Childhood Trauma: A Comprehensive Review of Effects, Assessments, and Treatments

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Between 1995 and 1997 researchers from Kaiser Permanente and the Centers for Disease Control and Prevention (CDC) conducted a study on a toxin so pervasive that repeated exposure had the potential to modify the brain and its development, DNA, immune and hormonal systems, and behavior (Felitti, et al., 1998). Researchers found that persistent exposure to chronic stress and trauma during childhood[1] increased the lifetime risk of disease and illness, mental illness, emotional and social problems, high-risk health behaviors, and victimization and perpetration (Felitti, et al., 1998). Among children, traumatic experiences are relatively common with more than 65% experiencing at least one traumatic incident during childhood, with half of these experiencing multiple traumatic events before adulthood (Copeland, Keeler, Angold, & Costello, 2007).

Children may experience trauma in many ways: accidents, serious illnesses or injuries, grief, and natural disasters to name a few. Secondhand knowledge of volatile situations can also have a traumatic impact on a child's emotional well-being (Nelson & Wampler, 2000). These traumatic experiences generally produce tolerable levels of stress (Shonkoff, 2010). However, persistently stressful situations from sources such as physical, sexual, and emotional abuse, neglect, family violence and discourse, community violence, caregiver substance abuse, mental illness, and imprisonment have the most pervasive and far-reaching effects (Cook, Blaustein, Spinazzola, & van der Kolk, 2003). These situations rarely occur in isolation, but rather occur in groups (Felitti, et al., 1998). Complex trauma is the repeated exposure to one or more of the aforementioned incidents (Cook, Blaustein, Spinazzola, & van der Kolk, 2003). Toxic stress is a result of complex trauma that occurs when there is frequent activation of the body's stress management systems such as the hormonal and neurochemical systems (Shonkoff, 2010).

[1] "Childhood", "child", and "children" will collectively refer to individuals from ages 0 to 18 unless otherwise specified.

The significant and startling findings of the Kaiser-CDC study has resulted in a call-to-action among medical and mental health professionals to address these findings by establishing trauma-centered assessments and treatments (Steele, 2009). In addition, research on the unique needs of special populations such as military, homeless, disabled, refugee, and lesbian/gay/bisexual/transgender (LGBT) youth need to be considered in the context of trauma (Rapporteur, et al., 2016). Lastly, experts on childhood trauma are calling on child welfare and juvenile justice systems, and schools to establish training, protocols, and rules for dealing with traumatized children (Ko, et al., 2008).

The Adverse Childhood Experiences Study (ACES)

The Adverse Childhood Experiences Study was conducted by Kaiser Permanente and the Centers for Disease Control and Prevention (CDC) between 1995 and 1997 as a response to unexpected findings from a previous CDC study (Felitti, 1993; Felitti, et al., 1998). In 1993, CDC researcher Dr. Vincent Felitti, found that the majority of participants in his obesity study had a history of sexual abuse. He theorized that eating and subsequent weight gain served as a coping mechanism for fear, anxiety, and depression (Felitti, 1993). Felitti's (1993) findings prompted the largest investigation of immediate and long-term effects of childhood trauma.

Methodology

Beginning in 1997 the CDC and Kaiser Permanente collected data in two waves from over 17,000 Health Maintenance Organization members (Felitti, et al., 1998). Female and male participants were equally represented (Felitti, et al., 1998). Racial and ethnic groups consisted of 74.8% white, 11.2% Hispanic, 7.2% Asian and Pacific Islander, and 4.5% African American (Felitti, et al., 1998). The ages of the participants ranged from 19 to 60 and over (Felitti, et al.,

1998). Most participants were college graduates with "some college", "high school graduate", and "not high school graduate" represented as well (Felitti, et al., 1998).

In addition to receiving physical exams and comprehensive reviews of health related histories, participants completed a survey consisting of childhood experiences, behaviors, and health statuses (Felitti, et al., 1998). ACE survey questions pertained to the participants' first 18 years of life (Felitti, et al., 1998). Questions were categorized within three major domains: abuse, household challenges, and neglect (Felitti, et al., 1998). Within the "abuse" category, questions were asked about emotional abuse, physical abuse, and sexual abuse (Felitti, et al., 1998). The "household challenges" category consisted of questions about violence toward their mother, household substance abuse, household mental illness, caregiver divorce or separation, and imprisoned household members (Felitti, et al., 1998). Lastly, the "neglect" category included emotional and physical neglect (Felitti, et al., 1998).

Findings

The prevalence of adverse childhood experiences of the ACE study sample (n=17,337) were as follows: 10.6% of participants had experienced emotional abuse, 28.3% had experienced physical abuse, and 20.7% had experienced sexual abuse (Felitti, et al., 1998). On measures of "household challenges", 12.7% had a mother who was treated violently, 26.9% reported experiencing household substance abuse, 19.4% reported mental illness within the household, 23.3% reported caregiver separation and/or divorce, and 4.7% had an incarcerated family member (Felitti, et al., 1998). On measures of, "neglect" 14.8% reported emotional neglect and 9.9% reported physical neglect (Felitti, et al., 1998).

Adverse childhood experiences had a dose-response relationship; as the number of traumatic childhood experiences increased, so did lifetime negative physical and mental health

outcomes (Felitti, et al., 1998). In fact, researchers found that ACEs were major contributors to the leading causes of death and disability (Felitti, et al., 1998). ACE score calculations were the sum of "yes" responses to the aforementioned categories (Felitti, et al., 1998). The numbers of adverse childhood experiences (or ACE scores) were reported as follows: 36.1% of participants reported no experiences, 26% reported one experience, 15.9% reported two experiences, 9.5% reported three experiences, and 12.5% reported four or more experiences (Felitti, et al., 1998).

A Continuance of ACES

Beginning in 1984, the CDC began collecting data throughout the United States through their Behavioral Risk Factor Surveillance System (BRFSS) (Centers for Disease Control and Prevention, n.d.). BRFSS is a telephone interview system that collects data on health-risk behaviors, medical conditions, and preventative measures (Centers for Disease Control and Prevention, n.d.). Data is collected in all 50 states from 400,000 adult participants each year (Centers for Disease Control and Prevention, n.d.). The CDC uses this data to implement health promotion programs on local, state, and federal levels (Centers for Disease Control and Prevention, n.d.).

Effects of Complex Trauma

To date over 40 negative physical and mental lifetime health outcomes have been found to have a dose-response relationship to adverse childhood experiences (ACEs) (Centers for Disease Control and Prevention, 2016). Researchers for the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente explained the *lifetime risks* association by illustrating how complex trauma disrupted neurodevelopment which caused social, emotional, and cognitive impairment (see Figure 1) (Felitti, et al., 1998). As a result of these impairments, high-risk behaviors were adopted leading to disability, disease, social and emotional problems, and

ultimately early death (Felitti, et al., 1998). However, neuroscientists have taken closer looks at the brain-body connection and have found how biochemicals are able to alter the body, brain, DNA, and cells in children exposed to toxic stress (Filiano, et al., 2016; Romens, McDonald, Svaren, & Pollak, 2014; Sapolsky, Romero, & Munck, 2000; Shalev, et al., 2013; Weder, et al., 2014). Without effective interventions, these alterations can potentially last throughout the lifespan.

Toxic Stress and the Body

The stress hormone cortisol plays an important role in stress reactions (Sapolsky, Romero, & Munck, 2000). Under normal circumstances high levels of cortisol are released to prepare the body for stressful events by activating immune, memory, and energy responses (Sapolsky, Romero, & Munck, 2000). This typical response is essential to healthy development (Sapolsky, Romero, & Munck, 2000). In the case of toxic stress, where stress-response systems are persistently activated, there is an overdose of cortisol (Sapolsky, Romero, & Munck, 2000). Cortisol overdose is caused by a reaction called gene methylation (Romens, McDonald, Svaren, & Pollak, 2014; Weder, et al., 2014).

During gene methylation, chemical markers adhere to genes that regulate stress responses and stop them from properly doing their jobs (Romens, McDonald, Svaren, & Pollak, 2014; Weder, et al., 2014). The alternation of these genes causes the body to be in a constant state of alert, perpetually releasing stress hormones (Romens, McDonald, Svaren, & Pollak, 2014; Weder, et al., 2014). Researchers found that children exposed to toxic stress showed alternations throughout their entire genome (Weder, et al., 2014). These alterations have been linked to a number of diseases (Romens, McDonald, Svaren, & Pollak, 2014; Weder, et al., 2014).

In addition to genetic alterations, toxic stress can also have adverse cellular effects. Telomeres are protective structures at the end of chromosomes (Shalev, et al., 2013). The destruction of telomeres has been observed in children exposed to toxic stress (Shalev, et al., 2013). As a result, cells prematurely age causing disease and frequent illness (Shalev, et al., 2013).

Until recently it was believed that the immune system had no connection to the brain, but research conducted by the University of Virginia found otherwise (Filiano, et al., 2016). The immune system inundates the body with chemicals that attack and eliminate toxins (Filiano, et al., 2016). The lymphatic system provides the chemical disbursement pathway (Filiano, et al., 2016). It is now known that this pathway also runs throughout the brain via lymphatic vessels (Filiano, et al., 2016). When a child is exposed to toxic stress the immune system is activated and inflammatory lymphatic chemicals flood the brain (Filiano, et al., 2016). The implications of these findings are still being investigated, but it is believed that the lymphatic brain-body pathway, as it pertains to the immune system, is responsible for a range of neurological diseases (Filiano, et al., 2016).

Disease, illness, and injury. Gene methylation, destruction of telomeres, and lymphatic brain-body pathways can lead to the long-term suppression of the immune system, can cause metabolic syndrome, bone mineral loss, high cholesterol, osteoporosis, arthritis, gastrointestinal disease, Cushing's syndrome, and hyperthyroidism (Felitti, et al., 1998; Felitti, 2009; Lupien, et al., 1998; Marie-Mitchell & O'Connor, 2013; Park, et al., 2016; Teicher, Anderson, & Polcari, 2012). In addition, gene methylation can exhaust the adrenal glands (Dube, et al., 2009). As a result, the adrenal gland can no longer produce enough cortisol to meet the body's demand (Dube, et al., 2009). This can cause autoimmune disorders such as lupus, muscular sclerosis,

rheumatoid arthritis, and fibromyalgia (Dube, et al., 2009). Toxic stress is also a suspected cause of Alzhemier's disease in some cases (Filiano, et al., 2016).

Other diseases often suffered by adults with high ACE scores include heart disease, cancer, stroke, liver disease, diabetes, chronic obstructive pulmonary disease (COPD), poor overall quality of life, and shortened lifespan (Anda, et al., 2008; Barile, Edwards, Dhingra, & Thompson, 2015; Brown, et al., 2009; Brown, et al., 2010; Dong, Dube, Felitti, Giles, & Anda, 2003; Dong, et al., 2004; Felitti, et al., 1998; Huang, et al., 2015). More specifically, ACE scores of four or more increase the risk for COPD and hepatitis two and a half times (Anda, et al., 2008; Felitti, et al., 1998). Individuals with ACE scores of seven or higher have three times the risk of contracting lung cancer and three and a half times the risk of developing heart disease (Felitti, et al., 1998). For each adverse childhood experience, a women's risk of contracting an autoimmune disease increases by 20% (Dube, et al., 2009). ACE scores of six or greater decrease the lifespan by nearly 20 years (Brown, et al., 2009). Other medical issues associated with ACEs are frequent headaches, high rates of fetal death, more prescription medications, and susceptibility to accidents (Anda, Brown, Felitti, Dube, & Giles, 2008; Anda, Tietjen, Schulman, Felitti, & Croft, 2010; Hillis, et al., 2004; Isohookana, Riala, Hakko, & Räsänen, 2013). Individuals with ACE scores of five or more had 70% more antidepressant prescription medications and were 6% more likely to experience fetal death than those with ACE scores of zero (Anda, Brown, Felitti, Dube, & Giles, 2008; Felitti, et al., 1998; Hillis, et al., 2004).

Toxic Stress and the Mind

Poor stress response regulation can occur when neural circuits, hormone and neurochemical systems are exposed to frequent activation through toxic stress (Loman & Gunnar, 2010; McEwen, 2008). These systems can become overly reactive or slow to return to

homeostasis during childhood and throughout the lifespan resulting in improper responses to neutral events (Loman & Gunnar; McEwen, 2008). In addition, toxic stress can lead to brain shrinkage, neuroinflammation, and defective neurocircuitry (Bluhm, Williamson, Osuch, Frewen, & Stevens, 2009; Daniels, Frewen, McKinnon, & Lanius, 2011; Ganguly & Brenhouse, 2015; Herringa, et al., 2013; Opel, et al., 2014; Sheridan, Fox, Zeanah, McLaughlin, & Nelson III, 2012; Vythilingam, et al., 2002)

When the developing brain is exposed to toxic stress, a hormone is released that has been found to shrink the size of the hippocampus (Opel, et al., 2014; Vythilingam, et al., 2002). This is known as hippocampal atrophy (Opel, et al., 2014; Vythilingam, et al., 2002). Hippocampal atrophy can negatively affect emotion control and spatial navigation[2] (Opel, et al., 2014). Magnetic resonance imaging studies have also found less grey matter in the prefrontal cortex and amygdala in children exposed to toxic stress (Sheridan, Fox, Zeanah, McLaughlin, & Nelson III, 2012). In addition, weak neural connections between the prefrontal cortex, amygdala, and hippocampus have been found in children exposed to toxic stress (Herringa, et al., 2013). These collective issues can significantly disrupt a child's ability to make decisions, process emotions such as fear, self-regulate[3], learn, and remember throughout their lifespan (Lupien, et al., 1998; Lupien, McEwen, Gunnar, & Heim, 2009).

A process called neural pruning occurs in the developing brain. During this process non-neural brain cells called microglia, which are part of the immune system, perform necessary housekeeping by devouring and digesting unused neurons and synaptic connections (Cunningham, Martínez-Cerdeño, & Noctor, 2013). In instances where children are exposed to

[2] Long-term and short-term memories are functions of spatial navigation (Basso, 2008). Spatial memory records information about an individual's environment and helps them orientate themselves in order to navigate the world they live in (Basso, 2008).
[3] "Self-regulate" refers to an individual's ability to initiate, inhibit, or modulate emotional, cognitive, physiological, and behavioral responses to external stimuli (Baumeister & Vohs, 2004).

toxic stress, the microglia overreact and overdose the brain with destructive neurochemicals which leads to neuroinflammation (Ganguly & Brenhouse, 2015). Neuroinflammation can cause poor mood regulation, deficient decision-making skills, and faulty executive functioning[4] in both childhood and across a lifetime (Ganguly & Brenhouse, 2015).

Within the brain exists a neurocircuitry network that is always on standby to help with problem solving functions by connecting memory to thought integration (Bluhm, Williamson, Osuch, Frewen, & Stevens, 2009). This "default setting" helps individuals properly respond to the world around them and decide what is important and what is not (Bluhm, Williamson, Osuch, Frewen, & Stevens, 2009). The brains of children who have been exposed to toxic stress lose their connection to the default state (Bluhm, Williamson, Osuch, Frewen, & Stevens, 2009; Daniels, Frewen, McKinnon, & Lanius, 2011). With the brain being unable to return to a healthy "idle" mode, children (and adults) have issues properly interacting with their environment (Daniels, Frewen, McKinnon, & Lanius, 2011).

