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# Neuroscience-Based Mindfulness Social Work Practice in Schools

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Chronic poverty and stressful life circumstances result in poor school performance and behaviors. Research demonstrates that these behaviors are not the result of student inadequacies and lack of proper discipline, but are rather of neurological adaptations to chronic poverty and toxic stress. These outcomes are driven by the body's attempt to protect itself even as the behaviors appear to be choices the student is making in a rational world. Neurobiologically, students adapt to these challenges by becoming both hypersensitive and self-protective. As a result, students are mistrustful and on alert beyond what is usual as a way of protecting themselves, consciously or unconsciously. Mindfulness programs provide important tools for shifting these challenges in the classroom by supporting feelings of safety and opportunities for growth and change in student learning and behaviors. Demonstrating the actual practice of mindfulness is not our intent given that there are many ways of using and learning mindfulness in the classroom. Rather, the focus is on the neurological outcomes of stressful lives, the neurological impact of mindfulness training, and providing resources for addressing student negative experiences and behaviors in schools.

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Student learning and behaviors are the focus of education in the crucible of the school setting. Failure of a student to demonstrate the standards of decorum and learning draws the attention of teachers and staff. This is particularly significant in schools located in poor and stressed communities where students, faculty, and parents are most often overwhelmed by serious challenges every day of their lives. The student who fails to demonstrate learning and proper behavior is most often viewed as a “problem” to be fixed, rehabilitated, or suspended. This usual school perspective assumes that there is something wrong with this child rather than considering what has happened and continues to happen to this child. Many of these students exhibiting unacceptable behaviors and learning are living within areas of community poverty and violence. Poverty itself is very likely a potentially negative factor for child development. For many children, poverty is an all-encompassing threat to their present and future lives. Poverty is most often a combination of overwhelmed parents struggling day to day within a very harsh environment (Jennings, 2019).

Research has demonstrated that children growing up in the midst of a community of poverty,

racism, chronic stress, and danger are at a distinct disadvantage in terms of learning and expected behaviors (Jennings, 2019; Jensen, 2009; Olson, 2014). Jensen (2009) defined *poverty* as a “chronic and debilitating condition that results from multiple adverse synergistic factors and affects the mind, body, and soul” (p. 6). It is vital that social workers, teachers, and administrative staff consider problematic behaviors and learning efforts as resulting from neurological adaptations to chronic poverty and toxic stress rather than as mere inadequacies or pathologies to be treated or punished. Research demonstrates that poverty and toxic stress on a child's neurobiological development have severe consequences in terms of behaviors and learning in the school (Jennings, 2019). Hart and Risley (1995) found in their research on children's language development that not only were poor and minority children lagging behind in terms of total numbers of words in their vocabulary, they were also faced with negative images of themselves. These children internalized these negative images, adopting negative beliefs about their own capabilities (McTighe & Willis, 2019). Hart and Risley (1995) were initially optimistic that these differences could be overcome, but were forced to conclude that “the problem of

skill differences among children at the time of school entry is bigger, more intractable, and more important than we had thought” (p. 6). As a consequence of a life of poverty, violence, and racism, students enter the school in survival mode resulting in the reactive behaviors of fight, flight, or freeze rather than being engaged in the classroom (Levine, 1997; Olson, 2014). These same neurological pathways provide a way of both understanding these negative consequences for students and addressing negative outcomes through mindfulness practice within the school (Greenland, 2010).

Disruptive behaviors include seeming to be distracted, not paying attention, aggression, defensiveness, withdrawal, and difficulty learning. Neuroscience demonstrates that these students are unconsciously shutting down their ability to think and learn as part of their neurological propensity to protect themselves from what they learn to perceive as threats to themselves (Anderson & Beauchamp, 2012; Colvert et al., 2008). It is important to note that mindfulness work in the classroom can rely on these same neurobiological processes to enable students to become more engaged in the classroom and have better performance in learning (Greenland, 2010; Himelstein, 2013; Mason, Murphy, & Jackson, 2019; Tokuhama-Espinosa, 2014). Mindfulness can have an impact on the entire school experience for students, faculty, and personnel (Jennings, 2019).

