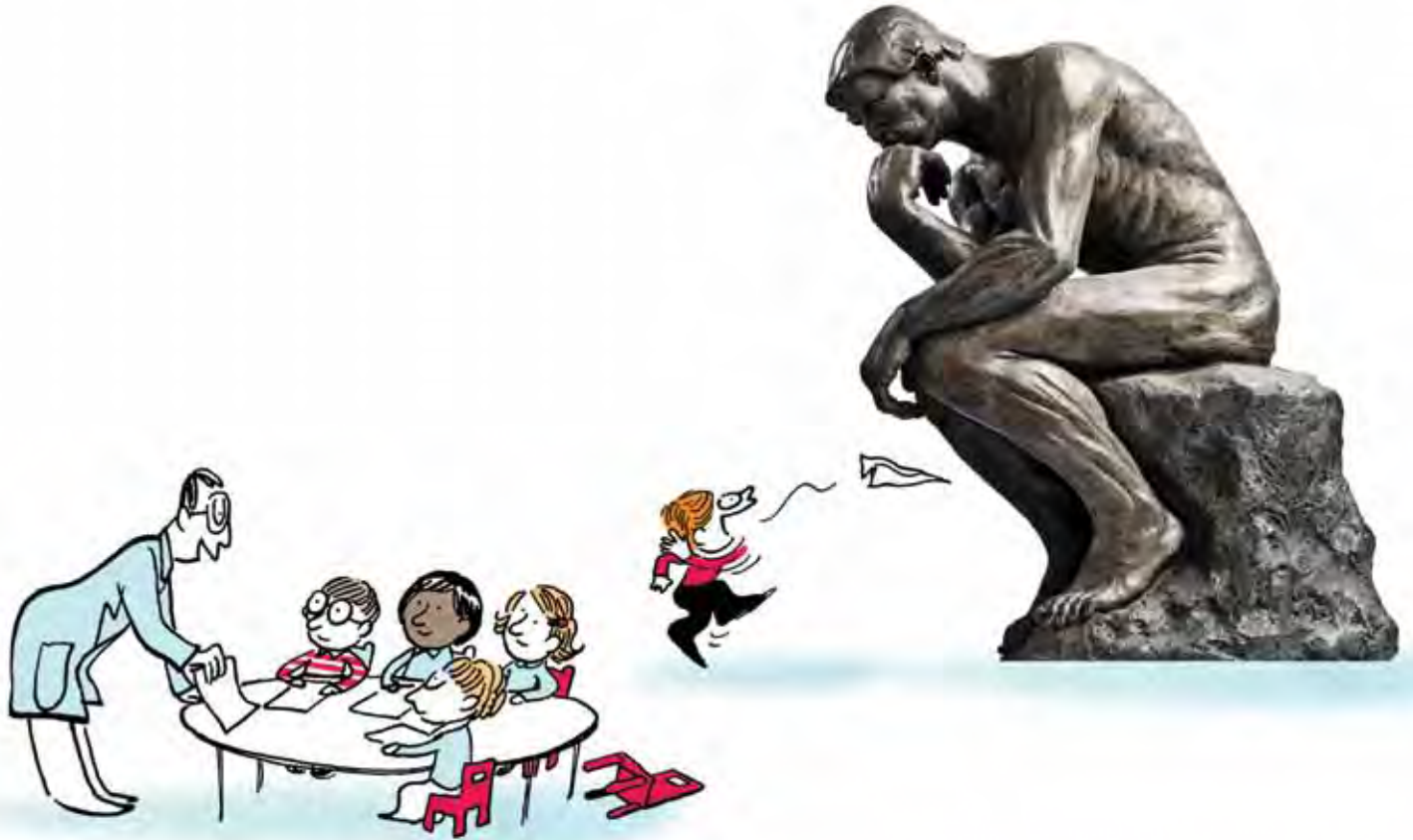


# Can Teachers Increase Students' Self-Control?



*How does the mind work—and especially how does it learn? Teachers' instructional decisions are based on a mix of theories learned in teacher education, trial and error, craft knowledge, and gut instinct. Such knowledge often serves us well, but is there anything sturdier to rely on?*

