



What Works? Research into Practice

Research monograph # 63
February 2016

Understanding Self-Regulation: Why Stressed Students Struggle to Learn

By Dr. David Tranter, School of Social Work, and Dr. Donald Kerr, Faculty of Education,
Lakehead University

Tips to Support Self-Regulation in Students

- Self-regulation refers to the influence of *states of arousal* and the ways in which people cope with and recover from *ongoing stress*.
- In particular, children who have experienced chronic stress can have great difficulty successfully matching their state of arousal with the demands of various classroom activities.
- Educators can do a lot to help students learn to meet challenges with the right level of arousal.

Self-regulation is a term used widely by educators; however, there is very little agreement about what it actually means. What do educators need to understand about self-regulation, and how can they support self-regulation in students?

Self-regulation is a term increasingly used but all too often misunderstood. A recent analysis of its use in scholarly literature found that the term had 88 variations related to 447 different concepts.¹ The fact that educators and experts frequently confound the term with self-control and executive function is understandable given how recent much of the research is in these highly interrelated areas. However, each term embodies a different assumption about the nature of students' behaviour. A proper understanding of self-regulation can inform educators' efforts to help. Below, we provide three analogies that can be used to understand, and to teach students, about self-regulation.

Self-Control as a Muscle

Self-control is famously exemplified by Mischel's Marshmallow Test, in which four-year-olds tried to resist eating a marshmallow for 15 minutes in order to win a second one.² Self-control is viewed as analogous to a muscle – something that is stronger for some and weaker for others.³ While a *self-control orientation* to behaviour is positive in that it holds that qualities like impulse control and deferred gratification can be strengthened over time, it also perpetuates a view that behaviour problems stem from an individual weakness in the student.⁴

Executive Function as an Air Traffic Control System

Executive function emphasizes higher-order meta-cognitive skills, including *working memory* (the ability to hold and work with information for short periods of time), *inhibitory control* (the ability to manage and filter thoughts and impulses), and *cognitive flexibility* (the ability to switch mental gears).⁵ Successful executive function is analogous to a personal air traffic control system that enables the negotiation of social, emotional, and cognitive tasks throughout the day. An *executive function orientation* to behaviour assumes that behaviour problems arise when these skills are deficient.

Self-Regulation as the Gas and Brakes

Self-regulation provides us with a very different explanation of how behaviour and learning problems arise. It emphasizes the influence of *states of arousal* and the ways in which students cope with and recover from *ongoing stress*. Central to this is the concept of *allostasis*, meaning that people constantly adjust their state of arousal in response to the various demands placed on them.⁶ These adjustments involve the entire nervous system. When a demand is placed on the individual, the *sympathetic nervous system* activates a range of brain and body functions associated with the “fight or flight response” to increase the overall state of arousal. When that demand is no longer present, the *parasympathetic nervous system* activates functions associated with the “rest and digest response” to lower the level of arousal. People don’t drive

all day at the same speed, but rather hit the “gas” or “brakes” to best match their arousal with their circumstances. A *self-regulation orientation* to behaviour focuses on whether the level of arousal is appropriate.

The Continuum of Regulation

In a typical school day, students must adjust their energy and alertness many times. Silent reading, group activities, outdoor play, and eating lunch with friends all require different levels of arousal and pose different kinds of stress. A *continuum of arousal* enables students to respond to and recover from challenges throughout the day.⁴ The task for students is to meet challenges with the right level of arousal. For example, a teacher may help some students “gear down” by reminding them to use their “indoor voices” when they come in from an outdoor activity.

Hyperarousal, Hypoarousal, and Allostatic Load

Difficulties in self-regulation arise when students are unable to match their arousal state with their circumstances. This is a particular challenge for students who have experienced *chronic stress*.⁴ The wear and tear imposed on the body by ongoing stress disrupts the normal process of allostasis. The consequence of repeated stress is referred to as *allostatic load*, which can lead to problems in self-regulation.⁶ Some students experience chronic *hyperarousal*, meaning that they tend to apply the gas too much and too often. These students can be highly active and overly sensitive to a variety of stimuli. Other students experience chronic *hypoarousal*, meaning they apply the brakes too much and the gas too little. These students may appear disengaged or inattentive. Still others may fluctuate relatively quickly between states, struggling to remain calm and focused.⁴

Self-Regulation Strategies in the Classroom

Successful self-regulation is not something we are born with; rather, it develops slowly throughout childhood and into the mid-twenties as parts of the brain fully develop and connect.⁵ For students who struggle with self-regulation, there are a number of things that educators can do to help:

In a typical school day, students must adjust their energy and alertness many times. Silent reading, group activities, outdoor play ... all require different levels of arousal and pose different kinds of stress.

Remember that stress takes many forms and students respond in unique ways. Stress is subjective and happens as a result of both past and present events. What might be a small stress for one student could be overwhelming for another. A loud school bell, or a difficult math problem will impact students in entirely different ways.⁷

Know your students. The more you know about the lives of your students, the more you can understand their behaviour. Conduct that seems entirely out of context will make sense if the rest of the picture is revealed. Even if you don't know the whole picture, knowing a little will make you more likely to empathize with your students.

Relationships have the most powerful influence on self-regulation. Each of us learns to self-regulate through our relationships with others. Children are first soothed by caregivers and, thus, learn to soothe themselves. Teachers have a powerful role to play in helping to regulate the arousal and recovery of their students. It's important that teachers remain calm, keep a warm sense of humour, and stay connected with each student.⁸

Student self-regulation starts with teacher self-regulation. Moods and arousal states are contagious. A stressed teacher can readily stress their students. Teachers need to recognize their own struggles and take steps to ensure that they practice good self-regulation.

