

## BRAIN RESEARCH AND RESILIENCY

**Adverse childhood experiences (ACEs) and extreme stress have psychological consequences that alter the structure of students' brains, which then lead to negative cognitive, physical and physiological, and mental health and behavioral challenges and outcomes.**<sup>1</sup> The impacts of these adverse and traumatic childhood experiences negatively impact students' abilities to learn and succeed in school by triggering flight or fight responses to "normal" situations in school, impacting students' memories and ability to learn and develop, and reducing students' abilities to manage and regulate their emotions and self-soothe.<sup>2</sup> These experiences can also lead to depression, anxiety, and posttraumatic stress syndrome, and are associated with lower school achievement, higher rates of chronic health conditions, and higher rates of criminal behavior.<sup>3</sup>

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*"Prolonged elevation of stress or stress hormones can also wreak havoc on the brain ... [and] are associated with anxiety and impairments in learning and memory."<sup>4</sup>*

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**Resilience enables students to encounter hardship and adversity without experiencing negative academic, mental health, behavioral, or physiological outcomes.**<sup>5</sup> Resilience represents a student's ability to adapt successfully and achieve a positive outcome when faced with adversity and significant stress.<sup>6</sup> Resilience can act as a characteristic, outcome, or process, and comprises traits such as perseverance, positivity, optimism, and determination.<sup>7</sup> Resilience is the skill that allows students to succeed despite negative experiences, thus overcoming barriers that would otherwise negatively impact academic, social, and physical outcomes.<sup>8</sup> Resiliency factors serve to protect students when they experience adversity, and thus a student's degree of resiliency will determine the strength of the impact of adverse experiences.<sup>9</sup> As with traumatic stress and experiences, there is also a neurological component to resilience, where resilient students demonstrate certain neurotransmitters involved in resilience. The physical components of resilience "interact with and balance each other to produce regulatory effects on acute and long-lasting adaptations to stress."<sup>10</sup>

**Resilience develops from a combination of a student's genetics and biological traits, environment and experiences, and family and community systems.**<sup>12</sup> This combination of internal and external factors, rather than singular factors in isolation, impacts a student's ability to respond and adapt positively when faced with adversity.<sup>13</sup> When parental, family, and community influences act positively in students' lives, they serve as "protective factors" that support the development of resilience. However, not having these positive influences can inhibit a student's resiliency levels.<sup>14</sup>



*"[I]t is the interaction between biology and environment that builds the capacities to cope with adversity and overcome threats to healthy development."<sup>11</sup>*

Indeed, research finds that certain factors predispose children to have higher levels of resilience and thus respond more positively to adverse experiences. These factors, which include supportive relationships, a sense of mastery over life circumstances, executive functioning skills, and supportive and affirming faith or cultural traditions, are explained in Figure 1, on the following page. The full existence of these features helps to protect students when they experience ACEs, while a lack of these factors increases the potential for adverse outcomes due to the experiences.<sup>15</sup>

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**Figure 1: Factors that Contribute to Resiliency When Faced with Adverse Childhood Experiences**



Source: The National Scientific Council on the Developing Child<sup>16</sup>

The features that contribute to resilience have significant implications for how schools can support the development of resilience in students to increase students' academic and non-academic success.<sup>17</sup>

## STRATEGIES FOR BOLSTERING STUDENT RESILIENCE FOR ACADEMIC RECOVERY

While many factors that impact a students' resilience are beyond a school's ability to impact, school leaders and educators can strategically implement initiatives and daily practices that effectively bolster students' resilience and ability to recover from conflict.<sup>18</sup> For example, the following figure presents evidence-based strategies for improving resilience from multiple angles that research finds affect student resilience levels. While schools can impact these strategies either directly or indirectly to various degrees, understanding how students can build resilience through stress reduction, physical health, social connections, emotional regulation, and cognitive training can help educators integrate and model behaviors for supporting student resilience into daily classroom practices.