*Cognitive science is an interdisciplinary field of researchers from psychology, neuroscience, linguistics, philosophy, computer science, and anthropology who seek to understand the mind. In this regular American Educator column, we consider findings from this field that are strong and clear enough to merit classroom application.*

BY DANIEL T. WILLINGHAM

**Question:** Some children seem to have very little difficulty staying on task, but others, try as they might, get distracted easily. And

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those seem to be the same students whose tempers flair at what seem to be small provocations. Why is it that some children have so much trouble controlling themselves? Is there anything I can do to help them?

**Answer:** Among cognitive scientists, this quality is usually called "self-regulation" and it has been the subject of intense study in the last five years. The idea is that there is often a rapid, automatic response to a situation, but that automatic response may not be the one that the individual, upon reflection, would want to make. Self-regulation refers to the ability to inhibit the automatic response and to do something else; more generally, it refers to the ability to control one's emotions, to control attention and other cognitive processes, and to plan and control behavior. This capacity turns out to have enormous consequences for academic and social success. And, as teachers observe daily, children differ widely in how much of this capacity they seem to have. Recent research indicates that teachers can help students—especially students having the most trouble—by providing an organized classroom environment, and by removing elements in the environment that can trigger impulsive behavior.

**W**hat do the following three scenarios have in common?

- Construction workers pour cement for a sidewalk outside your fifth-grade classroom, clearly visible through the windows, but Vincent manages to ignore this interesting scene and focus on his work.
- Fourteen-year-old Rosalind practices her piano scale exercises faithfully, even though she'd rather hang out with her friends, because she dreams of playing Chopin.
- Malik has been carefully building a block structure for five minutes when another preschooler walks by and accidentally knocks it over. Malik manages to swallow his disappointment and starts to build the structure again.

In each scenario, the child is showing *self-regulation*. Self-regulation refers to being able to control and plan emotions, cognitions, and behaviors.<sup>1</sup> Each child has an automatic inclination to do one thing—watch the construction workers, socialize with friends, mourn the fallen tower—but overcomes that impulse and chooses to do something else that serves longer-term goals.<sup>2</sup>

It seems obvious that self-regulation would be a prized trait. But researchers interested in understanding self-regulation (and trying to boost it) quickly run into complications. The three examples provided above seem to have something in common, but it's easy to see some differences as well. Vincent is regulating his attention in the face of external distractions. Some researchers have emphasized this feature of self-regulation, and measure it with laboratory tasks that require rapid shifts of attention.<sup>3</sup> A related idea is that self-regulation can be measured via the successful inhibition of responses that would come naturally or automatically. For example, in the Head-Toes-Knees-Shoulders task,<sup>4</sup> preschoolers are asked to touch a body part when the experimenter names a different body part (e.g., to touch their toes when the experimenter says “knees,” and to touch their knees when the experimenter says “toes”).

Other researchers have emphasized emotional regulation like that shown by Malik. It would not be ethical to frustrate small children for the sake of observing their reactions, so emotional regulation is sometimes measured by observing children in natural situations, and more often via a parental questionnaire.<sup>5</sup> Parents (or teachers) are asked to reflect on a child's typical behavior, and to rate a series of statements for how well they apply to the child: for example, “Tends to fall to pieces under stress,” and “Is easily irritated.”

Still other researchers have thought of self-regulation as more like Rosalind's piano practice. They have emphasized the ability to delay gratification; that is, to persist in a task that is unrewarding in anticipation of a greater reward in the future. A landmark study of delayed gratification among preschoolers was conducted by Walter Mischel.<sup>6</sup> A child was left alone in a room with a treat such

as a marshmallow. He could, at any time, ring a bell to summon the experimenter, and then he would be allowed to eat the marshmallow. But if the child could refrain from eating the marshmallow until the experimenter returned on her own, a second marshmallow would be added and the child could eat both. Thus, like Rosalind, the child had the choice of having something pleasurable immediately, or forgoing it in anticipation of gaining an even greater reward later.

