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"It is important to provide educators professional development (pre-service and in-service) centered around establishing attainable goals for children through identifying learning and emotion regulation strategies."
Christy Tirrell-Corbin



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Self-Regulation and Academic Achievement in the Context of Students' Experiences of Trauma and Adversity

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Self-Regulation and Academic Achievement in the Context of Students' Experiences of Trauma and Adversity

Amanda Ferrara

The negative consequences of trauma, or adversity, often interfere with students' success in school (Panlilio et al., 2018; Rieder & Cicchetti, 1989; Schatz et al., 2008; Schelble et al., 2010; Schultz et al., 2009). In particular, students who have experienced early trauma often demonstrate problems with behavioral, emotional, and cognitive self-regulation (Hanson et al., 2017; Heleniak et al., 2016; Kim-Spoon et al., 2013; Moylan et al., 2010; Schatz et al., 2008; Shonk & Cicchetti, 2001; Teisl & Cicchetti, 2008; Wamser-Nanney & Vandenberg, 2013). It may come as no surprise that, at least partly because of this, students with experiences of trauma demonstrate worse academic achievement outcomes compared to their peers (Crozier & Barth, 2005; Leiter & Johnsen, 1994, 1997; Slade & Wissow, 2007).

What Are Traumatic Events?

Traumatic events, also referred to as adverse events or adversity, can be conceptualized as having three components: an event, an experience, and negative effects (SAMHSA, 2014). Events can be single instances of exposure or repeated offenses. They are "actual or extreme threat[s] of physical or psychological harm or life-threatening neglect" (SAMHSA, 2014, p. 8). However, an adverse event in isolation may not be considered traumatic to an individual because individuals label and assign meaning to their events, which is referred to as their experience.

Traumatic events are experienced as a power differential in which one entity (e.g., another person, a force of nature, environment) can negatively influence a person. Often, the experience of early adversity is accompanied by feelings of powerlessness, questioning, humiliation, guilt, shame, betrayal, or silencing (SAMHSA, 2014). Finally, these events and experiences often culminate into long-lasting adverse effects, often due to overwhelming a person's ability to cope with the experience (Lieberman & Knorr, 2007).

Traumatic experiences include, but are not limited to, child maltreatment (i.e., physical, sexual, or emotional abuse and physical or emotional neglect), sexual assault, exposure to interpersonal violence in the home, living with an adult with substance abuse problems, living in foster care, community and school violence, and natural disasters. In addition, childhood maltreatment is important to understand as a subset of traumatic experiences because it has the potential to have unique effects on students, given its consideration as a form of complex trauma.

Such complex traumatic events are defined as adverse events that begin in childhood and are chronic, invasive, and interpersonal (Cook et al., 2003; Wamser-Nanney & Vandenberg, 2013). These events often occur with a caregiver, resulting in long-term negative effects across development and learning (The National Child Traumatic Stress Network, n.d.).

Trauma in the Context of Academia: Research and Practice

For those in academia, it is sometimes easy to feel like we do not have students with experiences of trauma in our classrooms or studies or to think about movies with a life-changing teacher teaching underserved youth. However, in the United States, approximately 58% of children from birth to age 18 have experienced one traumatic event, and 35% have experienced two or more (Giano et al., 2020).

Moreover, my research found that between 6 and 7% of undergraduate students report three or more traumatic events. This number of three or more is essential since this is often cited as the threshold after which individuals are at substantially increased risk for deleterious outcomes (Felitti et al., 1998). All of this is to say that you may never know what a student has or is experiencing in their personal life, but the effects of these events on students' self-regulation can spill over into their coursework and engagement in the classroom.

Not only is awareness and compassion for these students necessary, but the more we can better support students with

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individual and family well-being, self-regulation, and learning. Specifically, her prior work has focused on the effects of symptoms of trauma on students' self-regulated learning and metacognitive monitoring and evaluating programs designed to decrease child maltreatment.

compromised self-regulation capacities, the better our classrooms can prepare groups of students to face whatever is coming next in their lives.

In This Issue

In this issue of the *Times Magazine*, researchers and practitioners who tackle the problem of trauma affecting students' self-regulation and academic achievement in schools present recent findings, offer insight and lived experiences, and recommend best practices. Charles Alvarado and Emilee Herman wrote about the necessity of self-regulation for reading and how impaired self-regulatory processes for children with histories of childhood adversity can derail their reading achievement.

Samantha Ellner wrote about the intersection of learning disabilities, self-regulated learning, and child maltreatment. Lilli Falcon wrote about the effects of child neglect on emotion regulation and how these effects can spill over into the classroom, affecting self-regulated learning and academic achievement.

Carlo Panlilio wrote about his conceptual model that outlines intra- and inter-individual dynamic changes in development and learning due to adversity, which draws heavily on self-regulated learning theory (Panlilio & Corr, 2020), and how he has framed his program of research around this conceptual model.

Kim Kohler wrote about the interplay between exhausted, overworked teachers' dysregulation and students' challenges with self-regulation due to experiences of adversity. In her piece, she argues for including trauma-informed practices, cultivating socioemotional competence in teacher preparation programs, and offering trauma-informed practices we can all incorporate into our teaching and mentorship practices.

Rebecca Bertuccio wrote about her insights and experiences, having worked in public schools as a school psychologist. She reminds us all that students may be coming in with experiences we are unaware of, yet they need additional support, and we, as adults, are responsible for finding ways to provide this support.

