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A Cognitive Control Perspective of Self-Control Strength and Its Depletion

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Abstract

Self-control strength is a central construct to theories of willpower, optimal functioning, freedom from addiction, and abilities to override problematic social motives and behaviors (e.g., aggression). Understanding the processing basis of self-control strength, and more particularly its depletion, is thus of paramount importance to both basic and applied literatures. Self-control strength, the present review suggests, can be profitably viewed in cognitive control terms, particularly so in relation to operations of a brain-based cognitive control circuit involving the anterior cingulate cortex (linked to monitoring potential or actual unwanted outcomes) and the dorsolateral prefrontal cortex (linked to controlling potential or actual unwanted outcomes). Also, sufficient task motivation is important to operations of this circuit and depletion effects might be understood in terms of such depletion effects on task motivation. Multiple sources of evidence are marshaled in support of this cognitive control perspective of self-control strength. It is concluded that viewing self-control strength in cognitive control terms has considerable merit. Social, cognitive, personality, and clinical sources of data are integrated in the analysis.

William James (1890) was among the first psychologists to highlight the importance of self-control to adaptive functioning. Paradoxically, though, he was skeptical of the individual's ability to override problematic behaviors. Indeed, he suggested that habits, once established, are especially difficult to overcome (thus his oft-cited phrase 'set in plaster' to refer to adulthood functioning). Although building on quite different ideas concerning human nature, Freud (1957), Watson (1913), and Skinner (1963) also stressed the habitual, seemingly deterministic nature of social behaviors and responses to incentives (e.g., immediate reward). Cognitive psychology in the 1970s similarly emphasized automatic processes and habits (e.g., Collins & Loftus, 1975), as did social psychology in the 1980s (Higgins & Bargh, 1987) and 1990s (Bargh, 1997).

By the 1990s, though, numerous failures of the automaticity theory of cognition had been demonstrated, so much so that the opposite perspective was then emphasized – namely, the exquisite capability of individuals to ignore task-irrelevant stimuli, to control their performance in a top-down manner, and to override problematic processing routines or those prone to error (Pashler, 1998). In fact, it was shown that even severe sleep deprivation could be overcome, in relation to very boring vigilance tasks, to the extent that the individual was sufficiently motivated (Sanders, 1998). Motivational factors have also been implicated in other cognitive literatures concerned with understanding performance decrements across time (Ackerman, 1987).

Thus, the automaticity of semantic priming effects in cognitive tasks (Collins & Loftus, 1975) formed the basis of a meta-perspective on social judgments and behaviors that emphasized the unawareness and perhaps inescapability of such spreading-activation

influences (Bargh & Chartrand, 1999). Conversely, the recent social cognitive emphasis on self-control processes (Baumeister & Vohs, 2004) arguably borrows from prior cognitive research on executive control (Posner & Raichle, 1994) and cognitive control (Rabbitt, 1979) processes. For this reason, there is likely an intimate potential relationship between social and cognitive perspectives of how top-down control operates, an integrative potential that is systematically reviewed in our paper.

The Strength-Based Perspective of Self-Control

Baumeister, Heatherton, and Tice (1994) first suggested that multiple problematic outcomes of both social and clinical significance – among them, addiction, aggression, criminality, overeating, and gambling – could be understood in terms of failures of self-control. This review, and other early work in the area, gave rise to a set of interlinked hypotheses. First, the self's ability to control problematic outcomes is not unlimited in nature; rather, it is limited. Second, variations in self-control *strength*, both across individuals and across social occasions, are critical to understanding whether self-control operations will be successful or unsuccessful. Third, exercising self-control should undermine subsequent efforts after self-control, much as the extensive use of a muscle renders it fatigued (Muraven & Baumeister, 2000). Fourth, if there is a common self-control resource used for multiple purposes (Baumeister et al., 1994), even very different efforts after self-control (e.g., suppressing an emotional expression, then persisting on an unsolvable task) should mutually inhibit each other if the time interval between them is short.

