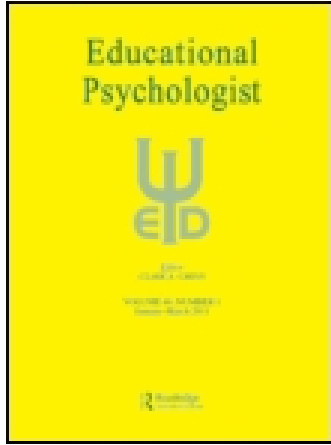


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Publisher: Routledge

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Educational Psychologist

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/hedp20>

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Published online: 19 Jun 2014.

To cite this article: Angela L. Duckworth, Tamar Szabó Gendler & James J. Gross (2014) Self-Control in School-Age Children, *Educational Psychologist*, 49:3, 199-217, DOI: [10.1080/00461520.2014.926225](https://doi.org/10.1080/00461520.2014.926225)

To link to this article: <http://dx.doi.org/10.1080/00461520.2014.926225>

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Self-Control in School-Age Children

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Conflicts between immediately rewarding activities and more enduringly valued goals abound in the lives of school-age children. Such conflicts call upon children to exercise self-control, a competence that depends in part on the mastery of metacognitive, prospective strategies. The *process model of self-control* organizes these strategies into five families corresponding to sequential phases in the process by which undesired and desired impulses lose or gather force over time. *Situation selection* and *situation modification* strategies involve choosing or changing physical or social circumstances. *Attentional deployment* and *cognitive change* strategies involve altering whether and how objective features of the situation are mentally represented. Finally, *response modulation* strategies involve the direct suppression or enhancement of impulses. The process model of self-control predicts that strategies deployed earlier in the process of impulse generation and regulation generally will be more effective than those deployed later. Implications of this self-control perspective for school-age children are considered.

No one can be called educated who will not do something that he would rather not do, at the time it ought to be done.

— Nicholas Murray Butler, founder of Columbia Teacher's College

Learning is said to be its own reward, but the task requirements of “studenting” include doing things that are useful or important in the long run but not altogether pleasant (and sometimes downright unpleasant) in the here and now (Corno & Mandinach, 2004). More than a century ago, James (1899) lectured to school teachers on the importance of self-control to what he considered ineluctable aspects of “classroom drudgery” (p. 109). Although instructional

methods have since evolved, diminishing emphasis on rote practice and memorization, current evidence for self-control as a determinant of academic outcomes is stronger than for any other aspect of personality or temperament (Duckworth & Allred, 2012; Duckworth & Carlson, 2013). For example, in prospective longitudinal studies, students who are better able to regulate their attention, emotion, and behavior earn higher teacher-assigned course grades (Duckworth, Tsukayama, & May, 2010), standardized achievement test scores (Blair & Razza, 2007; Duckworth, Tsukayama, & Kirby, 2013; W. Mischel, Shoda, & Rodriguez, 1989) and high school diplomas (Vitaro, Brendgen, Larose, & Tremblay, 2005).

The benefits of self-control extend beyond formal academic learning: Self-control also predicts social competence and positive relationships with both adults and peers (Eisenberg, Hofer, Sulik, & Spinrad, 2014; Eisenberg et al., 2009); lower levels of cigarette, alcohol, and drug use

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(Romer, Duckworth, Sznitman, & Sunhee, 2010; Wills & Stoolmiller, 2002); and better physical health (Tsukayama, Toomey, Faith, & Duckworth, 2010). Recently, a landmark longitudinal study found that self-control measured in childhood predicts success and well-being in adulthood, including income, savings, and physical and mental health, with effect sizes comparable in magnitude to those of general intelligence or family socioeconomic status (Moffitt et al., 2011). These positive life outcomes were partially explained by better decisions made in adolescence (e.g., staying in school, not smoking, and avoiding becoming a teenage parent).

In this article, we present an integrative model for self-control with a specific focus on different kinds of strategies school-age children can use to resist temptation. We begin by explicitly defining self-control and distinguishing this construct from self-regulated learning. Next, we introduce the *process model of self-control*. Within this theoretical framework, we explain how desired and undesired impulses gather (or lose) strength over time and how self-control involves intentional and strategic intervention at various stages of impulse generation. We then turn to metacognition and prospection, two foundational capacities that enable the deployment of any self-control strategy. Finally, we review the five families of self-control strategies characterized by the process model, including findings from empirical research and their potential application in the lives of school-age children.

CONCEPTUAL FOUNDATIONS

Two literatures are particularly relevant to self-control in school-age children. In the self-control literature, there is a long tradition of studying how individuals adjudicate between conflicting impulses, beginning with James (1899) and Freud (1920) and now including an increasingly large proportion of developmental, personality, social, and clinical psychology researchers (W. Mischel, 2014). More recently, in the educational psychology literature, there has emerged a very rich body of theoretical and empirical work on self-regulated learning (SRL). With few notable exceptions (e.g., Ben-Eliyahu & Linnenbrink-Garcia, 2013; Boekaerts, 2011), these two literatures have developed almost entirely in parallel, with little cross-fertilization. This is unfortunate, because we see self-control and SRL as overlapping—albeit separable—constructs. In this section, we elaborate on how they are both related and distinct, concluding with our specific focus in this article: self-control in school-age children.

Self-Control

Because research on self-control spans diverse theoretical traditions, a confusing array of terms are used synonymously

with self-control (e.g., self-regulation, self-discipline, will-power, effortful control, ego strength, and inhibitory control) and its opposite, impulsiveness (Depue & Collins, 1999; Evenden, 1999; J. L. White et al., 1994; Whiteside & Lynam, 2001). To avoid confusion, we begin by making our own conception of self-control explicit.

For our purposes here, self-control is the voluntary regulation of attentional, emotional, and behavioral impulses when immediate temptations conflict with more enduringly valued goals. We believe that this perspective represents an increasingly consensual definition of self-control, resonant not only with diverse psychological traditions (Baumeister, Heather-ton, & Tice, 1994; Eisenberg, Smith, Sadovsky, & Spinrad, 2004; Freud, 1920; Fujita, 2011; Hofmann, Friese, & Strack, 2009; Milkman, Rogers, & Bazerman, 2008; W. Mischel et al., 1989; Rachlin, 2000; Rothbart & Rueda, 2005) but also with classical and contemporary philosophical work on the same topic (Aristotle, 1999; Frankfurt, 1971).

Two features of our definition of self-control merit elaboration. First, self-control requires doing what we know to be best in the long run in the face of a more immediately rewarding option. For instance, in the delay of gratification task, children who wait long enough get to eat a larger amount of a favorite treat (e.g., two marshmallows) rather than a smaller amount (e.g., one marshmallow) right away (W. Mischel, Shoda, & Peake, 1988; W. Mischel et al., 1989). On many occasions, the rewards of exercising self-control are not only delayed but also abstract. For instance, students are often exhorted to study in order to “better their future prospects” or “to improve themselves” or “to fulfill their potential.” Both temporal distance and conceptual abstraction reduce the psychological salience of long-term goals that, although enduringly valued by the individual, are dramatically less alluring in the moment of choice than more concrete, immediately rewarding temptations (Fujita, Trope, Liberman, & Levin-Sagi, 2006). Our second definitional requirement of self-control is that it be self-initiated. The term “self” as a prefix to the term “control” specifies that it is the individual, rather than an authority figure, who instigates the process of regulation. This point allows us to distinguish between two classroom scenarios: an orderly classroom in which students are encouraged and taught to exercise self-control, and another where students are merely conforming to rules for fear of punishment. Children who willingly comply with directives from adults are easier to manage than those who do not, but compliance should not be confused with fully autonomous, self-initiated regulation (Eisenberg, Duckworth, Spinrad, & Valiente, 2012).

Self-Regulated Learning (SRL)

In recent decades, the construct of SRL has flourished in the educational psychology literature (Boekaerts & Cascallar, 2006; Corno & Mandinach, 2004; Efklides, 2011; Pintrich & de Groot, 1990; Winne & Hadwin, 1998; Zimmerman,

1990, 2000). SRL is defined differently by different authors but generally refers to “the agentic role of the learner” in autonomously, efficaciously guiding his or her own academic learning (Efklides, 2011, p. 6). SRL thus encompasses all aspects of students’ taking charge of their own learning. For example, SRL processes include volitional processes we discuss in this article (e.g., academic goal setting, planning, and self-talk) as well as motivational processes (e.g., academic self-efficacy, academic task value, and performance vs. mastery goal orientation) and cognitive processes (e.g., memorization and decoding strategies; Corno, 2011; Wolters, 2003; Zimmerman, 2000, 2008) we consider to be distinct from self-control. Accordingly, widely used questionnaire and interview measures of SRL assess not just how students handle conflicts between their academic goals and more pleasurable alternatives but also test taking and reading comprehension strategies, memorization and rehearsal strategies, interest and confidence in school, and anxiety about academic performance, among other factors (see Zimmerman, 2008, for a review). In sum, SRL is a very broad construct insofar as it encompasses all aspects of self-directed learning and yet highly domain-specific insofar as it is concerned exclusively with academic goals.

Self-Control in School-Age Children

Our interest in this article is to explore how school-age children can exercise self-control in all important domains of their life. Table 1 provides verbatim examples of everyday self-control successes and failures nominated by large and diverse sample of middle school students (Tsukayama, Duckworth, & Kim, 2013). These are the sorts of situations of interest to us here. Notably, although many examples relate to academic learning in the classroom (e.g., “tuning into what the teacher is saying,” “fooling around instead of completing work”), others relate to academic learning outside of the classroom (“not watching TV at the same time as doing homework,” “doing work as early as possible”). Many other examples relate to nonacademic domains of life (e.g., “doing your chores,” “starting a fight,” “cutting the line”).

Individuals who successfully exercise self-control in one domain may struggle mightily in another, and this within-individual domain-specificity can largely be explained by differences in how attractive some temptations are relative to others (Tsukayama, Duckworth, & Kim, 2012, 2013). For instance, a child who struggles with her temper but not with her homework may experience stronger impulses to discharge her anger than to procrastinate. Still, self-controlled behavior is moderately correlated across domains, suggesting that in conjunction with domain-specific impulses, there are also domain-general processes, including learnable, teachable strategies that explain why, across domains, some children are generally more self-controlled than others.

Thus, our perspective encompasses a *wider* range of situations (e.g., maintaining friendships) than those

TABLE 1
Examples of Self-Control Successes and Failures From Among
Hundreds Volunteered by Middle School Students

Self-Control Successes

Paying attention in class
Double-checking work
Tuning into what the teacher is saying
Being patient when a family member does something that could be annoying
Finishing your work on time
Being forgiving when a family member does something you don’t like
Giving others a chance to talk during discussions
Sitting up in your chair
Not watching TV at the same time as doing homework
Saying “Excuse me”
Doing work as early as possible
Doing your chores
Greeting teachers
Buckling seat belt
Raising your hand if you want something
Using table manners
Writing neatly
Taking only as much as you can eat
Taking out the trash
Asking for help if you need help

Self-Control Failures

Text messaging someone while you are supposed to do something else
Saying mean things to the bus driver
Leaving a room messy and dirty
Getting your brother or sister in trouble on purpose
Playing computer or videogames without permission
Asking for help without trying first
Mocking a teacher
Littering
Whining
Fighting over the TV remote
Throwing gum on the floor
Doing something totally irrelevant to what is going on in class
Passing notes while you’re supposed to pay attention to class
Cutting the line
Starting a fight
Eavesdropping
Cutting class
Breaking something (like a window) on purpose
Gossiping
Not flushing the toilet
Fooling around instead of completing work
Forgetting something needed for class
Not being able to find something because your desk, locker, or bedroom was messy
Forgetting to remember what your teacher told you to do
Letting your mind wandering when you should have been listening
Losing your temper at home or at school
Interrupting other students while they were talking
Saying something rude
Talking back to a teacher or parent when you are was upset

Note. Data from Tsukayama, Duckworth, and Kim (2013).

traditionally considered in SRL research. At the same time, we will be limiting our exposition to only a *subset* of SRL processes (specifically, volitional strategies enabling students to choose between valued goals and less valued but

momentarily more attractive temptations). That is, we will not consider motivational aspects of SRL (e.g., mastery vs. performance goal orientations) or cognitive processes unrelated to navigating conflicts between temptations and enduringly valued goals. (See Wolters, 2003, and Zimmerman, 1998, for important reviews of volitional processes in SRL.)