Finally, Christy Tirrell-Corbin wrote about her Trauma Sensitive Pedagogy (TSP) Project. This classroom-level intervention provides educators with the knowledge and skills to address the learning and social-emotional needs of children who have experienced complex trauma (Tirrell-Corbin & Panlilio, 2022). TSP is grounded in the neurobiology of early trauma and communicates how trauma can affect self-regulatory processes within the brain to teachers as well as strategies to address students' difficulties with self-regulation in the classroom.

Upon request, references are available by contacting Amanda Ferrara (amandaferrara16@gmail.com)



Amanda Ferrara's Dissertation Abstract

Background: Experiences of adversity and trauma have been associated with poor reading abilities for college students; however, there is a dearth of literature examining the learning processes that drive reading comprehension for students with a history of early adversity. Metacognitive monitoring has long been regarded as critical to reading comprehension (Wiley et al., 2016). Thus, poor metacognitive monitoring, specifically during reading comprehension tasks, is one such learning process that could help explain the achievement gap between students who have experienced trauma and their peers (e.g., Hong et al., 2018; Widom et al., 2012).

Objective: The present study sought to understand the extent to which college students who have experiences of lifetime adversity, childhood maltreatment, or symptoms of trauma differ from their peers in their use of metacognitive monitoring during a reading comprehension task.

Method: Reading comprehension, metacomprehension, and reading comprehension posttest metacognitive monitoring data were collected from 765 college undergraduates. The students also self-reported their experiences of trauma (i.e., experiences of lifetime adversity, childhood maltreatment, and symptoms of trauma). The relationship of each of the self-reports of trauma to absolute and relative metacomprehension and posttest metacognitive monitoring was tested. In addition, a path model was estimated to test if relative metacomprehension or posttest metacognitive monitoring mediated the relationship between each measure of trauma and reading comprehension.

Results: In two separate multiple regression analyses, the present study found that child maltreatment experiences, but not experiences of lifetime adversity or posttraumatic stress symptoms, were predictive of absolute metacomprehension accuracy (i.e., students' accuracy in estimating their reading comprehension prior to seeing the comprehension test) as well as absolute metacognitive monitoring accuracy on the posttest (i.e., students' accuracy in estimating their performance on each posttest question). In both cases, students who reported more childhood maltreatment demonstrated worse accuracy.

In a third multiple regression analysis, lifetime traumatic events, childhood maltreatment experiences, and posttraumatic stress symptoms failed to predict relative metacomprehension accuracy. However, in a final multiple regression analysis, posttraumatic stress symptoms, but not lifetime traumatic events or childhood maltreatment experiences, were predictive of relative metacognitive monitoring on the posttest such that students who reported more symptoms also demonstrated worse accuracy.

In addition, the study resulted in three main findings from the estimated path analysis.

- First, students' lifetime experiences of adversity were not directly or indirectly related to their reading comprehension, metacomprehension accuracy, or posttest monitoring accuracy.
- Second, students' experiences of child maltreatment were directly related to their reading comprehension such that students who reported more experiences of child maltreatment demonstrated better reading comprehension. There were no direct effects of maltreatment on either metacognitive monitoring variable or indirect effects of child maltreatment, meaning neither metacomprehension accuracy nor posttest

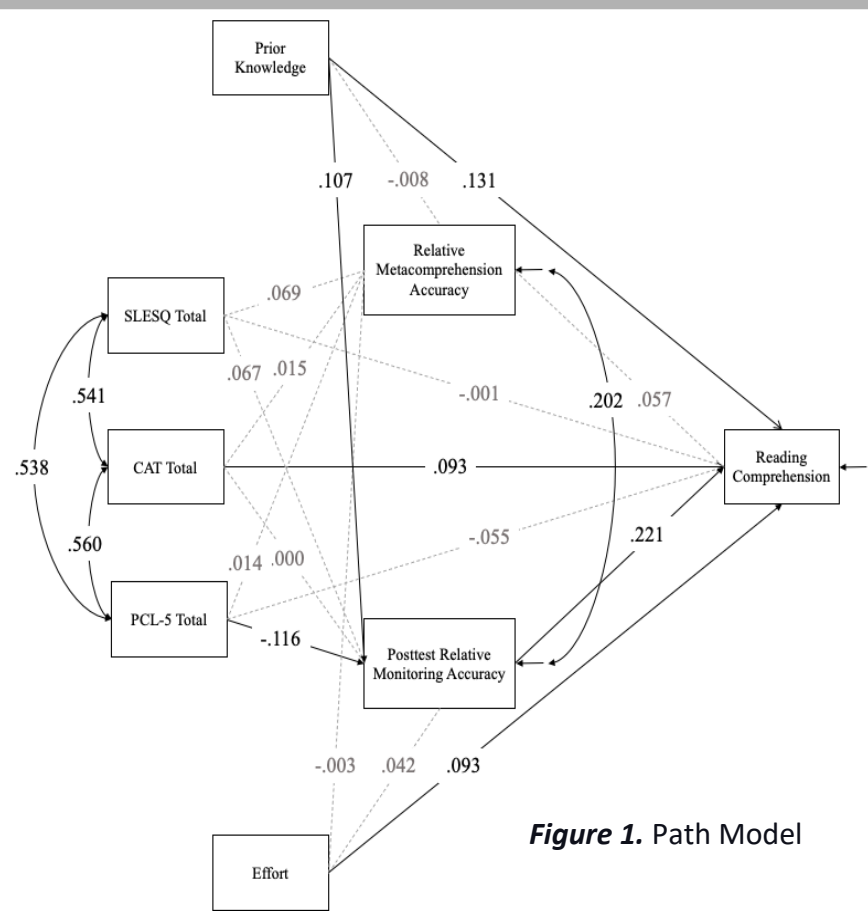
- ♦ The present study found that child maltreatment experiences were predictive of absolute metacomprehension accuracy.
- ♦ Posttraumatic stress symptoms were predictive of relative metacognitive monitoring on the posttest such that students who reported more symptoms also demonstrated worse accuracy.