Working from a neurological perspective, it is possible to create a positive and safer environment in the classroom and the school. Students and teachers have an opportunity to develop a sense of trust and security, allowing them to be less defensive and more focused on learning (Jennings, 2019). With the typical size of the classroom and the expectations for students to get through the curriculum, most teachers are doing their best just to meet the expectations for student success: passing the exams. Given this fact, the most useful approach to consider is that of conducting brief mindfulness sessions in the classroom and school that can be led by school social workers, teachers, and even students (Greenland, 2010; Himelstein, 2013; Mason et al., 2019; Tokuhama-Espinosa, 2014). Mindfulness is an intervention that benefits the entire class and the school, creating a positive and supportive change in the overall experience of students, teachers, and the staff (Greenland, 2010; Jennings, 2019). These relational, emotional, and behavioral concerns seem like distractions from the focus on teaching and learning

that is uppermost in the minds of schoolteachers and administrators. “However, whether or not we see and recognize them, the hidden emotional, relational, and neurological factors at work every moment among faculty and students wield a powerful influence on what will actually be learned” (Olson, 2014, p. xii). Bringing mindfulness into the school and classroom provides an opportunity to use the neurobiological process for creating a positive and supportive experience in the classroom and school.

Bringing the consequences of poverty, racism, conflict, and negative images of one’s self into the classroom has serious consequences for behaviors and learning. Given these disadvantages of poverty and stressful lives, the consequences of failures of any kind for these young students will only continue to construct a belief in their inability to learn and to be accepted in the classroom. These students are most often labeled in negative ways, which exacerbate the levels of stress and a continuation of the behavior. With this in mind, it is important that schools look beyond the “narrow focus on imparting knowledge and student academic achievements [and] make possible recognition of hidden emotional, relational, and neurological factors at work in every moment among teachers and students” (Olson, 2014, p. xii).

### **THE SOCIAL BRAIN: RELATIONSHIPS, MIND, AND THE BRAIN**

Relationships are the key to brain development and learning to be a particular individual with subsequent behaviors and emotions (Cozolino, 2006; Olson, 2014; Siegel, 2012). All of our moment-to-moment experiences have an effect on the structure of the brain and the tens of millions of neurons and synaptic connections (Siegel, 2012). *Neuroplasticity*, or the brain’s capacity to change and alter neural connections, is the foundation of learning about the world of others and the self (Porges, 2011). This process is required for the very development of the mind’s relationship with others. Millions of connections along synapses, dendrites, and the neuron are strengthened, redone, or changed within a thousandths of a second, again and again (Hanson & Mendius, 2009). This fundamentally continuous process makes it possible for humans to respond and change how they understand the world and their place in it. Therefore, neuroscience can play a significant role in understanding

both the negative experiences of development and the possible interventions that can bring about change in the way we respond to, in our case, children in schools.

Neuroscience research provides a perspective and a means by which teachers, social workers, and the staff of a school can help shift from being focused on the “problem” that results in seeing these behaviors as willful acts of defiance, anger, and poor learning outcomes toward an appreciation of these outcomes as adaptations to the consequences of poverty and chronic stressors in the family and community. The presence of neuroplasticity makes positive change possible by using mindfulness practices in the school and classroom (Jensen, 2009; Porges, 2011).

Our brain is a social organ that can only develop and thrive through connections with other brains (Siegel, 2012). Every interaction that the newborn has with its environment determines how this particular child will relate to the world. Siegel (2012) described this process:

Relationship experiences have a dominant influence on the brain because the circuits responsible for social perception are the same as or tightly linked to those that integrate the important functions controlling the creation of meaning, the regulation of bodily states, the modulation of emotion, the organization of memory, and the capacity for interpersonal communication. (p. 27)

The human brain is so structured that every experience is mapped out by neuronal connections. The more often a particular set of neurons are stimulated, the more easily they form and strengthen connections, again and again. Thus, repetition of any behavior reinforces that behavior. The greater the negative quality of the child’s experience, the stronger the negative neural connections and the more likely the negative impact on the child’s view of the world and how that child will react to their unique image of the world as safe or dangerous (Siegel, 2012). This increasingly negative perspective on the self and the world forms the basis of a negativity bias that results in seeing the world in more negative ways (Fredrickson, 2009).

