Pine, Costello & Masten, 2005; Thabet et al., 2009). Thabet, Shivram, Winter and Vostaris (2009) discuss the impact of negative attribution of parents of their own skills and the development of PTSD symptoms in their children. Hizli et al., (2009) reported that among children exposed to an earthquake in Turkey, caregiver impact (i.e.: the ability of the caregiver to provide consistent, predictable, nurturing care) was associated with PTSD development in children. Additionally, Hizli and colleagues (2009) noted that functionality (as defined by caregiver impact) and ability to return to previous way of life (normalcy) was the greatest predictor of PTSD symptom development in children.

Much of the literature explores the impact of variables as predictors of PTSD in children including dose response, distance from event, type, and degree of exposure to severity of symptoms (Freemont, 2004; Groome & Soureti, 2004; Lengua et al., 2006; Otto et al., 2007; Pine, Costello & Masten, 2005; Wang, Nomura, Pat-Horenczyk, Dopplet, Abramovitz, Brom & Chemtob, 2006). Groome and Soureti (2004) studied the impact of an earthquake on 178 Greek children five months after the event. The study found that children closest to the center of the earthquake, and therefore highly exposed,
showed greatest number of symptoms of anxiety and PTSD (Groome & Soureti, 2004). Pine, Costello and Masten (2005) concluded that distant trauma shows a weaker impact on severity of symptoms, but that a small number of children experience an adverse outcome, whether a local or distant event, dependent upon the meaning of the event within the context of the child’s life.

The literature varies in the association of risk between age and PTSD symptoms. Studies demonstrate age differences in responses of younger children and attribute the development of minimal symptoms as resulting from immature cognitive abilities necessary to fully understand the trauma (Dripchak, 2007; Green, Grace, Vary, Kramer, Glasser, & Leonard, 1991; Green, Crenshaw & Kolos, 2010; Pine, Costello & Masten, 2005). Some of the literature emphasizes cognitive immaturity as a protective factor in young children (Pine, Costello & Masten, 2005; Stover & Berkowitz, 2005), while others believe that higher number of stressors reduces the child’s access to active coping skills making children more vulnerable to symptoms of PTSD (Cohen, Chazan et al., 2010; Lengua et al., 2006; Pine, Costello & Masten, 2005). Green et al., (1991) found that among 2-15 year old children exposed to Buffalo Creek Dam break, those children in the youngest age group (2-7) showed fewer PTSD symptoms when compared to the older children (8-11 years old & 12-15 years old). Grant et al., (2000), in their meta-analysis of studies examining age as a factor, found that stressors were more strongly associated with parent reported symptoms in young children. Children 1-3 years old exposed to a traumatic event have shown higher symptoms of PTSD, Separation Anxiety Disorder, Major Depressive Disorder, higher internalizing and externalizing scores on the CBCL, and higher rates of reenactments and nightmares than children 4-6 years old (Khamis,
Some experts suggest a developmental window of 18–48 months when children are at particular risk of re-experiencing symptoms (Mongillo et al., 2009; Scheeringa & Zeanah, 1995). In general, there are few consistent findings for age as a moderator risk (Carter, Briggs-Gowan, Jones & Little, 2003; Grant et al., 2000).

Developmental rather than chronological age of event has become an important consideration in symptom development because memories are stored differently at different stages of development (Green, Crenshaw & Kolos, 2010; Khamis, 2004; Mongillo et al., 2009). A developmental progression of symptoms with younger children presenting with more disorganized traumatic responses has been linked more closely with primary caregiver responses (Green et al., 1991; Pine, Costello & Masten, 2005). Many studies find that mental health symptoms developed during toddlerhood persist into older childhood (Briggs-Gowan et al., 2001; Briggs-Gowan et al., 2004; Carter, Briggs-Gowan, Jones & Little, 2003; Lavigne, Arend et al., 1998; Rutter, 1970; Stormont, 2002). Terr et al., (1999) describe instances of post-traumatic event-specific play continuing for as long as 12-months post-event for children experiencing indirect or distant trauma. Green et al., (1991), in a study of children exposed to the Buffalo Creek dam collapse, observed symptoms of distress in children up to 2 years after the event. Studying children between 20-months to 6-years old, Scheeringa et al., (2003) assessed children exposed to various types of traumatic events (predominantly domestic violence and hospital populations) at three points in time, 7-months post-event, 1-year post-event, and 2-years post-event. The study found that the number of PTSD symptoms assessed at time-1 persisted 2 years later in these children (Green, Crenshaw & Kolos, 2010;
Scheeringa, 2006; Scheeringa, Zeanah, *et al.*, 2003). Ohmi *et al.*, (2002) found that of 32 preschool children exposed to a gas explosion at school, thirty presented with more than one PTSD symptom and that they remained positive for presence of symptoms at 1 year. Laor *et al.*, (1997) followed-up with three groups of preschool children (displaced, undisplaced, and threatened) exposed to SCUD missiles during the Gulf War and 30-months post event. At first assessment 6-months post event, all groups showed levels of event stress, but displaced children showed high levels of externalizing symptoms (Laor *et al.*, 1997). While at 30-months the displaced children experienced a decrease in symptoms of stress as compared to the others (the mean stress level of the displaced children remained higher than the other groups), all children still showed evidence of event related stress symptoms that was mediated by maternal mental health, impacting care giving (Laor *et al.*, 1997).

Symptom development varies in the literature regarding gender as a risk or protective factor (Grant *et al.*, 2006; Khamis, 2004; Thabet *et al.*, 2009). Studies that attribute gender as a risk factor for symptom development cite differences in coping skills and social expectations as factors (Hizli *et al.*, 2009). Tolin and Foa’s (2006) meta analysis found that regardless of type of study, females were more likely to meet PTSD criteria and experience more severe symptoms than males (Tolin & Foa, 2006). Ohmi *et al.*, (2002), utilizing alternative PTSD criteria for preschool children exposed to a gas explosion showed that girls exhibited more symptoms than boys 10 days after the event. On the other hand, Bannon, DeVoe, Klein and Miranda (2009), examined the relationship between gender and WTC exposure in young children. They found a moderating effect, in that boys scored significantly higher on internalizing and total behavior scores than
girls (Bannon, DeVoe, Klein & Miranda, 2009). In a meta analysis of moderatoral studies, Grant et al., (2006) emphasized that type of trauma exposure tended to determine risk for symptom development in issues of gender (poverty, divorce, and abuse studies for boys; violence exposure, disaster, and cumulative stressor studies for girls). Overall, no consistent sex differences in preschool samples have been found (Carter, Briggs-Gowan, Jones & Little, 2003; Grant et al., 2006; Pine et al., 2006; Tolin & Foa, 2006).

It is difficult to untangle family variables from socio-economic status frequently used as an indicator of risk in the literature. Studies utilize SES as an indicator for multiple variables including poverty, education, ethnicity, and many others (Huston, McLoyd & Garcia Coll, 1994). High socioeconomic status has been linked to better adjustment in children for reasons relating to access to services and social supports (Khamis, 2004, 2005; Murray, Rodriguez, Hoagwood & Jensen, 2006; Thabet et al., 2009). Other studies suggest that the effects of low socioeconomic status increase risk for symptom development due to cumulative risk factors such as community violence, poverty, or single parent households (Huston, Mcloyd & Garcia Coll, 1994; Murray, Rodriguez et al., 2006). Mei-Stedman, Dalgleish, Smith, Yule and Gluckman (2007) suggest that in younger populations, demographic factors play little role in the development of stress symptoms. Important aspects to recognize in the interpretation of risk and protective factors include issues of developmental time, social context and interaction of protective and risk factors on outcome along with understanding the impact of self-attributions of risk, accumulation of exposure or dose, and active coping during and after the experience of a traumatic event (Buckner et al., 2003; Cicchetti & Sroufe, 2000; Cohen, Chazan et al., 2010; Grant et al., 2006; Green, Crenshaw & Kolos, 2010;
Koenen et al., 2007; Lengua et al., 2006; Luthar, Cicchetti & Becker, 2000; Masten & Curtis, 2000; Pfefferbaum et al., 2000; Pine et al., 2006; Rutter & Sroufe, 2000).
This chapter briefly charts the evolution of trauma research with children and reviews the literature as it relates to symptoms, impact, and diagnosis in children. Initially, the diagnosis of Post Traumatic Stress Disorder (PTSD) was developed for assessment of adult symptoms and presentation after the experience of war (Salmon & Bryant, 2002). Although experts propose that individual reactions to stress occur on a continuum, adults and children cope with and adapt to traumatic stress in different ways (Carter, Briggs-Gowan, Jones & Little, 2003). Whereas adults tend to rely more heavily on language-base expressions and interactions, children naturally respond with symbolic expression through play, changes in behavior, anxiety, and attention problems and many experts postulate that effects of a single traumatic event may impact the child’s understanding of the environment, sense of safety, and mastery (Bandura, Capara et al., 2003; Bandura, 1997, 2002; Beardslee, 1989; Eth & Pynoos, 1985; Green, Crenshaw & Kolos, 2010; Haizlip & Corder, 1996; Nader & Pynoos, 1992; Stover & Berkowitz, 2005; Terr, 1990, 1991).

Early in the study of child trauma, Lenore Terr categorized trauma as either type I or type II (Haizlip & Corder, 1996; Terr, 1991; Tiet, Bird, Davies, Hoven, Cohen, Jensen, & Goodman, 1998). This conceptualization of trauma separated type of trauma by duration of exposure. Type I trauma referred to the response associated to a sudden single event with some symptoms observed in children including regression, hypervigilance, foreboding future, avoidance, and intrusive memories (Haizlip & Corder, 1996; Pine, Costello & Masten, 2005; Terr, 1991; Tiet et al., 1998). Type II trauma referred to
a reaction to chronic or multiple adverse events with manifested symptoms of
dissociation, emotional numbing, and denial (Haizlip & Corder, 1996; Terr, 1991; Tiet et
al., 1998). According to Terr (1991), a single traumatic event triggered symptoms of
regression, hyper-vigilance, foreboding future, avoidance, and intrusive memories in
children. Some experts maintain that, of young children exposed to a traumatic event,
those children exhibiting as few as one traumatic symptom suffer the same psychiatric
sequelae as those children meeting criteria for PTSD (Cohen, Mannarino et al., 2006).
Along with case studies, a small number of empirical studies document PTSD patterns
among preschool children that include observations of regression, behavioral disturbance,
event related fears, and aggression (Cohen, Mannarino & Staron, 2006; Cohen,
Mannarino et al., 2006; Pine, Costello & Masten, 2005; Terr, 1990, 1991). As the study
of trauma has progressed a more complex understanding of trauma and its impact upon
children has evolved to include environmental, developmental, and social factors.

The DSM-IV introduced Acute Stress Disorder (ASD) as a method to capture the
immediate impact of trauma exposure (Salmon & Bryant, 2002). ASD is distinguished
from PTSD by the inclusion of dissociative symptoms, and some experts believe that it is
a better measure of the initial experience of trauma by children (Miller, Enlow et al.,
2009). The few studies that exist on ASD in young children exposed to trauma show a
prevalence rate of 8% - 28% (Meiser-Stedman, Dalgleish, Smith et al., 2007; Miller,
Enlow et al., 2009). Recently, van der Kolk and colleagues (2009) have proposed a new
diagnosis for the DSM-V that addresses regulation function in young children. van der
Kolk and colleagues (2009) suggest that the DSM-V PTSD diagnosis may adequately
describe the impact of a single incident of traumatic exposure within the context of
consistent undisturbed care giving, but fails to capture the experience of children exposed to chronic interpersonal trauma and disrupted care giving relationships (van der Kolk, Pynoos, Cicchetti et al., 2009). Developmental Trauma Disorder proposed criteria include aspects of exposure, affective and physiological dysregulation, attentional and behavioral dysregulation, self and relational dysregulation, posttraumatic spectrum symptoms, duration of disturbance, and functional impairment (van der Kolk, Pynoos, Cicchetti et al., 2009). (See Appendix E for proposed criteria).

Researchers in trauma have begun to explore mechanisms through which trauma impacts child development and acknowledge the importance of understanding normalized responses to traumatic events. Blaustein and Kinniburgh (2010) present a three step circular model of translating complex trauma behaviors in children. Step 1 addresses schema development through experience and the integration of interpretations of danger into behavior. Children experiencing developmental trauma may develop hypervigilant responses to benign interactions with peers and adults. The experience of the world as dangerous results in the general relational assessments, interpretations, and responses of the child as if in danger. Step 2 of the model examines behavioral and physiological responses as purposeful and directed. For those children that have experienced trauma, need fulfillment and threat avoidance are manifested in their behavior. Blaustein and Kinniburgh (2010) identify some manifested behaviors in children as aggression, social isolation, avoidance, flat affect, and hyperactivity among others. Step 3 integrates the impact of trauma as interference with development. This interference creates gaps in the child’s experience of care giving and results in the child creating alternative means to getting basic needs met. (Blaustein & Kinniburgh, 2010).
As mentioned, few studies have examined the effect of traumatic exposure on preschool children and the research available rarely looks at response of children younger than school-age (Blaustein & Kinniburgh, 2010; Briggs-Gowan et al., 2001; Carter, et al., 2004; Cohen, Mannarino et al., 2006; Koenen et al., 2007; Pine, Costello & Masten, 2005; Scheeringa, 2006; Stover & Berkowitz, 2005). Traumatic exposure potentially impacts the areas of general development, expression, regulation of fear, trust, self-awareness, predictability, and understanding in children (Briggs-Gowan et al., 2001; Carter et al., 2004; Green, Crenshaw & Kolos, 2010; Haizlip & Corder, 1996; Rutter, 1970, 2007; Terr, 1991; Tiet et al., 1989). Fundamental aspects of cognitive, emotional, and physical capacities develop during childhood, placing young children at particular risk for the development of psychopathology after a traumatic event (Blaustein & Kinniburgh, 2010; Briggs-Gowan et al., 2004; Briggs-Gowan et al., 2001; Bronfenbrenner, 2005; Green, Crenshaw & Kolos, 2010; Piaget, 2000; Terr, 1990, 1991; van der Kolk, Roth et al., 2005). Childhood traumatic stress is believed to be an underlying factor contributing to many psychological disturbances of children, such as depression, anxiety, aggression, and hyperactivity (Bingham & Harmon, 1996; Briggs-Gowan et al., 2004; Briggs-Gowan et al., 2001). A traumatic event presents a disruption in the way in which a child organizes the world and, as a consequence, the child questions her own sense of mastery (Bandura, Capara et al., 2003; Bandura, 2002; Beardslee, 1989; Haizlip & Corder, 1996; Pine, Costello & Masten, 2005). A child develops a sense of safety through the experience of predictability in the world as providing and protecting his or her needs (Terr, 1990, 1991; van der Kolk, Roth et al., 2005).
Observations of children exposed to a traumatic event include instances of repetitive behaviors and play, trauma-specific fears, generalized fears, and changed attitudes about the future (Bingham & Harmon, 1996; Briggs-Gowan et al., 2004; Briggs-Gowen, Carter et al., 2001; Haizlip & Corder, 1996; Terr, 1990, 1991; Tiet, Bird et al., 1998). Re-experiencing, both during times of relaxation and triggered by reminders of the event, impact areas of sleep and play (Perrin, Smith & Yule, 2000). Behavioral disorders manifest and self-regulation becomes more difficult for the young child as a result of the exposure (Green, Crenshaw & Kolos, 2010; Perrin et al., 2000). Not only examining the outward appearance of troubling behaviors in children, studies have begun to investigate the neuropsychobiological sequelae of developmental interference due to traumatic experience (Schore, 2001a, 2001b). Young children appear to have difficulty concentrating or seem easily distracted and many children develop separation fears and require frequent check-ins with caregivers (Cohen, Mannarino & Staron, 2006; Cohen et al., 2006; Perrin et al., 2000).

*Diagnostic and Statistical Manual - IV*

While empirical evidence shows that children under age four present with symptoms common to those of PTSD, questions arise as to the sensitivity, reliability, and validity of DSM-IV criteria for children (Briggs-Gowan et al., 2001; Carter et al., 2004; Cohen, Mannarino & Staron, 2006; Cohen et al., 2006; Scheeringa, 2006; Stover & Berkowitz, 2005). Diagnostic criteria for PTSD requires young children to meet the same threshold as adults, including verbal report of internalizing symptoms, not assessable in non-verbal, pre-verbal or limited verbal children (Briggs-Gowan et al., 2004; Cattanach, 2003; Lederer, 2002; Ohmi, Kojima, Awai, Kamata, Sasaki, Tanaka,
Mochizuki, Hirooka & Hala, 2002; Scheeringa, 2006; Stover & Berkowitz, 2005).
Developmental factors influence the child’s perception of a traumatic event, and studies show that childhood psychic trauma and sequelae of traumatic life events last for very long periods of time in both verbal and pre-verbal children (Briggs-Gowan et al., 2001; Carter et al., 2004; Green, Crenshaw & Kolos, 2010; Green, Korol, Grace, Vary, Leonard, Glessor & Smitson-Cohen, 1991; Terr, 1991, 1990). Most of the existing literature on the effects of disasters and trauma utilizes main-effect models that focus on risk factors correlated to outcome rather than the indicators of trauma, expression of experience, and processes of coping (Cohen, Mannarino et al., 2006; Cohen, Mannarino & Staron, 2006; Scheeringa, 2006; Silverman & La Greca, 2002; Stover & Berkowitz, 2005). While not always capable of verbalizing the presence of troubling symptoms, evidence shows that the presence of symptoms affects other domains of childhood and emphasizes the need to develop ways for providers to investigate the experience of the child. Research must consider the level of impairment and the role of persistence and intensity of presenting symptoms.

*Alternative PTSD Criteria for Children*

Zero-to-Three (2005) in their Diagnostic Criteria: 0-3R manual, issued developmentally appropriate criteria relevant to mental health assessment in young children. The clinical diagnosis of Posttraumatic Stress Disorder according to the DC: 0-3R manual includes exposure to a traumatic event (acute or chronic) with symptoms persisting for at least one month. The manual emphasizes understanding the symptoms within the context of the child, caregiver, and traumatic experience. (see appendix D for
Zero-to–Three PTSD diagnostic criteria). A child must meet all five criteria for diagnosis of PTSD.

Most studies show no or low percentages of children meet PTSD DSM criteria; in fact, Lavigne et al., (1998) found prevalence of DSM PTSD in preschool children at 0.1%. One meta-analysis evaluated seven studies using standard checklists and interview to measure PTSD as compared to alternate diagnostic criteria (Scheeringa, 2006). This meta-analysis demonstrated that while most revealed that no or low percentages of children meet PTSD criteria, all studies found that 25% to 69% of the participants met criteria for an alternative PTSD criteria diagnosis (Scheeringa, 2006).