One recent empirical investigation comparing self-control to SRL found that although questionnaire measures of both constructs are associated with academic performance in high school, SRL questionnaires demonstrate greater predictive validity (Zimmerman & Kitsantas, 2014). We highlight this important study because it represents one of the first attempts to integrate these research traditions. In our view, the findings support our proposition that the construct of SRL is broader (encompassing all psychological processes related to autonomous learning, not just those that are volitional in nature) but also more domain specific (focusing specifically on the domain of academic learning). As might be expected, associations with outcomes like report card grades and standardized achievement test scores are stronger when predictors include motivational, cognitive, and volitional dimensions of student competence. Moreover, because SRL questionnaires refer specifically to the academic domain, whereas self-control questionnaires are domain general, we are not surprised that the predictive validity for academic outcomes was higher in Zimmerman's study for measured SRL than for measured self-control.

Although self-control generally improves as children grow older¹ (Eisenberg et al., 2012; Rueda, Posner, & Rothbart, 2005), most teachers are eager to accelerate its development. If, as a guide to classroom management published more than four decades ago suggests, "self-imposed discipline is the ideal of professional educators for their students" and if, to a large degree, "such discipline is a learned behavior" (LaGrand, 1969, p. 2), what do we know now, that we didn't before, about how to teach it? Is self-control, as the colloquial term *willpower* implies, simply a matter of forcing oneself to do what one doesn't feel like doing when directly confronted with temptation? Or are the most effective self-control strategies enacted long before temptations cross our path? In the remainder of this article, we use the *process model of self-control* to organize diverse self-control strategies according to their common

mechanisms. In doing so, we emphasize the relative efficiency of strategies that effectively change the strength of desirable and/or undesirable impulses well in advance of direct encounters with temptation.

THE PROCESS MODEL OF SELF-CONTROL

A popular view of self-control equates the capacity to resist temptation with internal fortitude. Likewise, most contemporary psychology research on self-control is dominated by the ego depletion model, a theory that suggests self-control relies on a limited energy source: With every act of self-control, this posited source of self-control energy is depleted (Baumeister, Schmeichel, & Vohs, 2007). In support of this model, ego depletion theorists have demonstrated in laboratory studies that performing one self-control task can impair performance on a second, unrelated self-control task. For example, undergraduates asked to eat radishes instead of candies and cookies subsequently quit faster on unsolvable puzzles than undergraduates asked to eat candies and cookies instead of radishes (Baumeister, Bratslavsky, Muraven, & Tice, 1998). As discussed in more detail next, we agree that brute force suppression or strengthening of undesired or desired impulses is one way to exercise self-control. We also concur that it can feel "exhausting" to do so, and in fact such exertions can impair later self-control. Where we differ is our emphasis on the multitude of intentional moves an individual can make far in advance of "last-ditch" efforts to directly modulate responses. Whereas the ego depletion model suggests that any attempt to regulate attention, emotion, and behavior necessarily exhausts a finite energy source that cannot in the short term be restored, our view is that aligning our actions with our intentions need not be such an aversive and unsustainable endeavor.

Indeed, as the story of Ulysses and the Sirens aptly illustrates, individuals can exercise self-control in considerably more strategic ways. On his famous odyssey home from the Trojan War, Ulysses is told by the goddess Circe that his ship will soon be passing the island of the Sirens, a group of beautiful sea nymphs whose enchanting song is known to lure sailors to a certain death. Aware that he and his crew will be unable to resist the temptation, Ulysses takes precautions: He blocks his sailors' ears with beeswax so that they will not hear the tempting voices and orders them to bind him firmly to the ship's mast so that he will be unable to act when he encounters their seductive sounds (Homer, 1961).

In a similar vein, Schelling wrote in his 1978 essay, "Economics, or the Art of Self-Management,"

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to forswear. Sometimes we put things out of reach for the moment of temptation, sometimes we promise

¹Note, however, that adolescents often behave more impulsively than slightly younger children. Why this is so, despite generally improving self-control competence, has remained a mystery until very recently. It is now known that during adolescence there is a dramatic increase in sensitivity to rewards and, in particular, to the thrill of risky, dangerous, rule-breaking behavior (Steinberg, 2007; Steinberg et al., 2009). Thus, although the capacity to regulate attentional, emotional, and behavioral impulses seems to improve steadily with age, certain impulses are especially strong during adolescence—and it is the combination of these two developmental trends that produces the spike in impulsive behavior.

ourselves small rewards, and sometimes we surrender authority to a trustworthy friend who will police our calories or our cigarettes. We place the alarm clock across the room so we cannot turn it off without getting out of bed. People who are chronically late set their watches a few minutes ahead to deceive themselves. (p. 290)

From personal experience and observation, Schelling enumerated many other “contrivances,” like committing publicly to deadlines that set a real penalty on procrastination and modifying exercise routines that make physical exertion feel more like a game than a duty.

The array of self-control strategies that Schelling (1978, 1984) and others (e.g., Ariely, 2008; Ariely & Wertenbroch, 2002; W. Mischel & Ayduk, 2004; Perry, Hechter, Menec, & Weinberg, 1993; Poston & Foreyt, 2000; Rachlin, 2000; Wansink, 2007; Wolters, 2003; Zimmerman, 1998) have described is dizzying, both in terms of their number and their variety. Are some “tricks” more effective than others? How do they work, and do they all work in the same way? Such questions can begin to be addressed when we organize diverse self-control strategies according to the temporal stage at which they are employed. Specifically, we can group strategies by *how* and *when* they work because distinct psychological processes unfold in sequence as we approach the required moment of resistance. Although not the only way to organize self-control strategies, temporal ordering is nevertheless very useful, in our view, for reasons we elaborate below. (See Wolters, 2003, and Zimmerman, 1998, for alternative frameworks rooted in the SRL tradition.)

Our theoretical framework for organizing self-control strategies represents an extension of the *process model of emotion regulation* (Gross, 1998; Gross & Thompson, 2007). This model proposes that impulses are response tendencies that develop over time. As illustrated in the upper portion of Figure 1, impulses are thought to come into being and to increase or decrease in intensity through a recursive situation-attention-appraisal-response sequence: First, an individual encounters a particular situation (e.g., walks into a noisy, somewhat chaotic classroom), next he

attends to particular features of this situation in particular ways (e.g., notices his friends talking in one corner), and then he appraises the situation (e.g., construes this as a good opportunity to find out what happened at the party he missed last night) in a way that, finally, gives rise to the generation of an impulse, or response tendency (e.g., walking over to join the conversation). This sequence is temporally and causally unidirectional; earlier stages causally influence later stages but not vice versa (e.g., entering a noisy classroom makes it more likely that a student will see his friends, but seeing his friends does not make entering the classroom more likely).

Because impulses are not always strong enough to be enacted in a single iteration, the cycle of situation-attention-appraisal-response often iterates several times before a response tendency is enacted. With each iteration, impulses can increase or decrease in intensity, depending on how information is processed. It is important to note that *several* recursive situation-attention-appraisal-response loops can be activated at once (Ochsner & Gross, 2014). Thus, in the preceding example, entering a noisy classroom might, in parallel, remind the student of his teacher’s request to “keep things quiet during this free period,” which may lead to the appraisal that taking out a book to read would be a good idea that may strengthen the impulse to take a seat and start reading. For any of these loops, the stronger the generated impulse, relative to other response tendencies, the more likely it is to be enacted. It is in the student’s interest to potentiate impulses that support her long-term goals (e.g., the impulse to get to join classmates in casual conversation) and to attenuate impulses that conflict with those goals (e.g., the impulse to instead watch another half hour of reality television). Hence, the crux of self-control is intentionally turning the tides by strengthening desired impulses and weakening undesired impulses.

We contend that directing the tides of impulse generation *earlier* is generally more efficient than attempting to do so later. Intervening earlier in the process is higher leverage in that doing so influences downstream stages within a given iteration of the situation-attention-appraisal-response loop as well as subsequent iterations thereof (for similar arguments, see Hofmann & Kotabe, 2012; Hofmann & Van Dillen, 2012; Magen & Gross, 2010; Sheppes & Gross, 2011). Therefore, the situation we choose to be in causally influences where we direct our attention; in turn, where we direct our attention influences how we appraise our situation; and this appraisal then helps determine how we respond. How we respond, of course, may alter our situation, leading again to downstream effects on attention, appraisal, and our next response. Paradoxically, the most forward-looking self-control strategies may be the least obvious for the same reason they are so effective: They minimize the subjective distress of resisting immediate gratification. In contrast to the ego depletion model, our model suggests that willpower, using “tricks”

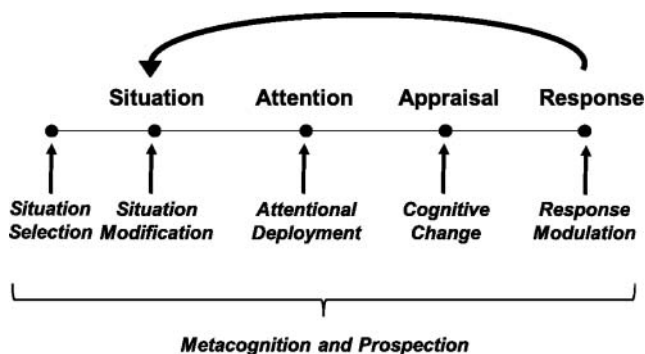


FIGURE 1 Process model of self-control, adapted from Gross & Thompson (2007). © Guilford Press. Adapted by permission of Guilford Press. Permission to reuse must be obtained from the rightsholder.

of the sort Schelling describes, may not *feel* like a test of the will at all.

The process model was originally developed to explain how individuals regulate their experience and expression of emotion. The unique theoretical contributions of our present article are threefold: First, we generalize the process model beyond emotion regulation to explain the regulation of attentional and behavioral impulses. To do so, we expand upon an initial effort by Magen and Gross (2010), presenting a more extensive exposition of how and why the outcome of each stage of impulse generation can be strategically directed. Second, whereas Magen and Gross explored self-control challenges facing adults (e.g., getting adequate physical exercise), we are here concerned with how the process model might illuminate the everyday dilemmas facing school-age children, including the examples listed in Table 1. Finally, we address metacognition and prospection, general capacities we consider foundational for the enactment of any self-control strategy but that have not been explicitly related to the process model.

THE FOUNDATIONS: METACOGNITION AND PROSPECTION

As illustrated in the lower portion of Figure 1, self-control strategies of all types rely on general capacities for metacognition and prospection. This is because all strategies entail using reflective, higher order mental processes to make predictions about how lower order processes will play out and, crucially, to intervene with these lower order processes.

Metacognition

Metacognition is cognition about cognition (Flavell, 1979). Metacognitive processes are second-order mental processes that take first-order, or primary, processes as their objects. As noted by several other authors (Achtziger, Martiny, Oettingen, & Gollwitzer, 2012; Flavell, 1979; Nelson, Narens, & Shimamura, 1994), self-control as we have characterized it is inherently metacognitive: In the absence of a higher order process, when two impulse-generating processes—one more valued in the long run but less salient at the moment and the other less valued but more salient—come into conflict, the less valued but more salient choice can dominate. However, a higher order process can in fact adjudicate between these impulses and, in various ways described in more detail later, diminish the potency of the less valued impulse and/or increase the potency of the more valued impulse.