Mental health. Adverse mental and behavioral health lifetime outcomes associated with ACEs include depression, suicide, memory disturbances, hallucinations, poor academic and work performance, and financial stress (Anda, et al., 2004; Blodgett, 2012; Brown, et al., 2007; Chapman, et al., 2004; Dube, et al., 2001; Whitfield, Dube, Felitti, & Anda, 2005). Compared to ACE scores of zero, scores of four or more increase the risk for depression four and a half times, and increase the risk for suicide 12 times (Felitti, et al., 1998). Individuals with ACE scores of four or more are 8% more likely to miss two or more days of work each month and are 15% more likely to have serious job issues and financial problems than those with ACE scores of zero (Anda, et al., 2004). Mediators between ACEs and poor work performance include marital,

[4] "Executive functioning" specifically refers to reasoning, problem solving, and planning (Ganguly & Brenhouse, 2015).

family, and sexual problems, depressed mood, anger problems, panic reactions, and somatic symptoms like back pain, joint problems, and headaches (Anda, et al., 2004). Students with three or more ACEs are more likely to score lower on standardized tests, be suspended or expelled, and have substantial absentee problems than children with no ACEs (Blodgett, et al., 2012).

Stress responses can be profoundly altered as well. Hypervigilant responses may include persistently feeling threatened, chronically anxious, defensive or hostile when there is no legitimate threat, and over-reactive or impulsive responses to nonthreatening situations (Loman & Gunnar, 2010). Hyporesponsiveness to hunger, sleepiness, pain, illness, and legitimate threats may also occur (McEwen, 2008).

Some neurobiological issues can rise to the level of mental disorders. One study found that individuals with ACE scores of four or more were diagnosed with nearly eight different DSM disorders throughout their lifetime (Putnam, Harris, & Putnam, 2013). Disorders reported in children exposed to high levels of toxic stress are panic disorder, mood disorder, posttraumatic stress disorder, generalized anxiety disorder, bipolar disorder, major depressive disorder, oppositional defiant disorder, attention-deficit/hyperactivity disorder, autism, and obsessive compulsive disorder (Briggs & Price, 2009; Brown, et al., 2016; Kerns & Lee, 2015; Pantell, Jutte, & Adler, 2014; Post, et al., 2015; Pynoos, Steinberg, & Piacentini, 1999; Trickey, Siddaway, Meiser-Stedman, Serpell, & Field, 2012).

Children exposed to toxic stress are especially vulnerable to social, emotional, and developmental issues. Children can exhibit behaviors such as impulsivity, self-destruction, aggression, poor body regulation (e.g. eating, sleeping, and elimination), and pathological self-soothing (e.g. self-harm) (Cook, Blaustein, Spinazzola, & van der Kolk, 2003). Their self-

concept can also be negatively modified which can lead to low self-esteem, shame, guilt, distorted body image, and an unpredictable or inconsistent sense of self[5] (Cook, Blaustein, Spinazzola, & van der Kolk, 2003). Cognitive issues such as problems with task completion, attention, planning, anticipation, and understanding responsibility have also been noted (Cook, Blaustein, Spinazzola, & van der Kolk, 2003).

Dissociation and problems with future orientation, attachment and relationships, affect regulation, and developmental delays are the most common effects of toxic stress in children. Dissociation presents as depersonalization, altered states of consciousness, impaired memory, and amnesia (Liotti, 2004; van Dijke, Ford, & van der Hart, 2015). Issues with future orientation include feelings of loss of control, hopelessness, negative expectations, decreased social competency, feelings of powerlessness, distrust in the world (in that it is not safe), fixed mindset[6], psychological myopia[7], learned helplessness, risk-taking, and a sense of a truncated lifespan (Wilson & Keane, 2004). Problems with attachment and relationships include apathy, interpersonal issues, isolation, and distrust (Liotti, 2004). Deficiencies in affect regulation cause frequent misunderstandings of internal states[8], difficulty expressing feelings, and issues with emotional self-regulation (Ford, 2005).

One study found that childhood risk factors had a dose-response relationship with developmental delays (Barth, et al., 2008). Risk factors examined were caregiver mental health problems and substance abuse, household violence, poverty, chronic illness (child), and child maltreatment (Barth, et al., 2008). Children exposed to six risk factors had nearly a 100% chance of being developmentally delayed, five risk factors had an 85% chance, four risk factors

[5] "Sense of self" refers to how individuals think about, evaluate or perceive themselves (Prebble, Addis, & Tippett, 2013).
[6] Fixed mindset is the belief that talent and intelligence are inherent and cannot be improved (Hochanadel & Finamore, 2015).
[7] Psychological myopia is cognitive nearsightedness when an individual has a tendency to make decisions based solely on their personal judgement rather than more relevant external information (Cutter, 1967).
[8] "Internal states" refers to needs, wants, interests, or desires (Di Cesare, Di Dio, Marchi, & Rizzolatti, 2015).

had a 55% chance, three risk factors had a 30% chance, and one to two risk factors had a 10% chance of being developmentally delayed (Barth, et al., 2008). Developmental delays may occur in children exposed to toxic stress in areas such as object constancy[9], language, executive functioning, information processing, and spatial awareness[10] (Cook, Blaustein, Spinazzola, & van der Kolk, 2003; Ford, 2005).

Health-risk behaviors. High ACEs increase health-risk behaviors such as smoking, drug and alcohol abuse, obesity, promiscuity and other sexual risk behaviors, unintended pregnancies, sexually transmitted diseases (STD), and teen pregnancy (Anda, et al., 1999; Dube, Anda, Felitti, Edwards, & Croft, 2002; Dube, Felitti, Dong, Chapman, & Anda, 2003; Hillis, Anda, Felitti, & Marchbanks, 2001; Williamson, Thompson, Anda, Dietz, & Felitti, 2002). Compared to individuals with no ACEs, ACE scores of four or more double their risk of becoming a smoker, increase their risk of becoming an alcoholic by seven times, are 12 times more likely to marry an alcoholic, are 10 times more likely to have injected street drugs, are 30 times more likely to have an unintended pregnancy, are three times more likely to have 50 or more sexual partners, and are 14 times more likely to contract a STD (Anda, et al., 1999; Dube, Anda, Felitti, Edwards, & Croft, 2002; Dube, Felitti, Dong, Chapman, & Anda, 2003; Hillis, Anda, Felitti, & Marchbanks, 2001). Data on children and high-risk behaviors related to ACEs is just as bleak. Compared to children with ACE scores of zero, those with ACE scores of four or higher are 20 times more likely to have intercourse by the age of 14 and 20 times more likely to get pregnant (as a teen) (Hillis, et al., 2004). Children with ACE scores of five or more are approximately 30% more

[9] "Object constancy" is a skill acquired during early development (Lax, Bach, & Burland, 1986). It is an understanding that an absent object or person still exists (Lax, Bach, & Burland, 1986).
[10] "Spatial awareness" refers to an individual's knowledge of objects in relation to themselves (Spencer, Blades, & Morsley, 1989).

likely to use alcohol and illegal drugs than those with ACE scores of zero (Dube, Felitti, Dong, Chapman, & Anda, 2003; Dube, et al., 2006).

Victimization and perpetration. Increased risks of victimization and perpetration, especially within the context of intimate partner violence and sexual violence, are common in those with high ACE scores. Overall, ACE scores of four or more increase the risk of violence perpetration, violent victimization, and incarceration by more than five times (Bellis, Hughes, Leckenby, Perkins, & Lowey, 2014). Compared to women with ACE scores of zero, those with ACE scores of five or greater are 14% more likely to become a victim of domestic violence and are 30% more likely to be sexually assaulted as an adult (Whitfield, Anda, Dube, & Felitti, 2003). Convicted felons with ACE scores of five or more are 11 times more likely to reoffend within the first year of probation and are 15 times more likely to reoffend within the second year of probation than those with ACE scores of zero (Anda, 2011).

Within the context of ACEs, children are not immune to violent perpetration. A 2010 study found that for each adverse experience[11] a child is exposed to, the likelihood of violent perpetration increased from 35% to 144% (Duke, Pettingell, McMorris, & Borowsky, 2010). Interpersonal violent perpetrations measured in the study were delinquency, bullying, physical altercations, dating violence, and bringing a gun to school (Duke, Pettingell, McMorris, & Borowsky, 2010). Self-directed violence included suicide attempt or ideation, and self-mutilation (Duke, Pettingell, McMorris, & Borowsky, 2010). Juvenile justice involved youth have roughly three times more ACEs than youth in the general population (Baglivio, et al., 2014).

Poverty

[11] ACEs included in the study were physical abuse, sexual abuse, witnessing abuse, and caregiver drug or alcohol abuse (Duke, Pettingell, McMorris, & Borowsky, 2010).

As Figure 2 shows, the cumulative physical and mental health effects of childhood trauma, if left untreated, have the potential to create a pathway to poverty in adulthood (Frederick & Goddard, 2007). Researchers are able to predict specific patterns of behavior, traits, and brain development in children affected by adverse childhood experiences (Cook, Blaustein, Spinazzola, & van der Kolk, 2003; Blodgett, et al., 2012; Brown, et al., 2016; Felitti, et al., 1998; Teicher, et al., 2003). These behaviors, traits, and brain development modifications include aggressive behavior, diminished understanding of social cues which can lead to conflicts among peers and family members, social isolation, attention problems including diagnoses of attention deficit/hyperactivity disorder and attention deficit disorder, low IQ, poor decision making skills, delays in language and reading, and altered brain lateralization [12] (Blodgett, et al., 2012; Brown, et al., 2016; Cook, Blaustein, Spinazzola, & van der Kolk, 2003; Felitti, et al., 1998; Teicher, et al., 2003).

Children who adopt these behaviors, traits, and brain modifications are at early risk for tobacco, alcohol, and drug use (Romer, 2010). Tobacco, alcohol, and drug use can further complicate adverse behaviors, traits, and brain development associated with trauma which can eventually lead to academic problems like being placed in special education classes, poor grades, delinquency, dropping out, suspension, and expulsion (Cox, Zhang, Johnson, & Bender, 2007; Miller & Plant, 1999). Research has found that poor academic performance increases the likelihood of unemployment, low-wage jobs, the need for public assistance, and incarceration (Reardon, 2011).

There are also indications that poverty *causes* adverse childhood experiences (Child Trends, 2013). Child Trends (2013) analyzed data from the National Survey of Children's

[12] Altered brain lateralization can impact language development, sensation, movement, attachment, social interactions, and the interpretation of nonverbal communications (De Pisapia, et al., 2014; Decety & Lamm, 2007; Hecht, 2014).

Health. Controlling for chronic economic hardship as an adverse childhood experience, children living on or near the poverty line were more than two times more likely to have had three or more adverse experiences than children living above the poverty line (Child Trends, 2013).

However, Dr. Felitti and Dr. Anda (2010), co-authors of the ACE study, contended that poverty, described as lack of money, did not cause poverty. Examining trauma from an epidemiological and intergenerational perspective, Felitti and Anda (2010) explained how the middle class had the highest amount of ACEs. The effect of childhood trauma on caregivers often affects their children (Felitti & Anda, 2010). For example, Felitti and Anda (2010) found that two out of four children with caregiver's who had ACE scores of three or more would end up in poverty because of the effects their own adverse childhood experiences would have in adulthood. So while it may be true that poverty causes ACEs the mitigating factor for children is the effect that ACEs had on their caregivers.

Sources of Trauma

It is estimated that 65% of children have experienced some type of trauma, with half of those experiencing multiple traumatic episodes before adulthood, but not all traumatic experiences have pervasive lifelong effects (Copeland, Keeler, Angold, & Costello, 2007; Finkelhor, Ormrod, & Turner, 2009). Positive stress responses are an important part of development (Gunnar & Quevedo, 2007). For example, common situations such as the first day of school or a routine doctor's visit may cause a temporary increase in heart rate and moderate stress hormone elevations, but generally do not produce lifelong adverse health consequences (Sapolsky, Romero, & Munck, 2000). Stress responses to secondary trauma or events such as medical procedures or serious injuries, loss of a loved one, and more seriously, crime victimization and natural disasters generally produce tolerable levels of stress *if* buffered by

sensitive and responsive caregivers (National Scientific Council on the Developing Child, 2014). However, toxic stress, a component of complex trauma, has the most adverse and significant effects to a child's well-being that lasts throughout their lifetime (Cook, Blaustein, Spinazzola, & van der Kolk, 2003). Because complex trauma has many aggravating factors, exposure rarely occurs in isolation, but rather occurs in groups (Felitti, et al., 1998).

Secondary Trauma

Secondary trauma refers to secondhand knowledge about trauma another has suffered either by hearing them talk about it or by witnessing the aftermath. One significant source of secondary trauma is exposure through events seen on television or the Internet (Villani, 2001). Children exposed to secondary trauma may exhibit the same symptoms as children exposed to more pervasive trauma: trouble concentrating, fearful worldview, sleep problems, regression, and withdrawal; although most of these symptoms are short-lived (Pine, Costello, & Masten, 2005). Secondary trauma also plays a role in traumatic events such as school shootings, natural disasters, and terrorism where the child is not directly involved, but is indirectly exposed (Galea, Nandi, & Vlahov, 2005; Pine, Costello, & Masten, 2005).

A child's response to secondary trauma is largely dependent on protective factors (Masten & Narayan, 2012). Generally, with the support of sensitive and responsive caregivers, children can recover within several weeks (National Scientific Council on the Developing Child, 2014). Younger children exposed to media coverage often cannot reconcile that repeated images are from the same event, not different events (Villani, 2001). It is recommended that young children avoid any media exposure to tragic events (Peek, 2008).

However, school age children are likely to hear about such events outside of the home. For older children, caregivers are encouraged to be aware of their child's potential exposure –

inquire about what they already know, correct misconceptions or misinformation, watch the events on television with them, answer their question, inquire about their feelings regarding the event, show them positive images of people helping each other, and be reassuring about their own safety (Masten & Narayan, 2012; Peek, 2008). Children often formulate their own reactions based on the responses from those around them; therefore, caregivers should model healthy coping mechanisms (Pine, Costello, & Masten, 2005). Professional assistance is recommended if the child's response to the event does not decrease within several weeks.

Traumatic Events

Traumatic events set themselves apart from secondary exposure because they involve the child's direct experiences. They can also produce many of the same symptoms as complex trauma; however, like secondary trauma responses, they are generally temporary (Pine, Costello, & Masten, 2005). Immediate symptoms of trauma related to illness or injury, death of a loved one, crime victimization, and natural disasters include anxiety, trouble concentrating, trouble sleeping, withdrawal, outbursts, increased sensory sensitivity, regression, risky behaviors, illnesses such as headaches and stomachaches, helplessness, aggression, clinginess, and poor academic performance (Green, et al., 1991; Pfefferbaum, et al., 2003; Shannon, Lonigan, Finch, Jr., & Taylor, 1994).

Also like secondary trauma, the effects of traumatic events can be mitigated through protective factors (Masten & Narayan, 2012). Caregivers should encourage children to talk about the event and share their feelings about it and answer their questions (Masten & Narayan, 2012). Caregivers should also look for signs of internalized fears and worries (Masten & Narayan, 2012). Providing a consistent environment and encouraging children to participate in normal activities will help strengthen their resilience (Masten & Narayan, 2012). Lastly, if a

child's reactions to the event do no subside or becomes increasingly worrisome, professional help is recommended.

Illness and injury. Children can experience psychological and physiological trauma related to pain, injury, illness, and medical procedures (Kazak, et al., 2006). Medical trauma is more often related to the child's perception of the experience rather than the actual severity of the illness or injury (Kazak, et al., 2006). Childhood illness and injury is not uncommon. Five out of 100 children are hospitalized each year for injuries and major acute or chronic illnesses (Fuhrmann, 2010). Each year 20 million children are seen by doctors for accidental injuries (Borse, et al., 2008). There are over 15,000 children diagnosed with cancer each year with 380,000 child cancer survivors (Ward, DeSantis, Robbins, Kohler, & Jemal, 2014). More than 1,000 organ transplant surgeries are performed on children each year and nearly 2,000 more are still waiting (U.S. Department of Health and Human Services, Current U.S. waiting list, 2016; U.S. Department of Health and Human Services, Transplants in the U.S. by recipient age, 2016)

Although most children are resilient and adaptive proceeding an illness or injury, some may experience increased arousal, re-experiencing the event, and avoidance of any associations to the event (Saxe, Vanderbilt, & Zuckerman, 2013). These responses are often born of the subjective belief that the world is no longer a safe place, that they are more vulnerable and helpless, and feelings of uncertainty and fear about medical procedures, outcomes, and their overall safety (Bronfman, Biron Campis, & Koocher, 1998; Kassam-Adams & Winston, 2004; Saxe, Vanderbilt, & Zuckerman, 2013). Children are more vulnerable to medical trauma because they may be unfamiliar with or fearful of the sights and sounds of a hospital setting, they are unable to reconcile the seriousness of their illness or injury (e.g. a broken leg may be perceived as life-threatening to a child), they are separated from their caregivers during medical

procedures, and they are often isolated from social support (e.g. their peers) (Rennick, Johnston, Dougherty, Platt, & Ritchie, 2002).

