

Alternatives to Exclusionary Punishment in Schools:  
Programs that Improve Self-Regulation and  
Address Student Trauma



Rural Opportunity Institute  
UNC Gillings School of Global Public Health  
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# **Alternatives to Exclusionary Punishment in Schools: Programs that Improve Self-Regulation and Address Student Trauma**

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*The opinions and views expressed in this report are those of the authors. They do not necessarily reflect the views of the Gillings School of Global Public Health- UNC at Chapel Hill, or of the Rural Opportunity Institute*

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## ACRONYMS

ACE	Adverse Childhood Experience
BF	Biofeedback
CBITS	Cognitive Behavioral Intervention for Trauma in Schools
CBT	Cognitive Behavioral Therapy
DPS	Denver Public Schools
DSBRPP	Denver School-Based Restorative Practices Partnership
ECPS	Edgcombe County Public Schools
HRV	Heart Rate Variability
IIRP	International Institute for Restorative Practices
MBCT	Mindfulness-Based Cognitive Therapy
MBSR	Mindfulness-Based Stress Reduction
NF	Neurofeedback
OUSD	Oakland Unified School District
PTSD	Post-Traumatic Stress Disorder
RJ	Restorative Justice
ROI	Rural Opportunity Institute
SEL	Social-Emotional Learning
SSET	Support for Students Exposed to Trauma

## I. EXECUTIVE SUMMARY

Edgecombe County is a rural county in Eastern North Carolina with a higher poverty rate, a lower than average median household income, and lower average education level compared with the rest of the state. Rural Opportunity Institute is a social innovation lab based in Edgecombe County that is working to break the cycle of intergenerational trauma caused by Adverse Childhood Experiences (ACEs). Toxic and chronic stress resulting from ACEs is associated with negative health and psychosocial outcomes throughout the life course. Toxic stress from ACEs can also impede the development of self-regulation skills, which are essential to success in school, peer relationships, and appropriate social behavior.

ROI has identified over-punishment in schools (in-school suspension, out-of-school suspension, and expulsion) for students with unaddressed trauma and underdeveloped executive functioning skills as a pain point in their community. This report outlines four school-based programs that may help to improve self-regulation skills in students with ACEs and provide alternatives to exclusionary discipline practices. For each intervention, we consider the available evidence for the impact on mental health and educational outcomes, and outline considerations for program implementation.

Support for Students Exposed to Trauma (SSET) is a Cognitive Behavioral intervention designed for students ages 10-14. It is designed to be implemented by teachers in a classroom setting, and training is available for free online. Results from the pilot evaluation of SSET suggests that SSET may be effective in reducing symptoms of depression and PTSD in students.

Restorative Justice (RJ) began as a criminal justice movement and has been adapted for schools. In a restorative justice system, the focus is on restoring relationships, rather than on punishment. Restorative Justice programs have seen success in Carrboro, NC, Oakland, CA, and Denver, CO, among other places, in reducing behavioral refractions and discipline referrals in schools.

Mindfulness is “the state, process, and practice of remembering to observe moment-to-moment experience with openness and without automatic patterns of previously conditioned thoughts, emotions, or behaviors” (AMRA 2018). Clinical research with adults has provided ample evidence of the effectiveness of these practices to support healing from some of the consequences of trauma. Recent research with children in school settings points to the effectiveness of delivering mindfulness programs in classrooms in reducing stress and improving self-regulation.

Biofeedback training is a therapeutic technique in which a subject’s biological activity is monitored while the information from that monitoring is made available to the subject in some understandable form such as a changing sound, visual display, or physical sensation. The purpose of the training is to teach people how to control involuntary physiological processes that contribute to painful symptoms and distress. Clinical studies of biofeedback provide evidence of its effectiveness in treating various symptoms and disorders which may result from chronic stress, including anxiety, depression, and learning disabilities. Used in schools, it may help to

reduce stress and improve attention and self-regulation among students, leading to better academic and behavioral outcomes.

Implementing SSET, Restorative Justice, mindfulness practice, or biofeedback training in schools may improve behavioral outcomes in schools without resorting to exclusionary discipline practices that may have negative academic and psychosocial effects. Furthermore, by providing students with the skills to self-regulate, these interventions may improve academic achievement and physical and emotional wellbeing among students.

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## II. INTRODUCTION

Edgecombe County, NC, is a rural, majority African-American county in Eastern North Carolina. Compared with the rest of the state, Edgecombe has a higher poverty rate, a lower median household income, and lower average education level (U.S. Census Bureau, 2017). It is believed by ROI and ROI's partners that a high proportion of Edgecombe County residents have a history of unaddressed emotional trauma caused by adverse childhood events (ACEs). ACEs are known to have a negative impact on health and life outcomes (Hughes et al., 2017; Vincent J Felitti et al., 1998).

Rural Opportunity Institute (ROI) is a social innovation lab based in Edgecombe County that is working to break the cycle of intergenerational trauma caused by ACEs. In 2019, ROI plans to pilot a variety of innovative programs in Edgecombe County in the hopes of identifying interventions to improve individual's long-term health and life outcomes. As part of their formative research, ROI co-founders interviewed Edgecombe County residents and key informants within the community. In doing so, they identified a number "pain points" in the community: common themes that individuals in the community identified as barriers to accomplishing their and their community's goals, and living healthy and fulfilling lives. One of the pain points pinpointed in the education system was "over-

punishment (in-school suspension, out-of-school suspension, and expulsion) for students with unaddressed trauma and underdeveloped executive functioning skills."

In recent decades, school officials have relied heavily on exclusionary discipline practices, such as out-of-school suspensions and expulsions, to address student misbehavior (Welsh & Little, 2018). Students with high levels of unaddressed trauma are more likely to have learning or behavioral problems in schools and are more likely to receive exclusionary punishments on a repeated basis (McInerney & Mcklindon, 2014). If the root of the misbehavior is trauma from ACEs, exclusionary discipline will not address the underlying cause, and students will continue to lack the executive functioning and self-regulation skills necessary to navigate through stressful interactions appropriately. In fact, evidence suggests that exclusionary discipline has negative implications for social learning and academic performance (Council on School Health, 2013). Worse, exclusionary discipline may facilitate students' entrance into the school-to-prison pipeline (Council on School Health, 2013). In this report, we outline four school-based programs that may help to improve self-regulation skills in students with ACEs and provide an alternative to exclusionary discipline practices.

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## How ACEs Impact Health

Adverse experiences during important formative years often lead to chronic activation of stress response mechanism, which impairs children's normal development of executive function and self-regulation skills (Center on the Developing Child, 2012). Those are the mental processes that enable one to plan, focus attention, remember instructions, and juggle multiple tasks successfully.

Children are not born with these abilities, and through their development, their brain needs to acquire those skill sets in order to filter distractions, prioritize tasks, set and achieve goals, and control impulses. Self-regulation and developed executive functioning are fundamental to successfully navigate the school system and build supportive peer networks (Center on the Developing Child, 2012).

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## Edgecombe County Background

Edgecombe County is a rural, majority African-American community in Eastern North Carolina. Compared with the rest of the state, Edgecombe County has a higher poverty rate (23.9% v. 14.7%), and lower median household income (\$32,300 v. \$48,200). Educational attainment is also lower than the state averages, with fewer high school graduates (77% v. 86.3%), and fewer people holding a Bachelor's degree (10.4% v. 29%) (U.S. Census Bureau, 2017).

The Edgecombe County Public Schools (ECPS) District serves over 6,200 students in Kindergarten through 12th grade (Edgecombe County Public Schools, n.d.). There are five elementary schools, four middle schools, one K-8 school, and four high schools. Its schools are smaller than average NC schools; on average Edgecombe middle schools have 271 students and high schools have 460 students (North Carolina State Board of Education, n.d.). ECPS high schools have a four-year

graduation rate of 77.3%, whereas the statewide average graduation rate is 86.3% (North Carolina State Board of Education, n.d.).

Over the last two decades, the jail incarceration rate (average daily number of residents in jail per 100,000 people) for Edgecombe County has been consistently higher than the state or national rates, with the exception of 2011 and 2015 (data were not available past 2015) ("Incarceration Trends: Edgecombe County, NC," 2015). Jail admissions rates (annual admissions per 100,000 of county residents age 15-64) were higher than state and national rates every year except for 2013. The prison incarceration rate (number of county residents in state prison, age 15-64) was 794.9 per 100,000 in 2015. Prison and jail incarceration rates steadily grew between 1985 and around 2008, and since 2008 have been slowly decreasing ("Incarceration Trends," 2015).