Finally, some researchers have trusted that when you describe self-regulation, people know what you mean. People generally feel confident in judging whether an individual is rather impulsive or more measured in his or her responses. These judgments seem to be correct, or at the very least, there is agreement among them: kindergarten teachers' ratings of their students' self-regulation

agree pretty well with the ratings of the same children by their first-grade teacher a year later.<sup>7</sup> And, perhaps more surprisingly, people seem to be honest when asked to rate their own self-regulation; self-ratings correspond with ratings provided (anonymously) by friends and coworkers.<sup>8</sup>

Are we really talking about the same thing in these various examples of self-regulation? To some extent, yes. Recent studies have administered a variety of self-regulation tests to the same set of individuals to test the obvious prediction: if the tests all measure the same thing, then individuals scoring well on one should score well on the others, and individuals scoring poorly on one will score poorly on the others.

Different measures of self-regulation are associated, but only moderately so.<sup>9</sup> In addition, neuroscientists have pointed out that different self-regulation tasks seem to depend on the same parts of the brain (more specifically, the prefrontal cortex controlling subcortical regions, which are associated with reward and emotion). This anatomic commonality is some indication that these diverse tasks are somewhat related.<sup>10</sup> For the sake of simplicity, I will talk about these perhaps different types of self-regulation as though they are the same thing.

### **Why is self-regulation good, and where does it come from?**

The usefulness of self-regulation seems intuitive, and indeed, higher levels of self-regulation are associated with a variety of positive outcomes in schooling. Controlling for other factors (such as family income, parents' education, and the like), preschoolers with good self-regulation have higher levels of school readiness—they are more likely to come to school physically healthy, with age-appropriate social and emotional functioning, and with a good attitude toward learning.<sup>11</sup> Good self-regulation in preschool predicts reading and math proficiency in kindergarten, over and above intelligence,<sup>12</sup> but poor self-regulation is associated with a greater likelihood of expulsion from preschool classrooms.<sup>13</sup>

The association of self-regulation and academic achievement continues into elementary school<sup>14</sup> and middle school.<sup>15</sup> We might

## **Good self-regulation in preschool predicts reading and math proficiency in kindergarten, over and above intelligence.**

wonder whether this association is just a byproduct of the student-teacher relationship; kids who are low in self-regulation are more likely to have behavior problems, whereas kids who are high in self-regulation are probably better liked by their teachers—little wonder that the latter learn more. But studies show that even when one accounts for these factors, self-regulation is still a strong predictor of academic achievement.<sup>16</sup>

Teachers' ratings of kids' self-regulation are also associated with children's social competence, including measures of their empathy,<sup>17</sup> as well as the extent to which they take classroom rules to heart<sup>18</sup> and show socially appropriate behavior.<sup>19</sup> Further, a lack of inhibitory control is associated with social problems. Students who are low in self-regulation are at greater risk for persistent disobedience, aggression, and temper tantrums.<sup>20</sup> In teens, poor self-regulation is associated with delinquency, drug and alcohol abuse, and risky sexual behavior.<sup>21</sup>

Given that it is so desirable, how can we help our students improve their self-regulation? To answer that question, we must first understand its source. One's success in self-regulation is partly due to genetics—you inherit a propensity toward impulsivity or self-regulation from your parents.<sup>22</sup> But that's only part of the story, and it's important to bear in mind that inherited traits can be changed. On occasion, people think of genetics as predestination, but consider that height is highly heritable—tall parents tend to have tall kids, and short parents short kids—but height is also susceptible to environmental factors. We grow to greater or lesser height depending on nutrition. In the case of self-regulation, the “nutrition” concerns the nature of the home and of parenting practices. In particular, two broad factors emerge as important in parenting: emotional support and cognitive support.