monitoring accuracy mediated the relationship between child maltreatment and reading comprehension.

- Third, there was an indirect effect of posttraumatic stress symptoms on reading comprehension. Specifically, the relationship between posttraumatic stress symptoms and reading comprehension was mediated by posttest relative monitoring accuracy such that students who reported more posttraumatic stress symptoms demonstrated worse relative monitoring accuracy, and worse monitoring accuracy predicted worse reading comprehension. Relative metacomprehension accuracy did not mediate the relationship between posttraumatic stress symptoms and reading comprehension.

Conclusions: The present study found differential effects of lifetime experiences of adversity, child maltreatment, and posttraumatic stress on college students' metacognitive monitoring during a reading comprehension task. As such, this study suggests that college students who have experienced trauma can benefit from academic interventions and supports targeting self-regulated learning processes.



Ferrara, A. M. (2022). *Understanding the impact of traumatic experiences on college students' use of metacognitive monitoring during a reading comprehension task* [Doctoral dissertation, The Pennsylvania State University].



Childhood Trauma, Self-Regulation, and Schools

Christy Tirrell-Corbin

Positive teacher-child relationships are of critical importance to young children as they co-occur with rapid social, emotional, cognitive, and physical development (Ansari et al., 2020) and because, other than their families, children spend most of their waking hours with teachers. Supportive teacher-student relationships allow children to feel safe, develop peer relationships, and take risks (Hamre & Pianta, 2006; Lippard et al., 2018). These relationships are also strong predictors of a student's academic success (Hamre & Pianta, 2001), with individual teacher-child relationships identified as critical to children's school readiness and academic trajectories (Blair et al., 2016; Rudasill et al., 2013). Furthermore, evidence suggests that one caring adult, such as a teacher, can mitigate the effects of childhood trauma (National Scientific Council on the Developing Child, 2014).

Nonetheless, most educators lack formal preparation to address students' traumatic experiences. This is, at least in part, because the faculty that taught them in educator preparation programs have no preparation themselves (Goldman & Grimbeek, 2014; Lawson et al., 2019). This lack of education leaves teachers to support their students in the best ways they know how, which evidence suggests puts teachers at risk emotionally (Tirrell-Corbin, Panlilio & Klika, 2021) and their students at risk across the developmental domains (Lawson et al., 2019).

I am a researcher who studies childhood trauma and the co-director of the Trauma Sensitive Pedagogy (TSP) Project, which is a classroom-level intervention that provides educators with the knowledge and skills to address the learning and social-emotional needs of children who have experienced complex trauma (Tirrell-Corbin & Panlilio, 2022). TSP is a year-long, school-based curriculum that commences with a three-day summer institute for educators and administrators, followed by monthly meetings to discuss trauma-sensitive instructional approaches based on case studies within the school building.

The TSP curriculum is grounded in the neurobiology of early trauma. Children who experience complex trauma have fewer synaptic connections, making critical thinking, problem-solving and higher-order thinking more difficult. They are also more likely to experience a persistent state of hyper-arousal, which causes them to be more reactive (fight or flight) and less thoughtful in their planning, making self-regulation more challenging (Kim & Cicchetti, 2010).

The impacts of early traumatic experiences on brain structures and socio-emotional functioning result in adverse cascading effects on children's learning processes. According to the National Scientific Council on the Developing Child, "In extreme cases, such as severe, chronic abuse (especially during early,

sensitive periods of brain development), the regions of the brain involved in fear, anxiety and impulsive responses may overproduce neural connections while those regions dedicated to reasoning, planning, and behavioral control may produce fewer neural connections" (2014, p. 2).

Trauma often results in decreased resilience and a lack of adult support and understanding (Carrion et al., 2007; Dykman et al.,

"While the [Centers for Disease Control and Prevention] CDC's strategies acknowledge students' mental health needs, mitigation of this problem is assumed to be addressed solely by returning to school. Such a response strategy requires school-based access to mental health services... While the cost of these initiatives may be high, the cost of perpetuating the epidemic of inequities by ignoring the holistic needs of our students indeed will be much higher."

Tirrell-Corbin, C., Panlilio, C., & Klika, J. B. (2021, February). *The Epidemic Behind the Mask: COVID-related Education Inequities*. The Hill. <https://thehill.com/opinion/education/539180-the-epidemic-behind-the-mask-covid-related-education-inequities/>

1997; Evans et al., 2008; Kim & Cicchetti, 2010; Shields & Cicchetti, 2001). Consequently, children who have experienced trauma often fall behind other children in measures of educational achievement.