In general, older children demonstrate more accurate metacognitive knowledge than younger children (Dimmitt & McCormick, 2012), suggesting that age-related increases in the capacity for self-reflexive cognition contribute to

age-related maturation in self-control (Cunningham, Zelazo, Packer, & Van Bavel, 2007). H. N. Mischel and Mischel (1983) showed that metacognitive knowledge about self-control strategies improves from age 4, when many children falsely believe that leaving treats in plain view in the delay of gratification paradigm makes it easier to wait for them, to age 6, when most children have learned that out of sight means out of mind. Similarly, H. N. Mischel and Mischel found that by age 12, most children understand that mentally representing treats in abstract, nonconsummatory terms (“The marshmallows are puffy like clouds”) facilitates delaying gratification compared to representing treats in concrete, consummatory terms (“The marshmallows taste yummy and chewy”; p. 606). Like W. Mischel (1981), our view is that increasingly sophisticated and accurate metacognitive knowledge about what makes self-control easier rather than harder lays the foundation for “a diverse array of strategies for effectively managing otherwise formidable tasks, and for overcoming ‘stimulus control’ with self-control” (p. 267).

Of course, normative age-related improvements do *not* imply that advances in metacognitive skills and knowledge are inevitable benefits of growing older. Social interactions with same-aged peers, older peers, and caring adults provide essential opportunities to model and practice metacognitive skills (Bandura & Mischel, 1965; Bodrova & Leong, 2007). In preschool-age children, providing opportunities and encouragement for pretend play has been theorized to cultivate metacognition and self-control (Berk, Mann, & Ogan, 2006; Singer & Singer, 2006; Vygotsky, 1933/1978; Whitebread, 2010), though it should be noted that a recent meta-analysis (Lillard, 2012) concluded that more empirical evidence is needed to confirm causal claims. It has recently been suggested that for school-age children, metacognitive skills and knowledge-supporting self-control be taught directly, trained, and supported in the same way that violin, mathematics, and soccer might be, with “many positive models of the successful exercise of self-control” and “many hours of practice” (Strayhorn, 2002b, p. 17; Strayhorn, 2002a).

Self-talk—literally talking to oneself, either out loud or covertly—appears to facilitate metacognitive representations, particularly in younger children. As just discussed, long-term goals are abstract by their nature (e.g., good health, honesty) or by virtue of being temporally removed from the present moment (e.g., two marshmallows after an indeterminate wait). Unlike immediately available temptations, therefore, long-term goals are often mentally represented in the inherently symbolic currency of words. This may explain the positive association between verbal ability and wait time in the delay of gratification paradigm (Rodríguez, Mischel, & Shoda, 1989) and the observation of preschoolers talking to themselves, reminding themselves of the contingencies of the situation (“If I wait here a little longer, I get to eat two marshmallows instead of one!”; Carlson

& Beck, 2009). Clinical research with highly impulsive children demonstrates that self-talk can be deliberately modeled, practiced, and reinforced (Kendall, 1977; Meichenbaum & Goodman, 1971). Kolovelonis, Goudas, Hassandra, & Dermitzaki (2012) have shown in a random assignment study of fifth and sixth graders that self-talk facilitates performance on physical tasks. Relatedly, in a review of programs shown to improve self-control, three of four curricula highlighted by Diamond and Lee (2011) explicitly encourage self-talk. (See Corno, 2001; McCaslin & Hickey, 2001; and Zimmerman, 2000, for a lengthier discussion of inner speech in school-age children.)

It bears noting that the metacognitive beliefs students acquire are not always adaptive. For instance, some students come to believe that their intelligence is entirely fixed (Yeager & Dweck, 2012), a belief at odds with empirical evidence that intelligence can be changed incrementally as a function of experience (Nisbett et al., 2012). The belief that human attributes are malleable is associated with higher self-control and academic achievement (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). Most relevantly, some individuals hold the metacognitive belief that self-control depends on a finite, physical resource (Job, Dweck, & Walton, 2010), a belief that leads individuals to set fewer goals (Mukhopadhyay & Johar, 2005) and to withdraw effort from challenging tasks (Job et al., 2010; Job, Walton, Bernecker, & Dweck, in press). Longitudinal intervention studies have established that when school-age children are exposed to information that corrects metacognitive fallacies, they respond with greater effort and improved academic performance (Yeager & Dweck, 2012).

Prospection

Prospection is the mental representation of possible futures (Gilbert & Wilson, 2007; Seligman, Railton, Baumeister, & Sripada, 2013). Insofar as they are initiated before, not after, impulses to indulge in temptation have gathered strength, strategies in the first four families identified in Table 1 require at least some degree of forethought and planning. And, even response modulation strategies—those initiated in the final stage of confronting temptation—are most likely to succeed when conceived of and committed to in advance. For instance, making simple, specific plans in advance enhances performance on challenging executive function tasks requiring task switching or response inhibition (A.-L. Cohen, Bayer, Jaudas, & Gollwitzer, 2008). Not surprisingly, personality questionnaires assessing self-control invariably include items or subscales assessing the tendency to plan ahead, regardless of whether they are designed for parents to rate their preschool children (Rothbart, Ahadi, Hersey, & Fisher, 2001) or for school-age children (Eysenck, Pearson, Easting, & Allsopp, 1984) or adults (Barratt, 1965, 1972; Tangney, Baumeister, & Boone, 2004; Whiteside & Lynam, 2001; Whiteside,

Lynam, Miller, & Reynolds, 2005) to rate themselves. Similarly, measures of SRL typically include goal setting and planning (Zimmerman, 2008), and the SRL literature affirms that such skills correlate with academic performance (e.g., Eilam & Aharon, 2003).

Like metacognition, prospection evolves over childhood and adolescence (Nurmi, 1991, 2005; Romer et al., 2010; Steinberg et al., 2009). For example, Steinberg et al. (2009) found that relative to early adolescents, older adolescents care more about the future, anticipate the future consequences of their behavior, and plan ahead. In the same study, older adolescents expressed a greater willingness to delay gratification: When given a series of hypothetical choices between smaller, sooner and larger, later sums of money (e.g., \$800 tomorrow vs. \$1,000 in a month), older adolescents were more likely to choose the latter. Romer et al. (2010) found very similar results in a nationally representative sample of American youth aged 14 to 22 years.

As with metacognition, age-related changes in prospection can be maladaptive. For example, simply fantasizing about the realization of future goals does not motivate action toward their realization (Oettingen, 2012; Taylor, Pham, Rivkin, & Armor, 1998). Likewise, exclusively dwelling on obstacles that lie beyond one's control does not incline individuals to take goal-directed action (Rotter, 1966; Seligman, 1990; Weiner, 1992). The good news is that children, adolescents, and adults have all demonstrated the capacity to learn more adaptive forms of prospection, such as mental contrasting with implementation intentions (Oettingen, 2012). In mental contrasting, a desired future goal is specified and then the positive outcomes of attaining this goal are articulated and contrasted with negative obstacles within control of the individual that stand in its way. Mental contrasting sets the stage for implementation intentions, specific action plans for when, where, and how to take action in order to circumvent or avoid the anticipated obstacles. In longitudinal intervention studies, mental contrasting with implementation intentions training has been shown to increase self-controlled behavior in school-age children (Duckworth, Gollwitzer, Kirby, & Oettingen, 2010), adolescents (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011), and adults (Adriaanse et al., 2010; Christiansen, Oettingen, Dahme, & Klinger, 2010; Kirk, Oettingen, & Gollwitzer, 2013). Preschool children also benefit from planning in advance how they hope to act in the future, though they require more direct guidance from adults to do so (Bodrova & Leong, 2001; W. Mischel & Patterson, 1976).

FIVE FAMILIES OF SELF-CONTROL STRATEGIES

As suggested by Figure 1, self-control strategies can be categorized into five families depending on the stage in the impulse-generative process at which they intervene.

Situation selection and *situation modification* strategies change our external circumstances, *attentional deployment* and *cognitive change* strategies influence our mental representations of our circumstances, and finally *response modulation* strategies intervene at the point of behavioral response. In the next subsections, we describe the five families of self-control strategies. For each family, we summarize relevant findings from both basic and applied research, extending our purview to related literatures (e.g., addiction research, dieting research) and studies of adults. In general, we find empirical evidence corroborating the efficacy of self-control strategies but surprisingly little translational research involving school-age children. Thus, our suggestions for how school-age children might employ particular self-control strategies in their everyday struggles with temptation (see Table 2) are necessarily extrapolative.

Situation Selection

Self-control strategies in the *situation selection* family involve consciously choosing to be in places or with people that facilitate self-control. Selecting situations strategically entails metacognition and prospection in the service of moving into contexts whose physical and social cues tend to strengthen desired impulses and attenuate undesired ones. Consider, for instance, a student whose goal is to stop procrastinating on homework. After school, she might decide that working will be easier in the school library. There, physical cues that prime thoughts of schoolwork (e.g., books, papers) abound, whereas physical cues that

prime thoughts of diversion or amusement (e.g., cell phones, video games) are absent. Thus, a student's attention may more easily be directed to work at the library than at home. A recent naturalistic study in which middle, high school, and college students were observed studying for 15 min in their homes found an average of between two and three visible technology-related distractors (e.g., TV, cell phone, Facebook page) in the study area (Rosen, Carrier, & Cheever, 2013). On average, students in the study studied fewer than 6 min before switching to technological distractors.

Another reason to choose the library over home is to capitalize on social cues in the situation (e.g., other students engaged in studying). Laboratory research has demonstrated that children tend to mimic the behavior of other people, even if they are complete strangers who act out a routine without words (Bandura, 1965; Herrmann, Legare, Harris, & Whitehouse, 2013). At least one study has shown that school-age children who watch an adult model delaying gratification follow suit, with measurable effects one month later (Bandura & Mischel, 1965). Modeling the behavior of others may be even more dramatic when social influences are intimate peers, as has been documented in naturalistic field work (Hogue & Steinberg, 1995; Kandel, 1978). Emerging experimental research on the dynamic social networks of school-age children indicates that friends help determine what children believe to be "normal" or "good" and, in turn, their own behavior, for example, with respect to bullying (Paluck & Shepherd, 2012).

TABLE 2
Families of Self-Control Strategies: Suggested Applications to School-Age Children

Strategy Type	Applications to School-Age Children
Situation selection	Studying in the library rather than at home to avoid distraction Spending time with more self-controlled (vs. more impulsive) classmates Joining a sports team with a strict and demanding coach Choosing a route to walk home which bypasses the mall or other venues that trigger impulsive behaviors
Situation modification	Sitting closer to the teacher and/or farther from more talkative students Placing cell phone out of reach or out of sight (e.g., in a desk drawer) Taking batteries out of the television remote control Choosing due dates for projects that evenly space work over time Turning off wireless connection if using laptop in class Using an app that limits use of Internet or blocks tempting sites
Attentional deployment	Tracking the speaker (i.e., looking directly at the teacher or the student who is speaking) Counting backwards from 100 during heated conflicts (e.g., after getting pushed on the playground or in the hallway) Imagining the aftermath (e.g., afterschool detention) of indulging in temptation (e.g., texting in class)
Cognitive change	Appraising physiological arousal (e.g., elevated heart rate) as excitement rather than anxiety during a test Framing mistakes as information rather than criticism Framing mental effort as an opportunity to exercise willpower Breaking a large, seemingly insurmountable project into smaller, more feasible chunks
Response modulation	Engaging in previously planned behaviors Deep breathing

Outside of educational psychology, there is considerable empirical support for the importance of both physical and social cues to self-control. For example, overweight children and adults tend to eat more after smelling and seeing tempting foods (Jansen et al., 2003; Papies & Hamstra, 2010; Rogers & Hill, 1989). Likewise, the sight and smell of cigarettes or even the location in which cigarettes are usually smoked can induce lapses in smokers trying to quit (Niaura et al., 1988). Physical trigger cues have been demonstrated to be the single most potent determinant of successful abstinence among drug addicts (Bonson et al., 2002; Kelley, 2004; Weiss, 2005). Drug addicts who continue to socialize with other drug users are more than 4 times more likely to continue to use drugs themselves (Schroeder et al., 2001), leading many treatment programs to advise recovering addicts to move to a new neighborhood (Doyle, Friedmann, & Zywiak, 2013). The dramatic influence of salient environmental cues on self-controlled behavior (Mann & Ward, 2007; Thaler & Sunstein, 2008; Wansink, 2007) helps explain why more self-controlled adults tend to avoid temptations as they go about their daily lives (Hofmann, Baumeister, Förster, & Vohs, 2012).