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## Research questions

In conducting this literature review, we sought answers to the following questions:

1. What options exist for schools to improve behavioral and psychological outcomes among students, particularly high-need students and those with unaddressed trauma?
  2. What are some alternatives to exclusionary and punitive discipline, such as out-of-school suspension (OSS), expulsion, and the involvement of law enforcement?
  3. What is the existing evidence supporting the effectiveness of these programs on health, educational, and life outcomes?
  4. What are the considerations for implementation for these programs, especially in regard to feasibility and cost?
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### III. PROFILE OF EVIDENCE

In researching this report, we examined several types of literature and contacted professionals from various fields. We held meetings with members of the school and judicial systems that acted in different capacities, as well as with advocacy organizations. We also contacted professional groups working with different forms of meditation instruction and biofeedback training.

We utilized databases of abstract and citations from peer-reviewed journal articles, reviewing the PubMed and Scopus search engines to identify articles and book chapters on varied topics such as biofeedback, self-regulation, mindfulness

meditation, and cognitive and behavioral therapy-based interventions. Where peer-reviewed academic literature was lacking, we consulted other forms of media such as white papers, online newspaper articles, and institutional websites. Increasingly, different strategies to address the impacts of trauma and toxic stress in children and adolescents have been integrated into the work of various associations, foundations, and institutes. We, therefore, explored the websites of these institutions for additional publications and data that were also incorporated in this review.

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## IV. FINDINGS

We begin by introducing the importance of self-regulation, and how the ability to self-regulate may be impacted by toxic stress. We then describe four potential interventions to improve behavioral and psychological outcomes among students, particularly high-need students, those with ACEs, and those with poorly developed executive functioning skills: a cognitive behavioral intervention called Support for Students Exposed to Trauma (SSET), the restorative justice (RJ) approach, mindfulness practices and biofeedback training. Some of these programs may be used in place of exclusionary discipline practices as a response to student misbehavior. All may be used alongside more traditional disciplinary practices or as ways to prevent misbehavior, thereby avoiding the need for discipline altogether. For each intervention, we consider the available evidence for the impact on mental health and educational outcomes, and outline considerations for program implementation.

### Self-Regulation

Self-regulation refers to individuals' ability to manage their emotions, behavior and body movement when faced with challenging and stressful situations, staying focused and paying attention (Center for the Developing child, 2012). It is not the same as self-control, or keeping one's impulses in check, but the ability of being flexible when expectations change, and of resisting to give in to frustrated outbursts (Morin, 2018). Self-regulation integrates aspects from related and

interdependent domains. Cognitive aspects include executive function skills; emotional aspects include motivation, reward seeking, and avoidance of discomfort; and physiological aspects include responsiveness to internal signals and the functional control of selected autonomic functions such as sweating (Korin, 2016).

When children are disturbed by stress, they might respond with regression to younger-aged behaviors, mood changes, somatic complaints, or activity-level changes (Korin, 2016). Competence in dealing with stress is learned via observation and social interactions, being ideally modeled, nurtured, and taught by caregivers (Korin, 2016). That is one of the reasons why those with higher ACE scores (and experience higher traumatic toxic stress) suffer in developing self-regulation skills, with consequences in their adult lives.

Some children might be highly regulated with respect to some domains but poorly in others or better-regulated in some contexts than in others (Korin, 2016). Helping children capitalize on strengths in one area of self-regulation can often help them to strengthen or generalize their skills to other areas, in turn helping to drive resilience processes and overall competence (Korin, 2016). Children with trauma can be helped via the reduction of their stressors, by learning to recognize the experience of calm states and to develop strategies that help them get back to calm states when they feel they are becoming agitated.

## SSET: A CBT-Based School Intervention

### Why CBT?

Trauma-Focused Cognitive Behavioral Therapy (CBT) has a strong evidence base for helping people, including children, overcome the effects of trauma (Mcinerney & Mcklindon, 2014). CBT is typically administered through individual therapy sessions; however, not all families have the resources to provide traditional individual counseling

for their child. Additionally, there may be stigma around mental illness and treatment that prevent parents and children from seeking mental health care. Providing CBT-based intervention in schools may be a way to reach children who may otherwise not have access to needed mental health services.

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### Description of CBITS and SSET

The Rand Corporation, along with the University of California Los Angeles (UCLA) and the Los Angeles Unified School District, created a program called Cognitive Behavioral Intervention for Trauma in Schools (CBITS) (Langley, Nadeem, Kataoka, Stein, & Jaycox, 2010). This program is geared towards students in 5<sup>th</sup> through 12<sup>th</sup> grade, who suffer from post-traumatic stress disorder (PTSD), depression, and behavioral issues resulting from trauma. The intervention consists of 10 group sessions, administered by a CBT-trained clinician, 1-3 individual sessions with the clinician, and 2 parents information sessions. It is implemented at schools over a period of 10 weeks and uses CBT techniques to help students develop skills in psychoeducation, relaxation, cognitive coping, trauma narrative and processing of traumatic memories and grief, gradual in vivo mastery of trauma reminders and generalized anxiety, and social problem-solving (Stein et al., 2011). CBITS has been cited as a recommended practice by the CDC Prevention Research Center, SAMHSA’s National Registry of Evidence-Based Programs and Practices,

and by the U.S. DOJ Office of Juvenile Justice and Delinquency Prevention (“CBITS: Learn More,” n.d.).

Because CBITS is designed to be implemented by a mental health professional, feasibility for implementation may be limited, as many schools do not have clinically trained mental health professionals. The lack of trained clinicians in schools has been a barrier in implementing CBITS (Jaycox et al., in Langley et al., 2010). In 2005, the Rand Corporation developed and piloted Support for Students Exposed to Trauma (SSET), as an adaptation of CBITS that can be implemented by teachers or other school staff without formal training in CBT (Jaycox et al., in Langley et al., 2010). Like CBITS, SSET involves 10 group lessons implemented in schools over 10 weeks and uses CBT techniques to teach the same set of skills to students. Students have “homework” to complete in between sessions to help them practice the skills. However, there are no individual sessions or parents information sessions, and sessions draw on the lesson plan format familiar to teachers (Jaycox,

Langley, & Dean, 2009). SSET is designed for middle school students, from ages 10-14 (Jaycox,

Langley, & Dean, 2009).

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### Evidence Base for SSET

While the evidence base for CBITS is strong, little research has been done so far to evaluate the effectiveness of SSET. A pilot study conducted by RAND in 2009 shows promise for feasibility and impact of SSET. Seventy-six children in two schools were randomized into an immediate and a delayed intervention group. The program was implemented by three teachers and one school counselor, each giving group sessions at their own convenience during their planning period. Three assessments were conducted: one at baseline, one at 3 months (after the immediate group received SSET), and one at 6 months (after the delayed group received SSET) (Jaycox, Langley, Stein, et al., 2009).

At the 3-month assessment, those who received SSET showed larger decreases in PTSD and depression than those who did not receive SSET. Teachers reported a small effect on student behavior, while parent-reported behavioral change was negligible. At the six-month assessment, depression

and PTSD among the immediate SSET group remained stable, and the delayed group showed some decrease PTSD, depression symptoms, and parent-reported behavioral problems. Teachers reported little change in behavioral problems for the delayed group. Effects were stable even when accounting for the school or for SSET implementer (Jaycox, Langley, Stein, et al., 2009).

Intervention effects from SSET were more pronounced among those with higher symptoms, while those with lower symptoms showed little to no change. The effects on depression and PTSD were smaller than in CBITS. The results of this pilot study suggest that implementing SSET in schools may be effective in reducing depression and PTSD among high-symptoms students. However, SSET may not be effective in addressing behavioral issues or improving mental health among low-symptom students (Jaycox, Langley, Stein, et al., 2009).

