

Evaluating a Trauma-Informed Resilience Curriculum in a Public Alternative High School:  
Student Treatment Outcomes and Staff Perceptions of Implementation

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**Abstract**

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Despite an increased awareness of the broad negative impacts of trauma exposure on the cognitive, academic, and social development of students, and the strong empirical support for supportive interventions at multiple levels, schools continue to struggle to implement such services for students. As the nation's largest provider of mental health services, schools face a variety of complexities, including mismatches in the preparation and theoretical orientation of service providers, to school infrastructure, leadership, professional development, mission, and funding structures being inhospitable to effective delivery. Schools may benefit from the efficiencies in assessment, differentiation, and monitoring provided by the multi-tiered system of supports (MTSS) framework. Specifically, trauma-informed interventions delivered to whole classes (tier 2), by teachers with limited specialized training are promising in terms of efficiency and sustainability, and remain limited. Equally promising for the school mental health literature is the integration of resilience theory, or the development of protective factors and the promotion positive adaptation in the face of risk. This mixed methods study evaluated the implementation of a 9-week tier 2 trauma and resilience curriculum developed by school administrators and

teachers in a public alternative high school in the Pacific Northwest. 53 students completed surveys at pre and post-intervention measuring their perceptions of their own resilience using a 59-item composite measure. Seven teachers shared survey and qualitative feedback on the implementation of the intervention in terms of its acceptability, feasibility, appropriateness, and effectiveness. Results indicate that students demonstrated significant growth post-treatment on 2 of 12 measures of resilience, including sleep and coping skills frequency, but a decrease on one brief measure of resilience. In terms of implementation, teachers generally found the intervention positive (averaging 4.21 out of 5 on all rating 4 domains), with the highest scores for its *appropriateness* for students and this alternative school, strong scores for its *acceptability* and *feasibility*, and the lowest scores for its *effectiveness*. Teachers appreciated the relevance of the content, the focus on psychoeducation and coping skills, the iterative design/pilot/revise process used when building the course, the provision of clear lesson plans and students sharing feelings of empowerment because of the course. To improve the intervention, teachers wanted increased integration of both current events related to equity and the cultural representativeness of the video elements of the curriculum, and sought to decrease disruptions to the intervention based on their competing professional roles while teaching, and irregular student attendance.

## TABLE OF CONTENTS

List of Figures.....	iii
List of Tables.....	iv
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: REVIEW OF THE LITERATURE.....	12
Trauma.....	12
Resilience.....	28
Addressing Trauma and Building Resilience.....	36
Implementation Considerations in School Systems.....	43
Theory of Change.....	48
Purpose of the Study.....	54
CHAPTER 3: METHOD.....	55
Experimental Design.....	55
Participants.....	56
Setting.....	58
Procedures.....	60
RQ1 Measures.....	61
RQ1 Data Collection.....	68
RQ1 Data Analysis.....	70
RQ2 Measures.....	71
RQ2 Data Collection.....	72
RQ2 Data Analysis.....	73
CHAPTER 4: RESULTS.....	73
RQ1 Results.....	75
RQ1 Principal Component Analysis.....	78
RQ2 Results.....	80
CHAPTER 5: DISCUSSION.....	92
Promising Findings.....	93

Challenging Findings.....	94
Implications for Intervention.....	95
Implications for Implementation.....	100
Limitations.....	104
Summary.....	106
Future Directions.....	108
REFERENCES.....	111
Appendix A: Student Composite Resilience Measure.....	138
Appendix B: ALFA-Q (modified for REACH).....	140
Appendix C: Missing Data .....	144
Appendix D: REACH Calendar .....	145
Appendix E: REACH Developmental Process Theory of Change .....	147

## LIST OF FIGURES

Figure Number	Page
1 – Trauma Informed Practices within an MTSS Framework .....	43
2 – Consolidated Framework for Implementation Research (CFIR).....	46
3 - REACH Theory of Change.....	50

## LIST OF TABLES

Table Number	Page
1 – Resilience and Vulnerability.....	32
2 – Protective and Risk Factors .....	37
3 – Demographic Information for All Enrolled Students, 2016-17.....	57
4 – Reach Skills and Validated Measures .....	61
5 - List of Measures (59 items). Validated measures are italicized .....	62
6 – Correlation of REACH Resilience Measures.....	75
7 – Paired Samples <i>t</i> -tests Comparing Mean Sums for Resilience Skill Components.....	78
8 – Staff Perceptions of REACH Acceptability, Feasibility, Appropriateness, and Effectiveness.....	80

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# Chapter 1

## Introduction

“Pain that is not transformed is transmitted.”

-Richard Rohr

“If we encourage and nurture these dispositions and competencies in our children as best we can, we have a basic survival kit for meeting adversities that tax the human spirit.”

-Werner & Smith, 1992, p. 204, as cited by Luthar 2015

In their most recent publication of statistics on child abuse and neglect, the US Department of Health and Human Services Administration for Children and Families reported that during 2014, Child Protective Services agencies received 3.6 million referrals for abuse or neglect, involving approximately 6.6 million children. Nearly 61% of these were screened in for follow up, representing a rate of 28.9 per 1,000 children nationally (US DHHS, 2016). This rate indicated a 7.4% increase from 2010, with nearly 63% of these referrals made by professionals, including police officers, lawyers, social workers, and teachers. 75% of victims suffered from neglect, 17% were physically abused, and 8.3% were sexually abused. 1,580 children died of abuse or neglect.

According to the National Center for PTSD, although such statistics are the most reliable source of data for trauma prevalence among young children, they underestimate childhood exposure to trauma because abuse and neglect are underreported, they only represent one type of traumatic event (Hamblen & Barnett, 2016), and the likelihood of traumatic exposure increases as children move into adolescence (Finkelhor, Turner, Ormond, & Hamby, 2009). Accurately estimating rates of traumatic exposure for school-aged youth is challenging, and published rates vary widely (Perfect, Turley, Carlson, Yohanna, & Saint Giles, 2016). However, Saunders and

Adams (2014) identified five nationally sampled studies utilizing strong methodologies, and report a number of startling rates for youth aged 0-17 years: 70% witnessed violence; 69-71% experienced physical abuse and assault; 29% were teased or bullied; 22% survived a disaster; 20-48% reported polyvictimization; 18% lost a loved one to a traumatic homicide; 13-17% of girls and 3-5% of boys reported sexual victimization; 10-21% survived a motor vehicle accident, and; 9% experienced internet-based victimization. Additional recent studies report two out of every three children experiencing at least one traumatic event before leaving high school (Finkelhor, et al., 2015; Gonzalez, Monzon, Solis, Jaycox, & Langley, 2016; McLaughlin, et al., 2013), and that these events are disproportionately experienced by African American, Native American, and Hispanic students (Woodbridge, et al., 2016). Dray and colleagues (2017) report that 10% to 20% of children and adolescents experience mental health problems, and that the typical age of onset is 12-24 years (Patel, Flisher, Hetrick, & McGorry, 2007).

## **Resilience**

The impacts of trauma on learning are well-documented, and can impair cognitive, academic, and social functioning (Anda, et al., 2006; Compas, 2006; Cook, et al., 2005; Perfect, et al., 2016; Porche, Costello, & Rosen-Reynoso, 2016; Substance Abuse and Mental Health Services Administration (SAMSHA), 2014). Fortunately, a great deal of descriptive and experimental work in recent decades has established resilience as a process within the social sciences capable of interrupting some of the risks associated with trauma exposure (Bethell, Newacheck, Hawes, & Halfon, 2014; Dray et al., 2017; Luthar & Cicchetti, 2000; Masten, A.S., 2011; Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003). Resilience is conceived as, “a dynamic developmental process encompassing the attainment of positive adaptation despite exposure to significant threats, severe adversity, or trauma that typically constitute major assaults

on the processes underlying biological and psychological development.” (Cicchetti & Garmezy, 1993, p. 404; Luthar et al., 2000, 2015; Masten, Best, & Garmezy, 1990; Masten & Tellegen, 2012; Rutter, 1987, 2012; Zolkoski & Bullock, 2012). In contrast to an adjective describing characteristics of youth, resilience has evolved over time to focus on the interactions amongst ecological and individual characteristics to identify multilevel systems and dynamic, interactive processes that contribute to positive adaptation to risk (Masten, 2006, 2011).

Emerging from the field of medicine in the early 1970s, theoretical and applied resilience research exploring youth development has increased dramatically in recent decades (Ager, 2013; Luthar et al., 2015; Zolkoski & Bullock, 2012), and focuses on the identification of protective factors at the individual, family, and community levels (Luthar, Crossman, & Small, 2015). As this field has grown, its focus has shifted from examining correlates of resilience and identifying underlying processes, to applying these findings through experiments evaluating prevention and intervention efforts (Dray, et al., 2017; Masten, 2007) and exploring biological contributors (Luthar & Brown, 2007; Luthar, Crossman, & Small, 2015).

Within the complex system of variables contributing to resilience, the protective influence of schools is well established (Fergus & Zimmerman, 2005; Luthar et al., 2015; Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003; Zolkoski & Bullock, 2012), and effective programs have been identified to improve student mental health and academic success in a variety of important domains. These include depression (Dray et al., 2017; Shochet et al., 2001), anxiety (Dray et al., 2017), hopelessness (Shochet et al., 2001), behavior and academic achievement (Baskin, Slaten, Sorenson, Glover-Russell, & Merson, 2010), school engagement and completion (Bethell, Newacheck, & Halfon, 2014) teacher-student relationships, academic self-concept, and peer victimization (Cappella et al., 2012).

## **School Mental Health and MTSS**

Such delivery of mental health services in school settings is as promising as it is complex. Public schools generally provide the greatest point of outreach, screening, and referral for mental health services in the US, and have been identified as the largest provider of mental health services for youth and adolescents (Burns, 1995; Franklin, Evans, Stephan, & Sugai, 2014; Kim, Ryan, Kelly, & Montgomery, 2012; Stephan, Sugai, Lever, & Connors, 2015). Despite this broad scope of implementation, school mental health services struggle to consistently provide supports that are adequate in terms of completeness, sustainability, durability, and spread (Stephan, Sugai, Lever, & Connors, 2015). Additional challenges range from mismatches in the preparation and theoretical orientation of service providers, to school infrastructure, leadership, professional development, mission, and funding structures being inhospitable to providing effective mental health supports (Evans, Stephan, & Sugai, 2014; Ko et al., 2008; Stephan et al., 2015).

Within the dynamic school mental health landscape, the involvement of teachers has expanded over time, partly as a result of the national adoption of the Response to Intervention (RTI) framework (Franklin et al., 2012), wherein teachers have assumed a greater role in providing universal, classroom-based interventions in academic, behavioral, and mental health domains. However, the majority of schools still rely on community agencies (Foster, Rollefso Doksum, Noonan, & Robinson, 2005) or district mental health staff (Adelman & Taylor, 2006) to provide mental health supports to students. Given these complexities, especially when considering the prevalence of trauma in US schools and the significant detrimental impacts on learning outcomes, the need for an improved system for implementing trauma-informed practices and developing resilience is clear.

One such system that has proven effective at integrating academic and social skill assessment, intervention, and monitoring is Multitiered Systems of Supports (MTSS). MTSS is a prevention-focused framework of providing targeted interventions in schools based on regular assessments of youth in academic and behavioral domains. As an RTI model, screening assessments are used to identify academic and behavioral challenges as early as possible to provide targeted interventions. Students receive differentiated interventions at appropriate “tiers” of service, with tier 1 interventions of low intensity and targeting all learners, tier 2 interventions of increased intensity and targeting groups of learners not responding adequately to tier 1 interventions, and tier 3 interventions targeting individual learners needing the most intensive supports. Student responsiveness to supports are carefully tracked at each tier of support, and interventions modified accordingly.

### **Trauma and resilience within the MTSS framework**

As discussed at length in subsequent chapters, the literature provides a number of recommendations when selecting and implementing interventions aimed at supporting the resilience process (Fergus & Zimmerman, 2005; Rutter, 2013; Zolkoski & Bullock, 2013). Due to the multifaceted nature of resilience, promoting skill development with a greater chance for generalization across behaviors or skill domains should be prioritized over those interventions with a limited scope. In addition, given the protective effects of repeated, limited exposure to stressors described as *challenge resilience* (See Chapter 2), interventions designed to build protective factors should incorporate repeated opportunities for youth to experience successful coping. Such experiences, especially as related to developing coping skills, self-reflection, and personal agency, not only build autonomy in developing youth, but also increase chances for successful application across developmental domains (Rutter 2013).

Interventions delivered to small groups or whole classrooms may provide the best instructional format to conform to these recommendations, while also maximizing the number of youth exposed to supports, and increasing opportunities for positive socialization in schools (Luthar et al., 2015). The lines between tiers within the MTSS model can often blur. For example, a general education teachers may provide universal classroom design and management strategies to all students (tier 1), while also delivering group instruction of a curriculum targeted to small groups (tier 2) but benefitting all students (Franklin et al., 2012; Richards, Pavri, Golez, Canges, & Murphy, 2007). To better understand some of these delineations, common trauma and resilience interventions at each tier are summarized below.

**Universal interventions.** With a preventative instructional focus, universal trauma practices are intended to be available to all students in all settings, delivered in a positive instructional climate, with prosocial problem-solving skills promoted broadly. Examples of such universal practices include: predictability, structure, emotional regulation instruction, common behavioral expectations, growth mindset, non-punitive discipline, ongoing staff trauma training and support, and effective de-escalation techniques (Chafouleas, et al., 2016; Cicchetti & Dunlap, 2015; Dorado, Martinez, McArthur, & Leibovitz, 2016; Multiplying Connections, 2010; Phifer & Hull, 2016; Shamblin, Graham, & Bianco, 2016,).

**Secondary interventions.** Interventions delivered to groups of students who may be in need of more intensive interventions than those provided universally are described as “secondary” “Tier 2” or “targeted.” Such interventions generally focus on psychoeducation about trauma-impacts on learning, self-regulation and coping skills, and building social support systems (Chafouleas et al., 2016). Most of the effective group interventions identified in the trauma literature are forms of cognitive behavioral therapy (CBT). A therapeutic treatment with

robust empirical support (Black, et al., 2012; Dray et al., 2017; Feeny, Foa, Treadwell, & March, 2004; Rolfsnes & Idsoe, 2011), CBT has been modified successfully for use in schools. The primary goal of CBT is, “to change thoughts and behaviors in an attempt to lessen or eliminate negative psychological symptoms” (Follete & Ruzek, 2006, as cited in Woodworth, et al, 2012, p 194). There are multiple forms of CBT, with selected examples including Multimodal Trauma Treatment (MMTT, Amaya-Jackson et al., 2003) and Cognitive Behavioral Intervention for Trauma in Schools (CBITS, Kataoka et al., 2003; Stein et al., 2003).

In addition to those interventions specifically focusing on trauma, the resilience literature identifies a number of tier 2 interventions that have proven effective in developing protective factors. The Resourceful Adolescent Program (RAP, Shochet, Holland & Whitefield, 1997) is a 11-session school-based program that includes CBT components, and has proven effective at reducing depression and hopelessness amongst adolescents (Shochet, Dadds, Holland, Whitefield, Harnett, & Osgarby, 2001). Responsive Advocacy for Life and Learning in Youth (RALLY, Noam & Hermann, 2002) provides student academic and behavioral supports to middle school students at all three tiers, both during and after school, including classroom-based supports provided by external staff. The PENN Resiliency Program (PRP, Gillham, Jaycox, Reivich, Seligman, & Silver, 1990) is a manualized CBT program delivered in twelve 90- to 120-minute sessions targeting early adolescent resilience and depression prevention. It can be delivered by teachers or school mental health staff, and multiple meta-analysis have produced conflicting results (Bastounis, Callaghan, Banerjee, & Michael, 2016; Brunswasser, Gillham, & Kim, 2009).

**Tertiary interventions.** For the 3-5% of the school population not responding to the interventions available at the universal and secondary levels, tertiary interventions may be

necessary. These interventions, also described as “tier 3” or “selected” require the greatest amount of resources for assessment, implementation, and monitoring. One technology applied most broadly in school settings is functional behavioral assessment, where student behaviors are reviewed systematically within their context to determine the function of behavior, related interventions are implemented, and student responses are reviewed carefully for intervention modification (Axelrod, 1987; Carr, 1977; Horner, 2000; Iwata, Dorsey, Slifer, Bauman, & Richman, 1994; O’Neill et al., 1997). Most individual interventions beyond functional assessment identified as successful in the literature are forms of CBT, although those students in need of services outside of these models may benefit from supports provided by community service providers and wraparound care models (Chafouleas et al., 2016). Examples of successful CBT-based interventions include: Trauma-Focused Cognitive Behavioral Therapy (TF-CBT, Black, et al, 2012; Cary & McMillen 2012; Cohen, Mannarino, Murray, & Igelman, 2006; Roberts, Kitchiner, Kenardy, & Bisson, 2010); Stanford Cue-Centered Therapy (SCCT, Carrion & Hull, 2009); Seeking Safety (Najavits, Weiss, & Liese, 1996; Brown, Najavits, Cadiz, Finkelstein, Heckman, & Rechberger, 2007; Najavits, Gallop, & Weiss, 2006), and; Trauma Affect Regulation: A Guide for Education and Therapy (TARGET, Marrow, Knudsen, Olafson, & Bucher, 2012; Ford, Steinberg, Hawke, Levine, & Zhange, 2012).

### **The Need for Additional Research**

Upon review of school-based trauma-informed practices within a multi-tiered system of support framework, the literature reveals a number of effective interventions at all tiers of service. For schools delivering interventions at each tier, it appears that the field may benefit from the expansion of tier 2 interventions due to their efficiency and suitability within school settings. Tier 3 supports described in this review are delivered in individual or small group

sessions, often requiring the involvement of parents, caregivers, and specialized staff. While providing the appropriate level of intervention intensity required for students at this level, the number of students impacted is limited, and the therapeutic and wraparound service models require significant and specialized staffing investments. Universal interventions create supportive conditions in which trauma-informed practices may be implemented school-wide, but are not designed to deliver all of the trauma-informed treatment components (Cook, et al., 2007) or techniques (Black, et al., 2012) recommended in the literature. As such, tier 2 interventions provide strong potential for efficiently providing trauma-informed care to a larger number of students, while allowing for specific focus on effective elements. In addition, the group delivery format of tier 2 interventions is suitable to school settings, addressing some of the infrastructure challenges identified above in providing school mental health services (Ko, et al., 2008).

Most tier 2 interventions supported in the literature are manualized CBT-based programs, and while these programs have successfully been modified for use within schools, the effectiveness of teachers in providing this content has produced mixed results (Baskin et al., 2010; Franklin et al., 2012; Rolfsnes & Idsoe, 2011; Wilson & Lipsey, 2007). That said, strong student attachment to teachers and schools has a powerful protective influence in supporting resilience (Cappella et al., 2012; Luthar, 2006; Luthar et al., 2015, Pianta, Hamre, & Alle, 2012). Teacher involvement in providing these supports is also more sustainable than alternatives. Programs such as RALLY (Noam & Hermann, 2002), while promising in their broad approach to building resilience and community inclusion, require significant investments in staffing, training, and coordination, and are dependent on non-school staff as service providers. Such reliance limits generalizability and sustainability, a phenomenon that Luthar and colleagues (2015) caution against. “Involvement of local school personnel in planning and implementation

stages is critical in ensuring that adopted programs will be sustained as part of a school's regular programming, rather than a temporary, intrusive, or cost-intensive add-on" (p. 772).

Of the secondary interventions described in this review, all show promise as effective treatments for youth impacted by traumatic exposure. However, there is room for extension of each of these programs to better serve youth in public schools. For example, Multi-Modal Trauma Treatment (MMTT) was designed for youth diagnosed with PTSD following single-incident trauma exposure, but not for the larger number of youth who may have experienced complex trauma. Similarly, CBITS targets youth exposed to community violence, and targets PTSD symptoms, anxiety, and depression, but not other prosocial protective factors.

Additional research should also include teacher and student input on the interventions as well as the process of implementation. In their qualitative evaluation of CBITS, Baweja, Santiago, Vona, Pears, Langley, and Kataoka (2016) explored factors supportive of teacher adoption and collaboration and produced a complex set of findings. They found that teachers who had a stronger belief in the need for a trauma intervention on campus were more supportive of the program, and that they expressed concern about the loss of instructional time required to implement CBITS. Teachers also expressed a strong desire for increased communication and professional development about trauma and its impacts on learning. Equally important is the inclusion of student input, often neglected in resilience research (Luthar, Lyman, & Crossman, 2014). Luthar, Crossman, and Small (2015) note, "A widespread tenant of developmental science is that self-report data are biased and thus non-optimal, but in resilience research, there must in fact be concerted focus on youths' phenomenological, subjective interpretations of their own realities" (p. 769).

In conclusion, the awareness of trauma-exposure, and its impacts on learning and development have increased the need for school systems to implement sustainable programs to develop protective variables supportive of resilience. Given the breadth and depth of these impacts, school systems may benefit from the utilization of organizational frameworks such as MTSS to expand the systematic assessment and provision of mental health services. Within MTSS, tier 2 interventions may hold the greatest potential for efficiently providing these supports to the greatest number of students. Interventions designed to be delivered by teachers with little formal training also may address concerns about sustainability raised in previous research. Thus, additional research in these areas is warranted to expand the relevant literatures in these areas.

## Chapter 2

### Review of the Literature

The scope of trauma exposure amongst school-aged youth is immense. Numerous recent studies indicate that a majority of students experience at least one such event before leaving high school (Finkelhor, et al., 2015; Gonzalez, et al., 2016; McLaughlin, et al., 2013), with examples including witnessing or being a victim of violence, bullying, disasters, homicide, vehicle accidents, sexual assault, or internet victimization (Saunders & Adams, 2014). The resulting impacts on learning are also severe, negatively influencing cognitive development (intelligence, memory, and verbal ability), academic performance (grades, test scores, special education participation, and school exclusion), and social functioning (internalizing and externalizing behavior problems) (Perfect et al., 2016). With adequate training and support, and attention to factors influencing implementation, schools have a unique capacity to provide broad mental health interventions to build resilient protective factors in and around students.

To situate the current program evaluation within the relevant empirical fields, selected literature will now be reviewed. After first defining trauma and stress, common trauma diagnoses and the varied impacts on school-aged youth are described. The concept of resilience is then reviewed, including a discussion of key terms and concepts, theoretical framing, characteristics, and issues in measurement. Then, utilizing a multi-tiered system of support framework, practices at the universal, secondary, and tertiary tiers to address trauma impacts and build the conditions supportive of resilience are discussed. Finally, a framework for implementation of evidence-based interventions is presented for use in subsequent analysis.