Alternative PTSD criteria are less dependent upon verbal reports and more upon observed behaviors (Scheeringa, 2006), an important consideration when working with young children. A study done by Scheeringa et al., (2003) found in a non-clinic sample using alternative criteria, child rate of PTSD diagnosis increased to 26%, a rate more consistent with rates in older children and adults. Like the DSM-IV-TR, the alternative diagnostic criterion A remains that the person must be exposed to a traumatic event that threatens the life of others. Criterion A2 of the DSM-IV-TR symptoms, the expression of intense fear is not included in the alternative for children because of the issue of verbal self-report (Perrin et al., 2000; Scheeringa, Zeanah et al., 2003). This criterion can be problematic in young children because of their immature ability to assess degree of treat and their reliance upon caregiver response. Repetitive play is included as one of the diagnostic criteria for PTSD for children, similar to intrusive re-experiencing of a traumatic event seen in adults (Eth, 2001; McClean-Russell, 1994; Schaefer, 1994). The new cluster suggested by Scheeringa, Zeanah, Myers, and Putnam (2003) includes the
appearance of at least one new symptom of separation anxiety, and aggression (see Appendix C for alternative criteria as suggested by Scheeringa).
CHAPTER FIVE
Typical Play and Post-traumatic Play

The literature demonstrates the interactional nature of play behavior and development. Similar to typical development, play evolves from the utilization of skills mastered in a previous stage as the child explores the current stage, all with the goal of progressing to the next stage (Piaget, 1972; Trad, 1989; Lewis & Carpendale, 2002; Turner & Helms, 1991; Vygotsky, 1986; Yates, Egeland & Stroufe, 2003). Because of the relationship between the two, play is considered a good approximation of the developmental level of a child and is used in many assessment tools for young children (Bratton, Ray et al., 2005; Briggs-Gowan et al., 2004; Cattanach, 2003; Lederer, 2002; Trad, 1989; Vondra & Belsky, 1991). Unfortunately, most diagnostic tools rely primarily upon verbal self-report and utilize norms established for older children, adolescents, and adults leading to frequent misdiagnosis of young children (Frost et al., 2007; Scheeringa 2006; Stover & Berkowitz, 2005; van der Kolk et al., 2009).

Much of the developmental literature reflects the importance of play in the normal maturation of the child (Bratton, Ray et al., 2005; Briggs-Gowan et al., 2004). Linked with cognitive, social and psychological outcomes in children, play and development are intimately related domains (Kreppner et al., 1999; Lederer, 2002; Nielson, 2000). Predicated upon the mastery of simplistic skills, play evolves sequentially and predictably, becoming increasingly complex as time proceeds (Piaget, 1971; Trad, 1989; Vondra & Belsky, 1991; Vygotsky, 1986). Piaget (1951) categorized play into three stages: practice, symbolic, and games with rules. In practice play, the child rehearses movements and behaviors (Frost et al., 2007). Once the child acquires the capacity for representational thought, symbolic play evolves, creating the arena for the child to
substitute one object for another (Frost et al., 2007; Piaget, 1951). Many experts view play as a way for children to construct solutions to countless situations, positive or negative, that the child cannot otherwise verbalize (Cattanach, 2003; Lederer, 2002; Trad, 1989; Vondra & Belsky, 1991). Piagetian theory asserts that play provides the opportunity to develop mastery over the impact of the environment upon the child and provides a context to test and make mistakes without consequence (Bratton, Ray et al., 2005; Frost et al., 2007; Vondra, Barnett & Cicchetti, 1990). Some theorists perceive play as a method for young children to exert control upon one aspect of their life otherwise dictated to them by others (Frost et al., 2007).

The literature defines play as comprising certain qualities that distinguish it from other behaviors, but no concrete definition exists (Cattanach, 2003; Frost et al., 2007; Roggman, 1991). Krasner and Pepler (1980) described four criteria as characteristic of play including intrinsic motivation, nonliterality, positive affect, and flexibility. One characteristic commonly associated with play is the aspect of pretend or make-believe attributed to the activity by the child. In play, the child automatically accommodates to the changes that occur naturally during the activity of play (Bratton, Ray et al., 2005; Cattanach, 2003; Frost et al., 2007). Some experts necessitate that the activity must appear enjoyable to the player, while others dispute this component and cite evidence from instances of traumatic play in which the child appears distressed (Cattanach, 2003; Frost et al., 2007; Terr, 1990, 1991). Overall, play is considered universal across cultures, although content may differ (Lewis & Carpendale, 2002; Smith, 2010; Vygotsky, 1986).
For multiple reasons, this study utilizes play to assess the impact of a traumatic event on young children. The literature recognizes play as a visual identifier of the developmental stage of a child as well as a reflection of the internal state of a child when verbal report is inaccessible or considered unreliable (Cattanach, 2003; Cohen, Chazan et al., 2010; Frost et al., 2007; Stover & Berkowitz, 2005). Green et al., (2010) assert that early memories are assessable in young children through play, behavior, and symbolism. Play characterizes what the child feels without consequence or responsibility (Cattanach, 2003; Cohen, Chazan et al., 2010; Vondra & Belsky, 1991). Play responds to the developmental needs of young children and therefore researchers interested in the experiences of young children consider play behaviors as the most complete form of expression for children (Cohen, Chazan et al., 2010; Lifter, 2000; Gil, 1991; Gitlin-Weiner et al., 2000; Terr, 1981a, 1981b, 1983b, 1984, 1991).

**Problematic Play**

Longitudinal studies suggest that children’s play as early as 3-years old can predict behavioral patterns and psychosocial adjustment up to a fifteen year period (Stover & Berkowitz, 2005). In their study of Romanian adoptees, Kreppner et al., (1999) examined the effect of early deprivation on aspects of play (Kreppner et al., 1999). They found that severe deprivation impacted later pretend and social role play at age four, suggesting later problems with peer relations (Kreppner et al., 1999). Play occupies a large role in the life of the child, and as a result, certain styles of play with traits different from normal play behaviors are seen in traumatized children (Cohen, Chazan et al., 2010; Terr, 1981a, 1981b, 1983b, 1984, 1991). Factor analytic studies have yielded two general clusters of children’s problematic behavior: internalizing and


Functioning as one of the major activities of childhood, loss of interest in and restricted or constricted play parallels the loss of interest in activities in adults a symptom required for a DSM-IV-TR diagnosis of PTSD (APA, 2000; Terr, Bloch et al., 1999). Traumatized children engage in play that is highly repetitive (Eth, 2001; Schaefer, 1994; Terr, 1983b; van der Kolk, 1989) and presents as ritualized with compulsive characteristics. Repetition recreates the experience and provides an opportunity for the child to intervene, change, or resolve the negative event. Terr (1983b) designated this ritualistic, compulsive, and repetitive play as post-traumatic play. In traumatized children, repetition relates to unresolved trauma, which causes discomfort or anxiety with no inherent resolution or flexibility in action or story (James, 1989; Sweeney, 1997; Terr, 1981a, 1981b, 1983b, 1984, 1991; Wallerstein, 1984). The child tests and incorporates new behaviors and derives alternative outcomes to the traumatic event which helps to re-establish safety and mastery (Frost et al., 2007; Cattanach, 2003; Vondra & Belsky,
Repetition provides the child the opportunity to assimilate negative emotions from a traumatic event by establishing control over their experience (Bandura, 1997, 2002; Bandura, Capara et al., 2003; Terr, 1990, 1991). As reflected in Bandura’s work, mastery is closely tied to competence and adaptation, both of which can be compromised by a traumatic event. Play allows a child to share a subjective experience (Bandura, 1997, 2002; Bandura, Capara et al., 2003; Cohen, Chazan, et al., 2010; Terr, 1990, 1991). Disruptions in play represent internalized experiences of emotional distress of the child (Green, Crenshaw & Kolos, 2010; Terr, 1981a, 1981b, 1983b, 1984, 1991). Children exhibit avoidant and dissociative behaviors in response to past traumatic experiences and these behaviors function as regulatory mechanisms to manage emotions or behaviors associated with the trauma (Terr, 1991). Some behavioral characteristics children exhibit after traumatic exposure include difficulty with transitions, anger, repetitive behaviors, hyperactivity, enuresis, sleep disruptions, psychosomatic ailments, aggressive, compulsive, oppositional, hypervigilant, antisocial, and self-destructive behaviors (Gil, 1991; Terr, 1991). Increased arousal, common in traumatized children, has manifested as sleep disturbance irritability, anger, difficulty concentrating, hypervigilance, exaggerated startle responses, and reactivity to triggers (Gil, 1991; Nader & Pynoos, 1992; Terr, 1981, 1983b, 1984; 1991b). As mentioned previously, studies document these symptoms and behaviors as occurring long after the event has taken place (Nader & Pynoos, 1992; Terr, 1981a, 1981b, 1983b, 1984, 1991).

In conjunction with distinguishing maladaptive and adaptive responses to trauma, it is essential to recognize normative responses, particularly relevant to diagnoses and treatment of children (Carter et al., 2004; Carter, Briggs-Gowan, Jones & Little, 2003;
Sameroff, 2000). Aspects of post-traumatic play can appear in the play of children that are not traumatized, but have been exposed to a traumatic event. Essentially a gateway to the internal world of a child, play functions as a way for children to communicate feelings, generate solutions, and heal emotionally and psychologically (Carter et al., 2004; Cattanach, 2003; Lederer, 2002; Nader & Pynoos, 1992; Winnicot, 1971). The literature demonstrates that the adjustment of a child to major life stresses shows moderate, but significant correlations between life events and poor adjustment as evident in lowered self-esteem, anxiety, depression, aggression, and school difficulties (Johnson, 1986). Cohen, Chazan et al., (2010) found in their study of posttraumatic play in exposed versus unexposed children that re-enactment and self-soothing play represented adaptive responses. Those children that implemented both re-enactment of the event and self-soothing showed fewer PTSD symptoms than those that did not (Cohen, Chazan et al., 2010).
CHAPTER SIX
Methods and Procedures

The current study originates from the NYCYCP study conducted by Dr. Ellen DeVoe and Dr. Tovah Klein – the NYC Young Children’s Project (R01 MH066462-01). The NYCYCP study gathered information both on the ways parents of young children were impacted by the WTC attacks and the impact upon their preschool children. The current study utilizes coded play behaviors of young children seen during the video-taped semi-structured interview administered by the NYC Young Children’s Project (NYCYCP) after the events of September 11, 2001. Implementation of standardized measures and semi-structured interviews occurred during the data collection phase of the NYCYCP. The current study utilized the existing video interviews and data on the standardized measures gathered by the NYCYCP study. The current study gathered data through observed play behavior of the sub-sample of exposed children on the videotaped interviews (See Appendix A for description of NYCYCP study)

Study Sample
The current study sample is a sub-sample from the NYCYCP study sample of 240 children from 180 families that participated in the project. The current study sub-sample consists of 89 children from 73 families. Parents provided consent for child participation in semi-structured videotaped interviews of the NYCYCP study. The NYCYCP study employed both standardized measures and open-ended questions in the interviews with parents and children. In the NYCYCP study, parental perceptions of their child’s experience of the WTC collapse were assessed using alternative PTSD criteria as established in the literature. The NYCYCP study adapted measures tested and utilized
for older children exposed to trauma because no reliable self-report measures of distress, behavioral functioning, and/or social-emotional issues for preschool children exist. Data collected with the Child Behavior Checklist (Achenbach & Rescorla, 2000a, 2000b) is validated with a normalized population and provides a base from which to analyze the responses and behaviors of the children that participated in the present study (see appendix A for standardized measures used for data collection for NYCYCP). The inclusion criteria in the final analysis for the current study required that the child data was complete from pre-WTC mention to post-WTC mention.

**Protocol**

This study utilized a sub-sample from the NYCYCP study. The sub-sample consisted of children interviewed about their experience of the World Trade Center disaster. The interview was developed and administered by the NYCYCP study. For purposes of analysis for the current study, the interview was segmented as pre-WTC mention play and post-WTC mention play. Pre-WTC mention was considered the period of time in which the child interacted with the interviewer without mention of the WTC event (either by the child or the interviewer). Post-WTC mention was considered the point in the interview when the child was asked by the interviewer to show what happened on 9/11 through the use of toys. The observers/coders of the video interview utilized the Play Behavior Observation Checklist (PBOC, unpublished measure) to record the behaviors seen during either the pre-segment or post-segment. Procedures are further detailed in the coding method section of this chapter.

**Development of Operational Definitions and Play Behavior Variables**
Review of existing instruments assessing the impact of trauma in older children, DSM-IV-TR posttraumatic stress disorder criteria, alternative criteria established for children, and generally accepted symptomology described by experts guided the development of the codes used for observation. The developmental psychopathology and psychology literature directed the development of the analysis tool. Information from the literature search was categorized into theory-based definitions of play and trauma, clinical descriptions of traumatic symptoms and play, and although small, available empirical research related to traumatized children. After consultation with faculty members and literature search, evidenced based instruments to adequately assess the play behaviors of young children exposed to a traumatic event were absent from the literature. Information from the literature review was incorporated into the operational definitions that comprise the subscales of the Play Behavior Observation Codes (PBOC).

First, a set of theory driven closed codes were developed. Using preliminary codes, raters reviewed videos. Any relevant themes were determined during the open-coding process of reviewing the videotapes, and findings modified the closed codes to include the new themes (Cooper, Hedges & Valentine, 1994; Padgett, 2008). Through deliberation and analysis, operational definitions for each subscale item for inclusion in the PBOC were developed through a collaborative process between faculty members, the coders, and myself. Each subscale item was discussed and described in concrete and specific terms, and review of each item revision preceded group consensus (Cooper, Hedges & Valentine, 1994). The coders were either masters level social work students or bachelor’s level psychology students concentrating on child development with experience in the field. A literature review, group meetings and consensus, revisions, and
development of operational definitions comprised the steps in creating the PBOC. (Cooper, Hedges & Valentine, 1994; Padgett, 2008).

The purpose of the study was to observe and describe the types of behaviors exhibited by children exposed to a traumatic event in order to determine impact of the event on the child. Behavioral anchors selected for the codes are based upon characteristics common to play behaviors seen in children exposed to a traumatic event and features typical of general play behaviors (Cooper, Hedges & Valentine, 1994; Padgett, 2008). All children in the study were exposed to a traumatic event, but not all were traumatized by the event. In order to capture these differences, the PBOC was designed to measure play behaviors related to the constructs of both play and trauma. In this study, play is considered an activity entered into willingly by the child. The child used play materials to show the interviewer “what happened on that day.” Play behaviors are conceptualized as a way for children to depict the event symbolically, illustrate their experiences, and express complex emotions they may not otherwise be able to verbalize resulting from their experience.

In the development of the PBOC, videotaped play sessions of the children exposed to the WTC collapse were viewed. While viewing the tapes, features of the behaviors seen were noted (Cooper, Hedges & Valentine, 1994; Padgett, 2008). Approximately 6-8 videos were viewed and rated during the development process. The review ensured that the PBOC captured behaviors salient to the concept of post-traumatic play and that each item represented a particular behavior or form of affective expression related to the concept of trauma. Additional potential items were generated through discussions between myself and Drs. Tovah Klein, Ellen DeVoe, and Michael
MacKenzie, all faculty members with extensive clinical and academic experience in traumatic behavior in children. Further clarification and refinement of the subscales that comprise the current version of the codes occurred as themes emerged during coding sessions (Cooper, Hedges & Valentine, 1994; Padgett, 2008). Each PBOC is composed of a four-point Gutman-like scale and allowed raters to code the videotaped interview sessions.

Many argue that young children typically lack the verbal and cognitive abilities required to accurately respond to self-report measures, therefore observation based codes are generally thought of as more objective and accurate than either self-report or parental report of child behavior. The four-point Gutman-like scale items provide four different levels of measure for each behavioral descriptor for each anchor, providing a high level of specificity in indicating change. Interrater reliability refers to the degree to which ratings of behavior by coders related to actual observed behavior and not to the coder’s subjective opinion, drift or interpretation. This was established through paring coders together and establishing consensus after each video was coded. The level of degree between coders never differed by more than one level. In an effort to reduce coder drift, teams shifted members from session to session (Cooper, Hedges & Valentine, 1994).

The user’s guide accompanied the PBOC and includes detailed directions for coding the video interviews (Appendix E). The PBOC guide includes a complete operational definition for each subscale of the coding scheme and inclusion of concrete examples of specific play behaviors for trained coders to apply to the actual interviews. Booster sessions were held to reacquaint coders with the definitions as well as train each new coder to the process of observation. As coding commenced, examples were refined and
clarified as needed. Each coder recorded the behaviors seen on the videos on the standardized Record Form (Appendix F & G).

**Subscale Items**

In order to capture the depth of information seen in the play of these children, subscales include characteristics representative of general play and indicators of distress and traumatic behaviors as defined in the literature. Each item falls within one of four subscales: a) Global Play Behavior Codes; b) Behavior Response Codes; c) Play Interference Codes; d) Traumatic Response Codes. Under the guidance of Dr. Klein, codes were evaluated based on relevance to play behavior and or trauma, usability, and observability. The literature related to play and observation of play includes measurement of three observable characteristics of general play comprised of movement, voice and relatedness of the child. These observable characteristics comprise the Global Play Behavior Codes. Behavior Response Codes reflect behaviors described in the literature of both posttraumatic play and general play behaviors. The Play Interference Codes mark instances of emotional distress in the child as the event is recounted through play. Each code defines 4 different levels of intensity of interference with the play. The Traumatic Response Codes reflect internalized affective responses of children exposed to the traumatic event manifested behaviorally.

**Coding Method**

In addition to the variables collected within the NYCYP study, this study focuses on the measurement of play behaviors as seen by trained coders utilizing theory driven measures specifically developed for the proposed study. A standardized play based tool neither exists in the literature for this specific population nor captures the
dynamic relationship between play and trauma as explored in this study. Investigators in
the NYCYCP study adapted some measures used for other events, different ages, and
populations. All coded play behaviors were observed on the videotapes of the child
interviews. In this study, exposed children were observed during the course of a play-
based interview. All behaviors exhibited by the child during the interview were recorded
as defined by the behavior/response and categorical codes utilized (See appendix E for
definitions and appendices for coding record F & G). (Padgett, 2008).

Each coder watched the video with a partner. Each coder-dyad watched either the
baseline section or play section of the interview. The baseline portion was designated as
the beginning, or warm-up period, of the interview before any mention of the WTC by
the child or interviewer. Using a 4-point Gutman-like scale, a baseline measure in voice,
movement, and relatedness was determined. Once the WTC (or related events) was
mentioned the baseline portion of the interview was considered complete. Even though
the length of time for each child differed, the mention of the WTC was the standardized
point at which baseline ended. The play section of the interview began at the point
within the interview that the child was presented with toys and asked to show the
interviewer what happened on the day the WTC collapsed. The coders experienced a
high rate of agreement in the coding of the play and very few ratings on the Gutman
scales differed between the coders. The coders only disagreed in the area of level of
degree (e.g. 1-4) rather than presence of the item (e.g. repetitive behavior, aggression).
Reliability of the domains and codes used to measure the play behaviors were determined
through interrater agreement and any disagreements were resolved through discussion
and concurrence between the coders. (Padgett, 2008).
In this section, demographic data are provided for the total study sample children and parents (N=71) and Alternative PTSD Criteria sample children and parents (n=15). The children meeting Alternative PTSD Criteria established by Scheeringa (2006) comprise the Alternative PTSD Criteria sample. As mentioned earlier in the paper, inclusion in the Alternative PTSD Criteria sample requires that the child must present with criterion A and at least one symptom from each criteria B (reexperiencing), C (avoidance), and D (arousal) (see appendix H for detailed frequencies of symptoms for both total sample and Alternative PTSD Criteria sample). Demographics such as age, gender, race/ethnicity and parent information for each sample is also reported in this chapter in Table 1 and Table 2.