Other than studying in the library, how might students use situation selection to facilitate self-control? We sketch out just a few speculative ideas in Table 2, including joining a sports team known to have a demanding coach. Choosing a route to walk home that bypasses the shopping mall is another idea. And, of course, spending more time with more self-controlled friends and less time with more impulsive friends may help. We are confident that students themselves are in a much better position to think about how they might place themselves in situations that make adherence to long-term goals easier rather than harder. Nevertheless, we are also assured that encounters with temptation cannot always be avoided entirely. Thus, we now turn our attention to how children can change, rather than select, their situations to advantage.

Situation Modification

Situations that cannot be avoided can often be proactively modified: *Situation modification* strategies entail purposefully changing the physical or social situation to either strengthen desired impulses or attenuate undesirable ones. Both metacognition and prospection are necessary for situation modification. To illustrate, consider the dilemma of getting out of a warm bed on a cold morning, a predicament that James (1890) described from personal experience:

We know what it is to get out of bed on a freezing morning in a room without a fire. . . . Probably most persons have lain on certain mornings for an hour at a time unable to brace themselves to the resolve. We think how late we shall be . . . but still the warm couch feels too delicious, the cold outside too cruel. (p. 524)

Situation selection will not work here. At least, it is not obvious how one can *avoid* altogether waking in a warm bed—hence Schelling’s advice to physically *modify* the situation, in particular by setting an alarm clock and placing it across the room the night before. Choosing the cold morning air over a warm bed can be difficult, but successful prospection will reveal that choosing the cold-morning-air-with-quiet over a warm-bed-with-blaring-noise is a bit easier.

Schelling’s alarm clock tactic exemplifies precommitment, a type of situation modification strategy in which individuals voluntarily change their situations to make temptations more costly or less attractive. For example, Ariely and Wertenbroch (2002) showed that undergraduates can voluntarily self-impose deadlines for long-term projects, agreeing in advance that their professors will deduct points if deadlines are not met, and these deadlines in fact do improve academic performance. Outside the educational context, Schwartz et al. (2014) has shown that grocery shoppers can use precommitment contracts (i.e., promising to pay a higher bill if they do not meet a target goal) to help them make healthier food purchases. Likewise, some recovering alcoholics take drugs that create immediate symptoms of a severe hangover upon consumption of alcohol (Krampe et al., 2006; Luty, 2006).

Another form of situation modification is to hide temptations from view, a technique that most children seem to intuit without direct instruction soon after their preschool years (H. N. Mischel & Mischel, 1983). Perhaps the earliest modern empirical evidence for the adage “out of sight, out of mind” comes from a series of experiments by W. Mischel and Ebbesen (1970) in which rewards in the delay of gratification paradigm were either concealed from view or left visible. Compared to when rewards were made visible, preschool children could wait much longer when rewards were hidden from view by an opaque cover or removed from the room by an experimenter. Likewise, W. Mischel, Ebbesen, and Zeiss (1972) found that children given a toy to play with waited longer than when no diversions were made available. Similarly, Wansink, Painter, and Lee (2006) found that secretaries ate more candy when the candy bowl was clear versus opaque. In the same study, secretaries ate more candy when the bowl was placed on their desk versus 2 m away, suggesting that not only visibility but also convenience can be manipulated to dampen the attractiveness of temptations. Relatedly, Rozin et al. (2011) found that making items in a salad bar only slightly more difficult to reach measurably reduced their consumption. Of course, the obverse—making desired impulses stronger by increasing the salience of goal-related cues—is also a form of situation modification. For example, correlational studies find that academic engagement is higher among students who sit at the front of the classroom (Schwabel & Cherlin, 1972; Walberg, 1969), and in one experimental study, elementary school

students who were randomly assigned to sit in the front of the classroom were rated by their peers as more attentive by both peers and teachers (Schwebel & Cherlin, 1972).

A third form of situation modification is to pair desired impulses (e.g., doing homework or household chores) with rewards (e.g., a small snack when the work is done). For example, listening to music has been shown to reduce the tedium of completing repetitive work tasks (Sansone, Weir, Harpster, & Morgan, 1992). Similarly, listening to entertaining audiobooks has been shown to increase gym visits, particularly if individuals follow a rule of not listening to them at any other time (Milkman, Minson, & Volpp, 2014). Of course, praise is itself a powerful reward, and students can learn to praise themselves for completing arduous but important tasks (Rosenbaum & Drabman, 1979; Strayhorn, 2002b). Indeed, numerous laboratory and field studies have shown that rewards (whether in the form of praise, food, enjoyable activities, or money) that are self-administered for completing a desired action tend to produce performance which is as good or better than when rewards are administered by another individual (e.g., teacher; Bandura, 1976).

Because they have less freedom than adults to choose where they spend time, school-age children may find situation modification more practical than situation selection. Imagine, for example, challenging a classroom of students to each make just one small physical change to their environments in order to facilitate self-control. We found that undergraduates tasked with this assignment were quite creative: Many students found smartphone apps that blocked access to distracting websites for periods of time (R. E. White, Shearer, Gross, & Duckworth, 2014). Others shut down their computers or turned their phones completely off while studying. One student hid her nail polish in a drawer to avoid procrastinating on her Chinese assignments, and another turned the television around so that he could not see the screen while sitting at his desk. Regardless of the particular change students made, they were as a group better able to meet their self-assigned study goals the following week than students randomly assigned to either a no-treatment or placebo-control condition. See Table 2 and Corno (2001) for additional suggestions.

Attentional Deployment

Sometimes, people are confronted with temptation in situations that they can neither choose nor change. In such cases, self-control is facilitated by selectively attending to certain aspects of the situation that either minimize the salience of temptation or heighten the salience of long-term goals. Like situation selection and situation modification, attentional deployment in the service of self-control requires both metacognition (thinking about one's attentional focus) and prospection (determining what it might be like if one

were to alter one's attentional focus). Although *attentional deployment* does not change any aspect of objective reality, it can dramatically alter subjective experience. Returning to the example of a warm bed on a freezing morning, James (1890) noted the utility of manipulating attention toward the day's plans:

If I may generalize from my own experience, we more often than not get up without any struggle or decision at all. A fortunate lapse of consciousness occurs; we forget both the warmth and the cold; we fall into some reverie connected with the day's life, in the course of which the idea flashes across us, "Hollo! I must lie here no longer"—an idea which at that lucky instant awakens no contradictory or paralyzing suggestions, and consequently produces immediately its appropriate motor effects. (p. 524)

Once attention is guided to the day's events, the impulse to get up is activated, whereas the impulse to cling to warmth and comfort is weakened. One can imagine adolescents in the same predicament as James intentionally overcoming the urge to lie in bed by turning their attention to breakfast, their first-period class, and the friends they hope to see that day. Likewise, one can imagine children struggling to complete a difficult reading assignment intentionally turning their backs to chatty classmates, or children struggling to contain their temper looking away from a momentarily despised adversary.

How does the strategy of attention deployment work? Any situation has many more features than we can possibly attend to at any given moment (Johnston & Dark, 1986). Like pinhole cameras, our perceptive faculties allow our brains to process just a fraction of the available information in a given situation. The literature on change blindness, the failure to notice objectively large changes in a visual stimulus (Simons & Ambinder, 2005) has vividly demonstrated this point, but everyday experience also confirms that we cannot attend to all possible features of our situations at once. Because only a tiny subset of cues in our physical environment (or, for that matter, cues in our internal environment like hunger or itchiness) is able to enter consciousness at once, we can *choose* to attend to those that facilitate, rather than undermine, our self-control (see Kavanagh, Andrade, & May, 2004).

Research employing the delay of gratification paradigm confirms James's suggestion to direct attention away from temptation. Specifically, in correlational studies, children who spontaneously diverted their gaze away from rewards waited longer than children who look directly at the rewards (W. Mischel et al., 1988; Rodriguez et al., 1989). A longitudinal study by Sethi, Mischel, Aber, Shoda, and Rodriguez (2000) showed that toddlers who used selective attention as a means of regulating their emotion were, at age 5, better able to delay gratification. In experimental studies, children randomly assigned to a condition in which

they are gently encouraged to think fun thoughts (e.g., singing songs, playing with toys) during the delay period wait longer than children assigned to conditions in which they are encouraged to think about either sad things or the rewards themselves (W. Mischel et al., 1972).

Selective attention has also been demonstrated to facilitate self-control when children must actively work, rather than passively wait, for deferred gratification. For instance, in Patterson and Mischel (1975), preschool children completed a boring pegboard task while “Mr. Clown Box,” a toy with flashing lights and other fun features, kept trying to interrupt them (“Come play and talk to me. I have big ears and love to hear what children say!”). Children were promised that if they kept working the entire time while the experimenter stepped away, they would be allowed to play with “fun toys” rather than “broken toys” shown to them at the beginning of the session. Children given strategies for focusing attention away from the Clown box and toward their work task (e.g., if the Clown Box makes that *bzzt* sound, then you can say to yourself, “I’m going to keep working so I can play with the fun toys and Mr. Clown Box later”) worked during 84% of a testing session, compared to children assigned to a no-strategy control condition who worked only 62% of the session. Subsequent studies using similar paradigms affirm that fixating attention on tempting rewards undermines self-control in work situations (Patterson & Mischel, 1976; Peake, Hebl, & Mischel, 2002).

Just as turning attention away from short-term temptations can facilitate self-control, so can activating mental representations of long-term goals, particularly when goals are compared to present circumstances. Self-monitoring (i.e., actively comparing desired and actual outcomes) energizes individuals to take action (Baumeister, Schmeichel, & Vohs, 2007; Carver & Scheier, 1998; Korotitsch & Nelson-Gray, 1999; Oettingen, 2012). Among the earliest and most articulate of exemplars of self-monitoring, Benjamin Franklin (1760/1996) made a chart listing 13 virtues to which he aspired and daily noted when he had and had not lived up to them. Journals have been shown to help students pay attention to their study behavior (Karoly, 1993; Morgan, 1985; Sagotsky, Patterson, & Lepper, 1978). For instance, daily journals remind dieters and smokers to keep track of what they consumed (Baker & Kirschenbaum, 1993; Burke, Wang, & Seveck, 2011; McFall, 1970).

How might attentional deployment facilitate self-control in the everyday lives of school-age children? As noted in Table 2, students in the KIPP charter schools are encouraged to track the speaker in the classroom at all times, including the teacher when they are lecturing or classmates when they are asking or answering questions. Of course, looking at the speaker itself requires self-control, but doing so may in turn minimize the salience of external distractions (e.g., classmates who may be fooling around) as well as distracting internal cues (e.g., feeling hot and sticky on a late spring day). Extended to the context of homework and

studying, students might try keeping their gaze fixated on their books rather than wandering elsewhere around the room. Or, as Cookie Monster learned in a recent episode of the television show *Sesame Street*, looking away from treats one is trying not to eat is difficult but still easier than looking directly at them (Sesame Workshop, 2013). Likewise, during heated interpersonal conflicts (e.g., getting pushed on the playground), it may be difficult for students to intentionally turn their attention inward (e.g., counting backwards from 100), but doing so can attenuate hasty, regrettable impulses (e.g., hitting the other child back).

Cognitive Change

When selecting or modifying the situation is not an option and attending to temptations is unavoidable, people can still change the way in which they think about their situation. *Cognitive change*—a strategy at least as old as Epictetus (1983)—entails appraising situational cues in ways that make temptation less appealing, valued long-term goals more appealing, or both. This strategy, like the others, involves considerable metacognition (thinking about how one is appraising the situation and finding new ways to think about the situation) as well as prospection (considering how one might feel if one thought about a situation in a different way). For example, many American students think about homework as a dreaded chore, whereas many Chinese students construe homework as an opportunity to develop useful skills (Chen & Stevenson, 1989). Nepalese children tend to appraise difficult interpersonal situations (e.g., falling down and getting dirty in front of friends) in terms of shame, whereas American children tend to appraise the same situations in terms of anger (Cole, Bruschi, & Tamang, 2002). Moderate stress can be perceived as either competence enhancing or competence debilitating, and such construals in turn influence the extent to which students seek out feedback and learn during stressful situations (Crum, Salovey, & Achor, 2013).