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### Considerations for Implementation of SSET

#### *Training*

Teachers or school counselors can implement SSET without formal mental health training (McInerney & Mcklindon, 2014). A free online training is offered through the SSET provider center website upon registration (“SSET Home,” n.d.). The online training provides approximately three and a half hours of video, along with video

transcripts, a few practice exercises, and a final test (“SSET Provider Center,” n.d.). Once a provider passes the test, they are certified to implement SSET. The SSET program also offers one- or two-day on-site training, which includes demonstrations, role-plays, and practice. On-site training is available for \$2,000 - \$8,000, depending on location and number of trainees. Only those who would

be implementing the program would need to be trained (“SSET Provider Center,” n.d.).

### *Parent Engagement and Consent for Screening and Participation*

Although parents do not participate directly in SSET, they should be engaged as much as possible through telephone conversations (Jaycox, Langley, Stein, et al., 2009). Parents must also give consent before screening and before implementation.

In the pilot study for SSET, the response rate for returning consent forms, especially in the first round, was low (Jaycox, Langley, Stein, et al., 2009).

Reaching parents and obtaining parental consent has also been noted as a barrier to successful implementation of SSET’s parent program, CBITS (Langley et al., 2010). Establishing contact with parents may be particularly difficult in an area with high poverty and daily stress such as Edgecombe County (Jaycox, Langley, Stein, et al., 2009; U.S. Census Bureau, 2017). The pilot study authors recommend that permission for screening be included with the regular beginning of school year forms, to increase the chance that parents will see, fill out, and return the initial consent forms (Jaycox, Langley, Stein, et al., 2009). Consent for screening and group participation templates are available in the SSET manual (for English) and through the SSET resource center (for Spanish) (Jaycox, Langley, & Dean, 2009; “SSET Resource Center,” n.d.).

### *Clinical support*

Although SSET is meant to be implemented by school staff who do not necessarily have training in CBT, it is necessary for implementers to have an ongoing relationship with a clinician who can provide clinical backup (Jaycox, Langley, Stein, et al., 2009). The clinician would need to be available for

consultation and referral during screening and implementation to address problems that are beyond the scope of SSET, and at the end of the program to ensure continuity for those who need additional support. The support clinician can be a school-based or district-level social worker or psychologist, or a contracted community provider. A clinician must be on-call to discuss with implementers within 24 hours if there is suspected or disclosed child abuse, if a student has a plan to harm another student or himself, or if a student’s emotional state is worsening (Jaycox, Langley, & Dean, 2009).

### *Timeline*

SSET is designed to be implemented over a period of 10 weeks (Jaycox, Langley, & Dean, 2009), and time must also be built in before the start of implementation to develop implementation and evaluation protocol, obtain parental consent and student assent for screening and participation, and screen students for eligibility to participate in the program. Program administrators should review school calendars to identify important school events that may clash with SSET sessions, so that time conflicts can be avoided (Jaycox, Langley, & Dean, 2009).

### *Scheduling*

SSET sessions are designed to be about an hour long and to be implemented during a class period, preferably a non-academic period (Jaycox, Langley, & Dean, 2009). If implemented during an academic class period, this would require students involved in the program to miss class once a week, which could affect their learning and academic performance. On the other hand, it could also affect student attendance at SSET sessions if other teachers do not give permission for students to miss



class. Interruptions to the normal schedule during the school day, such as assemblies or delayed openings, may also be a barrier to effectively implementing SSET sessions, as it has been for CBITS (Langley et al., 2010). A potential solution to these scheduling problems could be to hold SSET sessions after school instead of during a class period; however, the developers of the program note that attendance tends to suffer when sessions are held after school (Jaycox, Langley, & Dean, 2009).

Whether sessions are held during or after the school day, implementers would be giving up at least an hour of their week, once a week. If held during the school day, teachers would be giving up a planning period; and if held after school, implementers would be required to stay after school once a week (Langley et al., 2010). Given that teachers are often already under significant time pressure, it may be difficult for them to find the time in their day to implement SSET. Similarly, school counselors often have a lot of other responsibilities and may not have the time to implement SSET once a week. In a study on implementation barriers and facilitators for CBITS, implementers cited competing responsibilities as the strongest barrier to implementation, especially for those who did not successfully implement the program (Langley et al., 2010); it is reasonable to assume that similar time barriers might arise for implementers of SSET. To avoid scheduling conflicts, program administrators should collaborate with implementers, other teachers, and parents to determine the most acceptable timing of the intervention (Jaycox, Langley, & Dean, 2009). The implementation guide offers further suggestions for scheduling SSET sessions (Jaycox, Langley, & Dean, 2009).

### Cost

The cost of implementing SSET depends on what level of training implementers receive, whether implementers will receive a stipend, and on the cost of the services of a trained mental health provider for clinical backup. SSET can be implemented at very low cost. Free training is available online, and the developers of the program do not require any payment from schools who wish to implement (“SSET Provider Center,” n.d.). A stipend may be provided to implementers, as it was in the pilot study, but it is not required (Jaycox, Langley, Stein, et al., 2009). Some schools or districts may have a trained mental health professional on staff with the time to act as a clinical backup to an SSET program, eliminating the cost of contracting a clinician (Jaycox, Langley, & Dean, 2009). The only required cost in this case would be the cost of printing materials. A “gold standard” SSET program may include the following costs:

- \$2000-\$8000 for on-site training of all implementers (“SSET Resource Center,” n.d.)
- \$520 stipend per implementer per 10-session series (calculated at 10 hours of implementation, 10 hours of planning, and 6 hours of training, at \$20 an hour)
- \$100-\$200 for supplies: printing, notebooks for students, snacks
- Contracted mental health provider

### Capacity

The ideal group size is 6-10 students per group, with one or two facilitators per group (Jaycox, Langley, & Dean, 2009). There would need to be enough implementers to deliver SSET to all students who are eligible and who provide consent. In the pilot study, eligible and consenting students

represented only 4.7% of students whose parents were originally contacted about the study, though response rates for consent forms was an issue, as noted above (Jaycox, Langley, Stein, et al., 2009). At least one additional staff member would be needed to develop an implementation protocol, organize training, administer consent, help screen students, and organize SSET sessions (Jaycox, Langley, & Dean, 2009).

#### *Acceptability and Feasibility*

In the pilot study, SSET showed high acceptability both among parents and students who participated in the program. The pilot study also showed high feasibility for implementation (Jaycox, Langley, Stein, et al., 2009). However, it is important to note that the intervention as implemented in the pilot may have had additional resources, such as help from research staff, that may not be available at ECPS (Jaycox, Langley, & Dean, 2009). The need for a CBT-trained clinician for supervision may be a barrier to implementing SSET.

#### *Limitations*

SSET is not appropriate for all students. It is not intended for students who are in immediate crisis, who have behavior problems severe enough

that it would make it difficult for them to participate in a support group without disrupting it, or students with severe cognitive limitations putting them below a fourth-grade reading level (Jaycox, Langley, & Dean, 2009). SSET is also not designed to address trauma stemming from abuse. Some students will need more intensive intervention than SSET can provide and will need to be linked with a trained clinician but may still benefit from SSET. For example, students who have experienced abuse may work on other traumatic experiences in SSET while receiving counseling to address the abuse (Jaycox, Langley, & Dean, 2009). SSET has shown to be most effective in students with higher levels of depression and PTSD, and is not recommended for students who do not experience mental health symptoms resulting from trauma (Jaycox, Langley, Stein, et al., 2009). SSET was designed for middle school students age 10-14 and has only been evaluated for that age and grade range, but according to the SSET manual, it may be useful for students down to grade 4 or up to grade 9 (Jaycox, Langley, & Dean, 2009).

## Restorative Justice in Schools

### Restorative Justice Background

The restorative justice (RJ) movement began in the 1970s and 1980s as an alternative to the traditional criminal justice system and has since been adapted for use in schools and other settings (Watchel, 2016). Howard Zehr, a pioneer in the RJ movement, articulated a theory of restorative justice in 1990 with his book *Changing Lenses—A New Focus for Crime and Justice* (Watchel, 2016; Zehr, 2005). His work was influenced by the practices of indigenous peoples of North America and New Zealand (Zehr, 2005). Zehr's theory positions restorative justice as opposed to retributive justice. In a retributive justice system, crime is viewed as an offense against the state, which must be punished (Zehr, 1997). In a restorative justice system, crime (or in the case of schools, disruptive or harmful behavior) is viewed as a violation of people and relationships, the latter of which must be repaired in order to restore justice (Zehr, 1997). Restoration requires the voluntary participation of the victim (or victims), the offender, and the community (Zehr, 1997). The offender has the obligation to "make things right" to the victim, and to the community, but opprobrium and punishment are not priorities in RJ (Zehr, 1997). According to the RJ philosophy, the community has an obligation to the offender to

support efforts to integrate offenders back into the community, though they have a greater obligation to support the victim (Zehr, 1997). Since the 1990s, the RJ movement has spread worldwide, and has been used in a variety of settings including education, social work, counseling, youth services, workplaces and faith communities (Watchel, 2016).