Rouse and Fantuzzo (2009) found that child maltreatment was the strongest predictor of poor math and reading achievement as early as third grade. Research also suggests that children who display fear, anxiety, and impulsive responses are more likely to experience school expulsions or suspension (National Scientific Council on the Developing Child, 2014), especially children of color (Gilliam et al., 2016).

Some teachers' lack of preparedness to respond to the neurobiology of trauma appears to result in an over-reliance on discipline practices that do not consider the underlying reason for children's behaviors (Gilliam et al., 2016).

The scaffolded and sustained approach of our TSP project increased educators' awareness of the neurobiology of trauma and their implementation of goal-driven educational strategies. This resulted in a focus on teaching children self-regulation strategies to reduce stress and promote learning.

Therefore, to address the consequences of trauma on self-regulation, evidence suggests it is critically important to provide educators professional development (pre-service and in-service) centered around establishing attainable goals for children through identifying learning and emotion regulation strategies. After all, next to their families, children spend most of their waking hours with their teachers, thereby placing schools at the center of child-serving systems.

"The scaffolded and sustained approach of our TSP project increased educators' awareness of the neurobiology of trauma and their implementation of goal-driven educational strategies. This resulted in a focus on teaching children self-regulation strategies to reduce stress and promote learning."



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What Is In Your Backpack?

Rebecca F. Bertuccio

Picture this: *You are a five-year-old child entering public school for the first time. You arrive at school in a van with four other children you have never met. You hop out of the van and stare at an unfamiliar brick building, wearing shoes too tight for your feet. Your stomach roars with hunger, and the lack of restful sleep weighs down your eyelids. You are led into a kindergarten classroom behind a pair of tall legs. You are directed to sit in a plastic chair in front of a tiny table with your name tacked onto it. You are handed a bowl of cereal that you slurp down almost instantly. You feel curious yet terrified of the faces around you. When you begin to feel settled in your surroundings, the adults in the room announce a set of directions. You are asked to rise from your seat, stand in a straight line with the other children in the room, keep quiet, and march over to a new room called “the library.”*

Some who visualize the presented scenario may be able to follow classroom directions with ease; it may seem like a “typical” first day of school. Through the lens of a child who has endured experiences of trauma and neglect, others may envision the aforementioned scenario as an intense, anxiety-filled event. If so, some may assume the impulse to scream, hide under a desk, run around the classroom, or hurl those too-tight shoes across the room.

As someone who has worked in schools, I can attest that events similar to those presented in the latter scenario occur with even the most seasoned professionals. In my experience, it took a



Rebecca F. Bertuccio graduated from The Pennsylvania State University in 2020 with her PhD in School Psychology. She now works in a mental health care facility.

village to provide support to a student who came from a background of trauma. Support at the time ranged from strategies such as providing visual schedules to help with reinforcing expectations, ensuring basic needs (e.g., hunger, sleep) were met, employing longer wait time after giving directions, and utilizing positive reinforcement and token economy systems. By the end of the school year, the student was beginning to thrive.

“To support children who struggle with self-regulation as a result of childhood trauma, school teams are encouraged to take a proactive rather than reactive approach. Schools may need to evaluate the needs of their student body and overall community and make changes as appropriate.”

Children often arrive at school carrying much more than the materials in their backpacks. Unfortunately, school teams are not always aware of children's backgrounds in the school building. Consequently, without such information, it can be easy to attribute a child’s disruptive or externalizing behaviors to defiance or hyperactivity.

Teachers on the receiving end of such behaviors may feel overwhelmed. They may struggle to know how to appropriately respond to children in a way that teaches them the appropriate skills and minimizes the reoccurrence of such behaviors while providing core academic instruction.

To support children who struggle with self-regulation as a result of childhood trauma, school teams are encouraged to take a proactive rather than reactive approach. Schools may need to evaluate the needs of their student body and overall community and make changes as appropriate.

Schools looking to enact more significant changes may consider utilizing multi-tiered support systems for socioemotional learning. Universal instruction of socioemotional learning would likely be helpful to most students. However, to ensure that students receive supports that are appropriate to their needs, schools should consider employing a universal screening process to help identify at-risk students and provide additional services in small-group settings.

Further, educators may benefit from participating in training on trauma-informed teaching. Following initial or refresher training, consultation, coaching, and collaboration with other experienced professionals in the field may help to support teachers’ confidence and self-efficacy in their trauma-informed practice. No matter what approach schools take, school professionals are encouraged to think, “*What is in your backpack?*” when welcoming students with challenging behaviors into their classrooms.

“Children often arrive at school carrying much more than the materials in their backpacks. Unfortunately, school teams are not always aware of children's backgrounds in the school building. Consequently, without such information, it can be easy to attribute a child’s disruptive or externalizing behaviors to defiance or hyperactivity.”



The Roots of Effective Trauma-Informed Practices Begin Within Teacher Preparation Programs

Kimberly M. Kohler

Since Felitti and colleagues' seminal study on the effects of Adverse Childhood Experiences (i.e., ACEs), mounting evidence confirms the profound impact of adversity on children. Almost half of US children have experienced at least one ACE (i.e., abuse, neglect, household dysfunction; CDC, 2021), with higher rates of ACEs noted in historically excluded groups (Sacks & Murphey, 2018) and rural areas (Crouch et al., 2022).