## Trauma

The Substance Abuse and Mental Health Services Administration of the US Department of Health and Human Services (SAMSHA, 2014) reviewed over 40 years of research on trauma in an attempt to clearly define the concept for a broad array of consumers, including families and communities, survivors of trauma, practitioners, and researchers. As a product of this work, they have created the following definition of trauma:

Individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being. (p. 11)

According to this SAMSHA, a key characteristic of trauma is that individuals respond to traumatic events with a high degree of variability. They summarize the *experiences* of traumatic events, and the related *effects* as the “three E’s of trauma.” Traumatic events themselves may include an actual or extreme threat of physical or psychological harm, or severe, life-threatening neglect for a child that imperils healthy development. These events and may be singular or repeated. The *experience* of these events by individuals can vary greatly, and thus determine the trauma impact. Similar events may be experienced as traumatic by some but not by others, determined by how one labels, assigns meaning to, or is disrupted by traumatic events. These experiences may also be influenced by cultural beliefs, availability of social supports, and developmental stage. Finally, the *effects* of the how an individual experiences traumatic events determine the trauma impact. These effects may take place immediately after an event, or have a delayed onset and wide variation. Also, the relationship between traumatic events and these effects may not be recognized by the victim.

The “three E’s of trauma” shared by SAMSHA, as their summative definition resulting from a review of four decades of research in this field, is used as a working definition of trauma throughout this paper. Before examining the evidence-based practices aimed at improving the schooling outcomes of youth described herein, a more thorough examination of the underlying components of this trauma definition is provided below, beginning with the concept of stress.

## **Trauma and Stress**

To better understand diverse responses to trauma, it is helpful to consider variation in trauma types and the related stress responses. Traumatic events, either experienced or observed, have also been described as those perceived as dangerous or threatening, and “overwhelming a person’s capacity to cope, and eliciting intense feelings such as fear, terror, helplessness, and despair” (Buffington, Dierkhising, & Marsh, 2010, p 3). Whereas *acute trauma* is a single traumatic event, *chronic trauma* refers to multiple exposures over time or across settings. While these experiences are subjective, and as long as the victim is traumatized by the experience, s/he may experience the related negative effects (Perry, 2001, as cited in Black, Woodworth, Tremblay, & Carpenter, 2012).

The impacts of these traumatic experiences on children manifest in multiple ways, perhaps best understood as varied stress responses. While some stress is considered normal to healthy development, excessive stress can inhibit healthy development and significantly alter the neurological structure of the brain. According to Perry (2000), “When a child is threatened, various neurophysiological and neuroendocrine responses are initiated. If they persist, there will be ‘use-dependent’ alterations in the key neural systems involved in the stress response.” (p. 50) According to the National Scientific Council on the Developing Child (NSCDC) at Harvard

University's Center for the Developing Child (2014), such stress becomes problematic for children when it moves from *positive* to *tolerable* to *toxic* stress (see pp 1-2).

*Positive stress* is a moderate, short-lived stress response to normal life events, resulting in brief increases in heart rate or mild changes in stress hormone levels that are typically well controlled and managed. Adapting to such events is a normal feature of healthy development, and the mastery of such responses typically occur within the supportive guidance of warm, safe, and positive relationships. Positive stress responses may occur on a daily basis for children, such as in response to a school deadline, a traffic hazard, an intense physical workout, or the ending of a social relationship.

*Tolerable stress* is a response to more serious events that has the potential to negatively affect the architecture of the developing brain, but generally is shorter in duration and thus allows the brain to reverse potentially harmful effects with sufficient recovery time between stressful events. Examples of tolerable stress for children may include the death of a family member, divorce, or short-term exposure to violence. The ongoing presence of supportive adults is critical and facilitates such recovery by providing safe environments wherein children can learn to cope and recover. Without such supportive structures, such stressors have the potential to become toxic.

*Toxic stress* is the strong, frequent, or prolonged activation of the body's stress management system that results from stressful events that are chronic, uncontrollable, and/or experienced without the support of caring adults. Such stress can change the brain's architecture through the overproduction of neural connections in regions of the brain involved in fear, anxiety, and impulsive reactions, at the expense of critical neural development in areas dedicated to reasoning, planning, and behavioral control. Stress systems are also altered such that they

respond more quickly, and for longer periods of time than are necessary, to events that would not normally produce a stress response. Examples may include chronic parental neglect, persistent violence exposure, or ongoing physical abuse.

## **Trauma Diagnoses**

The complex interactions between traumatic events and related stressors, experiences, and effects result in a variety of trauma diagnoses, each of which requires varied responses within school settings. The three main types are described below, including Post-Traumatic Stress Disorder, Developmental Trauma Disorder, and Complex Trauma. Each is briefly defined, and diagnostic elements described.

### **Post-Traumatic Stress Disorder**

As the most well-known diagnosis for those dealing with trauma, Post-Traumatic Stress Disorder (PTSD) emerged in response to widespread ‘battle fatigue’ following US veteran’s home from WWI and WWII. According to the Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition (DSM–5; American Psychiatric Association, 2013), PTSD is defined as:

Exposure to actual or threatened death, serious injury or sexual violation... The disturbance, regardless of its trigger, causes clinically significant distress or impairment in the individual’s social interactions, capacity to work or other important areas of functioning. It is not the physiological result of another medical condition, medication, drugs or alcohol.

The disorder is characterized by four symptom clusters: intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Intrusion takes place when children re-experience a traumatic event, and may include flashbacks, nightmares, and other

psychological distress of reminders. Avoidance is defined as staying away from people, places, or activities that are associated with traumatic events. Examples may also include avoiding cognitions, feelings, or conversations with traumatic associations. Negative alterations in cognition and mood include changes in thoughts, feelings, and actions, and may involve negative or detached emotions about self or others, amnesia, or loss of interest. Finally, alterations in arousal and reactivity is defined as constantly living in a state of hyperawareness that can negatively impact the ability to perform daily tasks. These can present as hypervigilance, aggression, recklessness, or difficulty with sleep or concentration (American Psychological Association, 2013; National Institute of Mental Health, 2018).

These diagnostic criteria have been criticized as not always suitable for the diagnosis and treatment of children who have experienced trauma (Schmid, Petermann, & Fegert, 2013) for a number of reasons. First, criterion were developed based on symptoms in adults, and diagnoses are reliant on verbal descriptions of traumatic events that are often subjective and difficult to elicit from trauma-impacted children, especially given the complex milieu of childhood trauma and neglect. For example, an adult who has experienced a traumatic event, such as a violent foreign deployment during military service, has a broad set of life experiences against which to compare and contextualize this event, and the language with which to describe its effects. These factors make a PTSD diagnosis more likely within existing criterion. In contrast, a young child raised in a setting with similar levels of exposure to traumatic violence is less likely to have developed the contextual awareness of the unique nature of such events and experiences, or the descriptive capacities required to document their effects to allow for diagnosis.

Secondly, children who have experienced trauma exhibit symptoms distinct from adults that are not included within existing diagnostic criterion, including, “repetitive play, separation

anxiety, generalized (rather than trauma-specific) nightmares, omen formation, disorganized or agitated behaviors, and somatic symptoms” (Carrion & Hull, 2009, p 28). Youth with PTSD also frequently exhibit comorbid symptoms such as anxiety, mood, and externalizing disorders, and youth who do not meet PTSD criteria frequently display the same symptomatology as those who do. Finally, age and developmental stage also strongly influence symptom presentation in youth (Steiner, Carrion, Plattner, & Koopman, 2003).

To better diagnose and treat trauma-related symptoms in children, Developmental Trauma Disorder (DTD) was proposed by advocates for inclusion in the DSM-5. Although it was not included in this revised version, a new subtype of PTSD (the first developmental subtype of an existing disorder ever included in the DSM) called, “Posttraumatic Stress Disorder in Preschool Children” was added. The diagnostic criteria for this new subtype of PTSD are more developmentally sensitive than general PTSD criteria, and are primarily grounded in behavioral symptoms given the cognitive and expressive capacities of young children (Scheeringa, 2016). DTD is discussed further below, for its development provides key insights into the unique nature of trauma exposure during childhood.

### **Developmental Trauma Disorder (DTD)**

Developmental trauma as a diagnostic category attempts to capture the unique and compounding impacts of repeated trauma experienced by children during key phases of their development on symptoms evident during adulthood. The negative effects of repeated trauma combine with the interruptions to healthy childhood development, leading to, “outcomes that are not simply more severe than the sequelae of single incident trauma, but are qualitatively different in their tendency to affect multiple affective and interpersonal domains.” (Cloitre et al, 2009, p 405) In his initial proposal of DTD as a distinct diagnosis, van der Kolk (2005) provides insight

into the complex cognitive and behavior outcomes of such traumatic interruptions to healthy development:

At the core of traumatic stress is a breakdown in the capacity to regulate internal states. If the distress does not ease, the relevant sensations, affects, and cognitions cannot be associated – they are dissociated into sensory fragments – and, as a result, these children cannot comprehend what is happening or devise and execute appropriate plans of action.

(p 403)

DTD was first proposed in 2005 in response to the mismatch between the existing diagnostic criteria for PTSD and three unique aspects of childhood exposure: traumatization over several developmental periods; exposure to several trauma types (physical, mental, or sexual), and; the uniquely damaging impact of trauma delivered by trusted caregivers, those whose role in healthy development is central (Bremness, 2014).

DTD is composed of several diagnostic elements (See van der Kolk, 2005, pp 404-406), the first of which is *exposure*. This may include multiple or chronic exposure to one or more forms of developmentally adverse interpersonal trauma, such as: abandonment; betrayal; physical assaults; sexual assaults; threats to bodily integrity; coercive practices; emotional abuse, or; witnessing violence or death. It also may include subjective emotional experiences resulting from trauma exposure, such as rage, betrayal, fear, resignation, defeat, or shame. The next element is a *triggered pattern of repeated dysregulation*. In response to trauma cues, those exposed to trauma may repeatedly dysregulate in a variety of domains, with changes and intensity persisting and not returning to baseline by conscious awareness. Domains include: affective, somatic, behavioral, cognitive, relational, and self-attribution. A third element is *persistently altered attributions and expectancies*. Perceptions of self and others following

trauma exposure may be altered significantly. These may include: negative self-attribution; distrust of protective caregiver, loss of expectancy of protection by others; loss of trust in social agencies to protect; lack of recourse to social justice/ retribution; or the inevitability of future victimization. The final element is *functional impairment*. DTD may result in the significant disruption in basic life activities, in such domains as family, legal, peer, or vocational.

DTD was not included in the DSM-5 revision. Schmid and colleagues (2013) reviewed the arguments against its inclusion, revealing the complexities inherent in trauma diagnosis and treatment. First, the attempt of DTD to capture the multiple effects of trauma exposure leads to confusion and overlap between existing disorders, such as borderline personality disorder, attachment disorder, conduct disorder, and multiple complex development disorder. DTD also assumes that a variety of symptoms and syndromes result from one cause: trauma exposure. The problems with this rationale, also called ‘mono-causality,’ are that it may overlook genetic or biological causes of the same symptoms, leading to misdiagnosis and mistreatment. By erroneously focusing exclusively on trauma, for a youth who may not have experienced trauma but may be diagnosed with borderline personality disorder or ADHD, treatment providers may not utilize evidence-based interventions, or may not identify strengths and positive family resources as sources of effective treatment. ‘Inverse correlation’ is another argument against DTD inclusion, wherein the symptoms of DTD have also been identified as potential causes of DTD. An example is emotional dysregulation, which can result from DTD, yet also makes youth more likely to be traumatized in the first place. Finally, critics point out that there are few specific differences identified in DTD diagnosis by age group (3 year olds externalizing looks very different than 17 year olds), and that an increased focus on traumatic events over other comorbid disorders may lead treatment professionals to place an undue emphasis on trauma-

history exploration where it may not exist. A final trauma type, complex trauma, is summarized below.

### **Complex Trauma**

Experiencing trauma from multiple sources and at various points in time results in immediate and long-term health impacts that are interrelated and difficult to both diagnose and treat. This “complex trauma” stands in contrast to isolated impairment diagnosis resulting from exposure to trauma currently recognized in the DSM-5, including, but not limited to: depression, ADHD, conduct disorder, oppositional defiant disorder, attention-deficit/hyperactivity disorder, post-traumatic stress disorder, communication disorder, eating disorders, reactive attachment disorder, and others. When trauma results from isolated events, reminders of isolated incidents tend to produce “discrete conditioned behavioral and biological responses” (van der Kolk, 2005, p. 402), contrasting with the pervasive impacts on the brain of the developing child resulting from repeated traumatic exposure over time. To better describe, diagnose and treat those impacted by complex trauma exposure, Cook and colleagues (2005, 2007) identified seven primary domains of impairment in those impacted. These are summarized below.

**Attachment.** When children are dealing with traumatic stress involving caregivers, energy typically devoted development is instead utilized for self-protection and survival. Instead of developing the skills and capacities to process social and emotional experiences in safe and trusting caregiving relationships, youth experiencing traumatic stress limit this growth through emotional and physical protection and isolation. As a result, such youth experience difficulties with emotional regulation, stress management, help-seeking, setting healthy boundaries, interpersonal relationships, perspective taking, developing trust, and tuning in to the emotional states of others.

**Biology.** For younger children experiencing complex trauma, their ability to successfully integrate the feeling and sensing tasks of the right hemisphere of the brain with the left-hemispheric tasks such as abstract reasoning and long-range planning, is inhibited. As such, when faced with intense emotions, their ability to access rational thought is more limited than those who have experienced healthy development. This can lead to reactions during stress that include rage, confusion, withdrawal, or extreme helplessness. As children age into adolescence, neurological development increases rapidly in areas responsible for executive functioning in three critical domains: self-awareness in relation to others, processing complex emotional experiences, and decision-making based on previous experiences and perspective-taking. Whether resulting from ongoing exposure to complex trauma, or the manifestation during adolescence of previously underdeveloped stress responses, these youth struggle with emotional regulation, behavior, cognition, identity development, and empathy. Additional biological impairments may also include sensorimotor development, the inability to feel pain, problems with coordination, balance and body tone, and increased medical problems across multiple domains.

**Affect regulation.** The ability to both accurately identify an internal emotional experience and to then safely express those emotions can be severely impacted by youth who have experienced complex trauma. When exposed to inconsistent pairings of emotions and behavioral responses through modeling by caregivers, for example if a child's fear is met with laughter, or joy is met with violence, youth have difficulty developing and regulating their own emotional responses, and in soothing themselves following stress. Additional symptoms include numbing or avoidance of emotional experiences, difficulty labeling, expressing, or describing emotions or internal states, and maladaptive coping strategies.

**Dissociation.** Youth exposed to complex trauma often dissociate from their own experiences or external information they would otherwise process. Serving as a coping mechanism for those exposed to overwhelming trauma, thoughts and emotions can be disconnected, and physical sensations can exist outside of conscious awareness. Dissociation can lead to challenges with behavior management, self-concept, amnesia, distinct alterations in states of consciousness, depersonalization, and affect regulation. For example, a student who has experienced significant abuse may have learned to dissociate his or her emotions from physical sensations as a survival strategy. This can impact memories of such incidents, making subsequent reflective processing difficult.

**Behavioral control.** Complex trauma in children can lead to both over-controlled and under-controlled behavior problems. Both behaviors may serve a variety of functions for children who have been the victims of a variety of traumatic events, including: gaining control through re-enactment of traumatizing events, rigidly sticking to routines, inflexible bathroom rituals or food intake, or compulsive compliance to adult requests; avoiding sensory stimulation through isolation, avoiding intolerable levels of emotional arousal, or substance abuse, or; aggression, self-injury, sexualized behaviors, opposition, and difficulty understanding and complying with rules.

**Cognition.** The impacts of trauma and neglect on children's intellectual development are severe, given the significant impacts of reduced stimulation and the lack of emotional safety. Impacted youth experience early delays in expressive and receptive language development, less flexibility and creativity with problem solving, and challenges with attention, abstract reasoning, task completion, and executive functioning. These cognitive challenges often result in a number

of poor academic outcomes, including lower grades, lower test scores, increased special education participation, and an increased chance of dropping out of school.

**Self-concept.** In contrast to the positive sense of self that results from the provision of safe and nurturing parenting, youth who have experienced complex trauma often come to see themselves as ineffective, helpless, deficient, and unlovable. These children are more likely to blame themselves for negative experiences, less likely to talk about their emotions, and have a difficult time asking for and utilizing social supports. As a result, their self-concept and body image tends to be negative, they suffer from low self-esteem, and experience a high degree of shame and guilt.

### **Impacts of Trauma**

The toxic stress exposure resulting from trauma during early childhood has significant and negative impacts on brain development that persist across the lifespan due to the malleability of neural networks responsible for stress responses during fetal and early childhood periods. According to Perry (2009), the neural infrastructure built in early childhood has a lasting impact because the mature brain is much less responsive to environmental stimuli, giving exposure to toxic stress during childhood a significantly negative influence on health over time:

While experience may alter the behavior of an adult, experience literally provides the organizing framework for an infant and child. Because the brain is most plastic (receptive to environmental input) in early childhood, the child is most vulnerable to variance of experience during this time. (p. 245)

Persistently heightened responses to stressors resulting from toxic stress exposure can produce a wide array of physical (cardiovascular disease, diabetes, stroke) and mental health (depression,

anxiety disorders, alcoholism, drug abuse) outcomes over time (NSCDC, 2014; Felitti et al, 1998). These longer-term impacts of trauma received increased scrutiny and evaluation after publication of the landmark Adverse Childhood Experiences (ACEs) study by Felitti and colleagues in 1998. The impact of the ACEs study on public awareness of trauma and its effects on health and learning has been immense, with trauma-informed schools identified in an increasing number of states (Overstreet & Chafouleas, 2016), trauma curriculum and professional development expanding (Trauma and Learning Policy Initiative, 2016), and formal inclusion of trauma-informed approaches in updated federal education legislation (Every Student Succeeds Act, Pub. L. 114-95; Prewitt, 2016). Subsequent to its release and replication, researchers, human service professionals, and educators have invested heavily in understanding and addressing trauma impacts to better serve the public, given the scope of trauma's reach and the complexity of its impact in a variety of expected and unexpected domains (Anda, Butchart, Felitti, & Brown, 2010; Center for Disease Control and Prevention, 2016).

The ACEs study (Felitti et al, 1998) surveyed 17,337 adults in two waves of data collection to examine the prevalence of childhood abuse (psychological, physical, and sexual abuse) and household dysfunction (substance abuse, mental illness, mother treated violently, and household member imprisoned), and found that the prevalence of childhood ACEs were much higher than previously reported. The study also used logistic regression to compare these childhood ACEs with subsequent health risk factors and diseases among the same respondents. Those with more ACEs had increased exposure to health risk factors such as alcoholism, drug abuse, depression, suicide attempts, smoking, sexually transmitted diseases, physical inactivity, and severe obesity. Those with more ACEs were also more likely to develop heart disease,

cancer, skull fractures, diabetes, stroke, and liver disease. An increased number of ACEs dramatically increased the likelihood of having multiple health risk factors.

The findings from the ACEs study were also significant because the sample itself was 68% white and relatively well-educated (64% had attended at least some college, 37% of those graduating from college), one in which health risk factors and disease prevalence are lower than the population as a whole, raising alarming questions about the impacts of ACEs on populations with increased structural exposure to abuse and dysfunction (Mersky, Topitzes, & Reynolds, 2013). The ACEs study has since been replicated with more diverse samples (Burke, Hellman, Scott, Weems, & Carrion, 2011), resulting in revisions to the original questionnaire to include factors for those living in urban environments (Public Health Management Corporation, 2013). This “Philadelphia Urban ACE Survey” was given to 1,784 adults in Philadelphia with a response rate of 67%, and found that those living in this racially diverse urban environment reported ACEs at higher rates than those in previously published ACEs studies. Their ACE survey also included new items intended to measure the additional stressors faced by urban youth. These included: neighborhood safety and trust; bullying; witnessing violence; racism, and; foster care. Such impacts should be considered for educators working with urban youth.

### **Impacts of Trauma on Learning**

In addition to the general domains of impact described above for youth impacted by complex trauma, specific trauma impacts on learning are extensive, and well-documented. In their 2016 systematic review of school-related outcomes of trauma exposure, Perfect and colleagues provided a recent summary of this literature. Their focus was specifically on the extent to which three core learning factors, cognitive, academic, and teacher-reported social-emotional-behavioral, were associated with trauma exposure in school-aged youth. After initially

identifying 6,107 articles in the literature from 1990-2015, inclusion criteria were met for 506, each with a specific focus on the three core learning factors. Each is summarized below.

**Cognitive Functioning.** *Intelligence*, as measured by IQ scores, has been shown to be lower amongst youth who had witnessed or experienced violence, or who had been maltreated. These findings were evident using control groups, in longitudinal studies, and in cross-sectional samples. These scores were depressed further by those who also presented traumatic stress symptoms, those who had been abandoned or and in foster care, and those exposed to alcohol prenatally. *Memory*, including visual, verbal, spatial, and/or working memory, were all impaired by youth having experienced trauma. Notably, youth who had experienced neglect and had PTSD struggled especially with facial recognition tasks, as well as visual memory. Also, those who had experienced dissociation as a result of traumatic stress struggled with memory tasks even more than other trauma-exposed youth, and those who had experienced sexual, physical abuse, assaultive traumas, and abandonment had significantly lower working memory scores than normative groups. *Language and verbal ability* was a challenge for youth exposed to trauma as well, with youth who had experienced sexual abuse performing worse than others. Language disorder was also more prevalent amongst youth who had been maltreated. Finally, *attention* difficulties also contribute to cognitive challenges among these youth, impacted by arousal and dissociation symptoms. These challenges were most significant amongst those who had experienced sexual abuse, maltreatment, or alcohol exposure.

**Academic Functioning.** *Academic achievement* for youth exposed to maltreatment and neglect was compromised in the areas of reading and math. Youth exposed to trauma but not exhibiting traumatic stress symptoms functioned similar to their peers, but those with traumatic stress struggled in the areas of vocabulary, reading, math, spelling, language, and science. These

impacts are more significant in reading for youth who experienced neglect, in math for those with PTSD, and overall for those with more severe traumatic stress, chronic maltreatment, and those experiencing dissociation. *Other academic outcomes* were also impacted, including increased rates of school discipline and special education participation, and lower rates of school completion and attendance. These impacts were most significant for youth who had experienced sexual abuse, maltreatment, neglect, physical abuse, and violence exposure.