The term restorative practice is also used (RP) is also used, and may be used interchangeably with restorative justice, or as an extension of the restorative justice philosophy. Here we use the phrase restorative justice or RJ to refer to both restorative justice and restorative practice.

Today, there is no one single definition of RJ or comprehensive program that is used by practitioners, and RJ is often seen as more of a philosophy than in intervention in itself. (Song & Swearer, 2016). One of the practices that is common throughout RJ programs, however, is the use of circles (Song & Swearer, 2016). In a restorative circle, victim(s), offender(s), and members of the community sit in a literal circle and discuss the offenses that were committed and what must be done to restore the relationship(s) that were harmed (Sumner, Silverman, & Frampton, 2010).

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### Evidence and Practice

#### *McDougal Middle*

McDougal Middle School in Carrboro, NC,

saw a 75% drop in major discipline referrals the year that it started implementing restorative practices (Goad, 2017). To implement their restorative

justice program, two staff members (one Language Arts teacher and one behavioral and academic support specialist) traveled to Bethlehem, PA to receive training from the International Institute for Restorative Practice (IIRP). The year after implementation, the number of major referrals dropped 75%: from 64 referrals in 2012-13 to 17 referrals in 2013-14. After its initial success, the original 2-member RJ team began training other teachers in RJ (Goad, 2017).

#### *Oakland Unified School District*

In 2005, Cole Middle School in Oakland, CA, piloted an RJ program, with the help of Oakland Unified School District (OUSD) and local non-profit restorative justice organization, Restorative Justice for Oakland Youth (RJOY) (Sumner, Silverman, & Frampton, 2010). All staff were trained in RJ practices. The school began by implementing disciplinary circles and expanded to non-disciplinary community building activities. In 2007, RJ became the primary discipline program at Cole. An evaluation of Cole's pilot found that suspensions decreased by 87%, and expulsions decreased to zero during implementation. Some students felt that it helped them get along and prevent fighting. Some teachers felt that the RJ program allowed students to process their feelings and learn from their mistakes, which fostered personal growth (Sumner et al., 2010).

In a more recent evaluation of the OUSD RJ program, 88% of teachers reported RJ was helpful in managing difficult behavior, and 63% of staff

said it improved conflict resolution (Yusem, Mcclung, Curtiss Sarikey, & Wilson, 2014). Students reported "enhanced ability to understand peers, manage emotions, greater empathy, resolve conflict with parents, improve home environment, and maintain positive relationships with peers" (Yusem et al., 2014). In 2015, OUSD launched a plan to expand their Whole School Restorative Justice program to all 86 of its schools (Oakley, 2015).

#### *Denver Public Schools*

Between 2006 and 2009, the Denver School-Based Restorative Practices Partnership (DSBRPP) piloted RJ programs in several schools in Denver, CO (Anyon, 2016). Schools used dialogues, peace circles, conferencing, and peer-led mediation to get to the root cause of student behavior and address issues too minor to be dealt with by harsh disciplinary responses (Anyon, 2016). The restorative practices program in Denver has since expanded—now more than 40% of Denver's 207 have staff dedicated to restorative justice (Asmar, 2018). Since 2010, the suspension rate in Denver Public Schools (DPS) has dropped by 58% (Asmar, 2018). In 2016, the DSBRPP published a report on RJ programs in DPS. Interviews and focus groups with staff members were used to identify four essential strategies for implementing a whole-school RJ program: principal vision and commitment, staff buy-in, continuous and intensive professional development for staff, and the existence of a full-time RJ coordinator (Anyon, 2016).

## Considerations for Implementation

### *Exploration of Approaches*

Since there is no one way to implement RJ, school administrators will need to make decisions about which RJ strategies they will employ, and which RJ principles are most important to their schools. There is an abundance of material available on both the theory and implementation of RJ in schools; school administrators will have to do some research and decide what will work for their school in terms of needs and feasibility. Below we outline some of considerations that school administrators may take into account when deciding whether and how to implement an RJ program.

### *Whole School Approach*

In a whole-school RJ approach, all staff are trained in RJ, and RJ principles and programs are applied regularly in classroom settings, as both prevention and response to misbehavior and harmed relationships. Another option is to use RJ only as a response to misbehavior and as an alternative to exclusionary discipline practices. Using whole-school approach may be more effective than using RJ only as a response to misbehavior, but it also may take more time to implement and be costlier (Song & Swearer, 2016). OUSD and DPS use a whole-school approach in their RJ programming (Denver School-Based Restorative Practices Partnership, 2017; Jain et al., 2014).

### *RJ Coordinator*

It is recommended that any school implementing RJ have at least one RJ ambassador or coordinator on staff (Anyon, 2016). The RJ coordinator's role is to facilitate conferences and mediations, monitor restorative agreements, and

providing training and coaching to other staff members. The RJ coordinator must have good relationship-building skills (for example, empathy, active listening, and patience), as well as an awareness of students' lived realities outside of school. Staff members interviewed for the pilot evaluation agreed that these soft skills were more important in an RJ coordinator than RJ knowledge or experience (Anyon, 2016).

Due to the time-intensive nature of the work, it is ideal to have at least one full-time RJ coordinator on staff (Anyon, 2016). However, if funding is an issue, schools may instead train a family or community volunteer, assign the role of RJ coordinator to an existing staff member, or have multiple staff members share the role (Denver School-Based Restorative Practices Partnership, 2017). It is better to use school staff rather than an outside volunteer to ensure relationship continuity, which creates trust and community. If using an outside volunteer, the volunteer must have regular contact with the school (Sumner et al., 2010).

### *Staff Buy-In and Support*

In order for an RJ program to work, the principal and other school administrators have to believe that the RJ philosophy works, and be fully committed to using RJ practices even in the face of resistance and logistical challenges (Anyon, 2016). Staff buy-in is also necessary for a successful RJ program (Anyon, 2016). Uneven support from staff can affect student perception of RJ (Sumner et al., 2010). To improve staff buy-in, administration should involve teachers and staff in the development of RJ policies and protocols, and solicit



feedback from staff throughout the implementation process (Anyon, 2016). Support for RJ philosophy should be assessed during hiring (Anyon, 2016). Employing a strong advocate for RJ can help encourage support (Sumner et al., 2010).

### *Staff Training and Professional Development*

Training is needed in both intervention and implementation practice (Song & Swearer, 2016). Facilitators of RJ should have training from an experienced trainer. In a whole-school approach such as the programs used in Cole Middle School or DPS, all staff members who interact with students should receive training in RJ, including bus drivers, cafeteria workers, etc. (Denver School-Based Restorative Practices Partnership, 2017). DPS dedicated several days to training over the summer and provided booster sessions throughout the year during faculty meetings, team meetings, and shared planning time (Anyon, 2016). They also provided individualized coaching for staff members who had difficulty implementing RJ practices (Anyon, 2016). However, time and budget limitations may preclude training this extensive. Some schools may seek to have all their staff trained, but over a period of years, instead of all at once. Another option may be for a few staff members to become certified to train their colleagues in their school, as was done at McDougal Middle (Goad, 2017).

### *Behavior Teams*

A school implementing RJ may consider creating behavior teams, such as those used in DPS (Anyon, 2016). A behavior team brings together student supports and streamlines communication between administrators and educators (Denver School-Based Restorative Practices Partnership, 2017). A team might consist of an RJ coordinator, a

school administrator, teachers, nurses, a special education representative, and anyone else who has regular contact with students and commitment to implementing RJ principles (Denver School-Based Restorative Practices Partnership, 2017). The behavior team should meet weekly to review data and cases, determine interventions, monitor progress, and identify action steps (Anyon, 2016). These meetings can help improve implementation fidelity and be an important source of staff support (Anyon, 2016).

