

Traumatic Stress:
Risk and Resiliency Factors

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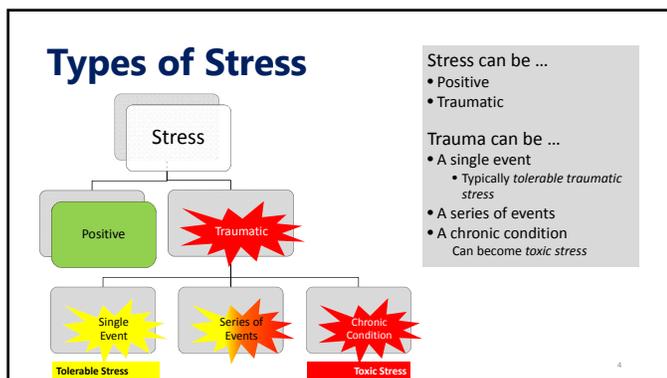
SACRAMENTO STATE
Realize the Possible

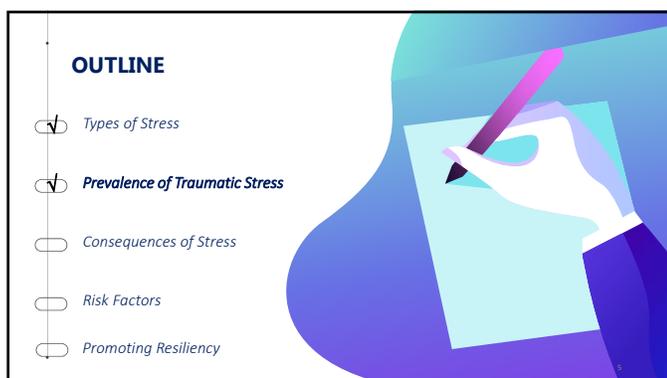
Workshop Description/Objective

Tragically many of our nation's school aged youth are exposed to acute and chronic traumatic stress. This exposure can have profound effects on multiple domains of a student's functioning. However, not all youth exposed to a common traumatic stressor are equally affected. This workshop explores those variables that serve as risk and vulnerability factors. **From this workshop it is anticipated that participants will gain understanding of how to promote resiliency among traumatized youth and how to identify those at risk for significant traumatic stress.**

OUTLINE

- Types of Stress
- Prevalence of Traumatic Stress
- Consequences of Stress
- Risk Factors
- Promoting Resiliency





Prevalence of Traumatic Stress

| | |
|----------------------------|------------------------------|
| • General Population | |
| ➤ Trauma Exposure | 43% (18 yr. olds) |
| ➤ PTSD Lifetime Prevalence | 8.7% (U.S.) |
| ➤ PTSD 12 month Prevalence | 3.5% (U.S.) |
| • Urban Populations | |
| ➤ Trauma Exposure | 82.5% (19-24 yr. olds, U.S.) |
| ➤ PTSD | 30% |
| • Foster Youth | |
| ➤ Trauma Exposure | 80.3% (17-18 yr. olds) |
| ➤ PTSD | 30% |

Prevalence of Traumatic Stress



Statistically significant decreases in students' cognitive performance scores the week following a homicide that occurred on their block (regardless of connection to victim) McCoy et al. (2015)

How many weeks during the year would students at your schools be affected?

<http://www.crimemapping.com>

OUTLINE

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Consequences of Traumatic Stress

Adverse Childhood Experiences



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    graph TD
      ACEs[ACEs] --> Neurobiology[Affects Neurobiology]
      Neurobiology --> Social[Results in Social, Emotional, Cognitive Impairment]
      Social --> RiskBehaviors[Increased Health Risk Behaviors]
      RiskBehaviors --> Problems[Disease, Disability, Social Problems]
      Problems --> EarlyDeath[Early Death]
  
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1. Emotional Abuse
2. Physical Abuse
3. Sexual Abuse
4. Physical Neglect
5. Emotional Neglect
6. Substance using Household Member
7. Mentally Ill Household Member
8. Witnessed Domestic Violence
9. Incarcerated Family Member

Felitti et al. (1998)

Consequences of Traumatic Stress

Psychological

- Increased risk for mental illness
 - Depressive disorders
 - Anxiety disorders (e.g., specific phobia, social anxiety disorder, panic disorder)
 - Trauma- and stressor-related disorders (i.e., disinhibited social engagement disorder, posttraumatic stress disorder, acute stress disorder, adjustment disorders)
 - Dissociative disorders (e.g., dissociative identity disorder, dissociative amnesia, depersonalization/derealization disorder)
 - Sleep-wake disorders (e.g., insomnia disorder, nightmare disorder)
 - Substance-related and addictive disorders

APA (2013); Brock et al. (2016)

Consequences of Traumatic Stress

Psychological

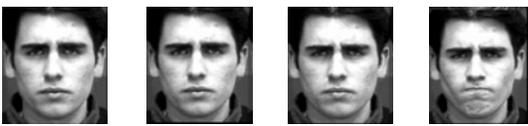
- Disturbed sleep
- Alcohol and drug use
- Avoidant behavioral responses
- Fearfulness
- Self-blame
- Decreased self-efficacy

Coolley-Quille & Lorion (1999); Kliever & Sullivan (2008); Margolin & Gordis (2000)

Consequences of Traumatic Stress

Psychological

- Affects how the brain processes information.
- What emotion do you see?