Death of a loved one. Children who have experience the death of a loved one are faced with three primary challenges: reconciling the event that caused the death, understanding the finality of death, and dealing with loss (Perry & Rubenstein, 1999). Most children are able to recover from loss, but may exhibit grief responses that are alarming or confusing to caregivers (Cohen, Mannarino, & Deblinger, 2006). It is not uncommon for children to experience abnormal sensory episodes such as hearing the loved one's voice or catching glimpses of them (Perry & Rubenstein, 1999). Children may try to avoid the subject or reminders of the person and how they died altogether; they may seem withdrawn or pretend that nothing happened (Cohen, Mannarino, & Knudsen, 2004). Reversely, they may re-experience the loss over and over by asking the same questions more than once, drawing pictures related to the death, or by talking to complete strangers about it (Cohen, Mannarino, & Knudsen, 2004). They may experience intrusive memories through nightmares and recurrent and disturbing thoughts about the death (Perry & Rubenstein, 1999). These are all common coping mechanisms that children may employ (Cohen, Mannarino, & Knudsen, 2004; Perry & Rubenstein, 1999). Generally, as time passes and children are able to make more sense of the loss, their grief responses will eventually diminish (Cohen, Mannarino, & Deblinger, 2006).

However, when children fail to return to normal functioning, their responses escalate, or become more worrisome they may be experiencing traumatic grief (Cohen, Mannarino, Greenberg, Padlo, & Shipley, 2002). Traumatic grief is more common in incidents of unexpected deaths such as accidents, suicides, and homicides, especially if the death is that of a caregiver (Cohen, Mannarino, & Knudsen, 2004). It is much more difficult for children to cope

with traumatic grief and it often times escalate to posttraumatic stress disorder (PTSD) (Cohen, Mannarino, & Knudsen, 2004). Symptoms specific to traumatic grief are enduring and include sleep difficulties, anger outbursts, trouble concentrating, hypervigilance, poor school performance, withdrawal, regression, fatigue, stomachaches, and headaches (Jacobs, Mazure, & Prigerson, 2000). These symptoms can largely be overcome with professional treatment (Cohen, Mannarino, & Knudsen, 2004).

Crime victimization. A child's response to being a victim of a crime is largely dependent on the type of crime (Luthra, et al., 2009). Violent crimes elicit a stronger response and are often associated with complex trauma (Luthra, et al., 2009). But, children can also be traumatized by isolated incidents such as personal robbery, peer assault, or familial property victimization such as burglary related theft and vandalism (Young, 2001). In fact, children between the ages of 12 and 18 are more likely to be victims of personal robbery and peer assault than adults (Child Trends, 2014).

What sets crime victimization apart from other traumatic events is the threat of re-victimization through the criminal justice system (Crenshaw, Stella, O'Neill-Stephens, & Walsen, 2016). Trauma memories are often fragmented, consisting of motor-sensory-visceral-somatic sensations that elicit terror and fear (Crenshaw, Stella, O'Neill-Stephens, & Walsen, 2016). Over time children can reconcile their experiences, make sense of them, put them into context, and can better verbalize their experience (Crenshaw, Stella, O'Neill-Stephens, & Walsen, 2016). However, interactions with the criminal justice system generally do not allow time for recovery (Crenshaw, Stella, O'Neill-Stephens, & Walsen, 2016). Child victim/witnesses are immediately thrust into situations where aggressive tactics and age-inappropriate language is likely to be used (Crenshaw, Stella, O'Neill-Stephens, & Walsen,

2016). Child psychiatrist Judith Herman (2003) stated, "Indeed, if one set out to intentionally design a system for provoking symptoms of posttraumatic stress disorder, it might look very much like a court of law" (p. 159). This stresses the importance of trauma-informed justice systems.

Natural disasters. Children's responses to natural disasters are partially dependent on their caregiver's response, how destructive or frightening the disaster was, and how quickly the family is able to recover or return to normal routines (Green, et al., 1991; Shannon, Lonigan, Finch, Jr., & Taylor, 1994). The best predictor of trauma symptoms in children following a natural disaster is, specifically, their mother's response (McFarlane, 1987). This relationship occurs because a mother's reaction to trauma, often times, alters her parenting style where she suddenly becomes overprotective (McFarlane, 1987). Children translate this overprotectiveness as maternal vulnerability which makes it more difficult for them to reconcile their own increased sense of vulnerability that often occurs after a natural disaster (McFarlane, 1987).

As with most traumatic events, children will exhibit symptoms such as regression, avoidance or reliving the event, hypervigilance, decreased concentration, sleep problems, and anger outbursts (Lonigan, Shannon, Finch, Jr., Daugherty, & Taylor, 1991). However, most children will recover in a supportive environment (Lonigan, Shannon, Finch, Jr., Daugherty, & Taylor, 1991). Caregivers can nurture resilience by limiting media exposure, monitoring adult conversations, returning to normal activities as soon as possible, being reassuring and hopeful, maintaining household rules and expectations, and being mindful that separation anxiety is common after traumatic events (Lonigan, Shannon, Finch, Jr., Daugherty, & Taylor, 1991; Pfefferbaum, Shaw, & American Academy of Child and Adolescent Psychiatry Committee on Quality Issues, 2013).

Complex Trauma

Complex trauma refers to simultaneous or sequential exposure to multiple traumatic events or persistent chronic situations (Cook, Blaustein, Spinazzola, & van der Kolk, 2003). Toxic stress, a response to complex trauma, causes the frequent activation of the body's stress management systems (Sapolsky, Romero, & Munck, 2000). It is the body's response to toxic stress that is primarily responsible for poor mental and physical health outcomes (Filiano, et al., 2016; Romens, McDonald, Svaren, & Pollak, 2014; Sapolsky, Romero, & Munck, 2000; Shalev, et al., 2013; Weder, et al., 2014). Younger children (ages 0-6) are especially vulnerable toxic stress because of the plasticity of the developing brain (Gunnar, 2003). In addition, maternal prenatal toxic stress can have adverse effects on the fetus (Glover, 2011; Kinsella & Monk, 2009). Complex trauma generally includes exposure to physical, emotional, and sexual abuse, neglect, caregiver substance abuse, mental illness, and incarceration, family violence, household dysfunction, and community violence (Felitti, et al., 1998). According to the Adverse Childhood Experiences (ACE) Study, nearly 65% of those surveyed had experienced complex trauma (Felitti, et al., 1998).

Early childhood trauma. From conception to young adulthood the body's biology is developing. The development of these systems can be considerably influenced by their environment (Gunnar, 2003). There is a common misperception that children between the ages of 0-6 are incapable of understanding traumatic experiences (Gunnar, 2003). Although young children may not be able to verbalize their feelings as well as older children, early childhood toxic stress can have profound effects on the brain which is very vulnerable during the early stages of development (Gunnar, 2003). The malleability of neural circuits during early brain development makes them very susceptible to modification (Loman & Gunnar, 2010).

Maternal toxic stress during pregnancy can also have adverse effects on fetal development and postnatal vulnerabilities (Glover, 2011; Kinsella & Monk, 2009). The "fetal origins hypothesis" contends that prenatal environments can significantly impact in utero physiology and development which can have lifelong implications (Kinsella & Monk, 2009). Maternal antenatal toxic stress can profoundly modify the fetus's neurodevelopment which increases the risk for autism, cognitive disorders and disabilities, and affective disorders (Glover, 2011). Abnormal fetal heart rate and activity and adverse effects to fetal autonomic and central nervous systems have also been observed (Kinsella & Monk, 2009). Lifetime outcomes include cardiovascular disease, metabolic syndrome, and double the risk of emotional or behavioral problems (Glover, 2011; Kinsella & Monk, 2009). Like the ACE study, outcomes represent a dose-response effect (Glover, 2011; Kinsella & Monk, 2009).

Sensitive, nurturing, and responsive caregivers can potentially compensate for negative behaviors associated with toxic stress in young children, even being able to prevent elevations in cortisol levels (Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). Experts recommend providing children with an environment abundant in social play and exploration (Francis, Diorio, Plotsky, & Meaney, 2002). It is especially important, for children who spend time in childcare services, that caregivers evaluate the environment and service provider's interactions with the children (Gunnar, Kryzer, Van Ryzin, & Phillips, 2010).

Abuse and neglect. In 2014 a reported 702,000 children were victims of neglect and abuse, 1,580 subsequently died with 80% of those being killed by a caregiver (U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau; 2016). Of those who suffered maltreatment, 9% suffered sexual abuse, 18% suffered physical abuse, and 80% suffered neglect (U.S.

Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau; 2016). Children age one or younger had the highest rates of victimization (U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau; 2016). Studies have indicated that families with lower socioeconomic statuses had higher rates of abuse (Bradley & Corwyn, 2002).

Caregiver attachment in early childhood plays a vital role in how individuals develop. Healthy attachments meet the child's basic needs for safety, love, and belonging (Ainsworth, 1979). It is through attachment that children learn how to trust, interact with others, regulate emotions, build self-esteem, and develop a worldview (Ainsworth, 1979). Children abused and neglected by primary caregivers have a difficult time building healthy attachments (Fergusson & Lynskey, 1997). Children who do not develop healthy attachments to primary caregivers often experience difficulties in maintaining emotional balance, developing trust, connecting with others, developing relationships, and recovering from stress, disappointment, or discouragement (Fergusson & Lynskey, 1997; George, 1996). These effects can last throughout their lifetime (George, 1996; Styron & Janoff-Bulman, 1997).

Physical and emotional abuse. Physical abuse is defined as a deliberate or negligible physical act or attempted physical act by a caregiver or someone that the child depends on for protection that causes pain or injury (Gross & Keller, 1992). Indications of physical abuse include frequent injuries that defy reasonable explanations, conflicting explanations between the caregiver and child, habitually high absentee rates at school, and difficulty walking or moving (due to pain) (Dubowitz & Bennett, 2007; McIntyre, 1987; Reiniger, Robison, & McHugh, 1995). Physical abuse during infancy can cause malformation and dysfunction in certain parts of

the brain (Dallam, 2001; Perry, 2001; U.S. Department of Health and Human Services & Administration on Children, Youth, and Families, 2001). This can lead to delays in language development, cognition (memory, attention, and learning), and socioemotional development in addition to sleep disturbances, hyperactivity, conduct disorders, and posttraumatic stress disorder (Dallam, 2001; Perry, 2001; U.S. Department of Health and Human Services & Administration on Children, Youth, and Families, 2001). Childhood abuse can also result in many lifelong chronic health issues including lung disease, heart disease, high cholesterol, liver disease, obesity, and high blood pressure (Danese, et al., 2009; Felitti, et al., 1998; Gilbert, et al., 2015). One study found that 80% of young adults who had been abused during childhood met the diagnostic criteria for at least one mental disorder; more specifically, depressive disorders, eating disorders, and anxiety disorders (Silverman, Reinherz, & Giaconia , 1996).

Children who experience physical abuse are 1.5 times more likely use illicit drugs in middle adulthood (Widom, Marmorstein, & White, 2006). Abused children are 25% more likely to experience teen pregnancy, delinquency, and academic failure (Kelley, Thornberry, & Smith, 1997). An abused child's likelihood of being arrested as a juvenile is 59% higher than children who are not abused. Childhood abuse also increases the likelihood of criminal behavior as an adult by 28% and perpetrating violent crime by 30% (Wisdom & Maxfield, 2001).

Emotional abuse occurs when a caregiver or person of trust constantly criticizes, rejects, belittles, dominates, and ignores their victim (Garbarino & Garbarino, 1994). Some examples of emotional abuse are withholding affection and comfort, threats of excessive corporal punishment, vocalizing a dislike or hatred for the child, using demeaning or negative terms to describe the child, unreasonable demands and expectations, constant unwarranted blame, and public humiliation (Kent & Wallar, 1998; Sanders & Becker-Lausen, 1995). Behavioral

presentations of emotional abuse include aggressiveness or excessive submissiveness, low self-esteem, antisocial behavior, withdraw, loss of bladder and bowl control, unreasonable fears of events (such as going home) or objects, flat affect, immature or overly mature behavior, attention and affection seeking, uncooperativeness, distrust of authority, and problems connecting with peers (Garbarino & Garbarino, 1994; Jantz & McMurray, 1995; Kent & Wallar, 1998; Sanders & Becker-Lausen, 1995).

Emotional abuse and physical abuse rarely occur in isolation, but are co-occurring patterns (Korfmacher, 1998). Children often have no expectation that it will get better and are sometimes afraid to admit or report abuse due to a fear of being punished, fear of being removed from their home, guilt and shame, or because they believe that it is normal or deserved (Ney, Fung, & Wickett, 1994; Palmer, Brown, Rae-Grant, & Loughlin, 1999). However, professionals who work with children are encouraged not to automatically assume that a child is being abused, to ask open-ended questions, and listen for inconsistencies before drawing a conclusion (Crosson-Tower, 2003; Radford, Glaser, & MacMillan, 2009).

Sexual abuse. Sexual abuse includes a range of sexual behaviors between a child and adult (or older child) that is intended to sexually stimulate the perpetrator (Finkelhor, 1979). The most common incidents include oral, anal, or vaginal intercourse and sexual fondling, touching, or kissing (Finkelhor, 1979). However, sexual abuse may also include sexual exploitation (e.g. pornography or prostitution), forcing a child to watch or look at pornographic materials, voyeurism, or exhibitionism (Finkelhor, 1979). Abusers may "groom" their victims by manipulating them with activities or gifts intended to make them feel special (Craven, Brown, & Gilchrist, 2006). Once the act has occurred the perpetrator may use threats or deception to coerce the child into silence (Finkelhor, 1987).

Sexually abused children may have difficulty sleeping, nightmares, depression, anxiety, regression (e.g. bedwetting or thumb sucking), poor school performance, poor personal hygiene, and may use sexual words, have sexual knowledge, or engage in sexual play activities that are inappropriate for their age (Browne & Finkelhor, 1986; Caldwell, Hodson, Craig, & Edgar, 2005; Cohen, Deblinger, Mannarino, & Steer, 2004; Mansell, Sobsey, & Moskal, 1998; Paolucci, Genuis, & Violato, 1999). Sexually abused boys are more likely to exhibit externalized behaviors such as anger outbursts, cruelty to others, running away, disassociation, and conduct disorders (Dube, et al., 2005; Paolucci, Genuis, & Violato, 1999). Sexually abused girls are more likely to become withdrawn and depressed (Dube, et al., 2005). Older children may engage in self-harm and suicide attempts (Dube, et al., 2005).

It is estimated that one in five girls and one in 20 boys will be sexually abused before the age of 18 (Finkelhor, 2008). Children between the ages of seven and 13 are the most vulnerable (Finkelhor, 2008). Three out four children who are sexually abused are usually victimized by someone they know (Kilpatrick, Saunders, & Smith, 2003). However, only about 30% of sexual abusers are family members (Snyder, 2000). Most (about 60%) perpetrators are non-relative acquaintances (e.g. family friends, neighbors, and babysitters) (Snyder, 2000).