**Figure 2: Pathways to Building Resilience**

PATHWAY	STRATEGY	EFFECT(S) ON RESILIENCE
Reducing fear and stress	Exposure and reconsolidation	Reduces fear
	Active avoidance	Reduces fear and facilitates active coping in the future (even in novel contexts)
	Controlling the stressor	Reduces distress and facilitates coping with other (even uncontrollable) stressors in the future
	Stress inoculation	Experience with moderate stressors toughens one against future stress
Boosting physical health	Sleeping	Supports homeostasis; supports consolidation of neuronal and immunological memory; can help improve mood
	Exercising	Fights medical disease; improves mood, attenuates the stress response, and boosts cognitive function

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PATHWAY	STRATEGY	EFFECT(S) ON RESILIENCE
	<b>Restricting food</b>	Can slow down medical disease; can improve memory, mood, sleep, quality of life, and fear extinction
<b>Connecting socially</b>	<b>Social connection and support</b>	Associated with greater longevity, psychological wellbeing, and physical health
	<b>Gratitude</b>	Reduces distress; enhances psychological and physical wellbeing
<b>Emotion regulation</b>	<b>Emotion disclosure</b>	Emotion disclosure Improves physical and psychological wellbeing in the long term
	<b>Affect labeling</b>	Reduces distress in short and long terms
	<b>Cognitive reappraisal</b>	Reduces distress in short and long terms
<b>Cognitive training</b>	<b>Cognitive-bias modification (CBM)</b>	Aims to reduce negativity bias in attention, interpretation, or memory and thus improve symptoms of depression and anxiety
	<b>Mindfulness training</b>	Buffers against stress; improves executive function, subjective wellbeing, and social relationship quality
	<b>Cognitive therapy</b>	Effective treatment for depression and anxiety

Source: *Consulting Psychology Journal: Practice and Research*<sup>19</sup>

### BUILD STRONG, SUPPORTIVE RELATIONSHIPS



**Strong relationships are critical to building resilience in students. Therefore, educators should strive to build secure, caring relationships with students as well as promote strong, healthy connections among students.**<sup>20</sup>

#### STUDENT-TEACHER RELATIONSHIPS

**As a strong relationship between a student and their parent or other caring adult represents one of the strongest factors for developing resilience, teachers should purposefully build strong relationships with students to support their resilience for academic recovery.**<sup>21</sup> Strong relationships help build resilience by “provid[ing] the personalized responsiveness, scaffolding, and protection that buffer children from developmental disruption.”<sup>22</sup> Positive relationships enable students to feel supported and cared about in school and can improve students' academic and social development, engagement, achievement, and feelings of safety and acceptance, in addition to building resilience to respond to trauma.<sup>23</sup>

Educators can build strong relationships with students by creating personal connections and showing an authentic interest in students' lives, showing they care for students' wellbeing and success, communicating that they truly believe that all students can succeed, demonstrating mutual respect, and setting high expectations while supporting students to meet those expectations.<sup>24</sup> Educators and school administrators should get to know their students and learn about their cultures and learning styles.<sup>25</sup> Similarly, gaining an understanding of students' home environments and where they spend time when not in school can help teachers recognize the kinds of support from which students may benefit most. Notably, when learning about students' home lives, cultures, and learning styles, educators should take a strengths-based approach that communicates support and appreciation for students' unique differences.<sup>26</sup>

Teachers who effectively establish strong, supportive connections with students recognize that they must earn students' trust and respect through their actions, and build trust by listening to and learning about their students.<sup>27</sup> Additionally, educators can use their relationships with students to support resilience by providing students with time and space to share their feelings and ask questions to an adult they know and trust.<sup>28</sup> Figure 3, on the following page, offers additional strategies for developing positive relationships with students.

**Figure 3: Strategies for Developing Caring Relationships with Students**

<p><b>Listen to your students and demonstrate empathy.</b></p>	<p><b>Work to understand lines of similarity and difference that exist between yourself and your students.</b></p>	<p><b>Act as an ally to students.</b></p>
<ul style="list-style-type: none"> <li>• Listen to your students and seek to understand their concerns.</li> <li>• Seek out student feedback, and try to incorporate this feedback into your teaching.</li> </ul>	<ul style="list-style-type: none"> <li>• Reflect on the implications of your own identity markers (race, class, gender, sexuality, ethnicity) and the ways in which they are similar to (or different from) those of your students.</li> <li>• Strive to create a classroom space where each student feels that his/her identities are honored and respected.</li> </ul>	<ul style="list-style-type: none"> <li>• Acknowledge and validate your students' experiences.</li> <li>• Seek to understand the personal and societal challenges they are up against.</li> <li>• Work with students to combat different forms of oppression they may face.</li> </ul>

Source: Sanford Inspire Program<sup>29</sup>

## PEER-TO-PEER RELATIONSHIPS AND CONNECTIONS

Students also develop resilience through making connections with their peers and school community. Accordingly, teachers should provide students with opportunities to develop relationships.<sup>30</sup> Within the classroom, teachers can implement activities that facilitate students' abilities to get to know one another and develop positive peer relationships.<sup>31</sup>