**Social-Emotional-Behavioral Functioning.** *Externalizing symptoms* such as aggression, defiance, hyperactivity, and disruption were more common in youth who had experienced natural disasters, sexual abuse, maltreatment, and violence. Those exposed to alcohol prenatally and those reporting maltreatment exhibited increased rates of hyperactivity, impulsivity, and oppositional defiant behaviors. *Internalizing symptoms* such as depression, anxiety, sadness, and low self-esteem were reported by teachers for those students who had experience maltreatment, and traumatic stress symptoms. These internalizing behaviors were more significant for youth who had experienced sexual abuse, and those with multiple symptoms of traumatic stress.

## **Resilience**

Given the extent of trauma exposure discussed above, and its broad and significant impacts on learning and healthy development, providing students with the skills to successfully navigate such adversities is critical. Resilience is conceived as, “a dynamic developmental process encompassing the attainment of positive adaptation despite exposure to significant threats, severe adversity, or trauma that typically constitute major assaults on the processes underlying biological and psychological development.” (Cicchetti & Garmezy, 1993, p. 404; Luthar et al., 2000; Luthar et al., 2015; Masten, Best, & Garmezy, 1990; Masten & Tellegen, 2012; Rutter, 1987, 2012; Zolkoski & Bullock, 2012). In this review the term *resilience* is used

instead of the character trait *resiliency* to emphasize this process of positive adaptation, and to not describe characteristics of children, parents, teachers, or communities may or may not have developed, in an effort to avoid assigning blame to those facing adverse circumstances (Luthar, Crossman, & Small, 2015). As described by Fergus and Zimmerman (2005), “Resilience is not a static trait... [it] is defined by the context, the population, the risk, the promotive factor, and the outcome... an analytic approach that examines relationships among risk and promotive factors is necessary for understanding adolescent resilience” (p. 404). Below key terms and concepts of resilience are presented, as well as a framework for resilience theory. Following this, characteristics of resilience are reviewed, as well as empirical insights on its measurement and development.

**Key terms and concepts.** Central to its definition are several key concepts, including adversity, positive adaptation, ego resiliency, and risk and protective factors. **Adversity** is a “high-risk condition that carries high odds for measured maladjustment in critical domains... when risks... coexist, effects tend to be synergistic” (Luthar, Crossman, & Small, 2015, p. 741). Its presence is required to distinguish resilience from competence. In addition, resilience encompasses both positive and negative adjustment to adversity, where competence only exists in relation to positive indices. For example, a student who does well in academic and athletic domains is exhibiting competence. If this same student had previously survived a traumatic brain injury, successfully completed many years of physical and speech therapy to overcome the impacts of the TBI, and then experienced academic and athletic success, this student is demonstrating resilience.

**Positive adaptation** is “adjustment that is much better than would be expected, given exposure to the risk condition under study... most commonly operationalized in terms of

behaviorally manifested social competence, or success at meeting stage-salient developmental tasks” (Luthar et al., 2015, p. 741). A key characteristic in relation to resilience is that the adaptation must be relevant to the risk. For example if measuring adaptation in response to parental violence against children, the absence of violent behavior amongst children would be relevant, where another positive adaptation such as academic success may not. The levels of success of the adaptation must also consider the seriousness of the risk exposure. Finally, given the complex and overlapping nature of risk exposure, adaptation should be measured across multiple domains of adjustment (Luthar et al., 2015).

Also known as vulnerability factors, **risk factors** are probability statements that predict the potential exacerbation of the negative effects of adverse conditions on people (Luthar et al., 2015; Zolkoski & Bullock, 2012). For example, poverty is a risk factor that likely increases the negative effects of maternal mental health challenges on children (Fergus & Zimmerman, 2005). Zolkoski and Bullock (2012) recommend that the predictive validity of these factors depend on three variables: when the assessment took place; which development systems were measured, and; variations in how children respond to changes in caregiving environments.

In contrast to risk factors, **protective or promotive factors** are factors that, “may influence, modify, ameliorate, or alter how a person responds to the adversity that places them at risk for maladaptive outcomes” (Rutter, 1985). For example, a student who lives in a violent neighborhood may be protected from some of the impacts of this violence if she lives in a home with high levels of parental involvement and monitoring, or if she is involved in extracurricular activities (Luthar et al., 2015). Additional information on risk and protective factors and their impacts on resilience are discussed further below.

**Theoretical models of resilience.** The research on resilience in the behavioral sciences emerged, from its origins in the field of medicine, around 1970, and has increased dramatically in recent decades (Ager, 2013; Luthar et al., 2015; Zolkoski & Bullock, 2012). Early research focused on resilience as an unchanging personal characteristic inherent to children who thrive despite adversity. Important shifts took place in the 1980s and early 1990s, wherein contributors to resilience expanded from the individual to include family and community factors, and resilience came to be viewed as more dynamic than static, evolving both across the lifespan and diverse life domains (Luthar et al., 2015; Rutter, 2012).

Zolkoski and Bullock (2012) describe three developmental waves of resilience research. The first wave focused on understanding and preventing psychopathology by examining children who adapted well to adverse situations. The second wave focused on, “detecting the processes and regulatory systems that accounted for protective factors associated with resilience” (p. 2296). The final wave shifted towards direct application of findings to promote resilience development through public policy and prevention programs. The field’s rapid empirical expansion includes work in a variety of academic fields, including, for example: disaster response, economics, climate change, child welfare, national security, and international development (Ager, 2013).

As illustrated above with the use of resilient versus resiliency, the terminology involved in research on resilience can be confusing to empirical practitioners and consumers. By definition, resilience describes a process of positive adaptation and healthy development in the face of risk and traumatic experiences. As such, both risk and positive adaptation are required elements of resilience, yet resilience theory adopts a strengths-focused approach by focusing on both the promotive assets (internal to individuals) or resources (external to individuals) that interact to build protection from risk. Critical to resilience theory is acknowledging the central

role of promotive factors external to individuals, both to de-emphasize the idea that resilience is an immutable character trait, and to elevate a focus on identifying and developing both individual skills and these ecological resources (Fergus & Zimmerman, 2005).

In their 2005 review of resilience frameworks, Fergus and Zimmerman present a table that clarifies the relationship between risk and resilience in this field, modified from an earlier version published by Tiet and Huizinga (2002). This table is illustrated in Table 1 below.

Table 1

*Resilience and Vulnerability*

	Low risk	High risk
Positive outcome	A (normative development)	<b>B (resilience theory)</b>
Negative outcome	C (inadequate risk assessment)	D (risk models)

(Fergus & Zimmerman, 2005, adapted from Tiet & Huizinga, 2002)

Cell A represents exposed to low risk and achieve positive outcomes follow normative development, and cell C represents youth exposed to low risk and achieving negative outcomes. Cell C represents an unexpected trajectory, since their risks have likely been inadequately assessed. Resilience theory posits that those youth in cell B, who have been exposed to high risks, yet achieve positive outcomes, are on a resilient trajectory. In contrast, cell D represents those demonstrating an expected trajectory in risk models, wherein they're exposed to high risk and achieving negative outcomes.

Three models of resilience identified by researchers include compensatory, protective, and challenge (Fergus & Zimmerman, 2005; Garmezy, Masten, & Tellegen, 1984; Rutter, 1985; Zolkoski & Bullock, 2012). *Compensatory resilience* occurs when a promotive factor acts

independently of a risk factor to counteract the risk. For example, children who are maltreated by their primary caregiver are at greater risk for school failure, but having strong connections with warm and rigorous teachers at school may compensate for some of the negative impacts of maltreatment. *Protective resilience*, on the other hand, occurs when a protective factor acts directly on a risk factor to alter its impact on outcomes. For example, if a child lived with a parent who had a history of maltreatment towards his children, and the child had an older sibling who protected them from abuse, the impact on school performance may be mitigated.

The *challenge* model of resilience is one in which the risk and protective factor are the same thing, and youth build their skills at coping with the variable through increasing levels of exposure. For example, if a child is exposed to stressful academic situations, and utilize coping skills to successfully handle the stress, their ability to handle increasingly stressful situations in the future increases. If students are never exposed to academic stress until they are older (and the stakes potentially higher), they may never build and practice coping skills. As such, the relationship between risk and outcomes is curvilinear, in that exposure to very low, or very high levels of risk increase the chance of negative outcomes, and exposure to challenging levels of stress increases skills and outcomes.

**Characteristics of resilience.** First, as described above, resilience is not a personal trait, but a process of positive adaptation. This process incorporates individual skills, yet these emerge within variable ecological contexts and result from diverse interactions amongst risk and protective factors (Fergus & Zimmerman, 2005; Luthar et al., 2015). Resilience requires exposure to adversity or risk. Attaining average functioning, avoiding trauma pathology, and accomplishing stage-salient tasks in the absence of risk exposure is considered competence within typical development. Resilience theory requires risk factors with which protective factors

may interact. Contributors to this contextual diversity may be personal, biological, and environmental. Examples of personal contributors include locus of control, optimism, hope, emotional regulation, self-efficacy, and attachment. Biological factors may include brain changes based on early adversity, supportive caregivers, or genetics. Environmental contributors may include social support and secure attachment to peer or family, schools, religion, violence exposure (Herrman, et al., 2011).

Resilience may also be evident in one setting or circumstance but not in different situations at that time, or even in the same situation at a different time (Cicchetti, 2013; Hermann et al., 2011; Luthar, Crossman, & Small, 2015). Similarly, resilience that promotes positive adaptation in a micro-level context (increased academic persistence in math class) may not translate to academic success based on macro-level variables (low quality math instruction based in inequitable school funding; Fergus & Zimmerman, 2005). Factors promotive of positive adaptation also vary in their impact based on population characteristics, such as (but not limited to) geography, gender, immigrant status, family income, and stage in adolescence (Fergus & Zimmerman, 2005). Studies have also indicated that siblings simultaneously experiencing the same event can interpret its level of adversity differently (Hetherington, & Stanley-Hagan, 1999). Such high degrees of variability between risk and promotive factors makes it critical that interpretation and generalization of empirical findings are undertaken with care, as discussed further below.

Rutter (2013) identified five additional characteristics of resilience. First, some positive adaptations may only be helpful in the presence of risk. For example, adoption may be a protective factor for those youth who previously lived in unstable foster or group homes, but not so for youth who did not face these contextual risks. Secondly, as described in the challenge

model of resilience above, the impacts of some risk factors decrease with repeated, brief exposure, allowing for coping skills to develop with time. Next, several key mental features have emerged as effective in supporting resilience, above specific coping strategies: planning and self-control. Planning incorporates both the reflective capacities to learn from previous experiences, and the determination and confidence to modify future behavior (Clausen, 1991; Quinton & Rutter, 1988). Self-control appears to exert strong and broad influences on resilience, independent of social class and IQ (Moffitt et al., 2011).

Rutter's (2013) fourth characteristic of resilience is that key turning points in adult life appear to have significant impacts on the development of resilience. The two primary turning points used as illustrations are marriage (Sampson & Laub, 1993), and military service (Elder, 1986, 1987). In both examples, these complex experiences provided participants with opportunities to sever connections with previous risk experiences, and to open them to protective future opportunities. Finally, interactions between genes and environment (G x E) appear to influence levels of risk and protection. The utility of G x E research has been questioned, given the applied nature of resilience research and the lack of genetic modification options available to mental health professionals (Luthar & Brown, 2007; Luthar, Crossman, & Small, 2015), but these factors again underscore the dynamic nature of resilience.

**Measuring resilience.** As a phenomenon or process reflecting relatively positive adaptation despite significant adversity or trauma, resilience itself is rarely ever directly measured, but instead subsumes constructs of adversity and adaptation. According to Luthar and colleagues (2015), "The central objective of resilience research is to identify *vulnerability* and *protective factors* that might *modify* the negative effects of adverse life experiences, and then, to identify *mechanisms* or *processes* that might underlie associations found" (p. 5). Given the

diverse and complex interactions amongst these factors, resilience research has two core characteristics: it is applied, and it draws from diverse academic disciplines (Luthar & Brown, 2007). Quantitative research primarily consists of two approaches: variable-based and person-based analyses. In variable-based analyses, regression is utilized to analyze predictive relationships between risk and protective factors and outcomes. In person-based analyses, groups categorized based on risk and protective factors are compared to themselves and others to detect impacts relationships (Luthar, Crossman, & Small, 2015).

Evidence of positive adaptation should address multiple domains, including behavioral, social/emotional, and academic (Kinard, 1998; Walsh, Dawson, & Mattingly, 2010), and include multiple measures eliciting input from as many stakeholders as possible, including students, teachers, parents. However, such broad assessment can have its challenges, including determining treatment impacts when so many measures are utilized, or if combining measures to simplify interpretation, masking important differences across measures (Kinard, 1998). Given the interdisciplinary nature of resilience research, challenges identified in measurement also include complicated and possibly competing conceptualizations of competent functioning. Walsh and colleagues (2010) reviewed twenty-one studies that examined resilience in youth following maltreatment across multiple domains (behavior and emotional, social, and academic competence). They recommend providing interventions to adolescents that address multiple functional domains (see also: Afifi & MacMillan, 2011), and then measuring each domain individually, but using comparable metrics for comparison of functioning across domains, such as low, medium, and high median scores.

### **Addressing Trauma and Building Resilience**

**Developing resilience.** Central to resilience theory is the focus on asset and resource development and building protective factors, as opposed to identifying and reducing deficits and risks (Fergus & Zimmerman, 2005; Rutter, 2013; Zolkoski & Bullock, 2012). Interventions can be aimed at building these protective factors at the individual, family, and community level (Luthar et al., 2015), or by internal (e.g. self-efficacy, self-control) or external community factors (e.g. parental involvement, attachment to teachers) (Dray et al., 2017). Previous studies have found that building protective factors in youth can reduce mental health problems (Luthar & Cicchetti, 2000), such as anxiety, depression, and stress (Bond, Toumbourou, Thomas, Catalano, & Patton, 2005; Hjemdal, Aune, Reinfjell, & Stiles, 2007; Hjemdal, Vogel, Solem, Hagen, & Stiles, 2011). Table 2 includes a list of protective and risk factors at each of these three levels. These lists are not exhaustive, but are included herein to display the scope of possibility for impacting resilient trajectories for our youth.

Table 2

*Protective and Risk Factors* (Fergus & Zimmerman, 2005; Luthar, Crossman, & Small, 2015; Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003; Zolkoski & Bullock, 2012)

Protective Factors	Risk Factors
<b>Family</b>	
High quality caregiving	Low infant nurturance
Attachment	Adversity and loss
Nurturance	Poor relationships
Support	Lack of parental monitoring
Monitoring	Family conflict
Communication skills	Excessive parental control
Limit setting	Parental drug use
Autonomy granting	Exposure to family violence
Parental involvement with school	Negative ethnic identification

Parental education  
Positive racial identity

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**Community**

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High quality childcare	Natural disasters
School attachment	War and violence
Supportive relationship with teachers	Underfunded schools
School-based support system	Poverty
Schoolwide ecological interventions	Negative peer influence
Peer attachment	Peer delinquent behaviors
Adult mentoring	Peer drug use
Social organization processes in neighborhoods	Low community norms for family closeness
High quality schools	Racial discrimination

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**Individual**

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Social skills	Drug abuse
Academic skills	School problems
Self-efficacy, self-esteem, self-control	Antisocial socialization
Positive affect	Traumatic exposure
Planning to attend college	Abuse
Participation in extracurricular activities	Risk-taking behavior
Religion/Spirituality	Low academic motivation
Problem solving	Gang involvement
Emotional intelligence	Low birth weight
Coping skills	Congenital defect
Executive functioning	Dropping out of school

When developing interventions aimed at promoting resilience, there are number of important considerations. First, because of the multifaceted nature of resilience, promoting skill

development with a greater chance for generalization across behaviors or skill domains should be prioritized over those interventions with a limited scope. Relatedly, given the dynamic nature of resilience, and the complex interactions between risk and protective factors, careful attention to population characteristics and student developmental level is advised when designing and selecting interventions (Fergus & Zimmerman, 2005; Zolkoski & Bullock, 2013). In addition, given the protective effects of repeated, limited exposure to stressors described as *challenge resilience* above, interventions designed to build protective factors should incorporate repeated opportunities for youth to experience successful coping. Such experiences, especially as related to developing coping skills, self-reflection, and personal agency, not only build autonomy in developing youth, but also increase chances for successful application across developmental domains (Rutter, 2013).

As described above, key turning points in life, such as marriage or military service, can have significant protective effects. While early interventions with children and parents also have powerful impacts on resilience, retaining this “lifespan” perspective is critical. It is important to provide youth with opportunities to reflect upon and learn from successful coping with past adversities, as well as to encourage them to remain open to new experiences, relationships, or opportunities that may allow them a fresh start (Rutter, 2103). Finally, in all interventions aimed at developing resilience, whether in clinical or school settings, promoting ownership of the process and activities amongst participants and their peers is key in building sustainable prosocial networks and reducing dependency on short term professional interventionists (Rutter, 2013).

### **General Trauma Treatment Components**

Cook and colleagues (2007) identified six effective components of interventions to support those impacted by complex trauma. These were developed by The Complex Trauma Workgroup of the National Child Traumatic Stress Network, and each is summarized below. (1) It is critical that all treatments take place within a *safe environment*, allowing the trauma victim to feel internally and externally comfortable enough to participate in the intervention. (2) Effective interventions must also include *self-regulation skills*, focused on improving interpersonal relatedness and self-attribution, arousal control, and restoring equilibrium following dysregulation of affect, behavior, physiology, and cognition. (3) Next, *self-reflective information processing* is critical, often taking the form of building trauma narratives. These are based on reflection on past and present experiences, to help assist in anticipation, planning, and decision-making. (4) The *integration of traumatic experiences* teaches children to incorporate, transform, or resolve traumatic memories or experiences. Therapeutic approaches include: meaning-making, traumatic memory containment or processing, mourning of a traumatic loss, symptom management and coping skills, and the development of present-oriented thinking and behavior. (5) Improving *relational engagement* is also critical, through assisting students to develop appropriate attachments within current relationships. This may include building interpersonal skills such as assertiveness, cooperation, limit-setting, reciprocity, perspective-taking, empathy, and the capacity for physical and emotional intimacy. (6) Lastly, *positive affect enhancement* helps students develop a positive sense of self through the use of creativity, imagination, future-orientation, achievement, competence, mastery-seeking, community-building, and the capacity to experience pleasure. (Cook, et al., 2007, pp 7-8).

### **General Trauma Treatment Techniques**

In addition to the general treatment components identified above, Black and colleagues (2012) identified five therapeutic techniques that are common across effective trauma-informed treatments for these older students. The first of these is *psychoeducation*, the goals of which are threefold: to teach youth what traumatic events are, how experiencing these events affects us, and how the resulting symptoms are perpetuated over time (Carrion & Hull, 2009). The next technique is teaching *coping skills* for dealing with trauma impacts. These typically include a variety of relaxation techniques, identifying triggers, and affect regulation and methods of expression (Amaya-Jackson et al., 2003; Carrion & Hull, 2009). Thirdly, similar to the general findings from Cook, et al., (2005) above, adolescents benefit from producing a *trauma narrative*. By providing the structured and supportive space for youth to recount and describe their traumatic experience(s), either orally or in writing, these narratives allow youth to face these experiences to facilitate healing and allow them to move forward (Amaya-Jackson et al., 2003).

A fourth technique is *cognitive restructuring*. According to Hassija and Gray (2010), “The goal of this technique is to increase the client’s awareness of his or her thought processes, thus allowing for modification of thinking errors and maladaptive beliefs.” This is achieved by identifying faulty logic, generating alternative interpretations, and by considering the probability and consequence of the traumatic event (Hassija & Gray, 2010, pp 114-115). Finally, effective treatments for adolescents include *post-treatment planning*, a component designed to increase the likelihood of sustaining the benefits of treatment after completion (Black, et al., 2012). Having reviewed the generally effective treatment components and techniques, we now briefly review the modes of delivery for these services within the largest mental health service provision system in the US, the public school system.

### **School-based MTSS Trauma Interventions**

As one of the most well studied MTSS systems, PBIS is a framework designed to improve the implementation of evidence-based behavioral interventions, with core features including, “(a) universal screening, (b) continuous progress monitoring, (c) team-driven data based coordination and problem solving, (d) evidence-based behavioral interventions, (e) sustained and scalable implementation fidelity, and (f) cultural and contextual responsiveness” (Evans, Stephan, & Sugai, 2014, p 64; Sugai et al., 2000; Walker et al., 1996).

This multi-tiered, preventative, and data-driven approach to problem-solving in schools has been successful in moving isolated interventions, even those deemed to be effective, from stand-alone programs to operating within an integrated and data-driven system. By doing so, the likelihood of developing buy-in amongst key stakeholders and implementers increases, along with intervention accuracy, durability, and scalability (Chafouleas, Johnson, Overstreet, & Santos, 2016). In their proposal for just such an integrated trauma-informed service delivery system using MTSS as a guiding framework, Chafouleas and colleagues (2016) recommend interventions at each tier of the MTSS framework. This proposal is illustrated in Figure 1. Since MTSS is a systems-level framework, considerations for successfully implementing such theory and practices within the complex milieu of schools are discussed.

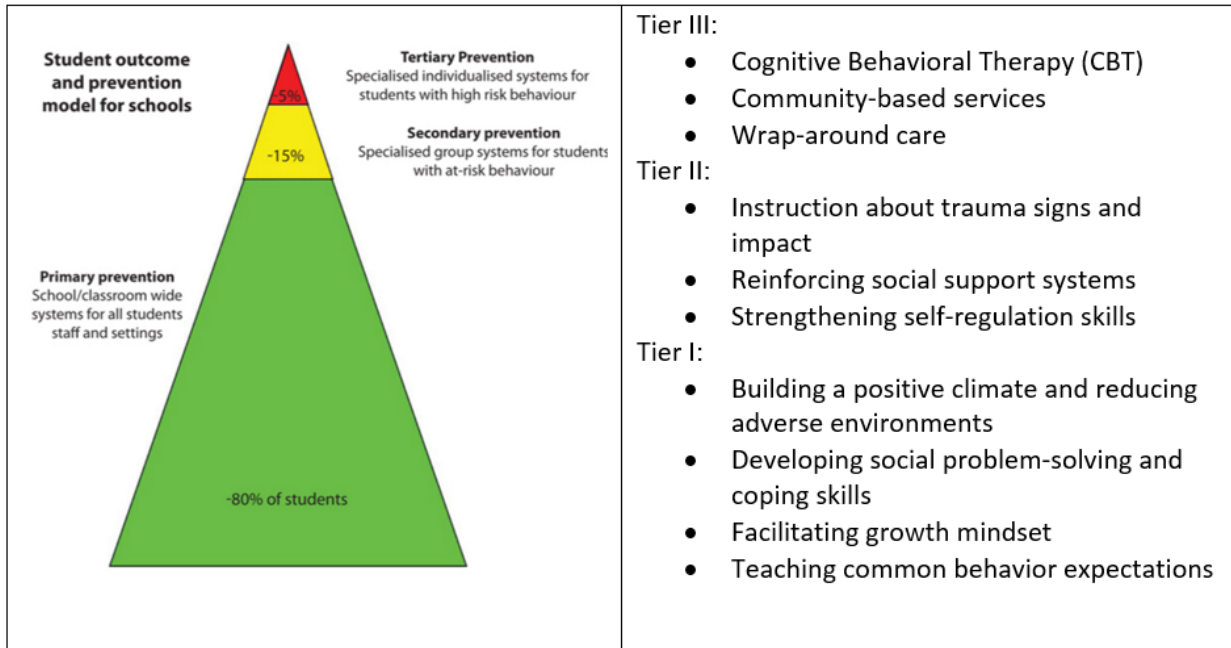


Figure 1. Trauma Informed Practices within an MTSS Framework (image: [www.pbis.org](http://www.pbis.org); text: Chafouleas et al., 2016).