In support of such hypotheses, individuals have been randomly assigned to a first task that either should or should not require use of limited-capacity self-control resources (Muraven & Baumeister, 2000). Consistent with predictions, it has been found that *depleting* self-control by a first task results in lesser self-control in a second, often unrelated task. Impressive generalization has occurred across multiple first tasks (Baumeister, Muraven, & Tice, 2000) and multiple dependent measures, in the latter case including objective measures of intellectual performance (Schmeichel, Vohs, & Baumeister, 2003), abilities to make favorable social impressions (Vohs, Baumeister, & Ciarocco, 2005), and tendencies toward physical aggression (DeWall, Baumeister, Stillman, & Gailliot, 2007). Self-control depletion, in other words, is quite problematic to subsequent functioning (Schmeichel & Baumeister, 2004).

Cognitive Control Processes

Self-control strength has been conceptualized in terms of momentarily available self-control resources and depletion effects have been similarly conceptualized (Baumeister et al., 2000). Resource-based views of human cognition and behavior have been surprisingly difficult to operationalize and verify, however (Pashler, 1998). We can reiterate here that very extreme manipulations of sleep deprivation and tedium – which should deplete self-control to the extreme as well – have resulted in surprisingly small performance deficits among task-motivated individuals (Sanders, 1998). In other words, cognitive analyses of resources and their depletion have resulted in somewhat of an explanatory dead end (Navon, 1984). Invoking the idea of resources might or might not be similarly problematic in understanding self-control strength processes and we do consider a recent demonstration that self-control strength covaries with blood glucose levels (Gailliot et al., 2007) in a later section of the paper.

Of more importance to our analysis is the potential link of the self-control strength construct to cognitive control processes. Cognitive control processes are typically examined in basic reaction time (RT) tasks, such as the color-word Stroop task (MacLeod, 1991), that require the individual to override a dominant response tendency (e.g., to categorize by the word in question) in favor of a sub-dominant response tendency (e.g., to categorize by the font color in question). The self-control and cognitive control literatures, thus, would seem to overlap considerably in their mutual concern with the person's ability to inhibit dominant responses in a task-defined or otherwise strategic manner (Miller & Cohen, 2001; van Veen & Carter, 2006).

Cognitive control processes can be assessed in several manners. In RT tasks, higher levels of cognitive control have been operationalized in terms of lesser interference in Stroop-like tasks (MacLeod, 1991) and in terms of greater tendencies to slow down following erroneous responses (Rabbitt, 1979). In neurocognitive terms, the anterior cingulate cortex (ACC) is involved in monitoring problematic processing and behavioral occurrences (van Veen & Carter, 2006), whereas the dorsolateral prefrontal cortex (dlPFC) is involved in instantiating cognitive control in a goal-directed (rather than habitual) manner (Kerns et al., 2004; Lieberman & Eisenberger, 2005). In neurocognitive terms, we primarily consider results involving an evoked brain-potential component termed the error-related negatively (ERN: Falkenstein, Hoormann, Christ, & Hohnsbein, 2000), whose neural generator is the ACC (van Veen & Carter, 2002). More will be said about these measures of cognitive control, and others, below.

A Heuristic Model

We do not seek to replace or supplant the strength-based theory of self-control (e.g., Schmeichel & Baumeister, 2004). Rather, we seek to further understand how self-control strength functions from a cognitive control perspective. Accordingly, Figure 1 decomposes self-control strength in terms of three overlapping, but also potentially separable, mechanisms – task motivation, task monitoring, and operating processes. Just as there are multiple contributors to cognitive control performance, then, we suggest that there are multiple contributors to understanding the self-control strength construct. Of additional

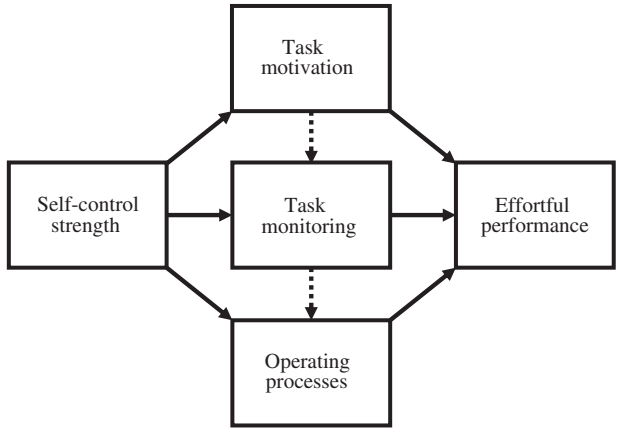

Figure 1 A Cognitive Control Perspective of Self-Control Strength, Hypothesized Mediators, and Effortful Performance.

importance, we suggest that self-control is probably not special, but rather borrows from a general-purpose brain-based system related to concern with, monitoring of, and remediation of problematic events and behaviors of multiple types (Miller & Cohen, 2001). Relevant evidence for this idea is reviewed below.