**Chronological and Developmental Age**

This study population is uniquely comprised of very young children. Many studies highlight the importance of considering developmental age in conjunction with chronological age both at time of incident and at time of recall, because memory access changes as the child develops, with younger children utilizing the implicit emotional memory system to store affective and behavioral experiences (DeBellis et al., 1999; Green, Crenshaw & Kolos, 2010; Khamis, 2007). Between the ages of two and three years, a child starts to become verbal, moving from simple words and sentences to communication of simple stories. Cognitively, the child begins to represent objects through substitution (Piaget, 1971; Vygotsky, 1986).

For the total study sample (N=71) the mean chronological age at time of event was 41.5 (SD=16.51 months; 3.45±1.37 years; median = 44 months; range = 1-69 months
old). At the interview, the ages of the children ranged from 10 months to 82 months, with a mean of 52.13 SD=16.6 months (4.34±1.38 years; median = 54 months old). On 9/11, thirteen (18.6%) children were theoretically at the non-verbal or preverbal (non/preverbal) stage of development (0-24 months). Data regarding developmental stage of the interview child were not gathered and was approximated based upon normalized behavioral expectations described in the literature and based upon theory. At the time of the interview, only four (5.6%) children remained in the non/preverbal stage of development. Thus, most (94.4%) of the children could at minimum communicate with simple stories to convey thoughts and emotions relating to their experience of 9/11 as well as provide additional information in areas needing further clarification through the use of play. For young children, developmental capacities change from month to month very rapidly, and therefore differences in age by one month can be significant. Experts maintain that even children exposed to trauma at preverbal stages have access to those memories through behavior as shown in this study population (Green, Crenshaw & Kolos, 2010). In non/preverbal children, children as young as 6 months old retain traumatic experiences within internal behavioral and emotional representations coded into memory (Green, Crenshaw & Kolos, 2010; Terr 1990, 1991).

**Table 1: Child Demographics**

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Total Sample</th>
<th>Alternative PTSD Criteria Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=71</td>
<td>n=15</td>
</tr>
<tr>
<td>On 9/11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than one year</td>
<td>4  5.6</td>
<td>-  -</td>
</tr>
<tr>
<td>One to Two years</td>
<td>9  12.7</td>
<td>1  6.7</td>
</tr>
<tr>
<td>2+ years to Three years</td>
<td>11 15.5</td>
<td>2  13.3</td>
</tr>
<tr>
<td>3+ years to Four years</td>
<td>16 22.5</td>
<td>4  26.6</td>
</tr>
<tr>
<td>4+ years to Five years</td>
<td>21 29.6</td>
<td>7  46.6</td>
</tr>
<tr>
<td>5+ years</td>
<td>7  9.9</td>
<td>1  6.7</td>
</tr>
<tr>
<td>Missing</td>
<td>3  4.2</td>
<td>-  -</td>
</tr>
<tr>
<td>At Interview</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than one year</td>
<td>1  1.4</td>
<td>-  -</td>
</tr>
</tbody>
</table>


Children meeting Alternative PTSD Criteria were slightly older than the total sample. At the interview, most of the children (80%) were over 4 years old with a mean age of 4.73 years (56.8 months). For this sample the mean chronological age at the time of the event was 46.53 months ± 11.5 months (mean = 3.87± .958 years; median = 49 months; range = 24-66 months old). On 9/11, one (6.7%) child was theoretically at the non/pre-verbal stage of development (0-24 months). At the interview, the ages of the children ranged from 35 months to 77 months old, with a mean of 56.8 months±11.3 months (mean = 4.73±.941 years; median = 58 months old). None of the children meeting Alternative PTSD Criteria remained in the non/pre-verbal stage of development at the time of the interview.

**Gender**

The boy/girl ratio was 1:1, which mirrors 50.7% female to 47.9 % male (1.4% missing information) population demographic for the US population (US Census Bureau, 2000). Thirty-four male (48.6%) and thirty-six female (51.4%) children comprised the sample. Gender disbursement for this population is reflective of the general population. Six boys and nine girls met Alternative PTSD Criteria.
Race/Ethnicity

Parents identified the race/ethnicity of their children. A majority (51) of the children were identified by their parents as White (71.8%). Fourteen children were identified as Mixed (19.7%). The remaining children were identified as Asian/Pacific Islander (2.8%), Black/African American (2.8%) or Other (1.4%). In 2000, US census race/ethnicity information shows 70% White, 17.0% Black/African American, 15.1% Hispanic or Latin American, 6.2% as Asian, and 9.1% of New York City residents identifying as Other. The racial demographic of this population of children was slightly higher for those children identified as White and Other as compared to the NYC racial/ethnic demographic.

Parent Demographics

Of the total sample, thirty-four parents interviewed were between the ages of 30-39 years old (48.6%) and thirty (42.9%) were between 40-49 years old (Table 2). Two parents that participated in the interview were less than 30 years old and four were between 50-59 years old. Average age for the interview parent was 40.14 years old. The racial/ethnic composition of the interview parents was 76.6% white and the spouse/partner racial/ethnic composition was 86.6% white. Alternative PTSD Criteria parent age ranged from 35 to 47 with mean age at 41±3.92 years, making them slightly older than the total sample N=71. A majority of the parents (80.0%) self identified as White, higher than the total sample, and lower representation of other ethnicities than the total sample. Overall, the Alternative PTSD sample reflected similar demographic to the total study sample.
The literature presents socioeconomic status (SES) as comprising income, education and occupational status and has shown to impact risk for mental health, cognitive, physical, behavioral and emotional problems (Conger & Donnellan, 2007; Duncan, Brooks-Gunn & Klebanov, 1994; Khamis 2007; Prince-Embry, 2009).

<table>
<thead>
<tr>
<th>Table 2: Parent Demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Parent Age</strong></td>
</tr>
<tr>
<td>Less than 30 years</td>
</tr>
<tr>
<td>30-39 years</td>
</tr>
<tr>
<td>40-49 years</td>
</tr>
<tr>
<td>50-59 years</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
</tr>
<tr>
<td>Black or African American</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
</tr>
<tr>
<td>Mixed</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td><strong>Socioeconomic Status</strong></td>
</tr>
<tr>
<td>51,000 – 75,000</td>
</tr>
<tr>
<td>76,000 – 100,000</td>
</tr>
<tr>
<td>100,000 – 150,000</td>
</tr>
<tr>
<td>151,000 – 200,000</td>
</tr>
<tr>
<td>201,000 – 250,000</td>
</tr>
<tr>
<td>251,000 – 300,000</td>
</tr>
<tr>
<td>Over 300,000</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
</tr>
<tr>
<td>Single</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Separated</td>
</tr>
<tr>
<td>Divorced</td>
</tr>
<tr>
<td>Living Together</td>
</tr>
<tr>
<td>Missing</td>
</tr>
</tbody>
</table>

The annual salary in the total study sample ranged from $51,000 to over $300,000 per year for 2001. The majority of families made $100,000 to $300,000 per year (52.9%) and 34.3% made over $300,000 per year in 2001. 2000 US Census shows median household income for New York City as $47,030 per year. Clearly, as illustrated by SES, the families that participated in this study are part of the high socioeconomic strata of
income, education and occupational status. Most of the children from both samples came from dual parent households making over $100,000 per year (86.0% for total sample; 93.3% for Alternative PTSD Criteria sample). Overall, the demographics for both the total sample and Alternative PTSD Criteria sample were similarly distributed as largely White, married, high socioeconomic income families.
CHAPTER EIGHT
Type of Exposure, Degree of Exposure and Proximity to the Event

In this section, type of exposure, degree of exposure and proximity to the event are examined for both the total study sample (N=71) and the Alternative PTSD Criteria sample (n=15). Exposure level for this study includes in-person experiences, television exposure and evacuation. Parents reported on 52 children and their exposure level (missing data = 19). None of the Alternative PTSD Criteria sample is missing report data. Figure 1 shows number of exposures experienced by the total study sample of children. This population of children was highly exposed with a mean number of exposures per child at 6.29±3.71 (range = 0-16). Two (2.8%) children experienced no exposures and 50 (96.2%) of the children experienced at least one exposure (in-person, television and evacuation). Forty-seven (67.1%) of the children experienced two or more exposures. The majority of exposed children (45) experienced in-person exposures. Thirty-five children (67.3%) experienced TV exposures. Thirty children were evacuated.

For both the total sample and Alternative PTSD Criteria sample, Table 3 details parents report of specific types of in-person, television exposures, and evacuation for
their children. For the children, in-person exposures included first hand, tactile experiences that could be considered as directly compromising the safety of the child or caregiver such as being in the cloud of smoke, being trapped in building, or witnessing the collapse of the buildings. According to the parents of the total sample of children, 57.1% smelled fires or chemicals resulting from the event and 54.3% heard sirens. None of the children saw body parts on the ground.

<table>
<thead>
<tr>
<th>Table 3: Parent Reported Child Exposures for Total Sample and Alternative PTSD Criteria Sample</th>
<th>Total Child Sample N=52</th>
<th>Alternative PTSD Sample N=15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In-person Exposure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saw body parts on the ground</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Saw people falling/jumping</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Saw the plane(s) hit</td>
<td>5</td>
<td>13.3</td>
</tr>
<tr>
<td>Saw people who were injured or dead</td>
<td>5</td>
<td>20.0</td>
</tr>
<tr>
<td>Was trapped in a building</td>
<td>5</td>
<td>6.7</td>
</tr>
<tr>
<td>Saw tower(s) collapse</td>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td>Heard or felt the impact of the planes hit</td>
<td>16</td>
<td>46.7</td>
</tr>
<tr>
<td>Saw the debris falling</td>
<td>16</td>
<td>33.3</td>
</tr>
<tr>
<td>Felt the impact of the planes or the collapse</td>
<td>17</td>
<td>46.7</td>
</tr>
<tr>
<td>Heard or felt the collapse</td>
<td>18</td>
<td>40.0</td>
</tr>
<tr>
<td>Saw the fires</td>
<td>19</td>
<td>46.7</td>
</tr>
<tr>
<td>In the cloud of smoke and dust</td>
<td>20</td>
<td>60.0</td>
</tr>
<tr>
<td>Heard sirens from rescue vehicles</td>
<td>38</td>
<td>80.0</td>
</tr>
<tr>
<td>Smelled fires and/or chemical smells</td>
<td>40</td>
<td>80.0</td>
</tr>
<tr>
<td><strong>TV Exposure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saw body parts on the ground</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Saw people falling/jumping</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Heard the collapse</td>
<td>3</td>
<td>6.7</td>
</tr>
<tr>
<td>Saw people who were injured or dead</td>
<td>3</td>
<td>6.7</td>
</tr>
<tr>
<td>Heard sirens from rescue vehicles</td>
<td>10</td>
<td>26.7</td>
</tr>
<tr>
<td>Saw the debris falling</td>
<td>12</td>
<td>26.7</td>
</tr>
<tr>
<td>Saw tower(s) collapse</td>
<td>19</td>
<td>33.3</td>
</tr>
<tr>
<td>Saw the fires</td>
<td>25</td>
<td>53.3</td>
</tr>
<tr>
<td>Saw the plane(s) hit</td>
<td>28</td>
<td>66.7</td>
</tr>
<tr>
<td><strong>Evacuation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>15</td>
</tr>
</tbody>
</table>

The Alternative PTSD Criteria sample was generally more exposed than the total sample. Higher percentage of the Alternative PTSD Criteria sample children (80%) smelled fires or chemical smells and/or heard sirens compared to the total sample. Other
exposure experiences related to the destruction of the buildings and the aftermath such as debris falling or seeing people falling or jumping. Five children (7.1%) of the total sample saw people injured or dead and of those children, three met Alternative PTSD Criteria (60%). A higher percentage of children from the Alternative PTSD Criteria sample experienced in-person exposures when compared to the total sample, excluding those exposures of “was trapped in a building” and “saw tower(s) collapse” in which a higher percentage of the total sample children were exposed.

Many of the children were exposed to media coverage of the event. The total sample parents reported that no children saw body parts on television, but that two (2.9%) saw people jumping and that three (4.3%) saw people injured or dead. Additionally, three (4.3%) children saw the collapse of the WTC, ten (14.3%) heard sirens, and 12 (17.1%) saw debris falling. Nineteen (27.1%) children saw the towers collapse, 25 (35.7%) saw the fires, and 28 (40%) saw the planes hit the WTC when broadcast on television. The Alternative PTSD Criteria sample had higher percentages of children exposed to the media than the total sample of children. Mean number of exposures for the children meeting Alternative PTSD Criteria were 7.73±4.07, slightly higher than the total population mean of 6.52±3.71 exposures. Compared to the total sample, higher percentage of Alternative PTSD Criteria sample children were exposed overall.

Sixty-one children were somewhat or more highly exposed to conversations about the
disaster amongst parents in the total sample, and for Alternative PTSD Criteria children all 15 children were exposed. Sixty-seven children from the total sample were exposed to media accounts during the first week and 13 children from the Alternative PTSD Criteria sample were exposed to media during the first week.

Table 4 details parent exposures. Total sample parents experienced a mean of 9.86±3.32 exposures (range = 4-18). Thirty-one (44.3%) parents evacuated due to the events on 9/11. In this sample, parents experienced mean of 9.47±3.22 PTSD symptoms and 30 (42.2%) parents screened positive for PTSD. In general, the parents in the total sample were highly exposed and many met criteria for a diagnosis for PTSD. Lower
percentages of the Alternative PTSD Criteria sample parents were media exposed than the total sample parents, but this group had higher percentages of in-person exposures than the total sample parents. The number of parent exposures (10.47±3.2) for the Alternative PTSD Criteria sample was higher than the total sample of parents (9.86±3.32). Slightly higher percentage of parents (46.7%) met criteria for PTSD than the total study sample. The mean number of parent PTSD symptoms for the Alternative PTSD Criteria sample was 10.10±3.79 compared to the total sample of 9.47±3.22.

Proximity

Much of the literature shows association between symptom development and proximity to event. As shown in Table 5, twenty-four (34.7%) children lived within 20 blocks of the disaster site. Six of the children lived in Battery Park City (BPC) across from the WTC at the time, totaling 25% of the children living within 20 blocks of the disaster site. Forty-five (65.2%) children lived more than 20 blocks away from the disaster site. Thirteen lived in Greenwich Village or within two miles, ten lived in Chelsea, one lived in Midtown, five lived in Brooklyn and two lived in other areas.

When the disaster occurred, thirty-nine children were at home (54.9%). Thirty-one (43.6%) children were not at home during the disaster. Twenty of those children were in preschool or daycare at the time. Four of the children were in transit, five were outside, and two were somewhere other than home or the previously mentioned locations. All of the families were considered residents of NYC, an island 2.3 miles wide and 13.4 miles long, and therefore, all the children were considered to be in close proximity to the collapse and aftermath of the WTC.
Evacuation as a result of the disaster suggests a significant change to way of life for the children, another risk factor associated with PTSD symptoms. The literature suggests that changes in lifestyle or day-to-day routine influence the development of symptoms in children. Thirty (42.2%) children evacuated the area, twenty-two children evacuated with the interview parent and eight evacuated with someone other than the interview parent. Thirty-seven families (52.9%) were able to return home after 9/11. Of those that needed to relocate, eleven (15.7%) stayed with friends or relatives and two (2.9%) had second homes. Eight children evacuated and seven children were not able to return home. Of the eight children that evacuated, two children stayed with relatives and six children stayed 2 or more places.

**Table 5: Child Proximity to WTC Collapse**

<table>
<thead>
<tr>
<th>Child Neighborhood</th>
<th>Total Sample N=71</th>
<th>Alternative PTSD Sample n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Battery Park City (BPC)</td>
<td>5</td>
<td>7.0</td>
</tr>
<tr>
<td>Not BPC, but within 5 blocks</td>
<td>19</td>
<td>26.8</td>
</tr>
<tr>
<td>Downtown 6-10 blocks</td>
<td>5</td>
<td>7.0</td>
</tr>
<tr>
<td>Tribes or 11-20 blocks</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>G. Village, or within 2 miles</td>
<td>13</td>
<td>18.3</td>
</tr>
<tr>
<td>Chelsea</td>
<td>8</td>
<td>11.3</td>
</tr>
<tr>
<td>Uptown (above 59th)</td>
<td>14</td>
<td>19.7</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>Outer Boroughs &amp; LI</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>Home</strong></td>
<td>39</td>
<td>54.9</td>
</tr>
<tr>
<td><strong>Preschool/day care</strong></td>
<td>20</td>
<td>28.2</td>
</tr>
<tr>
<td><strong>In transit</strong></td>
<td>4</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Outside</strong></td>
<td>5</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Somewhere else</strong></td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td>1</td>
<td>1.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evacuated</th>
<th>n=30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td><strong>home</strong></td>
<td>17</td>
</tr>
<tr>
<td>preschool or day care</td>
<td>10</td>
</tr>
<tr>
<td>outside</td>
<td>2</td>
</tr>
<tr>
<td>somewhere else</td>
<td>1</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
</tr>
</tbody>
</table>

As discussed, high SES allowed the families in this study to quickly secure housing alternatives and re-establish routines which may have been protective factors for the children in this population. Families in this population had access to social supports
including extended family, temporary shelter, other homes, and funds for rapid clean-up or relocation.
CHAPTER NINE
Symptom Measurement

In this chapter, results from parent report on the Child Behavior Checklist (CBCL) for the total sample (N=71) and Alternative PTSD Criteria sample (n=15) are examined. Two scales of the CBCL, internalizing and externalizing problems evaluate children broadly through thresholds established through normalized non-clinic samples (Achenbach & Rescorla, 2000a, 2000b). The internalizing problems scale includes four subscales: emotionally reactive, anxious/depressed, somatic complaints, and withdrawn. Externalizing problems score includes two syndrome subscales of attention problems and aggressive behavior (Achenbach & Rescorla, 2000a, 2000b). Standardized T-scores estimate the level of impairment for the child with internalizing, externalizing and total problems showing normal range of 50-59, borderline range of 60-63, and clinical range of 64-100 (Achenbach & Rescorla, 2000a, 2000b).

Parents reported on 61 children using the CBCL. Table 6 details parent reports. The levels of impairment in the study sample children were relatively low. According to the CBCL, seven (11.4%) children showed significant internalizing problems at the time of the interview, two (3.2%) showed significant externalizing problems, and five (8.2%) showed significant total problems. This population was highly exposed but measured below threshold on psychopathology with the CBCL.

The scores for the total study sample and Alternative PTSD Criteria sample means were compared to the normalized non-clinic CBCL sample means using one-sample T-test comparison of means. In comparing the scores for the normalized non-
The broadband sub-scale thresholds do not identify potential problems for children in this population exposed to a traumatic event. Although the CBCL works well for distinguishing syndrome thresholds for clinical samples, not all children exposed to a traumatic event present with clinical thresholds of disorder. Data gathered by the NYCYCP study using parent reports and a measurement tool modified specifically for the event of 9/11 based upon the Alternative PTSD Criteria, show more children meeting criteria for disturbance than the CBCL. As mentioned, 21.1% of the total sample met criteria for PTSD based upon alternative criteria proposed by Scheeringa et al. (2003), in contrast to the CBCL reports of internalizing (11.4%), externalizing (3.2%) and total problem scores (8.1%). The children meeting Alternative PTSD Criteria had significantly fewer attention problems (p=.001) as compared to the normalized non-clinic
sample of children on the CBCL. The other CBCL scores for the children in the Alternative PTSD Criteria sample were unremarkable. As was the trend across the study, the CBCL scores for the more symptomatic children resembled non-clinic normalized samples from the CBCL and therefore significant change scores diminished.