### Implementation Considerations in School Systems.

In response to concerns about the lack of uptake of evidence-based practices within medical settings, “Implementation Sciences” formally emerged as a distinct academic field with the publication of the online peer-reviewed journal, “Implementation Sciences” in 2006. Therein, the concept was defined by Eccles and Mittman as, “The scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and hence, to improve the quality and effectiveness of health services.” (p. 1)

Examination of implementation issues in the sciences clearly preceded this milestone, (i.e. Berman & McLaughlin, 1974; Glasgow, Vogt, & Boles (1999); Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Greenwood & Abbot, 2001; Kitson, Harvey, & McCormack, 1998; Rogers, 2002), but the identification of this field as distinct from others sought to address existing epistemological challenges. These included identifying and synthesizing research across

a wide array of disciplines and methodologies, and locating implementation-specific insights (such as intervention context and developmental processes) within studies primarily evaluating other empirical relationships. Now, with an explicit focus on the complex variables contributing to intervention development, diffusion, and sustainability across disciplines, the research in the field of implementation sciences has since expanded broadly, providing valuable tools to address the persistent research-to-practice gap.

One set of tools emerging from the development of this distinct field are implementation frameworks. While these vary in scope and areas of focus, each attempts to provide a mechanism for identifying and measuring the various factors influencing implementation (see: Aarons, Hurlburt, & Horwitz, 2011; Damschroder, Aron, Keith, Kirsh, Alexander, & Lowery, 2009; Fixsen, et al., 2005; Glasgow, et al., 1999; Greenhalgh, et al., 2004; Helfrich, et al., 2010; Wandersman, et al., 2008). As summarized by Cook and Odom (2013), the primary emphasis in the application of implementation science frameworks is to move from the ineffective model of ‘letting it happen’ (Tseng, 2012) to ‘making it happen.’ While inclusive of characteristics of interventions themselves, implementation frameworks explicitly focus on the processes involved in delivering, supporting, and sustaining practices previously found to be effective.

Of these frameworks, the Consolidated Framework for Implementation Research (CFIR, Damschroder et al., 2009) has been utilized extensively by researchers seeking a unifying framework for examining implementation in a variety of disciplines (CFIR Technical Assistance Team, 2014). The CFIR comprises a “list of constructs within general domains that are believed to influence... implementation,” with the goal of “advancing implementation science by providing consistent taxonomy, terminology, and definitions on which a knowledge base of findings across multiple contexts can be built.” (Damschroder, et al., 2009, p. 2-3) It was

developed using snowball sampling of articles citing Greenhalgh et al.'s 2004 review of nearly 500 published articles examining implementation in health care, to identify 19 new theoretical frameworks and models. These were summarized and consolidated to produce five main domains influencing implementation, each with multiple underlying descriptive constructs believed to influence implementation.

These five domains, as illustrated in Figure 2, are *intervention characteristics*, *outer setting*, *inner setting*, *characteristics of individuals*, and *process*. Each domain includes constructs believed to influence implementation. As described by Damoschroder and colleagues (2009), these constructs interact with each other, “in rich and complex ways to influence implementation effectiveness” (p. 3), a phenomenon they acknowledge as also having been identified in previous frameworks as well (Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005; Pettigrew & Whipp, 1992; Rycroft-Malone, Harvey, Kitson, McCormack, Seers, & Titchen, 2002).

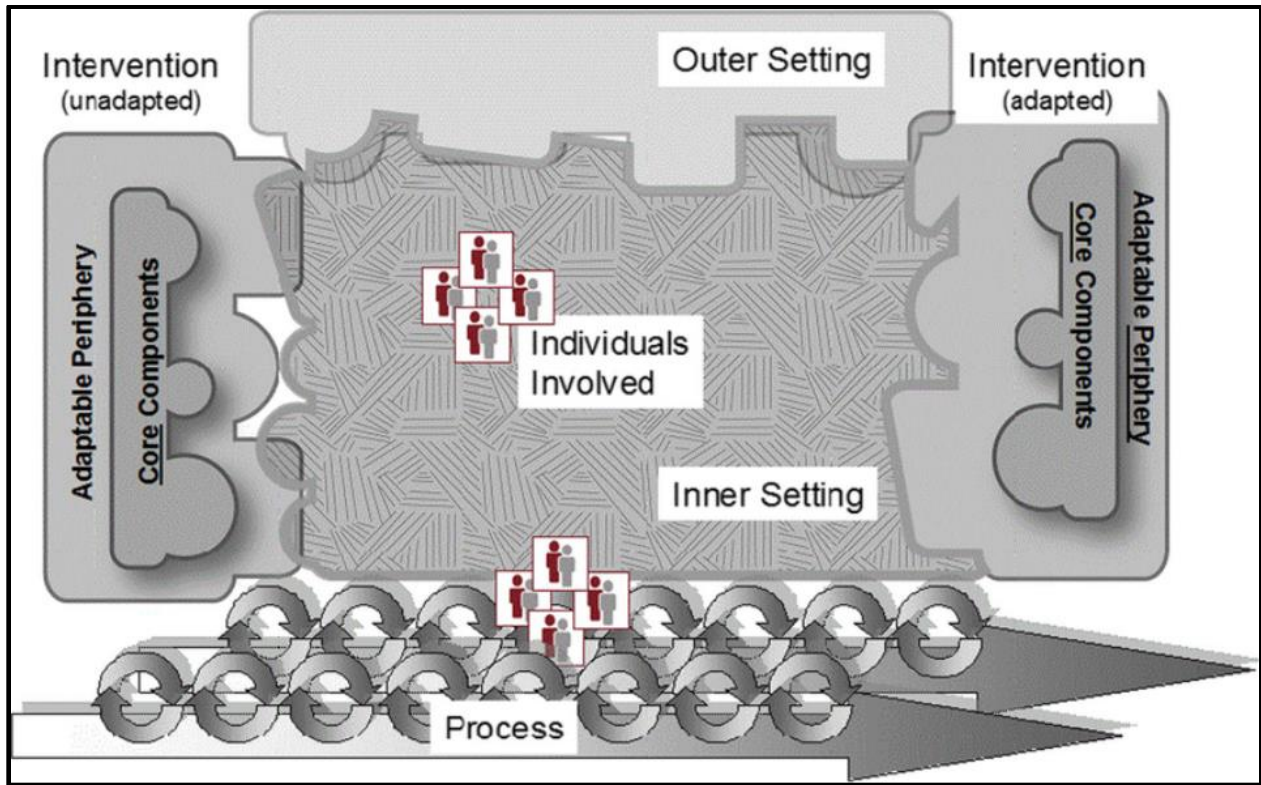


Figure 2. The Consolidated Framework for Implementation Research (CFIR). (Damschroder et al., 2009)

Given the importance of schools in providing mental health supports to children, and the ongoing challenges faced by school and mental health personnel in successfully implementing such supports (Baskin et al., 2010; Franklin et al., 2012; Ko et al., 2008; Rolfsnes and Idsoe, 2011; Wilson & Lipsey, 2007), it is important to consider factors contributing to implementation as we develop new interventions to meet student needs. As such, the *Characteristics of the Intervention* domain is of particular interest, and this domain will be utilized to interpret qualitative study findings. Given this focus, the eight constructs within this domain are summarized below. The first construct in this domain is the *source* of the intervention, and focuses primarily on perceptions of stakeholders as to whether it was developed internally or externally. Next, stakeholders' perceptions of the *strength and quality* of the intervention and its supporting evidence are included. Perceptions are also assessed as to the *relative advantage* of

the interventions compared to alternatives. The fourth construct is the intervention's *adaptability*, including its capacity for tailoring or refinement to meet the needs of practitioners and students in the local setting. *Trialability*, or the ability to test and withdraw the intervention locally is the next construct. The *complexity* of the intervention is also assessed, and this includes the difficulty of implementation, including, "duration, scope, radicalness, disruptiveness, centrality... intricacy and number of steps required to implement" (Damschroder et al., 2009, p. 6). The final two constructs are the intervention's *design quality and packaging*, and *costs*, which includes the cost of the intervention itself, costs of implementation, and opportunity costs.

School systems are notoriously challenging environments to implement and sustain new initiatives, given the wide array of contextual variables capable of disruption (Cook & Odom, 2013; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Even within the structure provided by the utilization of a MTSS framework, some overall guidance is provided in the trauma literature that is supportive of implementation across tiers. First, it is critical that schools invest the time in building staff awareness of core features of trauma-informed practices. SAMSHA (2014) recommends framing such practices around the "Four R's" of trauma: *realization* of what trauma is and its effects; *recognition* of the signs of trauma; a *response* that embraces trauma understanding across multiple tiers of services, and; *resisting* practices that could re-traumatize students. All practices, across all tiers of support, should be grounded in these basic principles.

An additional set of guiding considerations is provided by the Trauma and Learning Policy Initiative (Massachusetts Advocates for Children and Harvard Law School, 2013), which includes several key additions to the four "R's". They emphasize a holistic approach to ensuring academic, physical, social, and emotional safety for those impacted by trauma, by taking into account relationships, self-regulation, academic competence and emotional well-being. They also

encourage staff to embrace teamwork and ownership of all students across the school community to allow students multiple opportunities and settings in which to practice newly developing skills and build protective factors. Recent literature also encourages clearly defined plans for professional development and program evaluation of trauma-informed practices (Chafouleas, et al., 2016). Finally, in their review of implementation factors when integrating mental health supports within an MTSS framework, Sugai and Stephan (2013) propose five key considerations: to specify the needed and intended outcomes; to select the appropriate evidence-based practices; to adapt practices to local context and culture; to ensure that local support for implementation exists, and; to establish system-level progress monitoring and planning procedures.

### **Theory of Change.**

To address the need for school-based resilience and trauma curriculum that could be delivered to large groups in high school general education classes, a new curriculum was developed by practitioners at a public alternative high school in the Pacific Northwest. This intervention is called *Resilience, Education, Achievement, Choices, Hope (REACH)*. As presented in Figure 3 below, REACH builds upon a foundation of trauma-informed teaching practices. REACH was developed by teachers and administrators throughout the fall quarter of 2016 during weekly Professional Learning Community (PLC) meetings of the REACH teachers. The building principal and assistant principal (this author) wrote the lessons, and shared drafts with the members of the PLC for formative feedback. Each week the lessons from the previous week were reviewed and revisions made, followed by a preview of the upcoming lesson. Lessons were built from the professional learning and relevant literatures utilized during the previous school year to develop staff knowledge and skills to better implement universal trauma-informed practices. The theory of change below was developed retrospectively during the spring of 2017

by this author in consultation with the school principal and members of his doctoral advisory committee. Theories of change serve multiple purposes, including capturing the interactions of dynamic internal and external variables, and indicating causality between program assumptions, interventions, and outcomes (Baker & Bruner, 2010). The Foundations, Assumptions, Activities/Curriculum, and Outcomes domains were grouped as such after reviewing the curriculum and sorting its components in relation to the literatures on trauma-informed teaching and resilience, discussed above. This theory of change was shared with the REACH PLC in draft form for input and revision. The specific skills identified in the Activities/Curriculum domains were then utilized to build the student resilience survey for PE question one. Each domain of this theory of change is discussed briefly below to contextualize the current program evaluation.

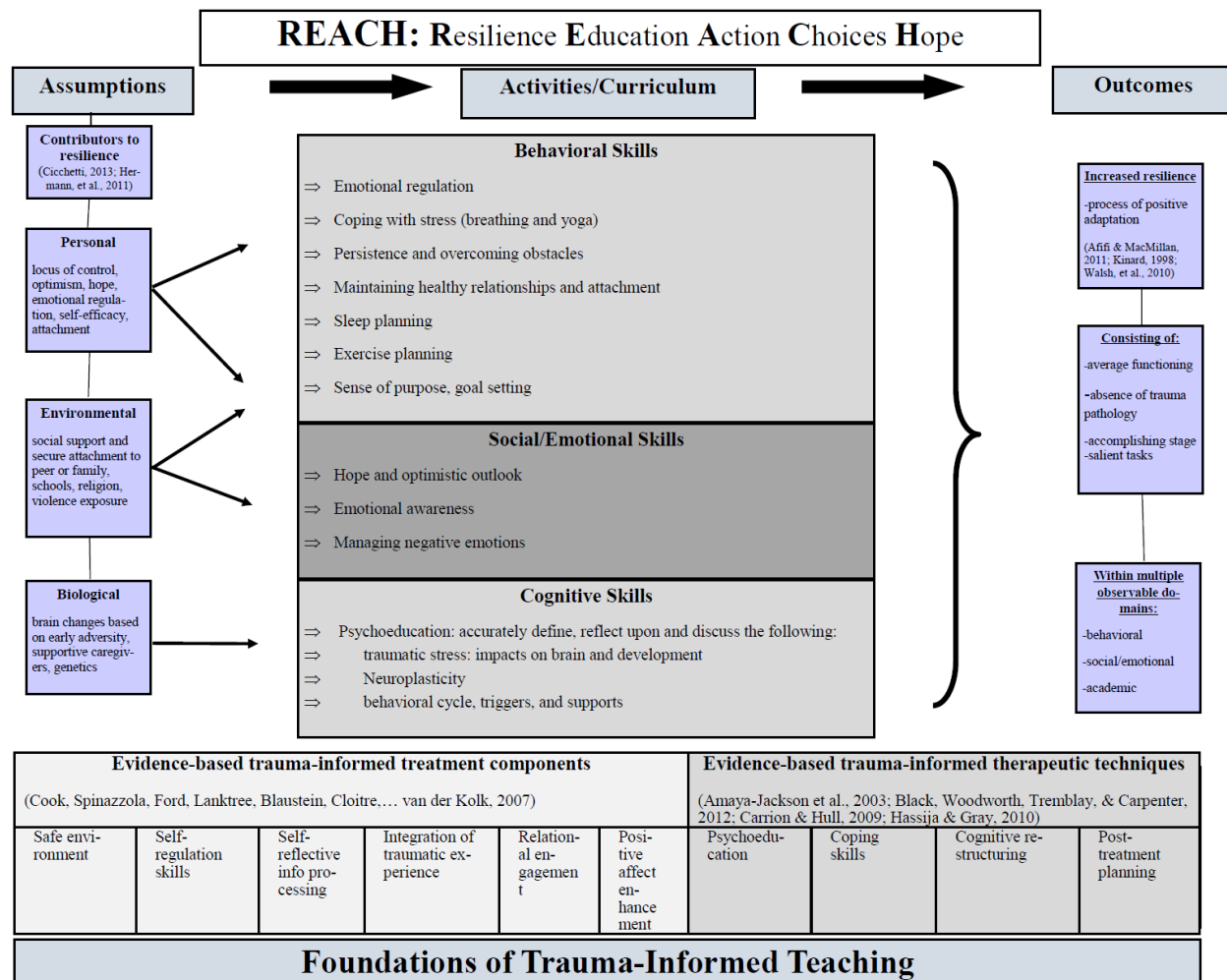


Figure 3. REACH Theory of Change

**Foundations.** Before describing the trauma-informed treatment components and therapeutic techniques that form the foundation of the intervention, I briefly describe the flow of the lessons in the course (See also Appendix D for a calendar of lessons by week). The curriculum addresses related topics in one-week units (4-5 lessons), generally moving throughout the course from understanding risk factors to building protective factors. The first unit focuses on adolescent brain development and neuroplasticity, and reinforces the concept that brains are highly responsive to new learning and effort, just like other muscles in the body. This first set of lessons

aim to empower students to take ownership of their own learning and habits, and to instill a “growth mindset” (Dweck, 2006) for the course. The next focus is on ACEs research and the impact of trauma on the brain, learning, and behavior. All students take the ACEs quiz anonymously, and results are calculated and shared with students privately. Week 3 introduces the concepts of resilience, motivation, and optimism, and weeks 4 and 5 provide skills and strategies for increasing resilience through healthy sleep and exercise habits, and building supportive relationships. Week 6 focuses on understanding the impact of trauma on our bodies, by exploring what happens when we experience intense emotions such as aggression, and by identifying healthy strategies for managing our own emotions and supporting others. Weeks 7 and 8 focus on building resilience through mindfulness and yoga practices, and week 9 explores sense of self through a series of moral reasoning exercises. As described above, the theory of change was developed and revised retrospectively after the lessons had been written and iteratively piloted and revised over several previous quarters.

These lessons integrate a number of the components of effective trauma-informed interventions, as identified by Cook and colleagues (2007), developed by the Complex Trauma Workgroup of the National Child Traumatic Stress Network and summarized in the previous literature review on multi-tiered trauma interventions. REACH is provided within a *safe environment*, allowing the trauma victim to feel internally and externally comfortable enough to participate in the intervention. Lessons also explicitly teach *self-regulation skills*, focused on improving interpersonal relatedness and self-attribution, arousal control, and restoring equilibrium following dysregulation of affect, behavior, physiology, and cognition. Each lesson also includes opportunities for *self-reflective information processing* through reflective journaling, reflective dialogue, and facilitated circles. REACH aims to improve *relational*

*engagement* by focusing on the identification of supportive relationships and healthy attachments. Lastly, REACH lessons built to develop resiliency, hope, optimism, perseverance, and a positive sense of self develop a *positive affect* and future-orientation, and the capacity to experience pleasure.

REACH also integrates several trauma-informed therapeutic techniques identified as effective for older students in the literature summarized previously by Black and colleagues (2012). These include *psychoeducation*, the goals of which are threefold: to teach youth what traumatic events are, how experiencing these events affects us, and how the resulting symptoms are perpetuated over time (Carrion & Hull, 2009). These skills are heavily emphasized in the first few weeks of REACH, and are also threaded throughout the entire course. The other technique is teaching *coping skills* for dealing with trauma impacts, as is explicitly taught in week 6. These typically include a variety of relaxation techniques, identifying triggers, and affect regulation and methods of expression (Amaya-Jackson et al., 2003; Carrion & Hull, 2009).

***Assumptions.*** As described above in Chapter 2, resilience is a complex and dynamic set of adaptations to adversity. The trauma-informed components and techniques that comprise the REACH intervention are designed to improve student resilience by specifically teaching behavioral, social/emotional, and cognitive skills. REACH targets these diverse skills based on the assumption that the contributors to resilience are themselves varied, and consist of personal, environmental, and biological factors. Examples of personal factors include locus of control, optimism, hope, emotional regulation, self-efficacy, and attachment (Cicchetti, 2013; Herrman, et al., 2011; Luthar, Crossman, & Small, 2015; Luthar & Brown, 2007). Environmental factors are described by Herrman and colleagues (2011) as contributing to resilience at the micro and macro levels. Examples of micro-level factors include social supports and secure attachments to

family, peers, or teachers. Macro-level factors may include access to high quality schools and community services, or spiritual communities, or protection from community violence. Finally, biological factors contributing to resilience may include brain changes based on adversity or stress, supportive caregivers, or genetics.

***Activities/ Curriculum.*** Given these assumptions of varied contributors to resilience, the skills targeted in REACH are themselves diverse, and include behavior, social/emotional, and cognitive domains. Each resilience contributor maps on to these skills, as identified in the theory of change with directional arrows: both personal and environmental contributors are addressed through behavioral and social/emotional skill development, and biological contributors are addressed through the development of cognitive skills. Behavioral skills include the following: emotional regulation; coping with stress; persistence and overcoming obstacles; maintaining healthy relationships and attachments; sleep and exercise planning, and; sense of purpose/goal setting. Social/emotional skills include: hope and optimistic outlook; emotional awareness, and; managing negative emotions. Lastly, cognitive skills primarily consist of psychoeducation related to the following: the impacts of traumatic stress on the brain and development; neuroplasticity, and; the behavioral cycle, triggers, and supports.

***Outcomes.*** The theory of change for REACH is that given the varied personal, environmental, and biological contributors to resilience, the course aims to build a broad set of behavioral, social/emotional, and cognitive skills to improve resilience. As described in Chapter 2, the improvement of resilience is evidenced by positive adaptation to adversity. This adaptation should consist of varied outcomes, including average functioning, the absence of trauma pathology, and accomplishing age-salient tasks. Finally, these outcomes should be observable within multiple life domains, including behavioral, social/emotional, and academic.

## **Purpose of Study**

Given the relatively limited number of tier 2 trauma-interventions, and the heavy reliance of many existing programs on instructors with specialized mental health training not typical of classroom teachers, this study sought to extend the literature on school-based trauma interventions by examining REACH, a tier 2 classroom-based resilience skill-building class taught by noncertified classroom teachers. Student reports of potential impacts on their own levels of resilience, as well as teacher insights on the characteristics of the intervention impacting successful implementation will be used in an analysis of factors influencing implementation.

Specifically, this program evaluation seeks to determine the following about REACH:

1. What impacts did REACH participation have on student self-reported levels of resiliency?
2. How do teachers view REACH in terms of acceptability, feasibility, appropriateness, and effectiveness?