*Negativity* is a significant part of our sense of safety. That is, humans are capable of protecting themselves because their neurological system is

built to protect them from danger. Without awareness, we are always unconsciously scanning the world around us for potential threats. The autonomic nervous system is constantly scanning the world around us every quarter of a second to determine if we are safe (Olson, 2014). Evolution has developed this process to protect us from others or marauding beasts. Levine (1997) noted that “it is best to notice the rustling of the bushes than be eaten or harmed in some way; . . . hence, it is better that any uncertainty or ambiguity is experienced as a threat” (Levine, 1997, p. 42). Positivity research states that we all are balancing negative perspectives with positive perspectives throughout our waking life (Fredrickson, 2009). Similarly, when positive and nurturing connections are strengthened the child is more likely to feel comfortable, safe, and less defensive.

“According to Hebb’s axiom, neurons that fire together wire together (Hebb, 1949), and dendrites increase in size and efficiency and when something is repeated over and over . . . the neuronal pathway becomes stronger and stronger” (Burdick, 2013, p. 22). Negative words and thoughts create and embellish a negative lens that, in turn, interprets experiences in very negative terms. Rather than focusing on the positive, the mind is sensitized to seeing things in a negative light. Not only students, but also school faculty and staff tend to become very focused on what is negative in any situation. When negativity in word and thought is used, resulting changes in these biological structures create a world of danger as negative experiences happen over and over. Negativity has much greater impact than positivity (Fredrickson, 2009).

Humans have a built-in propensity to be on guard all the time (Fredrickson, 2009; Hanson & Mendius, 2009). As a consequence, there is a permanent change in the brain memory structure, creating an alert system that is constantly being reinforced by increasing experiences such as living in a dangerous neighborhood, having to face possible gangs or a bully, or having to experience poverty and racism every day. Even a simple reprimand in the classroom can very likely be seen as a threat. It is the function of the hippocampus that unconsciously brings past traumatic experiences into the present. The hippocampus acts as the search engine for memory of experiences, particularly traumatic ones (Alexander, 2009, p. 720). Even if a traumatized child is too young to remember adverse experi-

riences, the person will likely remember what happened implicitly in terms of body sensations or emotions (Alexander, 2009). These students walk into class with heightened sensitivity.

When children grow up in an uncertain environment of neglect and danger, this defensive system is strengthened with each incident. Each incident increases the number of synaptic connections, resulting in a state of hypernegative alert. This is an adaptation to the uncertain environment, a biological response intended to keep the child alive, yet it results in numerous problematic outcomes such as distrust of others and behavioral conflicts in school, at home, and in the community. Given the neuroplasticity of synaptic connections, the practice of mindfulness, using this very same process, can change these negative pathways to more positive pathways in the brain.

### **THE NEUROBIOLOGICAL CONSEQUENCES OF LIVING IN POVERTY AND CHRONIC STRESS**

Infants are neurologically developed at birth to make contact with the mother, and the mother has an instinct to bond with the infant (M. L. Smith, Cottrell, Gosselin, & Schyns, 2005). The infant and the mother are engaged in this dance allowing for the bonds of safety to develop by lessening the protective social distances through eye contact, facial expressions, and soothing vocal expressions (Porges, 2011). These significant neurobiological developments build the capacity of the child to develop the capability to relate to others and to begin to build a sense of self and what qualities that self might have. It is also initiating the protective processes leading to fight, flight, or freeze responses.

The biology of the neurological process consists of a complexity of physical structures such as the thalamus, amygdala, sympathetic nervous system, hippocampus, and hypothalamus (Cozolino, 2013; Hanson & Mendius, 2009; Newberg & Waldman, 2012; Porges, 2011; Siegel, 2012). These structures are engaged through hormones. For example, when faced with a sense of possible harm, which can very easily be an emotional experience rather than a physical threat, the amygdala sets off a series of reactions. In turn, the thalamus sends norepinephrine throughout the brain. This releases epinephrine and norepinephrine and cortisol, which prepares the body to respond defensively and engaging the amygdala again, which in turn produces even more cortisol, triggering the fight, flight, or

freeze response to protect the person from perceived harm or danger. It is important to recognize that this biochemical sequence is an automatic physical response to what is unconsciously or consciously perceived and responded to by the limbic system as a threat of some kind. This works as an automatic pilot, directing the response. Note that higher levels of cortisol affect the hippocampus, resulting in a decrease of the brain's ability to learn material and recall information leading to failures in the classroom (Hanson & Mendius, 2009; Siegel, 2007).