**Exposure**

Based on the literature, there was an expectation of a dose response in the children with higher levels of exposure resulting in higher levels of symptoms. Table 7 shows CBCL scores when categorized by exposure level. Data show significant levels of change in the children with fewer exposures when compared to the normalized non-clinic CBCL sample. Although the changes are significantly different, they are significantly lower than the CBCL non-clinic sample. As the exposures increase fewer significant scores appear, but the change scores get closer to the normalized non-clinic CBCL sample scores. This suggests that the normal baseline for the children in the study is significantly lower that normalized non-clinic CBCL sample. The sample reflects other

<table>
<thead>
<tr>
<th></th>
<th>2 to 4 exposures n = 13</th>
<th>5 to 7 exposures n = 13</th>
<th>8 to 10 exposures n = 9</th>
<th>11+ exposures n = 12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m (sd)</td>
<td>diff</td>
<td>sig</td>
<td>m (sd)</td>
</tr>
<tr>
<td>Emotionally Reactive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious Depressed</td>
<td>1.0 (1.1)</td>
<td>-1.4</td>
<td>.001**</td>
<td>4.1 (2.5)</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>1.1 (1.3)</td>
<td>-6.46</td>
<td>.001**</td>
<td>3.3 (2.4)</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>2.6 (2.4)</td>
<td>-1.107</td>
<td>.109</td>
<td>1.9 (1.9)</td>
</tr>
<tr>
<td>Sleep Problems</td>
<td>9.2 (1.1)</td>
<td>-576</td>
<td>.105</td>
<td>2.2 (2.6)</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>5.0 (4.3)</td>
<td>-5.4</td>
<td>.001**</td>
<td>13.7 (6.3)</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBCL Internal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw</td>
<td>4.3 (3.3)</td>
<td>-4.2</td>
<td>.001**</td>
<td>11.6 (7.5)</td>
</tr>
<tr>
<td>t-score</td>
<td>42.5 (8.0)</td>
<td>-7.4</td>
<td>.006*</td>
<td>54.0 (11.1)</td>
</tr>
<tr>
<td>CBCL External</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw</td>
<td>5.9 (5.4)</td>
<td>-6.9</td>
<td>.001**</td>
<td>15.9 (7.6)</td>
</tr>
<tr>
<td>t-score</td>
<td>40.0 (8.7)</td>
<td>-9.9</td>
<td>.002*</td>
<td>54.0 (8.7)</td>
</tr>
<tr>
<td>CBCL Total Problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw</td>
<td>16.0 (13.0)</td>
<td>-17.2</td>
<td>.000**</td>
<td>41.0 (20.4)</td>
</tr>
<tr>
<td>t-score</td>
<td>39.9 (9.0)</td>
<td>-10.1</td>
<td>.002*</td>
<td>54.0 (10.1)</td>
</tr>
</tbody>
</table>

* significant at the .05 level
** significant at the .001 level
literature showing a dose response in that the study sample scores significantly lower than the normalized CBCL sample overall. Those study sample children experiencing higher levels of exposure become increasingly similar to the normalized non-clinic children scores and therefore more traumatized than their study sample peers.

**Developmental Age**

Studies using the Child Behavior Checklist generally use older children with symptoms that can be normative or transient for younger children. Konold et al., (2003) examined the applicability of the CBCL 1½ - 5 in a community sample. The study argues that the population used by Achenbach and Rescorla to standardize the tool scored above median levels for dysfunction, skewing results when used on other populations. Konold et al., (2003) urge the use of caution when applying the use of the tool in more heterogeneous populations and community samples. Of the children verbal on 9/11 (n=55), 14 children met Alternative PTSD Criteria. **Table 8** details parent report.

<table>
<thead>
<tr>
<th>Table 8: CBCL scores by Age of child on 9/11 and at Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of child on 9/11</strong></td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Non/preverbal</strong></td>
</tr>
<tr>
<td><strong>0-24 months</strong></td>
</tr>
<tr>
<td><strong>n=7</strong></td>
</tr>
<tr>
<td>Emotionally Reactive</td>
</tr>
<tr>
<td>Anxious Depressed</td>
</tr>
<tr>
<td>Somatic Complaints</td>
</tr>
<tr>
<td>Withdrawn</td>
</tr>
<tr>
<td>Sleep Problems</td>
</tr>
<tr>
<td>Attention Problems</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
</tr>
<tr>
<td>CBCL Internal Raw</td>
</tr>
<tr>
<td>CBCL Internal t-score</td>
</tr>
<tr>
<td>CBCL External Raw</td>
</tr>
<tr>
<td>CBCL External t-score</td>
</tr>
<tr>
<td>CBCL Total Problem Raw</td>
</tr>
<tr>
<td>CBCL Total Problem t-score</td>
</tr>
</tbody>
</table>

*significant at the .05 level
**significant at the .001 level
**Gender**

As shown in Table 9, when the total sample was separated by gender, boys showed significantly higher somatic complaints (mean = 1.1±1.4, p = .019) and significantly lower scores in withdrawn (mean = 1.0±0.9, p = .000) and attention (mean =1.1±1.3, p = .000) problems. The internalizing (mean = 45.4±9.2, p = .009), externalizing (mean = 43.9±9.2, p = .001), and total (mean = 43.9±9.0, p = .001) problem t-scores were also significantly lower from the non-clinic sample.

<table>
<thead>
<tr>
<th>Table 9: CBCL Normalized Non-Clinic Male Sample compared to Total Sample Male and Alternative PTSD Criteria Male Sample CBCL Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBCL Normalized non-clinic Male</td>
</tr>
<tr>
<td>N=460</td>
</tr>
<tr>
<td>Emotionally Reactive</td>
</tr>
<tr>
<td>Anxious Depressed</td>
</tr>
<tr>
<td>Somatic Complaints</td>
</tr>
<tr>
<td>Withdrawn</td>
</tr>
<tr>
<td>Attention Problems</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
</tr>
<tr>
<td>CBCL Internal Raw</td>
</tr>
<tr>
<td>T-score</td>
</tr>
<tr>
<td>CBCL External Raw</td>
</tr>
<tr>
<td>T-score</td>
</tr>
<tr>
<td>CBCL Total Problem Raw</td>
</tr>
<tr>
<td>T-Score</td>
</tr>
</tbody>
</table>

* significant at the .05 level
** significant at the .001 level

The girls showed significantly higher levels in somatic complaints (mean = 1.3±1.6, p = .038) and significantly lower in withdrawn (mean = 1.4±1.9, p = .016), attention problems (mean = .9±1.6, p = .000), and externalizing t-scores (mean = 45.7±9.7, p = .014). In contrast to the boys, the girls also showed significantly higher levels in the emotionally reactive (mean = 2.5±2.3, p = .004) and aggressive behavior (mean = 8.7±5.9, p = .003) scales as well as the raw scores for the total problem (mean = 28.4±18.9, p = .015) computations as compared to the non-clinic sample.
Table 10: CBCL Normalized Non-clinic Female Population compared to Total Sample Female and Alternative PTSD Criteria sample Female CBCL Mean Scores

<table>
<thead>
<tr>
<th></th>
<th>CBCL Normalized non-clinic Female (N=474)</th>
<th>Total Female Sample (n=36)</th>
<th>Alternative PTSD Criteria Female Sample (n=9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m (sd)</td>
<td>m (sd)</td>
<td>sig</td>
</tr>
<tr>
<td>Emotionally Reactive</td>
<td>1.3 (1.9)</td>
<td>2.5 (2.3)</td>
<td>.004*</td>
</tr>
<tr>
<td>Anxious Depressed</td>
<td>2.2 (2.4)</td>
<td>2.4 (2.2)</td>
<td>.588</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>0.7 (1.2)</td>
<td>1.3 (1.6)</td>
<td>.038*</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>2.3 (2.9)</td>
<td>1.4 (1.9)</td>
<td>.016*</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>2.6 (3.4)</td>
<td>0.9 (1.6)</td>
<td>.000**</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>5.3 (7.6)</td>
<td>8.7 (5.9)</td>
<td>.003*</td>
</tr>
<tr>
<td>CBCL Internal Raw</td>
<td>6.4 (6.9)</td>
<td>7.7 (6.3)</td>
<td>.239</td>
</tr>
<tr>
<td></td>
<td>50.1 (10.0)</td>
<td>48.0 (10.8)</td>
<td>.314</td>
</tr>
<tr>
<td>CBCL External Raw</td>
<td>8.0 (10.1)</td>
<td>9.7 (6.8)</td>
<td>.173</td>
</tr>
<tr>
<td></td>
<td>50.3 (9.6)</td>
<td>45.7 (9.7)</td>
<td>.014*</td>
</tr>
<tr>
<td>CBCL Total Problem Raw</td>
<td>19.6 (20.9)</td>
<td>28.4 (18.9)</td>
<td>.015*</td>
</tr>
<tr>
<td></td>
<td>50.3 (10.2)</td>
<td>47.2 (10.5)</td>
<td>.124</td>
</tr>
<tr>
<td>CBCL Total Problem T-score</td>
<td>53.1 (11.1)</td>
<td>51.1 (8.5)</td>
<td>.784</td>
</tr>
</tbody>
</table>

*significant at the .05 level  
**significant at the .001 level

The literature shows mixed results regarding gender as a risk factor for PTSD symptoms. Grant et al., (2006) reported that in studies reporting moderating effects of gender girls were more likely to experience internalizing symptoms while boys tended to experience more externalizing symptoms.

Six boys (40%) and 9 girls (60%) in the sample of children met alternative criteria for PTSD. When separated by gender, the girls were significantly more emotionally reactive (p=.017), had more somatic complaints (p=.035), more aggressive behaviors (p=.007) and more total problems (p=.030) than girls from the normalized CBCL non-clinic sample (N= 474). The girls from this study showed significantly fewer attention problems (p=.043) than the normalized sample of girls. The boys showed significantly lower scores in withdrawn symptoms (p=.031) and attention problems (p=.000) than boys from a standardized CBCL non-clinic sample (N=460).

The total sample of boys and Alternative PTSD Criteria sample showed only one significantly higher score in somatic complaints for the total sample boys when compared
to the CBCL standardized non-clinic sample. All other significant scores were lower in both the CBCL and Alternative PTSD Criteria sample for the boys. On the other hand, the total sample of girls and Alternative PTSD Criteria sample had significantly higher scores in emotionally reactive, somatic complaints, aggressive behavior, and raw total problems for both. All other significant scores for the total sample girls were lower, comprising half of the significant scores. For the Alternative PTSD Criteria sample girls only one significantly lower score was present.
CHAPTER TEN
Play Behavior Observation Checklist

Using the Play Behavior Observation Checklist (PBOC) designed for the current study, the change in play behaviors from pre-WTC mention to post-WTC mention was measured and recorded through observation of the children. In this study, change is representative of an internalized dysregulation in the child triggered by the mention of the event and observed through externalized behaviors. The change observed may be different for each child and therefore a positive or negative change in an item indicates a dysregulation. Dysregulation as triggered by the mention of the WTC was captured, rather than child idiosyncratic behaviors which would be present in both pre and post-WTC segments.

Table 11 shows change according to direction and presence for both the total study sample and Alternative PTSD Criteria sample. In the global play behaviors, the total sample had thirty-eight children that showed change in voice, thirty children that changed in amount of movement and twenty-seven children that had a change in relatedness from pre- to post mention. The changes in this domain were not particularly remarkable for the total sample. All of the items in this domain are considered global characteristics required for play and storytelling to commence. Within the direction of change, more of the children that experienced a change became less verbal, mobile, and related. There was an expectation that for both voice and movement that change would occur, but that the change could occur in either direction, which is reflected in the data. Change was expected in the negative direction for relatedness, as is shown in the data. Most of the children that experienced change showed a lower ability to relate. For the
Alternative PTSD Criteria sample, no change occurred in movement or relatedness, but as mentioned, the children that had baseline levels of dysregulation may not have experienced a marked change from pre- to post.

Domain 2 items relate to behavioral responses in the children. The literature shows that most common symptoms observed in young children include intrusion, restricted social range/affect and arousal symptoms such as irritability or anger, trauma specific fear, generalized fears, regressive symptoms, distractibility and aggressiveness (Tolin & Foa, 2006; Green et al., 1991). For both the total sample and Alternative PTSD Criteria sample, significantly higher scores in all items in the behavior responses, excluding emotion expression, was expected to occur and is reflected in the data. Lower emotion expression could reflect a restriction of affect for the child when confronted with experience of the traumatic event. On the other hand, lowered scores are not considered unusual because some children react to stressful situations by withdrawing from the interaction.

The play interference codes of domain 3 show attempts to regulate anxiety by the child and ability to tell the story through play. Distraction and interruption served as a way for the children to take a temporary break from the frame of the story. There are many reasons for this, including that for those children needing less interruption/distraction were perhaps more distracted at baseline, and became much more focused and comfortable as they discussed the events with the interviewer. On the other hand, some of the children could have relied on other forms of regulation such as disruption as ways to reregulate their level of anxiety, as noted in the Alternative PTSD Criteria sample. For
those children that showed higher scores in disruption, the distress they experienced in
telling the story required them to physically separate or leave the frame of play.

Table 11: Direction and presence of change in score from Pre-WTC Mention to Post-WTC Mention on PBOC

<table>
<thead>
<tr>
<th>Domain 1 – Global Play Behaviors</th>
<th>Total Sample</th>
<th>Alternative PTSD Criteria sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=71</td>
<td>n=15</td>
</tr>
<tr>
<td>Direction (+) Presence (-)</td>
<td>(+) (-)</td>
<td>Total change</td>
</tr>
<tr>
<td>n</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Voice</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>Movement</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>Relatedness</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Domain 2 – Behavior Response</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Repetitive Behavior</td>
<td>53</td>
<td>15</td>
</tr>
<tr>
<td>Event Related Behavior</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>Event Related Narrative</td>
<td>56</td>
<td>8</td>
</tr>
<tr>
<td>Emotion Expression</td>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td>Domain 3 – Play Interference</td>
<td>14</td>
<td>36</td>
</tr>
<tr>
<td>Interact</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>Interrupt</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>Disturb</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>Domain 4 – Traumatic Response</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>Avoidance</td>
<td>39</td>
<td>12</td>
</tr>
<tr>
<td>Anxiety</td>
<td>33</td>
<td>17</td>
</tr>
<tr>
<td>Aggression</td>
<td>46</td>
<td>10</td>
</tr>
<tr>
<td>Creating Safety In</td>
<td>51</td>
<td>8</td>
</tr>
<tr>
<td>Creating Safety Out</td>
<td>34</td>
<td>15</td>
</tr>
<tr>
<td>Self Soothe</td>
<td>46</td>
<td>2</td>
</tr>
<tr>
<td>Meaning Making</td>
<td>49</td>
<td>9</td>
</tr>
<tr>
<td>Regression</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>11</td>
</tr>
</tbody>
</table>

Domain 4 items reflected traumatic responses seen in traumatized children as
detailed in the literature. Overall, the change was in the positive direction for both
samples as expected. Negative direction changes in items such as anxiety, avoidance,
creating safety in, creating safety out, and self soothing possibly reflect children that
became more comfortable or better able to regulate affect under stress. The change for
the Alternative PTSD sample was not as notable at that for the total sample for possibly
many of the same reasons as mentioned earlier.
Total change score from pre to post WTC mention ranged from -33 to 38 (mean = 5.72±12.86). The mean change for the Alternative PTSD Criteria sample positive/negative change (mean = 7.53) was not significantly different from the total study sample mean (mean = 5.42). Table 12 shows the number of changes for each child. For the total sample, changes ranged from 0 to 19 (mean = 12.37±4.02). The Alternative PTSD Criteria sample ranged from 0 to 13 changes (mean = 9.13±3.31). The total sample had a larger range of changes and higher mean than the Alternative PTSD sample. Twenty-five children from the total sample experienced 14 or more changes from pre- to post mention, with none meeting Alternative PTSD Criteria.

<table>
<thead>
<tr>
<th>Number of changes</th>
<th>Total Sample N=71</th>
<th>Alternative PTSD Criteria Sample n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>1 1.4</td>
<td>1 6.7</td>
</tr>
<tr>
<td>Four</td>
<td>1 1.4</td>
<td>1 6.7</td>
</tr>
<tr>
<td>Seven</td>
<td>3 4.3</td>
<td>1 6.7</td>
</tr>
<tr>
<td>Eight</td>
<td>3 4.3</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Nine</td>
<td>8 11.4</td>
<td>3 20.0</td>
</tr>
<tr>
<td>Ten</td>
<td>10 14.3</td>
<td>3 20.0</td>
</tr>
<tr>
<td>Eleven</td>
<td>7 10.0</td>
<td>4 28.7</td>
</tr>
<tr>
<td>Twelve</td>
<td>7 10.0</td>
<td>1 6.7</td>
</tr>
<tr>
<td>Thirteen</td>
<td>5 7.1</td>
<td>1 6.7</td>
</tr>
<tr>
<td>Fourteen</td>
<td>5 7.1</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Fifteen</td>
<td>4 5.7</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Sixteen</td>
<td>4 5.7</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Seventeen</td>
<td>1 1.4</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Eighteen</td>
<td>1 1.4</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Nineteen</td>
<td>10 14.3</td>
<td>0 0.0</td>
</tr>
</tbody>
</table>

The mean number of changes for the total sample was 12.37±4.02 was statistically significant at the .000 level when compared to the Alternative PTSD Criteria sample mean number of changes (mean = 9.13±3.314). When controlling for children meeting Alternative PTSD criteria in the total sample, the mean positive/negative change 4.83±14.271 and mean number of changes 13.25±3.758.
Change in Means Pre/Post WTC mention

This section reviews the results from the Play Behavior Observation Codes used to measure the change in behaviors observed after the mention of the WTC to the children during the interview. The total sample of children showed a mean decrease from pre- to post-WTC mention in the areas of relatedness, emotion expression, and interaction. In describing the behaviors of traumatized children, the literature shows increased withdraw and impact in the areas of affective response in children. These results are supported in the literature. The Alternative PTSD Criteria sample change was not significantly different from pre- to post in any item.