## **Chapter 3**

### **Method**

#### **Experimental Design**

A mixed method program evaluation design was utilized for this study. As an emergent intervention, a variety of student, staff, and school level variables were considered for evaluation. In consultation with the teachers and school administrators who have been active in developing and piloting this intervention since 2016, as well as the author's doctoral supervisory committee, two levels of focus were selected for this analysis: impacts on students, and staff perceptions of the curriculum and its developmental process. In an attempt to balance quantitative and qualitative data, this evaluation sought to identify any promising student outcomes while allowing those implementing the intervention to share contextual insights regarding development and implementation, and to have a voice in identifying research priorities. This type of utilization-focused evaluation allows for increased ownership of findings and implications for local practitioners (Patton, 2008). In addition, as described above, resilience theory implicates both individual skill development and contextual variables in building promotive factors to mitigate risk exposure and support healthy development (Fergus & Zimmerman, 2005), and the inclusion of both skill and context-focused variables in this analysis supports this as well. Impacts of the curriculum on students were measured quantitatively by assessing student self-reported levels of resilience from pre- to post intervention. Staff perceptions of curriculum acceptability, feasibility, appropriateness, and effectiveness were measured quantitatively, while additional qualitative questions provided general contextual insights.

Research procedures are described in greater detail in subsequent sections. Briefly, to measure student changes that may have resulted from the curriculum, students completed a 59-item survey during the first and last weeks of the 9-week intervention. This survey comprised a collection of seven standardized instruments measuring elements of resilience, stress, flourishing, thriving, satisfaction with life, academic self-sufficiency, growth mindset, and life skills. In addition, five more non-standardized scales were added that directly and briefly measured elements of the curriculum. Within-subjects paired *t*-test were conducted to compare pre and post treatment scores for statistical significance. To measure staff perceptions of curriculum acceptability, feasibility, appropriateness, and effectiveness, all teachers were given a modified, 19-item version of the Acceptability, Likely Effectiveness, Feasibility, and Appropriateness Questionnaire (ALFA-Q; Cook & Lyon, 2013). Each of the four sections of the survey included qualitative questions for staff assessing general feedback, curricular strengths, and recommendation for improvements.

## **Participants**

**Students.** Participants were high school students enrolled in an alternative public high school in the Pacific Northwest. This school accepts students on a rolling basis every week of the school year, and many of the students have been referred from other schools after disciplinary suspensions or expulsions. Many of these students are required to complete a one-quarter (9 or 10 weeks) behavior modification class before they are allowed to return to their neighborhood comprehensive school, and REACH meets this requirement. As such, one goal for the intervention school is to offer REACH every quarter of the school year to allow interested students the chance to return to their neighborhood school as soon as possible. Given the broader perceived benefits of the course, another goal is for all students to take this class at some point

during the year. This study was conducted during the spring quarter of the 2016-17 academic year, and students enrolled in REACH during that quarter were systematically no different than students enrolled during any other quarter. To maintain student anonymity, unique identifiers were generated by students themselves. While allowing for pre- and post-test matching, this method did not allow researchers to gather additional participant demographic or performance data. To provide some contextual insights into the school as a whole, school-wide demographics are provided in Table 3 below, utilizing data from the state department of education.

Table 3

*Demographic Information for All Enrolled Students, 2016-17*

Enrollment May 2017	479
FRL	71%
IEP	29%
Transitional Bilingual	10%
Male	54%
Foster Care	3%
Hispanic	25%
American Indian/ Alaskan Native	4%
Asian	10%
Black/ African American	35%
Native Hawaiian/ Other Pacific Islander	3%
White	18%
Two or More Races	7%

**Teachers.** Ten teachers taught the resilience class during the study period, seven of whom completed and returned the ALFA-Q, and are included as participants. This alternative school is comprised of 10 small school campuses spread across the city, described further below.

At these sites, the teachers of the resilience curriculum are all non-certified staff (teachers who work with students but who have not completed a teacher certification program) who also provide behavior modification instruction to students and liaison with parents and community partners. All teachers are African American, four are female, and three are male. Years of experience at the school for the seven participants ranges from 2 to 15, and averages 6.6.

## **Setting**

This study took place at an alternative high school in the Pacific Northwest. The school is comprised of a network of small campuses spread out across the city designed to support students who need different interventions and services than those offered in comprehensive schools. These unique supports at each campus include: individual CBT-based mental health services; intensive social work case management; individual and group drug and alcohol interventions; truancy case management; 6-week paid job readiness programs; cross-fit classes; African American Male Achievement classes (Chatmon, 2010); online credit retrieval; advisory classes designed to promote non-cognitive variables (Tracey & Sedlacek, 1982), and; daily restorative and community-building circles. Potential confounding influences of these interventions on student participants in this evaluation are discussed in the Limitations section of Chapter 5.

The school collaborates with community-based organizations and agencies to provide a unique learning environment with aligned academic interventions at each campus, as well as a broad array of intensive wraparound services, described above, to support students disproportionately impacted by trauma, homelessness, domestic violence, chemical dependency, and mental health issues. Although each campus provides the same academic and wraparound supports, each is also located in a unique setting with a community partner. For example,

campuses are located within a homeless shelter, a local church, an airplane hangar, within adult and juvenile correctional facilities, a downtown office building, and several community centers.

The school is committed to working with every student from a strengths-based perspective, regardless of his or her past, and believes that every student can grow and succeed if given the right support and encouragement. The school receives new students each week through the school year. Each campus provides the same academic program, and all teachers from the school meet weekly for departmental planning through weekly Professional Learning Community (PLC) team meetings, and all staff training. The school has been implementing multi-tiered trauma-informed supports for several years. A selection of the universal supports are described below in the school's "Trauma Informed Approach" provided in the staff handbook (2016):

All staff at [our school] work hard to understand the impact of trauma on our students. We maintain a calm and focused environment. As staff members we do not take student behavior personally and we do not escalate situations. We support students through tough times and we de-escalate volatile situations. We know that our tone of voice, the environment we create and the way we interact with students can either be triggering or calming. We strive to make our students feel a sense of love and belonging.

In addition to REACH, students in need of secondary interventions participate in a range of small group interventions available to students from any of the school sites to support their needs in a variety of domains, including drug and alcohol, trauma and loss, and truancy. Those students with the most intense trauma needs receive a variety of tertiary wraparound support services provided by internal and external medical, psychological, and social work staff, including

Cognitive Behavioral Therapy. As new students enroll each week, all are screened by the school nurse for behavioral concerns using the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1998). This information is used to refer and track students in need of additional wraparound services.

### **Description of Independent Variable: “REACH” Resilience Curriculum**

During the 2015-16 school year, this school lost six students to gun-related deaths, with one death per month during the first six months of the school year – half were homicides, and half were suicides. During that school year the staff invested heavily in its own professional development related to the impacts of trauma exposure on teaching and learning. During the spring of 2016, the school decided to develop a course to teach this information to all students through a new elective class called REACH. The aim of this course was generally twofold: to teach students about the impacts of adverse childhood experiences and trauma exposure on their brains, learning, and behavior, and; to teach students skills to increase resilience and mitigate trauma impacts. REACH classes take place each academic quarter of the year, five days per week for fifty minutes each, for nine weeks. Class sizes are typically fewer than 15 students enrolled, with daily attendance varying widely. The theory of change for REACH is presented in Chapter 2, above.

### **Procedures**

**Research Question One: What impacts did REACH participation have on student self-reported levels of resiliency?**

**Dependent Variable.** The dependent variable for the first program evaluation question is changes in self-reported student resilience scores on a 59-item pre-post composite survey. Using this within-subject paired design allowed for individual students to serve as their own controls. Survey items were selected after mapping the skill components within the curriculum to the categories within the theory of change, although there is some overlap across domains for some measures, as illustrated in Table 4 below. These skill components were then matched with existing validated measures to generate survey items.

Table 4  
*REACH Skills and Validated Measures*

Skills	Measures
<b>Cognitive skills</b>	
1. Psychoeducation: accurately define, reflect upon and discuss the following: <ul style="list-style-type: none"> <li>a. traumatic stress: impacts on brain and development</li> <li>b. neuroplasticity</li> <li>c. behavioral cycle, triggers, and supports</li> <li>d. mindfulness: impacts on brain and stress</li> </ul>	<i>Brief Resilience Scale</i> <i>Perceived Stress Scale</i> <i>Growth Mindset Scale</i>
<b>Emotional Skills</b>	
1. Hope and optimistic outlook	<i>Flourishing Scale</i>
2. Emotional awareness	<i>Brief Inventory of Thriving</i>
3. Managing negative emotions	<i>Satisfaction with Life Scale</i>
<b>Behavioral Skills</b>	
1. Emotional regulation	<i>Brief Resilience Scale</i>
2. Coping with stress (breathing and yoga)	<i>Perceived Stress Scale</i>
3. Persistence and overcoming obstacles	<i>Student Self-Report of Academic Self-Sufficiency</i>
4. Maintaining healthy relationships and attachments	
5. Sleep planning	
6. Exercise planning	
7. Sense of purpose, goal setting	

## Measures

The composite measure was comprised of all items from seven validated measures (46 items) and 13 additional items specific to REACH (see Table 5 below for a list of measures, and Appendix A for a copy of the measure given to students). Validated measures included the following: *Flourishing Scale* (Diener et al., 2010); *Satisfaction with Life Scale* (Diener, 1985); *Growth Mindset Scale* (Dweck, Chiu, & Hong, 1995); *Brief Resilience Scale* (Smith, Dalen, Wiggins, Tooley, & Bernard, 2008); *Brief Inventory of Thriving* (BIT, Su, Tay, & Diener, in press); *Student Self-Report of Academic Self-Sufficiency* (Hoover-Dempsey & Sander, 2005); and, *Perceived Stress Scale* (Cohen, Kamarck, & Mermelstein, 1983). Non-validated measures included: *Trauma Cognitive Skills*; *Coping Skills Rating Scale*; *Exercise Frequency*; *Sleep Frequency*; and, *Coping Skills Frequency Scale*. Psychometrics and sample questions for each are described briefly below.

Table 4

*List of Measures (59 items). Validated measures are italicized.*

1. *Flourishing Scale* (8)
2. *Satisfaction with Life Scale* (5)
3. *Growth Mindset Scale* (3)
4. Trauma Cognitive Skills (3)
5. *Brief Resilience Scale* (6)
6. *Brief Inventory of Thriving* (10)
7. *Academic Self-Sufficiency* (5)
8. Coping Skills Rating (5)
9. *Perceived Stress Scale* (10)
10. Exercise Frequency (1)
11. Sleep Frequency (1)
12. Coping Skills Frequency (2)

The *Flourishing Scale* (FS; Diener, et al., 2010; Silva & Caetano, 2011) is an 8-item measure of social-psychological prosperity, with items ranging from “positive relationships, to

feelings of competence, to having meaning and purpose in life.” (p. 146) Examples of questions include, “I lead a purposeful and meaningful life” and, “I am engaged and interested in my daily activities.” The FS is a 7-point scale, with 1 indicating strong disagreement, and 7 indicating strong agreement. The overall internal reliability was excellent ( $\alpha=0.87$ ), and its temporal reliability after one month was good (0.71). A principal axis factor analysis indicated that one strong factor produced an eigenvalue of 4.24, accounting for 53% of item variance, with all others factors producing eigenvalues below 1.0. Convergent validity indicated that the FS correlated strongly with other measures of well-being, such as the Basic Needs Satisfaction Scale (Ryan & Deci 2000), the Ryff Scales of Psychological Well-being (Ryff, 2008), and the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

The *Satisfaction with Life Scale* (SWLS; Diener, 1985) is a 5-item measure of life satisfaction as a cognitive-judgmental process. Sample questions include, “The conditions of my life are excellent” and, “I am satisfied with my life,” and scale options range from 1 (strongly disagree) to 7 (strongly agree). The internal reliability was strong ( $\alpha=0.87$ ), and the two-month test-retest correlation was good ( $r=0.82$ ), although in their review of subsequent studies, Pavot and Diener (1993) found the temporal reliability to decline over time (0.54 after 4 years). A principal axis factor analysis indicated a single factor accounting for 66% of item variance, a general finding that has been supported in subsequent studies, even when the SWLS was translated into multiple languages (Pavot & Diener, 1993).

The *Growth Mindset Scale* (GMS; Dweck, Chiu, & Hong, 1995) is a 3-item measure of implicit theories of intelligence, analyzing respondent levels of agreement with statements indicating intelligence as a characteristic that is either *incremental* (malleable), or *entity* (fixed) in nature. Survey items include a 6 point Likert scale, with 1 indicating strong disagreement, and

6 indicating strong agreement. Given the large number of items on this composite measure, and since all other Likert scales were either 5- or 7-point scales, a 7-point Likert was instead used to increase clarity for students. Sample questions include, “Your intelligence is something about you that you can’t change very much,” and, “You can learn new things, but you can’t really change your basic intelligence.” Measure psychometrics reported by Dweck and colleagues (1995) summarize findings from 6 validation studies of the GMS (Altemeyer, 1981; Coopersmith, 1967; Kerlinger, 1984; Levenson, 1974; Paulhus, 1984; and, Snyder, 1974). The internal reliability was strong ( $\alpha=0.94-0.98$ ), and the two-week test-retest correlation was good ( $r=0.82$ ). To address concerns about acquiescence bias, five of the six studies conducted factor analyses, indicating a single factor accounting for 91-96% of item variance across all studies. Measure items were also independent of respondents’ political affiliations, age, political beliefs, or religion. In terms of discriminant validity, measures were found to be unrelated to measures of cognitive ability, confidence in intellectual ability, self-esteem, optimism or confidence in other people and the world, social-political attitudes, and political conservatism or liberalism.

The *Brief Resilience Scale* (BRS: Smith, Dalen, Wiggins, Tooley, & Bernard, 2008) is a 6-item measure of resilience specifically focusing on the ability to bounce back from stress. Survey items include a 5 point Likert scale, with 1 indicating strong disagreement, and 5 indicating strong agreement. Items 1, 3, and 5 are positively worded, and items 2, 4, 6 are negatively worded. For scoring, negatively worded items are to be reverse coded to determine a mean score. Sample questions include, “I tend to bounce back quickly after hard times,” and, “It is hard for me to snap back when something bad happens.” The internal reliability was strong ( $\alpha=0.80-0.91$ ), and the test-retest correlation was good at one month ( $r=0.69$ ) and two months ( $r=0.62$ ). The factor structure was examined using a principal component analysis with a

varimax rotation (negative items were reverse coded), indicating a 1-factor solutions accounting for 55-67% of the variance, with factor loadings ranging from 0.68 to 0.91. Convergent validity indicated that the BRS correlated strongly with respondent characteristics, including positive correlations with resilience measures, optimism, purpose in life, social support, active coping, and positive reframing. It was negatively correlated with pessimism, negative interactions, behavioral disengagement, denial, and self-blame.

*Brief Inventory of Thriving* (BIT; Su, Tay, & Diener, 2014) is a 10-item measure of overall psychological strengths and weaknesses. Survey items include a 5 point Likert scale, with 1 indicating strong disagreement, and 5 indicating strong agreement. Sample questions include, “My life has a clear sense of purpose,” “I can succeed if I put my mind to it,” and, “In most activities I do, I feel energized.” The internal reliability was strong ( $\alpha=0.90$ ), and the test-retest correlation was good at four months ( $r=0.83$ ). Principal component analysis indicated a 1-factor solutions accounting for 57.53% of the total variance, with factor loadings ranging from 0.58 to 0.84. Convergent validity with all existing measures of well-being, with correlations ranging from 0.72 on the *Self Mastery Scale* (SMS; Pearlin & Schooler, 1978), to 0.82 on the *Flourishing Scale* (FS; Diener et al., 2009). In terms of concurrent and predictive validity, the BIT was positively correlated with self-perception of health ( $r = 0.48$ ) and negatively with number of days in the past year when mental health was not good ( $r = -0.48$ ). The BIT also predicted numerous indicators of physical health and health behaviors.

The *Student Self-Report of Academic Self-Sufficiency* (Hoover-Dempsey & Sander, 2005) is a 5-item measure of student beliefs about their abilities to complete schoolwork successfully. Survey items include a 4 point Likert scale, with 1 indicating strong disagreement, and 4 indicating strong agreement. Given the large number of items on this composite measure, and

since all other Likert scales were either 5- or 7-point scales, a 5-point Likert was instead used to increase clarity for students. Sample questions include, “I can do even the hardest school work if I try” and, “I can figure out difficult class assignments.” The internal reliability was strong ( $\alpha=0.71$ ), but additional psychometrics were located for this analysis.

The *Perceived Stress Scale* (PSS; Cohen et al., 1983; Cohen & Williamson, 1988) is a 14 or 10-item measure of the degree to which one perceives aspects of one’s life as uncontrollable, unpredictable, and overloading. The 10-item version used for this analysis includes a 5-point Likert scale, with 1 indicating strong disagreement, and 5 indicating strong agreement. Items 4, 5, 7, and 8 are positively worded, and items 1, 2, 3, 6, 9, and 10 are negatively worded. For scoring, negatively worded items are to be reverse coded to determine a mean score. Sample questions include, “In the last month, how often have you been upset because of something that happened unexpectedly?” and, “In the last month how often have you been able to control irritations in your life?” Originally published as a 14-item measure in 1983, and then as a 10-item measure in 1988, Roberti, Harrington, and Storch evaluated the psychometrics of the 10-item version of the PSS in 2006 and reported the findings below. The internal reliability was strong ( $\alpha=0.89$ ), and no test-re-test data were collected. Exploratory factor analysis (with positively worded items not reverse coded) indicated a 2-factor solution, explaining 61.9% of the total variance, with factor loadings ranging from 0.57 to 0.83. Convergent validity was measured using Pearson product-moment correlations and indicated high correlations with the *State-Trait Anxiety Inventory-Trait* (STAI-T; Spielberger, 1983) and low-moderate correlations with the *Multidimensional Health Locus of Control* (MHLC; Wallston, Wallston, & Devellis, 1978). Divergent validity was measured using Pearson product-moment correlations and indicated zero or small correlations with the *Sensation Seeking Scale* (SSS; Zuckerman, Eysenck, & Eysenck,

1978), the *Santa Clara Strength of Religious Faith Questionnaire-Short Form* (SCSRFQ-SF; Plante, Vallaeys, Sherman, & Wallston, 2002), and the *Adult Aggression Scale* (Morales, Ruh, & Werner, 2002).

There were also 5 non-validated scales and items comprising 13 additional items to specifically address skills within REACH (sleep planning, exercise planning, coping skills, and trauma-specific cognitive skills), while keeping the survey short enough to be feasibly completed by students in under 10 minutes. Including validated measures for all items would have more than doubled the length of the survey. In pilot testing, the 59-item survey took 6-8 minutes to complete. These scales and items included: *Trauma Cognitive Skills*; *Coping Skills Rating Scale*; *Exercise Frequency*; *Sleep Frequency*; and, *Coping Skills Frequency Scale*.

The *Trauma Cognitive Skills Scale* was added to measure any growth in the acquisition of key concepts regarding the impact of trauma on the brain and learning, as well as neuroplasticity. This scale included 3 items measured using a 7 point Likert scale, with 1 indicating strong disagreement, and 7 indicating strong agreement. Questions included, “Exposure to childhood trauma can impact your brain and health,” “People who have been impacted by childhood trauma can take positive steps to make their lives better,” and, “Your brain is like a muscle that changes when you learn new things and practice new skills.” No additional psychometrics are available for these items.

The *Coping Skills Rating Scale* was added to measure student’s ability to recognize signs of stress in themselves, practice calming techniques, and pause before reacting to intense emotions. This scale included 5 items measured using a 5 point Likert scale, with 1 indicating strong disagreement, and 5 indicating strong agreement. Samples of questions include, “I am able to recognize the signs in my own body when I’m under stress,” “I can calm myself down

when I'm stressed or angry," and, "I am able to recognize when I'm experiencing intense emotions, and to pause before I react." No additional psychometrics are available for these items.

The *Exercise Frequency* item was added to measure the frequency of student exercise in the last month. This scale included 1 item measured using a 5 point frequency scale, with 1 indicating never, and 7 indicating very often. The only question was, "In the last month, how often have you exercised?" No additional psychometrics are available for this item.

The *Sleep Frequency* item was added to measure the frequency of student sleep in the last month. This scale included 1 item measured using a 5 point frequency scale, with 1 indicating never, and 7 indicating very often. The only question was, "In the last month, how often did you wake up in the morning feeling like you had a good night's sleep?" No additional psychometrics are available for this item.

Finally, the *Coping Skills Frequency Scale* was added to measure the frequency of student use of coping skills taught in the course in the last month. This scale included 1 item measured using a 5 point frequency scale, with 1 indicating never, and 7 indicating very often. The two questions were, "In the last month, when you were in a situation where someone or something made you really angry, how often did you lose your temper?" and, "In the last month, when you were in a situation where someone or something made you really angry, how often did you use a coping strategy (ex: breathing, taking a break) instead of losing your temper?" No additional psychometrics are available for this item.

## **Data Collection**

All data were collected by REACH teachers who were trained during a PLC meeting. Pre-intervention surveys were completed by students at all sites by these teachers during the first

week of spring quarter and collected the following week. Students were able to complete the survey any day during the first week that was their first day of class, and although this school accepts new students every week of the school year, to preserve the integrity of REACH, students were not allowed to enroll in REACH after one the first week of each new quarter. During the PLC before the last week of the quarter, staff received a refresher training on data collection and they then collected post-intervention surveys during the last week of class. Data were collected by this author for analysis and reporting. Students were asked to provide a memorable unique identifier to their surveys so they could be matched for analysis (the first two letters of their mother or guardian's first name and the day of the month of their birthday, see appendix). This system kept student identification anonymous, and while allowing for pre-post matching.

To measure fidelity of implementation, lessons were observed weekly by a research assistant funded through a local grant. The research assistant learned about REACH by attending the weekly PLC meetings, and was trained in collecting fidelity data using the lesson plans by this author. Since the two administrators who developed the curriculum with the teachers and facilitated ongoing professional development were also the professional evaluators for many of the teachers, any observations of lessons completed by them were not included in this fidelity analysis, since teachers may have felt coerced to teach the lessons with greater fidelity. All data collected by the research assistant was shared with this author anonymously to increase teacher feelings of openness in discussing REACH, and to better estimate implementation fidelity during normal (non-evaluative) classroom instruction.

## **Data Analysis**

To determine if there were any statistically significant increases in student reports of resilience, within-subjects paired *t*-tests were conducted for each of the twelve measures included in the composite survey (See Table X below). Adjustments of the *p*-value were made using the Benjamini-Hochberg (1995) procedure to account for the multiple comparisons and reduce the likelihood of family-wise Type I error rate.

### **Research Question Two: How do teachers view REACH in terms of acceptability, feasibility, appropriateness, and effectiveness?**

Although the empirical base evaluating resilience is itself not new, the research on school-based resilience interventions have increased dramatically in recent years (Bethell et al., 2014; Dray et al., 2017). Within such an emergent field, newly developed curriculum benefit from robust analysis utilizing multiple techniques and considering the perspectives of diverse stakeholders. Including the perspectives of those implementing REACH was intended to provide insights into some variables influencing implementation. The characteristics of the intervention (Damschroder, et al., 2009) are one of five factors supportive of closing the research to practice gap for promising interventions.