Obviously, this is an extremely simplified version of just one aspect of this alarm system. Still, these systems are at work even in the midst of simple interactions with others or when in a dangerous or negative situation such as poverty or family or community violence. Student challenges in the classroom are taking place in the context of these complex neurobiological processes and are not based on a conscious choice of actions. What this points to is that once overwhelmed by a toxic environment, the neurophysiology and neurochemistry maintain these behaviors in the school setting. If a student has grown up in the midst of stressful life challenges, the protective biological processes are more easily activated. It is not that students are just choosing to be reactive and problematic. In fact, they are caught up in a biological warning system that looks like students are making an elective choice to respond negatively (Olson, 2014). It is important to realize that the brain is constructing what is experienced. "Only a small fraction of the inputs . . . comes directly from the external world; the rest comes from internal memories . . . your brain *simulates* the world" creating a virtual representation of reality (Hanson & Mendius, 2009, p. 43).

The polyvagal theory (Porges, 2011) and the concepts of neuroception are significant factors in understanding the consequences of stress on brain development, behaviors, and change over time (Cozolino, 2006; Doidge, 2007; Porges, 2011). "Neuroception is the specific unconscious awareness of the presentations of others in terms of body and facial expressivity, gestures and prosodic vocalizations" (Geller & Porges, 2014, p. 181). Students are unconsciously evaluating safety and preparing for any assumed threat. This process includes sensing the emotions and body language of teachers, staff, and the other students. Students sensing

these interactions as threats have difficulty “keeping calm, [maintaining] positive social engagements, physical healing and focus for learning” (Elliot, 2019, p. 21).

The very first mother-and-infant attachment bond forms at the time of birth. “Even at these first moments, potent cues of safety or danger are detected by cortical areas and are focused on movements of the upper part of the face, eye contact, prosody of voice, and body posture” (Geller & Porges, 2014, p. 184). If the child is met with an attentive and calm parent who displays warmth in her voice, face, and touch, the idea of safety is experienced as a reduction of the protective mode. It is not a matter of turning on the safety but damping down the defensive and protective modes that are built into the brain (Olson, 2014). As a consequence, closeness, positive contact, and other social engagement behaviors become possible. These findings are present when considering attachment theory (Bowlby, 1973). In contrast, “when situations appear risky and attachment has been disrupted, the brain circuits that regulate the defense strategies are activated and reinforced over time. Social approaches are met with aggressive behaviors or withdrawal” (Porges, 2011, p. 13).

Many of these “problematic” children are not prepared to participate in the basic tasks of listening, paying attention, following directions, or understanding the rules. These children arrive at school with a distrust of adults and other students. More than likely, these students experience teachers, teacher aids, other students, and even school social workers as threatening given that the adults and even older kids in their community have been threatening and unreliable (van der Kolk, 2003).

When the student is chastised for not following specific rules such as not talking, staying in their seat, following instructions, or paying attention when the teacher is talking and giving instructions, this traumatized student interprets the criticism as a potential threat (Anderson & Beauchamp, 2012). Rather than being inattentive, these students have learned to be hypervigilant, resulting in overwhelming anxiety (Anderson & Beauchamp, 2012; Baylin & Hughes, 2016). These students are overwhelmed by their own hyperattention, scanning the room for any sounds or actions that might be a threat, which takes their attention away from the teacher. This hypervigilance is a common outcome from living in poverty and its stressful and

dangerous communities. Every one of us is vigilant but unaware that every second our brains are scanning the world around us for any threats (Hanson & Mendius, 2009; van der Kolk, 2014). Protection and safety are one of the primary functions of the human brain. Likewise, when students are under constant stressors such as poverty and toxic stress, they are less likely to be able to recall what might have just happened and seem as if they are not paying attention. In part, the body’s protective system induces greater amounts of cortisol, which degrades the hippocampus’s ability to form new memories. As a result, these students are most likely to have no immediate recall of a lesson or memorizing information (Cozolino, 2013). Jennings (2019) described some common behaviors associated with exposure to traumatic events. Obviously,