### *Timeline and Time Commitment*

An RJ program can take two or more years to implement, especially if using a whole-school approach. Riestenberg lists four stages of implementation: exploration, installation, initial implementation, and full implementation (Riestenberg, n.d.). Throughout these four stages, school administrators track outcomes and use data to inform implementation. The stages do not always have to be taken in order, but they have to be done fully, which can take two to four years (Riestenberg, n.d.). Cole Middle School's program was also implemented over the course of two years (Sumner et al., 2010). The DPS implementation guide provides a timeline for implementation with benchmarks for the first month, first and second years, and beyond (Denver School-Based Restorative Practices Partnership, 2017). In Denver's model, critical steps are achieved in year one, growth in year two, and sustainability beyond that. However, an RJ program does not necessarily have to be implemented fully in order to start seeing results.

Once an RJ program is fully installed, it takes time to plan for and implement circles, which may take away from other activities during the day



(Sumner et al., 2010). Proponents say, however, that RJ will save time in long run by preventing misbehavior (Sumner et al., 2010).

### *Implementing with Fidelity*

Implementation fidelity refers to the degree to which an intervention or program is delivered as intended (Carroll et al., 2007). If a specific implementation guide is not followed, assessing fidelity presents a challenge. If assessing fidelity to a specific RJ program is not an option, schools may assess fidelity to underlying RJ principles. The following questions can be asked to assess fidelity of a school-based RJ program:

1. Do circles and conferences address the 3 critical questions advocated by Howard Zehr (Song & Swearer, 2016)?
  - a. Who was harmed? What is the extent of the harm?
  - b. What are the needs that gave rise to the event?
  - c. How do we make this right? How do we ensure that harm is repaired, relationships are restored, and future harm is prevented?
2. Were students given a chance to actively participate in circles and conferences on the

same level as teachers? Do restorative solutions come out of a conversation between offender, victim, and community, or are they handed down from above?

3. Are restorative practices used instead of, or in addition to punitive discipline? If used in addition, is there a focus on restoring relationships and reintegrating the student back into the school environment?

### *Cost*

The primary costs associated with implementing an RJ program in a school are the hiring of an RJ coordinator and the cost of training staff. The cost of training will depend on where and from whom staff receives training, how many staff are trained, and how much training they receive. The cost of hiring an RJ coordinator depends on whether a new staff member is hired and whether they are hired full-time. It would be ideal for a school implementing RJ to have a budget with outside funding; however it may be possible to circumvent or reduce many costs using creative solutions (Denver School-Based Restorative Practices Partnership, 2017).

## Mindfulness Meditation Practices

### What is Mindfulness?

Mindfulness as practice is described as the psychological process of bringing one's attention to experiences occurring in the present moment without judgment or particular attention to any specific experience (Baer, 2003). Mindfulness can be developed through the practice of meditation, but research suggests that similar mental patterns, with comparable benefits, are developed through other training using biofeedback, also object of this review (Brandmeyer & Delorme, 2013). Although the origin of the idea and the practices are linked to Buddhism (from the Pali term "*sati*"), most of the mindfulness interventions now tested in the scientific literature are secular in nature. Formal training exercises, such as learning how to attend to breathing or refraining from letting attention drift into streams of thought, form the backbone of many interventions. Collectively, these interventions aim to foster greater awareness of present moment experience, which may have multiple benefits ranging from enhancing the quality and vividness of our daily life to improving chronic pain (Creswell, 2017).

The first established and studied program, Mindfulness-Based Stress Reduction (MBSR), was developed in a behavioral medicine setting for populations with chronic pain and stress-related disorders and used a wide range of practices, including hatha-yoga postures and mindful eating or walking (Kabat-Zin, 1982; Baer, 2003). Later, researchers of Cognitive Behavior Therapy (CBT) integrated MBSR's evidence-based practices to create "Mindfulness-Based Cognitive Therapy" (MBCT) for the

treatment of recurrent depression (Baer, 2003).

As mindfulness techniques became part of the general psychology toolbox, they enjoyed increased curiosity and acceptance in western societies. But adoption of general mindfulness practices by educational institutions has received some criticism, especially from those who have seen it initially being employed as a neoliberal practice aimed solely at improving workers' productivity and financial outcomes (Purser & Loy, 2013). There is fear that institutions will propose the practice in school settings to make kids (especially those in lower socioeconomic status) docile and accepting in face of crumbling social systems ("contemplate the school-to-prison pipeline") (Hsu, 2013). Critics also argue that the original deep spiritual tradition is being re-fashioned (McMindfulness) into a banal, therapeutic, self-help technique that instead of generating compassion and awareness, might work to actually reinforce the roots of people's suffering. In response to this critique, the adoption of mindfulness is best used as part of a critical pedagogy that encourages students to question and challenge the policies and conditions that create their stress and unhappiness.

In its original Buddhist context, the term "*sati*" has a wider meaning and purpose than the English word "mindfulness." It is related to improving one's perception of reality and discerning what is beneficial and what is not, and quieting, steadying and soothing the mind by this discernment (Chiesa, 2013). Buddhists differentiate between Right Mindfulness (*samma sati*) and Wrong

Mindfulness (*miccha sati*). Right Mindfulness awareness is characterized by wholesome intentions and positive mental qualities that lead to human flourishing and optimal well-being for others as well as oneself (Purser & Loy, 2013). Though Buddhist scholarship has informed a great deal of the psychological research on mindfulness and mindfulness interventions, it is by no means exclusive to Buddhism or Buddhist contemplative practices. Being mindfully aware is not synonymous with being a Buddhist; it is instead a basic feature of being human (Creswell, 2017).

Whether intentionally adopting the

Buddhist traditional attitudes and approaches or not, research has clearly shown that meditation and other practices that encourage mindfulness can be effective in improving student's self-regulation and impulse control. Mindfulness practice can also alleviate some of the effects of toxic stress, facilitating better learning, and provides a skill set that promotes lasting physical and emotional wellbeing (Ortiz, 2017; Meiklejohn et al, 2012). School-based mindfulness training offers an opportunity for students to improve attentional skills, which may enhance their resilience to cope with academic and psychosocial challenges.

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## Evidence

Scientific studies of mindfulness practice have given promising results for improved mental and physical health, cognitive and emotional factors, and interpersonal outcomes. However, academics agree that that the research and literature to date has methodological limitations, such as small samples, lack of active control groups, and a lack of high-quality measures (Creswell 2017). Though the general understanding of mindfulness intervention for adults has improved in the last two decades, most studies have been conducted in clinical, rather than institutional, settings.

There has been a shift over the past decade toward moving mindfulness intervention RCTs into institutional settings such as prisons, workplaces, or schools. However, more randomized control trial studies still need to be conducted to examine mindfulness intervention effects in settings beyond medical or psychological clinics (Creswell 2017). High-

quality RCT studies are needed to evaluate the safety, efficacy, and effectiveness of interventions in those particular contexts.

The application of mindfulness-based approaches with children and adolescents is a newly evolving field, with current evidence suggesting these approaches are acceptable and feasible with youth (Meiklejohn 2012). The benefits experienced by children with unaddressed trauma might be similar to those that can be experienced by adults with unaddressed trauma (Ortiz, 2017). Research on the relationships between trauma, stress, self-regulation, and psychosocial, educational, and professional outcomes suggests that early interventions can be more effective in affecting the cycle of intergenerational trauma in communities (Meiklejohn, 2012).

Programs and models currently being used in schools throughout the country have already

been the object of peer-reviewed articles that illustrate various features of mindfulness practice. Studies have included qualitative analyses of satisfaction and feasibility of particular approaches, systematic reviews of program implementation fidelity, and the biological mechanisms involved in the physical benefits of the practice.

The dedicated scientific journal [Mindfulness](#), established in 2010, publishes peer-reviewed

papers that examine the latest research findings and best practices in mindfulness interventions. The journal also features articles that discuss the training of healthcare professionals to administer mindfulness programs, as well as philosophical and commentary papers that present diverse viewpoints including psychology, medicine, neurobiology, culture, spirituality, and wisdom traditions.

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## Considerations for Implementation

### *Diversity of models and programs*

Organizations have been implementing school-based mindfulness programs across many countries, sometimes integrating light yoga posture or mindful playing practices. Programs can be delivered by experienced practitioners or by classroom teachers who have received prior training. Several interventions offer teacher, educational assistant, or parent training components. Delivery models can provide lessons in school and after-school settings as well as within the community, research settings, and outpatient clinics. The length and frequency of lessons and the duration of the programs vary according to the age of the student and the chosen setting (Meiklejohn et al, 2012).