## **Measures**

To measure staff perceptions of the quality of REACH specifically in terms of acceptability, feasibility, appropriateness, and effectiveness, all teachers were given a modified, 19-item version of the ALFA-Q survey (Cook & Lyon, 2013; see Appendix). This survey was developed to measure staff perceptions of key components of implementation, and is a 5-item Likert scale responses, with responses ranging from 1 (“Not at all”) to 5 (“Extremely”). All

questions ask staff to share feedback from the own perspective, and their belief about the perspectives of their fellow educators. Questions addressing acceptability include: implementation; satisfaction; credibility; organization and delivery; and, comfort with supporting the curriculum. Those items assessing feasibility include: compatibility with the practical realities and resources of their setting; disadvantages with implementation based on the natural professional development activities in schools, and; overall feasibility for implementation in school settings. Appropriateness of the intervention was measured by: compatibility with the school's mission and expectations to support academic success; implementation of practices focused on building resilience, and; overall appropriateness for improving school-based practices for students impacted by trauma. Finally, teacher insights on intervention effectiveness were assessed by exploring: usefulness of the curriculum in supporting implementation of the intervention; usefulness of the curriculum to alter or validate fellow educators' beliefs; curriculum's likelihood to improve student resilience and academic success, and; enabling educators to adopt effective practices to build student resilience and academic success.

Ten REACH teachers were given a modified version of the ALFA-Q, including 19 survey questions, using a 5 point rating scale ranging from 1 (not at all) to 5 (extremely) examining staff perceptions of the *acceptability* (8 questions), *feasibility* (4 questions), *appropriateness* (3 questions), and *effectiveness* (4 questions) of the intervention. Following each subsection, three open ended questions elicited general qualitative feedback on the intervention, as well as intervention strengths and suggestions for improvement. Each of the four sections of the survey included qualitative questions for staff assessing general feedback, curricular strengths, and recommendation for improvements. The inclusion of these open-ended questions

was intended to allow practitioners the opportunity to provide additional feedback on the intervention itself.

### **Data Collection**

The ALFA-Q was reviewed with staff in a PLC during the final week of the quarter of the study. Surveys were distributed, and participants were told that the survey was anonymous. Thirty minutes was allocated at the end of the PLC for staff to complete the survey, during which time the two administrators who were present left the room. Surveys were collected by one PLC member in an envelope, and anyone who needed more time was encouraged to turn in their survey in a mailbox in the main office. All ten REACH teachers were present.

### **Data Analysis**

All ALFA-Q survey responses were tabulated and descriptive statistics calculated for each question, and for each of the four subsections. The qualitative questions were analyzed and summarized using open and thematic cluster coding (Miles, Huberman, & Saldana, 2013). Key themes for each subsection of the ALFA-Q were presented using illustrative quotes. The *Characteristics of the Intervention* domain of the Consolidated Framework for Implementation Research (CFIR; Damschroder et al., 2009) was then used to interpret staff responses regarding elements of implementation.

## Chapter 4

### Results

This chapter includes the program evaluation results regarding the impacts of REACH participation on student self-reported levels of resiliency, and staff perceptions of curriculum acceptability, feasibility, appropriateness, and effectiveness. Findings are presented in order of research question.

**Treatment Fidelity.** As described above, a research assistant was employed for this project utilizing a local grant in order to observe lessons and track implementation fidelity. Using the lesson plans provided to all teachers of REACH, she observed 19 lessons at 8 different school sites over the course of the 9 weeks of this study. While observing lessons, she tracked adherence to lesson plans, and reported a mean fidelity score of 76.2%. During this time, REACH was taught at 10 school sites, with approximately 45 lessons per teacher, for a total of 450 total possible lessons, assuming that every teacher taught every lesson every day of the quarter. Although an overestimation of the actual number of lessons taught, 19 of these 450 represents less than 4% of all possible classes. Even though it may be difficult to generalize to typical practice from such a small sampling of overall lessons, this data is included herein because all other observations of REACH were conducted by the two primary authors of the curriculum, who also serve as professional evaluators for the teachers. Implementation fidelity during evaluative observations may be higher than typical practice, and as so this data was excluded from this study.

## **Research Question 1: What impacts did REACH participation have on student self-reported levels of resiliency?**

### **Missing Data**

Pretests were given to all students enrolled during the first week of the intervention, and 60 were returned. Posttests were given during the last week of treatment, and 58 were returned, of which 56 were matched to pretests using unique identifiers. 4 pretests had no matching posttest, and 2 different posttests had no matching pretest, bringing the total number of unique test IDs to 62. All 6 tests without matches were removed from the sample. In addition, 3 matching test sets were determined to be incomplete (2 pre- and 1 post-test) wherein the students did not complete the entire last page of the survey (14 of 59 items, 24%), so these were also removed from the sample. After removing these 9 subjects, 53 of 62 (0.855) of the original sample are included in the final analysis. No individual subscales exceeded 15% in its degree of missing data, and so all were included in the final analysis. Any missing items were replaced with the mean score. See Appendix C for a table describing these missing data.

### **Results**

Table 6 shows the correlations among the 12 REACH resilience pre-test measures on the data for 53 participants. Results indicate that 29 out of 66 correlations were statistically significant, and 7 of 12 scales were associated with at least 6 other scales (*Brief Inventory of Thriving, Flourishing Scale, Satisfaction with Life Scale, Coping Skills Rating, Perceived Stress, Brief Resilience, and Academic Self-Sufficiency*). Of these 7 scales with strong correlations to other scales, 6 were previously validated. The only previously validated scale that is an exception is the *Growth Mindset Scale*, which was only correlated with 2 other scales. Of the 5 non-

validated scales, *Coping Skills Rating* was associated with 7 other scales, *Coping Skills Frequency* with 4, *Trauma Cognitive Skills* with 3, *Sleep Frequency* with 2, and *Exercise Frequency* with none. The only significant negative correlation was between the *Growth Mindset* and *Satisfaction with Life* ( $r(54) = -.29, p < 0.05, 2\text{-tailed}$ ). In general, the results suggest that within the composite measure of resilience, previously validated scales tended to be more positively associated with each other, with a few exceptions. Notably, among the 3 scales found to have changed significantly following REACH participation, described below, the only significant correlation was between *Brief Resilience* and *Sleep Frequency* ( $r(54) = .31, p < 0.05, 2\text{-tailed}$ ).

Table 6

*Correlation of REACH Resilience Measures*

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Flourishing	--											
2. Satisfaction with Life	.66**	--										
3. Growth Mindset	.02	-.29*	--									
4. Trauma Cognitive Skills	.45**	.20	.32*	--								
5. Brief Resilience	.32*	.45**	.14	-.00	--							
6. Brief Inventory of Thriving	.76**	.76**	.03	.39**	.50**	--						
7. Academic Self Sufficiency	.54**	.48**	.07	.22	.35**	.60**	--					
8. Coping Skills Rating	.49**	.60**	-.06	.16	.55**	.69**	.64**	--				
9. Perceived Stress Frequency	.35**	.36**	.22	.03	.52**	.40**	.27	.37**	--			
10. Exercise Frequency	.15	.10	.07	.04	.18	.27	.06	.16	.14	--		
11. Sleep Frequency	.09	.14	.05	-.43	.33*	.19	.09	.05	.37**	.16	--	
12. Coping Skills Frequency	.24	.10	.04	.06	.19	.27*	.40**	.39**	.27*	.11	.17	--

\*\*  $p < 0.01$  (2-tailed).

\*  $p < 0.05$  (2-tailed).

To determine if there were any statistically significant increases in student reports of resilience following participation in REACH, within-subjects paired  $t$ -tests were conducted for each of the twelve measures included in the composite survey, as illustrated in Table 7 below.

Negatively worded Items within measures were reverse coded in SPSS so that all responses indicating improvements in rating or frequency were larger numbers to allow for the use of sum as a comparative metric to detect growth that may have resulted from the intervention. Measures with negatively worded items included the *Growth Mindset Scale*, *Brief Resilience Scale*, *Perceived Stress Scale*, and *Coping Frequency Scale*. The null hypothesis was that the score sums for each measure did not differ from pre to post. Given that multiple comparisons were made using the same data set, the Benjamini-Hochberg (1995) adjustment was utilized to account for the familywise type I error rate.

As illustrated in Table 7, before the adjustment for multiple comparisons, 6 of 12 measures were significant at  $p < .05$ , including: *Flourishing Scale* ( $t_{52} = -2.259$ ,  $p = .028$ ); *Brief Resilience Scale* ( $t_{52} = -3.60$ ),  $p = .001$ ; *Perceived Stress Frequency Scale* ( $t_{52} = -2.057$ ,  $p = .045$ ); *Exercise Frequency Scale* ( $t_{52} = -2.246$ ,  $p = .029$ ); *Sleep Frequency Scale* ( $t_{52} = -2.981$ ,  $p = .004$ ); and *Coping Skills Frequency* ( $t_{52} = 4.40$ ,  $p = .003$ ). After Benjamini-Hochberg adjustments, only three measures remained significant, including: *Brief Resilience Scale* ( $p = .012$ ,  $d = -.53$ ), which decreased from pre-intervention ( $M=18.77$ ,  $SD=3.82$ ) to post-intervention ( $M=17.34$ ,  $SD=2.69$ ); *Sleep Frequency Scale* ( $p = .016$ ,  $d = .40$ ) which increased from pre-intervention ( $M=2.70$ ,  $SD=1.01$ ) to post-intervention ( $M=3.09$ ,  $SD=1.02$ ); and, *Coping Skills Frequency Scale* ( $p = .003$ ,  $d = .60$ ), which increased from pre-intervention ( $M=5.74$ ,  $SD=1.43$ ) to post-intervention ( $M=6.68$ ,  $SD=1.43$ ). Though not significant, of interest for future study would be the three scales with small  $p$ -values and small-medium effect sizes that did not retain significance after adjustment. These include the *Flourishing Scale* ( $d = .31$ ), the *Perceived Stress Scale*, ( $d = .28$ ), and the *Exercise Frequency Scale* ( $d = .31$ ). These measures are described as, “nearly significant” in the discussion.

## Principal Components Analysis

The *Brief Resilience Scale* indicated statistically significant *reductions* in resilience following treatment, a counterintuitive finding. Half of the 6 questions were negatively stated, and each alternated in order with a positively stated item. Utilizing this type of survey design, while effective at combating acquiescence bias (a respondent's tendency to want to agree with questionnaire statements), has generally been found to negatively impact the reliability and validity of instruments (Chyung, Barkin, & Shamsy, 2018). To determine if these negatively worded items contributed to measurement error in this study, a principal component analysis with varimax rotation was conducted. Results showed that a 2-factor model fit the *Brief Resilience Scale* items well. The communalities in this data set range from 0.144 (lowest) to 0.999 (highest). Items 3, 4, and 5 appear to have lower than acceptable communalities (BR3=0.293, BR4=0.370, BR5=0.144). The eigenvalues indicate that the set of 2 factors together is explaining 43.97% of the variance. Factor 1 explains 23.47% of the variance after rotation, and Factor 2 explains 20.50% of the variance after rotation. The critical correlation for the rotated factor matrix (N=53) is  $\pm 0.722$  (Stevens, 2002, p. 394). For Factor 1, the only significant variable is BR4 (0.997), and for Factor 2 the only significant variable is BR1 (0.889). However, for Factor 1, all negatively worded items (BR2 (0.504), BR4 (0.997), and BR6 (0.396)) are larger than the positively worded items (BR1 (0.140), BR3 (0.087), and BR5 (-0.024)). Similarly, for Factor 2, all positively worded items (BR1 (0.889), BR3 (0.518), and BR5 (0.361)) are larger than the negatively worded items BR2 (0.084), BR4 (-0.074), and BR6 (0.066)).

Given these findings, measure items appeared to be loading on to two distinct factors as expected, with the negatively worded items (Factor 1) and positively worded items (Factor 2) loading together, and indicating no significant cross-loading. The factor score covariance matrix

also indicates orthogonality across Factors 1 and 2, with both covariances close to zero (-0.013). With these loadings, the *Brief Resilience Scale* was re-analyzed using the two factors identified in the factor analysis separately, and only the positively worded items remained significant ( $p = .019$ ), still indicating a mean reduction in resilience from pre ( $M=10.42$ ,  $SD=2.41$ ) to post treatment ( $M=9.53$ ,  $SD=1.93$ ).

Table 7

*Paired Samples t-tests Comparing Mean Sums for Resilience Skill Components*

Skill Components	Pre-REACH		Post-REACH		<i>t</i>	<i>p</i> -value	Benjamini-Hochberg <i>p</i> -value	Effect size Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
1. Flourishing	43.47	7.53	45.38	7.28	2.26	.028	.070	0.31
2. Satisfaction with Life	22.04	7.19	21.64	7.04	-0.54	.593	.725	-0.07
3. Growth Mindset	14.43	5.27	15.28	4.97	1.67	.074	.127	0.25
4. Trauma Cognitive Skills	17.17	2.78	17.15	2.69	-0.05	.961	.961	-0.01
5. Brief Resilience	18.77	3.82	17.34	2.62	-3.60	.001	.012*	-0.53
Factor 1: Positively worded	10.42	2.41	9.53	1.93	2.39	.020	.019*	0.41
Factor 2: Negatively worded	8.35	0.37	7.81	2.18	1.62	.111	.109	0.35
6. Brief Inventory of Thriving	37.66	7.87	38.08	7.23	0.48	.635	.725	0.07
7. Academic Self Sufficiency	18.26	3.96	18.47	3.43	0.44	.665	.725	0.06
8. Coping Skills Rating	17.81	4.23	17.11	3.94	-1.54	.130	.195	-0.21
9. Perceived Stress Frequency	28.45	5.65	29.81	5.50	2.06	.045	.090	0.28
10. Exercise Frequency	3.13	1.19	3.49	1.07	2.25	.029	.070	0.31
11. Sleep Frequency	2.70	1.01	3.09	1.02	2.98	.004	.016*	0.40
12. Coping Skills Frequency	5.74	1.43	6.68	1.43	4.40	.003	.016*	0.60

\* $p < .05$ , two-tailed, adjusted for multiple comparisons using Benjamini-Hochberg (1995).  $N = 53$ ,  $df = 52$ .

**Research Question 2: How do teachers view REACH in terms of acceptability, feasibility, appropriateness, and effectiveness?**

Of the ten teachers, seven submitted completed ALFA-Q surveys, producing a response rate of 70%. Those teachers who did not submit a survey were present when it was given out to all staff, but chose to not turn a survey in. Below, overall survey results are presented first, followed by a summary of thematic qualitative findings for each ALFA-Q subsection.

As a recently developed measure, the ALFA-Q has been piloted in multiple studies by Lyon and colleagues, but none with large enough sample sizes to produce psychometric specifications for data analysis. Scores and descriptive statistics for each survey item are presented in Table X below. In all but one of the questions, higher scores indicate more positive staff perceptions of the intervention. The one exception is question eleven, examining the feasibility of the intervention, where lower scores indicating disagreement reflect positive perceptions. This item asked, “To what extent do you believe there are disadvantages or issues with implementing the curriculum in a way that is consistent with natural professional development activities that occur in schools?” In Table 8, statistics for all items are presented in original form, and item eleven was reverse scored when computing the *curriculum feasibility* subsection mean and standard deviation to allow for comparison with other subsections of the ALFA-Q.

**Overall ALFA-Q findings.** As illustrated in Table 8, staff generally responded positively to REACH, with an overall response average of 4.21, and means above 4 in all subdomains (acceptability,  $M = 4.14$ ,  $SD = 0.72$ ; feasibility,  $M = 4.14$ ,  $SD = 0.59$ ; appropriateness,  $M = 4.57$ ,  $SD = 0.60$ ; effectiveness,  $M = 4$ ,  $SD = 0.82$ ). Staff reported the highest scores regarding the appropriateness of the curriculum, and the lowest scores regarding curricular effectiveness. Additional quantitative and qualitative findings are described below.

Table 8

*Staff Perceptions of REACH Acceptability, Feasibility, Appropriateness, and Effectiveness*

Subsection	M	SD
<b>Curriculum Acceptability</b>		
1. To what extent are you satisfied with the implementation of the curriculum?	4.14	0.72
2. To what extent do you believe your fellow educators are satisfied with the curriculum?	4.00	0.82
3. How credible do you find the curriculum?	3.86	0.38
4. How credible do you believe fellow educators find the curriculum?	4.43	0.79
5. How well organized and delivered did you find the curriculum?	4.00	0.82
6. How well organized and delivered do you believe fellow educators found the information and support provided to implement the curriculum?	4.29	0.76
7. How comfortable are you with supporting the curriculum?	4.14	0.90
8. How comfortable do you believe fellow educators are with supporting the curriculum?	4.14	0.69
<b>Curriculum Feasibility</b>		
	<b>4.14*</b>	<b>0.59</b>
9. How compatible do you find the curriculum with the practical realities and resources of the school setting?	4.14	0.69
10. How compatible do you believe fellow educators find the curriculum to be with the practical realities and resources of the school setting?	3.86	0.38
11. To what extent do you believe there are disadvantages or issues with implementing the curriculum in a way that is consistent with natural professional development activities that occur in schools?	1.57	0.53
12. Overall, how feasible do you believe the curriculum is for implementation in school settings?	4.14	0.69
<b>Curriculum Appropriateness</b>		
	<b>4.57</b>	<b>0.60</b>
13. How compatible is the curriculum with the school's mission and expectations to support the academic success of students?	4.71	0.49
14. How relevant is the curriculum to the implementation of practices that focus on building resilience and supporting academic success?	4.71	0.49
15. Overall, how appropriate do you believe the curriculum is for improving school-based practices for students who are have been impacted by trauma?	4.29	0.76
<b>Curriculum Effectiveness</b>		
	<b>4.00</b>	<b>0.82</b>
16. How useful was the curriculum to support the implementation of the intervention?	4.43	0.53
17. How useful was the curriculum to either alter fellow educators' beliefs or validate/solidify their existing beliefs?	3.71	0.76
18. To what extent do you believe the curriculum is likely to improve students' resilience and academic success?	4.14	0.90
19. Overall, to what extent will the curriculum effectively enable educators within a school to adopt effective practices that target trauma-impacted students' resilience	3.71	0.95

*N* = 7. *Note:* M = Mean, SD = Standard Deviation. 19-item 5-point rating scale, ranging from 1 (not at all) to 5 (extremely); \*higher scores indicate more positive perceptions of intervention for all items except 11, which was transformed only for the subsection mean to all for comparison across subsections.

**Acceptability.** This subsection was the longest of the ALFA-Q, comprising eight questions, and respondents reported an average score of 4.14. Within this domain, the item generating the highest response scores asked how credible the respondent found the curriculum (M = 4.43), followed by two items assessing respondent and peer perceptions of curricular organization and delivery (M = 4.29). When asked, “How comfortable are you with supporting the curriculum?” as well as their perceptions of fellow educator’s comfort levels, the average response was 4.14 for both questions. Respondents reported strong satisfaction with implementing the curriculum (M = 4.00), but lower scores on peer perceptions of credibility (M = 4.00) than their own perceptions of credibility (M = 4.43). Finally, the lowest scores in terms of curriculum acceptability (M = 3.86) reflected respondent perceptions of their fellow educator’s satisfaction with the curriculum.

**Qualitative Responses.** When asked to share additional feedback, strengths, and suggestions for improvement in terms of curricular acceptability, a number of themes emerged. First, in terms of strengths, teachers reported broadly that students appreciated the focus of REACH on psychoeducation and coping skills. They shared that students enjoyed learning about their own brains, bodies, and the impacts of ACEs on their health and development. Once teacher stated:

Although the ACEs quiz can be sobering, once we get into the brain science, they love it... they complain that we don’t have more science classes, and REACH makes them feel like college students, learning terms that other students – and some teachers – don’t even know.

These same types of comments were repeated in reference to learning about body triggers and coping strategies. Teachers expressed appreciation for the content, as well as urgency in passing these skills along to students, as exemplified below:

This is what our students are going through – they need to understand their brains, their triggers, and learn some skills to chill out and not get into so much trouble for always reacting to the smallest provocation. Jails are waiting for them, and they need to understand this.

An additional strength in terms of the acceptability of REACH was the provision, ongoing review, and utility of the lesson plans. As described elsewhere, teachers meet every week to review the previous and upcoming lessons, and have multiple opportunities to become familiar with what they're teaching in the class. The scores for the two questions measuring the organization and delivery of the curriculum were of the highest in this subdomain ( $M = 4.29$ ), and the appreciation was illustrated in quotes such as this, "I love the lessons and the PLC process where we get to continually revise everything. I never run out of things to teach – grab the lesson, peek at my notes, and go for it!"

Respondents also identified a number of areas for improvement in this subdomain. First, multiple teachers reported that REACH would be more acceptable if it were updated to include more focus on current events, such as the Black Lives Matter movement. At the time of this study, there was a great deal of discussion at the community and national level about the impacts of racial trauma and police brutality on African American communities. This was a topic that the school staff and students spend a great deal of time discussing and addressing (training, book studies, participating in local marches, etc.). The teachers of REACH, all of whom were African

American, expressed dismay that racial trauma had yet to be incorporated into REACH, a class explicitly designed to address trauma and resilience for our students.

Relatedly, staff repeatedly expressed a desire to have a more racially diverse set of academics and “experts” represented in the videos utilized in the class. One teacher noted the following, “We need more people of color in the videos – students get turned off by seeing white academics talking at them about trauma, and so do I.” Staff also expressed a clear desire to expand the scope of REACH to also include trauma based on the diverse elements of students’ identities such as sexual orientation and gender.

REACH should incorporate more about the influence of other aspects of identity – sexual identity, race, gender – students say really mean things to each other about this stuff, and I think that is in some way their own lack of knowledge and their own trauma coming through. These kids have been through a lot, and it may be easier for them to joke about these things than to be vulnerable and learn. More lessons about this might help.

The final theme emerging from teacher input on intervention appropriateness was the complex and divergent responses to the coping strategy lessons focused on yoga and mindfulness. Some responses were critical of the language and terminology used in the yoga lessons, stating that it was off-putting to many students, especially since it was interpreted by some as being religious, and that this had a huge impact on attendance, especially for male students. One teacher stated:

Students think yoga and meditation are religious, even though I tell them it has nothing to do with that. It doesn’t matter, they just don’t show up to my class for two weeks...

especially the boys... and that sucks. We should either call it something else, or just get rid of it.