Even if it is an overstatement to claim “there is nothing either good or bad but thinking makes it so” (Shakespeare, 2008; *Hamlet* act 2, scene 2, lines 239–251), a growing body of experimental research supports this general intuition and, further, demonstrates the direct relevance of cognitive change in regulating effort on academic tasks. For example, sixth-grade students encouraged to think of mistakes as indicative of learning rather than hard limits on their ability tried harder and performed better on demanding working memory and reading comprehension tasks (Autin & Croizet, 2012). Similarly, college students preparing for the GRE instructed to think of their arousal as improving their performance outperformed students in a no-treatment control condition (Jamieson, Mendes, Blackstock, & Schmader, 2010). College students taking a timed math test were more successful in ignoring funny video clips when encouraged to frame the task as a “test of their

willpower” than students who performed the same task without such explicit framing (Magen & Gross, 2007).

School-age children can also use cognitive change as a strategy to regulate their interpersonal behavior. In particular, some children tend to interpret other people’s intentions as hostile in intent, and this hostile attribution bias is reliably associated with more aggressive behavior (de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). For instance, a student who gets bumped by another student while in line at the cafeteria and assumes hostile intent is more likely to push back and start a fight. FastTrack, a multifaceted preventive intervention program for elementary school students, has been shown to reduce antisocial behavior in adolescence at least in part by encouraging more benign attributions for peer provocations (Dodge, Godwin, & The Conduct Problems Prevention Research Group, 2013).

A cognitive change strategy with particular relevance to self-control entails psychological distancing (Trope & Liberman, 2010). At one end of the psychological distance continuum are detailed mental representations of the ego-centric here and now. At the other end of the continuum are abstract representations that are removed in time, space, social distance, and/or realism. Temptations often involve low-level construals (“This cookie smells amazing!”) that are inherently more salient and thus quite powerful determinants of behavior, whereas valued goals often involve high-level construals (“I need to eat in a healthy way!”; Fujita, 2011). Shifting to more abstract, higher level construals of the situation can tip the balance in favor of longer term goals because such representations facilitate extraction of goal-relevant features, whereas lower level construals accentuate proximal temptations (Fujita & Carnevale, 2012).

The earliest evidence for psychological distancing as an effective self-control strategy came from experiments using the delay of gratification paradigm. Preschool children waiting for a preferred reward who are cued to dwell on the “cool” features of rewards (e.g., “If you want to, when you want to, you can think about how the marshmallows look like white puffy clouds”) were able to wait twice as long as children cued to dwell on their consummatory, “hot” features (e.g., “If you want to, when you want to, you can think about how sweet and chewy the marshmallows taste”; W. Mischel & Baker, 1975). Even more remarkably, children faced with actual treats but cued to pretend they were pictures by essentially “putting a frame around them in your head” waited more than twice as long as children shown pictures of the rewards but asked to imagine that they are real (Moore, Mischel, & Zeiss, 1976). Similarly, preschoolers and chimpanzees given the option to point to symbols for different quantities of treats (e.g., a mouse to represent a small amount and an elephant to represent a large amount) are both significantly better at inhibiting impulsive responses than when presented with the actual

treats themselves (Boysen & Berntson, 1995; Carlson, Davis, & Leach, 2005). Psychological distancing has also been studied in adults as a strategy for regulating eating and exercise (Mann, de Ridder, & Fujita, 2013), emotions (Kross & Grossmann, 2011), and decision making (Pronin, Olivola, & Kennedy, 2008).

Emerging research on school-age children confirms findings obtained using younger and older individuals. For example, Kross, Duckworth, Tsukayama, and Mischel (2011) conducted a study in which fifth graders recalled an angry memory and were randomly assigned to do so from a psychologically distanced perspective (“Now take a few steps back. Move away from the situation to a point where you can now watch the event unfold from a distance and see yourself in the event. As you do this, focus on what has now become the distant you. Now watch the situation unfold as if it were happening to the distant you all over again.”) or a psychologically immersed perspective (“Now see the situation unfold through your own eyes as if it were happening to you all over again.”). Compared to children in the immersed condition, children in the self-distanced group blamed the other person involved in their recalled experience significantly less, which in turn led them to display significantly lower levels of emotional reactivity.

The possibilities for applying cognitive change to diverse self-control dilemmas are endless, and we offer a few specific suggestions in Table 2. One example inspired by experimental research is to frame copious edits on an essay as evidence that teachers hold high standards and give such detailed feedback because they believe their students can achieve those standards (Yeager et al., 2014).

Nevertheless, in our view, deliberately changing cognitions is nevertheless less efficient than intervening with impulse generation in prior stages. Once the gravitational field of temptation has been entered, it requires considerable cognitive effort to reverse the developing recursive process whereby attention to a temptation heightens its “hot” features (Sheppes & Gross, 2011).

Response Modulation

Unfortunately, there are occasions when impulses to indulge in short-term temptation at the expense of long-term goals must be experienced rather than eluded. Perhaps there was no way the critical situations could have been avoided or modified. Perhaps attention could not have been diverted from temptation and thoughts could not have been controlled. Or perhaps these earlier stages were, in fact, possible points of intervention but no action was taken at the opportune times. *Response modulation* refers to the way in which people attempt to enact desired impulses once undesired impulses have already developed. This approach to self-control may make more modest demands on metacognition and prospection than the others, but some degree of both is often nonetheless

necessary. Effectively, this family of strategies encompasses ways in which we “just say no” to undesired impulses and “just say yes” to desired impulses.

Although we include response modulation as the fifth and final family of self-control strategies, it could easily be argued that response modulation is hardly strategic at all. Exhorting children to “calm down!” “control your temper!” “pay attention!” or otherwise suppress immediately rewarding yet ultimately undesired impulses is commonplace. Yet how many children—or, for that matter, adults—would say that doing so is an easy or pleasant experience? As noted in our earlier discussion of prospection, planning ahead what one intends to do in a direct confrontation with temptation can help (e.g., “If that boy teases me again, I will control my temper!”; Gollwitzer, 1999). Still, we contend that an unrequited impulse, however detrimental that impulse may be in the long run, is nonetheless experienced as unpleasant in the moment (Kurzban, Duckworth, Kable, & Myers, 2013). Moreover, the capacity to exert top-down control over impulses, while superior in human beings compared to any other animal, is nevertheless far from foolproof: Even adults make mistakes in simple laboratory tasks of executive function (J. D. Cohen, 2005).

Perhaps the best studied example of response modulation is in the emotional domain (Gross, 1998). Both children and adults are capable of voluntarily hiding overt displays of emotion, but hiding how we feel often comes at a cost. Hiding a smile, suppressing a frown, and pretending not to be worried are all effortful behaviors requiring substantial cognitive resources that could otherwise be deployed for other functions (Richards & Gross, 2000). Moreover, suppressing emotions can magnify one’s physiological responses, leading to greater cardiovascular responses than one would experience if one were not suppressing one’s emotions (Gross & Levenson, 1993, 1997). Emotional suppression also has social consequences: Suppressing emotions can increase the blood pressure of people around us and lead them to like us less than they otherwise would (Butler et al., 2003).

The specific mechanism by which impulse suppression hinders later self-control is debatable. As noted earlier, one view is that self-control relies on a finite, physical resource (e.g., brain glucose) that is depleted with use (Baumeister, Vohs, & Tice, 2007). More recently, alternative explanations have been proposed (Inzlicht & Schmeichel, 2012; Kurzban et al., 2013). In particular, it has been suggested that resisting temptation precipitates feelings of distress that alert individuals to the conflict between mutually exclusive goals (Inzlicht & Legault, 2014) and the foregone value of the “road not taken” (Kurzban et al., 2013). That is, it may be that when an individual adjudicates between two conflicting impulses, the value of the unexecuted impulse is registered as psychological distress or longing, thereby enabling the individual to keep track of what he or she is giving up by choosing the ultimately more desired

impulse. If sufficient, this signal may prompt individuals to reverse their commitment, breaking their self-declared promise, for instance, to do homework before watching television.

Leaving aside why response modulation can impair later efforts at self-control, there is the incontrovertible fact that resisting temptation is an unpleasant experience: Doing it just doesn’t feel very good. For instance, in a recent study of high school students attempting to actively resist tempting videos and games in order to do math problems, self-reported boredom, frustration, and fatigue increased steadily over time, and elevation in these unpleasant feelings paralleled increases in time spent on distractions (vs. math) as well as decreases in the number of correctly solved math problems (Plummer, Galla, D’Mello, & Duckworth, 2013). So, although response modulation can be used in any conflict pitting temptations against more enduringly valued goals, it is in our view the least effective and least efficient of all self-control strategies.

CONCLUDING COMMENT

The English word *strategy* derives from the Greek word (*strategos*) for military general. These etymological origins are revealing. It is the responsibility of the general to ponder, far before meeting the enemy face-to-face, decisions about how, when, and where best to take action. These choices are deliberate and intentional, aimed to turn the tide of events to advantage. In battles of self-control, of course, the enemy is within. Still, the metaphor holds. Decisions that school-age children make well in advance of confronting temptation can make all the difference between victory and defeat. Indeed, regulating attention, emotion, and behavior in any of the scenarios listed in Table 1 hinges as much on what children do in advance of confronting temptation as on their brute force willpower in the heat of the moment.

In this review, we have proposed that the myriad strategies school-age children employ across distinct life circumstances can be helpfully organized using a simple conceptual framework that specifies distinct phases of impulse generation. According to the *process model of self-control*, the earliest strategies target our physical or social situation, which we can either select or modify to our advantage. Next, we have the option of altering mental representations of our situation, selectively deploying our attention or intentionally changing how we appraise our circumstances. If all else fails, when faced directly with the experience of temptation, we can attempt to alter our response tendencies themselves. Using any of these strategies requires metacognition and prospection, the abilities to think about our own thinking and to forecast future possibilities before taking action in the present.

Our review highlights areas of inquiry that have received relatively little empirical attention to date. In particular,

there is surprisingly little research on situation selection strategies, which are the techniques our model would predict to be the most effective. Situation modification strategies have received somewhat more attention, but on the whole, self-control psychologists have focused mostly on mental strategies (attention deployment and cognitive change). Overall, there is an urgent need for more translational research on self-control in school-age children. Relatedly, the almost complete independence of the self-control and SRL literatures suggests that both would benefit from cross-fertilization. Our organizing framework here was inspired by the process model, originally developed to understand how individuals regulate emotion and more recently applied to other kinds of impulses. We hope that in future work we are able to integrate our approach with conceptually overlapping work undertaken in the SRL tradition (e.g., Corno, 2001; Wolters, 2003; Zimmerman, 1998).

Thus, our review raises many more questions than it answers: What is the best way to instruct children in self-control strategies? Should instruction be didactic and direct, or should children simply be provided with models to emulate? What role should parents versus teachers play in the cultivation of self-control, and what synergistic benefits derive from consistent messaging across home and school contexts? What are the developmental considerations that might inform which strategies are best to teach at what age? What insights might be gained by cross-fertilizing the literature on self-control with the largely independent literature on transfer in learning? For example, might framing discussions about self-control in more general, expansive terms (Engle, Lama, Meyera, & Nixa, 2012) help students generalize a self-control strategy mastered in one domain to another? It is our hope that using the process model of self-control to organize extant knowledge about self-control in school-age children will stimulate research designed to answer these and related questions.