**Figure 4: Tips for Encouraging Peer Relationships**

<ul style="list-style-type: none"> <li>• <b>Monitor class time for naturally occurring, positive peer social interactions.</b> <ul style="list-style-type: none"> <li>○ Actively move around the classroom, interact with students during activities, and look for students who are using the targeted social skills.</li> <li>○ Be ready to provide assistance, support, and direction to promote successful peer interactions among students.</li> <li>○ Provide cueing as needed by reminding students to           <ul style="list-style-type: none"> <li>▪ Work together,</li> <li>▪ Share with their friends, and</li> <li>▪ Be persistent.</li> </ul> </li> </ul> </li> <li>• <b>Provide additional assistance to students, as needed, to ensure that peer social interactions are successful.</b> For example:       <ul style="list-style-type: none"> <li>○ Model the appropriate behavior,</li> <li>○ Give specific verbal cues (e.g., "remember to tap him on the shoulder"),</li> <li>○ Provide physical assistance, and</li> <li>○ Create opportunities for students to talk about how to have friendships.</li> </ul> </li> <li>• <b>Affirm students who are using targeted social skills</b> with positive feedback and attention. Offer encouragement or support</li> </ul>
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Source: National Center on Safe Supportive Learning Environments<sup>32</sup>

Additionally, educators can increase students' chances for positive peer relationships by teaching skills for successfully working together and creating healthy relationships.<sup>33</sup> Sample, basic social skills to teach to support peer relationships include:<sup>34</sup>

- Getting a friend's attention,
- Sharing belongings or work tasks,
- Asking peers to share,
- Providing an idea to a peer,
- Saying something nice to a friend, and
- Working things out.

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Educators can use the following process to teach these skills during large group settings. While this process is geared for students in the middle grades, teachers can vary the steps and amount of scaffolding according to students' grade level and maturity.

**Figure 5: Sample Process for Teaching Peer Relationship Skills**



Source: National Center on Safe Supportive Learning Environments<sup>35</sup>

In addition to promoting students to make connections with their peers in the classroom, schools can also support resilience by encouraging students to form and join school clubs and organizations, which promote community and can lead to additional friendships beyond the classroom.<sup>36</sup>

### DEVELOP STUDENTS' SOCIAL-EMOTIONAL SKILLS



**As robust social-emotional skills are critical to building resilience, schools should focus on initiatives and interventions that teach students to identify and regulate their emotions.**<sup>37</sup>

Schools should explicitly teach students to identify their emotions and causes of stress or anxiety. Encouraging students to share their feelings and stressors in small groups or with the class can help build a trusting classroom community and continue to build positive peer relationships.<sup>38</sup>

Students experiencing poverty and those with ACEs are likely to have fewer social-emotional skills.<sup>39</sup> Implementing an SEL curriculum geared towards all students can help build students' social-emotional skills and resilience, as SEL programs often address skills that also impact resilience: self-awareness, self-management, responsible decision-making, social awareness, and relationship skills. Notably, however, students with traumatic and adverse experiences will require further SEL interventions to support their needs.<sup>40</sup> Accordingly, social-emotional skills that help build resilience and which educators should prioritize, include:<sup>41</sup>

- **Emotional Regulation:** The ability to keep calm and express emotions in a way that helps the situation;
- **Impulse Control:** The ability to make a conscious choice whether to act on a desire to take action, and the ability to delay gratification and persevere;
- **Causal Analysis:** The ability to analyze problems and identify causes accurately;
- **Empathy:** The ability to understand the feelings and needs of another person;
- **Realistic Optimism:** The ability to keep a positive outlook without denying reality;
- **Self-Efficacy:** The belief in one's ability to solve problems and handle stress; and
- **Opportunity Seeking:** The ability to take new opportunities and reach out to others.