Of females who experienced childhood sexual abuse by a family member, 63% also reported rape or attempted rape after the age of 14 (Lalor & McElvaney, 2010). Adolescent and teenage females who were sexually abused as a child were two times more likely to have had intercourse by age 15, three times more likely to become pregnant as a teen, two times more likely to not use birth control, and over two times more likely to have had more than one sexual partner compared to those who had not been victimized (Stock, Bell, Boyer, & Connell, 1997). Adolescent and teenage males who were sexually abused during early childhood were three

times more likely to be promiscuous, two times more likely to have had unprotected sex, and five times more likely to have caused teenage pregnancy compared to those with no history of abuse (Homma, Wang, Saewyc, & Kishor, 2012). Children who live with only one parent or live in adversely dysfunctional homes are at higher risk for being sexually victimized (Finkelhor, 2009). Like with physical and emotional abuse, child victims of sexual abuse may be afraid to report it (Palmer, Brown, Rae-Grant, & Loughlin, 1999).

Neglect. Neglect occurs when a caregiver repeatedly withholds care that is appropriate for the child's age (Dubowitz, 2016). Common forms of neglect are physical neglect, medical neglect, emotional neglect, educational neglect, environmental neglect, inadequate supervision, and newborns addicted or exposed to drugs. Physical neglect includes nutritional neglect, clothing neglect, and abandonment (Gaudin, 1995; Harrington, Zuravin, DePanfilis, Ting, & Dubowitz, 2002). Physical neglect also includes "shuttling" which is repeatedly leaving a child in the care of others for long periods of time (e.g. days, weeks, or months) and "expulsion" which is kicking a child out of the home without arrangements to provide them with adequate shelter or care by others (Gaudin, 1995). Other types of physical neglect are careless disregards for the child's safety and wellbeing such reckless driving with the child in the car (to include intoxicated driving), failure to provide age appropriate car restraints, leaving a child in the car unsupervised, and not providing adequate hygiene (Gaudin, 1995).

Medical neglect includes denying or delaying a child's healthcare needs such as not giving a child needed medication, not providing preventative dental or medical care, not getting care for a sick or injured child, and not providing mental health care (Frank, Drotar, Cook, Bleiker, & Kasper, 2001). Emotional neglect occurs when caregivers fail to provide adequate attention and nurturing or denies the child social interactions (Erickson & Egeland, 2002).

Emotional neglect is thought to have more adverse and longer lasting effects than physical neglect (Goldman, Salus, Wolcott, & Kennedy, 2003). Educational neglect involves failing to assist the child with homework and allowing chronic truancy (Mennen, Kim, Sang, & Tricketta, 2010).

Environmental neglect involves exposure to in-home hazards such as illegal and legal drugs, poisons, electrical wires, stairs, weapons, secondhand smoke, and unsanitary household conditions like rodent or bug infestations, exposed excrement, rotting food, and failing to provide basic utilities such as heat, water, and sewer (Dubowitz, 2016; Dubowitz, Pitts, & Black, 2004). Inadequate supervision includes leaving a young child home alone or with younger siblings to care for, allowing the child to partake in dangerous or illegal activities, leaving a child with an inappropriate caregiver, and depending on the age, not properly supervising the child inside and outside of the home (Dubowitz, 2016; Zuravin, 2001). Lastly, children who are prenatally exposed to drugs and alcohol are at higher risk for physical, mental, and developmental disabilities (Zuckerman & Bresnahan, 1991). Prenatal exposure to drugs and alcohol increases a child's risk of being abused or neglected by 20% (Chasnof & Lowder, 1999).

Neglect has been found to have adverse developmental effects that can last throughout a lifetime: health, physical, intellectual, cognitive, emotional, psychological, social, and behavioral delays have been observed (DePanfilis , 2006). Indicators of child neglect are malnourishment (bloated stomach or unusually thin), frequently mentions that they are left home alone or that they care for younger siblings, dirty or poorly fitted clothing, improperly dressed for weather, untreated illnesses, injuries, or dental issues, poor hygiene, and frequently appears tired (DePanfilis , 2006). It is important to note that isolated incidents of a caregiver not providing for a child are not necessarily neglect (DePanfilis , 2006). It is also important to

consider socioecological factors such as poverty and social isolation when evaluating neglect (Dubowitz, Black, Starr, & Zuravin, 1993; Erickson & Egeland, 2002). In these cases, social support can often alleviate the problem (Dubowitz, Black, Starr, & Zuravin, 1993; Erickson & Egeland, 2002).

Family dysfunction. Family dysfunction encompasses several interrelated and overlapping conditions. Children exposed to caregiver substance abuse and addiction, caregiver mental illness, domestic violence, and incarceration, divorce and separation, and general household instability are more prone to an array of behavioral, psychiatric, and medical issues (Felitti, et al., 1998). Children living in dysfunctional households often feel shameful of their situation and are afraid to bring friends to their home (Anda, et al., 2004). This can lead to social isolation (Dube, Felitti, Dong, Chapman, & Anda, 2003).

Because of the lack of consistency in dysfunctional homes, children become mistrusting and confused (Dong, et al., 2004). Inconsistency can also lead to low self-esteem and decreased internal locus of control[13] (McEwen, 2013). They may also have overwhelming feelings of guilt, ambivalence, fear, and insecurity (Repetti, Taylor, & Seeman, 2002). The prevalence of depression, anxiety, eating disorders, sociopathy, attention deficit/hyperactivity, and suicide attempts among these children are much higher than that of their peers (Felitti, et al., 1998). Academic issues can also arise from children being tired and unable to concentrate at school, having little support completing homework, and they have more learning disabilities, miss more days of schools, repeat more grades, and have higher levels of expulsion (Blodgett, et al., 2012; Leahy, 2015; Miller & Plant, 1999). Higher incidents of headaches and migraines, gastrointestinal disorders, and asthma have been observed in children exposed to household dysfunction (Felitti, et al., 1998).

[13] Internal locus of control is the belief that one has control over or can influence outcomes (Lefcourt, 1991).

Caregiver substance abuse and addiction. Substance abuse is often times an underlying factor in incidents of domestic violence, child abuse and neglect, caregiver incarceration, separation, divorce, and dysfunctional household environments (Dong, et al., 2004). One study found that children exposed to caregiver alcohol abuse were 25 times more likely to be sexually abused, 20 times more likely to be physically abused, and 25 times more likely to suffer emotional abuse than children who had never experienced caregiver alcohol abuse (Anda, 2011). Children of alcoholics (COA) and children of substance abusers (COSA) are six times more likely to witness domestic violence (Anda, 2011). COAs and COSAs are three to four times more likely to become alcoholics and are at a substantially higher risk of becoming drug addicts compared to children of non-addicts (Dube, Anda, Felitti, Edwards, & Croft, 2002). Most recent estimates indicate that 8.3 million children in the United States live with a substance addicted caregiver with the majority of those caregivers dependent on alcohol and the remaining addicted to illicit drugs (Substance Abuse and Mental Health Services Administration - Office of Applied Studies, 2008).

The behavioral effects that alcohol and drugs have on caregivers can be very confusing to children; they may not understand that substances are controlling their caregiver's behavior (Famularo, Kinscherff, & Fenton, 1992). A caregiver may be loving in some instances and withdrawn in others, leaving children feeling anxious due to the unpredictability of their caregiver's behavior (Famularo, Kinscherff, & Fenton, 1992; Wisdom, Ireland, & Glynn, 1995). Caregiver alcohol and drug abuse can also create dangerous and traumatic situations for children such as caregiver intoxicated driving, excessive angry outbursts, and criminal activity (Wisdom, Ireland, & Glynn, 1995). In addition, children may be put in positions to care for their siblings and to manage age inappropriate household duties (Magura & Laudet, 1996).

Caregiver mental illness. It is estimated that 3% of children live with a severely mentally ill caregiver (Pretis & Dimova, 2008). According to the World Health Organization (2001), this number is predicted to rise. The longstanding, sudden, or repetitive nature of caregiver mental illness can be very overwhelming for children because, by nature, they have limited coping skills, defense mechanisms, and social support (Udwin, 1993). Due to stigma and having little knowledge about mental illness, children are often unwilling to discuss their situation with outsiders, leaving them isolated and feeling shame or guilt (Battaglino, 1987; Heller, Roccoforte, & Cook, 1997). Children may also experience grief and traumatic loss; feeling that the caregiver they once knew is gone or during incidents of caregiver hospitalization, which, for severely mentally ill patients, can last from one month to a year (Mattejat & Remschmidt, 2008; Mental Health America of Wisconsin, 2011). Children often become secondary to a caregiver's mental illness as family decisions are based on how it will affect the mentally ill caregiver (Leahy, 2015).

Caregiver mental illness can adversely affect parenting. For example, mentally ill caregivers may have less eye contact, physical interactions, and positive facial expressions (Mattejat & Remschmidt, 2008). Mothers specifically may have reduced empathy and a reduced ability to recognize, interpret, and respond to their child's emotional signals (Mattejat & Remschmidt, 2008). Parenting styles may be inconsistent, fluctuating between permissive and controlling. Mentally ill caregivers may also find it difficult to set consistent boundaries, control their child's behavior, have positive verbal expressions and communications, and often overreact to common stressors (Mattejat & Remschmidt, 2008). As children get older, mentally ill parents may have difficulties supporting their child's development, more specifically in areas of

autonomy[14], competence, and independence (Mattejat & Remschmidt, 2008). Older children may also find it difficult to identify with mentally ill parents and are more frequently drawn into parental conflicts (Mattejat & Remschmidt, 2008).

Domestic violence. Domestic violence is defined, within the psychological framework, as patterns of behavior that occurs, generally, between intimate partners (Holden, 2003). Domestic violence is grounded in a need to control and doesn't only apply to physical or sexual violence, but also psychological abuse through threats of violence and economical abuse (Baker, Jaffe, Ashbourne, & Carter, 2002). A 2011 study found that 25.6 percent of the children surveyed (n = 4549) had been exposed to family violence at some point during their lives (Hamby, Finkelhor, Turner, & Ormrod, 2011). Children under the age of five are most likely to witness domestic violence than any other age (Fantuzzo, Boruch, Beriama, Atkins, & Marcus, 1997). Children who witness domestic violence often learn that violence equals power and control and sometimes affection (Holt, Buckley, & Whelan, 2008).

Symptoms of children exposed to domestic violence are largely dependent on their stage of development, the severity of the incident(s), the number of incidents, and their caregiver's response to them after the incident (Fantuzzo, Boruch, Beriama, Atkins, & Marcus, 1997). Common symptoms in children up to age five include regression, separation anxiety, disruptions in eating and sleep habits, impulsivity, increased aggression, over-reactive outbursts, hyperactivity, constant worry about their safety or the safety of their caregiver, lack of responsiveness to rules and boundaries, and may frequently complain of headaches or stomachaches (Baker, Jaffe, Ashbourne, & Carter, 2002; Jackson, Cram, & Seymour, 2000; Rossman, Hughes, & Rosenburg, 2000; Taylor, Zuckerman, Harik, & Groves, 1994). Younger children may also become distressed when exposed noises or visual images associated with the

[14] Autonomy refers to one's ability to make their own choices; free will (Deci & Ryan, 2002).

violence and may be reluctant to engage in exploratory play (Baker, Jaffe, Ashbourne, & Carter, 2002). Symptoms of children age six to 11 include nightmares, difficulty concentrating, numbing[15], difficulty establishing relationships with peers, and avoidance of social situations (Carlson, 1984; Rossman, Hughes, & Rosenburg, 2000). Common symptoms in children age 12 to 18 include antisocial behavior, substance abuse, running away, depression, generalized anxiety, academic failure, and violent or abusive behavior in dating relationships (Edleson, 1999; Jackson, Cram, & Seymour, 2000).

Regardless of frequency, children who are exposed to domestic violence are at an increased risk for abuse (Herrenkohl, Sousa, Tajima, Herrenkohl, & Moylan, 2008). Children who are frequently exposed to domestic violence are 42% more likely to be sexually abused, 60% more likely to be physically abused, and 65% more likely to be emotionally abused than children with no exposure (Anda, 2011). Children who have been exposed to domestic violence one to two times are 7% more likely to be sexually abused, 20% more likely to be physically abused, and 15% more likely to be emotionally abused than children who are not exposed to domestic violence (Anda, 2011).

In addition, children exposed to domestic violence are more likely to experience other adverse childhood experiences. For example, children who have a battered mother are 95% more likely to have one other ACE, 82% more likely to have two other ACEs, 64% more likely to have three other ACEs, 48% more likely to have four other ACEs, and 52% more likely to have five or more ACEs than their peers (Anda, 2011). ACE scores can also predict ones likelihood of becoming a victim of domestic violence in adulthood. Women with ACE scores of five or more are 14% more likely to be a victim of domestic violence (Anda, 2011).

[15] Emotional numbing refers to an individual's difficulty in experiencing positive emotions while at the same time being able to experience negative emotions (Ford & Kidd, 1998).

Incarcerated caregiver(s). It is estimated that 2.3 million children have at least one incarcerated caregiver; however, only half of these children lived with their parent(s) prior to incarceration and the majority that did, lived with their mother (Mumola, 2000). The mean age of children with an incarcerated parent is eight; mothers assume responsibility 90% of the time when a father goes to jail while fathers assume responsibility only 30% of the time (Mumola, 2000). Unfortunately, the incarceration rate among mothers has been consistently rising over the last 10 years (Mumola, 2000). In many cases, grandparents become primary caregivers (Mumola, 2000).

The effect that caregiver incarceration has on a child depends on several factors: the age of the child, familial conditions prior to the incarceration, quality of alternative housing arrangements, and access to the incarcerated caregiver (Baunach, 1985; Bloom & Steinhart, 1993; Johnson, 1991; Johnston, 1995; Mumalo, 2000; Myers et al., 1999; Sack, Seidler, & Thomas, 1976; Sroufe, 1988; Thompson, 1998). Witnessing the arrest can be very traumatic for children and many suffer flashbacks of the event and have nightmares (Jose-Kampfner, 1995). It is estimated that one in five children are present at the time of the arrest with half of those being age six or under (Johnson, 1991). Some argue that concealing a caregiver's incarceration from a child reduces stress; however, others argue that children are better able to cope if the event is explained to them in age appropriate terms (Ayers, Sandler, West, & Roosa, 1996; Becker & Margolin, 1967; Snyder-Joy & Carlo, 1998). One study indicated that children who were uninformed of their caregiver's incarceration were more fearful and anxious than those who were informed (Johnson, 1995).

Caregiver incarceration can have an especially adverse lifelong impact on infants. Mother-infant bonding is critical to a child's development (Myers, Smarch, Amlund-Hagen, &

Kennon, 1999). When caregivers, especially mothers, are incarcerated the infant does not have the opportunity to form a healthy attachment (Myers, Smarch, Amlund-Hagen, & Kennon, 1999). These children often have lifelong emotional and behavioral problems (Myers, Smarch, Amlund-Hagen, & Kennon, 1999). In addition to developing insecure attachments to primary caregivers, toddlers have the capacity to understand changes in their circumstances when a caregiver is incarcerated (Johnson, 1995, Thompson, 1998). Changes such as relocation and divorce can negatively affect a child's cognitive abilities and relationships (Sroufe, 1988).

One study found that 70% of toddlers with incarcerated mothers had psychological and emotional problems (Baunach, 1985). These problems included shame, guilt, anxiety, withdrawal, depression, hypervigilance, eating disorders, anger, and aggression (Bloom & Steinhart, 1992; Fishman, 1983; Gaudin, 1984; Johnston, 1995; Jose-Kampfner, 1995; Sack, Seidler, & Thomas, 1976). Problems associated with children age six and up are generally observed in the context of peer relationships and school-related issues (Sack, Seidler, & Thomas, 1976). One study found that 70% of children with an incarcerated parent exhibited poor academic performance and 5% had behavioral problems in the classroom (Stanton, 1980). Some children are reluctant to go back to school after their parent's arrest due to fear of being ostracized or teased (Jose-Kampfner, 1991). As school-aged children get older, drop-out rates and suspensions are higher for children with an incarcerated parent than their peers (Trice, 1997).