For school-aged children, in particular, ACEs may manifest in significant learning and executive functioning difficulties, mental health challenges, and emotional and behavioral dysregulation (NCTSN, 2022), often leading to adverse outcomes in adulthood (CDC, 2019).

It is important to remember that one's response to adversity is highly individualized, and children may experience similar events differently, leading to varying outcomes. However, the continuing COVID-19 pandemic and related stressors have escalated mental health challenges and post-traumatic stress-like reactions (Bridgland et al., 2021), only amplifying ACEs' impact.

Having at least one caring adult outside a child's family is an essential protective factor (CDC, 2021). For many, this is an educator. Educators who provide a classroom environment that focuses on unconditional care and concern allow children who have experienced adversity to feel safe, seen, and heard.

Caring educators support students by helping them navigate relationships, effectively cope with complex thoughts and emotions, and build greater self-regulation and resilience (Sciaraffa et al., 2018). Although 30 states and DC require schools to provide professional development on trauma-informed practices (TIPs) to in-service level educators (Temkin et al., 2021), a recent review of teacher preparation program (TPP) competencies found that only five states have TIPs as part of their requirements (Redding & VanLone, 2022).

Educators experience high levels of stress (Greenberg et al., 2016), which can

begin as early as teacher preparation (Gardner, 2010). Stressed and emotionally exhausted educators are more reactive to behavioral challenges and less instructionally effective, thus negatively impacting student learning outcomes (Jennings & Greenberg, 2009).

Although systematic changes must be vigorously addressed (e.g., greater support, higher wages), stressed and dysregulated educators cannot provide effective TIPs in the classroom (Osher et al., 2021). Therefore, I argue that the roots of effective TIPs begin by cultivating greater social-emotional competence (SEC), self-regulated learning, and resilience of our future educators in TPPs.

Knowing the time for additional programming in TPPs is extremely limited, I find the most practical way of supporting greater SEC and resilience of our future educators is to infuse practices within required coursework and to model TIPs, as described below:

- **On day one, establish your classroom as a safe space for everyone:** Have students discuss what this safe space should look like, sound like, and feel like. Type up, post, and review/discuss these student-generated guideposts often.
- **Cultivate connection and community with others:** Start each class with a check-in using mood memes, fun polls (e.g., best ice cream flavor), or a quick game (e.g., would you rather).
- **Make mindfulness-based practices (MBPs) a part of the course routine:** Invite students to participate in breathing practices or provide movement breaks using gentle yoga (i.e., link movement to breath) during more extended class periods. For educators, MBPs promise to help mitigate stress and build greater SEC and resilience by increasing self-awareness, emotion regulation, and compassion for themselves and students (Abenavoli et al., 2013; Roeser et al., 2012). A recent review of MBPs provided during TPPs noted decreased levels of stress and increased facets of psychological well-being, self-compassion, and self-efficacy (Kohler, 2020). However, MBPs should not be viewed as the "magic pill" or a substitute for critical systematic changes but as one more strategy in their toolbox.
- **Model compassion for oneself and others:** Students often think they



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are alone in how they feel or what they experience. Model how to recognize and name difficult emotions such as anger, frustration, and envy. Discuss effective coping and calming strategies (e.g., taking three deep breaths) and ways to be kind to oneself during challenging situations and difficult emotions.

- **Teach mindful listening:** Model listening for understanding and holding space for the speaker rather than thinking about what you will say next or problem-solving. Approach all conversations through the lens of compassion, not reaction.

The practices listed above are just a few ways to cultivate greater SEC and resilience of future educators with the teacher preparation framework. Future research should focus on the acceptability and long-term effectiveness of such practices.

"Caring educators support students by helping them navigate relationships, effectively cope with complex thoughts and emotions, and build greater self-regulation and resilience."

Additional Recommended Resources

Jennings, P. A. (2015). *Mindfulness for teachers: Simple skills for peace and productivity in the classroom (the Norton series on the social neuroscience of education)*. WW Norton & Company.

Jennings, P. A. (2018). *The trauma-sensitive classroom: Building resilience with compassionate teaching*. WW Norton & Company.

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Learning, Adversity, and Self-Regulation: Understanding Mechanisms of Change to Support Children's Learning

Carlo Panlilio

Early experiences of adversity and trauma, particularly maltreatment, tend to be linked with developmental delays and disabilities (Bright et al., 2016; Jones et al., 2012) that cascade into later educational challenges for children and youth (Ryan et al., 2018; Stone, 2007). This public health concern has reached a crescendo and finally caught the attention of policymakers at the federal and state levels, who have called for the inclusion of trauma-informed practices (TIPs) to address the learning needs of children affected by trauma.

For example, the Trauma-Informed Schools Act of 2019 (H.R. 4146) amended the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801) to provide criteria for using federal funds to support evidence-based TIPs in schools.

Unfortunately, the push toward implementing TIPs in schools is outpacing the evidence for intervention effectiveness and our understanding of learning-related processes important for developing effective interventions. Furthermore, discipline-specific research in this area often does not account for complexities surrounding development and learning in adversity, employing methodologies that assume a simple relationship.

Therefore, my program of research attempts to bring together perspectives drawn from educational psychology and developmental science into child welfare research, resulting in a conceptual model that outlines intra- and inter-individual dynamic changes in development and learning due to adversity (Panlilio & Corr, 2020). **(Continued on the next page)**

Carlo Panlilio, PhD, is an Assistant Professor in the Department of Educational Psychology, Counseling, and Special Education, and a faculty member with the Child Maltreatment Solutions Network, at The Pennsylvania State University. His research focuses on the dynamic interplay between development and learning for children who experience maltreatment and how the elucidation of such processes can inform trauma-informed practice in schools.