- Physically abused children recognized anger sooner than did controls (who had not been abused).

Pollak et al. (2009)

Consequences of Traumatic Stress

Psychological

- Affects how the brain processes information
"... maltreatment may sensitize children to certain emotional information that may be adaptive in abusive contexts but maladaptive in more normative interpersonal situations."

Pollak et al. (2009, p. 6)

Consequences of Traumatic Stress

Psychological

- Behavioral and school adjustment difficulties
 - ↑ Trauma exposure = ↑ Problem behaviors
 - Attachment difficulties
 - Skipping school
 - Running away from home
 - Substance abuse
 - Suicidality
 - Criminality
 - Self-injury
 - Alcohol use
 - Victim of sexual exploitation

Layne et al. (2014)

Consequences of Traumatic Stress

Behavioral/School Adjustment

- Stress can be adaptive

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Consequences of Traumatic Stress

Behavioral/School Adjustment

- Complex, chronic or toxic stress can be damaging

Body returns to baseline (homeostasis) when threat discontinues

Adrenaline & cortisol prepare the body to respond

Traumatic Stress and Perceived Threat

Fight, Flight, or Freeze

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Consequences of Traumatic Stress

Behavioral/School Adjustment

- Problems focusing/concentrating (Compas & Boyer, 2001; Pynoos & Nader, 1998; Traweek, 2006)
- Poor social functioning (Rucklidge, 2006)
- Outbursts of anger, hyperactivity, impulsivity (Glod & Teicher, 1996)

“... when this stress exposure occurs repeatedly or in the context of high social biological vulnerability, children begin to experience a ‘wear and tear’ process known as allostatic load. Allostatic load is characterized by less activation in brain regions like the prefrontal cortex that are responsible for reflective self-regulation and sustained attention and increased activation in regions of the limbic system that are associated with automated, emotion-related responses to threat.” (McCoy et al., 2015, p. 3)

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Consequences of Traumatic Stress

Behavioral/School Adjustment

- Persistent fear response
 - May lose ability to differentiate between danger and safety, may identify a treat in a nonthreatening environment
- Hyperarousal
 - Highly sensitive to nonverbal cues, such as eye contact or a touch on the arm. Consumed with a need to monitor nonverbal cues for threats. Less able to interpret and respond to verbal cues, even when in a nonthreatening classroom environment. Often labeled as learning disabled because their brains have developed so that they are constantly on alert and are unable to achieve the relative calm necessary for learning.

Child Welfare Information Gateway (2015)

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Consequences of Traumatic Stress

Behavioral/School Adjustment

- Weakened response to positive feedback
- Complicated social interactions
 - Alterations to brain functioning can make interaction with others difficult.
 - May perceive threats in safe situations and react accordingly.

Child Welfare Information Gateway (2015)

Consequences of Traumatic Stress

Neurobiological

Child Welfare Information Gateway (2015)

Consequences of Traumatic Stress

Neurobiological

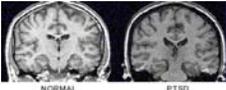
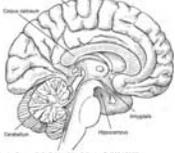
- **Hippocampus:** Central to learning and memory. Maltreatment reduces hippocampus volume. Toxic stress reduces this brain region's capacity to bring cortisol levels back to normal after a stressful event
- **Corpus callosum:** Responsible for inter-hemispheric communication. Maltreatment results in decreased volume of this brain structure
- **Cerebellum:** Helps to coordinate motor behavior and executive functioning. Maltreatment results in decreased volume of this brain structure

Child Welfare Information Gateway (2015)

Consequences of Traumatic Stress

Neurobiological

- **Prefrontal cortex:** Critical to behavior, cognition, emotional regulation. Severe neglect results in a smaller prefrontal cortex
- **Amygdala:** Helps to determine if stimuli are threatening and triggers emotional responses. Maltreatment, abuse and neglect can cause over activity in this brain region
- **Cortisol levels:** Severe maltreatment results abnormal cortisol levels causes the body to react differently to stress.

Child Welfare Information Gateway (2015)

Credit: Taylor, S. F., Cohen, L., & Zeanah, C. (2004). PTSD, Alcohol and the adolescent brain. *Neuroscience Bulletin*, 28(2), 209-212.