For the total sample, the data in Table 13 show significantly higher scores in the areas of event related behavior (ERB), event related narrative (ERN), disruption, avoidance, anxiety, aggression, creating safety in, creating safety out and meaning making. Higher scores in ERB and ERM occurred in the data as expected. As illustrated in the literature, in attempt to regulate and tolerate unpleasant experiences, the children in the study sample showed significantly higher levels disruption, avoidance, anxiety, aggression, and creating safety out. Children exposed to a traumatic event typically

<table>
<thead>
<tr>
<th></th>
<th>Total Study Sample</th>
<th>Alternative PTSD Criteria Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=71</td>
<td>n=15</td>
</tr>
<tr>
<td></td>
<td>Pre    Post  diff</td>
<td>Pre    Post  diff  sig     Pre    Post  diff  sig</td>
</tr>
<tr>
<td>Domain 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voice</td>
<td>8.17   7.41  -.761</td>
<td>7.46   7.33  -.13  .033*</td>
</tr>
<tr>
<td>Movement</td>
<td>2.76   2.52  -2.39  .078</td>
<td>2.60   2.67  .06  .193</td>
</tr>
<tr>
<td>Relatedness</td>
<td>2.55   2.37  -1.83  .193</td>
<td>2.13   2.00  -.13  .164</td>
</tr>
<tr>
<td>Event Related Behavior</td>
<td>2.86   2.52  -3.38  .004*</td>
<td>2.73   2.67  .06  .582</td>
</tr>
<tr>
<td>Domain 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repetitive Behavior</td>
<td>6.62   8.58  1.95  .000**</td>
<td>6.26   8.86  2.6  .000**</td>
</tr>
<tr>
<td>Event Related Behavior</td>
<td>.97    2.17  1.19  .000**</td>
<td>.93    2.33  1.40  .000**</td>
</tr>
<tr>
<td>Event Related Narrative</td>
<td>1.10   2.23  1.12  .000**</td>
<td>1.13   2.33  1.20  .000**</td>
</tr>
<tr>
<td>Emotion Expression</td>
<td>2.69   2.14  -5.49  .000**</td>
<td>2.47   2.33  -.13  .634</td>
</tr>
<tr>
<td>Domain 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>7.06   7.27  .214  .449</td>
<td>6.26   6.33  .06  .876</td>
</tr>
<tr>
<td>Interruption</td>
<td>2.82   2.54  -.282  .036*</td>
<td>2.73   2.60  -.13  .334</td>
</tr>
<tr>
<td></td>
<td>1.43   1.24  .182  .113</td>
<td>1.13   1.00  -.13  .334</td>
</tr>
</tbody>
</table>
attempt to establish a reason for the event as such, the data show higher scores in the creation of safety inside the frame of play and meaning making. In comparing the mean post scores for the total sample to the Alternative PTSD Criteria sample, post movement, post interruption, post distraction, post disruption, total post, and post domain 3 were statistically significantly different at the .05 level.

**Exposure**

As seen in the literature in children exposed to a traumatic event, Table 14 shows data significantly lower in relatedness (p = .004), emotion expression (p = .000) and interaction (p = .036) was seen in the children post-WTC mention. Also seen in the total sample were significantly higher scores in ERB (p = .000), ERN (p = .000), disruption (p = .000), anxiety (p= .037), aggression (p= .000), creating safety in (p = .000), creating safety out (p = .001), and meaning making (p = .000). Children under duress will tend to relate and interact less with others. The literature highlights observed increases in avoidance and anxiety in children exposed to a traumatic event. In attempt to regulate internalized emotions, the children implement ways to re-establish safety through attempting to reduce anxiety associated with the experience of the event. PBOC Paired sample t-tests for Alternative PTSD Criteria sample showed significantly higher scores in
Table 14: Change in Mean Pre-Post WTC mention Scores on PBOC by number of Child Exposures

<table>
<thead>
<tr>
<th>Domain</th>
<th>2 to 4 exposures</th>
<th>5 to 7 exposures</th>
<th>8 to 10 exposures</th>
<th>11+ exposures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pre</td>
<td>post</td>
<td>diff</td>
<td>sig</td>
</tr>
<tr>
<td>Domain 1</td>
<td>8.9</td>
<td>8.6</td>
<td>-.23</td>
<td>.534</td>
</tr>
<tr>
<td>Voice</td>
<td>3.0</td>
<td>3.0</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Movement</td>
<td>2.9</td>
<td>2.7</td>
<td>.15</td>
<td>.502</td>
</tr>
<tr>
<td>Relatedness</td>
<td>3.0</td>
<td>2.9</td>
<td>-.07</td>
<td>.673</td>
</tr>
<tr>
<td>Domain 2</td>
<td>6.6</td>
<td>9.0</td>
<td>2.4</td>
<td>.004*</td>
</tr>
<tr>
<td>Repetitive Behavior</td>
<td>1.8</td>
<td>2.1</td>
<td>.30</td>
<td>.264</td>
</tr>
<tr>
<td>Event Related Behavior</td>
<td>1.0</td>
<td>2.1</td>
<td>1.1</td>
<td>.000**</td>
</tr>
<tr>
<td>Event Related Narrative</td>
<td>1.0</td>
<td>2.3</td>
<td>1.3</td>
<td>.000**</td>
</tr>
<tr>
<td>Emotion Expression</td>
<td>2.6</td>
<td>2.3</td>
<td>-.30</td>
<td>.264</td>
</tr>
<tr>
<td>Domain 3</td>
<td>7.0</td>
<td>8.3</td>
<td>1.2</td>
<td>.011*</td>
</tr>
<tr>
<td>Interaction</td>
<td>2.8</td>
<td>3.0</td>
<td>.23</td>
<td>.387</td>
</tr>
<tr>
<td>Interruption</td>
<td>1.3</td>
<td>1.6</td>
<td>.23</td>
<td>.387</td>
</tr>
<tr>
<td>Distraction</td>
<td>1.6</td>
<td>1.6</td>
<td>.00</td>
<td>1.0</td>
</tr>
<tr>
<td>Disruption</td>
<td>1.2</td>
<td>2.0</td>
<td>.76</td>
<td>.006*</td>
</tr>
<tr>
<td>Domain 4</td>
<td>11.8</td>
<td>16.2</td>
<td>4.3</td>
<td>.002*</td>
</tr>
<tr>
<td>Avoidance</td>
<td>1.6</td>
<td>2.3</td>
<td>.69</td>
<td>.022*</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.0</td>
<td>1.9</td>
<td>-.07</td>
<td>.819</td>
</tr>
<tr>
<td>Aggression</td>
<td>1.3</td>
<td>2.4</td>
<td>1.1</td>
<td>.001**</td>
</tr>
<tr>
<td>Creating Safety In</td>
<td>1.0</td>
<td>2.1</td>
<td>1.1</td>
<td>.000**</td>
</tr>
<tr>
<td>Creating Safety Out</td>
<td>1.2</td>
<td>1.6</td>
<td>.38</td>
<td>.175</td>
</tr>
<tr>
<td>Self-Soothing</td>
<td>2.1</td>
<td>2.0</td>
<td>-.07</td>
<td>.808</td>
</tr>
<tr>
<td>Meaning Making</td>
<td>1.3</td>
<td>2.5</td>
<td>1.1</td>
<td>.002*</td>
</tr>
<tr>
<td>Regression</td>
<td>1.1</td>
<td>1.1</td>
<td>.00</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Total 34.4 42.3 7.8 0.001** 32.9 43.0 10.0 0.000** 29.1 48.0 18.8 0.002* 33.3 44.7 11.3 0.000**

*significant at the .05 level

**significant at the .001 level
ERB (p=.000), ERN (p=.000), avoidance (p=.012), aggression (p=.001), creating safety in (p=.000), creating safety out (p=.023), and meaning making (p=.002). Using the PBOC to examine the data for the total study sample, non-exposed children (n=2) in the study showed no significant change from pre to post WTC mention, as expected. Children that experienced 2 to 4 exposures showed significantly higher change from pre to post WTC mention in the areas of disruption (p=.006), avoidance (p=.022), and aggression (p=.001). The 2-4 exposure children had 2 children that met Alternative PTSD Criteria. Children that experienced 5 to 7 exposures showed significantly higher change from pre to post WTC mention in distraction (p=.012), avoidance (p=.002), aggression (p=.000), creating safety out (p=.003), and self soothing (p=.026). Five children experiencing 5-7 exposures met Alternative PTSD Criteria. Children that experienced 8 – 10 exposures showed significantly higher changes in pre to post WTC mention in areas of repetitive behavior (p=.012), avoidance (p=.000), anxiety (p=.002), aggression (p=.001), and creating safety out (p=.021), three children in this category met Alternative PTSD Criteria. The children that experienced 11+ exposures showed higher change in areas of event related behavior (p=.00), event related narrative (p=.01), creating safety in (p=.05) and meaning making. Of the children experiencing 11+ exposures (n=12), 4 children met Alternative PTSD Criteria sample.

Gender

Separating the total sample by gender showed some slight differences in significance levels. Table 15 shows for boys, ERB (p=.000), ERN (p=.000), disruption (p=.002), avoidance (p=.001), aggression (p=.000), creating safety in (p=.000), creating safety out (p=.032), and meaning making (p=.000) showed significantly higher change from pre- to post- WTC mention. For the girls, lowered scores in
relatedness (p = .030), emotion expression (p = .001), and interruption (p = .032) occurred. Higher scores in ERB (p = .000), ERN (p = .000), disruption (p = .011), creating safety in (p = .000), creating safety out (p = .008), and meaning making (p = .000).

Table 15: Change in Mean Pre-Post WTC mention PBOC by Gender

<table>
<thead>
<tr>
<th></th>
<th>Male n = 34</th>
<th>Female n = 36</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatedness</td>
<td>2.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Movement</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Voice</td>
<td>2.7</td>
<td>2.6</td>
</tr>
<tr>
<td>Emotion Expression</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Total</td>
<td>11.1</td>
<td>16.2</td>
</tr>
<tr>
<td><strong>Domain 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repetitive Behavior</td>
<td>1.8</td>
<td>2.1</td>
</tr>
<tr>
<td>Event Related Behavior</td>
<td>.97</td>
<td>2.2</td>
</tr>
<tr>
<td>Event Related Narrative</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Emotion Expression</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Total</td>
<td>6.8</td>
<td>9.3</td>
</tr>
<tr>
<td><strong>Domain 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>1.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Distraction</td>
<td>1.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>2.7</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Domain 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance</td>
<td>1.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Aggression</td>
<td>1.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Creating Safety In</td>
<td>1.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Creating Safety Out</td>
<td>1.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Self-Soothing</td>
<td>2.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Meaning Making</td>
<td>1.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Regression</td>
<td>1.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Total</td>
<td>11.1</td>
<td>16.2</td>
</tr>
</tbody>
</table>

*significant at the .05 level  
**significant at the .001 level
In this chapter, transcripts of the child interviews were reviewed. The transcripts further convey the objective experience of events and subjective internalized experience of young children observed in the play. Klein, DeVoe, Miranda-Julien & Linas (2009) conducted focus groups with 67 New York City parents after 9/11 to assess themes in behavioral and emotional responses in children. Parents reported their observations of their child’s reactions to the event both immediately and over time. The focus groups showed themes consistent with the literature on traumatic responses in children including generalized fear, anxiety, sleep problems, separation issues, and WTC specific fears (Klein, DeVoe, Miranda-Julien & Linas, 2009). The children used toys, behavior, and imagery to express internalized emotions. Two categories of play behaviors emerged from this study and were used simultaneously by the children. The first category reflected the general experience of fear, anxiety, and aggression inherent to any traumatic event and expected from any individual exposed to an event like the World Trade Center attacks. The second category included behaviors and narrative directly associated with the individual experiences of the child on the day of the terrorist attacks. Within both categories, the children exhibited strategies to self soothe and re-establish a sense of safety which allowed them to self regulate and continue with the activity.

As expected in any experience of a terrifying event, many children recalled their feelings of fear and anxiety during the event. Because the nature of the World Trade Center Attacks was aggressive, the children used aggressive language and behaviors to describe the event. The following excerpt is from a 4 year 7 month-old male explaining
what he saw when the towers collapsed. This child was trapped in a building during the event and was witness to 6 other in-person experiences.

**Childs Age At Interview:** 55 months (4 years 7 months)
**Childs Age on 9/11/01:** 44 months (3 years 8 months)
**Sex of Child:** Male

Interviewer: Yeah, did you ever go there with your mommy or daddy?
Child: No. Yeah. But, when it crashed we got out of the world trade center so fast as we can it crashed, right mommy?
Mom: Yeah.
Child: We got out of the world trade center as fast as we can when it crashed?
Mom: Yeah.
Child: We stayed there and stayed there for long long and then when it ... and you know how the WTC fell down?
Interviewer: No, how?
Child: One plane was flying the wrong, wrong way and it CRASHED
[Interrupts, bangs hands against the wall]
Interviewer: Oh, my goodness.
Child: And the pieces fell down on the policemen, and the policemen wanted to talk to the guy who crashed into the World Trade Center, and it broke into pieces, because it [the plane] went through. It went BTHHHHH.
[Interrupts, crashes his body into the wall]
Interviewer: It went through the building?
Child: Yeah. And then the hole - when the hole was there, the plane hit the hole and it exploded it like BTHHHHH
[Picks hands up in the air to show explosion].
Interviewer: Wow, did you see that?
Child: No.
Interviewer: No?
Child: Because we were out when it exploded because we saw so many people leaving our house. So we were out when it exploded.
Interviewer: Did you see anything out of your window?
Child: Well, I saw the things falling down.
[Takes action figures, holds them high above his head, and crashes them into the floor]
BTHHHH. Things falling down. But those were just papers.

The child immediately relates the experience of escaping the falling building and checks in with his mother standing nearby. As mentioned earlier in this paper, repetition in traumatized children correlates to a sense of anxiety experienced by the child when no acceptable resolution of the story has been reached. This child repeats the statement of the building falling. The resolution abruptly comes when the child moves on to explain how the building crashed. This child expresses aggression throughout the story through banging, hitting, and increases in physicality and vocalizing.
At times the children expressed a generalized affective response as they described the event. Because of the intensity, some of the children needed to establish a barrier between the retelling of the story and the triggering of feelings. The barriers were sometimes physical and sometimes metaphoric. This 5 year 2 month old female child distances herself from the experience by taking on the role of a newswoman to tell relay her experience.

**Interviewer:** . . . So what is it like for me to talk to you about the twin towers?

**Child:** Uhm. I will talk about it. I’ll be the newswoman.

**Interviewer:** You’re going to be the newswoman talking about it?

**Child:** Yeah.

**Interviewer:** Okay, come here. Be the newswoman and talk about it.

**Child:** . . . It knocked down. But by this guy Brad Cliff and he was very glad that he did it, but we were not glad either.

**Interviewer:** Why was he glad that he did it.

**Child:** Because he was very mean and he. . . . he loved to kill.

**Interviewer:** Because he was very mean and he loved to kill?

**Child:** Yeah.

**Interviewer:** He loved to kill and lots of people died there.

**Child:** Lots of people died there?

**Interviewer:** Yeah lots of people.

**Child:** Did anyone get out?

**Interviewer:** Nobody.

**Child:** Nobody got out safe?

**Interviewer:** Uh huh. Nobody got out safe except some people got out safe.

**Child:** Oh. I heard lots of people got out safe.

**Interviewer:** Yeah.

**Interviewer:** But most people were not out safe.

**Child:** Oh okay.

**Child:** Some of the people got out safe, but most of the people were not out safe. Anyway, the bad guys are still here, so watch out.

**Interviewer:** Excuse me, Excuse me. Can I ask you a question?

**Child:** What?

**Interviewer:** Miss Reporter. Uhmm, Miss Newsperson

**Child:** Yeah?

**Interviewer:** Who told you that? Who told you that this all happened? Who told you that people died here?

**Child:** Well, well, I was there.
She expresses fear and loss of safety through her dialogue with the interviewer. She is able to indirectly, through the newswoman role, express feelings and experiences otherwise too overwhelming for her to express directly. The following excerpt is from a 4 year and 6 month old female as she describes the types and content of conversations she has with friends using her Barbie as a mechanism to remain safe.

**Child's Age at Interview:** 54 months (4 years 6 months)

**Child's Age on 9/11/01:** 42 months (3 years 6 months)

**Sex of Child:** Female

**Interviewer:** . . . And do you ever talk about it with your friends?

**Child:** Sometimes

**Interviewer:** Sometimes? What do you say, what do you talk about?

**Child:** I don’t know, but the only way I can answer is if I could get one of my Barbies because she knows one of the answers

**Interviewer:** Oh, okay, can you bring your Barbie?

**Child:** Yeah.

[Runs to get doll]

**Interviewer:** So what’s your Barbie’s name?

**Child:** Daffy.

**Interviewer:** Daffy. So can I ask her? Let me ask her: Daffy, what does . . . she talk about with her friends?

**Child:** [Child Holds doll up in front of face.]

She talks about when it blows up and then it falls down.

**Interviewer:** Really? What do they say?

**Child:** They say, ‘where did you go?’

**Interviewer:** So they talk about what they did that day?

**Child:** Mm hmm. And they talk about what day it was, and it was Tuesday right?

**Interviewer:** Okay, so they talk about Tuesday, and what they did that day?

**Child:** [Child makes doll nod]

**Interviewer:** Oh, did they ever talk about what they were feeling that day?

**Child:** [Child makes doll nod]

**Interviewer:** And what were they feeling that day?

**Child:** They were feeling sad and scared.

**Interviewer:** Yeah. What were they sad about?

**Child:** We were sad about when it blowed up.

**Interviewer:** Yeah? What were they scared about?

**Child:** We were scared about the happened.

**Interviewer:** Yeah, that was really, really scary. Well Daffy, thank you very much

**Child:** You’re welcome.

[Child runs and puts doll away].

The child holds the doll in front of her face as a barrier, allowing her to feel safe enough to answer the questions asked. Anxiety and fear emerged outside of the context of play with many of the children as they discussed their feelings. Many expressed these feelings
through avoidance or aggression towards the interviewer, objects or themselves. In the following excerpt, the 5 year 9 month old male uses tools provided by the interviewer to communicate intense feelings, rather than verbalize them.

**Child’s age at interview:** 69 months (5 years 9 months)

**Child’s age on 9-11-01:** 57 months (4 years 9 months)

**Sex of child:** Male

**Interviewer:** . . . So remember when we talked about feelings? How do you feel now when you talk about the World Trade Center? . . .

**Child:** I missed it.

**Interviewer:** You missed it? Do you feel sad?

**Child:** [Nod]

**Interviewer:** You feel sad? How much sad do you feel?

**Child:** [Points to circles on paper]

Small.

**Interviewer:** Small. A little. Why do you feel sad?

**Child:** Because, I miss walking around it.

**Interviewer:** You miss walking around the World Trade Center. And how much do you miss it?

**Child:** [Points to circles on paper]

**Interviewer:** A lot. Me too I really, really miss it. I’m just going to ask you a couple more questions. Do you ever think about the World Trade Center when you don’t want to?

**Child:** Yeah.

**Interviewer:** Yeah? What do you think about?

**Child:** I think about how tall it was.

**Interviewer:** How tall it was...

**Child:** I think about how crashed it was. Maybe it was too tall, and the pilot didn’t see where it was going, and it crashed.

**Interviewer:** You think that’s how the crash happened?

**Child:** [Nod]

The child above is able to convey degree and intensity of feelings with a simple rating scale using circles increasing in size provided by the interviewer. He also attempts to find meaning and establish safety by attributing the attack to a mistake. This provides a less terrifying more predictable resolution for an event that otherwise would remain uncertain and random.

Another example of meaning making, this 5 year 7 month old female provides information regarding 9/11, the perpetrator of the attack, and reasons why. This child had significant internalizing behaviors on the CBCL. Her parent reported that most of
her exposures were on TV including the planes hitting the towers, the collapse, and the fires.