High quality caregiver-child relationships can serve as protective factors to help buffer a child's anxiety and grief when a caregiver is incarcerated, however; most incarcerated caregivers have a history of insufficient parenting skills so these protective factors are often unavailable (Johnson, 1991; Myers, Smarch, Amlund-Hagen, & Kennon, 1999; Thompson, 1998). Most times children are better able to cope when placed in the care of a familiar family member,

however; this too can present challenges (Bloom & Steinhart, 1993; Mumalo, 2000). Many families are not financially prepared to unexpectedly take in a child and in the case of grandparents; there may be physical boundaries and generational complications (Bloom & Steinhart, 1993; Mumalo, 2000). Visiting an incarcerated caregiver in prison can be very intimidating and scary for children; however, research indicates that anxiety will subside if children can visit their caregiver regularly (Bloom & Steinhart, 1993; Simon & Landis, 1991). Frequent visitation can help calm a child's concerns about their caregiver's safety and helps build caregiver/child emotional bonds (Sack, 1977).

Separation and divorce. Regardless of whether or not parents are cooperative, compromising, and mature during separation and divorce it is likely that children will experience some psychological stress (Wallerstein & Lewis, 2004). Factors that contribute to a child's response to separation and divorce are the duration, frequency, and intensity of parental conflict, the quality of the child/parent relationship, and how well parents are able to focus on the child's needs before, during, and after the separation and divorce (Richards & Ely, 1998). Generally if children were not exposed parental conflicts, had sensitive and nurturing relationships with their parents, and parents were responsive to the child's needs, most children eventually adapt to separation and divorce (Wallerstein & Lewis, 2004).

Still, children of separation and divorce may experience a sense of abandonment and loss, anger, denial, and sadness and more behavioral and academic problems than their peers (Franke, 1983). One study indicated that 39% of girls and 29% of boys had high levels of posttraumatic stress symptoms after their parent's divorce (Joseph, Mynard, & Mayall, 2000). However, the lifelong effects on children of separation and divorce seem to be more adverse and indicate a delayed response and externalized reactions (Richards & Ely, 1998).

College aged females whose parents are divorced are less likely to attend college than their peers from stable families (Richards & Ely, 1998). Females are also 45% more likely to marry before the age of 20 compared to 15.6% of females whose parents remained together (Richards, 1996). Both males and females of divorced families are more likely to cohabitate (Richards & Ely, 1998). Research indicates that early marriage and cohabitation are risk factors for separation and divorce, so it is no surprise that separation and divorce rates are higher among adults whose parents were also separated or divorced (Amato, 2000; Graefe & Lichter, 1999; Moore & Waite, 1981). Overall, adult children of divorce have issues achieving intimate relationships and committing to marriage and parenthood (Wallerstein & Lewis, 2004). Lastly, adult children of split families are also more likely to experience financial difficulties and poverty and more psychological illnesses (Richards & Ely, 1998).

General household dysfunction. Household dysfunction is a set of conditions that inhibit healthy family functioning (Dong, et al., 2004; Forward, 1989). It is generally a culmination of separation and divorce, caregiver incarceration, mental illness, and substance abuse, and domestic violence (Dong, et al., 2004). However, household dysfunction can also include constant or extreme conflicts between parents, children, and other members of the household, lack of empathy among family members, marginalization of certain family members, lack of quality family time, disrespect of boundaries, unrealistic expectations, harsh or dogmatic discipline, over-parenting, ruling by fear, failure to set age appropriate rules and boundaries, and social isolation (Dong, et al., 2004; Forward, 1989; Frick, 1994; Higgins, 2003; Kazdin, 1995).

Community violence. Community violence is not only violence committed against an individual outside of the home, but knowledge of, participating in, and witnessing violence in their community. It is estimated that by the age of five, inner-city children have been directly

exposed to community violence, more specifically, gang activity and shootings (Bell & Jenkins, 1991). A 2015 national survey found that 54.5% of the children surveyed had been physically assaulted, 40.2% had been victims of property crimes, 27.5% had witnessed an assault, and 7.9% had been indirectly exposed to community violence (Finkelhor, Turner, Shattuck, Hamby, & Kracke, 2015).

One study found that children exposed to community violence in Chicago had the same trauma symptoms as children in war-torn areas like the West Bank, Mozambique, and Cambodia (Garbarino, Dubrow, Kostelny, & Pardo, 1992). Common complaints from children exposed to community violence are: mistrust, constant fear and focus on survival, doing anything to stay safe such as carrying a weapon, are on-guard all of the time, fear for their family's safety, especially younger siblings, feelings of a truncated lifespan, difficulty concentrating, nightmares, hypervigilance, constant anger, stomachaches and headaches, reluctancy to form bonds, and a preoccupation with violence (National Child Traumatic Stress Network, 2000). Like exposure to domestic violence, exposure to high levels of community violence is associated with behavioral, emotional, social, and cognitive problems in older children and can be long-lasting (Cooley-Quille, Turner, & Beidel, 1995; Pynoos & Eth, 1985; Pynoos & Nader, 1988; Terr, 1983).

Posttraumatic symptoms are common in children exposed to community violence. Symptoms include numbing, flat affect, sleep interruptions, avoidance or re-experience, and exaggerated startle responses (Pynoos & Nader, 1988). In addition, many children exposed to community violence experience low self-esteem, memory lapses, fatigue, aggression, impulsivity, social withdrawal, and poor school performance (Pynoos & Nader, 1988). Non-school aged children can also be affected by community violence and often display passive and regressive symptoms (Peterson, Luborsky, & Seligman, 1983).

Trauma Screening and Assessment

Screenings are often referred to as norm-referenced tests in that they are standardized, are evaluated the same way, and are measured against statistical means of normative responses (Eabon & Abrahamson, n.d.; Kerig, Ford, & Olafson, 2014). As illustrated in Table 1, screening tools are generally pre-written questionnaires that may involve self-reports, caregiver report, or provider report (e.g. teacher, caseworker, or guidance counselor) (Kisiel, Conradi, Fehrenbach, Torgerson, & Briggs, 2014). In cases where caregivers are not the source of trauma, it is important to engage the family in the screening process; explain the purpose of the screening, how information obtained in the screening will be used, and refer the family to appropriate resources if necessary (Kisiel, Conradi, Fehrenbach, Torgerson, & Briggs, 2014). Because trauma screening is descriptive rather than diagnostic, it can be universally implemented by non-clinicians upon initial contact with the child (Kerig, Ford, & Olafson, 2014). Due to the cost-effectiveness of screening, it can be used in a variety of settings such as schools, juvenile justice and child welfare systems, and shelters to determine if a child needs to be referred for a more comprehensive assessment (Briere & Spinazzola, 2009; Strand, Sarmiento, & Pasquale, 2005; Kerig, Ford, & Olafson, 2014).

Trauma assessment is more focused and comprehensive than screening and is usually done by a mental health professional (Kerig, Ford, & Olafson, 2014). Assessments implement a variety of components such as observations, standardized measures, formal and informal interviews with the child, teachers, social services workers, caregivers, and parents, and a review of school and medical records (Eabon & Abrahamson, n.d.; Kerig, Ford, & Olafson, 2014). In general, assessments usually results in a diagnosis, case conceptualization, treatment, and progress and outcome evaluations (Kerig, Ford, & Olafson, 2014).

Trauma assessment should evaluate two major elements: exposure and reaction (Briere & Spinazzola, 2009). Exposure assessment involves examining what type of trauma the child was exposed to and how long the exposure lasted (Briere & Spinazzola, 2009). Assessing reaction involves evaluating the child's response to exposure such as behavioral, emotional, and physical presentations (Briere & Spinazzola, 2009). It is important to note that not all children who experience trauma will exhibit adverse reactions (Briere & Spinazzola, 2009). Reactions to look for are hyperarousal when discussing the event(s), intrusive memories about the event, behavioral problems, avoidance of triggers, aggressiveness, anxiety, depression, irritability, and interpersonal problems (Briere & Spinazzola, 2009; Kisiel, Conradi, Fehrenbach, Torgerson, & Briggs, 2014; Strand, Sarmiento, & Pasquale, 2005). During the assessment process it is important to be mindful of the child's stage of development, cognitive skills, race, age, and culture and how those factors may impact their emotional interpretation of traumatic events (Briere & Spinazzola, 2009; Nader, 2007).

Treatment

Brains, bodies, and lives are somewhat resilient. The use of effective treatment methods and the integration of resilience factors can help victims of trauma improve and lead productive lives (Strand, Hansen, & Courtney, 2013). Core components of effective trauma focused treatments should include psychoeducation about loss and trauma reminders, grief reactions, posttraumatic stress symptoms, instruction on emotional self-regulation, relapse prevention, safety, and adaptive routines, motivational interviewing, client advocacy, parent/child relationship, trauma narrative construction, and frequent evaluations of treatment plans (Courtois, 2004; Ford & Courtois, 2013; Strand, Hansen, & Courtney, 2013). Many empirically

supported trauma focused treatment methods have been established specifically for complex trauma[16].

Trauma Affect Regulation Group Education and Therapy (TARGET) theoretical perspective is based on developmental trauma and cognitive behavioral therapy and focuses on trauma regulation, trauma processing, relationship repair, and social engagement using strength-based and resilience-enhancing approaches (Ford & Russo, 2006). TARGET also can incorporate historical trauma, spiritual beliefs, families with low socioeconomic statuses, and community norms (Ford & Russo, 2006). TARGET is ideal for juvenile justice, school, and child welfare settings (Agosti, Conradi, Halladay, & Langan, 2013; Brunzell, Waters, & Stokes, 2015; Ford & Blaustein, 2013).

Ford and Hawke (2012) tested the efficacy of TARGET in a juvenile justice setting. They found that TARGET and behavioral issues had a dose-response relationship; the more TARGET sessions the youth attended the fewer punitive and disciplinary actions were taken against them (Ford & Hawke, 2012). According to Ford and Hawke (2012), this outcome supported their hypothesis that teaching affect regulation positively contributed to the well-being and safety of the youth residing in juvenile detention. In a similar study, Marrow and colleagues found that the implementation of TARGET in juvenile detention facilities reduced depression and increased optimism and hope among the residents (Marrow, Knudsen, Olafson, & Bucher, 2012).

Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS) is a form of cognitive behavioral therapy that addresses issues such as dissociation, affect regulation, impulsivity, self-regulation, somatization, future orientation, and relationships (Brom, Pat-Horenczyk, & Ford, 2009). It is designed to specifically to address trauma related to physical

[16] See Table 2

and sexual abuse and community violence that is ongoing by helping youth to cope through improved self-efficacy and establishing positive relationships (Habib & DeRosa, 2008). SPARCS is culturally sensitive and incorporates "meaning making" – what trauma means in the context of cultural beliefs (Habib & DeRosa, 2008). SPARCS has successfully been implemented in schools, group homes, residential treatment facilities, outpatient settings, boarding school, outpatient clinics, foster care, homeless shelters, and juvenile justice facilities (Dorsey, Briggs, & Woods, 2011; Ford, Chapman, Connor, & Cruise, 2012; Weiner, Schneider, & Lyons, 2009; Zelechoski, et al., 2013).

The Mental Health Services and Policy Program of the Illinois Department of Children and Family Services conducted a pilot study of SPARCS involving youth ages 13-21 from two different child welfare agencies (Kisiel, Marett, Markiwicz, & Fehrenbach, 2008). Participation criteria included having at least one traumatic experiences categorized as moderate to severe and noticeable difficulties dealing with the trauma (Kisiel, Marett, Markiwicz, & Fehrenbach, 2008). After time-limited exposure to SPARCS, participants showed decreases in traumatic stress symptoms, emotional and behavioral issues, health risk behaviors and increases in positive life functioning and strengths (Kisiel, Marett, Markiwicz, & Fehrenbach, 2008).

Integrative Treatment of Complex Trauma (ITCT) for adolescents and children takes a multidimensional approach, employing several different models: attachment, cognitive behavioral, exposure, affect regulation, mindfulness, triggers, and psychoeducation (Lawson & Quinn, 2013). ITCT addresses physical, sexual, and emotional abuse, traumatic grief, community violence, and medical trauma (Lanktree & Briere, 2013). It also addresses issues related to social marginalization and poverty (Lanktree, et al., 2012). ITCT is appropriate for use in individual, family, or group settings, in hospitals, and inpatient and outpatient clinics and has

been especially effective in homeless children and youth in the juvenile justice system (Lanktree, et al., 2012).

Lanktree and colleagues (2012) examined ITCT effectiveness among youth living in high risk communities. They found that ITCT significantly reduced posttraumatic stress symptoms, anxiety, and depression and greatly reduced sexual issues, anger, and dissociation (Lanktree, et al., 2012). The effects of ITCT were dose-dependent; the more sessions the youth attended the higher the positive outcomes (Lanktree, et al., 2012). ITCT has also been found to be an effective treatment for substance abuse in traumatized adolescents and teens (Briere & Lanktree, 2014).

Attachment, Regulation, and Competency (ARC) therapy is based on attachment theory, child development, resilience factors, and addresses attachment, self-regulation, and social competency[17] (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013). It primarily targets early childhood trauma and ongoing adverse experiences (Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005). ARC is unique in that considers contextual and cultural factors related to the child, the child's caregivers, and the social environment of the child (Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005). The goal of ARC is to not only treat the child, but also develop a trauma informed milieu and systems that interact with the child (Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005). ARC is appropriate for parent workshops, home based programs, individual, group, and family therapy (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013).

[17] Social competency is defined as one's ability to effectively communicate with others, to be amiable or congenial in social situations, and to appropriately view themselves in relation to others (Semrud-Clikeman, 2007).

A pilot study of the ARC framework was conducted in a residential facility that treated youth exposed to complex trauma (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013). Significant reductions in internalizing and externalizing behaviors, posttraumatic stress symptoms, and use of restraints were observed (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013). Another study of adopted children with a history of complex trauma found significate reductions in depression, anger, anxiety, dissociation, and internalizing and externalizing issues after 16 weeks of individual and group ARC treatments (Hodgdon, Blaustein, Kinniburgh, Peterson, & Spinazzola, 2016). The positive effects of ARC treatment were observed during a 12-month follow up assessment (Hodgdon, Blaustein, Kinniburgh, Peterson, & Spinazzola, 2016).

Trauma Systems Therapy (TST) is partially grounded in Bronfenbrenner's social-ecological model in that a disruption in one sphere can interfere with other spheres (Dorsey, Briggs, & Woods, 2011). Because TST involves exploring multiple spheres in the child's life, a multidisciplinary team is usually engaged in treatment (Saxe, Ellis, & Brown, 2015). The team may include important figures in the child's life such as spiritual leaders, teachers, and caseworkers (Saxe, Ellis, & Brown, 2015). Although usually applied in individual therapy settings, TST can be adapted to apply to group settings such as schools, families, and neighborhoods (Ellis, Fogler, Hansen, Forbes, & Navalta, 2012). TST is executed in three stages: safety focused treatment, regulation focused treatment, and beyond trauma treatment (Saxe, Ellis, & Kaplow, 2006).

Brown and colleagues tested the efficacy of TST in a Boston, MA residential treatment facility (Brown, McCauley, Navalta, & Saxe, 2013). They found that the regular implementation of TST resulted in a decrease in the use of physical restraints among residents (Brown,

McCauley, Navalta, & Saxe, 2013). They also found a significant increase in placement stability with children in foster care that had been exposed to complex trauma (Brown, McCauley, Navalta, & Saxe, 2013). Compared to an average of 3.4 placement moves, after TST, placement moves were reduced to an average of 1.4 (Brown, McCauley, Navalta, & Saxe, 2013).