Our research of the current scientific literature and of various media outlets has shown a large number of programs and models developed for children of different ages, and of initiatives being led by local groups and implemented in different school systems. As people from different areas and institutions have explored the practice,

programmatic variations have naturally come up and others have disappeared. Many groups have created research partnerships with academicians to generate data and increase the quality of the evidence for the results they have obtained. Already several programs have been implemented and studied on a schoolwide scale (e.g. [Learning to BREATHE](#), [MSBR-T](#), [Mindful Schools](#)).

Several groups have recently received praise from the media and have shown high acceptability in their communities, where they are currently working. They are also partnering with academicians to advance the scientific rigor of their research and improve their programs. The [Holistic Life Foundation](#) has been empowering communities through yoga, self-care, and mindfulness in Baltimore schools. [Minds Incorporated](#) is dedicated to empowering Washington DC area schools by teaching mindfulness-based practices to not only to students, but also to educators and parents. [Mindful Kids Miami](#) has been serving students from pre-K through the 12th grade in Miami-Dade County and throughout Florida, helps educators, health

providers and caregivers teach mindfulness skills to children and youth in schools and other settings. [MindUP](#), the signature program of The Goldie Hawn Foundation, has been using a classroom-based curriculum involving neuroscience, social-emotional learning (SEL), positive psychology, and mindful awareness to help children develop the mental fitness necessary to thrive in school, work and life. [Mindful Schools](#), from Oakland, CA, has a school-wide approach with courses and curricula designed for under-resourced public schools facing high turnover rates and toxic stress, offering educators practical skills for self-care, facilitation, and connecting with youth, providing simple, effective mindfulness practices that can be integrated into the school day and adapted for diverse environments.

We will next briefly contrast two mindfulness initiatives with distinct models. The comparison demonstrates the diversity of ways in which the use of mindfulness can be brought to education and implemented in classroom. *MindUP* promotes a schoolwide change that incorporates new curricula into the classroom and involves the school administration, while *Mindful Schools* offers two levels of training to individual educators, and a year-long certification program that enables educators to train other professionals and tailor school-wide curriculum adaptation.

- *MindUP*

- Model: classroom-based curriculum, spanning ages 3 to 14; 15-lesson series is based on four pillars: neuroscience, social-emotional learning (SEL), positive psychology and mindful awareness. Lessons work together to build awareness and self-regulation that increases a

child's academic performance, self-control, empathy, and optimism

- Program: A consultant leads the school staff in two on-site workshops and one parent workshop; three video conference calls throughout the year; and curriculum guides and chimes for all staff members.
- Costs: \$6,000-\$8,000 per school year

- *Mindful Schools*

- Two levels of training for teachers and educators (6 weeks each) as well as a full year Mindful Teacher Certification Program to enable training other professionals
- Each training level is delivered online and demands 2 to 4 hours weekly for 6 weeks
  - Fundamentals: introduction to mindfulness meditation and support for daily practice
  - Educator Essentials: Learn to accurately present the research on mindfulness and youth and understand the basic neuroscience of attention and emotion; facilitation skills to work with youth at different developmental stages, plus group facilitation and classroom management skills, resources to present to administrators, school, and agency staff
  - Teacher Certification Program: deepens the Educator Essentials training; begins and ends with five-day in-person, residential retreats, and is comprised of online modules, workshops, teaching labs, and other learning opportunities. Graduates are certified to teach to different audiences including adults, as well as adapt the curriculum to schools' specific needs



- Costs:
  - Mindful Teacher Certification Program - US\$ 5,875,00 tuition (discount options and scholarships available), plus retreats costs (East or West Coast locations)
  - Individual: Fundamentals - US\$ 125.00 / Educator Essentials - US\$ 550.00
  - Groups (>4): Fundamentals - US\$ 75.00 / Educator Essentials - US\$ 275.00

### Timeline

The duration of individual teachers' training plus the setting up of classroom practices tends to be shorter than the amount of time required for the typical school-wide program adoption process. Therefore, the choice of the programmatic options establishes not only the duration of the implementation process but when it can be started. Teacher training generally happen either in week-long retreat style programs or using online or hybrid methods that last about 2 months. Retreats are not offered very often, and the marginal costs associated with transportation and boarding may difficult access, while online training have the advantage of being self-paced but the possible disadvantage of not being effective in supporting the beginning of mindfulness practices or instilling the value of experience in educators.

### Cost

Programs offer distinct modalities of training for teachers (and sometimes other school staff) with varied costs. School-wide programs will cost a few thousand dollars, while individual educator training will require about 500 hundred dollars per person. Training often includes material that describes research relevant to the method being employed, manuals to be used in classroom practice

and in school-wide implementation processes, as well as issues pertinent to parents or guardians.

### Challenges

Practical challenges reported by developers and implementers of mindfulness-based curricula models include:

- Scientific concerns: the need for continued development and refinement of the best practices for adapting well-established adult mindfulness training for younger populations and lack of agreement on the active ingredients of the programs and ways to measure their effectiveness through rigorous scientific research;
- Administrative issues: the need for funding and frequent changes in school's educational policies, budgeting, priorities, proposed solutions, and decision makers; motivating schools to embrace the curricula;
- Curriculum challenges: scheduling teaching in multiple schools, including finding a suitable time within the school curriculum, and finding space conducive to practice within a school.

These challenges point to the indispensable role of continued research in broadening the credibility and appeal of mindfulness training for K-12 students (Meiklejohn et al, 2012)

### Potential Unintended Consequences.

It is not uncommon for intervention participants to report various unpleasant reactions, such as agitation, anxiety, discomfort, or confusion, during formal training exercises (although it is more common for participants to report feelings of relaxation and contentment) (Cresswell, 2017). Negative reactions are viewed as an important feature of the psychotherapeutic change process in mindfulness interventions, because sustained mindful attention



to one's experience is thought to help participants explore and understand the full embodied experience of these reactions, to learn that the experience of these reactions is temporary, and to foster insight into how one reacts to these uncomfortable experiences (Creswell, 2017).

Some studies suggest that mindfulness

training can be initially cognitively depleting. In addition to specific risks and adverse events, it is important to consider the possibility that the conscious effort of maintaining awareness of present moment experience might have temporary cognitive costs among individuals who are new to mindfulness interventions. (Creswell, 2017).

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## Biofeedback and Neurofeedback

### What is Biofeedback?

Biofeedback (BF) therapies are training programs in which a subject's biological activity is monitored by a non-invasive instrument while the information from that monitoring is made available to the subject in some understandable form such as a changing sound, visual display, or physical sensation. Sensors for BF include galvanic skin response (skin voltage is very sensitive to moisture levels from sweat glands), thermistors (to measure skin temperature), photoplethysmographs (for measuring peripheral blood flow and heart rate), electromyographs (for measuring muscle tension) and others.

An article published in *Mental Health in Family Medicine* defines BF as

*“a mind-body technique in which individuals learn how to modify their physiology for the purpose of improving physical, mental, emotional, and spiritual health”* (Frank et al, 2010).

The purpose of biofeedback training is to teach people how to control involuntary physiological processes (to self-regulate) that might contribute to painful symptoms and distress. In some ways, this use of biofeedback can be understood as a means to accelerate the learning process that leads to relaxation and that also happens during meditation. With regular practice, in a very short time, people are able to increase the activation of their body's power to rest and recuperate naturally. These are the same mechanisms in the body that,

when exposed to stress, are gradually shut down in order allow the activation of other mechanisms that are able to give a more appropriate response to the stressor. Toxic stress leads to repeated activation of the sympathetic nervous system, the command center for the structures responsible for the fight/flight/freeze responses.

### *Heart Rate Variability*

Heart Rate Variability (HRV) is the variation in the time interval between heartbeats (Khazan, 2013). Higher variability is associated with better alternation of the two branches (one accelerates, and one slows down) of the autonomic nervous system (responsible for regulating most of the body's internal functions) (HeartMath Inc, 2018). It can be an important indicator of health and fitness, and when this system is functioning properly, the body is able to self-regulate and restore equilibrium when it gets disrupted (Khazan, 2013).