Learning, Adversity, and Self-Regulation: Understanding Mechanisms of Change to Support Children’s Learning

Carlo Panlilio

(Continued from previous page)

My work focuses on building the empirical evidence for this model via three main strands of research that include

1. understanding processes that link early adversity, learning, and education outcomes;
2. advancing research methodologies to better capture the complexities in development, learning, and prevention; and
3. improving trauma-informed educational support for students with a history of early adversity.

Understanding Processes Linking Early Adversity, Learning, and Education Outcomes

Early adversity is associated with structural and functional changes in children’s neurophysiology (e.g., Blair, 2010; Cicchetti et al., 2010; Pollak, 2015; Teicher & Samson, 2016) that affect self-regulation (SR), which is defined as the “volitional management of attention and arousal...for the purpose of goal-directed action” (Blair & Ursache, 2010, p. 305).

Key to this definition is the inclusion of stress physiology in the conceptualization of bottom-up (i.e., automatic processes of emotional arousal and reactivity) and top-down (i.e., active or volitional processes for directing attention, organizing cognitive resources, and regulating emotions) processes.

Given the functional adaptation of SR within the context of adversity, it may be possible that children exhibit appropriate emotional and behavioral responses within adverse or traumatic environments to ensure survival.

Prolonged exposure to these adverse events in the absence of a consistent and caring adult may result in toxic stress responses (Shonkoff et al., 2012; Trickett et al., 2014) that organize children’s emotions, thoughts, attention, and action that privilege bottom-up responses, resulting in more reactive responses that may pose a problem in classroom-based learning.

To further understand the impact of trauma and adversity on learning, it was necessary to integrate stress physiology and SR with self-regulated learning (SRL) processes and better understand how students with adverse histories orient toward learning goals and plan accordingly.

It is essential that students access their motivational beliefs, engage in strategy selection and metacognitive monitoring, engage and persist through

academic tasks, and understand causal attributions for their performance (Perry et al., 2020; Pintrich, 2000; Zimmerman & Schunk, 2011).

To date, my lab has been working on contributing to the empirical evidence for this integrative model by showing that

- ♦ emotion regulation problems mediate the effect of early maltreatment on later academic achievement (Panlilio et al., 2017),
- ♦ early adversity and trauma symptoms affect students’ metacognitive processes (Ferrara & Panlilio, 2020), and
- ♦ academic engagement is an important mechanism impacted by trauma (Mullins & Panlilio, 2021).

Further work is being done to understand the impact of special education referrals (Ellner et al., 2021) and accommodations (Ellner et al., 2022) on academic outcomes, as well as understanding the role of executive control (i.e., top-down processes) on emerging literacy and reading outcomes (Falcon et al., 2022).

Advancing Research Methodologies

Given the dynamic and transactional nature of SR and SRL across development and learning within my model, mainly due to early adversity, it becomes vital to use novel statistical methods to capture such complexities as they unfold across micro-time. For example, heterogeneous emergent properties of dynamic SR/SRL systems can be examined via finite mixture models.

Panlilio et al. (2020) used a group-based trajectory model (GBTM) to examine the latent classification of young foster children based on the emotion dynamic parameters of baseline, peak intensity, and time to peak in the arousal and modulation of fear.

In another study (Lunkenheimer et al., 2019), my colleagues and I used GBTM to examine micro-time latent trajectory patterns of preschoolers’ task persistence that varied based on mother vs. father scaffolding. Currently, my lab collaborates with developmental psychology colleagues on an NIH-funded project to understand how dyadic synchrony patterns between parent and child emerge to explain the transmission of anxiety (Perlman et al., 2022).

Specifically, we will be using dynamic structural equation models (DSEM) and mixture DSEM to capture neurological, physiological, and behavioral data patterns inherent in intensive longitudinal designs

Improving Trauma-Informed Educational Support for Students

A key feature of my conceptual model (Panlilio & Corr, 2020) is the inclusion of teacher-student relationship quality that can buffer the effects of early adversity on SR/SRL and later academic outcomes.

Findings from the first strand on malleable SR/SRL mechanisms (e.g., emotion regulation, metacognitive monitoring, engagement, attention), along with modeling the dynamic dyadic transaction over time, serve to inform the development, implementation, and evaluation of the Trauma Sensitive Pedagogy (TSP) Curriculum (Panlilio & Tirrell-Corbin, 2017).

Elements of this TIP were built from guidelines outlined in Panlilio (2019) on trauma-informed schools. This translational aspect of my work provides the avenue by which we can begin to examine what TSP program elements for teachers and specific SR/SRL target processes in students result in positive academic outcomes.

Upon request, references are available by contacting Carlo Panlilio (ccp15@psu.edu)

“Early adversity is associated with structural and functional changes in children’s neurophysiology... that affect self-regulation (SR)... To further understand the impact of trauma and adversity on learning, it was necessary to integrate stress physiology and SR with self-regulated learning (SRL) processes and better understand how students with adverse histories orient toward learning goals and plan accordingly.”