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Consequences of Traumatic Stress

How Childhood Trauma Affects Health Across a Lifetime

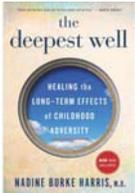
Nadine Burke Harris TED-MED: <https://www.youtube.com/watch?v=95ovI3dsNk>



Consequences of Traumatic Stress

An accessible and informative treatment of toxic stress

Burke Harris, N. (2018). *The deepest well: Healing the long-term effects of childhood adversity*. New York, NY: Houghton Mifflin Harcourt.

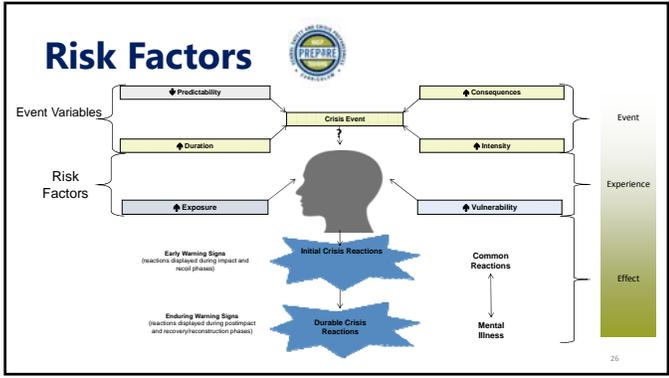


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OUTLINE

- ✓ Types of Stress
- ✓ Prevalence of Traumatic Stress
- ✓ Consequences of Stress
- ✓ Risk Factors
- Promoting Resiliency





Risk Factors

Pretrauma internal vulnerability

1. Preexisting physical and psychological illness
2. Trauma history (e.g., ACEs)
3. Avoidance coping
4. Social withdrawal
5. Lower developmental level
6. Poor self-efficacy
7. High psychophysiological arousal
8. Pessimism



Risk Factors

Pretrauma external vulnerability

- Lack of family support and resources
 - Absence of family resources
 - Poor family functioning
 - Parental traumatic stress
 - Family history of PTSD
 - Parental mental illness
 - Poverty
- Lack of extrafamilial social resources
 - Social isolation
 - Low social support
 - Lack of perceived social support
 - Bias and discrimination



Social isolation linked with higher risk of death!!
<https://psychcentral.com/news/2018/11/17/social-isolation-linked-to-higher-risk-of-death/140458.html>

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Risk Factors

| | Low Risk | Moderate Risk | High Risk |
|---|--|---|--|
| Physical Proximity | <input type="checkbox"/> Out of vicinity of crisis site | <input type="checkbox"/> Present on crisis site | <input type="checkbox"/> Crisis victim or eye witness |
| Emotional Proximity | <input type="checkbox"/> Did not know victim(s) | <input type="checkbox"/> Friend of victim(s) <input type="checkbox"/> Acquaintance of victim(s) | <input type="checkbox"/> Relative of victim(s) <input type="checkbox"/> Best friend of victim(s) |
| Internal Vulnerabilities | <input type="checkbox"/> Active coping style <input type="checkbox"/> Mentally healthy <input type="checkbox"/> Good self-regulation of emotion <input type="checkbox"/> High developmental level <input type="checkbox"/> No trauma history | <input type="checkbox"/> No clear coping style <input type="checkbox"/> Uncertainty about previous mental health <input type="checkbox"/> Some difficulties with self-regulation of emotion <input type="checkbox"/> Appearance of instability at times <input type="checkbox"/> Trauma history | <input type="checkbox"/> Avoidance coping style <input type="checkbox"/> Preexisting mental illness <input type="checkbox"/> Poor self-regulation of emotion <input type="checkbox"/> Low developmental level <input type="checkbox"/> Significant trauma history |
| External Vulnerabilities | <input type="checkbox"/> Living with intact nuclear family members <input type="checkbox"/> Good parent-child relationship <input type="checkbox"/> Good family functioning <input type="checkbox"/> No parental traumatic stress <input type="checkbox"/> Good social resources | <input type="checkbox"/> Living with some nuclear family members <input type="checkbox"/> Parent-child relationship at times strained <input type="checkbox"/> Family functioning at times challenged <input type="checkbox"/> Some parental traumatic stress <input type="checkbox"/> Social resources/relations at times challenged | <input type="checkbox"/> Not living with any nuclear family members <input type="checkbox"/> Poor parent-child relationship <input type="checkbox"/> Poor family functioning <input type="checkbox"/> Significant parental traumatic stress <input type="checkbox"/> Poor or absent social resources |
| Immediate Reactions During the Crisis | <input type="checkbox"/> Remained calm during the crisis event | <input type="checkbox"/> Displayed mild to moderate distress during the crisis event | <input type="checkbox"/> Displayed acute distress (e.g., fight, panic, dissociation) during the crisis event |
| Current or Ongoing Reactions and Coping | <input type="checkbox"/> Only a few common crisis reactions displayed <input type="checkbox"/> Coping is adaptive (i.e., it allows daily functioning at previous levels) | <input type="checkbox"/> Many common crisis reactions displayed <input type="checkbox"/> Coping is tentative (e.g., the individual is unsure about how to cope with the crisis) | <input type="checkbox"/> Mental health referral indicators displayed (e.g., acute dissociation, hyperarousal, depression, psychosis) <input type="checkbox"/> Coping is absent or maladaptive (e.g., suicidal or homicidal ideation, substance abuse) |
| Total: | | | |