Several studies indicate that emotional supports from parents—meaningful praise,\* affection, sensitivity to the child's needs, and encouragement—are associated with more successful self-regulation, and their opposites—criticism, coldness, indifference to the child's needs, and physical or verbal control—are associated with poor self-regulation in the child.<sup>23</sup> In studies like these, parent-child interaction is typically measured through direct observation. The researcher might visit the home, or the parent and child might come to the laboratory and be asked to perform a collaborative task, such as assembling a figure from Legos. Whether at home or in the lab, the parent-child interaction is categorized on several dimensions, using a set coding scheme (which is somewhat similar to a detailed rubric that a teacher may use to assess students' presentations). This finding—that parental warmth is associated with the child's self-regulation—complements other work showing that positive interactions with adults

help children understand their own emotional experiences, the emotional experiences of others, and how to interact in a responsive, sensitive manner.<sup>24</sup>

In addition to emotional support, studies show that cognitive support from parents is also important. As you might expect, one source of cognitive support is intellectual stimulation from parents (e.g., posing questions to the child, using complex sentence structures) and intellectual resources in the home (e.g., books, engaging toys). Other data show that kids gain self-regulation skills when their parents encourage them to be autonomous, and provide support for that autonomy.<sup>25</sup> Somewhat more subtle is the cognitive support that comes from the principles of behavior and limits that parents set. Children appear to develop better self-regulation skills in homes where there are well-structured and consistent rules.<sup>26</sup> We might speculate that when the daily routine inside the home is predictable (and both the rules and their enforcement are predictable), children are more likely to adjust their own behavior to conform to the routine, and that repeated practice in this sort of adjustment yields long-term increases in self-regulation. The bending of one's own wishes to the rules of the house constitutes practice in self-regulation.

This research is still relatively new; a detailed picture of the particular influences that shape self-regulation is not yet apparent. It is difficult to be more specific about which features of an emotionally warm and cognitively supportive home are crucial, because many features of such homes are themselves correlated, making it difficult to pinpoint the influence of any one of them.<sup>27</sup> The influence of different parenting practices is also difficult to specify, because parenting does not just affect kids—kids affect parenting practices. That is, different children elicit different parenting strategies from the same parents.<sup>28</sup> Parents often feel that they had a pretty well-thought-out philosophy of parenting, but then the children came along with different plans! Thus, we can easily imagine a situation in which kids have (perhaps small) differences in self-regulation due to genetic factors, and these small differences lead parents to make different choices in parenting strategies, which in turn influence the child's behavior, which then influences the parents, and so on.

### What can teachers do?

Students begin preschool with a set of self-regulation skills that are a product of their genetic inheritance and their family environment. Can their experiences at school change their self-regulation, for better or worse?

There have been some promising attempts to write school curricula that improve self-regulation in children. One example is *Tools of the Mind*, an early childhood program comprised of 40 activities meant to improve a set of three mental functions, one of which is self-regulation. (The others are working memory—the

## Students who are low in self-regulation are at greater risk for persistent disobedience.



\*To find out what constitutes meaningful praise, see “How Praise Can Motivate—or Stifle,” which I wrote for the Winter 2005–2006 issue of *American Educator*: [www.aft.org/newspubs/periodicals/ae/winter0506/willingham.cfm](http://www.aft.org/newspubs/periodicals/ae/winter0506/willingham.cfm).

mental “space” in which thought happens—and cognitive flexibility, that is, the ability to adjust to change.) The 40 activities include, for example, dramatic play, aids to improve memory, activities that encourage collaborative turn-taking, and activities meant to encourage talking to oneself as a self-regulatory strategy. The curriculum takes up 80 percent of the school day, and interventions of one or two years have been shown to have positive effects on children’s self-regulation.<sup>29</sup> Another example that helps develop self-regulation while focusing on social and emotional learning is the Promoting Alternative Thinking Strategies curriculum for preschool and elementary school children.<sup>30</sup> These two programs have some evidence of effectiveness, but more research needs to be done.