**Child's age at interview:** 67 months (5 years 7 months)  
**Child's age on 9-11-01:** 57 months (4 years 9 months)  
**Sex of child:** Female

**Interviewer:** He was here but he was downstairs. How do you think that happened? How do you think the buildings collapsed?

**Child:** Because the planes crashed.

**Interviewer:** Because the planes crashed? Why do you think it crashed into a building?

**Child:** Osama Bin Laden wanted to crash into the building.

**Interviewer:** Osama Bin Laden wanted to crash into the buildings? Who’s Osama bin Laden?

**Child:** What?

**Interviewer:** Can you tell me who he is? How do you know about him?

**Child:** He’s a bad guy.

**Interviewer:** A bad guy?

**Child:** I saw him on TV.

**Interviewer:** You saw him on TV too! Wow, you’ve seen a lot of things on TV. How do you feel when you think about the World Trade Center now?

**Child:** Sad.

**Interviewer:** Sad?

**Child:** I can’t even go to sleep.

**Interviewer:** Sad. And you can’t even go to sleep?

**Child:** Yeah.

**Interviewer:** Do you have nightmares sometimes?

**Child:** Sometimes.

**Interviewer:** Can you tell me about a bad dream you had one time?

**Child:** That my friend, my building and my friend’s building broke off.

**Interviewer:** Oh, you’re afraid that a plane might crash into your building and your friend’s building.

**Child:** Yeah.

**Interviewer:** Yeah, that must be scary.

In the example above, the girl reveals she experiences nightmares and concern that a building may crash in the future. She reveals that she feels anxious about her own safety and the safety of others through the content of her dream.

In the next segment, a 4 year 10 month old male tries to negotiate between talking about the event and his emotional reaction to the event. This child had a significant externalized behavior score on the CBCL. The parent reported seeing themes of 9/11 in his play and had noticed his attempts at avoiding places, people and things connected to the event.

**Child's age at Interview:** 58 months (4 years 10 months)  
**Child's age at 9-11-01:** 46 months (3 years 10 months)
Sex of Child: Male

Interviewer: ... do you remember what you were feeling when you saw the fires?
Child: No, I forgot.
Interviewer: You forgot? Well do you think you were feeling worried.
Child: No.
Interviewer: No? Or you know what? I have a whole bunch of faces to show me. Maybe you can show me on the -
Child: I don't wanna see.
Interviewer: You don't want to see?
Child: No.
Interviewer: Okay maybe I'll just put them over here. I wanna see the mad face.
Child: I wanna see the mad face.
Interviewer: You wanna see the mad face?
Child: I see it.
Interviewer: You see a mad face?
Child: Yes.
Interviewer: Yeah? Is that mad face?
Child: Sad.
Interviewer: Where's the sad face? ... That's sad. Well, what's something that makes you mad? Can you think of something that makes you mad? ...
Child: ... I don't wanna.
Interviewer: You don't wanna? Okay ...
Interviewer: Just in the kid’s eyes? Yeah? How did that feel when the dust was coming in your eyes? Remember how that felt?
Child: Uhm, that feels scary.
Interviewer: Scary. Bet that was scary. Was anything else scary that day? What else was scary that day?
Child: When the World Trade Center … uhm … fell down.

She establishes safety during the telling of the event by distinguishing that the parents were safe from the dust and able to protect the children. This 5 year 9 month old male clearly articulates symptoms and recurring themes of 9/11 in his play. He creates safety using a pillow as a comfort and barrier from the feelings that are triggered.

Child’s age at interview: 69 months (5 years 9 months)
Child’s age on 9-11-01: 57 months (4 years 9 months)
Sex of child: Male

Interviewer: Yeah. . . . So what do you do when you think about the World Trade Center? . . . And you think about the things you just told me about?
Child: Yeah.
Interviewer: Yeah. And do you ever stop thinking about them?
Child: No.
Interviewer: You don’t stop think about the World Trade Center? You always always think about them?
Child: Yeah.
Interviewer: Now you said you miss walking around the World Trade Center . . . I want to ask you something. Do you ever play games about the World Trade Center?
Child: Uh…sort of.
Interviewer: What sort of games?
Child: Uh, …build up into the World Trade Center, and then the planes come in and they crash…
Interviewer: Hmm… do you still play with them?
Child: Uh, yeah.
Interviewer: You still play with them? Hmm…And do you have any other feelings about the World Trade Center?
Child: (shake head)
Interviewer: No? Ok. What’s going on?
Child: I want to make a nice puffy pillow.
Interviewer: Oh, you want a nice puffy pillow. Ok. Do you ever talk to your friends about the World Trade Center?
Child: A little.
Interviewer: A little. What do you guys talk about?
Child: Like why did they crash into the World Trade Center.
Interviewer: Well what did your friends tell you?
Child: They say I don’t know.
Interviewer: They say I don’t know. And then do you explain to them?
Child: No. I don’t know how.

The parent of the child above reported that the child re-enacts themes of 9/11 in his play, gets upset from reminders, and avoids hearing adults talk about the event. According to
his parent, this child has experienced new fears, hypervigilance, nightmares, and changes in his sleeping. In the next segment, this 4 year and 7 month old female re-establishes safety within the context of the play.

**Child's age at interview:** 55 months (4 years 7 months)
**Child's age on 9-11-01:** 44 months (3 years 8 months)
**Sex of Child:** Female

Interviewer: No those people – whoever those people are. They were all over there. Did they get hurt?
Child: No.
Interviewer: No.
Child: Because my house is very safe if you stand here.
[Points to block on floor]
Interviewer: Oh your house is very safe if you stand near it.
Child: But if you stand near one of these . . .
[Points to a block on floor]
A plane might crash.
Interviewer: Oh, if you stand over there a plane might crash.
Child: 'Cause. 'Cause guess what.
Interviewer: What?
Child: This building says, “No Planes crashing.” It says up here.
Interviewer: Oh, this building. This is your house? This is where you live? Says on the top, “No planes crashing.” So that makes it safe. . . When those buildings crashed down, what was it like? What do you remember about it?
Child: I don’t remember anything
Interviewer: But you told me about the smoke. What was the smoke about? It went right over the house.
Child: Guess why? It saw the sign.
Interviewer: Oh, it saw the sign that says “No planes crashing.”

This little girl clearly establishes rules to be followed by others when flying planes. This conveys an effort to recreate predictability and therefore safety in this child’s life. The children expressed internalized experience through behaviors while demonstrating their participation in the event. As evidenced by the narratives, the children recalled specific details of their experience and revealed subjective experiences of those events through verbal and behavioral indicators.

**Discussion**

The purpose of this dissertation was to examine the relationship between traumatic exposure, symptom development, and expression in young children. This study explored one potential method of communication of internalized subjective
experiences of young children through play observation. Grasping the complexity of their experience through narrative excerpts, the children revealed complex feelings reinforcing the results from the PBOC and not typically captured in other measures. Play showed to be an effective tool for measuring impact of a traumatic event in young children. The children offered information on internal and external experiences of the event through their play and description. Using the PBOC and narrative findings, themes seen in similar studies examining play and behavior in children exposed to a traumatic event emerged (Cohen, Chazan et al., 2010; Klein, DeVoe, Miranda-Julien & Linas, 2009). In their own language, the children clearly described the impact, which differs significantly from psychopathology, of 9/11 on their life, but is no less central to helping children cope. As reflected in the more recent literature, emphasis upon subjective attribution and meaning of the event shows to influence symptom development in children. This study documented the subjective experience of the children through self-report and descriptive observation of behavior. Findings from the study suggest that child self-report can in fact provide insight into the impact of a traumatic event upon young children.

The PBOC tool, in contrast to the CBCL, provided an opportunity to examine externalized behaviors and a measure of internalizing symptoms experienced by the child when asked to recall traumatic events. PBOC indicates a change in response by the child when triggered. The PBOC findings suggest that this study sample, comprised of highly exposed children, regulated affective disturbance triggered by mention of the traumatic event through strategies described in the literature such as re-enacting, meaning making, self-soothing, and creating safety. The PBOC domains marked aspects of both play and
trauma with the observed play behaviors augmenting and enriching the context from which to understand the perspective of the child and the impact of the trauma. Overall, the total sample showed significant changes in behaviors on the PBOC, specifically in areas of affect regulation like avoidance, anxiety, aggression, establishing safety, and finding meaning in a negative event. These findings highlight the need for more complete measures of children’s experience. Additionally, the child narrative excerpts clearly indicate recall of events and emotions. Excerpts show examples of children avoiding intense feelings 9-12 months after the exposure to the disaster. Through the PBOC, trauma exposure clearly affected play behaviors; analysis did not determine effect of exposure upon mental health symptoms, perhaps because of some other mediating variables not captured in the data. Parent exposure did not significantly impact CBCL or PBOC.

Used in many studies of young children, the CBCL data indicated that the children were not experiencing high levels of dysregulation or symptomology. The findings suggest that the CBCL did not adequately capture the impact of the event on the children, supporting other studies indicating that the CBCL measure general distress rather than traumatic symptoms (Sim, Friedrich, Daves, Trentham, Leguna & Pithers, 2005). At minimum, the expectation for young children exposed to a traumatic event is an increase in externalizing behaviors, which was not demonstrated in the scores on the CBCL. The general theme for the findings on the associations between child exposures using the CBCL showed significantly lower scores for the children in the study sample when compared to standardized, non-clinic CBCL sample scores. When gender was explored, there were no distinguishing trends in the data, as seen in much of the literature.
The analyses of the qualitative data provide limited information about the impact of the event upon the children interviewed and appears irrelevant in comparison to the narrative from the children.

For purposes of the analysis the sample was divided into two categories, total sample (N=71) and Alternative PTSD Criteria sample (n=15). Twenty-one point one percent of the total sample met Alternative PTSD Criteria, more closely representing results in the literature. The rationale for the division was that those children meeting Alternative PTSD Criteria would show higher levels of impact and change than the total sample in all measurement in the study (CBCL and PBOC). When compared to the CBCL normalized non-clinic sample, the Alternative PTSD Criteria sample showed only one significant change in mean in attention problems, which was lower than the normalized mean. Although not significant, one interesting trend in the mean scores was that all Alternative PTSD Criteria sample children mean CBCL scores were higher (excluding those scores for sleep problems and attention problems which were equal) than the total study sample scores. This suggests that the Alternative PTSD Criteria sample, when compared to the total sample, were more impacted. In terms of diagnostic criteria and symptom development, the CBCL and Alternative PTSD Criteria provided limited information regarding the experience of the children in this study. Although the children in this study did not meet criteria for PTSD as triggered by the event, they were impacted as evidenced by the narratives of their experiences and observations of the characteristics of play exhibited on the videotaped interviews.

Limitations
This study is limited by several factors. There are many barriers in any study of the impact of trauma on children. A major limitation of this study is the absence of a control or comparison sample. It is virtually impossible to obtain a control sample in instances of traumatic exposure in children. Personal and professional ethics, human subjects, and IRB approval standards prohibit the introduction of a traumatic event to a sample of children to create the circumstances of authentic intervention design. In this study, normalized non-clinic samples of validated and reliable measurement studies were used as comparison to the study sample. Those children not able to play on the videotaped interviews or those that did not have complete CBCL or pre/post data were excluded from the analysis.

This study sample was also not random, but rather primarily a convenience sample of those exposed to the events of 9/11. As a result, parents wanting to alleviate fears that their child was traumatized by 9/11 or in denial about the impact of the event on the child may have self-selected to the study sample. The data suggest that parent reports of symptoms and responses in their children were not entirely accurate or did not capture the entire experience of the child, as reflected in other parent-child studies reliant on parent report (Golden, Hagglof, Levin & Persson, 2008; Meiser-Stedman, Smith, Glucksman, Yule & Dalgleish, 2007; Stover & Berkowitz, 2005). Additionally, parents may have underreported symptoms and responses of the children due to their own traumatic impact, denial of child symptoms, or the concern regarding their own ability to keep their child safe.

Particular to this sample of children, numerous protective factors in social conditions at several levels were present such as generally high socioeconomic status,
family function, low mental health symptoms, and minimal past traumatic exposure. The quantity of risk factors rather than the quality of the risk factors seem to have a greater predictive value for development of pathology, as shown by the children in this study. The children in this study demonstrate a considerable amount of social and economic advantage, which may have mediated any impact of a traumatic event. Presumably high SES allowed these families access to social supports and other services needed to re-establish daily routines and activities for the children in a timely way (e.g. relocation, school enrollment, extended family supports). Functioning as a protective factor, SES seems to have assisted in preventing accumulation of risk for this population. But the PBOC still shows pre/post WTC change for the children in this study. Lastly, this study focuses upon urban affluent children in a major metropolitan city in terms of exposure to media, community violence, population density, diversity and resources. Despite these limitations, these findings highlight the need for effective methods to capture the experience and impact of a traumatic event upon all young children.

Clinical Implications

The PBOC tool is relatively easy to administer in a clinical setting. Although it requires more than one observation of the child for pre/post data, it offers data to support change in behaviors throughout service provision. It is easily incorporated into the therapeutic progress notes used to document the progress of a child in therapy. Additionally, in research settings, it allows the researcher to capture rich information not necessarily captured by other measures.

There is a degree of comfort in thinking that children are not impacted by a traumatic event. Adult concepts of child innocence and denial make it easy to ignore the impact of
a traumatic experience upon young children. While the findings from this study should not be generalized to the entire population of children exposed to a traumatic event, key information is useful. The literature shows increasing attention to the process of coping and resilience rather than direct linear causality of risk exposure to negative outcomes, emphasizing the importance of context in the paradigm of clinical diagnosis for children. The findings in this study highlight the importance of the transactional relationships between factors at various ecological levels that may contribute to symptom development in young children.

The study population demographics create an opportunity to examine the impact of a specific delineated traumatic event, without complication from other factors. While all but two children were exposed to the adverse event, not all the children were traumatized by the event. The ability of the children in this study to successfully utilize adaptive play as a coping mechanism clearly indicates the presence of an effect of the traumatic event upon the children in the study sample, a finding not indicated by other measures. These findings are illustrative of the concept of adaptive play described by Cohen, Chazan et al., (2010) that suggest self-soothing and re-enactment are components of this type of play which allows children to participate in the retelling of an event and manage discomfort simultaneously. Differentiation between impact and psychopathology needs to be clarified. Additionally, future examination of impact needs to include all socioeconomic levels since the literature shows increased attention to family factors such as cohesion and communication as mediating symptom development. It is clear that cohesion and communication, among other positive variables, are not dependent upon family dollar income (Harnish, Dodge, Valente, 1995; Huston, McLoyd, Garcia Coll,
1994; Maggi, Kohen, Hertzman & D’Angiulli, 2004). Studies of affluent pre-adolescent and adolescent students reveal similar levels of disturbance as their less affluent peers which is accounted for by isolation from parents and inconsistent non-parental care giving (Ansary & Luthar, 2009; Harnish, Dodge, Valente, 1995; Luthar & Latendresse, 2005; Luthar, 2003a; Vanderbilt-Adriance & Shaw, 2008).

Based upon the literature, and shown in this study sample, these findings suggest that similar patterns of generalized play are seen in all children exposed to any traumatic event. This study provided an opportunity to examine the way in which children apply strategies to cope with uncomfortable or distressing events validating the capacity of children to report subjective experiences through their own report and prompted the development of a systematic measurement of traumatic play behaviors and description of how children express their experience of an extraordinary event. Although informed by normal development, the literature predominately focuses upon the dysfunctional and abnormal outcome associated with chronic exposure to adversity. It is necessary to distinguish between traumatic impact and traumatic pathology in that even children presenting with sub-clinical levels of symptoms are impacted and need guidance in ways to process traumatic events. Perhaps the reason it is difficult to capture the presentation of pathology in young children is because an entirely different paradigm in which to understand children and their experience must be established.

CONCLUSION

In this study, play behaviors of children exposed to a traumatic event were analyzed to measure the impact of a traumatic event on young children. Data from the NYCYCP study through a standardized measurement tool (CBCL) and Alternative PTSD
Criteria for children (Scheeringa, 2006) was used, along with a tool designed specifically to record changes in observed play behaviors for this population (PBOC). Variables explored were those shown to impact symptom development including exposure, chronological and developmental age, SES, and parental impact. Observations of play behaviors for this highly exposed sample provided data for correlation analysis to the mental health status of a traumatized child through standardized tools. Because no tool to measure play behavior existed in the literature, in order to identify play behaviors and to assess the impact of the traumatic event upon the exposed children it was necessary to develop an observation-based tool (PBOC).

As suggested by Michael Rutter (1983, 2005, 2006), maintenance of the common belief that young children do not remember traumatic experiences within the literature may be a result of a desire to maintain the innocence of childhood. Perhaps that is one reason there are few effective tools to measure the impact of trauma upon young children. In reality, all individuals will experience some type of risk or stressor, each differing in intensity, frequency, duration, and meaning. The development of competent responses to stressors and subsequent implementation has shown to protect the individual from long term negative impact of adversity and minimize functional and emotional disruptions. Several preventive programs to mediate the future life course of children at risk for negative outcomes are based upon a preventive premise. These models focus on developmentally appropriate ways of building competence and fostering healthy adaptation skills before the threat of crisis or adversity is present.

Because verbal dexterity and transient behavioral stages are normative for younger cohorts, methods of communication with young children must be explored to
understand degree and severity of responses along the spectrum of mental health issues. Researchers and practitioners must learn language and culture of the populations with which they work. Play is the gateway to the experiences of a young child and understanding this complex language is necessary to accessing the needs of the young child. Play functions as a multi-dimensional tool for assessment, as a critical domain in PTSD, as a natural form of communication, and as a tool to help children work through problems, understand the world and express complex thoughts and feelings they cannot otherwise verbalize. Patterns of adaptation, developed early in life, reflect the ability of the individual to cope successfully with life. Play is a fundamental component to the general process of coping in children and allows us to teach them to regulate responses to the environment.

Future studies of children aged 2-6 years old should explore the impact of traumatic experiences in the areas of social, emotional, physical, cognitive and psychological development and the impact of parental coping and mental health status on the ability of young children to manage their affective regulation. Knowledge regarding the specific ways trauma affects children under 6-years-old remains minimal. To date, few studies identify or describe the ways preschool children communicate or express their experience of trauma, adaptive or maladaptive, presenting basic problems with assessment of traumatized children.

The examination of the systems that exert the most influence on the experiences of the child provides the most comprehensive understanding of the impact of a traumatic event on a child. It is clear that assessment of young children needs to include the caregiver relationship as well as contextual factors such as community, family, and
culture. Fostering universal factors identified as protective early in life can provide a strong foundation for future encounters with adversity. Themes that emerge in the literature emphasize the importance of connections to competent and caring adults in the family and community, cognitive and self-regulation skills, positive views of self, and motivation to be effective in the environment. Enhancing the inherent ability of the child to generate adaptive solutions to traumatic events is one way towards the development of effective and relevant interventions. The delineation of how adaptive systems develop and their operation under diverse conditions is important information for intervention development.


Bandura, A., Caprara, G., Barbaranelli, C., Gerbino, M. & Pastorelli C. (2003) Role of


Cohen, P., Cohen, J., Kasen, S., Velez, C., Hartmark, C., Johnson, J., Rojas M., Brook, J.