Trauma Focused Cognitive Behavioral Therapy (TF-CBT) addresses common emotional and social issues related to trauma including posttraumatic stress disorder, attachment and relationship problems, academic problems, cognitive issues, depression, and anxiety (Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011). It also addresses trauma processing, trust, safety, behavior, affect, and thought regulation, family communication, and parenting skills (Cohen & Mannarino, 2008; Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011). TF-CBT is designed to for trauma related to sexual abuse, traumatic grief, domestic violence, terrorism, and natural disasters (Cohen & Mannarino, 2008). TF-CBT has been modified to work in public systems (e.g. child welfare, juvenile justice, and schools) as well as special populations (e.g. military) (Cohen & Mannarino, 2008; Cohen, Mannarino, Berliner, & Deblinger, 2000; Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011).

The use of TF-CBT on young children between the ages of three to six who had been sexually abused yielded positive findings (Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie, 2011). Posttraumatic stress symptoms were most significantly reduced followed by depression, anxiety, and oppositional defiant disorder even after a six month follow up (Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie, 2011). Research also indicates that TF-CBT is useful in the treatment of posttraumatic stress disorder in children exposed to isolated traumatic events (March, Amaya-Jackson, Murray, & Schulte, 1998).

Real Life Heroes (RLF) is a resilience-based treatment that can be used in a variety of settings (Richardson, Kagan, Henry, Delorenzo, & Brophy, 2001). It specifically addresses abandonment, loss, domestic violence, disasters, medical trauma, neglect, and physical, emotional, and sexual abuse and is most suitable for complex posttraumatic stress (Kagan, 2007; Richardson, Kagan, Henry, Delorenzo, & Brophy, 2001). RLF is generally utilized in children who lack safe and stable home environments and healthy attachments to caregivers (Kagan, Douglas, Hornik, & Kratz, 2008). RLF employs several tools such as yoga, story-telling, mindfulness, multi-sensory and creative arts to restore, improve, or build relationships and affect regulation (Kagan, Douglas, Hornick, & Kratz, 2008; Kagan & Spinazzola, 2013).

A pilot study including 41 children exposed to household dysfunction, their caregivers, and clinicians assessed the effectiveness of Real Life Heroes (Kagan, Douglas, Hornik, & Kratz, 2008). After four months of exposure to the Real Life Heroes framework, children had significant reductions in behavioral issues (Kagan, Douglas, Hornik, & Kratz, 2008). After a year of treatment, children showed caregiver security and attchment improvements (Kagan, Douglas, Hornik, & Kratz, 2008).

Child-Parent Psychotherapy (CPP) integrates attachment theory, theories of development, social learning theory, psychodynamic theory, and cognitive behavioral theory to teach affect regulation, safety, relationships, and trauma responses (Lieberman, Ippen, & Van Horn, 2006; Lieberman, Van Horn, & Ippen, 2005). CPP is especially helpful when trauma has had an adverse effect on the child-parent relationship (Cicchetti, Rogosch, & Toth, 2006). It specifically addresses physical, emotional, and sexual abuse, neglect, and domestic violence (Lieberman, Ippen, & Van Horn, 2006; Lieberman, Van Horn, & Ippen, 2005). CPP has been successful utilized for treatment of refugee trauma (Cohen & Mannarino, 2010).

Many studies on CPP examined the role attachment played in childhood trauma. For example, Cicchetti, Rogosch, and Toth (2006) conducted a study on the effectiveness of CPP on mothers of emotionally neglected infants. In addition to CPP, other treatments were evaluated; psychoeducational parenting intervention and community standards and controls (Cicchetti, Rogosch, & Toth, 2006). After 12 months of treatment, mothers and infants engaged in CPP showed the most substantial increases in secure attachments (Cicchetti, Rogosch, & Toth, 2006). Findings were similar in a study involving toddlers (Cicchetti, Rogosch, & Toth, 2000; Cicchetti, Toth, & Rogosch, 1999).

Strengthening Family Coping Resources (SFCR) is whole family therapy intended to address ongoing stress and trauma such as community violence or poverty (Kiser, Donohue, Hodgkinson, & Medoff, 2010). The theoretical framework includes a multitude of approaches that can be tailored to meet family-specific needs such as family resilience theory, attachment theory, coping theory, family ritual and routine theory, and social support theory (Kiser, Donohue, Hodgkinson, & Medoff, 2010). SFCR nurtures protective factors like safety, social support and resources, crisis management, consistency, togetherness, and positive affect (Kiser, Donohue, Hodgkinson, & Medoff, 2010).

A study on the viability of SFCR among low-income, urban families found that the treatment was successful in a multifamily group format (Kiser, Donohue, Hodgkinson, Medoff, & Black, 2010). Children who were exposed to complex trauma saw reductions in posttraumatic symptoms, emotional and behavioral issues, re-experiencing, arousal symptoms, depression, anxiety, social problems, attention issues, and aggressive behaviors (Kiser, Donohue, Hodgkinson, Medoff, & Black, 2010). In a similar study on urban youth living in poverty, Kiser (2007) noted a key protective factor born of SFCR. She found that strengthening rituals and

routines within the family unit helped nurture structure and stability which reduced the risk of trauma symptoms in children living in violent communities (Kiser, 2007).

Future Considerations

A wealth of research on childhood trauma has been conducted since the ACE study. Trauma-focused assessment and treatments have been established (Steele, 2009). The mental/medical implication of ACEs has helped bridge the gap between mental health care and physical health care. However, professionals are still breaking ground on trauma assessments and treatments in special populations such as military, homeless, disabled, refugee, and lesbian/gay/bisexual/transgender (LGBT) youth (Rapporteur, et al., 2016). In addition, experts on childhood trauma are calling on child welfare and juvenile justice systems, and schools to consider the implications that childhood trauma has on health, behavior, and development by implementing trauma informed practices and protocols (Ko, et al., 2008).

Special Populations

Some of the most vulnerable members of society are often overlooked in trauma research. In addition to potential trauma exposures that all children face, military, homeless, disabled, refugee, and LGBT youth have unique challenges are at greater risk for complex trauma than the general population (Alfano, Lau, Balderas, Bunnell, & Beidel, 2016; Bostwick, 2007; Buckner, Beardslee, & Bassuk, 2004; Chambon, 1989; Goldson, 2001). Pathways to quality interventions for special populations exposed to trauma include cultural sensitivity, better accessibility to resources, encouraging positive identities, and understanding unique risk and resilience factors (Sue, Arredondo, & McDavis, 1992).

Military. There are a number of important concepts that providers treating children of military members should be mindful of, but none so important than the fact that they are always

in transition (Hall, 2008). The average military child moves six to nine times between age five and 18 (Hall, 2008). Children in military families can experience a great deal of stress related to frequent moves, but most notably, children whose caregiver(s) deploy during wartime experience the highest amount of psychological stress (Lincoln, Swift, & Shorteno-Fraser, 2008). During the conflicts in Iraq and Afghanistan alone, two million children had a caregiver that deployed, 19,000 had a caregiver wounded while serving, and over 2,200 children lost a caregiver (Chartrand, Molinda, Frank, White, & Shope, 2008; Sogomonyan & Cooper, 2010).

Compared to civilian children, military children have higher rates of academic struggles, peer and family conflicts, and mental health problems (Alfano, Lau, Balderas, Bunnell, & Beidel, 2016). In addition, research has indicated an increase in child maltreatment rates among military children of a deployed parent (Alfano, Lau, Balderas, Bunnell, & Beidel, 2016). Lastly, a 2014 study found that adverse childhood experiences (ACEs) were more common in military members than their civilian counterparts and as the ACE study illustrated, ACEs are usually intergenerational (Blosnich, Dichter, Cerulli, Batten, & Bossarte, 2014; Felitti, et al., 1998). Research into military children and trauma is just breaking ground. Professionals are calling on research with more rigorous methodologies, more longitudinal studies than can measure the long-term effects of military life on children, research that examines a more extensive range of parental and contextual influences and objective measures of stress, and most importantly, an evaluation of resilience and adaptive factors that can help facilitate trauma-informed support services (Alfano, Lau, Balderas, Bunnell, & Beidel, 2016).

Homeless. There are approximately 2.5 million homeless children in the United States (Bassuk, DeCandia, Beach, & Berman, 2014). In addition to the stressors of homelessness such as poverty and shelter life, homeless children are often deprived of the most basic needs:

nutrition, adequate clothing, health and dental care, social interactions, and sometimes adequate education (Armstrong, 2009; Samuels, Shinn, & Buckner, 2010; Wadsworth et al., 2008). They are twice as likely to suffer physical illnesses, have a learning disability, and repeat a grade as other children (Buckner, Beardslee, & Bassuk, 2004).

By the time a homeless child turns eight, they have a one and three chance of developing a mental disorder (Goodman, Saxe, & Harvey, 1991). The high rates of mental disorders in homeless children are compounded by the fact that opportunities for mental health interventions are rare (Samuels, Shinn, & Buckner, 2010). In fact, more than one-fifth of preschool aged homeless children have emotional, behavioral, and developmental issues pervasive enough to require professional treatment, but less than one-third receive intervention (Burt, et al., 1999).

Shelters have generally been recognized as having volatile environments where children are often re-traumatized so it is important for shelter workers to be able to recognize trauma symptoms in children and be prepared to refer them to appropriate services (Burt, et al., 1999). Schools have been identified as places where homeless children find comfort, stability, and support. Studies indicate that school-based interventions have improved the development of positive relationships, self-regulation, and self-control (Goodwin & Miller, 2013; Swick, 2005). It is recommended that schools who have not adopted trauma-informed interventions for homeless children start by providing environments that promote safety and hope and most importantly provide a continuum of services (Swick, 2005).

Disabled. Children with disabilities are more likely to have adverse experiences in nearly every category of complex trauma than children without disabilities (Goldson, 2001). According to one study, children with disabilities were nearly 5% more likely to suffer physical abuse and nearly 2% more likely to suffer sexual abuse than their peers (Goldson, 2001). The

majority of physical abuse perpetrators are immediate caregivers while the majority of sexual abuse perpetrators are other family members (Sullivan & Knutson, 2000). Incidents of sexual abuse against disabled children are four times more common in institutions than at home (Blatt & Brown, 1986).

Individuals with disabilities are four times more likely to be victims of crime than individuals without disabilities (Petersilia, 2001). Unfortunately, crimes against the disabled are less likely to be investigated due to processing and communication problems (Avrin, Charlton, & Tallant, 1998; Senn, 1988). Exposure to trauma is more likely to cause developmental delays in disabled children than in children without disabilities because disabled children are predisposed to certain conditions like impaired resiliency and emotional problems (Burrows & Kochurka, 1995).

The assessment and delivery of treatment for disabled individuals requires special considerations due to potential communication impairments, impairments of abstract, fluid, and flexible thought, poor generalization skills, and a generally imperviousness to ambiguity (Avrin, Charlton, & Tallant, 1998). Specific communication and behavioral difficulties that may arise in clinical settings include misunderstandings of nonverbal communications and social cues, intrusive behaviors, idiosyncratic language, a tendency to ask many questions, especially rote questions, one-sided conversations, and an inability to measure the effect their behavior has on others (Avrin, Charlton, & Tallant, 1998). Mental health professionals are advised to use slow speech - presenting concepts one at a time, visual interpretations of their spoken messages, frequently ask for feedback to assess whether the client comprehends, be specific, and most importantly, involve caregivers in treatment (Avrin, Charlton, & Tallant, 1998).

Refugees. Refugee children are faced with a different set of challenges than naturalized children, but most times trauma occurs prior to fleeing their home country (Birman & Tran, 2008). Children may have experienced torture, malnutrition, property loss, physical assault, rape, and have likely witnessed a great deal of violence and death (Birman & Tran, 2008; Hollifield, et al., 2005). The flight process can also be very traumatic for children (Hollifield, et al., 2005). Children can also suffer post-migration trauma that experts consider similar or worse than war-related trauma (Heptinstall, Sethna, & Taylor, 2004; Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997).

Common stressors for refugee children include issues related to resettlement, acculturation, and isolation (Chambon, 1989). Resettlement stress may include loss of social support, poverty, inadequate housing, and inaccessibility to resources (Chambon, 1989; Lustin, et al., 2004). Acculturation can be especially difficult for refugee children because usually they were forced to leave their home country (Fazel, Reed, Panter-Brick, & Stein, 2012). There may be language barriers that prevent them from forming relationships with peers and they have issues developing a healthy identity that encompasses both their old country and new country. Isolation can have the most adverse effects on refugee children (Fazel, Reed, Panter-Brick, & Stein, 2012). They can experience discrimination, harassment, and loss of social status (Fazel, Reed, Panter-Brick, & Stein, 2012).

Refugee children who experience trauma are likely to present with the same symptoms as other children; however, multicultural competencies are especially important when working with refugee children (Bala, Mooren, & Kramer, 2014). Culture can influence how refugees communicate their symptoms and what symptoms they report (Kleinman, 1988). Culture can also influence stigma, coping skills, social support, the type of help they seek, and even if they

seek help at all (Lustin, et al., 2004; Pumariega, Rothe, & Pumariega, 2005). It is also important to be mindful of culture-bound syndromes which are symptoms that may be more common in some cultures than others (Guarnaccia & Rogler, 1999). Lastly, due to the fact that caregivers also experienced trauma, whole family counseling is important (Chambon, 1989).

LGBT. LGBT youth are the most underrepresented in trauma research (Killen-Harvey, 2006). They are not only vulnerable to trauma that all youth may experience, but also are at increased risk for harassment, abuse, and rejection which can result in higher incidents of mental illness, suicide, and hate crimes (Bostwick, 2007; D'Augelli, Grossman, & Starks, 2006; House, Van Horn, Coppeans, & Stepleman, 2011). It is estimated that LGBT youth are 25% more likely to attempt suicide, are 84% more likely to have their life threatened, and 45% more likely to be assaulted than their peers (Bostwick, 2007; D'Augelli, Grossman, & Starks, 2006). They are also two times more likely to develop a mood or anxiety disorder, posttraumatic stress disorder, and body dysphoria disorder than their heterosexual peers (Bostwick, 2007). LGBT youth also miss considerably more days of school, are more likely to become homeless than their peers (due to being kicked out of the home), and are more likely to participate in health-risk behaviors like self-injury and drug/alcohol abuse (Bostwick, 2007; House, Van Horn, Coppeans, & Stepleman, 2011; Kann, et al., 2011).

Many mental health issues that LGBT youth experience are related to the process of developing and expressing their identity, therefore, it is important that professionals do not pressure them to “come out” (Greene, Bieschke, Perez, & DeBord, 2007). Key tenants for the successful treatment of LGBT youth include understanding the difference between being LGBT and same sex sexual encounters, inclusive terminology, providing a safe-space where the client can be vulnerable, develop competencies on sexual identity development, and connect the client

to resources where they can interact with other LGBT youth (Greene, Bieschke, Perez, & DeBord, 2007; Murphy, Rawlings, & Howe, 2002). It is also important that professionals working with LGBT youth acknowledge their client's struggles, isolation, and resilience (Greene, Bieschke, Perez, & DeBord, 2007).

Trauma-Informed Systems

A study by The National Center for Child Traumatic Stress identified several deficiencies in systems (e.g. child welfare, juvenile justice, and schools) that serve children likely exposed to trauma (Taylor & Siegfried, 2005). Of the agencies studied, most agencies did not conduct posttraumatic stress assessments on children who had experienced maltreatment (Taylor & Siegfried, 2005). Less than half of the agencies trained staff on evidence-based treatments for trauma exposure and over a third did no training on trauma assessment (Taylor & Siegfried, 2005). One third of the agencies studied never made referrals to treatment providers based on trauma assessments (Taylor & Siegfried, 2005). Interagency communication was mostly nonexistent; referring agencies seldom supplied in-depth information related to the child's history on trauma with schools being reported as the least helpful (Taylor & Siegfried, 2005).