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Schools can help students develop resilience by teaching students to use positive coping skills for when they encounter adversity and stress.<sup>42</sup> Coping strategies are skills that students can consciously employ to minimize stress and promote wellbeing during times of stress or adversity.<sup>43</sup> Coping strategies help students regulate their emotions and deal with them positively.<sup>44</sup> However, it is critical to not only teach students about the value of coping mechanisms, but to teach them which coping methods help build resilience, as not all coping strategies support resilience, and some, such as worrying or ignoring the problem, can inhibit resilience development. Alternatively, learning strategies such as problem-solving and positive reinterpretation provide students with tools for dealing with stress in a way that bolsters their resilience for coping with current and future conflict. Figure 6, below, provides a variety of coping strategies according to whether they build or inhibit resilience. Teachers should model and teach students multiple coping strategies for building resilience, as “developing a repertoire of productive coping strategies which can be flexibly employed in different situations is key.”<sup>45</sup> Additionally, students should understand that coping strategies are unique, so what works well for one student might not be the best coping mechanism for another.<sup>46</sup>

**Figure 6: Coping Strategies that Enhance and Undermine Resilience Development**

Resilience-Enhancing	Resilience-Undermining
<ul style="list-style-type: none"> <li>▪ <b>Positive reinterpretation:</b> Reinterpreting a stressful event in positive terms</li> <li>▪ <b>Humor:</b> Finding aspects to laugh at in order to minimize stress</li> <li>▪ <b>Active coping:</b> Initiating direct action to mitigate the stress</li> <li>▪ <b>Planning:</b> Selecting a series of steps to best handle the problem</li> <li>▪ <b>Seeking help and social support:</b> Seeking advice, assistance or information, moral support, empathy or understanding</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Focus on, and venting, emotions:</b> Focusing on what is distressing or upsetting and releasing those feelings</li> <li>▪ <b>Mental disengagement:</b> Choosing activities which distract the student from thinking about the stress</li> <li>▪ <b>Behavioral disengagement:</b> Reducing effort applied to dealing with the stressful event</li> <li>▪ <b>Denial:</b> Denying or acting as though the stressor is not real</li> <li>▪ <b>Acceptance:</b> Accepting the reality of a situation</li> </ul>

Source: The Education Hub<sup>47</sup>

**Additional social-emotional skills that schools can prioritize to help students develop resilience for academic recovery include self-efficacy and a growth mindset.**<sup>48</sup> Educators should provide students with opportunities to bolster their self-efficacy and feel they have control over their environment. Resilient students believe in themselves and their ability to influence their outcomes through their actions.<sup>49</sup> Thus, teachers should look for opportunities during instruction and assessment that provide students with choice and let them build confidence in their skills.<sup>50</sup> Similarly, growth mindset relates to resilience because it reflects how students view and persist when encountering challenges. While students with a fixed mindset believe that intelligence is a “fixed quantity that they either possess or do not possess” those with a growth mindset believe that intelligence is a “malleable quantity that can be increased with effort and learning.”<sup>51</sup> Accordingly, “When students are taught that their brains are malleable and can develop, and shown ways to improve their academic skills, there can be striking effects on resilience.”<sup>52</sup> Developing a growth mindset in students can positively impact resilience and students’ academic achievement.<sup>53</sup>