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OUTLINE

-  Types of Stress
-  Prevalence of Traumatic Stress
-  Consequences of Stress
-  Risk Factors
-  Promoting Resiliency



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Promoting Resiliency

Universal Interventions

- Promote school safety
 - > Keep the school as the 6 hours during the day when the student is free of the ongoing stressor.
 - Interrupt hyperarousal and the stress response
 - > Remove students from dangerous or harmful situations.
 - > Practice disaster/crisis response procedures (e.g., evacuations, lockdowns).
 - Give students some control over crises that impact the school
 - Students know how to keep themselves safe



Brock et al. (2016)

Promoting Resiliency

Universal Interventions

- Bolster External Supports
 - > Facilitate school connectedness and engagement
 - Taking "[Every Opportunity](#)"
 - > How might you facilitate connectedness at your school?



Brock et al. (2016)

Promoting Resiliency

Universal Interventions

- Bolster External Supports
 - > Support families
 - Provide parent education and appropriate social services
 - > Facilitate peer relationships
 - > Provide access to positive adult role models
 - > Ensure connections with pro-social institutions



Brock et al. (2016)

Promoting Resiliency

Universal Interventions

- Bolster Internal Supports: Mindfulness
 - > Mindful schools (K-12) www.mindfulschools.org
 - > Mindful Life Project <http://mindfullifeproject.org>
 - > Learning to Breathe: <http://learningtobreathe.org>
 - > MindUP: (preK-8) www.thehawndfoundation.org
 - > Still Quiet Place (K-12) www.stillquietplace.com
 - > Stressed Teens (13-18yo) www.stressteens.com



Brock et al. (2016)

Promoting Resiliency



Brock et al. (2016)

Promoting Resiliency

Universal Interventions

- Bolster Internal Supports: SEL Curriculum
 - 2013 CASSEL GUIDE
 - <https://casel.org>
 - Effective Social and Emotional Learning Programs
 - Pre-K and Elementary School Edition
 - Contents



CASEL (2013): <http://casel.org/wp-content/uploads/2013/01/2013-casel-guide-1.pdf>

Promoting Resiliency

Universal Interventions

- What are you doing in your schools (on a school wide basis) to promote resiliency?
- Small group discussion
- Large group sharing



Brock et al. (2016)

Promoting Resiliency

Selected Interventions

- Bolster Internal Supports
 - Psychological education
 - Practical safety tips
 - Make the ongoing stressor more controllable
 - Education regarding hyperarousal's adaptive function
 - Physical and emotional consequences of chronic (uninterrupted) hyperarousal
 - Education regarding the symptoms of traumatic stress
 - Help students to understand why they are reacting as they are

Promoting Resiliency

Selected Interventions

- Bolster Internal Supports
 - Psychological education
 - Interrupt/Stop hyperarousal
 - Apps that support mindfulness and relaxation.



Brock et al. (2016)

Promoting Resiliency

Selected Interventions

- What are you doing in your schools (on a selected basis) to promote student resiliency?
- Small group discussion
- Large group sharing



Brock et al. (2016)

Promoting Resiliency

Targeted Interventions

- Counseling
 - > Individual or group?
 - Will it be part of the IEP as a Designated Instructional Service (DIS)?
 - Goal(s)...Education, Coping skills, Social skills, decreasing suicidal ideation/behaviors, substance use



Brock et al. (2016)

Promoting Resiliency

Targeted Interventions

- *C-BITS: Cognitive Behavioral Interventions for Trauma in Schools*
 - > Teaches six cognitive-behavioral techniques:
 - Education about reactions to trauma
 - Relaxation training
 - Cognitive therapy
 - Real life exposure
 - Stress or trauma exposure
 - Social problem-solving
 - > Includes two parent education sessions and one teacher education.
 - > Average = 10 sessions
 - > Reduces symptoms of PTSD depression, behavior problems

<http://www.pandora.org/health/trauma/cbits/>
<http://www.socis.com/erh/summaries/cbits/ced04.htm>
 Jaycox et al. (2010) Free online training: <https://cbitsprogram.org/>



Promoting Resiliency

Targeted Interventions

- What are you doing in your schools (on a targeted basis) to promote student resiliency?
- Small group discussion
- Large group sharing



Brock et al. (2016)

Promoting Resiliency

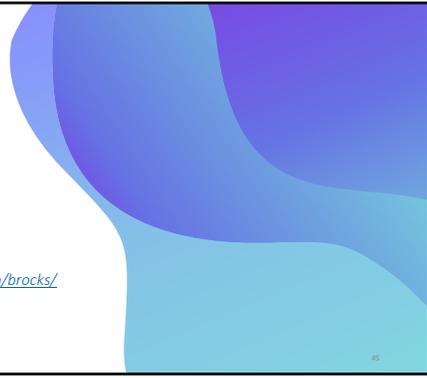
An accessible and informative treatment of resilience

Matsten, A. S. (2014). *Ordinary magic: Resilience in development*. New York, NY: Guilford.