The Effects of Early Neglect on Emotion Regulation

Lilyan (Lilli) Falcon

Child neglect accounts for most child maltreatment cases in the United States and has recently gained significant attention in the child maltreatment and child welfare literature. While specific definitions of child neglect vary in different states, neglect can be conceptualized as acts of omission in care by a caregiver or a failure to meet a child's basic needs.

Common types of neglect include physical, emotional, educational, and medical neglect and inadequate supervision (Child Welfare Information Gateway, 2018). Neglect can have various short- and long-term adverse effects on the physical, socio-emotional, and cognitive domains of well-being, which have important implications for learning over a child's development.

A central component of my research investigates how emotion regulation in young children is mainly affected by neglect and how such consequences impact children's learning. According to Thompson (1994), *emotion regulation* is "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (p. 28).

Given that emotion regulation development relies on young children's social environments (Thompson, 1994), those who experience maltreatment, especially neglect, may miss out on significant experience-dependent socio-emotional learning opportunities necessary for optimal emotion regulation (Young & Widom, 2014). Such adverse effects of neglect on emotion regulation may manifest in different ways. For example, children may exhibit emotion dysregulation across social contexts, including the classroom.

Emotion dysregulation typically involves two distinct yet related processes. First, dysregulation may manifest as emotional under-regulation or an inability to control one's emotional expression and a tendency to be overwhelmed by emotions resulting in what teachers often may observe as "externalizing" behaviors.

Alternatively, emotion over-regulation may manifest as being emotionally numb or unable to express or recognize one's emotions, which can similarly have adverse outcomes for the child. Often observed as "internalizing" behaviors, over-regulation may sometimes be more challenging to recognize in learning environments, given that such outward manifestations may be misconstrued as compliance in the



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classroom.

According to Thompson, "optimal" emotion regulation differs based on context and an individual's goals (Thompson, 1994). For a neglected child, emotional stability or security goals may precede learning-related goals. It can be misunderstood as a lack of interest or ability rather than an adaptive response to adverse developmental contexts, such as experiences of abuse and neglect.

To create and implement interventions that assist children who have experienced early neglect, researchers and educators must acknowledge the various learning- and development-related processes that can negatively impact emotion dysregulation. For instance, under-regulated emotions may increase attention or behavior difficulties in a school environment, while over-regulated emotions may decrease engagement in learning activities and social interactions that affect teacher and peer relationships.

If a child cannot exhibit an average, expectable emotional response to an emotionally distressing situation, they may experience challenges with attentional orientation and control necessary to engage in learning-related goals and activities. Similarly, for those who are over-regulated and cannot express positively balanced emotions, it is possible they can experience difficulties connecting to their peers or their teachers. Furthermore, neglect in early childhood may have detrimental effects on the various components of self-

regulated learning.

Drawing on Zimmerman's (2000) model, emotionally dysregulated children may experience difficulties with planning and preparation (i.e., setting goals or selecting strategies) for learning-related tasks. Emotion dysregulation may also negatively impact the performance phase of learning, given attentional problems that affect persistence in a challenging task.

However, it is essential to note the role of protective factors in strengthening the regulatory capacity and strategy use in young children, especially those affected by neglect, given their potential as targets for intervention efforts. For example, educators or caregivers can serve as positive role models through which children may observe and learn effective emotion regulation strategies and context-dependent coping skills.

Explicit instruction on regulatory strategies can also help children develop effective regulatory skills. Educators may explicitly teach coping skills or metacognitive strategies to help children identify what they are feeling and why they feel that way and develop healthy ways to regulate extreme emotions.

Various socio-emotional interventions targeting regulatory skills early in life have been shown to support child outcomes such as learning, language, and mental health (Murray et al., 2015).

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Self-Regulated Learning: In Real Life

Samantha Ellner



Samantha Ellner, MS, is a fourth-year doctoral student in Educational Psychology at The Pennsylvania State University. Her work centers around the intersectionality between disability and maltreatment, specifically the impact of maltreatment histories on language and reading abilities.

Children with disabilities and experiences of maltreatment typically end up in special education services. Although the etiology of their disabilities may be different, any SPED class likely has children with disability histories alongside children with histories of maltreatment. Though these children’s symptoms may be similar, the cause of their symptoms differs. This information is vital for intervention because it could be that children with maltreatment histories respond to intervention differently. Further, although we understand how disability and maltreatment individually affect SRL abilities in learners, it remains unknown how these compounded effects of disability *and* maltreatment on SRL abilities play out for students.

In a classroom, a child may present with symptoms indicating a specific disability when, in fact, factors are causing these unobservable symptoms. For example, there is a subsection of reading-disabled children who are known to have a specific comprehension deficit (Nation, 2009).

These children can decode words fluently but struggle with higher-level skills, such as vocabulary and grammar knowledge. However, these readers also have impairments in broader executive function skills, such as difficulties with “integration, monitoring, and inference-making” (Ebert & Scott, 2016).

What is unclear is if these children’s reading needs are the result of poor reading abilities or if there is a more severe cognitive impairment that is affecting overall functioning. Further, although a reading impairment may be more apparent to a classroom teacher, these children may also demonstrate impairments in their SRL abilities that can go undiagnosed and untreated (Zhang & Tomblin, 2000), resulting in compounded delays later on (Stone, 2007).