An energizer of the cognitive control system is motivation (Sarter, Gehring, & Kozak, 2006). Stated in other terms, if there is low motivation to control a problematic tendency, it is unlikely that the cognitive control system of the prefrontal cortex will be recruited. This in turn would result in suboptimal performance (Lieberman & Eisenberger, 2005). Thus, one major component to self-control strength is likely one's willingness to work hard on a difficult task. There are reasons for thinking that performing one effortful task is likely to undermine one's motivation to work hard on a second effortful task. In other words, depletion effects may be understood in motivational terms. Relevant evidence for this idea is reviewed below.

Potentially separable from self-control capacity or even task motivation is what we term *task monitoring*. To perform non-habitual tasks well, potential or actual mistakes must be recognized. In the absence of recognizing error-proneness, cognitive and behavioral habits would dominate (Lieberman & Eisenberger, 2005). Although many of these habits would generally serve the self, many would not (Bargh & Chartrand, 1999). From this perspective, task monitoring processes are crucial, though not sufficient by themselves (Kerns et al., 2004), for overriding problematic response tendencies. Self-control strength and its depletion may thus be reliant on such monitoring processes, a point substantiated in our review.

The success (versus failure) of cognitive control is primarily a result of dlPFC activation (Kerns et al., 2004) and the processes uniquely implemented by this brain structure (Knight & Stuss, 2002). Damage to the dlPFC leads to perseverative tendencies and behaviors, major difficulties in social functioning, and indeed to impaired self- and emotion-control abilities (Saint-Cyr, Bronstein, & Cummings, 2002). Note that these consequences of dlPFC damage are highly consistent with impaired self-control as highlighted by the strength-based theory of self-control (Baumeister et al., 2000). Thus, it is suggested that the recruitment of the dlPFC's resources should play an important role in understanding whether self-control will be instantiated or not (Goldberg, 2001). Finally, the dlPFC is activated in context-specific terms (Miller & Cohen, 2001) and we provide evidence that self-control strength may be similarly characterized.

Findings in Support of the Heuristic Model

One purpose of the review is to introduce studies involving cognitive control measures and findings that would seem especially germane to understanding how self-control strength works. In addition, a number of social and personality psychologists have adopted and adapted cognitive control methods in understanding the processing basis of self-control strength. Relevant findings of this type are reviewed as well. In sum, there is an emergent potential interface of social and cognitive perspectives on top-down control that we sought to highlight.

Self-control strength in terms of task motivation

A first important set of studies was reported by Schmeichel (2007). In four studies, he showed that there appears a close connection between self-control depletion effects and cognitive control processes. Manipulations of ego depletion undermined cognitive control

performance (e.g., Experiment 1) and the reverse direction of influence was found as well (Experiment 3). Related results have been reported by Schmeichel, Volokhov, and Demaree (2008). These data strongly suggest that basic processes related to cognitive control (e.g., working memory, reliant on the dlPFC: Goldberg, 2001) overlap considerably with those involved in self-control of a more molar social type (e.g., suppressing one's emotional displays).

The cognitive control literature has suggested that controlling unwanted outcomes may be more dependent on task motivation than on capacity or strength (Gehring & Knight, 2000; Sarter et al., 2006). Muraven's social psychology research is particularly relevant to this emphasis on task motivation. First, Muraven and Slessareva (2003) showed that apparent depletion effects due to the use of self-control resources could be overcome to the extent that the individual was offered a sufficient incentive for doing so (for a related priming perspective, see Martijn et al., 2007). Second, Muraven, Shmueli, and Burkley (2006) found that self-control depletion effects were highly dependent on whether participants expected a demanding task in the future. Third, consistent with earlier findings reported by Moller, Deci, and Ryan (2006), Muraven, Gagne, and Rosman (2008) found that engaging in self-control for intrinsic, participant-endorsed reasons did not undermine subsequent self-control performance. In sum, there appears to be a close potential link between lower levels of task-motivation and self-control failures. Such motivational factors are further discussed below, particularly so because we believe that they influence the other mechanisms involved in self-control depicted in Figure 1.