Thank You!

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Vulnerability Factors That Increase the Probability of Psychological Trauma¹

Whereas physical proximity addresses where students were at the time of a crisis, and emotional proximity reflects whether students knew someone involved in a crisis, personal vulnerabilities address *who the student is* at the time of the crisis. Though not considered to be as important to the development of traumatic stress as crisis exposure (Trickey, Siddaway, Meiser-Stedman, Serpell, & Field, 2012), internal and external vulnerability factors have been suggested to increase the probability of psychological trauma. For example, from a systematic literature review, DiGangi et al. (2013) state:

[T]he conclusions of these 54 studies suggest that not all negative aspects of trauma are outcomes of it; rather these studies suggest that certain factors predispose individuals to PTSD. The major conclusion of this review is that many factors, historically thought to be consequences of trauma, are most likely risk factors for PTSD. More specifically, some studies suggest that the very symptoms of PTSD are, in fact, not symptoms of an index trauma, but may play a causal role in its etiology. (p. 742)

Although crisis exposure variables are specific to the crisis situation, personal vulnerabilities are general risk factors that are applicable to all situations, not just the crisis event. This discussion separates personal vulnerability into two general risk classes: internal and external.

Internal Vulnerability Factors

A number of internal vulnerability factors can increase a student's psychological trauma risk. The first has its origins in the children's coping literature, which makes distinctions between active (or approach) and avoidance coping strategies (Ayers, Sandler, West, & Roosa, 1996; Ebata & Moos, 1994). Active coping strategies are direct and deliberate actions aimed at solving crisis-generated problems. Avoidance coping, on the other hand, involves thoughts and actions that attempt to focus away from a stressful situation, that is, to stop thinking about or dealing with the stressor (Sandler, Wolchik, MacKinnon, Ayers, & Roosa, 1997). This latter type of coping behavior is consistently associated with a greater incidence of mental illness.

However, in extremely high-stress situations, some initial avoidance coping responses are adaptive. For example, in the instance of an individual who is held up at gunpoint in the parking lot of a local shopping center, the victim, after giving his wallet to the robber, calmly gets into his car and drives home. However, the moment he walks in the door, he breaks down, cries, and begins to feel distressed. In this instance, avoidance coping can be seen as having bought the individual time to get to a place where he was physically and emotionally safe and could confront a frightening reality. Nevertheless, it is clear that individuals who continue to employ avoidance coping as a longer-term problem-solving strategy are more likely to have a poorer mental health outcome (Dawson et al., 2014; Deković, Koning, Stams, & Buist, 2008; DiGangi et al., 2013; Gil & Caspi, 2006; Krause, Kaltman, Goodman, & Dutton, 2008). Consistent with this observation, a meta-analysis conducted by Trickey et al. (2012) suggests avoidance coping as being a powerful vulnerability factor for children and adolescents. Specifically, thought suppression, the blaming of others for something bad happening, and distractions were among the coping styles with the largest effect sizes for predicting traumatic stress.

Silver, Holman, McIntosh, Poulin, and Gil-Rivas (2002), in their nationwide longitudinal study of psychological responses to 9/11, made the point that several coping strategies, particularly those involving denial or disengagement from coping, related to higher levels of distress 6 months after the event. In contrast, active coping strategies, such as accepting the event, were associated with less long-term stress. Similarly, Stallard and Smith (2007) found that children's cognitive coping style was a significant predictor of posttraumatic stress 8 months following a traffic accident.

¹ Adapted from *School Crisis Prevention and Intervention: The PREPaRE Model* (2nd ed.; p. 20-208), by S. E. Brock et al., 2016, Bethesda, MD: NASP. Copyright 2016 by the National Association of School Psychologists.

Finally, two other types of avoidance coping—state (i.e., situation-specific) and trait (i.e., typical)—are associated with an increased risk for posttraumatic stress disorder (PTSD; Dempsey, Overstreet, & Moely, 2000; Gil & Caspi, 2006) and indicate a greater need for crisis intervention support (Gil, 2005). Regarding how such coping may affect traumatic stress, Dempsey et al. (2000) speculated that the use of avoidance coping strategies impedes children's ability to understand and integrate crises or prevent the habituation to recurrent trauma-related thoughts.