Delancy-Black, V., Covington, C., Ondersma, S., Nordstrom-Lee, B., Templin, T., Ager,


APPENDIX A

New York City Young Children’s Project Study (NYCYCP)

The NYCYCP Study was conducted by Drs. Ellen DeVoe and Tovah Klein, with the aim of gathering information both on the ways parents of young children were impacted by the WTC attacks and the impact upon their preschool children. A better understanding of adaptive process, normative reactions, atypical responses and psychopathology of children and their caregivers exposed to a traumatic event promotes the creation of developmentally sensitive assessment tools, design of age appropriate interventions, and provision of on-going support for all children and families exposed to a traumatic event. The current study sample is a subsample of children (n=71) from the NYCYCP study. Participant recruitment for the NYCYCP study took place at eleven early childhood centers in New York City (NYC) during the summer of 2002. All measurement tools and data used in the current study, excluding the PBOC, were administered and gathered by the NYCYCP study. Below is a description of the NYCYCP study, without which the current study could not have occurred.

Inclusion criteria: To be included in the NYCYCP study, each family had to have at least one child between two and five on September 11, 2001. Participation in the video-taped interviews required parental consent and child assent.

Study Site and Proximity to WTC: Nine of the eleven childhood centers were located in Lower Manhattan below 14th street; one was located in Brooklyn with windows facing the World Trade Center; one childhood center was not within visual distance of the Towers.
Recruitment: Parents were approached by the research staff at participant day care centers and early child educational sites. Description of the study was provided and contact information was procured if parents expressed an interest in further information. An investigator contacted the interested parents and gave detailed information concerning the project and answered any questions. Parents aged 18 or above with at least one child 5 years or younger could participate. Other criteria included English language proficiency to participate in interviews and ability to give informed consent. All parents and children spoke English.

Standardized Measures

Child Interview

All child-interviews were conducted and recorded from June 2002 to October 2002 in New York City. Each child-interview included an adult interviewer with a background in social work or psychology. The interviewers utilized developmentally appropriate questions, age-appropriate play materials, and validated measures used in other studies with young children. At times, a second individual observed and operated the camera. Interviewers began the process by asking the child basic questions, for example, name, age, birthday, favorite foods, hobbies, and school activities. This process allowed the interviewer to establish rapport through non-threatening means. Additionally, the interviewer could assess the developmental level and relational style of the child and accommodate to each individually, while at the same time allocate time for the child to become comfortable with the interviewer.

After completing the first section of the interview, questions relating to the child’s experience of the WTC were introduced. The interviewer followed the lead of the child
and continued to gauge the anxiety and discomfort of the child throughout. Each child was told that they did not have to answer any questions or participate in any activity that made them uncomfortable and could stop the interview at any time. The interviewer, guided by the child, utilized the same language and descriptors as offered by the child to describe the event (i.e. World Trade Center, 9/11, WTC). Once the child had completed the narrative form of the interview, the interviewer asked the child to show what happened on the day of the World Trade Center using age-appropriate toys and materials. At the conclusion of the interview, the child was asked to complete Peabody Picture-Vocabulary Test (PPVT). Children were offered a small toy or snack for their participation in the interview.

**Parent Interview**

Audio taped and transcribed, the parent interview lasted an average of 1.5 hours and took place in a location selected by the parent. Levels of exposure and mental health status of the family and the child were assessed during the parent interview. Standardized measures were used to determine parent and child mental health status during the parent interview. Mental health status of the parent(s) was assessed in three domains including Post-Traumatic Stress Disorder (PTSD), anxiety and depression.

**Measures**

Using the data from the NYCYCP study, mental health and exposure variables were gathered through retrospective parent report and standardized measures.

*The Brief Symptom Inventory (Derogatis, 1993) (BSI)* reflects psychological symptom patterns of psychiatric and medical patients as well as community non-patient respondents. The BSI is a 53-item inventory of psychological symptoms with each rated
on a scale of 0 to 5 (not at all to extremely). The measure includes information on nine principal symptom dimensions including anxiety, somatization, phobic anxiety, obsessive-compulsive, interpersonal sensitivity, psychosis, depression, hostility, and paranoid ideation. Additionally, this tool collects information regarding six depression indicators and three global distress indices.

*Post Traumatic Stress Disorder Checklist – Terror (Weathers, Litz, Huska, & Keane, 1994, Norris, 2001) (PCL-T):* The PCL-T assesses trauma symptoms through a 5-point response scale for degree of distress associated with each symptom and a single distress measure for participants to rate overall level of stress on a scale from 1 to 10. The first two modules of the three part interview developed specifically for 9/11 were used to assess exposure and loss of psychosocial resources (Weathers et al., 1994; Norris, 2001).

The *parental report version of the Child Behavior Checklist (Achenbach & Rescorla, 2000a, 2000b) (CBCL)* for children 1-5 years old captured three domains of behavior. The tool measures internalizing, externalizing, and total problem scores along with clinical and sub-clinical levels. Reliability of the measure is .68 to .92 with a mean of .84 (Briggs-Gowan, Carter, Irwin, Wachtel, Cicchetti 2004)

*Brief Infant & Toddler Social & Emotional Assessment Scale (Carter & Briggs-Gowan, 1998) (BITSEA):* Using the 60-item questionnaire, 1-2 year old children were assessed in the domains of externalizing behavior, internalizing problems, dysregulation, and competencies. Test-retest reliability for the measure is .87 for the BITSEA problem (BITSEA p) and .85 for the BITSEA competence (BITSEA c)
Child sleep disturbances: Changes in sleep were assessed with a 5-question assessment developed from preschool children exposed to SCUD missile attacks (Laor et al., 1996).

PTSD Status: Determined with adapted DSM-IV criteria in three cluster areas determined PTSD status. Similar to other studies examining this age group, adapted threshold requirements included one avoidance symptom (cluster C), three re-experiencing symptoms (cluster B) and two hyperarousal symptoms (cluster D).

PTSD Semi-Structured Interview for Infants and Young Children (Scheeringa & Zeanah 1994) The parent-report section of Scheeringa and Zeanah (1994) PTSD Semi-Structured Interview for Infants and Young Children comprised of 19 items related to traumatic symptomology along with supplemental questions developed by the co-investigators of the study assessed issues regarding play and behavior changes related to trauma exposure in children. The interviewer asked parent(s) about 9/11 coupled with a related PTSD symptom. With each symptom the parent reports as present, the interviewer solicits specific examples as evidence. The symptom list is based upon DSM-IV criteria list as well as developmentally appropriate symptoms and allows for diagnosis using either DSM-IV criteria or alternate criteria.


Parent Report of the Child’s Reaction to Stress (Fletcher, 1991) Along with items from the parallel form, this measure was adapted and shortened for the study to assess responses to a specific stressful or traumatic event.
ZERO TO THREE - The National Center for Clinical Infant Studies (Zero-TO-Three, 1994 (ZTT): ZTT specific criteria PTSD were used to evaluate the types and severity of trauma symptoms in children 0-3 and include the following: re-experiencing in the form of post-traumatic play, nightmares, and behavioral re-enactments; symptoms of numbing and increased arousal; and developmentally-specific changes in behavior such as regression, aggression, the development of new fears, and separation anxiety.

Peabody Picture-Vocabulary Test (PPVT): The PPVT measure is a picture-based multiple-choice measure of receptive vocabulary in 20 content categories. Internal consistency was .93 and .92 for test-retest reliability.

Demographic Survey: Variables recording child/parental age, child gender, ethnicity, religious background, income, education, employment, educational status, and family structure.

Background Survey: Significant life events occurring prior and since 9/11 were recorded as part of the demographic survey.

Retrospective reports: PTSD, anxiety and depression were evaluated via retrospective accounts of symptoms at 1-3 months post-event and current symptoms 9-13 months post-event.

Child Mental Health Status: Child mental health status was assessed through parent report. Parents reported levels of trauma, behavioral functioning, and mental health status through standardized and adapted measures of tools utilized in other studies assessing traumatic symptoms in young children.

Child Exposure to WTC Disaster: Parent reported the level of the child’s exposure to the event. Parents also reported on their knowledge of the child’s experiences the day
of the attacks and completed a checklist of their own and/or their child’s exposure to the WTC disaster. Parents provided estimates as to the amount, frequency, and supervision of their child’s exposure to media coverage of the event.

The NYC Young Children’s Project - R01 MH066462-01
APPENDIX B
Diagnostic Criteria PTSD
DSM- IV-TR

CRITERIA A:
The person has been exposed to a traumatic event in which both were present:

(1) the person experience, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
(2) the person’s response involved intense fear, helplessness, or horror. Note: in children, this may be experienced instead by disorganized or agitated behavior

CRITERIA B:
The traumatic event is persistently reexperienced in one (or more) of the following ways:

(1) recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
(2) recurrent or distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
(3) acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: in young children, trauma-specific reenactment may occur.
(4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
(5) psychological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

CRITERIA C:
Persistant avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

(1) efforts to avoid thoughts, feelings, or conversations associated with the trauma
(2) efforts to avoid activities, places, or people that arouse recollections of the trauma
(3) inability to recall an important aspect of the trauma
(4) markedly diminished interest or participation in significant activities
(5) feelings of detachment or estrangement from others
(6) restricted range of affect (e.g., unable to have loving feelings
(7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)
Criteria D:
Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. difficulty falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilance
5. exaggerated startle response

Criteria E:
Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

Criteria F:
The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:
Acute: if duration of symptoms is less than 3 months
Chronic: if duration of symptoms is 3 months or more

Specify if:
With Delayed Onset: if onset of symptoms is at least 6 months after the stressor
APPENDIX C
Alternative PTSD Criteria for Children

A. The person has been exposed to a traumatic event

1. The person experience, witnessed, or was confronted with and event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others

(A[2] is not required because preverbal children cannot report on their reaction at the time of the event and an adult may or may not have been present to witness the child’s reaction.)

B. The traumatic event is persistently reexperienced in one (or more) of the following ways:

1. Recurrent and intrusive recollection of the event (but not necessarily distressing), including images, thoughts or perception. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
2. Recurrent distressing dreams of the events. Note: In children, there may be frightening dreams without recognizable content.
3. Objective, behavioral manifestations of a flashback are observed but the individual may not be able to verbalize the content of the experience.
4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by one (or more) of the following:

1. Efforts to avoid activities, places, or people that arouse recollections of the trauma.
2. Markedly diminished interest or participation in significant activities. Note: in young children, this is mainly observed as constriction of play.
3. Feeling of detachment or estrangement from others. Note: In young children, this is mainly observed as social withdrawal.
4. Restricted range of affect (e.g., unable to have loving feelings).
5. Loss of previously acquired developmental skills, such as toileting and speech.

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by one (or more) of the following:

1. Difficulty falling or staying asleep.
2. Irritability or outbursts of anger or extreme temper tantrums and fussiness.
3. Difficulty concentrating.
4. Hypervigilance.
5. Exaggerated startle response.
New Cluster. At least one (or more) of the following:

1. New separation anxiety.
2. New onset of aggression.
3. New Fears without obvious links to the trauma, such as fear of going to the bathroom alone or fear of the dark.

Note: Modifications in wording to DSM-IV criteria are noted in italics

The diagnosis of Posttraumatic Stress Disorder requires that all five of the following criteria be met:

1. The child has been exposed to a traumatic event—that is, an event involving actual or threatened death or serious injury or threat to the physical or psychological integrity of the child or another person.

2. The child shows evidence of reexperiencing the traumatic event(s) by at least one of the following:

   a. Posttraumatic play - that is, play that (1) represents a reenactment of some aspect of the trauma, (2) is compulsively driven, (3) fails to relieve anxiety, and (4) is more literal and less elaborate and imaginative than usual.

      *Example:* A toddler who was bitten by a dog plays out a scene in which she growls and snarls, then makes sudden lunges. She does not comment on this play and repeats the scene with little variation. An example of adaptive play reenactment, in contrast, might be the play of a toddler who was bitten by a dog and then plays out numerous scenes of scary dogs, with different circumstances and outcomes apparent as the content of the play changes over time.

   b. Recurrent and intrusive recollections of the traumatic event outside play – that is, repeated statements or questions about the event that suggests a fascination with the event or preoccupation with some aspect of the event. Distress is not necessarily apparent.

      *Example:* A toddler who was bitten by a dog talks endlessly about the dog and seems drawn to their images in books or on television.

   c. Repeated nightmares, the content of which may or may not be linked to the traumatic event.

   d. Physiological distress, expressed in language or behavior, at exposure to reminders of the event.

      *Example:* A parent or caregiver may report feeling that the child’s heart is pounding, observe that the child is shaking and trembling, or feel that the child’s hands and/or face are sweaty. A young child with verbal skills may report these same physiologic symptoms himself, as well as
additional somatic symptoms such as upset stomach, chest tightness, or shortness of breath.

e. Recurrent episodes of flashbacks or dissociation – that is, reenactment of the event without any sense on the child’s part as to the source of the ideas. The behavior is dissociated from the child’s intentionality or sense of purpose. The symptom may also present as starting or freezing.

*Example*: A toddler who is engaged in doll play does not comment on the sound of a siren in the street but abruptly begins a fighting sequence with the dolls, having been reminded of the ambulance which arrived after an argument between her parents.

3. The child experiences a numbing of responsiveness or interference with developmental momentum. The numbing or developmental problem appears or intensifies after the trauma and is revealed by *at least one* of the following symptoms:

   a. Increase in social withdrawal.
   b. Restricted range of affect.
   c. Markedly diminished interest or participation in significant activities, including play, social interactions, and daily routines.
   d. Efforts to avoid activities, places, or people that arouse recollection of the trauma, including efforts to avoid thoughts, feelings, and conversations associated with the trauma.

4. After a traumatic event, a child may exhibit symptoms of increased arousal, as revealed by *at least two* of the following:

   a. Difficulty going to sleep, evidenced by strong bedtime protest, difficulty falling or staying asleep, or repeated night waking unrelated to nightmares.
   b. Difficulty concentrating.
   c. Hypervigilance.
   d. Exaggerated startle response.
   e. Increased irritability, outbursts of anger or extreme fussiness, or temper tantrums.

5. This pattern of symptoms persists for *at least 1 month*.

*Associated features*: Young children who have experienced a traumatic event may temporarily lose previously acquired skills. Aggression toward peers, adults, or animals may appear. Fears not present before the traumatic event may become evident, including separation anxiety, fear of toileting alone, and fear of the dark, among others. Sexual and aggressive behaviors that are inappropriate for the child’s age may be seen.
APPENDIX E
Developmental Trauma Disorder

A. Exposure
1. Multiple or chronic exposure to one or more forms of developmentally adverse interpersonal trauma (abandonment, betrayal, physical assaults, sexual assaults, threats to bodily integrity, coercive practices, emotional abuse, witnessing violence and death).
2. Subjective Experience (rage, betrayal, fear, resignation, defeat, shame).

B. Triggered pattern of repeated dysregulation in response to trauma cues

Dysregulation (high or low) in presence of cues. Changes persist and do not return to baseline; not reduced in intensity by conscious awareness.

- Affective
- Somatic (physiological, motoric, medical)
- Behavioral (e.g. re-enactment, cutting)
- Cognitive (thinking that it is happening again, confusion, dissociation, depersonalization).
- Relational (clingling, oppositional, distrustful, compliant).
- Self-attribution (self-hate and blame).

C. Persistently Altered Attributions and Expectancies
- Negative self-attribution
- Distrust protective caretaker
- Loss of expectancy of protection by others
- Loss of trust in social agencies to protect
- Lack of recourse to social justice/retribution
- Inevitability of future victimization

D. Functional Impairment

- Educational
- Familial
- Peer
- Legal
- Vocational

APPENDIX F
Code Definitions

Global Play Behavior Codes

The literature provides no clear or consistent definition of play, but describes aspects within three global dimensions comprised of: 1.) movement, 2.) voice and, 3.) relatedness of the child. The Global Play Behavior codes reflect these dimensions and measure the degree to which these characteristics are present in the play of each child in the video.

Voice Scale. Voice will be evaluated on 4-items including frequency, fluency, volume, and pitch.

- **Frequency**: number of times verbal utterance occur
- **Fluency**: level or degree of smoothness or flow when speaking
- **Volume**: density or amount of words or sounds uttered
- **Pitch**: auditory attribute of sound on a scale from low to high
  
  (Ex: quiet or loud; shrill or deep)

4. **High**: Provides details to questions posed. Frequently uses many words and sounds when speaking. High degree of smoothness and fluidity when speaking. Multiple changes in sound.

3. **Average**: Range of frequency, fluency, volume and pitch. Range in levels of smoothness and fluidity when speaking as well as number of words used. Answers questions completely and in detail.

2. **Low**: Few qualitative changes in frequency, fluency, volume and pitch. Minimal variability in density and amount of words as well as smoothness and fluidity of language. Limited change in sound on scale. Few utterances.

1. **None**: No qualitative changes in frequency, fluency, volume, and pitch. Delivers information with no change in number of words, level of sound, smoothness of language, number of utterances.

Movement Scale. Measurement of both fine and gross motor skills as well as qualitative characteristics such as levels, pace, frequency, and physicality.

Definitions:

- **Physicality**: degree of bodily strength and contact utilized by the child
- **Motor skill**: the degree to which the child coordinates and controls body movements to effectively achieve a certain goal.

4. **High**: Extreme change in degree of motor activity (fine or gross). Highly active. Moves from one place to another. Constantly moving. High range of frequency and physicality of movement.
3. **Average**: Range of fine and gross motor activity. Modulates between active and still. Varied physicality and pace.

2. **Low**: Few changes in body position or movement. Limited use of fine or gross motor response to activity or context. Low physicality.

1. **None**: No movement or change in level or degree of motor activity. No change in physicality or use of fine or gross motor skills.

**Relatedness.** How the child interacts with the interviewer. This measure includes quality of interactions that incorporate responsiveness, engagement, social interaction, and comfort level.

4. **High**: Highly friendly or responsive to questions and activities. Engaged with interviewer and activities. Highly social and interactive. Very comfortable with surroundings.

3. **Average**: Responds to questions and participates in activities. Interacts with interviewer and surroundings comfortably. May need a warm up or short period of time to begin to interact.

2. **Low**: Reluctantly engages in activity or with interviewer. Takes a long period to engage. May appear withdrawn, uncomfortable, or shy.

1. **None**: Unwilling to interact or engage with interview or in activities. Not social and very uncomfortable with activities, interviewer or surroundings.

**Behavior Response Codes.**

Behavior Response Codes reflect behaviors described in the literature of both symptoms of trauma and general play behaviors.

**Repetitive behaviors:** Child specific play behaviors, sequences or themes that reoccur throughout the play related to the event (building and rebuilding; crashing; replaying of event with no ending). Can include narrative themes or sequences. Behavior or narrative theme must occur at least 2 times to consider repetitive. The frequency of the same behavior, number of distinct behaviors, context of action or behavior, and fluidity of storyline contribute to the score. Repetitive play can be both a return to a previous play sequence or theme and/or the continuation of a previous repetitive play sequence or theme.

- **Frequency:** Number of times the activity repeats
- **Number:** Number of distinctly different behaviors
- **Context:** Relation or relevancy of action or behavior to furthering
Fluidity: The degree to which the behavior moves the narrative forward and remains within the context of the story, rather than play actions unrelated to the story the child tells.