The National Center for Child Traumatic Stress has devised a trauma-informed framework for systems working with children to consider (de Arellano, Ko, Danielson, & Sprague, 2008). These guidelines are applicable to child welfare, juvenile justice, and school systems (de Arellano, Ko, Danielson, & Sprague, 2008). Effective trauma-informed systems includes the following: routine trauma screenings, culturally competent evidence-based treatments, psychoeducation, strengthens protective and resilience factors, addresses caregiver trauma and its impact on children, and integration and continuity of care across childcare systems (de Arellano, Ko, Danielson, & Sprague, 2008).

Child Welfare. Many children placed in the child welfare system are there because they had already experienced some type of complex trauma (Pecora, Jensen, Romanelli, Jackson, & Ortiz, 2009). However, an overview of current child welfare systems indicate that few are trauma-informed with regards to training, performance, policy, assessment, and treatments (Agosti, Conradi, Halladay, & Langan, 2013). Effective trauma-informed child welfare practices include trauma knowledge building, trauma-focused assessments and treatments, case planning and management, identification of external trauma-informed services, and partnerships and collaboration with other systems (Agosti, Conradi, Halladay, & Langan, 2013).

Basic tenants of trauma knowledge building include staff training, staff coaching and support, trauma-based psychoeducation for caregivers including foster parents, and addressing secondary trauma that workers may experience when working with trauma victims (Agosti, Conradi, Halladay, & Langan, 2013). General guidelines for trauma-focused assessments and treatments include modifying assessments and treatments to meet the needs of trauma victims and sharing assessments with other providers such as pediatricians, therapists, and school counselors (Agosti, Conradi, Halladay, & Langan, 2013). Important practices involving case planning and management include providing birth parents with information about their child's placement in group homes or foster care, giving foster parents a comprehensive review of the child's trauma history, facilitating healthy relationships between foster parents and biological parents, and conducting team meetings that include all individuals directly involved in the child's life (Agosti, Conradi, Halladay, & Langan, 2013).

Examples of identifying external trauma-informed services include increasing in-house access to trauma-focused treatments and a comprehensive list of trauma-informed services in the event a child needs to be referred to a practice outside of the child welfare system (Agosti,

Conradi, Halladay, & Langan, 2013). Lastly, partnerships with other systems can create more opportunities for training (Agosti, Conradi, Halladay, & Langan, 2013). In addition, partnerships can help systems that generally do not engage in mental health treatments (such as court systems) learn about childhood trauma (Agosti, Conradi, Halladay, & Langan, 2013).

Juvenile Justice. Trauma-informed procedures and policies can make juvenile justice systems more effective by providing physical and psychological safety for all parties involved (Dierkhising, Ko, & Goldman, 2013). Trauma-informed juvenile justice systems support recovery, prevents further traumatization, and recognizes the effects that trauma has on behavior (Dierkhising, Ko, & Goldman, 2013). It is recommended that juvenile justice systems avoid practices that may further aggravate trauma symptoms such as coercion, shackling, and cuffing (Dierkhising, Ko, & Goldman, 2013). They should mandate staff psychoeducation on coping strategies and triggers (Dierkhising, Ko, & Goldman, 2013).

Children in the juvenile justice system should be afforded trauma-informed legal representation (Dierkhising, Ko, & Goldman, 2013). Effective juvenile justice systems should also provide trauma-specific treatment while considering the age, gender identification, sex, socioeconomic status, cognitive and emotional development, and culture (Dierkhising, Ko, & Goldman, 2013). Lastly, they should ensure collaboration with other agencies (Dierkhising, Ko, & Goldman, 2013).

Schools. Trauma can impact a child's ability to learn and to function effectively in a classroom environment (National Child Traumatic Stress Network Schools Committee, 2008). Often times school is a child's only safe environment where they can build relationships with compassionate individuals who can nurture their success (Cole, et al., 2006). The Flexible Framework is an outline by which to assist schools in constructing a trauma-informed and

trauma-sensitive environment (Cole, et al., 2006). The Flexible Framework includes six key elements: school wide infrastructure and culture, teacher and staff training, coordination with mental health professionals, and trauma-sensitive non-academic strategies, protocols, procedures, and policies (Cole, et al., 2006).

Educators can also help children cope with trauma by maintaining consistency, allowing students to make choices when appropriate (sometimes children feel a loss of control after a traumatic event), set limits and assert logical consequences for rule breaking, recognize trauma related behavioral issues, increase encouragement and support, be sensitive to potential triggers including anniversaries of traumatic events, and be mindful of other student's reactions to traumatized classmates (National Child Traumatic Stress Network Schools Committee, 2008). Educators can also provide safe spaces for children to discuss what has happened to them (National Child Traumatic Stress Network Schools Committee, 2008). Children should be given simple answers and educators should clarify misconceptions (National Child Traumatic Stress Network Schools Committee, 2008). Lastly, children exposed to traumatic events or living in a toxic environment may need modifications in homework such as shortened assignments and after school tutoring (National Child Traumatic Stress Network Schools Committee, 2008).

Conclusion

Since the Adverse Childhood Experiences Study (ACES), researchers have amassed in-depth studies into the consequences of toxic stress. Despite the wealth of knowledge available, high ACE scores continue to be a world-health problem, but there are success stories (World Health Organization, 2009). Arizona has established an ACE Consortium which has embarked on a successful public campaign (Stevens, 2014). Since its inception in 2006 the ACE Consortium has trained over 450 community members who offer community presentations and

workshops on ACEs (Stevens, 2014). Their first presentation reached 13,000 Arizonians (Stevens, 2014). They also offer an easy-to-understand webpage and downloadable presentations (Stevens, 2014). Because of the ACE Consortium, Arizona's largest healthcare provider now includes routine trauma screenings for families and the Arizona Department of Health Services now includes the ACE questionnaire in their Behavioral Risk Factor Surveillance System (Stevens, 2014).

Beginning in 2011, Iowa has conducted two ACE surveys with one underway and another scheduled (Stevens, 2014). The state has also hosted two ACE summits (Stevens, 2014). Walla Walla, Washington has 42 community networks working to educate the community on the consequences of ACEs (Stevens, 2014). They also launched the Children's Resilience Initiative in 2010, which raises awareness on brain development and ACEs (Stevens, 2014). Lincoln High School in Walla Walla has gained national attention for their implementation of trauma-informed training for educators (Stevens, 2014).

Inspired by the ACE study, Father Jeff Putthoff, and Dr. Jeffrey Brenner of Camden, NJ found ways to help their community utilizing their unique skill sets (Hochman, 2014). Father Putthoff founded Hopework N' Camden which is a trauma-informed GED provider and offers skills training to help youth form pathways to college and/or employment (Hochman, 2014). In 2013, Father Putthoff also hosted a trauma summit which was attended by community activists, law enforcement, clergy, and educators (Hochman, 2014). He is also working on a collaborative trauma-focused effort called Healing 10 (Hochman, 2014).

Dr. Brenner, a Camden physician, changed his entire practice to reflect biomedical information learned from the ACE study and other trauma related research (Hochman, 2014). As executive director of the Camden Coalition of Healthcare Providers (CCHP), he has

implemented routine trauma screenings in medical offices around Camden. In 2014 Father Putthoff joined forces with Dr. Brenner to train CCHP AmeriCorps volunteers (Hochman, 2014).

The implications of the ACE study continue to infiltrate communities all over the United States from trauma education for professionals in and around Philadelphia to trauma-sensitive judicial systems in Florida to the first trauma-informed city of Tarpon Springs, FL to a trauma-informed NFL (Finkel, 2014; Hochman, 2014; Stevens, 2014). Policy makers are already incorporating findings of the ACE study into legislation. Vermont has proposed a bill that will require health providers to perform ACE screenings (Till, 2014). Washington State passed legislation which developed private partnerships to further trauma-informed and resilience-building practices (ACEs Public-Private Initiative, n.d.). In 2014, California proposed a bill aimed at lowering adverse childhood experiences (Bocanegra, Bonta, Bradford, Buchanan, & Calderon, 2014). Though progress may be slow, these success stories and legislative efforts are proof that moving towards a trauma-sensitive society is critical to public health.

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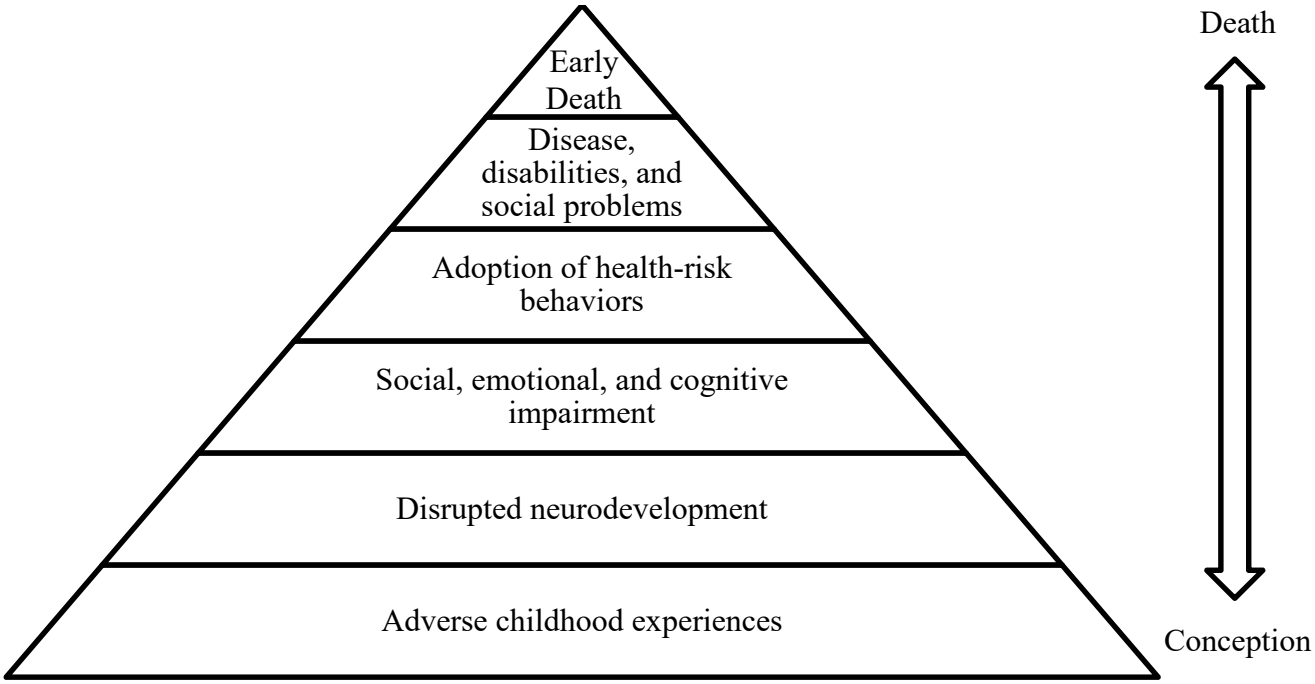

Figure 1. The ACE Pyramid. Reprinted from "Mechanism by which adverse childhood experiences influence health and well-being throughout the lifespan", by Centers for Disease Control and Prevention, n.d. Retrieved from https://www.cdc.gov/violenceprevention/acestudy/about.html

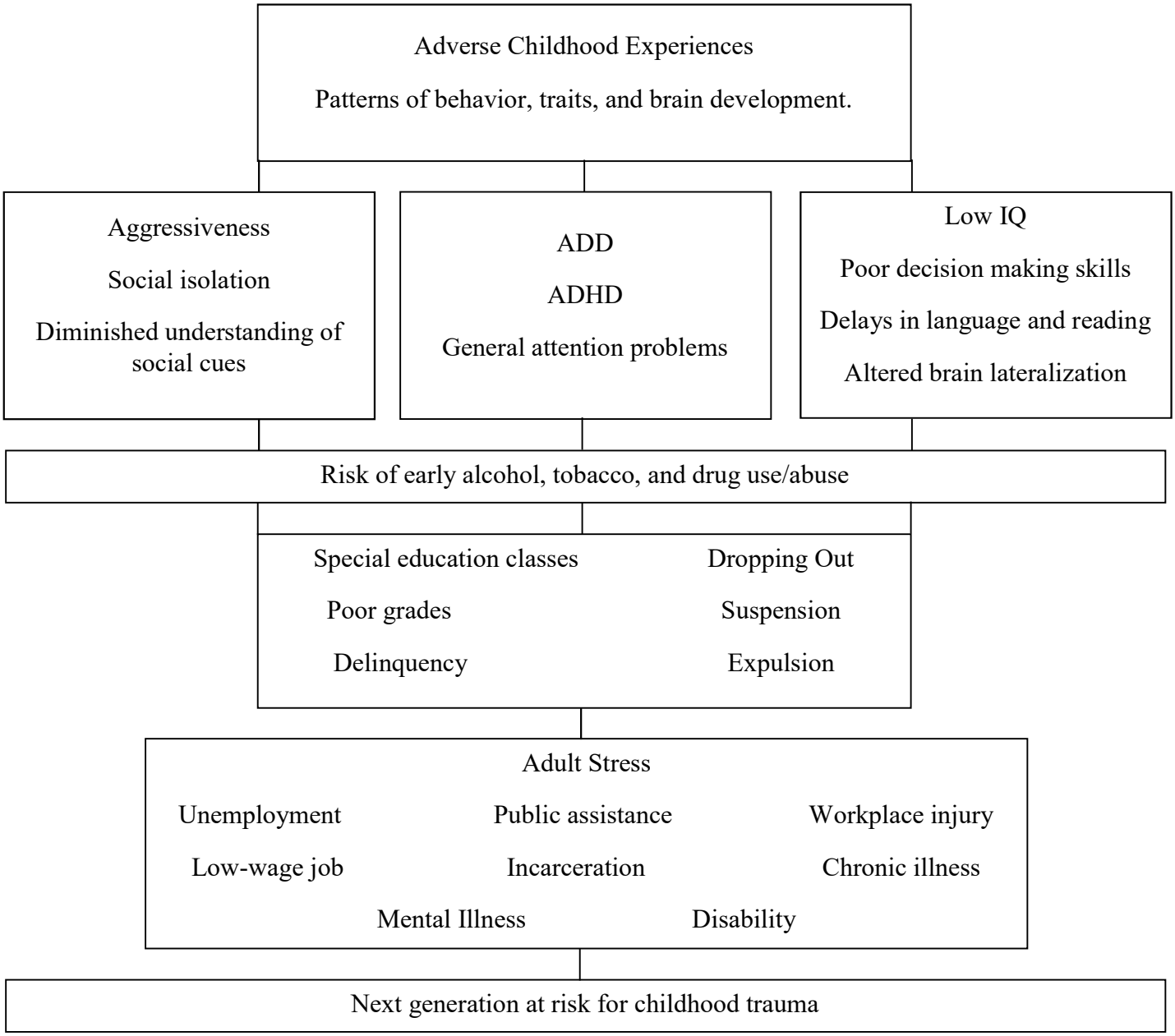

Figure 2. Pathways to poverty. Adapted from "Adverse childhood experiences: Connecting a developmental lens to the health of society – Pathways to poverty [PowerPoint slides]", by Anda, 2011. Retrieved from https://www.in.gov/dcs/files/2Dr_Anda5steps.pdf

Table 1.