Self-control strength in terms of task monitoring

Personality and clinical investigations have shown that monitoring processes are crucial to effective self-control in general terms (that is, aside from self-control depletion manipulations). Brown and Ryan (2003) found that individual differences in mindfulness, conceptualized in monitoring terms, were associated with numerous beneficial outcomes, including higher levels of subjective well-being, higher levels of autonomous functioning, and lower levels of depression. The latter result is particularly important because numerous studies have now shown that being mindful of present reality (i.e., monitoring it to a greater extent) mitigates even clinical tendencies toward depression (Williams, 2008).

More germane to our processing analysis, though, are three recent studies. Compton et al. (2008) found that individuals displaying stronger ERN responses to errors (reflecting error-monitoring processes: Holroyd & Coles, 2002) were better able to control their emotional reactions to stressors in daily life. Compton et al. (2009) replicated this pattern and showed that it was true of both depressed and non-depressed individuals. Hirsh and Inzlicht (in press) extended this link of ERN processes to everyday life outcomes by showing that individuals displaying stronger ERNs had higher GPAs, a classic measure of self-control success (Tangney, Baumeister, & Boone, 2004). At least from an individual differences perspective, then, the monitoring processes linked to the ACC (van Veen & Carter, 2002) appear particularly informative in understanding outcomes typically viewed in strength-related terms (Baumeister et al., 1994). Further studies of this ERN model of self-control can be recommended.

Turning to a related issue, Figure 1 suggests that greater task motivation should be associated with greater task monitoring. Studies provide direct support for this idea. When participants are motivated to be accurate, their brains exhibit evidence of increased monitoring for conflict or error (Falkenstein et al., 2000). Conversely, when participants are not personally invested in a task, there appears to be less monitoring of one's potential

for error (Hajcak, Moser, Yeung, & Simons, 2005). A particularly relevant study was conducted by Inzlicht and Gutsell (2007). They found that a self-control depletion manipulation resulted in a smaller subsequent ERN signal in a basic cognitive task. Conceptually similar results have been reported by others (Inzlicht, McKay, & Aronson, 2006; Richeson & Shelton, 2003). Thus, task monitoring is sensitive to both depletion and motivational influences and may thus be a key component of whether self-control performance will be successful or not.

Finally, there is a great deal of convergence on the importance of the ACC (the generator of the ERN: van Veen & Carter, 2002) to monitoring both unwanted cognitive and social outcomes. It is well-established that the ACC responds to error-prone contexts or actual errors (van Veen & Carter, 2006). More recently, it has been shown that the ACC responds to social rejection manipulations (Eisenberger, Lieberman, & Williams, 2003), pain (Rainville, Duncan, Price, Carrier, & Bushnell, 1997), and negative emotional events and experiences (Duncan & Barrett, 2007). Data of this type have led to the idea that the ACC serves a quite general purpose in recognizing problematic occurrences, cognitive as well as social (Lieberman & Eisenberger, 2005). Results of this type are further suggestive that the same ACC-dlPFC circuit is likely to be involved in both cognitive control and self-control (Goldberg, 2001).

Self-control strength in terms of operating processes

The monitoring processes of the ACC are viewed as perhaps necessary, but not sufficient, for instantiating cognitive control (Lieberman & Eisenberger, 2005). For example, high levels of ACC activity have been observed among individuals (such as those suffering from obsessive-compulsive disorder) who nonetheless exhibit difficulties overriding unwanted behaviors (Gehring & Knight, 2000). Thus, the role of the ACC is conceptualized as a problem-monitor, which in turn recruits the dlPFC to do the actual work of inhibiting problematic response tendencies (Miller & Cohen, 2001). An elegant cognitive control study along these lines was conducted by Kerns et al. (2004).