Suppose a teacher wants to improve the self-regulation of the children in her classroom, and she is not free to adopt a wholesale curriculum (or is not sure she wants to do so). What steps might she take?

Several studies indicate that teachers actually have minimal impact on the development of children’s self-regulation.<sup>31</sup> But these overall effects may be minimal because schooling affects self-regulation for just a subset of children (since those who come to school with good self-regulation will show no improvement in the studies). One study<sup>32</sup> that did find that teachers can have an impact focused on kindergartners who, at age 15 months, had been categorized as “socially bold” (which previous studies have found is an indicator that children are more likely to be off task in kindergarten). The researchers categorized the teachers as sensitive, overcontrolling, or detached. Sensitive teachers were consistent, positive, warm, and appropriately responsive to children’s cues. Overcontrolling teachers imposed their own learning agenda on children without heeding their cues. Detached teachers were frequently unaware of what children were doing, and responded only halfheartedly when the children needed adult supervision. When paired with an overcontrolling or detached teacher, kids who had been socially bold at 15 months were likely to be off task and to act in impulsive, inappropriate ways. But if paired with a sensitive teacher, these children showed fewer negative behaviors, less time off task, and more self-reliance. In short, teachers can have an impact on the kids who need it most.

Similar results were observed in a more recent study of first-graders.<sup>33</sup> An intervention with their teachers emphasized (1) improving planning and organization, (2) making classroom management more consistent, and (3) facilitating students’ independent and small-group work. As in the study just described, it was only students who started the year with poor self-regulation who were helped by being in the classroom of a teacher who had

undergone the training.<sup>34</sup> Students who started the year with average or better self-regulation skills showed no special advantage from being in these classrooms. (All students did improve, as self-regulation would be expected to improve with age.) These findings dovetail with earlier findings that students learn more in classrooms that are well organized,<sup>35</sup> and that teachers who devote more time to classroom organization in the fall have more student-managed activities in the spring.<sup>36</sup>

Thus, in the final analysis, the factors that improve self-regulation in the home—warmth, organization, and predictability—also seem to be important in classrooms. Children learn to self-regulate through practice. A well-organized classroom requires that children practice inhibiting their own moment-to-moment desires in favor of acting in accordance with the pace set by the teacher. In addition, a well-organized classroom minimizes

chaos and distractions. But with all this talk of organization, let’s not imagine a police state—warmth is just as important, both to the benefit of the classroom atmosphere, and to help students learn empathy and emotional regulation. The fact that students with initially poor self-regulation benefit most indicates that these children are learning at school something that other children learned at home.

Creating an organized classroom with a warm atmosphere is something that every teacher strives for; knowing that it may have a positive impact on students’ self-regulation may put it even higher on a teacher’s (long) list of priorities. But improving classroom organization and atmosphere is also a long-term project. Are there strategies available in the short term that can help students better self-regulate? A different body of research is relevant

to this question, and it does offer some suggestions. Researchers have posed the following relevant question: when confronted with a challenge to self-regulation—for example, a dieter offered a sumptuous dessert—what factors in the *immediate environment* predict whether self-regulation will reign, or whether the dieter will succumb to temptation? Researchers have identified three factors that predict yielding: negative emotions, lapses, and cue exposure. Let’s briefly explore each, then turn to the possible implications for the classroom.