In HRV biofeedback training the goal is to develop awareness of one's breathing and of one's emotional state, both of which interact and influence the autonomic balance (Yucha, 2004). The biofeedback setup for HRV involves monitoring either heart rate alone or heart rate plus respiration and the HRV is maximized at a particular “resonant frequency” (breathing rate per minute). Improvement while assisted by biofeedback might average four to ten sessions (Yucha, 2004).

### *Neurofeedback*

Neurofeedback (NF) is a form of biofeedback training that uses the Electroencephalogram, also known as the “brain wave”, as the signal used

to provide feedback. Sensors on the client's heads register the brainwaves which are converted into feedback signals that are displayed typically visually. NF can be used to induce brain relaxation using visual, sound, or tactile feedback to increase specific brain waves (alpha) by operant conditioning of the brain (AAPB, 2011). Using operant

conditioning, learning is motivated by a reinforcement after the behavior is demonstrated and in practice, the therapist is simply there to explain what the biofeedback equipment is measuring and how it relates to the patient's physiology (Frank et al, 2010).

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## Evidence

BF has enjoyed great success in treating numerous conditions including those related to muscle tension (temporomandibular-joint disorder, back pain, tension headaches/migraines, tendonitis, incontinence), plus anxiety, hypertension, epilepsy, some chronic pain conditions, certain breathing disorders, some types of cardiac arrhythmias, and substance abuse (Frasson et al, 1997). Several of these health conditions, including muscle pain and tension, high blood pressure, anxiety, and insomnia, can be caused or exacerbated by chronic exposure to toxic stress (Khazan, 2013).

NF can also address a number of these but is more commonly used to address learning and psychological symptoms typically observed in disorders such as attention-deficit/hyperactivity disorder, obsessive-compulsive disorder, and depression, for example (Khazan, 2013). Interventions

using a wide variety of NF brain-computer interfaces (BCIs) have been shown to be effective for teaching children how to self-regulate anxiety and attention. They have also been shown to be effective for treating PTSD in adults and children (Antle et al, 2018). Using NF BCI systems for self-regulation training that include games provides motivation for the user and has been linked to high training compliance and reduced attrition in clinical studies (Antle et al, 2018).

For any children, but especially for those suffering the consequences of trauma, biofeedback can be a simple, straightforward, and fun mechanism to teach them how to self-regulate. As mentioned, improved relaxation and self-regulation generates a variety of additional benefits associated with healing and improved immune function (Yucha, 2004).

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## Considerations for implementation

### *Feasibility*

The ability and likelihood to successfully implement interventions or research studies

depend on the study design, the populations and settings involved, and the indicators chosen for the program evaluation. In any case, the nature of BF

as training and not therapy, implicates that interventions using BF training to broadly address the effects of traumatic toxic stress are expected to be unnecessary after some sessions, especially in the cases where specific mental health issues are being addressed. Though feasibility for the adoption of a specific system can vary according to the type of program, initial financial investments are proportionally higher due to the need to purchase equipment. Additionally, there might be costs associated to training operators, though training can be done remotely using multimedia materials and the commercially available devices described above are designed to be used without need of technical supervision.

#### *Acceptability*

Biofeedback can be a good choice as a main treatment or as an adjunctive treatment. That can happen for different reasons, such as client's preferences for non-invasive methods and the fact that there are no contraindications or drug interaction concerns. It is sometimes more acceptable than traditional psychotherapy because of the stigma that is still attached to psychotherapy, and may be a good alternative to clients who have been noncompliant with other treatments. For example, children and adolescents are sometimes hard to engage in psychotherapy, while biofeedback is often interesting and engaging enough to get their attention and increase willingness to participate due to its use of software (Khazan, 2013).

#### *Timeline*

Training to operate more complex systems can be done in a few hours or days, while implementation of intervention can happen throughout the school year. Clients using the training to

address health problems typically have sessions for a couple months before they can be stimulated to incur in self-regulation practices that do not depend on biofeedback devices. The devices commercially available tend to come with easy to follow instructions, and video content can often be accessed using the internet. Those that connect to smartphones, tablets or personal computers often include additional embedded instructions and real time coaching messages which allow users to pace their learning and practice and track their usage and progress.

#### *Costs and Devices*

Many studies position sensors in the participants' scalps and use professional grade machines to read the input and produce feedback, while a good number of more recent research use small devices that can be easily purchased over the internet and that offer proprietary software for use in smartphones or personal computers. Costs involved with BF but not considered in this review include the cost of computers or smartphones and their operational systems. Typically, hardware (devices and peripherals) are accompanied by proprietary training system software and licenses for personal or commercial use. Professional grade equipment can cost several hundred to thousands of dollars, but their use tends to be restricted to therapeutic or research settings. The following table describes equipment that represent alternatives to NF training from two different companies. They are easily accessible by any person and are currently used by therapists in their private practices.

#### *Challenges*

Although NF training is becoming more popular due to its use by high performance artists

and athletes, it is common for people to initially display reservations about NF training. That is typically due to lack of correct and clear information about what the training can and cannot do for them, and because there are genuine concerns about the use of the data being generated by the EEG readings and the possible misuse of that information. It is important to recognize the history of traumatic experiences with medical research over the past century which has generated a rejection of medical like interventions in some minority populations, especially African-Americans.

*Potential Unintended Consequences*

BF and NF training can be helpful in

strengthening nervous system function regardless of history of past trauma and be used both as a training to improve performance or as a therapeutic tool. In the cases interventions are structured to single out students deemed at higher risk, there is the danger of increasing stigma towards vulnerable populations who already deal with highly stigmatized issues, such as learning impairments, economic disparities and or the burden of food insecurity. But those are programmatic considerations that do not relate directly to the training and should be addressed with the participation of the school community (educators, children and parents).

Table 1 – Neurofeedback Devices

Company/ Device	Description	System/ Software	Price	Considerations
<a href="#">HeartMath emWave Pro Desktop</a>	HRV monitoring system (requires purchase of + emWave ear sensors - USD 25 per unit)	Computer software	USD 299	Supports unlimited number of clients. Offers coherence techniques and interactive content. Can retrieve data from other HeartMath equipment. Training books included
<a href="#">HeartMath emWave2 handheld</a>	Standalone handheld device with pulse reader, breath pacer and coherence indicator. Includes ear sensor.	Inbuilt software	USD 199	Portability allows users to pace their training in the setting of their choosing. Can also connect to computer systems.
<a href="#">HeartMath Inner Balance</a> Bluetooth Sensor	HRV reader device connected to earlobe or fingertip. Bluetooth connection to smartphone/ tablet.	iOS and Android app	USD 159	Portability. Guided meditations practices and live coaching. Four challenge levels. Free online platform with extra functions such as journal notes and practice plans.
<a href="#">HeartMath Inner Balance</a> Lightning Sensor	HRV reader device connected to earlobe or fingertip. Wired connection to smartphone/ tablet.	iOS only app	USD 129	Portability. Guided meditations practices and live coaching. Four challenge levels. Free online platform with extra functions such as journal notes and practice plans.
<a href="#">Interaxon Inc MUSE headband</a>	Multi-sensor EEG reader device. Bluetooth connection to smartphone/tablet.	iOS and Android app	USD 199	Real-time meditation guidance and progress tracking software. People with long hair need to tie it up to allow device to read data.
<a href="#">Interaxon Inc MUSE2 headband</a>	Multi-sensor EEG and PPG reader device with oximetry, gyroscope and accelerometer. Bluetooth connection to smartphone/tablet.	iOS and Android app	USD 249	Increased functions and possibility of creating more information from other measurements (breath, heart rate, body movement) devices, that can be associated to the EEG data.

## V. CONCLUSION

Schools can be an important setting to promote activities and interventions that improve self-regulation and address the consequences of traumatic toxic stress. In low-resource areas, schools can play a central role in supporting families and communities. They can be important allies in interrupting the cycle of intergenerational trauma both by not incurring in punitive disciplinary practices and by providing safe spaces and purposeful practices to mitigate the effects of childhood trauma. This document presented four alternatives that are not mutually exclusive. On the contrary, they are complementary and affect the school environment in different levels, from individuals to schools' culture and policies.

SSET may be useful for improving emotional wellbeing among middle school students, specifically in reducing symptoms of depression and PTSD. However, more research is needed to verify the effectiveness of SSET. Barriers to implementing SSET would likely be low, as training and implementation resources are available or free online, and schools would not have to hire any additional personnel provided that a CBT-trained counselor was already on staff with the school or school district. Challenges to implementing SSET include establishing parental consent and engagement and potential scheduling conflicts.