This is an example of how SRL affects real children in real life. It is easy to break down these moments into individual, unrelated things or to assess these skills on an unrealistically micro-level. Nevertheless, the reality is that an issue with SRL is not isolated. Children with impaired SRL abilities likely demonstrate various other impairments in seemingly unrelated abilities. Knowing this, it is the responsibility of SRL researchers to investigate how SRL functions in typically developing children and to ask how these abilities may be impaired and further impact overall cognitive functioning.

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In typical learners, self-regulated learning (SRL) can start off small. In life, children begin testing their ability to plan, perform, and reflect with smaller, minor tasks (Zimmerman & Moylan, 2009). As these learners grow, they become students in a school, and self-regulated learning becomes more complicated as students begin learning complex skills, such as reading and math. A typical student can test their abilities, learn from their mistakes, and adjust. However, what happens when this process breaks down? Or is there an outside factor inhibiting this cycle?

Some students do not have the privilege of having such intact cognitive abilities. For example, children with learning disabilities can demonstrate breakdowns in their SRL abilities due to many factors. Impaired processing speed, attention abilities, or executive functioning skills can further impact a student’s effectiveness and accuracy with any SRL phases.

Children with maltreatment histories also demonstrate issues such as emotional dysregulation and language and executive functioning impairments (Eckenrode et al., 1993; Pears & Fisher, 2005), all of which can impact SRL abilities in these children.

Nevertheless, why does this matter? If we know that disability and maltreatment impact individual abilities related to SRL, why does it matter if a learner has a disability and maltreatment history? For the researcher, the outcomes may be the same, but in real life (IRL), these learners are children attending school, and impaired SRL abilities could be a symptom of more significant learning needs that can impact academic success.

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Reading is often considered foundational for all academic achievement and learning. However, it is a complex skill that can be difficult to master as effective reading requires integrating many different processes and pieces of information. Readers must actively and passively process information in their visual fields, use motor functions (e.g., eye movement) efficiently to navigate across a page, and simultaneously access prior word and sentence (i.e., language) knowledge.

Although good readers will integrate these processes automatically, having intact and active *self-regulation* — the ability to recruit control processes, such as attention and effortful control, for goal-oriented action (Blair & Raver, 2015; Panlilio et al., 2019) — is crucial to coordinate their integration. Difficulties in reading can arise when self-regulation is impaired.

The literature shows an increased risk for negatively altered developmental and academic trajectories when volatility is introduced to a child's environment through childhood adversity (Maclean et al., 2016; Slade & Wissow, 2007). Specifically, several language and reading deficits are seen as early as elementary school in children exposed to adversity (e.g., Fantuzzo et al., 2011).

There is reason to suggest that deviations from normal or expected developmental outcomes may in part be explained by the effects childhood adversity has on attention, a subcomponent of self-regulation, because of its role in facilitating directed and sustained focus towards important word features while simultaneously disregarding irrelevant information (van de Sande et al., 2013).

In a recent study using a large longitudinal data set, I (Alvarado) examined the role of sustained attention within a context of adversity and its effects on children's reading outcomes. Findings indicated that both reading comprehension and reading achievement were predicted by several external and internal factors, with sustained attention emerging as the primary predictor for all reading outcomes.

“These results reflect the critical role that sustained attention has on children's reading outcomes after exposure to adversity during early childhood. Within the framework of self-regulated learning (Zimmerman, 2008), attentional focusing, or *sustained attention*, is indeed identified as a key component of learning.”

External factors such as early childhood adversity and parent-level attributes (i.e., mother's education, household income) only predicted later reading comprehension (at age nine), while internal factors, including sustained attention and other child-level factors (i.e., sex) predicted reading achievement at age five and nine, with attention predicting reading comprehension at age nine as well.

These results reflect the critical role that sustained attention has on children's reading outcomes after exposure to adversity during early childhood. Within the framework of self-regulated learning (Zimmerman, 2008), attentional focusing, or *sustained attention*, is indeed identified as a key component of learning. As a limited cognitive resource that maintains vigilance over time, sustained attention enables concentration and engagement with reading stimuli.

Experiences with childhood adversity, however, can create attentional biases that may alter a reader's focus. Physically abused children, for instance, have been shown to have an attentional bias in which they preferentially gaze at threatening stimuli for longer and more often than those that have not been maltreated (Pollak & Tolley-Schell, 2003).

Together, these results directly affect trauma-informed practices in schools that serve adversity-exposed and traumatized students. An intentional and thoughtful inclusion of self-regulation practices that improve attention should be incorporated, such as teaching students how to reread, paraphrase, and self-explain during reading (Moss et al., 2011).

In addition, the results of this study, along with our recent systematic review of language outcomes in maltreatment samples (Alvarado et al., 2022), have implications for researchers studying the complex relationship between childhood adversity and learning outcomes. The importance of both internal and external factors, along with the developmental and scaffolded nature of reading, suggest that it may also be meaningful to consider how different dimensions of an adverse event can lead to varied reading- and language-related outcomes.

Previous research has acknowledged that an adversity's characteristics, such as its type, frequency, severity, and chronicity, may lead to differential outcomes (English et al., 2005); however, our review found that few articles looked at any dimensions beyond type (Alvarado et al., 2022).

As researchers seek to understand how adverse events impact reading and attention, it is essential to consider adversity as a multidimensional construct. A complete picture of these complex relationships will better prepare both researchers and educators to assist children whose lives have been impacted by adversity successfully.



The Role of Sustained Attention on Reading Outcomes Within a Context of Childhood Adversity

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