Negative emotions such as anger, depression, stress, or frustration are likely to make adults act impulsively.<sup>37</sup> When people are upset, they are more likely to overindulge in food<sup>38</sup> or alcohol,<sup>39</sup> or to abuse drugs.<sup>40</sup> They are more likely to act aggressively,<sup>41</sup> to impulsively spend too much money,<sup>42</sup> or to engage in risky sexual behavior.<sup>43</sup> Even just being tired makes adults more likely to lie.<sup>44</sup> Negative emotions seem to make people act in the moment, and to disregard future consequences. The reason is not known with any certainty; it’s been suggested that the negative emotion draws

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much of their attention, and so compromises decision making,<sup>45</sup> or that indulging provides short-term relief from anxiety, and so seems rational in the moment.<sup>46</sup>

A second problem for self-regulation is lapses (that is, “falling off the wagon”). It is familiar to us in the form of the dieter eating a brownie or the reforming alcoholic having a drink; once the abstainer has lapsed, it seems not only easy to lapse again, but pointless to abstain any longer. This phenomenon has been repeated several times in the laboratory. If subjects can eat as much or as little as they care to during the experiment, dieters will eat less than nondieters, as one might expect. But if, as part of the experiment, everyone is *required* to eat a high calorie food, dieters *don’t* eat less in order to compensate for the calories just consumed. On the contrary, dieters in that situation eat *more* than nondieters.<sup>47</sup>

A third feature of the environment that can make self-regulation challenging is cues (that is, subtle or overt reminders of the appeal of the thing to be avoided). Simply put, if I’m dieting, it’s harder for me to turn down a sundae if I actually *see* it.<sup>48</sup> The visual appeal might make me think about how marvelous it would taste. Similarly, actually seeing drugs or drug paraphernalia makes it more likely that substance abusers will relapse.<sup>49</sup>

These three factors that confound self-regulation—negative emotions, lapses, and cues—suggest some classroom changes that might help students. First, teachers can try to be mindful of the effect of negative emotions on students’ ability to self-regulate. When a student does act impulsively, a calm, warm correction and redirection of the student is more likely to prevent further impulsive acts than a rebuke that makes the student feel bad. In addition, teachers should expect that a student who is depressed or is having a hard time at home will have more difficulty working on his own, controlling his temper, and other tasks that require self-regulation. The student might need more support from the environment—a quiet environment in which to work, for example, or more monitoring and guidance than other students on independent work. Needless to say, such support must be provided in a sensitive manner so that the student does not feel singled out among her peers.

The data on negative emotions also provide some insight into what can be the cyclical nature of misbehavior. Many misbehaviors—fighting, teasing, breaking rules—are associated with negative emotions, and negative emotions reduce the ability to self-regulate. For example, the child who gets in a fight will be angry and probably frustrated. When the fight is broken up, those negative emotions will make it harder for the child to do anything

requiring self-regulation—including staying out of another fight.

The finding that lapses can lead to people more or less giving up their attempts to self-regulate points again to the importance of the student-teacher relationship. With a warm, trusting relationship in place, the teacher will have the credibility to encourage the student to put the lapse behind him, and to resolve again to behave as he knows he should: attend to his work, refrain from fighting, or avoid whatever the trouble spot may be.

The importance of cues in self-regulation failures yields a straightforward classroom application: get rid of the cues. In his celebrated marshmallow study, Mischel noted that the children who did not eat the marshmallow often used a strategy of eliminating the cue: they turned around in their seats, for example, so

that the marshmallow was no longer visible, and thus, less tempting. I once visited a first-grade classroom that had just acquired a rabbit as a class pet. In the hour I was there, children sitting near the bunny found it almost impossible to concentrate on anything else. When I visited the next week, the teacher had hung an attractive wall hanging from the ceiling, hiding the rabbit’s cage. Problem solved. When students are distracted, it’s always worth considering removing the distraction altogether, rather than counting on the students to ignore it. More generally, when there is a trigger in the environment that prompts poor self-regulation in one

or more students, it’s worth weighing the pros and cons of removing the trigger.

**H**elping students better self-regulate is a daunting task because it seems such a personal, permanent quality of an individual. But researchers have shown that it is open to change, and they also have shown that good self-regulation is associated with a broad spectrum of positive academic and social outcomes, and that poor self-regulation is associated with greater risk for correspondingly bad outcomes. These facts highlight the urgency for teachers to do all they can to help students grow in this area. □

The fact that students with initially poor self-regulation benefit most indicates that these children are learning at school something that others learned at home.



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