anxiety, hypervigilance to danger, hyperarousal, aggression . . . attention lapses are signs of trauma. . . . Students have difficulty maintaining sustained attention because they have trouble distinguishing between relevant and irrelevant information. As a result, they are . . . easily threatened by unexpected information. [These students are] trying to interpret the teacher’s mood, rather than hearing the information [the teacher] is communicating. When the teacher calls the [student] out asking the student a question, the [student] might become agitated. Thus, these students are seen as not trying or incapable of doing the work required. (Jennings, 2019, p. 33)

### IMPLEMENTING COMPASSIONATE MINDFULNESS IN THE CLASSROOM AND THE SCHOOL

Mindfulness practice is not the same as meditation. *Mindfulness* is being aware of the external world such as a sound or paying attention to the world around you; *meditation* focuses on the inner world as an intentional practice with a specific internal experience such as a mantra. “Mindfulness is purposely paying attention to the present moment with an attitude of openness, nonjudgment, and acceptance” (Hick, 2009, p. 4).

Mindfulness is experienced as being present in the moment without judgment or reactive responses. Being present means that rather than acting out or ruminating about a situation, you are able to observe

without judgment an external experience such as a sound. Mindfulness has been shown to support self-regulation by simply noticing the emotions or thoughts without reacting. Newberg and Waldman (2012) found in their research that mindfulness practices can strengthen the neural circuits associated with empathy, compassion, and moral decision making. A different approach in how the world of others can be perceived is a positive shift that engages neuroplasticity, thus creating a more positive outlook. Neuroplasticity is the means by which mindfulness practice changes our perception of ourselves and others.

The efficacy of mindfulness has been demonstrated in research on students. Given the “evidence-based” standard that most schools require, mindfulness has been demonstrated to be supported in working with various groups such as children, adolescents, and adults. It is particularly impactful when working with anxiety, stress reactions, and traumatic experiences such as poverty, physical assault, and posttraumatic stress disorder. Recall that *mindfulness* has been defined as the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment-to-moment (Kabat-Zinn, 2003). For example, if you stop for a moment and concentrate on a single sound like a bell ringing or a single chime for as long as you can still hear it, you have just experienced mindfulness. When you concentrate on the single ring until it fades out, you focus your mind in the present moment without having your mind wander off. This is not easy at first, but with practice you should be able to stay focused for longer and longer periods of time. The practice of having your mind be very still and focused, being mindful of the moment, is necessary for paying attention or working on an assignment. The mind is very easily distracted by everyday experiences like worrying what might occur as you try to read this sentence. Paying attention to a sound by bringing your awareness back to the sound when your mind wanders off is mindfulness. With teenagers and younger students, it is useful to start with a sound or observation of a moving object, such as snow falling in a globe (each student can construct their own individual globe with plastic bottles; for instructions, see Willard, 2019). Very useful online services such Insight Timer or Calm are available for access and use in the classroom or school.

Mindfulness has been shown to be effective on student concentration and decreasing problematic behaviors (Berkovich-Ohana, Glicksohn, & Goldstein, 2012). Biegel and Brown (2012) completed a study of children in California who had participated in mindfulness classroom programs. Before the intervention was administered, children were scoring far below the normative scores for their ages on the child version of the Attention Network Task (ANT-C) executive control test. Dramatic improvements in ANT-C executive control scores were seen following the intervention and were sustained at three months post-intervention. The ANT-C results showed that the mindfulness intervention was related to increased executive control among a population of participants who were already struggling and below the norm in attention skills.