The second internal vulnerability factor is the individual's baseline physical and mental health (Deković et al., 2008; McDermott, Duffy, Percy, Fitzgerald, & Cole, 2013; Ozer, Best, Lipsey, & Weiss, 2003; Perrin et al., 2014). Mentally healthy individuals are better able to cope with crises than those with preexisting mental illness (Busso, McLaughlin, & Sheridan, 2014). Both Trickey et al.'s (2012) meta-analysis and DiGangi et al.'s (2013) systematic review of the literature identify pretrauma psychopathology (including anxiety, conduct problems, and depression) as being associated with an increased risk of traumatic stress. Not surprisingly, a prior diagnosis of PTSD was one of the strongest predictors of current symptoms (Trickey et al., 2012). Similarly, Gil-Rivas, Holman, and Silver (2004) reported that a history of mental health disorders was associated with increased reports of high levels of 9/11-related acute trauma symptomatology. Furthermore, these acute symptoms signaled greater risk for higher levels of longer-term symptomatology.

In addition to poor mental health, emerging evidence suggests that poor physical health may also be associated with the development of traumatic stress. Specifically, in a retrospective cohort study of adults who were physically proximal to the March 2011 Great East Japan Earthquake, Momma et al. (2014) report that measures of predisaster lifestyle (drinking) and physical functioning (hypertension and lower leg extension power) were associated with self-reported symptoms of traumatic stress.

The third internal vulnerability factor is a tendency toward social withdrawal. Provision of social supports is arguably the most powerful of the mental health crisis interventions. Consequently, it is not surprising that withdrawal from this helpful resource is a predictor of traumatic stress (Trickey et al., 2012).

The fourth factor is having a history of prior traumatization (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993; Breslau, 1998; Brewin, Andrews, & Valentine, 2000; Hoven et al., 2004; Imanaka, Morinobu, Toki, & Yamawaki, 2006; Möhlen, Parzer, Resch, & Brunner, 2005; Nader, Pynoos, Fairbanks, & Frederick, 1990; Nemeroff, 2004; Nemeroff et al., 2006; Olff, Langeland, & Gersons, 2005; Ozer et al., 2003; Trickey et al., 2012; Ying, Wu, Lin, & Chen, 2013). Particularly when combined with pretrauma anxiety and depression, prior exposure to violence is predictive of traumatic stress (Busso et al., 2014). According to Yehuda and Hyman (2005), "it may be that the real consequence of terrorism in children is to create a basis for risk for psychopathology in response to subsequent trauma exposure" (p. 1777).

Some literature suggests that individuals who have adaptively coped with stressful events, such as natural disasters, might be better able to cope with future traumas (Adams et al., 2014; Kilmer, 2006; Meyerson, Grant, Carter, & Kilmer, 2011). However, this result may not be the case for all crises, especially when an individual has had a high level of exposure to an extreme stressor, such as sexual assault (Lecic-Tosevski, Gavrilovic, Knezevic, & Priebe, 2003; Shakespeare-Finch & Lurie-Beck, 2014).

Children who have experienced repeated traumatic stressors, especially child abuse and neglect, are more likely to have traumatic stress reactions, disassociate, and display mood swings than single-incident trauma survivors (Terr, 1991; Vásquez et al., 2012; Widom, 1999). In explaining how trauma history serves as a risk factor for traumatic stress, Olff et al. (2005) suggested that these experiences can adversely affect the development of coping skills and that they promote a heightened automatic response to stress.

Research conducted by Galea et al. (2002) highlights the importance of assessing trauma history. For example, a phone survey of Manhattan Island residents, conducted several weeks after the World Trade Center attacks, found that among individuals who had no prior trauma history, only 4.2% reported symptoms of traumatic stress. By contrast, among individuals with two or more significantly stressful

events in their personal histories, 18.5% reported PTSD symptoms. In addition, among those with no trauma history, only 5.6% reported symptoms of depression, whereas 24.1% of those with two or more stressful events reported such symptoms. It is especially important to identify individuals who have experienced prior crises that are similar to the current crisis event. Supporting this observation, Nader et al. (1990) reported that a school shooting was more traumatic for youth who had previously been the victims of violent acts such as child abuse.

The fifth internal vulnerability factor is having low developmental or cognitive levels of functioning. Once an event is judged to be threatening, with all other factors held constant, low developmental level predicts psychological trauma (Applied Research and Consulting et al., 2002; Banks & Weems, 2014; Hoven et al., 2004; King, King, Foy, & Gudanowski, 1996; Schwarz & Kowalski, 1991; Silva et al., 2000; Singer, Flannery, Guo, Miller, & Leibbrandt, 2004). This greater vulnerability of younger children and developmentally delayed youth is likely due to several factors, including (a) a relative lack of coping experience and skills (Boymyea, Risbrough, & Lang, 2012); (b) perception, understanding, and memory of the event; (c) susceptibility to parental distress (Caffo & Belaise, 2003); (d) a smaller social support network; and (e) less well developed emotional regulation (Lonigan, Phillips, & Richey, 2003). In addition to chronological age, relative cognitive ability is related to risk for PTSD among trauma-exposed individuals. For example, Silva et al. (2000) reported that higher IQ was associated with lower severity of PTSD symptoms following exposure to traumatic stressors (i.e., experiencing war, witnessing violence, or being sexually abused). Conversely, small but significant associations between low IQ and greater risk for traumatic stress has been identified (DiGangi et al., 2013; Trickey et al., 2012). Poor executive functioning has also been suggested to be a risk factor for traumatic stress (Boymyea et al., 2012).