### EMPHASIZE THE IMPORTANCE OF HEALTHY LIFESTYLE ACTIONS

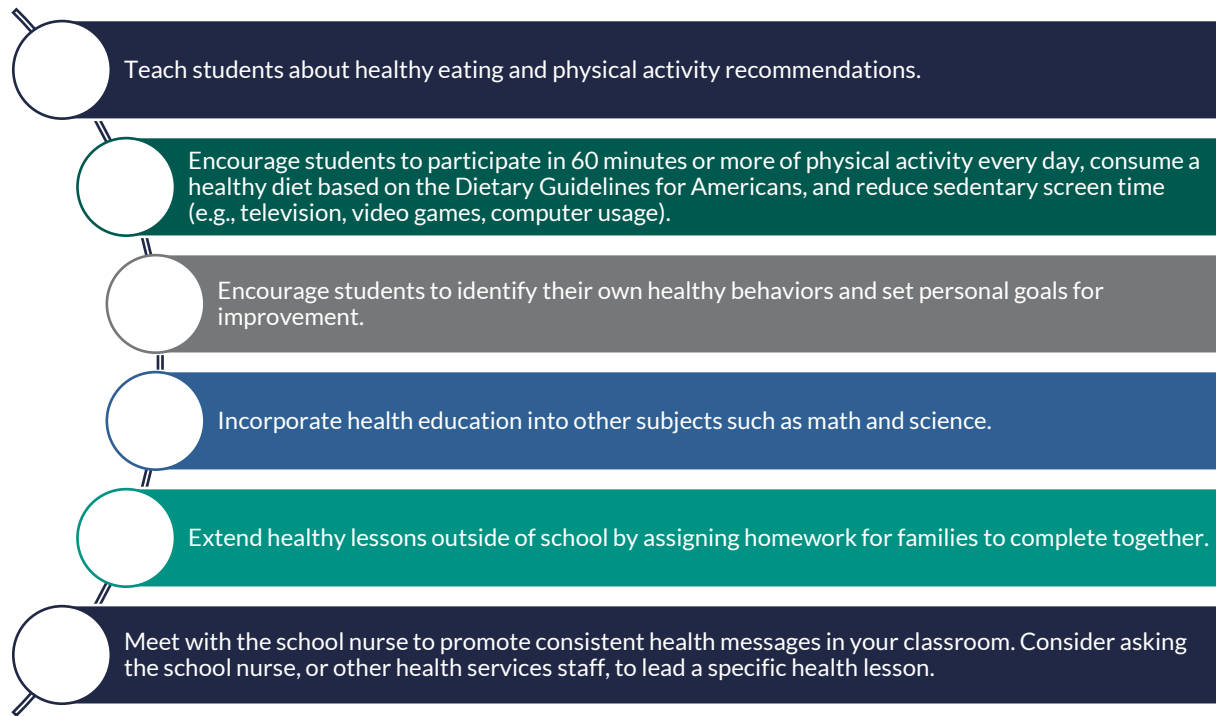


**Schools and teachers should emphasize and promote the importance of a healthy lifestyle to students, as physical health contributes to building and maintaining resilience.**<sup>54</sup> Components of a healthy lifestyle that support resilience and which educators should focus on include a well-balanced diet and proper nutrition, regular exercise and physical activity, appropriate sleep, and adequate hydration.<sup>55</sup> As stress has physical manifestations that negatively impact physical health, it is important that students learn to engage in healthy lifestyle practices that protect from the physical toll of stress and trauma.<sup>56</sup> Schools should ensure that students understand the importance of self-care for their

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physical and mental wellbeing, rather than just as a popular trend or buzzword.<sup>57</sup> Figure 7 below presents strategies for teachers for integrating education on healthy eating and physical activity.

**Figure 7: Tips for Encouraging Students to Engage in Healthy Eating and Physical Activity**



Source: Center for Disease Control and Prevention<sup>58</sup>

In addition to promoting healthy lifestyle habits, educators should also teach students the consequences of using unhealthy coping mechanisms to address stress and emotions such as alcohol, drugs, or other substances.<sup>59</sup> Additionally, school leaders and teachers should model healthy behaviors for students, including modeling physical activity and an active lifestyle as well as a healthy diet in what students see them eating and drinking. Teachers and other school staff can also encourage students to join healthy school activities and physical activities, such as athletics, physical activity clubs, and walk-and-bike to school programs.<sup>60</sup> Participating in physical activities and clubs at school not only increase student health but can encourage connections with peers.

The National Center on Safe Supportive Learning Environment offers free professional learning resources for schools for helping educators “strengthen their skills for nurturing student resilience.” While these tools are geared for educators at the middle and junior high school levels specifically, they contain tools that educators of all levels can adapt. The “[Building Student Resilience Toolkit](#)” includes the following four modules:

- [Module 1: Building Resilience in the Face of Adversity](#)
- [Module 2: Building Student Resilience in the Classroom](#)
- [Module 3: Self-Care Guide for All Staff](#)
- [Module 4: Resilience Building Resource Guide for Administrators](#)



### DISCUSSION GUIDE

School leaders can use this discussion guide to facilitate conversation and reflection on how they and their school community can bolster student resiliency to support academic success, particularly for students experiencing conflict.

**Directions:** Reflect on each question individually or in a small group and prepare to discuss with your colleagues.

- ❓ What impacts of trauma and resilience do we see in students? What physical signs of stress, anxiety, and trauma, in particular, might we see in students? How can we connect with students when we suspect they may be experiencing extreme stress or adversity?
  
- ❓ Which factors that contribute to student resilience can schools influence directly? Are there any we can influence indirectly? Which factors that lead to resilience are out of schools' control to influence?
  
- ❓ How can administrators and teachers use a strengths-based approach to support resilience development in all students and students experiencing conflict?
  
- ❓ How can teachers best build strong, supportive relationships with students? How can school leaders communicate the importance of these relationships to teachers?
  
- ❓ What classroom practices, routines, and activities can teachers incorporate that will help students build peer relationships?