Outcome studies demonstrate the efficacy of mindfulness in schools and in particular with so-called problematic behaviors. Zenner, Hermleben-Kurz, and Walach (2014) conducted a “meta-analysis of 1,348 students instructed in mindfulness and found that the more frequent the practice in the classroom, the greater were the positive outcomes” (p. 17). These studies have shown positive effects in general learning outcomes, when measuring specific student testing and social skills improvement, attention, and motivation to learn. Likewise, a meta-analysis looking at 24 studies found that those students exposed to mindfulness practice did much better on learning outcomes than the control groups (Zoogman, Goldberg, Hoyt, & Miller, 2015). This was especially true for students who had demonstrated signs of chronic stress.

Research has shown that changes in perceived stress and neuroplasticity occurred in nonmeditative states, indicating that the benefits of mindfulness training generalized beyond the active meditative state. The study conducted by Bauer and colleagues (2019) provided initial evidence that mindfulness training in children reduces stress and promotes functional brain changes and that such training can be integrated into the school curriculum for entire classes. This study also reveals the first evidence that a neurocognitive mechanism for both stress and its reduction by mindfulness training is related specifically to reduced thalamus and amygdala responses. This shift prevents reactive behaviors and enhances the ability to focus on listening and recalling information in the classroom.

A report produced by Kirp (2014) gives an account of middle and high schools in the San Francisco Bay area that have incorporated a twice-daily schoolwide mindfulness moment by sounding a gong throughout the school and in the classrooms. Students are to listen as closely as possible and for as long as the deep sound reverberates through the school, approximately 15 to 20 seconds. The students and teachers listened until they could no longer hear the sound. The outcomes were improved behaviors and attention to learning in the classroom. Referred to as Quiet Time, the first year of this practice resulted in a 45 percent drop in suspensions. Over time, the attendance rates climbed to 98 percent. Grade point averages improved, and more students went on to high school.

The All Mindful Life Project (Mason et al., 2019) conducted in the Robert W. Coleman Elementary School in Baltimore, Maryland, included the daily mindfulness practices with the Mindful Moment Room decorated with calming colors, sounds, and objects, where students who need more time to calm down engage in mindfulness practices. The school social worker helps students go through the mindfulness practices. Once the student is calm, the social worker briefly talks with them about the incident and helps them devise a plan for what to do when the student is faced with a similar situation. When used in a high school setting, suspensions decreased from 49 in a school year to 23 the following year. The number of students promoted to the ninth and 10th grades went from 45 percent to 64 percent.

## CONCLUSION

School social workers have a special place in the lives of students, families, and communities. They have the capacity to support the emotional and academic success of students and the school. Rather than being stressed by the intensity of school social work practice with all the demands for interventions, school social workers can rely on mindfulness practice to make significant progress in this very hard endeavor. Resorting to remediation, punishments, and suspensions only exacerbate the student's difficulties given their neurobiological challenges. Research on the neurological impact of mindfulness practices in the classroom demonstrates a potential means for school social workers

to engage teachers and students in making a difference in the lives of students in and out of the classroom. Siegel (2007) noted that "mindful awareness improves our ability to regulate emotion, to combat emotional dysfunction, to improve our pattern of thinking, and to reduce negative mindsets" (p. 6). It is important to note that the first steps must be a buy-in from school boards, principals, teachers, and parents. From our professional experiences working within schools, this is the greatest hurdle. School social workers can play a significant role in bringing these ideas to the attention of school staff and the community. It requires community organizing skills and the ability to form supportive groups such as families and educators.

School social workers have two basic challenges when working in school systems. First, as mentioned, learning mindfulness practices and becoming comfortable with them is necessary so that the worker appreciates the method learned and is able to share it with colleagues, school staff, and students. A very easy tool is the Calm app, which can be downloaded on a cell phone (M. A. Smith & Tew, 2012). This can be amplified so that the sounds can engage all the students. The Insight Timer app also provides a range of practices (Plowman & Plowman, 2015).

Preparing oneself is key to practice, and so is buy-in from administration and classroom teachers. In our particular location it has been our experience that administrations and faculty do not see the values of nonacademic interventions even when research is presented to them. They are focused on poor school performance by emphasizing teaching time in the classroom and managing the disruptive students. In our small community we have had partial success with several teachers in an elementary school. Even with minimal time for mindfulness exercises in the classroom, they were surprised to see their students more relaxed during classroom activities, and their students were much more relaxed and focused when taking the end-of-grade examinations. **CS**

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