Although lower developmental level is generally a risk factor for psychological trauma, there is an exception to this rule. As Stallard and Salter (2003) have observed, children under the age of 11 years “may not, however, have the necessary knowledge or level of cognitive development to understand the degree of threat or potential implications posed by the trauma” (p. 451). Groome and Soureti (2004) further reported that, following the 1999 Athens earthquake in the district closest to the earthquake, younger children had higher scores on measures of PTSD and anxiety. However, in the district farthest away from the earthquake, older children had the highest scores on these measures. In interpreting these results, Groome and Soureti suggested that although the younger children who were closer to the earthquake had more symptoms because of fewer coping strategies (among other factors), older children who were more distant from the earthquake had more symptoms because of a greater understanding of the event.

The sixth internal vulnerability factor is a poor sense of self-efficacy (Trickey et al., 2012). Specifically, Boymyea et al. (2012) report that beliefs about oneself, including feelings of limited worth and ability to cope with the crisis are associated with greater PTSD symptoms. Related to the construct of self-efficacy is locus of control, as children with high self-efficacy are likely to believe that they have control over the outcome of a given situation. In a study of adolescents (12–20 years) several months after a magnitude 8.0 earthquake in China, Zhang, Jiang, Ho, and Wu (2011) found that an external locus of control (e.g., believing that the outcome of a situation is related to chance or to powerful others) predicted the severity of traumatic stress symptoms. This finding is not surprising given that the perception of an event as a crisis is associated with the degree to which the event is viewed as uncontrollable (Foa, Zinbarg, & Rothbaum, 1992). The more uncontrollable a crisis event is perceived to be, the greater the event’s potential to generate traumatic stress.

The seventh internal vulnerability factor is high baseline psychophysiological arousal (e.g., startle reactivity). DiGangi et al.’s (2013) literature review identified 10 studies related to arousal, and 8 of those suggested that this factor predicted symptoms of traumatic stress. Behaviorally, arousal differences may manifest as differences in temperament, and it has been suggested that individuals with easy temperaments are less prone to emotional reactions subsequent to crisis exposure. Conversely, individuals who are known to have a negative temperament, become easily upset, and have difficulty calming down appear to be more vulnerable to psychological trauma and thus should be given a higher priority for crisis intervention treatment (McNally, Bryant, & Ehlers, 2003).

Recently a study of Boston area adolescents conducted by Busso et al. (2014) used pretrauma measures of sympathetic reactivity (the part of the central nervous system responsible for the fight or flight response) to evaluate the role of arousal in traumatic stress. These researchers found that high levels of pretrauma sympathetic reactivity, as measured by electrocardiogram recordings in response to a laboratory stressor (the Trier Social Stress Test, which included asking participants to give a speech that was critically evaluated), were associated with elevated posttraumatic stress symptoms after participants' naturally occurring media exposure to the 2013 Boston Marathon bombings.

The eighth internal vulnerability factor is broadly defined as the tendency to be pessimistic (DiGangi et al., 2013). Specifically, Boymyea et al. (2012) reported the following tendencies to be associated with traumatic stress reactions: dwelling on negative emotions and events; attributing events to internal, stable, and global causes; and tending to pervasively predict environmental threats combined with feeling that such threats are quickly increasing.

External Vulnerability Factors

For the purposes of this discussion, this section discusses two general classes of external vulnerability: (a) lack of family support and resources, and (b) lack of extrafamilial social resources (Lai, Kelley, Harrison, Thompson, & Self-Brown, 2014). The one word that best summarizes most of these risk factors is *aloneness*, and it is consistent with research suggesting that among children, low levels of social support are associated with traumatic stress (Murphy, Shevlin, Armour, Elklit, & Christoffersen, 2014). In other words, these are variables that, when present, at the very least result in trauma-exposed individuals viewing themselves as being alone when coping with the stressor. Results of meta-analyses have documented that the absence of such external support systems is a predictor of traumatic stress (Ozer et al., 2003; Trickey et al., 2012). Given these findings, a primary goal of crisis intervention is to reestablish naturally occurring social support systems.

The first external vulnerability factor is the physical absence of family support and resources. Most fundamentally this includes the physical absence of familial support. When such support systems are absent or depleted, trauma-exposed youth are at greater risk for traumatic stress reactions (Yorbik, Akbiyik, Kirmizigul, & Söhmen, 2004). For example, among Cambodian refugee children, not being able to reunite and live with a nuclear family member after being forced to leave their country (following the massive trauma inflicted by the Pol Pot regime) was predictive of maladaptive adjustment (Kinzie, Sack, Angell, Manson, & Rath, 1986). The researchers concluded that "having reestablished some contact with family members in this setting [the United States] mitigated some of the symptoms of the severe trauma, while being alone or in a foster family exacerbated the disorder" (p. 375).