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- 1. ? What clubs, organizations, and schoolwide experiences does our school have that can promote strong peer relationships among students? What kinds of experiences could we develop to promote these relationships?
- 2. ? Which student populations need the most support? How do we know this? How can we identify students in need of more targeted social-emotional intervention?
- 3. ? How can school leaders and teachers engage parents, families, and community members in partnering to bolster student resilience?
- 4. ? How can school staff model the relationship, social-emotional, and healthy lifestyle skills that contribute to resilience? How can school leaders gain buy-in from school staff for promoting these skills?
- 5. ? How can we equip teachers with the tools, skills, and time to support the social-emotional learning of all students, and students with adverse experiences, in particular?
- 6. ? As a school community, how can we encourage students to lead a healthy lifestyle and engage in self-care in order to protect against stress and negative emotions?

## ENDNOTES

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- <sup>37</sup> [1] "Building Student Resilience Toolkit." National Center on Safe Supportive Learning Environments. <https://safesupportivelearning.ed.gov/building-student-resilience-toolkit> [2] Lippman and Schmitz, Op. cit. [3] "How to Help Students Improve Their Resilience," Op. cit., p. 2. [4] Lew, M. "A 4-Step Process for Building Student Resilience." *Edutopia*, November 7, 2018. <https://www.edutopia.org/article/4-step-process-building-student-resilience>
- <sup>38</sup> Lew, Op. cit.
- <sup>39</sup> "Building Student Resilience Toolkit," Op. cit.
- <sup>40</sup> Ibid.
- <sup>41</sup> Bullet points quoted verbatim with slight modification from: "How to Help Students Improve Their Resilience," Op. cit., p. 1.
- <sup>42</sup> Ibid., p. 2.
- <sup>43</sup> [1] Lew, Op. cit. [2] "How to Help Students Improve Their Resilience," Op. cit., p. 2.
- <sup>44</sup> Lew, Op. cit.
- <sup>45</sup> "How to Help Students Improve Their Resilience," Op. cit., p. 2.
- <sup>46</sup> Lew, Op. cit.
- <sup>47</sup> Figure contents quoted verbatim with slight grammatical modification from: "How to Help Students Improve Their Resilience," Op. cit., p. 2.

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<sup>48</sup> [1] “Trauma-Informed Teaching Strategies to Implement in the Classroom.” American University School of Education, February 8, 2021. <https://soeonline.american.edu/blog/trauma-informed-teaching/> [2] “How to Help Students Improve Their Resilience,” Op. cit., pp. 4–5.

<sup>49</sup> [1] “Trauma-Informed Teaching Strategies to Implement in the Classroom,” Op. cit. [2] “How to Help Students Improve Their Resilience,” Op. cit., p. 4.

<sup>50</sup> “Trauma-Informed Teaching Strategies to Implement in the Classroom,” Op. cit.

<sup>51</sup> Dweck, C.S., G.M. Walton, and G.L. Cohen. “Academic Tenacity: Mindsets and Skills That Promote Long-Term Learning.” Bill & Melinda Gates Foundation, 2014. p. 5. <https://ed.stanford.edu/sites/default/files/manual/dweck-walton-cohen-2014.pdf>

<sup>52</sup> “How to Help Students Improve Their Resilience,” Op. cit., p. 5.

<sup>53</sup> Ibid.

<sup>54</sup> [1] Lippman and Schmitz, Op. cit. [2] Tabibnia and Radecki, Op. cit., p. 67.

<sup>55</sup> [1] Lippman and Schmitz, Op. cit. [2] “Building Your Resilience.” American Psychological Association, 2012. <https://www.apa.org/topics/resilience> [3] Tabibnia and Radecki, Op. cit., p. 67.

<sup>56</sup> “Building Your Resilience,” Op. cit.

<sup>57</sup> [1] “Resilience Guide for Parents and Teachers,” Op. cit. [2] “Building Your Resilience,” Op. cit.

<sup>58</sup> Figure contents quoted verbatim from: “Tips for Teachers: Promoting Healthy Eating & Physical Activity in the Classroom.” Center for Disease Control and Prevention. p. 3. <https://www.cdc.gov/healthyschools/npao/pdf/tips-for-teachers.pdf>

<sup>59</sup> “Building Your Resilience,” Op. cit.

<sup>60</sup> “Tips for Teachers: Promoting Healthy Eating & Physical Activity in the Classroom,” Op. cit., p. 4.