Consider the impact of your classroom and school environment. The physical environment of the school can be a source of stress for many students. As much as teachers like to decorate their classes with colourful samples of student work, many classrooms are overloaded with stimulation. Rather than inspiring students to

achieve, these classes can overwhelm some children. Many teachers are now creating calming classrooms with quiet workspaces, subdued lighting, and other features to create an atmosphere that supports concentration and learning.⁹

For some children, schools might be the only place where there is consistent calm, and teachers might be the only adults who teach them the calming strategies that they will rely on for the rest of their lives.

Teach children to be more aware of their arousal states.

While shifts in arousal states are often ubiquitous, students are usually quite keen to learn the signs in themselves and their peers that indicate stress and problems with arousal. Young students will eagerly approach the teacher and report having an "upset amygdala" in much the same way he or she would report a need to go to the washroom.

Teach children to develop self-regulation skills. Children are less skeptical and self-conscious than adults and are generally happy to learn self-regulation strategies. For example, students readily respond to mindfulness and meditation strategies and, once learned, often practise them without prompting from their teachers.¹⁰ Similarly, when fidget toys and calming tools are made available to students, they quickly learn to incorporate them into their everyday school routine.

Use down-regulating strategies when needed. Sitting still for most of the day can be a challenge for any student. Transitions from one activity to the next can disrupt concentration and make it tough for students to refocus. Class-wide down-regulating strategies such as deep breathing, listening to a story, or watching a calming video can help the entire class prepare for the next lesson. Teachers should create an atmosphere in the class and state of mind in their students that will best fit the expectations of the planned work.^{4, 11}

Use up-regulating strategies when needed. As the day wears on, many students can slip into a hypoaroused state

and start to daydream and lose focus. It's important for teachers to build in regular activities, especially in the form of physical movement, to help students up-regulate and renew focus.⁴ Physical activity has the unique ability to energize hypoaroused students and to discharge energy for hyperaroused students.¹²

Successful self-regulation takes a long time to master.

Most adults, regardless of upbringing or exposure to stress, sometimes struggle to remain calm and focused. For children who experience ongoing stress, learning self-regulation can be a difficult challenge; teachers have an opportunity to make a tremendous difference in these

students' lives. For some children, schools might be the only place where there is consistent calm, and teachers might be the only adults who teach them the calming strategies that they will rely on for the rest of their lives.¹¹

In Sum

Self-regulation is about responding to stress and managing one's state of arousal. Students who have experienced chronic stress often struggle to self-regulate; their level of arousal may be either too low or high or may fluctuate rapidly through the school day. Once educators understand self-regulation, they can utilize a variety of strategies to help their students be self-regulated and ready to learn.

References

1. Burman, J. T., Green, C. D., & Shanker, S. (2015). On the meanings of self-regulation: Digital humanities in service of conceptual clarification. *Child Development*, 86, 1507–1521.
2. Mischel, W. (2014). *The marshmallow test: Mastering self-control*. New York, NY: Little Brown.
3. Baumeister, R. F., & Tierney, J. (2012). *Willpower: Rediscovering the greatest human strength*. New York, NY: Penguin Books.
4. Shanker, S. (2013). *Calm, alert, and learning: Classroom strategies for self-regulation*. Don Mills, ON: Pearson.
5. National Scientific Council on the Developing Child & Harvard University. (2011). *Building the brain's "air traffic control" system: How early experiences shape the development of executive function*. Cambridge, MA: Center on the Developing Child.
6. McEwen, B. S., & Wingfield, J. C. (2003). The concept of allostasis in biology and biomedicine. *Hormones and Behavior*, 43, 2–15.
7. NCTSN Core Curriculum on Childhood Trauma Task Force. (2012). *The 12 core concepts: Concepts for understanding traumatic stress responses in children and families*. UCLA-Duke University National Center for Child Traumatic Stress.
8. National Scientific Council on the Developing Child & Harvard University. (2008). *The timing and quality of early experiences combine to shape brain architecture*. Cambridge, MA: Center on the Developing Child.
9. Benson, H., Wilcher, M. (2000). Academic performance among middle school students after exposure to a relaxation response curriculum. *Journal of Research and Development in Education*, 33, 156–165.
10. Meiklejohn, J., Phillips, C., Freedman, M., Griffin, M., Biegel, G., Roach, A., Pinger, L. (2012). Integrating mindfulness training into K–12 education: Fostering the resilience of teachers and students. *Mindfulness*, 3, 291–307.
11. Cole, S. F. (2005). *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Boston, MA: Massachusetts Advocates for Children.
12. Ratey, J. (2008). *Spark: The revolutionary new science of exercise and the brain*. New York, NY: Little Brown.

What Works? Research into Practice is produced by a partnership between the Ontario Association of Deans of Education and the Student Achievement Division.

To learn more about how to write a monograph [click here](#)
[Mobilizing Research into Practice in Meaningful Ways](#)
By Dr. Michelann Parr and Dr. Terry Campbell Co-editors

What Works? is updated and posted at: www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/WhatWorks.html

The opinions and conclusions contained in these monographs are, those of the authors and do not necessarily reflect the policies, views, or directions of the Ontario Ministry of Education or the Student Achievement Division.

ISSN 1913-1097 *What Works? Research Into Practice* (Print)
ISSN 1913-1100 *What Works? Research Into Practice* (Online)