4. **High**: Child repeats behaviors four or more times in any number of activities or behaviors (Smashes plane 4 times, builds WTC 4 times, knocks down WTC 5 times and Child clearly returns to a previous play sequence or theme and/or engages in repetitive play continuously during interview.

3. **Moderate**: Child repeats behaviors two to four times in two or more activities or behaviors in either the context of the play narrative or outside the context of the narrative (smashes plane twice, rebuilds buildings three times). Child can maintain a linear structure to the narrative or may convey a non-linear or confused story in a few areas but not all maintains overall structure. Child clearly returns to a previous play sequence or theme and plays this way during

2. **Low**: Child repeats behaviors at least once in one activity or behavior (smashing plane twice during the interview in context of the narrative). Story maintains linear structure with a beginning, middle and end. Child clearly returns to a previous play sequence or theme and displays this behavior during the interview a few times (1-2 times).

1. **None**: Does not engage in repetitive play. Child may play with a distinct linear flow to the action or child may show confused or resistant play, but does not repeat sequences or themes during the interview.

Behaviors must be considered **intentional play**: specific play behaviors, play sequences or themes that reference particular experiences of the child and not idiosyncratic behaviors of the child.

**Examples:**

Theme repetition: A boy tells a story about a guy responsible for searching for remaining embers from the collapse of the towers to make sure all the fire is extinguished and to rescue people from the disaster. Later, the child pretends to search and extinguish fires amongst the blocks (representing fallen towers) and evacuate people to safe places.

Sequence Repetition: Child builds towers and flies plane into building. After crashing the plan, child rebuilds the towers and repeats the sequence.

A child completes a play sequence and moves on to another activity. After the conclusion of the activity the child returns to the play sequence initiated prior to the activity.

**Event Related Behavior**: Any type of play behavior observed related to the specific event.
4. **High**: Numerous behaviors related to the event falling both within and without the context of the story in relation to the overall level and number of play behaviors exhibited by the child.

3. **Moderate**: Many play behaviors related to the event within the context of the story (can have some outside the context of the story but may not) and in relation to the overall level and number of play behaviors exhibited by the child.

2. **Low**: A couple of play behaviors only related to the event within the context of the story or in relation to the overall level of play.

1. **None**: No play behaviors related to the event - although the child may play during the interview, the behaviors are not related to the event.

**Event Related Narrative**: Any narrative explicating or describing any detail or aspect related to the event.

4. **High**: Frequent (may be constant) narrative related to the event within the context of the story and/or references outside the context of the story.

3. **Moderate**: Multiple references to the event within the context of the story, and/or some references outside the context of the story.

2. **Low**: Few narrative references to the event within the context of the story and/or outside of it.

1. **None**: No references to the event.

**Emotion Expression**: Verbal or physical expression of emotion such as a statement of affect either spontaneously or in response to a question (ex: “I felt angry,” “I was sad,” “I am happy”) or physical expression (ex: crying, laughter).

4. **High**: Child has frequent emotional expressions.

3. **Average**: Child has many emotional expressions.

2. **Low**: Child has a few emotional expressions.

1. **None**: Child has no emotional expressions.

---

**Play Disturbance Codes.**

Play interference refers to strategies or tactics engaged by the child related to anxiety, coping and self soothing behaviors when distressed during play. They constitute shift in play, either subtle or sudden; at extreme, shift is abrupt and clearly in response to internal changes. Child may or may not be able to comfort or soothe self. Play interference is an
internal shift and may not be obvious, but usually the child physically indicates various levels of intensity of play interference. Play Interference only occurs within a meaningful play sequence. An abrupt shift away from the narrative theme or sequence can be considered Play interference, but is dependent upon continuation of play.

**Disruption**: Behaviors or verbalizations that result in pause or termination of play, discussion of ideas, thoughts, images, themes or retelling of event (*ex*: play unrelated to topic, refusal to play, leave without returning. *Note*: may not result in the complete termination of the play only those behaviors related to the event.).

Examples:
- Child has an abrupt shift away from a meaningful play sequence and is not able to engage in self-soothing behavior to return to meaningful play
- Child is able to self-soothe but does not return to meaningful play
- Child is unable to engage in self-soothing in response to a play disruption:

4. **High**: Abrupt shift in play, clearly in response to anxiety/discomfort related to play; child uses self-soothing play to calm self or child remains highly distressed during interview but does not return to play sequence or theme.

3. **Average**: Sudden or obvious shift in play that appears to be in response to anxiety / discomfort related to play; child appears to ‘recover’ quickly, does not return to previous play, but may initiate a new play sequence or theme.

2. **Low**: Obvious shift in play that might be in response to anxiety/discomfort related to play but anxiety/discomfort is unclear does not return to previous play, but initiates a new play sequence or theme.

1. **None**: Child does not exhibit any shift of theme, sequence or play disruption during interview

**Interaction**: Communication or contact initiated by the child to engage interviewer or outside person in the action. Can include verbal or non-verbal actions such as eye contact, child initiated questions, touching, or giving out toys.

4. **High**: Frequent number of interactions (consistently through the interview) with interviewer or outside person in the action though out the interview implemented in response to anxiety/discomfort.

3. **Average**: Many interactions (at least half the time) with the interviewer or outside person in the action implemented in response to anxiety/discomfort

2. **Low**: Few interactions (Less than half the time) with the interviewer or outside person in the action implemented in response to anxiety/discomfort.
1. **None**: No interaction with interviewer or outside person in the action during the interview in response to anxiety/discomfort.

**Interruption**: Attention to something outside of the frame of the play sequence, narrative or actions, verbal or behavioral, so child can attend to unrelated action or task (not necessarily child initiated). Unlike a disruption, child returns to play theme or sequence. *(Ex: bathroom break, checking on others, leaving room, siblings arrive, asking for a toy or how it works)*.

4. **High**: Child attention shifts outside the play sequence, narrative or actions to attend to unrelated task throughout the interview and they are related to child’s emotional discomfort. Child is able to self-soothe and to return to meaningful play

3. **Average**: Child has many shifts outside the play sequence, narrative or actions to attend to unrelated task, obvious or subtle, related to child’s emotional discomfort. Child is able to self-soothe and to return to meaningful play

2. **Low**: Child has a shift outside the play sequence, narrative or actions to attend to unrelated task that might be related to discomfort, but this is unclear

1. **None**: Child has no obvious shifts outside the play sequence, narrative or actions to attend to unrelated task related to child’s emotional discomfort.

**Distraction**: A child-initiated physical or verbal action or behavior that removes the child from the action of the play, takes child off task, or redirects the discussion ideas, thoughts, images or retelling of the event – even if only for a moment. *(Ex: asking for interviewer to repeat the question, ignoring, asking unrelated question. *Note*: not a direct command or request to stop talking about the event or refusal to continue with or commence with play see disruption).*

4. **High**: Child has frequent shifts in play that appears to be in response to anxiety or discomfort related to play themes but child appears to self soothe quickly and continues to play (previous or new play themes, sequence or narrative).

3. **Average**: Child has some shifts in play in response to anxiety or discomfort related to play themes but child appears to self-soothe quickly and continues to play (previous or new play themes, sequence or narrative).

2. **Low**: Child has a few shifts in play that may be in response anxiety or discomfort related to play, but not clear, and child appears to recover and continues to play (previous or new play themes, sequence or narrative).

1. **None**: Child has no shifts in play in response to anxiety or discomfort related to play.
Traumatic Response Codes.

Traumatic Response codes reflect characteristics of maladaptive and adaptive responses of children exposed to traumatic events as described in the literature. Any strategy employed by the child to provide relief from or to regulate uncomfortable, emotionally conflicted and/or frustration related to the event. Strategies can have more than one code.

Avoidance: Verbal or behavioral attempt by the child to distract or disrupt the action or telling of the story or breaking of play frame, sequence or theme related to the event.

4. **High**: Child exhibits a high level of avoidance or distancing and actively rejects and action or activity related to event, actively ignores or distracts the interviewer in obvious attempt to redirect action or telling of the story or breaking of play frame, sequence or theme related to the event. Child may or may not return to meaningful play.

3. **Average**: Child exhibits moderate level of distancing, can modulate between engagement and distancing. Attempts to redirect action or telling of the story or breaking of play frame, sequence or theme related to the event. Child returns to meaningful play.

2. **Low**: Child exhibits occasional distancing or redirect action or telling of the story or breaking of play frame, sequence or theme related to the event. Child returns to meaningful play.

1. **None**: Child does not exhibit any distancing behavior or redirect action or telling of the story or breaking of play frame, sequence or theme related to the event.

Anxiety: Any action or verbalization that indicates discomfort, increase in worry, tension (can manifest as hyperactivity). Can be disproportionate or excessive emotional response to stimulus or threat which can include both subjective and physical disturbance (*ex*: fidgeting, screaming, shrieking, random noises, inappropriate laughter)

4. **High**: Child exhibits frequent actions or verbalization that indicates discomfort, increase in worry, or tension related to action or telling of the story, play sequence or theme related to the event.

3. **Average**: Child modulates between actions or verbalization that indicates discomfort, increase in worry, or tension related to action or telling of the story, play sequence or theme related to the event.

2. **Low**: Child occasionally exhibits actions or verbalization indicating discomfort, increase in worry, or tension related to action or telling of the story, play sequence or theme related to the event.
1. **None**: Child does not exhibit actions or verbalizations indicating discomfort, increase in worry, or tension related to action or telling of the story, play sequence or theme related to the event.

   *Aggression*: Physical or verbal action that is destructive to objects or persons – can be toward self. Can include impulsivity or disruptive behaviors (throwing, kicking, punching, and crashing).

4. **High**: Child exhibits frequent actions or verbalization destructive to objects or persons. May not be related to action or telling of the story, play sequence or theme associated with the event.

3. **Average**: Child exhibits some actions or verbalization destructive to objects or persons. May not be related to action or telling of the story, play sequence or theme associated with the event.

2. **Low**: Child occasionally exhibits actions or verbalization destructive to objects or persons. May not be related to action or telling of the story, play sequence or theme associated with the event.

1. **None**: Child exhibits no actions or verbalization destructive to objects or persons at all.

*Creating safety:*

   *In the frame of play*: establishing or designating an area in the play as being safe from harm.

   4. **High**: Frequent effort, reference, or action to establish or designate an area in the play as being safe from harm.

   3. **Average**: Some effort, reference, or action to establish or designate an area in the play as being safe from harm.

   2. **Low**: Occasional effort, reference or action to establish or designate an area in the play as being safe from harm.

   1. **None**: No effort, reference, or action to establish or designate an area in the play as being safe from harm.

*Self-soothing*: Any action or verbalization that the child displays to self soothe or enable him/her to continue with topic (ex: transitional object; checking on loved ones). Self-Soothing behavior may or may not take the form of play or outside frame of play.
4. **High**: Frequent effort, reference or action to establish or designate an area in the play as being safe, soothing, regulating disturbance or maintain a sense of calm for the child.

3. **Average**: Some effort, reference or action to establish or designate an area as being safe, soothing, regulating disturbance or may maintain a sense of calm for the child.

2. **Low**: Occasional effort, reference or action to establish or designate an area as being safe, soothing, regulating disturbance or may maintain a sense of calm for the child.

1. **None**: No effort, reference or action to establish or designate an area as being safe, soothing, regulating disturbance or any maintenance of calm for the child.

*Meaning making*: Any attempt to make sense of or explain the occurrence of an inexplicable event or action (WTC, Plane Crash).

4. **High**: Frequent displays of effort, references or actions to make sense of or explain the occurrence of an inexplicable event or action.

3. **Average**: Multiple displays of effort, references or actions to make sense of or explain the occurrence of an inexplicable event or action.

2. **Low**: Few references, actions or effort to make sense of or explain the occurrence of an inexplicable event or action.

1. **None**: No reference, action or effort to make sense of or explain the occurrence of an inexplicable event or action.

*Regression*: Any behaviors or verbalizations that reflect behavior below the child’s stated age.

4. **High**: Frequent display of behaviors or verbalizations not below child’s stated age or developmental stage.

3. **Average**: Multiple displays of behaviors or verbalizations below of the child’s stated age or developmental stage.

2. **Low**: Few displays of behaviors or verbalizations below of the child’s stated age or developmental stage.

1. **None**: No display of behaviors or verbalizations below the child’s stated age or developmental stage.
**APPENDIX G**  
Pre-WTC mention Coder Record

<table>
<thead>
<tr>
<th>Tape Number:</th>
<th>Date:</th>
<th>Coder:</th>
<th>Interviewer:</th>
<th>Child age: DOB:</th>
<th>Code Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start Time:</th>
<th>5 seconds:</th>
<th>End Time:</th>
<th>Total time of play:</th>
<th>Child age on 9/11/2001:</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>00:05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DOMAINS

<table>
<thead>
<tr>
<th>Voice</th>
<th>Movement</th>
<th>Relatedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

### BEHAVIOR-PLAY RESPONSE CODES

<table>
<thead>
<tr>
<th>Repetitive behaviors</th>
<th>Event Related Behavior</th>
<th>Event Related Narrative</th>
<th>Emotion Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

### PLAY INTERFERENCE CODES

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Interruption</th>
<th>Distraction</th>
<th>Disruption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

### TRAUMATIC RESPONSE CODES

<table>
<thead>
<tr>
<th>Avoidance</th>
<th>Anxiety</th>
<th>Aggression</th>
<th>Creating Safety In</th>
<th>Creating Safety Out</th>
<th>Self-soothing</th>
<th>Meaning Making</th>
<th>Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
APPENDIX H
Post-WTC mention Coder Record

<table>
<thead>
<tr>
<th>POST-WTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape Number:</td>
</tr>
<tr>
<td>Start Time:</td>
</tr>
</tbody>
</table>

**DOMAINS**

<table>
<thead>
<tr>
<th>Voice</th>
<th>Movement</th>
<th>Relatedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

**BEHAVIOR-PLAY RESPONSE CODES**

<table>
<thead>
<tr>
<th>Repetitive behaviors</th>
<th>Event Related Behavior</th>
<th>Event Related Narrative</th>
<th>Emotion Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

**PLAY INTERFERENCE CODES**

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Interruption</th>
<th>Distraction</th>
<th>Disruption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

**TRAUMATIC RESPONSE CODES**

<table>
<thead>
<tr>
<th>Avoidance</th>
<th>Anxiety</th>
<th>Aggression</th>
<th>Creating Safety In</th>
<th>Creating Safety Out</th>
<th>Self-soothing</th>
<th>Meaning Making</th>
<th>Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>
APPENDIX I
Frequencies of Alternative PTSD Criteria Symptoms in Total Sample and Alternative PTSD Sample

The appendix details the frequencies for each cluster of symptoms for both the total sample (N=71) and the sample of children meeting alternative criteria for PTSD (n=15). Fifteen children (21.1% of the total sample N=71) met criteria for PTSD based upon alternative criteria proposed by Scheeringa et al., (2003).

Table 16: Frequency of children meeting Alternative PTSD Criteria Cluster Items

<table>
<thead>
<tr>
<th>Criteria Cluster A</th>
<th>Total Sample N=71</th>
<th>Alternative PTSD Sample n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responded to WTC attacks by looking afraid/acting helpless/very disturbed?</td>
<td>27 38.6</td>
<td>11 73.3</td>
</tr>
<tr>
<td>Renacted part of WTC Attacks/experiences s/he had that day?</td>
<td>23 32.9</td>
<td>7 46.7</td>
</tr>
<tr>
<td>Made repeated statements/questions about WTC Attacks?</td>
<td>32 45.7</td>
<td>15 100.0</td>
</tr>
<tr>
<td>Made repeated statements/questions about WTC Attacks? Appear distressed?</td>
<td>17 24.3</td>
<td>8 53.3</td>
</tr>
<tr>
<td>Had nightmares?</td>
<td>37 52.9</td>
<td>11 73.3</td>
</tr>
<tr>
<td>Appeared to have flashbacks?</td>
<td>3 4.3</td>
<td>2 13.3</td>
</tr>
<tr>
<td>Looked upset b/c saw/heard reminder of WTC Attacks?</td>
<td>11 15.7</td>
<td>4 26.7</td>
</tr>
<tr>
<td>Gotten physically worked up because of a reminder of 9/11?</td>
<td>2 2.9</td>
<td>2 13.3</td>
</tr>
<tr>
<td>Attacks become a theme in your child's play?</td>
<td>23 32.9</td>
<td>4 26.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria Cluster B</th>
<th>Total Sample N=71</th>
<th>Alternative PTSD Sample n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tried to avoid hearing/stop you talking about WTC Attacks?</td>
<td>9 12.9</td>
<td>3 20.0</td>
</tr>
<tr>
<td>Tried to avoid places/people/things connected to WTC attacks?</td>
<td>3 4.3</td>
<td>2 13.3</td>
</tr>
<tr>
<td>Withdrawn/less sociable than before 9/11?</td>
<td>10 14.3</td>
<td>5 33.3</td>
</tr>
<tr>
<td>Shown less emotion than usual?</td>
<td>1 1.4</td>
<td>0 0</td>
</tr>
<tr>
<td>Lost some skills s/he learned before 9/11?</td>
<td>9 12.9</td>
<td>4 26.7</td>
</tr>
<tr>
<td>Appeared to space out or be in a daze?</td>
<td>18 25.7</td>
<td>11 73.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria Cluster C</th>
<th>Total Sample N=71</th>
<th>Alternative PTSD Sample n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shown increased irritability?</td>
<td>18 25.7</td>
<td>8 53.3</td>
</tr>
<tr>
<td>Shown increased fussiness?</td>
<td>14 20.0</td>
<td>6 40.0</td>
</tr>
<tr>
<td>Shown more extreme mood swings?</td>
<td>11 15.7</td>
<td>8 53.3</td>
</tr>
<tr>
<td>Shown more temper tantrums?</td>
<td>18 25.7</td>
<td>8 53.3</td>
</tr>
<tr>
<td>Shown increased or excessive crying?</td>
<td>18 25.7</td>
<td>9 60.0</td>
</tr>
<tr>
<td>Gotten scared when heard sudden noise/someone came from behind?</td>
<td>21 30.0</td>
<td>9 60.0</td>
</tr>
<tr>
<td>Changes in your child’s sleeping?</td>
<td>39 55.7</td>
<td>12 80.0</td>
</tr>
<tr>
<td>Of the children experiencing sleep changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent waking</td>
<td>21 53.8</td>
<td>5 33.3</td>
</tr>
<tr>
<td>Calling out to you or other parent at night</td>
<td>19 48.7</td>
<td>5 33.3</td>
</tr>
<tr>
<td>Difficulty going to sleep</td>
<td>11 28.2</td>
<td>1 6.7</td>
</tr>
<tr>
<td>Awaken seeming frightened</td>
<td>15 38.5</td>
<td>5 33.3</td>
</tr>
<tr>
<td>Afraid to sleep alone</td>
<td>24 61.5</td>
<td>9 60.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria New Cluster</th>
<th>Total Sample N=71</th>
<th>Alternative PTSD Sample n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Since 9/11 - become afraid of things s/he wasn’t afraid of before 9/11?</td>
<td>32 45.7</td>
<td>11 73.3</td>
</tr>
<tr>
<td>Since 9/11 - been a lot more aggressive than s/he used to be?</td>
<td>14 20.0</td>
<td>2 13.3</td>
</tr>
</tbody>
</table>