Standardized Measures

Name of Measure	Domains	Targeted Age	Format	Source
Structured Interview for Disorders of Extreme Stress SIDES	Affect Dysregulation Somatization Attention/Consciousness Self-Perception Relations with Others Systems of Meaning	17-18+	Clinician-Based Interview Self-Report (SIDES-SR)	Pelcovitz et al., 1997
Structured Interview for Disorders of Extreme Stress Adolescent Version SIDES-A	Affect Dysregulation Somatization Attention/Consciousness Self-Perception Relations with Others Systems of Meaning	12-18	Clinician-Based Interview	Habib & Labruna, 2011
Child and Adolescent Needs and Strengths- Trauma Comprehensive CANS Trauma	Attachment Affect Dysregulation Behavioral Control Dissociation Biology Trauma Exposure Caregiver Functioning Strengths	3-18	Clinician Rating/Information Integration Tool	Kisiel, Fehrenbach, Small, & Lyons, 2009
Trauma Symptom Checklist for Children TSCC	Anger Anxiety Depression Dissociation Fantasy Sexual Concerns Somatic/Biology	8-16	Self-Report	Briere, 1996
Trauma Symptom Checklist for Young Children TSCYC	Traumatic Stress Somatic/Biology Anxiety/Mood	3-12	Caregiver Report	Briere et al., 2001
Youth Outcome Questionnaire YOQ – 2.01	Interpersonal Distress Somatic Concerns Interpersonal Relationships Social Problems Behavioral Control	4-17	Caregiver Report	Wells, Burlingame, Lambert, Hoag, & Hope, 1996
Youth Outcome Questionnaire Self-Report YOQ – 2.0 SR	Interpersonal Distress Somatic Concerns Interpersonal Relationships Social Problems Behavioral Dysfunction	12-18	Self-Report	Wells, Burlingame, & Lambert,1999

Name of Measure	Domains	Targeted Age	Format	Source
Children's Alexithymia Measure CAM	Affect Dysregulation	5-17	Observer Report	Way, et al., 2010
Difficulties in Emotional Regulation Scale DERS	Affect Dysregulation	18-60	Self-Report	Gratz & Roemer, 2004
Five Factor Personality Inventory for Children FFPI-C	Affect Dysregulation Behavioral Control	9-18	Self-Report	Kroes, Veerman, & De Bruyn, 2005
Minnesota Multiphasic Personality Inventory for Adolescents MMPI-A	Affect Dysregulation Somatic/Biology (Hypochondriasis and Hysteria Scales)	14-18	Self-Report	Stokes, Pogge, Sarnicola, & McGrath, 2009
Personality Inventory for Youth/ Personality Inventory for Children, Second Edition PIC-2	Affect Dysregulation Cognition Somatic/Biology	5-19	Parent Report Youth Self-Report Teacher Report	Negy, Lachar, Gruber, & Garza, 2001
Affect Intensity and Reactivity Measure for Youth AIR-Y	Affect Dysregulation	10-17	Self-Report	Jones, Leen-Feldner, Olatunji, & Hawks, 2009
Abbreviated Dysregulation Inventory ADI	Affect Dysregulation Cognitive Behavioral Control	12-18	Self-Report	Mezzich, Tarter, Giancola, & Kirisci, 2001
Attachment Questionnaire for Children AQC	Attachment	9-18	Self-Report	Muris, Vlaeyen, & Meesters, 2001
Inventory of Parent and Peer Attachment IPPA	Attachment	3	5 Story Completion Tasks	Armsden & Greenberg, 1987
Child Dissociative Checklist CDC	Dissociation	5-12	Caregiver Report	Putnam & Helmers, 1993
Adolescent Dissociative Experiences Scale A-DES	Dissociation	11-18	Self-Report	Armstrong, Putnam, Carlson, Libero, & Smith, 1997
Children's Perceptual Alterations Scale CPAS	Dissociation	8-12	Self-Report	Evers-Szostak & Sanders, 1992
Dissociative Features Profile (DFP)	Dissociation	5-17	Clinician report	Silberg, 1996
Children's Dissociative Experiences Scale & Posttraumatic Symptom Inventory CDES & PTSI	Dissociation	6-12	Self-report	Stolbach, 1997 Cloitre, et al., 2009

Name of Measure	Domains	Targeted Age	Format	Source
Children's Attributions and Perceptions Scale CAPS	Cognition	7-17	Clinician Interview	Mannarino, Cohen, & Berman, 1994
Children's Hope Scale	Cognition	8-19	Self-Report	Snyder, et al., 1997
Behavior Rating Inventory of Executive Function BRIEF	Cognition	5-18	Caregiver Report Teacher Report	Gioia, Isquith, Guy, & Kenworthy, 2000
Behavior Assessment System for Children-2 BASC-2	Cognition Behavioral Control Somatic/Biology	2 – 21	Youth Self-Report Caregiver Report Teacher Report	Kamphaus, et al., 1999
Child Behavior Checklist CBCL	Behavioral Control Affect Dysregulation Somatic/Biology Cognition	1.5-18	Caregiver Report	Achenbach, 2011
Child Sexual Behavior Inventory CSBI	Behavioral Control	2-12	Caregiver Report	Friedrich, et al., 1992
Perceived Competence Scales for Children	Behavioral Control	Not Specified	Self-Report	Harter, 1982
Piers-Harris Children's Self-Concept Scale, 2nd ed. Piers-Harris-2	Self-Concept	7-18	Self-report	Piers & Harris, 2002
Traumatic Events Screening Inventory Parent Report Revised TESI-CRF-R	Trauma Exposure/History	4-18	Caregiver Report Youth Report Interview Versions	Ippen, et al., 2002
Juvenile Victimization Questionnaire JVQ	Trauma Exposure/History	2-17	Caregiver Report Youth Report	Hamby S. L., Finkelhor, Ormond, & Turner, 2004
UCLA PTSD Reaction Index	Trauma Exposure/History (Exposure Portion) PTSD Symptoms	7-18	Caregiver Report Youth Report	Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998
Trauma History Checklist and Interview THC	Trauma Exposure/History	13 - adult	Self-Report Interview	Habib & Labruna, 2011
Dimensions of Stressful Events Rating Scale DOSE	Trauma Exposure/History	6-18	Clinician Administered	Fletcher, 1994
Parent-Child Relationship Inventory PCRI	Trauma Exposure/History	3-15	Caregiver Report	Gerard, 1994
Clinician Administered PTSD Scale for Children and Adolescents CAPS-CA	PTSD Symptoms	8-15	Clinician Administered Youth Interview	Nader, et al., 2004

Name of Measure	Domains	Targeted Age	Format	Source
Diagnostic Interview for Children and Adolescents DICA	PTSD Symptoms	6-17	Semi-Structured Interview	Reich, 2000
Family Environment Scale FES	Caregiver/Family Functioning Response to Trauma	5-11: Pictorial Adaptation 12-18+	Caregiver ReportYouth Report	Moos, 1990
Family Assessment of Needs and Strengths: Trauma Exposure and Adaptation FANS-TEA	Caregiver/Family Functioning Response to Trauma	Not Specified	Clinician Interview	Lyons, et al., 2009
Parenting Stress Index-Short Form PSI-SF	Caregiver/Family Functioning & Response to Trauma	10-12	Caregiver Report	Abidin, 1995
Parent Emotional Reaction Questionnaire PERQ	Caregiver/Family Functioning Response to Trauma	Not Specified	Caregiver Report	Cohen & Mannarino, 1996
Brief Symptom Inventory BSI	Caregiver/Family Functioning Response to Trauma	13+	Caregiver Report	Derogatis & Melisaratos , 1983
Coping Responses Inventory Youth CRI-Y	Resilience, Coping, & Strengths	12-18	Self-Report	Moos, 1993
Children's Coping Strategies Checklist CCSC	Resilience, Coping, & Strengths	9 – 13	Self-Report	Ayers, Sandler, West, & Roosa, 1996
Multidimensional Scale of Perceived Social Support MSPSS	Resilience, Coping, & Strengths	Children, adolescents, and adults	Self-report	Zimet, Dahlem, Zimet, & Farley, 1988
World Assumptions Scale WAS	Resilience, Coping, & Strengths	13+	Self-report	Janoff-Bulman, 1989
Strengths and Difficulties Questionnaire SDQ	Resilience, Coping, & Strengths	3-18+	Caregiver Report Teacher Report Youth Report	Goodman, 1997

Note. Adapted from "Standardized measures to assess complex trauma," by National Child Traumatic Stress Network, n.d. Retrieved from http://www.nctsn.org/trauma-types/complex-trauma/standardized-measures-assess-complex-trauma

Table 2

Trauma Treatment

Name of Intervention	Targeted Populations	Modality
Adapted Dialectical Behavior Therapy for Special Populations (DBT-SP)	8-21; both males and females; for youth experiencing a wide range of traumas	Individual
Alternatives for Families - A Cognitive Behavioral Therapy (AF-CBT)	School-age children; for youth experiencing a wide range of traumas	Individual and Family
Assessment-Based Treatment for Traumatized Children: Trauma Assessment Pathway (TAP)	0-18; both males and females; for children who have experienced a wide range of traumas	Individual, Family, and Systems
Attachment and Biobehavioral Catch-up (ABC)	Birth – 24 months; both males and females; for low-income families who have experienced neglect, abuse, domestic violence, placement instability	Individual and Family
Attachment, Self-Regulation, and Competence (ARC): A Comprehensive Framework for Intervention with Complexly Traumatized Youth	2-21; both males and females; for children, caregivers, and systems that have experienced a wide range of traumas	Individual, Family, and Systems
Child Adult Relationship Enhancement (CARE)	Children of all ages and their caregivers; both males and females	Family and Systems
Child and Family Traumatic Stress Intervention (CFTSI)	7-18; both males and females; for parents and children who may have complex trauma histories	Individual, Family, and Systems
Child Development-Community Policing Program	0-18+; both males and females; for children and families in the aftermath of crime and violence.	Individual, Family, and Systems
Child-Parent Psychotherapy (CPP)	0-6; both males and females; for youth who have experienced a wide range of traumas and parents with chronic trauma	Individual, Family, and Systems
Cognitive Behavioral Intervention for Trauma in Schools (CBITS)	10-15; both males and females; for children who have experienced a wide range of traumas	Individual, Family, and Systems
Combined Parent Child Cognitive-Behavioral Approach for Children and Families At-Risk for Child Physical Abuse (CPC-CBT)	4-17; both male and female; for families with a history of physical abuse and inappropriate physical discipline/coercive parenting strategies	Individual, Group, and Family
Combined TF-CBT and SSRI Treatment (2007)	10-18; females	Individual and Family
Community Outreach Program (COPE)	4-18; both males and females; for traumatized children who are presenting with behavior or social-emotional problems	Individual and Family
Culturally Modified Trauma-Focused Treatment (CM-TFT)	4-18; both males and females; Latino/Hispanic; for youth who have experienced a wide range of traumas	Individual and Family
Family Advocate Program	18-70; both males and females; for youth who present with anxiety, depression, PTSD symptoms, and/or traumatic loss	Family
Forensically-Sensitive Therapy	4-17; predominantly female; for youth presenting problems ranging from anxiety and depression to risk-taking behaviors and functional impairment. Program is designed for a mental health clinic.	Individual and Family
Group Treatment for Children Affected by Domestic Violence	5-no upper limit; both males and females; for children and their nonoffending parents who have been exposed to DV	Individual, Family, and Systems
Honoring Children, Making Relatives	3-7; both males and females; for American Indian and Alaska Native children	Individual and Family
Honoring Children, Mending the Circle	3-18; both males and females; for American Indian and Alaska Native children	Individual
Honoring Children, Respectful Ways	3-12; both males and females; for American Indian and Alaska Native children	Individual

Name of Intervention	Targeted Populations	Modality
Integrative Treatment of Complex Trauma (ITCT-C, ITCT-A)	2-21; both males and females; for Hispanic-American, African-American, Caucasian, Asian-American; for youth who may have complex trauma histories	Individual, Family, and Systems
International Family Adult and Child Enhancement Services (IFACES)	6-12; both males and females; for refugee and immigrant children who have experienced trauma as a result of war or displacement	Individual
Let's Connect (LC)	3-15; both males and females; for children who have experienced a wide range of traumas	Individual and Family
Parent-Child Interaction Therapy (PCIT)	2-12; both males and females	Individual, Family, and Systems
Problematic Sexual Behavior-Cognitive-Behavioral Therapy for School-Age Children (PSB-CBT-S)	7-12; both males and females; for children with problematic sexual behavior may or may not have a history of trauma	Individual, Family, and Systems
Psychological First Aid (PFA)	0-120; both males and females; for individuals immediately following disasters, terrorism, and other emergencies	Individual
Real Life Heroes (RLH)	6-12, plus adolescents (13-19) with delays in social, emotional or cognitive functioning; both males and females; for children who have experienced a wide range of traumas	Individual, Family, and Systems
Risk Reduction through Family Therapy (RRTF)	13-18, both males and females; for adolescents and family; primary trauma type is childhood sexual abuse/sexual assault	Family
Safe Harbor Program	6-21; both males and females; provided in schools for children and adolescents exposed to trauma and violence who may present with a range of problems and symptoms	Individual, Group, and Family
Safety, Mentoring, Advocacy, Recovery, and Treatment (SMART)	3-11; both males and females; to date the model has been effectively used with primarily African-American children; majority of families are low income	Individual, Family, and Systems
Sanctuary Model	4-no upper limit; both males and females; evidence-supported template for system change based on the active creation and maintenance of a nonviolent, democratic, productive community to help people heal from trauma	Systems
Sanctuary Model Plus (IRIS Project)	Children and adolescents placed in residential treatment centers and their families	Group and Systems
Skills for Psychological Recovery (SPR)	5-120; both males and females	Individual and Family
Skills Training in Affective and Interpersonal Regulation/Narrative Story-Telling (STAIR/NST)	12-21; for females who have experienced sexual/physical abuse and a range of additional traumas, including community violence, domestic violence, and sexual assault	Individual and Group
Southeast Asian Teen Village	adolescents; females, Southeast Asian (mostly Hmong)	Group
Streetwork Project	13-23; both males and females; harm reduction program good with a wide variety of ethnic/racial groups, religious group, and the LGBTQ community	Individual, Group, and Systems
Strengthening Family Coping Resources (SFCR)	0-no upper limit; both males and females; for families experiencing economic hardship	Family
Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS)	12-21; both males and females; for adolescents with Complex Trauma, e.g. adolescents exposed to chronic interpersonal trauma (such as ongoing physical abuse) and/or separate types of trauma (e.g. community violence, sexual assault).	Group
Trauma Adapted Family Connections (TA-FC)	0-18; both males and females; who reside in the household; families experiencing complex development trauma, at risk of neglect	Individual, Group, and Family

Name of Intervention	Targeted Populations	Modality
Trauma Affect Regulation: Guide for Education and Therapy (TARGET)	10-18+; both males and females; for children and caregivers experiencing traumatic stress; very frequently with single parents or with families whose children have limited contact with biological parents (e.g., foster kids, residential placements), and diversity of religious affiliations	Individual, Family, Group, and Systems
Trauma and Grief Component Therapy for Adolescents (TGCT-A)	12-20; both males and females; for trauma-exposed or traumatically bereaved older children and adolescents	Individual, Family, Group, and Systems
Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)	3-21; both males and females; for children with Posttraumatic Stress Disorder (PTSD) or other problems related to traumatic life experiences, and their parents or primary caregivers	Individual and Family
Trauma-Focused Coping in Schools (TFC) (AKA: Multimodality Trauma Treatment Trauma-Focused Coping-MMTT)	6-18; both males and females; for children exposed to single incident trauma and targets posttraumatic stress disorder (PTSD) and collateral symptoms of depression, anxiety, anger, and external locus of control	Individual and Group
Trauma-Informed Organizational Self-Assessment	6-19; both males and females; for children who have experienced a wide range of traumas	Individual, Family, and Systems
Trauma Systems Therapy (TST)	6-19; both males and females; for youth who have experienced a wide range of traumas	Systems
Trauma Systems Therapy for Refugees (TST-R) (2016) (PDF)	10-18; both males and females; newly arriving, recently resettled, and established refugee youth and communities	Systems

Note. Reprinted from "National Child Traumatic Stress Network empirically supported treatments and promising practices", by National Child Traumatic Stress Network, n.d. Retrieved from http://www.nctsn.org/resources/topics/treatments-that-work/promising-practices