Our general expectation is that when deciding among specific self-control strategies, earlier is better than later. The efficiency of early intervention derives from time being a one-way street: Earlier phases of impulse generation influence what happens in later phases in the process model (as well as iterations thereof), but not vice versa. Moreover, taking action at earlier phases reduces the phenomenological experience of self-control—the aversive feeling familiar to us all who have struggled internally to do what we ought to do instead of what in the moment would be more gratifying (Inzlicht & Legault, 2014; Kurzban et al., 2013). It is perhaps unsurprising that there are direct parallels between what we have proposed and ancient Buddhist teachings (Kumar, 2003) which likewise emphasize the superiority of avoiding, rather than confronting directly, temptation, and with the world's major Western religious traditions Judaism, Christianity and Islam—each of which emphasizes this theme both in its scriptures and in its practices.

Whereas Freud (1920) suggested that children would spontaneously develop self-control “under the influence of the instructress Necessity” (p. 444), our voices join the chorus of psychologists and educators encouraging a more proactive and supportive approach (Anderson & Prawat, 1983; Hofmann & Kotabe, 2012; Strayhorn, 2002b). Indeed, like any other competency, self-control appears to depend on knowledge and skills that can be learned directly, modeled vicariously, practiced, and reinforced. In our view, school-age children can and should be taught that self-control derives most effectively from strategically avoiding, rather than quashing directly, undesired impulses. We believe that with the support of caring adults, children can learn to be the generals of their own lives, intentionally selecting and shaping their situations to advantage and, subsequently, directing their attention and their cognition in ways that facilitate, rather than undermine, self-control.

REFERENCES

- Achtziger, A., Martiny, S. E., Oettingen, G., & Gollwitzer, P. M. (2012). Meta-cognitive processes in the self-regulation of goal pursuit. In P. Brinot & K. DeMarree (Eds.), *Social meta-cognition. Frontiers of social psychology* (pp. 121–141). New York, NY: Psychology Press.
- Adriaanse, M. A., Oettingen, G., Gollwitzer, P. M., Hennes, E. P., de Ridder, D. T. D., & de Wit, J. B. F. (2010). When planning is not enough: Fighting unhealthy snacking habits by mental contrasting with implementation intentions (MCII). *European Journal of Social Psychology*, 40, 1277–1293.
- Anderson, L., & Prawat, R. (1983). Responsibility in the classroom: A synthesis of research on teaching self-control. *Educational Leadership*, 40 (7), 62–66.
- Ariely, D. (2008). *Predictably irrational: The hidden forces that shape our decisions*. New York, NY: HarperCollins.
- Ariely, D., & Wertenbroch, K. (2002). Procrastination, deadlines, and performance: Self-control by precommitment. *Psychological Science*, 13, 219–224.
- Aristotle. (1999). *Nicomachean ethics* (T. Irwin, Trans.; 2nd ed.). Indianapolis, IN: Hackett.
- Autin, F., & Croizet, J. C. (2012). Improving working memory efficiency by reframing metacognitive interpretation of task difficulty. *Journal of Experimental Psychology: General*, 141, 610–618. doi: 10.1037/a0027478
- Baker, R. C., & Kirschenbaum, D. S. (1993). Self-monitoring may be necessary for successful weight control. *Behavior Therapy*, 24, 377–394.
- Bandura, A. (1965). Influence of models' reinforcement contingencies on the acquisition of imitative responses. *Journal of Personality and Social Psychology*, 1, 589–595.
- Bandura, A. (1976). Self-reinforcement: Theoretical and methodological considerations. *Behaviorism*, 4, 135–155.
- Bandura, A., & Mischel, W. (1965). Modifications of self-imposed delay of reward through exposure to live and symbolic models. *Journal of Personality and Social Psychology*, 2, 698–705.
- Barratt, E. S. (1965). Factor analysis of some psychometric measures of impulsiveness and anxiety. *Psychological Reports*, 16, 547–554.
- Barratt, E. S. (1972). Anxiety and impulsiveness: Toward a neuropsychological model. In C. D. Spielberger (Ed.), *Anxiety: Current trends in theory and research* (Vol. 1, pp. 195–222). New York, NY: Academic.

- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, 74, 1252–1265.
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation* (Vol. 307). San Diego, CA: Academic.
- Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). Self-regulation and the executive function: The self as controlling agent. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (pp. 516–539). New York, NY: Guilford.
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science*, 16, 351–355.
- Ben-Eliyahu, A., & Linnenbrink-Garcia, L. (2013). Extending self-regulated learning to include self-regulated emotion strategies. *Motivation and Emotion*, 37, 558–573.
- Berk, L. E., Mann, T. D., & Ogan, A. T. (2006). Make-believe play: Well-spring for development of self-regulation. In D. Singer, R. Gollwitzer, & K. Hirsh-Parek (Eds.), *Play-learning: How play motivates and enhances children's cognitive and social-emotional growth* (pp. 74–100). New York, NY: Oxford University Press.
- Blair, C., & Razza, R. P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, 78, 647–663.
- Bodrova, E., & Leong, D. J. (2001). *Educational effectiveness of a Vygotskian approach to preschool education: A randomized trial*. Geneva, Switzerland: International Bureau of Education.
- Bodrova, E., & Leong, D. J. (2007). *Tools of the mind: The Vygotskian approach to early childhood education*. Upper Saddle River, NJ: Pearson Education.
- Boekaerts, M. (2011). Emotions, emotion regulation, and self-regulation of learning. In *Handbook of self-regulation of learning and performance* (pp. 408–425). New York, NY: Routledge.
- Boekaerts, M., & Cascallar, E. (2006). How far have we moved toward the integration of theory and practice in self-regulation? *Educational Psychology Review*, 18, 199–210.
- Bonson, K. R., Grant, S. J., Contoreggi, C. S., Links, J. M., Metcalfe, J., Weyl, H. L., . . . , & London, E. D. (2002). Neural systems and cue-induced cocaine craving. *Neuropsychopharmacology*, 26, 376–386.
- Boysen, S. T., & Berntson, G. G. (1995). Responses to quantity: perceptual versus cognitive mechanisms in chimpanzees (Pan troglodytes). *Journal of Experimental Psychology: Animal Behavior Processes*, 21, 82.
- Burke, L. E., Wang, J., & Sevvick, M. A. (2011). Self-monitoring in weight loss: a systematic review of the literature. *Journal of the American Dietetic Association*, 111, 92–102.
- Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin*, 139, 655–701.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erickson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion*, 3, 48–67.
- Carlson, S. M., & Beck, D. M. (2009). Symbols as tools in the development of executive function. In A. Winsler, C. Fernyhough, & I. Montero (Eds.), *Private speech, executive functioning, and the development of verbal self-regulation* (pp. 163–175). New York, NY: Cambridge University Press.
- Carlson, S. M., Davis, A. C., & Leach, J. G. (2005). Less is more: Executive function and symbolic representation in preschool children. *Psychological Science*, 16, 609–616.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior* (Vol. 439). New York, NY: Cambridge University Press.
- Chen, C., & Stevenson, H. W. (1989). Homework: A cross-cultural examination. *Child Development*, 60, 551–561.
- Christiansen, S., Oettingen, G., Dahme, B., & Klinger, R. (2010). A short goal-pursuit intervention to improve physical capacity: A randomized clinical trial in chronic back pain patients. *Pain*, 149, 444–452.
- Cohen, A.-L., Bayer, U. C., Jaudas, A., & Gollwitzer, P. M. (2008). Self-regulatory strategy and executive control: implementation intentions modulate task switching and Simon task performance. *Psychological Research*, 72, 12–26.
- Cohen, J. D. (2005). The vulcanization of the human brain: A neural perspective on interactions between cognition and emotion. *The Journal of Economic Perspectives*, 19(4), 3–24. doi:10.1257/089533005775196750
- Cole, P. M., Bruschi, C. J., & Tamang, B. L. (2002). Cultural differences in children's emotional reactions to difficult situations. *Child Development*, 73, 983–996.
- Corno, L. (2001). Volitional aspects of self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement* (pp. 191–225). Mahwah, NJ: Erlbaum.
- Corno, L. (2011). Studying self-regulation habits. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 361–375). New York, NY: Routledge.
- Corno, L., & Mandinach, E. B. (2004). What we have learned about student engagement in the past twenty years. *Big Theories Revisited*, 4, 299–328.
- Crum, A. J., Salovey, P., & Achor, S. (2013). Rethinking stress: The role of mindsets in determining the stress response. *Journal of Personality and Social Psychology*, 104, 716–733.
- Cunningham, W. A., Zelazo, P. D., Packer, D. J., & Van Bavel, J. J. (2007). The iterative reprocessing model: A multilevel framework for attitudes and evaluation. *Social Cognition*, 25, 736–760.
- de Castro, B., Veerman, J. W., Koops, W., Bosch, J. D., & Monshouwer, H. J. (2002). Hostile attribution of intent and aggressive behavior: A meta-analysis. *Child Development*, 73, 916–934.
- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22, 491–569.
- Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science*, 333, 959–964.
- Dimmitt, C., & McCormick, C. B. (2012). Metacognition in education. In K. R. Harris, S. Graham, T. Urdan, C. B. McCormick, G. M. Sinatra, & J. Sweller (Eds.), *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues* (pp. 157–187). Washington, DC: American Psychological Association.
- Dodge, K. A., Godwin, J., & The Conduct Problems Prevention Research Group. (2013). Social-information-processing patterns mediate the impact of preventative intervention on adolescent antisocial behavior. *Psychological Science*, 24, 456–465.
- Doyle, T. J., Friedmann, P. D., & Zywiak, W. H. (2013). Management of patients with alcohol dependence in recovery: Options for maintenance and anticipating and managing relapse in primary care. In R. Saitz (Ed.), *Addressing unhealthy alcohol use in primary care* (pp. 85–92). New York, NY: Springer.
- Duckworth, A. L., & Allred, K. M. (2012). Temperament in the classroom. In M. Zenter & R. L. Shiner (Eds.), *Handbook of temperament* (pp. 627–644). New York, NY: Guilford.
- Duckworth, A. L., & Carlson, S. M. (2013). Self-regulation and school success. In F. M. E. Grouzet, U. Muller, & B. W. Sokol (Eds.), *Self-regulation and autonomy: Social and developmental dimensions of human conduct* (pp. 208–230). New York, NY: Cambridge University Press.
- Duckworth, A. L., Gollwitzer, A., Kirby, T., & Oettingen, G. (2010). From fantasy to action: Mental Contrasting with Implementation Intentions (MCII) improves report card grades and school attendance among disadvantaged children. *Social Psychological and Personality Science*, 4, 745–753.
- Duckworth, A. L., Grant, H., Loew, B., Oettingen, G., & Gollwitzer, P. M. (2011). Self-regulation strategies improve self-discipline in adolescents:

- Benefits of mental contrasting and implementation intention. *Educational Psychology*, 31, 17–26.
- Duckworth, A. L., Tsukayama, E., & Kirby, T. (2013). Is it really self-control? Examining the predictive power of the delay gratification task. *Personality and Social Psychology Bulletin*, 39, 843–855.
- Duckworth, A. L., Tsukayama, E., & May, H. (2010). Establishing causality using longitudinal hierarchical linear modeling: An illustration predicting achievement from self-control. *Social Psychological and Personality Science*, 1, 311–317.
- Efklides, A. (2011). Interactions of metacognition with motivation and affect in self-regulated learning: The MASRL model. *Educational Psychologist*, 46, 6–25.
- Eilam, B., & Aharon, I. (2003). Students' planning in the process of self-regulated learning. *Contemporary Educational Psychology*, 28, 304–334.
- Eisenberg, N., Duckworth, A. L., Spinrad, T. L., & Valiente, C. (2012). Conscientiousness: Origins in childhood? *Developmental Psychology*, 50, 1331–1349.
- Eisenberg, N., Hofer, C., Sulik, M. J., & Spinrad, T. L. (2014). Self-regulation, effortful control, and their socioemotional correlates. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 157–172). New York, NY: Guilford.
- Eisenberg, N., Smith, C. L., Sadovsky, A., & Spinrad, T. (Eds.). (2004). Effortful control: Relations with emotion regulation, adjustment, and socialization in childhood. In R. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation research, theory and applications* (pp. 259–282). New York, NY: Guilford.
- Eisenberg, N., Valiente, C., Spinrad, T. L., Cumberland, A., Liew, J., Reiser, M., . . . , & Losoya, S. H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental Psychology* 45, 988–1008.
- Engle, R. A., Lama, D. P., Meyera, X. S., & Nixa, S. E. (2012). How does expansive framing promote transfer? Several proposed explanations and a research agenda for investigating them. *Educational Psychologist*, 47, 215–231.
- Epictetus. (1983). *The handbook* (N. P. White, Trans.). Indianapolis, IN: Hackett.
- Evenden, J. L. (1999). Varieties of impulsivity. *Psychopharmacology*, 146, 348–361.
- Eysenck, S. B., Pearson, P. R., Easting, G., & Allsopp, J. F. (1984). Age norms for impulsiveness, venturesomeness and empathy in children. *Personality and Individual Differences*, 6, 613–619.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34, 906–911.
- Frankfurt, H. G. (1971). Freedom of the will and the concept of a person. *The Journal of Philosophy*, 68, 5–20.
- Franklin, B. (1996). *The art of virtue* (3rd ed.). Eden Prairie, MN: Acorn. (Original work published 1760)
- Freud, S. (1920). *Introductory lectures on psychoanalysis*. New York, NY: W. W. Norton.
- Fujita, K. (2011). On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review*, 15, 352–366.
- Fujita, K., & Carnevale, J. J. (2012). Transcending temptation through abstraction. *Current Directions in Psychological Science*, 21, 248–252. doi:10.1177/0963721412449169
- Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology*, 90, 351–367.
- Gilbert, D. T. & Wilson, T. D. (2007). Prospection: Experiencing the future. *Science*, 317, 1351–1354.
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54, 493–503.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2, 271.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, 64, 970–986. doi:10.1037/0022-3514.64.6.970
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*, 106, 95–103. doi:10.1037//0021-843X.106.1.95
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–23). New York, NY: Guilford.
- Herrmann, P. A., Legare, C. H., Harris, P. L., & Whitehouse, H. (2013). Stick to the script: The effect of witnessing multiple actors on children's imitation. *Cognition*, 129, 536–543.
- Hofmann, W., Baumeister, R. F., Förster, G., & Vohs, K. D. (2012). Everyday temptations: An experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, 102, 1318.
- Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from dual-systems perspective. *Perspectives on Psychological Science*, 4, 162–176.
- Hofmann, W., & Kotabe, H. (2012). A general model of preventive and interventive self-control. *Social and Personality Psychology Compass*, 6, 707–722. doi:10.1111/j.1751-9004.2012.00461.x
- Hofmann, W., & Van Dillen, L. (2012). Desire: The new hot spot in self-control research. *Current Directions in Psychological Science*, 21, 317–322. doi:10.1177/0963721412453587
- Hogue, A., & Steinberg, L. (1995). Homophily of internalized distress in adolescent peer groups. *Developmental Psychology*, 31, 897–906.
- Homer. (1961). *The Odyssey* (R. Fitzgerald, Trans.). New York, NY: Doubleday.
- Inzlicht, M., & Legault, L. (2014). No pain, no gain: How distress underlies effective self-control (and unites diverse social psychological phenomena). In J. Forgas & E. Harmon-Jones (Eds.), *The control within: motivation and its regulation* (pp. 115–136). New York, NY: Psychology Press.
- Inzlicht, M., & Schmeichel, B. J. (2012). What is ego depletion? Toward a mechanistic revision of the resource model of self-control. *Perspectives on Psychological Science*, 7, 450–463. doi:10.1177/1745691612454134
- James, W. (1890). *The principles of psychology* (Vol. II). New York, NY: Holt.
- James, W. (1899). *Talks to teachers on psychology and to students on some of life's ideals*. New York, NY: Holt.
- Jamieson, J. P., Mendes, W. B., Blackstock, E., & Schmader, T. (2010). Turning the knots in your stomach into bows: Reappraising arousal improves performance on the GRE. *Journal of Experimental Social Psychology*, 46, 208–212.
- Jansen, A., Theunissen, N., Slechten, K., Nederkoorn, C., Boon, B., Mulken, S., & Roefs, A. (2003). Overweight children overeat after exposure to food cues. *Eating Behaviors*, 4, 197–209. doi:10.1016/S1471-0153(03)00011-4
- Job, V., Dweck, C. S., & Walton, G. M. (2010). Ego depletion—Is it all in your head? Implicit theories about willpower affect self-regulation. *Psychological Science*, 21, 1686–1693.
- Job, V., Walton, G. M., Bernecker, K., & Dweck, C. S. (in press). Implicit theories about willpower predict self-regulation and grades in everyday life. *Journal of Personality and Social Psychology*.
- Johnston, W. A., & Dark, V. J. (1986). Selective attention. *Annual Review of Psychology*, 37, 43–75.
- Kandel, D. B. (1978). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology*, 84, 427–436.
- Karoly, P. (1993). Mechanisms of self-regulation: A systems view. *Annual Review of Psychology*, 44, 23–52.

- Kavanagh, D. J., Andrade, J., & May, J. (2004). Imaginary relish and exquisite torture: The elaborated intrusion theory of desire. *Psychological Review*, 112, 446–467.
- Kelley, A. E. (2004). Memory and addiction: Shared neural circuitry and molecular mechanisms. *Neuron*, 44, 161–179.
- Kendall, P. C. (1977). On the efficacious use of verbal self-instructional procedures with children. *Cognitive Therapy and Research*, 1, 331–341.
- Kirk, D., Oettingen, G., & Gollwitzer, P. M. (2013). Promoting integrative bargaining: Mental contrasting with implementation intentions. *International Journal of Conflict Management*, 24, 148–165.
- Kolovelonis, A., Goudas, M., Hassandra, M., & Dermitzaki, I. (2012). Self-regulated learning in physical education: Examining the effects of emulative and self-control practice. *Psychology of Sport and Exercise*, 13, 383–389.
- Korotitsch, W. J., & Nelson-Gray, R. O. (1999). An overview of self-monitoring research in assessment and treatment. *Psychological Assessment*, 11, 415–425.
- Krampe, H., Stawicki, S., Wagner, T., Bartels, C., Aust, C., R  ther, E., . . . , & Ehrenreich, H. (2006). Follow-up of 180 alcoholic patients for up to 7 years after outpatient treatment: Impact of alcohol deterrents on outcome. *Alcoholism: Clinical and Experimental Research*, 30, 86–95.
- Kross, E., Duckworth, A., Ayduk, O., Tsukayama, E., & Mischel, W. (2011). The effect of self-distancing on adaptive versus maladaptive self-reflection in children. *Emotion*, 11, 1032–1039. doi:10.1037/a0021787
- Kross, E., & Grossmann, I. (2011). Boosting wisdom: Distance from the self enhances wise reasoning, attitudes, and behavior. *Journal of Experimental Psychology: General*, 14, 43–48.
- Kumar, S. M. (2003). An introduction to Buddhism for the cognitive-behavioral therapist. *Cognitive and Behavioral Practice*, 9, 40–43.
- Kurzban, R., Duckworth, A. L., Kable, J. W., & Myers, J. (2013). An opportunity cost model of subjective effort and task performance. *Behavioral and Brain Sciences*, 36, 661–726.
- LaGrand, L. E. (1969). *Discipline in the secondary schools*. New York, NY: Parker.
- Lillard, A. (2012). Preschool children's development in classic Montessori, supplemented Montessori, and conventional programs. *Journal of School Psychology*, 50, 379–401.
- Luty, J. (2006). What works in alcohol use disorders? *Advances in Psychiatric Treatment*, 12, 13–22.
- Magen, E., & Gross, J. J. (2007). Harnessing the need for immediate gratification: Cognitive reconstrual modulates the reward value of temptations. *Emotion*, 7, 415–428.
- Magen, E., & Gross, J. J. (2010). Getting our act together: Toward a general model of self-control. In R. Hassin, K. Ochsner, & Y. Trope (Eds.), *Self control in society, mind and brain* (pp. 335–353). Oxford, England: Oxford University Press.
- Mann, T., de Ridder, D., & Fujita, K. (2013). Self-regulation of health behavior: Social psychological approaches to goal setting and goal striving. *Health Psychology*, 32, 487–498.
- Mann, T., & Ward, A. (2007). Attention, self-control, and health behaviors. *Current Directions in Psychological Science*, 16, 280–283.
- McCaslin, M., & Hickey, D. T. (2001). Self-regulated learning and academic achievement: A Vygotskian view. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement* (pp. 227–252). Mahwah, NJ: Erlbaum.
- McFall, R. M. (1970). Effects of self monitoring on normal smoking behavior. *Journal of Consulting and Clinical Psychology*, 35, 135–142.
- Meichenbaum, D. H., & Goodman, J. (1971). Training impulsive children to talk to themselves: A means of developing self-control. *Journal of Abnormal Psychology*, 77, 115–126.
- Milkman, K. L., Minson, J., & Volpp, K. (2014). Holding the Hunger Games hostage at the gym: An evaluation of temptation bundling. *Management Science*, 60, 283–299.
- Milkman, K. L., Rogers, T., & Bazerman, M. H. (2008). Harnessing our inner angels and demons: What we have learned about want/should conflicts and how that knowledge can help us reduce short-sighted decision making. *Perspectives on Psychological Science*, 3, 324–338.
- Mischel, H. N., & Mischel, W. (1983). The development of children's knowledge of self-control strategies. *Child Development*, 54, 603–619.
- Mischel, W. (1981). Metacognition and the rules of delay. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures* (pp. 240–272). New York, NY: Cambridge University Press.
- Mischel, W. (2014). *The marshmallow test: Mastering self-control*. New York, NY: Little, Brown.
- Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive-affective processing system: The dynamics of delay of gratification. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 99–129). New York, NY: Guilford.
- Mischel, W., & Baker, N. (1975). Cognitive appraisals and transformations in delay behavior. *Journal of Personality and Social Psychology*, 31, 254–261.
- Mischel, W., & Ebbesen, E. B. (1970). Attention in delay of gratification. *Journal of Personality and Social Psychology*, 16, 329–337.
- Mischel, W., Ebbesen, E. B., & Zeiss, A. R. (1972). Cognitive and attentional mechanisms in delay of gratification. *Journal of Personality and Social Psychology*, 21, 204–218.
- Mischel, W., & Patterson, C. J. (1976). Substantive and structural elements of effective plans for self-control. *Journal of Personality and Social Psychology*, 34, 942–950.
- Mischel, W., Shoda, Y., & Peake, P. K. (1988). The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of Personality and Social Psychology*, 54, 687–696.
- Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989). Delay of gratification in children. *Science*, 244, 933–938.
- Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., . . . , & Caspia, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of the Sciences of the United States of America*, 108, 2693–2698.
- Moore, B., Mischel, W., & Zeiss, A. (1976). Comparative effects of the reward stimulus and its cognitive representation in voluntary delay. *Journal of Personality and Social Psychology*, 34, 419–424.
- Morgan, M. (1985). Self-monitoring of attained subgoals in private study. *Journal of Educational Psychology*, 77, 623–630.
- Mukhopadhyay, A., & Johar, G. V. (2005). Where there is a will, is there a way? Effects of lay theories of self-control on setting and keeping resolutions. *Journal of Consumer Research*, 31, 779–786.
- Nelson, T., Narens, L. M. J., & Shimamura, A. P. (1994). *Metacognition: Knowing about knowing*. Cambridge, MA: MIT Press.
- Niaura, R. S., Rohsenow, D. J., Binkoff, J. A., Monti, P. M., Pedraza, M., & Abrams, D. B. (1988). Relevance of cue reactivity to understanding alcohol and smoking relapse. *Journal of Abnormal Psychology*, 97, 133.
- Nisbett, R. E., Aronson, J., Blair, C., Dickens, W., Flynn, J., Halpern, D. F., & Turkheimer, E. (2012). Intelligence: New findings and theoretical developments. *American Psychologist*, 67, 130–159.
- Nurmi, J. E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. *Developmental Review*, 11(1), 1–59.
- Nurmi, J. E. (2005). Thinking about and acting upon the future: Development of future orientation across the life span. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp. 31–57). Mahwah, NJ: Erlbaum.
- Ochsner, K., & Gross, J. J. (2014). The neural bases of emotion and emotion regulation: A valuation perspective. In J. J. Gross (Ed.), *Handbook of emotion regulation* (2nd ed., pp. 23–42). New York, NY: Guilford.
- Oettingen, G. (2012). Future thought and behaviour change. *European Review of Social Psychology*, 23, 1–63.