This view was expressed by several other teachers, yet the opposite view was also strongly represented. Some teachers felt that just because yoga and mindfulness are unfamiliar to students, if they help students build coping skills, it should remain in the course. Earlier in the year of the study, the staff spent one quarter taking yoga lessons once per week during PLC time, and one teacher connected this experience (positive for her or him) to some student experiences:

More yoga... Yoga is the best part of REACH because you actually feel different right away after you try it. I was a little shy the first time, when we did it during PLC. Once I experienced it, I was in. Students complain about it, but those are the students who don't ever try it. Those who try it want to do it more, not less. This goes for teachers, too.

Such contrasting views toward these aspects of the curriculum reflected the passion of many of the REACH teachers. As is discussed in the *appropriateness* section below, although teachers shared divergent views towards aspects of the course, overall they expressed a strong commitment to improving the curriculum, and conveyed a sense that these ideas and skills were important and were not going to be taught in other classes or settings.

**Feasibility.** This subsection was composed of four questions, focusing on the overall feasibility of implementation in schools, the compatibility of the intervention with the “practical realities and resources” of schools, and its consistency with the “natural professional development activities” of the school. Respondents reported an average score of 4.14, with item eleven transformed to allow for comparison across items and subsections. Similar to responses in the *acceptability* subdomain, the scores for teachers’ own perceptions of compatibility were

higher ( $M = 4.14$ ) than their beliefs about their peer's perception ( $M = 3.86$ ). Teachers reported strong overall perceptions of implementation feasibility, and did not identify disadvantages when considering implementation consistency within existing professional development activities ( $M = 4.43$  after transcription).

***Qualitative Responses.*** When considering the feasibility of implementing REACH, the respondents again expressed several common themes. In terms of strengths, teachers found the consistent format of the lesson plans helpful, and liked the embedded video links and digital access to the lessons. Although some found the lessons to long for one class period, as discussed further below, others found the consistency of lessons helpful, and reported that they were able to modify lessons effectively for students who attend on a limited basis, and even for some students not even in the class, as expressed below:

It has spun off in unexpected ways – I see it like a movie preview – they want more!

What is REACH? When can I take it? I don't make them wait – If they're really interested in a lesson, I'll find time to give the most powerful pieces to them 1:1 because they may not be with us next quarter, may transfer schools, lose housing... you never know. It's too good to not share.

As an alternative school with a flexible attendance policy to meet the needs of students with diverse time demands and many who face significant barriers to consistent attendance, teachers expressed frustration in teaching REACH to an ever-changing group of students. Although the school does not enroll new students into REACH after the first week of the quarter, those enrolled many come and go unpredictably. This was summed up by one teacher, who wrote,

So many of our students struggle with attendance. If every student attended every class, it would be great. Now I feel like I'm always trying to play catch up to get them all on the same page. If they miss the first week, the second week just doesn't make any sense.

Similar to student attendance issues, staff also expressed frustration at having their classes interrupted as a result of their unique professional roles at their school sites. In terms of feasibility, this emerged as an area of greater concern, wherein the REACH teachers are often those on site who monitor who comes and goes into the building, and deal with student crises and conflicts. One teacher summarized this sentiment clearly:

I need someone else to cover for me as the lead during my REACH class. I love this class, spend tons of time prepping, making visuals, and then I'm halfway into a lesson or discussion, and a fight breaks out, or another teacher is having a hard time w/ a student and wants me to fix it... and the momentum just stops. It frustrates me and the students, too.

Another teacher reinforced this sentiment, yet seemed to accept it as a part of the role, "I never get through any lessons. Honestly, I like REACH, but this is a crazy job, and I just do what I can – I've never made it through an entire lesson without some type of interruption." This theme was repeated in numerous ways in staff responses, with many feeling like the lessons were too long, and that the class either needed to be extended into two quarters, or cover fewer topics. One teacher stated, "We cover too much. Every week is something new, and they need more time to practice the new skills – more scenarios. Cover fewer concepts in more depth, please!"

**Appropriateness.** Questions in this subdomain examined the compatibility of REACH with the school's mission and expectations, the relevance of the curriculum for building

resilience, and the overall appropriateness of the curriculum for addressing the school-based needs of students impacted by trauma. The scores for this area were the highest of all ALFA-Q subdomains, with an average response across the three questions of 4.57. The scores for compatibility with school mission and relevance for building resilience were the same ( $M = 4.71$ ) and were higher than the question assessing overall appropriateness ( $M = 4.29$ ).

***Qualitative Responses.*** Themes regarding the appropriateness of REACH included unique feedback, as well as those echoing issues shared in previous subdomains. The first theme was that staff felt strongly that REACH was a critical element of the overall school model. One teacher commented, “REACH is very appropriate... it is the most important class we teach.” Other terms mentioned in this vein were “core” “central” and “critical” and the excerpt below captures this sentiment most clearly:

This is the heart of what we do as a school – we’re set up to support these students in a different way, but most of their time during the day feels pretty traditional. REACH is different, this is where we get to help them name what’s happened to them (TRAUMA!) and learn some skills that’ll actually help them in the long term.

On a similar note, REACH staff also identified a strength of the class as its relevance to students. “My students connect quickly with these ideas – they like taking and talking about the ACEs survey, and they love the brain lessons. It is relevant in a way that other classes aren’t – they stay very focused.”

As discussed above, staff expressed concern over the lack of racially diverse professionals represented in the videos used in the class. When commenting on suggestions for changing REACH to make it more appropriate, staff suggested taking one quarter off from

teaching the class to review all of the videos in the current curriculum and look for more diverse presenters to use instead. Teachers also advocated for expanding the concept of trauma beyond the content currently included in the class to include additional settings, such as social media, music, movies, and other forms of media. To illustrate, one teacher stated, “For REACH to be more appropriate, we need to go where they are spending most of their time (Facebook, Snapchat) and teach them to question what’s repeatedly traumatizing them without their awareness. This goes for all forms of media.”

**Effectiveness.** Compared to the other subdomains of the ALFA-Q, teacher feedback on the effectiveness of the intervention was the lowest ( $M = 4.00$ ), although it also had the highest standard deviation (0.82). The highest scores in this section were in response to the usefulness of the curriculum to support implementation ( $M = 4.43$ ), and the extent to which the REACH was likely to improve student resilience and academic success ( $M = 4.14$ ). The lower scores in this section measured the usefulness of REACH in influencing the beliefs of fellow educators ( $M = 3.71$ ), and the overall ability of REACH to increase adoption of practices promotive of resilience and academic success ( $M = 3.71$ ).

**Qualitative Responses.** The key themes in terms of both what is working with REACH and what would make it better relate to participation, but in different ways. In terms of the greatest strengths of the intervention, staff expressed that for those students who are able to access most of the course material through consistent attendance and participation, the class has the potential to develop students in important ways. One teacher stated, “For those who get into it, you do see a shift – attendance, look more rested... it seems empowering to them to learn that ACEs aren’t their fault, and that they can take charge of their responses to stress.” Another

teacher added, similarly, “For those who attend, it is very relevant & empowering... you see a light go on.”

According to teachers, improving REACH will require an expansion in participation in numerous ways. First, for students, teachers advocated for reducing the number of topics covered, and teaching them cyclically throughout the course to expand the number of students who could access the lessons. One teacher summarized it this way:

This class is designed for students who come every day, every week. We need to shrink the overall number of things we teach, and thread them throughout the whole course – reteaching key ideas. What if we did a new breathing exercise every week? What if we talked about ACEs and strategies in little bits every week instead of in these small units that end up being all or nothing for some students?

In addition to expanding student participation, teachers shared several ideas for expanding staff exposure to REACH. These included taking what is working in the curriculum and applying it to other parts of the school, as described here, “Expand the core ideas of REACH to advisory, other classes... like really celebrating growth at our sites... behavioral charts, credit earning, passing classes, attendance.” Participants seemed somewhat unsure of how some ideas in REACH would be received by teachers of other subjects. These concerns included them acting as advocates for their students with other teachers as described herein:

I’ve learned that not all teachers really believe the idea that ACEs impacts behavior, and this is hard. WE (CEAs) believe this, and we’re sometimes sticking up for our students when they have a meltdown during testing, or whatever. To make REACH more effective, we need to teach these ideas to the whole staff – every week.

The themes identified from teacher insights on the acceptability, feasibility, appropriateness, and effectiveness of REACH will now be reviewed in combination with student self-reported levels of growth in factors promotive of resilience as a part of the discussion.

## **Chapter 5**

### **Discussion**

In response to growing awareness of trauma exposure amongst school-aged children and the resulting impacts on development and learning, schools have integrated multi-tiered interventions to develop protective factors supportive of resilience (Chafouleas et al., 2016). Tier 2 classroom-based trauma interventions delivered by general education teachers provide the most efficient means of delivering prevention services to large numbers of students, while addressing some of the implementation challenges faced by mental health interventions in school settings (Ko et al., 2008; Stephan et al., 2015). While existing resilience programs such as CBITS have demonstrated success in multiple settings, challenges persist when general education teachers are asked to deliver mental health curricula (Baskin et al., 2010; Franklin et al., 2012; Rolfsnes and Idsoe, 2011; Wilson & Lipsey, 2007). A need for further research has been established in addressing these concerns, as well as expanding programs at the secondary level amongst schools implementing multi-tiered supports (Chafouleas, Johnson, Overstreet, & Santos, 2016; Dorado, Martinez, McArthur, & Leibovitz, 2016; Rolfsnes & Idsoe, 2011; Shamblin, Graham, & Bianco, 2016). In addition, studies eliciting input from students and teachers at the local level (Luthar et al., 2014, 2015) are critical in exploring implementation of emerging programs.

This study evaluated two aspects of a classroom-based tier 2 trauma and resilience curriculum: 1) the impacts of program participation on student self-reported levels of resiliency; and, 2) teacher views of the program in terms of acceptability, feasibility, appropriateness, and effectiveness. The discussion below examines promising and challenging findings, explores the

implications of these findings for interventions such as REACH and the implementation process, and identifies study limitations and suggestions for future research.

### **Promising Findings**

This intervention is unique in its inclusion of many empirically recommended trauma-informed treatment components (Cook, et al., 2007) and techniques (Black, et al., 2012) within a 9-week class delivered by non-certified teachers with no formal teaching nor mental health training, in a public alternative high school setting. School-based resilience interventions have proven effective in addressing depression and (Dray et al., 2017; Shochet et al., 2001), anxiety (Dray et al., 2017), hopelessness (Shochet et al., 2001), behavior and academic achievement (Baskin, Slaten, Sorenson, Glover-Russell, & Merson, 2010), school engagement and completion (Bethell, Newacheck, & Halfon, 2014) teacher-student relationships, academic self-concept, and peer victimization (Cappella et al., 2012). This study has extended the literature by evaluating an intervention that is longer (37 hours) than existing resilience programs such as the Penn Resilience Program (PRP, Gillham, Jaycox, Reivich, Seligman, & Silver, 1990), Resourceful Adolescent Program (RAP, Shochet, Dadds, Holland, Whitefield, Harnett, & Osgarby, 2001) and Responsive Advocacy for Life and Learning in Youth (RALLY, Noam & Hermann, 2002). This study also includes both staff and student input, addresses multiple functional domains as recommended in previous literature (Afifi & Macmillan, 2011; Walsh et al., 2010), and utilizes classroom-based teachers to deliver the intervention, a feature that is fairly unique in the literature (Adelman & Taylor, 2006; Foster et al., 2005).

Results indicate several promising features of the intervention, including that 8 of 12 scales measuring student levels of resilience demonstrated growth following treatment, with 2 of these statistically significant, and 3 more nearly significant. Of the two significant measures,

effect sizes were both medium to medium/large (*Coping Skills Frequency*:  $d = 0.60$ ; *Sleep Frequency*:  $d = 0.40$ ). The four scales within the composite measure that asked students to rate the frequency of their response within the last 30 days all produced positive significant or nearly significant results. Although only *Coping Skills Frequency* and *Sleep Frequency* items were significantly positive, the improvements in measures of perceived stress and exercise over the course of 9 weeks is a promising finding for REACH.

Overall, teachers expressed positive views of REACH on the ALFA-Q, and expressed a strong belief in the relevance and appropriateness of the content for their students, especially for the psychoeducational and coping strategies components. Teachers also shared strong support for the acceptability and feasibility of REACH, and found the provision and review of lessons plans helpful during weekly PLC meetings. Teacher buy-in to new interventions in school settings is critical, and has been included in many implementation frameworks (see: Aarons, Hurlburt, & Horwitz, 2011; Damschroder, Aron, Keith, Kirsh, Alexander, & Lowery, 2009; Fixsen, et al., 2005; Glasgow, et al., 1999; Greenhalgh, et al., 2004; Helfrich, et al., 2010; Wandersman, et al., 2008). Although the sample size was very small, having teachers so clearly express their belief in REACH speaks highly of its capacity to sustain implementation.

### **Challenging Findings**

Several challenges were also identified in this program evaluation. First, 4 of 12 scales indicated decreases in resilience following treatment, although only one (*Brief Resilience Scale*) was statistically significant. The effect size for this scale was also medium ( $d = -0.53$ ). Although this finding was unexpected, it is not surprising given the broad curricular aims of the program, and teacher reports of lower than desired student attendance. In addition, 9 of the 12 scales included in the composite measure of resilience were not statistically significant. This indicates

that overall the intervention appears to have impacted students in a limited manner, and is in need of more refined measurement and revision. The psychoeducation components of REACH, including trauma cognitive skills, growth mindset, and understanding coping fared poorly, despite favorable teacher responses to these elements of the curriculum, discussed below. Interestingly, although students reported decreases in understanding coping skills following treatment, their frequency of using such skills in the last 30 days was significant and positive. Such complexities underlie the need for additional research, and perhaps the curriculum could integrate elements of successful CBT programs to address these interactions between participant thoughts, feelings and behaviors (Allison & Ferreira, 2017; Jaycox, 2004).

Teachers also identified numerous challenges with REACH. They suggested expanding opportunities for students to connect with the content through integrating more racially diverse presenters in the video components, and the inclusion of content acknowledging trauma exposure resulting from discrimination based on race, gender, and sexual orientation. Teachers also expressed frustration at various disruptions to full program implementation, primarily resulting from inconsistent student attendance and disruptions of staff by other issues at their school sites, and they suggested either shrinking the scope of the curriculum or addressing disruptions. Strong and divergent views were expressed regarding the relevance and effectiveness of the yoga and mindfulness components of the intervention.

### **Implications for Intervention**

As discussed in Chapter 2, three models of resilience identified by researchers include *compensatory*, *protective*, and *challenge* (Fergus & Zimmerman, 2005; Garmezy, Masten, & Tellegen, 1984; Rutter, 1985; Zolkoski & Bullock, 2012). Of these, *challenge* resilience may be the most suitable for development within school settings, given its focus on repeated exposure to

increasing levels of risk to allow for the practice of the skills needed to buffer against stressors.

Michael Rutter (2013) further describes this phenomenon:

Resilience may be fostered by exposure to manageable challenges or small doses of a stress experience, rather than by avoidance of the environmental hazard... some risk factors may actually be quite 'steeling' or strengthening if they occur in a way and at a time when the individual can cope successfully. (p. 482)

Schools readily provide such 'steeling' opportunities, with challenging academic and social situations, predictable access to skill instruction and feedback from trained adults, and practice opportunities within peer networks. As illustrated in the theory of change for REACH (see Chapter 2), the intent of the intervention was to focus on the development of behavioral, social/emotional, and cognitive skills through the utilization of trauma-informed treatment components and techniques. Upon review, the components of REACH that increased student resilience after treatment were those behavioral skills integrating such opportunities for planning and practice. For example, lessons on sleep, exercise, and coping skills all include graphic organizers for developing individualized plans, and lessons integrate peer to peer sharing and revisiting of strategies spanning multiple lessons. Such practice and post-treatment planning opportunities are recommended by Cook and colleagues (2012), and imply that future revisions of the curriculum could perhaps target fewer skills, with increased opportunities for curricular looping.

An additional implication for REACH and related interventions is that REACH was simply not powerful enough to shift broader student perceptions of their own feelings or cognitive skills, such as happiness, growth mindset, optimism, or hope. It is troubling that none of the validated measures of resilience demonstrated significant growth over the course of this

intensive intervention, comprised of more than 40 lessons over 9 weeks. REACH had no significant impact on developing students' growth mindsets nor their trauma cognitive skills, which included such statements as, "People who have been impacted by childhood trauma can take positive steps to make their lives better," and, "Your brain is like a muscle that changes when you learn new things and practice new skills." Staff feedback clearly indicated that too many concepts were covered to allow for sufficient in-depth exploration or skill mastery. It is likely that students simply lacked sufficient opportunities to practice the skills that may shift self-perceptions in critical areas, especially with inconsistent attendance. When considering the deep impacts of trauma on student cognitive and social/emotional functioning, the development of these buffering skills promotive of resilient adaptation requires more time and focus than was provided in this iteration of REACH.

Just as competence without risk exposure does not itself constitute resilience, learning about new coping and cognitive skills in the absence of challenging situations within which to apply them will not alone lead to increases in *challenge* resilience. Based on this study design, we do not know what types of challenges students may have encountered within or outside of school during the 9 weeks of the course, or if they successfully applied any of the skills taught during REACH to those challenges. As evident in the literature related to the development of interventions for assessing and treating students engaging in self-injurious behaviors following functional assessment (e.g. Iwata, Dorsey, Slifer, Bauman, & Richman, 1994), finding ways to safely put students into a state of agitation to observe, analyze, and teach new skills can be very difficult and raise ethical issues. Although conducting functional assessments for all students in a tier 2 intervention such as REACH is impossible and inefficient, preventatively teaching students new skills (Hastings & Noone, 2005) and safely providing them opportunities to practice them

could build *challenge* resilience both within and outside of the classroom. REACH may benefit from integrating planning and reflection based on challenges experienced outside of the REACH class, such as in other academic classes, or in settings outside of school such as work, sports, peer interactions, community, or family. These opportunities to apply new coping and cognitive skills in external contexts may also extend course access for those students who struggle with attendance. Additional suggestions for increasing the potency of REACH and opportunities to practice new skills include: modularizing the curriculum and moving parts of it online to increase access; providing ready access in class to previous lessons; and, supporting schema development using visual aids within classrooms (checklists, anchor charts, graphic organizers).

Despite the strong empirical base for resilience promoting interventions described above, these challenging REACH findings are consistent with literature documenting limited effects of resilience programs with similar characteristics. In their 2017 randomized control trial assessing the effectiveness of a universal school-based mental health and resilience intervention involving more than 2000 students in Australia, Dray and colleagues found no significant differences between treatment and control groups in targeted outcomes at 3 month follow up. Similarly, evaluations of Penn Resiliency Program (Gilham et al., 1990) have produced mixed results in various meta-analyses (Bastounis et al., 2016; Brunswasser et al., 2009; Tak, Kleinjan, Lichtwarck-Aschoff, & Rutger, 2014), leading Bastounis and colleagues to recommend against its large scale roll-out. In their discussion of these less-promising findings, Dray and colleagues (2017) point out that the development of protective factors and skills promotive of resilient adaptation is a time intensive process, that schools present promising but difficult implementation settings, and that such interventions insufficiently address needs in the family domain.

These conclusions were also identified in the 2011 Rochester Child Resilience Project (Cowen, Hightower, Pedro-Carroll, Work, Wyman, & Haffey), which sought to determine the genesis of resilient outcomes amongst highly stressed urban children through interviews with students and their parents. They found that childhood resilience was most strongly influenced by the provision of a consistent and warm early caregiving environment, and that three characteristics differentiated stress-resilient youth (N = 75) from their stress-affected peers (N = 72): self-perception and self-regulation; interpersonal competence; and, coping orientation. They also found that the earlier in life students were able to develop these characteristics, the more likely they were to be able respond positively to stress in later years. The opposite, they argue, is also true. “By middle childhood, developmental trajectories for many children, though not 100% immutable, are at least well-established and difficult to change.” (p 273-274) The development of factors promotive of resilient adaptation gets more difficult over time for youth who did not have access to these early advantages, and may be difficult to shift with brief interventions during adolescence. They continue,

Because the caregiving process goes deep and is affected by many factors... it is unlikely that brief superficial interventions, however well-conceived and conducted, will have enduring positive effects... The chances of finding quick fixes in this area are slim. (p 274)

Despite these difficulties, this evaluation of REACH provided some promising findings, and helpful insights for future revision and analysis. Given the simplicity of the current study design, all of the complexities described above cannot be fully analyzed herein, and future multivariate models should incorporate additional factors such as student and staff attendance and treatment integrity. The inclusion of additional proximal and distal evidence of positive

adaptation, such as test scores, attendance, credit earning, or employment status would also strengthen future analysis.

### **Implications for Implementation**

The ALFA-Q was utilized to measure staff perceptions of REACH so that modifications can be made to both the intervention itself, as well as the processes utilized to design, deliver, and revise the curriculum. As described in previous chapters, the development and uptake of innovative school practices, such as school mental health services, is a complex undertaking (Cook & Odom, 2013; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005), and implementation frameworks have been developed to assist in the analysis and interpretation of such complexities. After discussing implications of staff feedback overall, we highlight evident contributors to implementation using the *Characteristics of the Intervention* domain of the CFIR (Damschroeder et al., 2009).

The overall support for REACH was relatively strong, although qualitative feedback identified important areas for curricular revision. Given the iterative nature of the development and revision cycle that has been established for the curriculum at this school, it is likely that such changes will be made collaboratively, indicating promise for successful implementation. The finding that teachers rated the appropriateness of REACH as the highest domain is not surprising, given the mission of this alternative school in explicitly supporting students who have faced previous challenges. The teacher comment that, “This is the heart of what we do as a school” best captures this sentiment, one that may not be expressed at comprehensive high schools with a broader focus. Although this may limit generalizability to other settings over time, it indicates strong buy-in amongst teachers, a critical factor supportive of durability as identified in previous research (Baweja et al., 2016).

Within the acceptability domain of the ALFA-Q, teachers suggested increasing the diversity of professionals included within the video modules, and including more content focused on broader aspects of identity and their roles in resilience. This reflects deep practitioner knowledge of issues of importance to staff and students, and underscores the critical role of inclusive practices to ensure maximum local staff participation in developing, piloting, and revising such interventions. As described by Luthar (2015), this involvement is essential in ensuring program sustainability, as opposed to being viewed as, “a temporary, intrusive, or cost-intensive add-on” (p. 18). Structures supportive of eliciting ongoing teacher feedback, such as regular PLC meetings, also received strong teacher support on feasibility domain of the ALFA-Q. These findings extend those of Baweja, Santiago, Vona, Pears, Langley, and Kataoka (2016), who also found that ongoing communication and training were supportive factors for trauma-based interventions.