Restorative Justice offers an alternative to exclusionary and punitive discipline in schools. Schools that have implemented restorative justice programs report improvements in school climate and student behavior and reductions in disciplinary referrals. Effective implementation of a school-

based RJ program requires support and buy-in from administration and staff, a dedicated RJ coordinator, and ongoing professional development in RJ philosophy and practice. Challenges to RJ may include the financial cost of paying an RJ coordinator, lack of time necessary to effectively implement a program, and the potential for misunderstanding of or skepticism towards the RJ philosophy.

School-based mindfulness training can also alleviate some of the effects of toxic stress, improving student's self-regulation and impulse control, which may enhance students' resilience to cope with academic and psychosocial challenges. Research has shown promising results from programs implemented in schools and there is a great diversity in possible interventions. Barriers to implementation are often the need for more robust evidence, a cultural shift in institutions, and the financial investment in training, though the practice can be learned and transmitted without greater costs using existing resources.

Biofeedback and neurofeedback training programs facilitate the experience of coherent physiological patterns and teach self-regulation skills with the assistance of electronic devices. Modern equipment is easy to operate, and software capabilities assist lay personnel in operating the systems and providing initial training to clients. Barriers are related to the possible stigma suffered by clients, although the interactive feedback software and ubiquity of gadget suggests high acceptability. Initial costs related to the purchase of equipment can be a challenge in implementing biofeedback, but those can offset by the number of clients that can be



trained with individual devices and the lack of costs associated to professional providers.

These four approaches represent alternatives to punitive disciplinary measurements that can be used in the Edgecombe County Public Schools as ways to address the effects of toxic stress and trauma in the community, and to interrupt the school-to-prison-pipeline. The recognition of the importance of the adverse childhood experiences to health and education outcomes opens new possibilities of interventions to break the cycle of

intergenerational trauma and decrease health and socioeconomic disparities. Cognitive and behavioral therapy can address the immediate needs of students, while Restorative Justice practices can change culture and environments providing healing from within communities. Biofeedback and mindfulness practices empower individuals by increasing their well-being through improved self-regulation and executive functioning skills, with impacts in their future personal and professional lives.

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## VI. APPENDIX

### Additional Reading and Resources for Restorative Justice

#### Free Implementation Guides

- School-Wide Restorative Practices: Step by Step (Denver Implementation Guide): <https://www.skidmore.edu/campusrj/documents/Denver-2017-School-Wide-RP-Implementation-Guide.pdf>
- OUSD Restorative Justice Implementation Guide: A Whole School Approach: <https://www.ousd.org/cms/lib/CA01001176/Centricity/Domain/134/BTC-OUSD1-IG-08b-web.pdf>
- Safer Saner Schools 11 Essential Elements (from the IIRP): [http://www.iirp.edu/pdf/SSS\\_Implementation\\_Overview.pdf](http://www.iirp.edu/pdf/SSS_Implementation_Overview.pdf)
- San Francisco Unified School District Restorative Practices Whole-School Implementation Guide: <https://www.healthiersf.org/RestorativePractices/Resources/documents/SFUSD%20Whole%20School%20Implementation%20Guide%20ofinal.pdf>
- Fix School Discipline Educator Toolkit: <http://www.fixschooldiscipline.org/educator-toolkit/>

#### Books on Theory and Practice of Restorative Justice

- *Changing Lenses: A New Focus for Crime and Justice*, by Howard Zehr: [https://www.amazon.com/Little-Book-Restorative-Justice-Peacebuilding-dp/1561488232/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1463887048&sr=1-1&keywords=little+book+restorative+justice](https://www.amazon.com/Little-Book-Restorative-Justice-Peacebuilding-dp/1561488232/ref=sr_1_1?s=books&ie=UTF8&qid=1463887048&sr=1-1&keywords=little+book+restorative+justice)
- *The Little Book of Restorative Justice*, by Howard Zehr: [https://www.amazon.com/Little-Book-Restorative-Justice-Peacebuilding-ebook/dp/BooRW2UXS8/ref=sr\\_1\\_3?s=books&ie=UTF8&qid=1548087610&sr=1-3&keywords=little+book+of+restorative+justice](https://www.amazon.com/Little-Book-Restorative-Justice-Peacebuilding-ebook/dp/BooRW2UXS8/ref=sr_1_3?s=books&ie=UTF8&qid=1548087610&sr=1-3&keywords=little+book+of+restorative+justice)
- *The Little Book of Restorative Discipline in School*, by Lorraine Stutzman Amstutz and Judy H. Mullet: [https://www.amazon.com/Little-Book-Restorative-Discipline-Schools/dp/1561485063/ref=pd\\_bxgy\\_14\\_img\\_3?ie=UTF8&refRID=oDZ9KVSE6C97YQGFMN96](https://www.amazon.com/Little-Book-Restorative-Discipline-Schools/dp/1561485063/ref=pd_bxgy_14_img_3?ie=UTF8&refRID=oDZ9KVSE6C97YQGFMN96)
- *Implementing Restorative Practice in Schools: A Practical Guide to Transforming School Communities* by Margaret Thorsborne: [https://www.amazon.com/Implementing-Restorative-Practice-Schools-Transforming/dp/1849053774/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1548087688&sr=1-1&keywords=implementing+restorative+practices+in+schools](https://www.amazon.com/Implementing-Restorative-Practice-Schools-Transforming/dp/1849053774/ref=sr_1_1?s=books&ie=UTF8&qid=1548087688&sr=1-1&keywords=implementing+restorative+practices+in+schools)

### Program Evaluation Reports and Lessons Learned

- School-based restorative justice as an alternative to zero-tolerance policies: Lessons from West Oakland (Cole Middle School Pilot Evaluation): [https://www.law.berkeley.edu/files/thcsj/10-2010\\_School-based\\_Restorative\\_Justice\\_As\\_an\\_Alternative\\_to\\_Zero-Tolerance\\_Policies.pdf](https://www.law.berkeley.edu/files/thcsj/10-2010_School-based_Restorative_Justice_As_an_Alternative_to_Zero-Tolerance_Policies.pdf)
- Restorative Justice in Oakland Schools: Implementation and Impacts: <http://www.rjtica.org/wp-content/uploads/2015/04/OUUSD-RJ-Report-full.pdf>
- Taking Restorative Practices School-wide: Insights from Three Schools in Denver: [https://b3cdn.net/advancement/213db9b237a868a182\\_jfm6ii7yo.pdf](https://b3cdn.net/advancement/213db9b237a868a182_jfm6ii7yo.pdf)

### Organizations offering RJ Training

- The IIRP offers trainings in basic and advanced restorative practices. They also offer courses to experienced practitioners in becoming licensed trainers. <https://www.iirp.edu/professional-development/basic-restorative-practices/>
- Triad Restorative Justice: Offers consulting, training, conference facilitation, and support coaching for schools and educators. Offers a two-year Whole School Integration and two licensed trainings from the IIRP: Introduction to Restorative Practices and Using Circles Effectively. Based in Winston Salem, NC <http://www.triad-rj.org/>

### Other Readings and Resources

- Restorative Justice in U.S. Schools: A Research Review. [https://jprc.wested.org/wp-content/uploads/2016/12/RJ\\_Literature-Review-updated-Dec-2016.pdf](https://jprc.wested.org/wp-content/uploads/2016/12/RJ_Literature-Review-updated-Dec-2016.pdf)
  - The Restorative Implementation, from the IIRP. [https://www.iirp.edu/images/pdf/Nancy\\_NY-Riestenberg-final2.pdf](https://www.iirp.edu/images/pdf/Nancy_NY-Riestenberg-final2.pdf)
  - SFUSD RP website: - training materials, videos, brochures translated into several languages, the restorative questions in several languages, posters, a class curriculum to teach students about circle, policy language and a whole school implementation guide. <https://www.healthiersf.org/RestorativePractices/>
  - The Challenge of Culture Change, by Peta Blood and Margaret Thorsborne: [https://www.restorative-resources.org/uploads/5/6/1/4/56143033/challenge\\_of\\_culture\\_change.pdf](https://www.restorative-resources.org/uploads/5/6/1/4/56143033/challenge_of_culture_change.pdf)
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