- Paluck, E. L., & Shepherd, H. (2012). The salience of social referents: A field experiment on collective norms and harassment behavior in a school social network. *Journal of Personality and Social Psychology*, 103, 899–915.
- Papies, E. K., & Hamstra, P. (2010). Goal priming and eating behavior: Enhancing self-regulation by environmental cues. *Health Psychology*, 29, 384–388.
- Patterson, C. J., & Mischel, W. (1975). Plans to resist distraction. *Developmental Psychology*, 11, 369–378.
- Patterson, C. J., & Mischel, W. (1976). Effects of temptation-inhibiting and task-facilitating plans on self-control. *Journal of Personality and Social Psychology*, 33, 209–217.
- Peake, P. K., Hebl, M., & Mischel, W. (2002). Strategic attention deployment for delay of gratification in working and waiting situations. *Developmental Psychology*, 38, 313–326.
- Perry, R. P., Hechter, F. J., Menec, V. H., & Weinberg, L. E. (1993). Enhancing achievement motivation and performance in college students: An attributional retraining perspective. *Research in Higher Education*, 34, 687–723.
- Pintrich, P. R., & de Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33–40. doi:10.1037/0022-0663.82.1.33
- Plummer, B. D., Galla, B. M., D'Mello, S. K., & Duckworth, A. L. (2013, May). *Development and validation of a modern persistence performance task*. Paper presented at the 25th annual convention of the Association for Psychological Science, Washington, DC.
- Poston, W. S. C., & Foreyt, J. P. (2000). Successful management of the obese patient. *American Family Physician*, 61, 3615–3622.
- Pronin, E., Olivola, C. Y., & Kennedy, K. A. (2008). Doing unto future selves as you would do unto others: Psychological distance and decision making. *Personality and Social Psychology Bulletin*, 34, 224–236.
- Rachlin, H. (2000). *The science of self-control*. Cambridge, MA: Harvard University Press.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, 79, 410–424. doi:10.1037/0022-3514.79.3.410
- Rodriguez, M. L., Mischel, W., & Shoda, Y. (1989). Cognitive person variables in the delay of gratification of older children at risk. *Journal of Personality and Social Psychology*, 57, 358–367.
- Rogers, P. J., & Hill, A. J. (1989). Breakdown of dietary restraint following mere exposure to food stimuli: Interrelationships between restraint, hunger, salivation, and food intake. *Addictive Behaviors*, 14, 387–397. doi:10.1016/0306-4603(89)90026-9
- Romer, D., Duckworth, A. L., Sznitman, S., Sunhee, P. (2010). Can adolescents learn self-control? Delay of gratification in the development of control over risk taking. *Prevention Science* 11, 319–330.
- Rosen, L. D., Carrier, M. L., & Cheever, N. A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior*, 29, 948–958. doi:10.1016/j.chb.2012.12.001
- Rosenbaum, M. S., & Drabman, R. S. (1979). Self-control training in the classroom: A review and critique. *Journal of Applied Behavior Analysis*, 12, 467–485.
- Rothbart, M. K., Ahadi, S. A., Hersey, K. L., & Fisher, P. (2001). Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. *Child Development*, 72, 1394–1408.
- Rothbart, M. K., & Rueda, M. R. (2005). The development of effortful control. In U. Mayr, E. Awh, & S. W. Keele (Eds.), *Developing individuality in the human brain* (pp. 167–188). Washington, DC: American Psychological Association.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, 1–28.
- Rozin, P., Scott, S., Dingley, M., Urbanek, J. K., Jiang, H., & Kaltenbach, M. (2011). Nudge to nobesity I: Minor changes in accessibility decrease food intake. *Judgment and Decision Making*, 6, 323–332.
- Rueda, M. R., Posner, M. I., & Rothbart, M. K. (2005). The development of executive attention: Contributions to the emergence of self-regulation. *Developmental Neuropsychology*, 28, 573–594.
- Sagotsky, G., Patterson, C. J., & Lepper, M. R. (1978). Training children's self-control: A field experiment in self-monitoring and goal-setting in the classroom. *Journal of Experimental Child Psychology*, 25, 242–253.
- Sansone, C., Weir, C., Harpster, L., & Morgan, C. (1992). Once a boring task always a boring task? Interest as a self-regulatory mechanism. *Journal of Personality and Social Psychology*, 63, 379–390.
- Schelling, T. C. (1978). Egonomics, or the art of self-management. *The American Economic Review*, 68, 290–294. doi:10.2307/1816707
- Schelling, T. C. (1984). *The intimate contest for self-command*. Harvard Institute of Economic Research.
- Schwartz, J., Mochon, D., Wyper, L., Maroba, J., Patel, D., & Ariely, D. (2014). Healthier by precommitment. *Psychological Science*, 25, 538–546.
- Schroeder, J. R., Latkin, C. A., Hoover, D. R., Curry, A. D., Knowlton, A. R., & Celentano, D. D. (2001). Illicit drug use in one's social network and in one's neighborhood predicts individual heroin and cocaine use. *Annals of Epidemiology*, 11, 389.
- Schwebel, A. I., & Cherlin, D. L. (1972). Physical and social distancing in teacher-pupil relationships. *Journal of Educational Psychology*, 63, 543–550.
- Seligman, M. E. P. (1990). *Learned optimism: The skills to conquer life's obstacles, large and small*. New York, NY: Random House.
- Seligman, M. E. P., Railton, P., Baumeister, R. F., & Sripada, C. (2013). Navigating into the future or driven by the past. *Perspectives on Psychological Science*, 8, 119–141. doi:10.1177/1745691612474317
- Sesame Workshop. (Producer). (2013). *Cookie Monster learns a lesson from Tom Hiddleston* [Video file]. Available from https://www.youtube.com/watch?v=b_ubVVnWgk
- Sethi, A., Mischel, W., Aber, J. L., Shoda, Y., & Rodriguez, M. L. (2000). The role of strategic attention deployment in development of self-regulation: Predicting preschoolers' delay of gratification from mother-toddler interactions. *Developmental Psychology*, 36, 767–777.
- Shakespeare, W. (2008). *Hamlet* (J. Bate & E. Rasmussen, Eds.). New York, NY: Modern Library.
- Sheppes, G., & Gross, J. J. (2011). Is timing everything? Temporal considerations in emotion regulation. *Personality and Social Psychology Review*, 15, 319–331.
- Simons, D. J., & Ambinder, M. S. (2005). Change blindness theory and consequences. *Current Directions in Psychological Science*, 14, 44–48.
- Singer, J. L., & Singer, D. G. (2006). Preschoolers' imaginative play as precursor of narrative consciousness. *Imagination, Cognition and Personality*, 25, 97–117.
- Steinberg, L. (2007). Risk-taking in adolescence: New perspectives from brain and behavioral science. *Current Directions in Psychological Science*, 16, 55–59.
- Steinberg, L., Graham, S., O'Brien, L., Woolard, J., Cauffman, E., & Banich, M. (2009). Age differences in future orientation and delay discounting. *Child Development*, 80, 28–44.
- Strayhorn, J. M. (2002a). Self-control: Theory and research. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41, 7–16.
- Strayhorn, J. M. (2002b). Self-control: Toward systematic training programs. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 17–27.
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72, 271–322.
- Taylor, S. E., Pham, L. B., Rivkin, I. D., & Armor, D. A. (1998). Harnessing the imagination: Mental simulation, self-regulation, and coping. *American Psychologist*, 53, 429–439. doi:10.1037/0003-066x.53.4.429
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. New Haven, CT: Yale University Press.

- Trope, Y., & Liberman, N. (2010). Construal level theory of psychological distance. *Psychological Review*, 117, 440–463.
- Tsukayama, E., Duckworth, A. L., & Kim, B. E. (2012). Resisting everything except temptation: Evidence and an explanation for domain-specific impulsivity. *European Journal of Personality*, 26, 318–334. doi:10.1002/per.481
- Tsukayama, E., Duckworth, A. L., & Kim, B. E. (2013). Domain-specific impulsivity in school-age children. *Developmental Science*, 16, 879–893.
- Tsukayama, E., Toomey, S. L., Faith, M. S., & Duckworth, A. L. (2010). Self-control as a protective factor against overweight status in the transition from childhood to adolescence. *Archives of Pediatrics and Adolescent Medicine*, 164, 631–635.
- Vitaro, F., Brendgen, M., Larose, S., & Tremblay, R. E. (2005). Kindergarten disruptive behaviors, protective factors, and educational achievement by early adulthood. *Journal of Educational Psychology*, 97, 617–629.
- Vygotsky, L. (1978). Play and its role in the mental development of the child. In M. Cole (Ed.), *Soviet developmental psychology* (pp. 76–99). White Plains, NY: M. E. Sharpe. (Original work published 1933)
- Walberg, H. J. (1969). Physical and psychological distance in the classroom. *The School Review*, 77, 64–70.
- Wansink, B. (2007). *Mindless eating: Why we eat more than we think*. New York, NY: Bantam.
- Wansink, B., Painter, J. E., & Lee, Y. K. (2006). The office candy dish: proximity's influence on estimated and actual consumption. *International Journal of Obesity*, 30, 871–875.
- Weiner, B. (1992). *Human motivation: Metaphors, theories, and research*. Thousand Oaks, CA: Sage.
- Weiss, F. (2005). Neurobiology of craving, conditioned reward and relapse. *Current Opinion in Pharmacology*, 5, 9–19.
- White, J. L., Moffitt, T. E., Caspi, A., Bartusch, D. J., Needles, D. J., & Stouthamer-Loeber, M. (1994). Measuring impulsivity and examining its relationship to delinquency. *Journal of Abnormal Psychology*, 103, 192–205.
- White, R. E., Shearer, A., Gross, J. J., & Duckworth, A. L. (2014). *Situation modification strategies in college students*. Manuscript in preparation.
- Whitebread, D. (2010). Play, metacognition and self-regulation. In P. Broadhead, J. Howard, & E. Wood (Eds.), *Play and learning in the early years: From research to practice* (pp. 161–176). London, England: Sage.
- Whiteside, S. P., & Lynam, D. R. (2001). The Five Factor Model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, 30, 669–689.
- Whiteside, S. P., Lynam, D. R., Miller, J. D., & Reynolds, S. K. (2005). Validation of the UPPS impulsive behaviour scale: A four-factor model of impulsivity. *European Journal of Personality*, 19, 559–574.
- Wills, T. A., & Stoolmiller, M. (2002). The role of self-control in early escalation of substance use: A time-varying analysis. *Journal of Consulting and Clinical Psychology*, 70, 986–997.
- Winne, H. P. & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 277–304). Mahwah, NJ: Erlbaum.
- Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, 38, 189–205.
- Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist*, 47, 302–314.
- Yeager, D. S., Purdie-Vaughns, V., Garcia, J., Apfel, N., Brzustoski, P., Master, A., . . . & Cohen, G. L. (2014). Breaking the cycle of mistrust: Wise interventions to provide critical feedback across the racial divide. *Journal of Experimental Psychology: General*, 144, 804–824.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25, 3–17.
- Zimmerman, B. J. (1998). Academic studying and the development of personal skill: A self-regulatory perspective. *Educational Psychologist*, 33, 73–86.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). San Diego, CA: Academic.
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45, 166–183.
- Zimmerman, B. J., & Kitsantas, A. (2014). Comparing students' self-discipline and self-regulation measures and their prediction of academic achievement. *Contemporary Educational Psychology*, 39, 145–155.