Intervention effectiveness received the lowest score of all domains, with concerns evident in several contradictory data emerging from this analysis. These include strong and divergent opinions on the yoga and mindfulness components, and overall feasibility support despite serious concerns about treatment integrity resulting from student attendance and staff disruptions. In addition, staff shared strong internal beliefs about appropriateness, although expressed that other teachers in the school may not share these beliefs as strongly. A final contradiction of concern is the mismatch between student and staff perceptions of the psychoeducation and coping skills components of the intervention. Several staff shared that students enjoyed these elements, saying, for example, “once we get into the brain science, they love it...” Staff also shared that this type of content was important, in statements such as, “They need to understand their brains, their triggers, and learn some skills to chill out and not get into so much trouble for always

reacting to the smallest provocation.” However, student self-report data indicated that trauma cognitive skills and coping skills ratings, although not statistically significant, actually both decreased following intervention. This mismatch between staff perceptions of what students value and are enjoy, and the skill development that students report, is concerning, and calls for future research and analysis, as described below.

The *Characteristics of the Intervention* domain of the CFIR includes the following eight domains: source; strength and quality; relative advantage; adaptability; trialability; complexity; design quality and packaging, and; costs. Staff feedback data indicate four characteristics of REACH that are supportive of successful implementation. The weekly PLC structure and iterative revision processes of REACH speak positively of its *adaptability* to the local context, classroom realities, and student feedback. Similarly, this process is supportive of intervention *trialability*, as evidenced by weekly and quarterly revisions. Implementation of REACH began in the fall of 2016, and at the time of this evaluation (spring quarter, 2016), it was in its third iteration. Although the context in which REACH was implemented is itself complicated, teachers described the lessons as clear, supportive, easy to use, and central to the core work of the school, all positive features of its *complexity* and *design quality and packaging*.

The influence of several intervention characteristics on implementation are difficult to interpret within this data set. The *relative advantages* of the intervention were not explicitly discussed, nor were its relative *costs*. Stakeholder perceptions of the *source* of REACH is difficult to ascertain with accuracy. As described above, teachers expressed appreciation for the recurring PLC meetings and iterative revision practices that provide opportunities for staff feedback. However, since two school administrators wrote the initial lessons, facilitate most of

these PLC discussions, and professionally evaluate many of the teachers, staff may not be able to fully share any critical feedback.

The feature of REACH that appears to be less supportive of successful implementation is its *strength*, as indicated by relatively low scores on the *effectiveness* domain of the ALFA-Q. Of particular note were staff concerns about the ability of the intervention to accommodate for the known challenge at this school of inconsistent student attendance, as well as the impacts of staff disruptions on the intervention for those students in attendance. The implementation fidelity data described above, with 76% adherence to lesson plans, may demonstrate promise, except when considering that fewer than 5% of potential REACH lessons were observed. Taken together, these concerns about intervention dosage and implementation fidelity speak to potential challenges with the potency of REACH as currently implemented.

These findings extend those of Baweja and colleagues (2016) in their evaluation of factors promotive of teacher support for CBITS implementation. Teachers who had a stronger belief in the need for a trauma intervention on campus were more supportive of CBITS, and given the strong teacher support for the intervention *appropriateness* on the ALFA-Q, these findings are promising. The finding CBITS teachers expressed concern about the loss of instructional time required to implement CBITS was not evident with the teachers of REACH, who contrastingly expressed frustration at disruptions to instruction based on student attendance challenges and other aspects of their role. CBITS teachers expressed a strong desire for increased communication and professional development about trauma and its impacts on learning. REACH teachers, on the other hand, generally shared positive feedback about the *acceptability* and *feasibility* of the intervention, and were appreciative of weekly PLC meetings and lesson plan

provision and revision. Despite the concerns about program *effectiveness* on the ALFA-Q, these aspects of reach are very promising in terms of implementation.

## **Limitations**

There are a number of limitations to this evaluation that are important to note. For the first research question, this analysis only included student self-report data to measure changes in levels of resilience. As a process of positive adaptation in the face of adversity, it is critical to include measures indicative of such adaptation (Kinard, 1998; Walsh et al., 2010), and self-report alone is insufficient as a metric in this domain. This limits generalizations of findings regarding resilience. An additional limitation regarding measurement is that the student survey was a composite measure, with both validated and invalidated measures and items. Although this was done to create a measure that was broad enough to detect growth in elements of resilience that may have been influenced by the intervention while keeping it brief enough to be reasonably completed by adolescents, it also limits external validity. Specifically, the 13 items within the 4 measures asking about sleep planning, exercise planning, coping skills, and trauma-specific cognitive skills provide important insights about this new intervention for future research, but should be interpreted with caution. The process of building the measures inferred by this author from the elements of the curriculum also limits any conclusions about specific curricular components. Direct measures of all components would allow for stronger internal validity. An additional measurement limitation is that the *Growth Mindset Scale* and the *Student Self-Report of Academic Self-Sufficiency* were adjusted from 4 or 6-point Likert scales to 5 or 7-point scales to match the other Likert scales used for all other items. This was done to increase clarity for students who were responding. This changes the psychometric properties of these validated

measures, and had either measure produced significant changes from pre to post-intervention, it would have limited the validity of these measures.

An additional limitation of this study is the possible confounding influence of the other wraparound supports provided to students in this school, as described in Chapter 3. Since the school is designed to support students in difficult circumstances with a variety of social, academic, and behavioral intervention services, it is difficult to rule out any influences these services may have had upon student self-reports of resilience. The use of paired t-tests was used strategically so students could serve as their own control, but it is also possible that participants may have also received non-REACH intervention supports, a consideration for future evaluations of the program.

A final, but significant limitation regarding any impacts of the intervention on changes in student resilience is the absence of data on student attendance during intervention, and limited data on implementation fidelity. In an effort to retain student anonymity, and to not bias instructional fidelity by having the administrators collect fidelity data, these two critical indicators of intervention dosage are mostly absent. This is problematic in an attempt to evaluate a new intervention in general, and specifically since staff identified disruptions to teaching as a key qualitative barrier to implementation.

There were also important limitations related to the second research question evaluating staff perceptions of the intervention. First, the questions at the end of each subsection of the ALFA-Q were included to allow respondents an opportunity to share intervention feedback in addition to the rating scale items. Although these two sources of data provided insights into REACH, the inclusion of qualitative interviews after reviewing these data would have allowed for additional insights from these professionals. This was not done in an effort to maintain

anonymity for respondents, but it would have allowed for more comprehensive contextual data regarding factors influencing intervention characteristics and implementation.

Relatedly, an additional limitation grows from this author's dual roles in this project, as an evaluator of REACH, and as the professional evaluator for many of the teachers of the curriculum. Those teachers not evaluated by this author were evaluated by another member of the administrative team, and the staff may have felt some pressure to amend their feedback on the ALFA –Q and related questions based on these relationships. All survey data was collected and submitted anonymously, and with no administrator present during completion, but this is an important factor to note. Also worth noting is that only 7 of 10 teachers submitted the ALFA-Q. With a sample size of only 10, a response rate of only 70% excludes a significant amount of teacher input. Their inclusion in the ALFA-Q rating scale and qualitative data may have significantly impacted the findings, and this should be kept in mind when interpreting findings. Finally, as a promising new tool that has been piloted in numerous studies, the ALFA-Q was selected for its concise assessment of elements influencing implementation from the perspective of practitioners. However, since it has yet to undergo psychometric validation, the findings associated with it should also be interpreted with caution.

## **Summary**

In summary, this program evaluation contributes to the literature examining school-based mental health interventions by extending the findings of Baweja and colleagues (2016), identifying aspects of the implementation process for REACH that appear supportive of sustainability and buy-in, especially the curricular relevance, developmental process, and ongoing support. The characteristics of the intervention, using the CFIR (Damschroeder et al., 2009) that appeared promotive of implementation were its *adaptability* to the local context,

classroom realities, and student feedback, *trialability*, and *complexity* and *design quality and packaging*. This study also indicates promise for school-based mental health interventions delivered by general education teachers with limited training in trauma and resilience, a key factor for expanding the effectiveness of school-based mental health supports given the central role of teachers in supporting and delivering tier 1 and 2 interventions (Franklin, et al., 2012).

In addition, the positive findings related to significant increases in student-reported frequency of using coping skills, sleep, and exercise within the last 30 days at the end of treatment support the theoretical concept of *challenge* resilience (Fergus & Zimmerman, 2005; Garmezy, Masten, & Tellegen, 1984; Rutter, 1985; Zolkoski & Bullock, 2012), since these skills were the ones that involved the greatest opportunities for planning and practice during the intervention (Cook et al., 2012). The lack of significant (or negative) growth using the validated measures of resilience is disappointing, but also aligns with previous literature documenting the difficulty in developing resilience in adolescents using brief interventions (Cowen et al., 2011).

Overall, important insights can be drawn from the synthesis of MTSS and trauma-informed teaching. The significant expansion of SWPBIS to schools across the world speaks highly of its robustness as a preventative model that focuses on environmental manipulation, as opposed to focusing on changing students. As described by SWPBIS pioneer Dr. Rob Horner (2000), “The signature feature of positive behavior support has been a committed focus on fixing environments, not people... We must design schools, homes, and communities that effectively prevent problem behaviors.” (p. 97) Such sentiment echoes one of the central beliefs of trauma-informed schools, that instead of asking students, *what is wrong with you?* we instead ask, *what happened to you?* As the nation’s largest provider of educational and mental health services to students, shifting school systems to better help students heal from traumatic exposure and

develop new skills to buffer against associated risks is critical. This intervention demonstrates a great deal of promise as an integrated tier 2 intervention with the potential for replication in broader contexts.

### **Future Directions**

Given the myriad contributors to the successful implementation of school-based mental health supports such as REACH, future research should utilize published implementation frameworks (see, for example: Aarons, Hurlburt, & Horwitz, 2011; Damschroder, Aron, Keith, Kirsh, Alexander, & Lowery, 2009; Fixsen, et al., 2005; Glasgow, et al., 1999; Greenhalgh, et al., 2004; Helfrich, et al., 2010; Wandersman, et al., 2008) to carefully evaluate the factors influencing implementation. These may provide important insights on the characteristics of the setting, intervention, or processes involved that are inhibiting or supporting implementation.

Future research should also elicit input on intervention components during and after treatment. Since many resilience interventions include multiple treatment components or curricular modules, feedback gathered weekly may better capture student and staff insights during implementation to inform component analysis in addition to the overall treatment. In addition, evidence of positive adaptation in multiple domains, including academic, behavioral, social/emotional, and vocational, should be collected during and after intervention, and at follow-up periods to measure any lasting impacts of treatment. Given the important protective influence of academic success against aggression and substance abuse (Noam and Hermann, 2002), its inclusion is critical.

While student self-report data provide their own insights on treatment impacts, objective measures of the above functional performance indicators following treatment provide better

evidence of resilient adaptation. Additional data sources could also include multi-level modeling with data also provided by parents or a family member (Li et al., 2017; Zimmerman, 2017), using measures such as the Strengths and Difficulties Questionnaire (Dray et al., 2017). Future assessments could also benefit from the utilization of one validated measure of resilient adaptation, such as the Resilience Scale (Ahern, Kiehl, Sole, & Byers, 2006; Oladipo, 2015; Waginald, 2009; Wagnild & Young, 1993), instead of a combined measure such as that utilized for this study. In addition, qualitative input from students would provide important contextual insights on the intervention, as well as other aspects of implementation. Finally, given the well-documented success of CBT-focused interventions to support youth impacted by trauma exposure, elements of CBT could be incorporated into promising components of REACH for future evaluation.

Given the frustration expressed by practitioners in this study by the interruptions to fully implementing the curriculum, either resulting from inconsistent student attendance or staff disruptions based on the complexity of their roles, future evaluations should account for these variables in their models. Future research may also explore the development and implementation of a modularized version of this curriculum that students could more feasibly complete in smaller units without needing to necessarily complete every lesson, in chronological order. These revisions may also more readily facilitate the movement of some content online, delivered through a hybrid course model. These changes may increase student access and completion, staff satisfaction, and would also be fruitful subjects for future evaluation. Finally, of the five techniques recommended by Black and colleagues (2012) for addressing trauma, REACH does not include a trauma-narrative component (Amaya-Jackson et al., 2003), or cognitive

restructuring (Hassija & Gray, 2010). The integration of such techniques may strengthen the intervention and should be considered for future evaluation.

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## APPENDIX

### Appendix A. Student Composite Resilience Measure

**Amazing REACH Students!** Thank you for taking the time to complete this survey. This is the **POST-SURVEY** for REACH, and asks the same questions as the PRE-SURVEY you took at the beginning of the quarter. *Please use the SAME information above that you used in your previous survey so we can match your surveys.* Participation is voluntary and survey results are anonymous and will have no impact on your grade. *This survey will take about 7 minutes to complete.*

Your REACH teacher will read each question aloud to make sure they are clear to you. *If you have any questions, please ask!*  
Please read each statement below and **circle** one number for each statement that best matches your thoughts or feelings right now.

	<b>Statement</b>	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1	I lead a purposeful and meaningful life	1	2	3	4	5	6	7
2	My social relationships are supportive and rewarding	1	2	3	4	5	6	7
3	I am engaged and interested in my daily activities	1	2	3	4	5	6	7
4	I actively contribute to the happiness and well-being of others	1	2	3	4	5	6	7
5	I am competent and capable in the activities that are important to me	1	2	3	4	5	6	7
6	I am a good person and live a good life	1	2	3	4	5	6	7
7	I am optimistic about my future	1	2	3	4	5	6	7
8	People respect me	1	2	3	4	5	6	7
9	In most ways my life is close to my ideal	1	2	3	4	5	6	7
10	The conditions of my life are excellent	1	2	3	4	5	6	7
11	I am satisfied with life	1	2	3	4	5	6	7
12	So far I have gotten the important things I want in life	1	2	3	4	5	6	7
13	If I could live my life over, I would change almost nothing	1	2	3	4	5	6	7
14	You can learn new things, but you can't really change your basic intelligence.	1	2	3	4	5	6	7
15	Your intelligence is something about you that you can't change very much.	1	2	3	4	5	6	7
16	You have a certain amount of intelligence and you really can't do much to change it.	1	2	3	4	5	6	7
17	Exposure to childhood trauma can impact your brain and health.	1	2	3	4	5	6	7
18	People who have been impacted by childhood trauma can take positive steps to make their lives better.	1	2	3	4	5	6	7
19	Your brain is like a muscle that changes when you learn new things and practice new skills.	1	2	3	4	5	6	7

	<i>NOTE: for these questions, there are only 5 choices →</i>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
20	I tend to bounce back quickly after hard times	1	2	3	4	5
21	I have a hard time making it through stressful events	1	2	3	4	5
22	It does not take me long to recover from a stressful event	1	2	3	4	5
23	It is hard for me to snap back when something bad happens	1	2	3	4	5
24	I usually come through difficult times with little trouble	1	2	3	4	5
25	I tend to take a long time to get over set-backs in my life	1	2	3	4	5
26	My life has a clear sense of purpose	1	2	3	4	5
27	I am optimistic about my future	1	2	3	4	5
28	My life is going well	1	2	3	4	5
29	I feel good most of the time	1	2	3	4	5
30	What I do in life is valuable and worthwhile	1	2	3	4	5
31	I can succeed if I put my mind to it	1	2	3	4	5
32	I am achieving most of my goals	1	2	3	4	5
33	In most activities I do, I feel energized	1	2	3	4	5
34	There are people who appreciate me as a person	1	2	3	4	5
35	I feel a sense of belonging in my community	1	2	3	4	5
36	I can do even the hardest school work if I try	1	2	3	4	5
37	I can learn the things taught in my classes	1	2	3	4	5
38	I can figure out difficult class assignments	1	2	3	4	5
39	I can focus in class when I need to even when I'm dealing with other stuff outside of class	1	2	3	4	5
40	I am able to stay focused until I complete a task	1	2	3	4	5
41	I am able to recognize the signs in my own body when I'm under stress.	1	2	3	4	5
42	I can calm myself down when I'm stressed out or angry.	1	2	3	4	5
43	I am able to practice simple breathing techniques to remain present and focused.	1	2	3	4	5
44	I am able to practice simple movements to remain present and focused (ex: like yoga or stretching).	1	2	3	4	5
45	I am able to recognize when I'm experiencing intense emotions, and to pause before I react.	1	2	3	4	5

	<i>NOTE: for these questions, there are 5 NEW choices →</i>	Never	Almost Never	Sometimes	Fairly Often	Very Often
46	<b><i>In the last month:</i></b> ... how often have you been upset because of something that happened unexpectedly?	1	2	3	4	5
47	... how often have you felt that you were unable to control the important things in your life?	1	2	3	4	5
48	... how often have you felt nervous and "stressed"?	1	2	3	4	5
49	... how often have you felt confident about your ability to handle your personal problems?	1	2	3	4	5
50	... how often have you felt that things were going your way?	1	2	3	4	5
51	... how often have you found that you could not cope with all the things that you had to do?	1	2	3	4	5
52	... how often have you been able to control irritations in your life?	1	2	3	4	5
53	... how often have you felt that you were on top of things?	1	2	3	4	5
54	... how often have you been angered because of things that were outside of your control?	1	2	3	4	5
55	... how often have you felt difficulties were piling up so high that you could not overcome them?	1	2	3	4	5
56	... how often have you exercised?	1	2	3	4	5
57	... how often did you wake up in the morning feeling like you had a good night's sleep?	1	2	3	4	5
58	... when you were in a situation where someone or something made you really angry, how often did you lose your temper?	1	2	3	4	5
59	... when you were in a situation where someone or something made you really angry, how often did you use a coping strategy (ex: breathing, taking a break) instead of losing your temper?	1	2	3	4	5

**THANK YOU FOR YOUR TIME! YOU ARE HELPING MAKE REACH BETTER FOR FUTURE STUDENTS!**



What changes would you make to the intervention to make it more <b>acceptable</b> ?

**Curriculum Feasibility**

1a) How compatible do you find the curriculum with the practical realities and resources of the school setting?

Not at all		Moderately		Extremely
1	2	3	4	5

1b) How compatible do you believe fellow educators find the curriculum to be with the practical realities and resources of the school setting?

Not at all		Moderately		Extremely
1	2	3	4	5

2) To what extent do you believe there are disadvantages or issues with implementing the curriculum in a way that is consistent with natural professional development activities that occur in schools?

Not at all		Moderately		Extremely
1	2	3	4	5

3) Overall, how feasible do you believe the curriculum is for implementation in school settings?

Not at all		Moderately		Extremely
1	2	3	4	5

Please share any additional feedback about the <b>feasibility</b> of the intervention.
In terms of <b>feasibility</b> , what are the greatest strengths of the intervention?

What changes would you make to the intervention to make it more <b>feasible</b> ?

**Curriculum Appropriateness**

- 1) How compatible is the curriculum with the school’s mission and expectations to support the academic success of students?
 

Not at all		Moderately		Extremely
1	2	3	4	5
  
- 2) How relevant is the curriculum to the implementation of practices that focus on building resilience and supporting academic success?
 

Not at all		Moderately		Extremely
1	2	3	4	5
  
- 3) Overall, how appropriate do you believe the curriculum is for improving school-based practices for students who are have been impacted by trauma?
 

Not at all		Moderately		Extremely
1	2	3	4	5

Please share any additional feedback about the <b>appropriateness</b> of the intervention.
In terms of <b>appropriateness</b> , what are the greatest strengths of the intervention?
What changes would you make to the intervention to make it more <b>appropriateness</b> ?



### Appendix C. Missing Data

<b>Subject</b>	<b>Pre</b>	<b>Post</b>	<b>Decision</b>
54	OK	Missing	Excluded from final analysis
55	OK	Missing	Excluded from final analysis
56	OK	Missing	Excluded from final analysis
57	OK	Missing	Excluded from final analysis
58	Missing last page	OK	Excluded from final analysis
59	Missing last page	OK	Excluded from final analysis
60	OK	Missing last page	Excluded from final analysis
61	Unknown	OK	Excluded from final analysis
62	Unknown	OK	Excluded from final analysis

## Appendix D. REACH Calendar

### **Week 1: Understanding Your Brain**

1. Introduction to REACH and Circle
2. Brain Development and Growth
3. Neuroplasticity – Your Brain Will Change Based on What You Do and Think
4. Introduction to Trauma
5. Reflective Circle #1

### **Week 4: Struggle, Sleep, and Your Brain**

14. Gray Wolf Story and Intro to Resilience Framework
15. The Brain and Sleep
16. Sleep, Cleansing Your Brain, and Resilience
17. Exercise, Your Brain, and Resilience
18. Reflective Circle #3

### **Week 7: Mindfulness**

28. Introduction to Mindfulness
29. Mindfulness Strategies and Practice
30. More Mindfulness Strategies and Practice
31. Mindful Breathing and The Seahawks

### **Week 2: Childhood Trauma: What It Means for Your Health and Future**

6. Introducing the ACEs Study and the Impact of Childhood Trauma
7. Health Outcomes of Childhood Trauma
8. Toxic Stress and the Brain (

### **Week 5: Motivation and Relationships**

19. Supportive Relationships and Resilience
20. Relational Resilience Skills #1
21. Relational Resilience Skills #2
22. Street Resilience
23. Reflective Circle 4

### **Week 8: Yoga: Body and Breath**

33. Intro to Yoga and the Mind/Body Connection
34. Yoga as Strategy to Create Space between Emotion and Action
35. Using Body Signs to Identify Fact vs. Fiction
36. Using Yoga to Build Compassion for Yourself

### **Week 3: Resilience: Optimism and Hope**

9. Introduction to Resilience
10. Resilience and Motivation
11. Optimism
12. Overcoming Obstacles
13. Reflective Circle 2

### **Week 6: Understanding Your Body Sign/Triggers and Reducing Anger**

24. Brain in Palm of Hand
25. Understanding and Managing Emotions
26. Emotional Strategies for When “I Flip My Lid”
27. Reflective Circle 5

### **Week 9: Moral Reasoning**

37. The Moral Side of Murder
38. A Lesson in Lying, Free to Choose
39. Affirmative Action
40. Hired Guns
41. Reflective Circle (#41)

32. Reflective Circle 7 + More  
Mindfulness Apps

**Week 10: Course evaluation  
and closing circle**

Appendix E. REACH Developmental Process Theory of Change