While necessary, for some individuals the presence of a family is not sufficient to prevent aloneness and foster recovery from exposure to a traumatic event. In some circumstances, family resources may be physically present but practically (or psychologically) unavailable to provide support. When families are functioning poorly, and this essential support system is practically absent, youth are more alone and thus at greater risk for traumatic stress and maladaptive coping (Barenbaum, Ruchkin, & Schwab-Stone, 2004; DiGangi et al., 2013; Trickey et al., 2012). When a family is dysfunctional, trauma-exposed youth may have increased difficulty adapting to stressors and may look to other less prosocial resources, such as substance abuse, to cope (Hilarski, 2004). For example, it has been established that the nature and quality of the parent-child relationship is an important source of resilience. Specific parenting characteristics that have been associated with resilience include warmth, structure, and high expectations (Doll & Lyon, 1998). Furthermore, the degree of family support predicts children's long-term emotional response to stressful events (Shaw, 2003). According to Qouta, Punamäki, and El Sarraj (2005), "It is well accepted that supportive and wise parents enhance children's mental health and favorable cognitive-emotional development, in general..., and in traumatized families in particular" (p. 150).

Unique factors related to family functioning are also sources of vulnerability. From their study of families who had been exposed to a petrochemical plant explosion that killed 30, wounded 3,000, and destroyed 30,000 homes, Birmes et al. (2009) suggested that factors typically identified as negatively affecting family functioning were associated with lower levels of traumatic stress. Specifically, they suggested that children's perceptions of enmeshed family cohesion (i.e., extremely strong family bonds, emotional ties,

and limited autonomy within the family system) and rigid family adaptability (i.e., an extremely low capacity to alter family rules regarding discipline and relationships with authority) served as protective factors. Children from both types of families had significantly lower rates of traumatic stress. Within the context of a crisis that affected all family members, the feeling of belonging to an extremely close-knit family was helpful. Children in families characterized by rigid adaptability may feel more secure because they are in environments where the rules are especially firm, clear, and predictable and parenting is consistent.

Parents' traumatic stress (e.g., PTSD) has been linked to more severe symptoms of distress and PTSD among their children (Kadak, Nasiroğlu, Boysan, & Aydin, 2013; Lambert, Holzer, & Hasbun, 2014; Morris, Gabert-Quillen, & Delahanty, 2012; Salloum, Stover, Swaidan, & Storch, 2014). However, that increased prevalence in children may be associated with a family's history of PTSD and the child's genetic, rather than environmental, vulnerability to PTSD (Boymyea et al., 2012). Parental traumatic stress may also make family support resources practically unavailable to traumatized youth and thus increase both actual and perceived aloneness. For example, when a family's caregivers are significantly distressed, they are less likely to recognize their children's need for mental health support and intervention (Brown & Bobrow, 2004). However, parental traumatic stress does more than simply render family resources unavailable to youth. Adults' reactions to traumatic events may be a cause of traumatic stress. When a primary caregiver suffers from traumatic stress, not only does it deprive the child of an important coping resource, but it also increases the child's perceptions of the event as threatening, because children (especially younger children) often look to adult reactions to gauge the danger presented by an event. If parents and other caregivers behave as if an event is very dangerous, then children are likely to respond accordingly (Kadak et al., 2013; Qouta et al., 2005; Shaw, 2003).

Parents' psychological problems may also result in a lack of familial support and have been identified as an external vulnerability risk factor (Kadak et al., 2013; Ozer et al., 2003; Trickey et al., 2012). Parental mental health is an important determinant of how well children cope with traumatic events (Kiliç, Özgüven, & Sayil, 2003; Qouta et al., 2005).

Poverty or economic status is another external vulnerability factor that, when lacking, can increase the risk of psychological trauma (Brymer et al., 2006). Students who come from impoverished backgrounds are more likely to have experienced prior traumatic events and trauma-related psychopathology, such as PTSD (Buka, Stichick, Birdthistle, & Earls, 2001; Seedat, Nyamai, Njenga, Vythilingum, & Stein, 2004). These families often have less access to resources needed to mitigate crisis-generated problems (Brymer et al., 2006).

The second general class of external personal vulnerability factors is a lack of extrafamilial social resources. In addition to the absence of family resources, the actual or perceived absence of extrafamilial social relationships is another important factor associated with vulnerability to traumatic stress (Trickey et al., 2012) and a causal factor in the development of children's posttraumatic stress (McDermott, Berry, & Cobham, 2014). Individuals who must face a crisis without supportive and nurturing friends or relatives have been found to suffer more from PTSD than those with such resources (McNally et al., 2003). Close peer friendships, access to positive adult models outside of the family, and strong connections to prosocial organizations or institutions are protective, as are positive academic or nonacademic school experiences.

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