Further, at least two sources of evidence link the dlPFC to outcomes of relevance to understanding self-control strength. The first source establishes quite clearly that damage to the dlPFC results in problems in controlling habitual thoughts, feelings, motivations, and behaviors (Knight & Stuss, 2002). Thus, if there is a brain locus of self-control, it is most clearly dependent on processes instantiated by the dlPFC (Goldberg, 2001). The second source links dlPFC activation (as well as activation in other brain structures not of central interest here) to preferences and choices consistent with favoring long-term rationality over short-term immediate gains (e.g., McClure, Botvinick, Yeung, Greene, & Cohen, 2007). Because self-control processes operate similarly (Baumeister et al., 1994), the results of McClure et al. are highly informative concerning this dlPFC/self-control interface.

In contrast to the ERN findings reported above, though, there is preciously little social or personality work on dlPFC's probable link to self-control operations. That said, error-correction processes in RT (e.g., slowing down following an error) have shown a systematic relationship to dlPFC activation (Kerns, 2006; Kerns et al., 2004). In this cognitive control context, the five studies of Robinson (2007) are informative. He found that individuals who paused following their cognitive errors to a greater extent reported (1) higher levels of life satisfaction, (2) lower levels of depression, (3) were seen to be happier by naïve observers, (4) were better capable of recognizing rewards and punishments in the environment, and (5) exhibited better abilities to inhibit dominant task sets.

The utility of this cognitive model of self-control strength was further substantiated in several subsequent investigations. Wilkowski and Robinson (2008a) showed that highly psychopathic individuals slowed down following error feedback to a lesser extent, consistent with clinical theories of psychopathy (Patterson & Newman, 1993). Moeller and Robinson (2009) found that men, relative to women, exhibited this tendency to a lesser extent, consistent with men's greater levels of behavioral impulsivity (e.g., Eagly & Steffen, 1986). Other related findings can be cited as well (Robinson, Ode, Wilkowski, & Amodio, 2007; Robinson, Pearce, Engel, & Wonderlich, 2009). Thus, a cognitive control model of self-control strength appears to have considerable value, primarily so far from an individual differences perspective.

Context-specificity in the cognitive control system

The strength-based perspective of self-control (Muraven & Baumeister, 2000) posits that a common set of resources are used in relation to multiple self-control efforts. Results are generally compelling in support of this point (Baumeister et al., 2000; Schmeichel & Baumeister, 2004). Yet, Baumeister et al. (1994) also highlighted cases in which self-control failures appeared particular to a given class of temptations (e.g., alcohol, gambling, or procrastination). Thus, self-control could operate in both general and context-specific terms.

From a cognitive control perspective, in fact, specificity of the latter type should be expected. For the ACC to serve as an effective 'alarm' system (Lieberman & Eisenberger, 2005), it should remain quiescent much of the time. Otherwise, it would lose its value, much like in the 'boy who cried wolf' parable. Similarly, the dlPFC's activity shows exquisite sensitivity to the contexts in which it is needed (Lieberman & Eisenberger, 2005). It follows that there should be self-control benefits to recruiting cognitive control wisely – i.e., in *particular* situations in which not doing so could be problematic. Recent studies have supported such ideas.

In an interesting analysis of self-control, Kuhl (2000) proposed two distinct responses to stress, one state-oriented in nature and the other action-oriented in nature. The state orientation is marked by ruminating on stress, higher levels of self-consciousness, and emotion-focused coping. The action orientation is marked by efforts to meet threats or challenges by action, lower levels of self-consciousness, and problem-focused coping. In an impressive program of research, Jostmann and Koole (2006, 2007) have found that action-oriented individuals *are not* higher in their self-control or cognitive control capacities in the absence of stressors. However, in the presence of stressors, it appears that action-oriented individuals recruit cognitive control, whereas state-oriented individuals do not. It is intuitive that this differential pattern may well be key to understanding the maladaptive responses to stress exhibited by state-oriented individuals.

Self-control issues figure prominently in anger and aggression. A recent body of work has provided significant insights into the cognitive control processes involved. Traditional theories of aggression contend that individuals are pawns of their activated hostile thoughts. For example, it is well-established that incidental priming procedures of a hostility-related type (e.g., hostile media exposure) result in higher levels of subsequently reported anger, exhibited aggression, pro-violence attitudes., and so on (Anderson et al., 2003). However, such priming effects, though significant, are small to moderate in magnitude (Bushman & Anderson, 2001). This fact has given rise to a recent body of findings indicating that some individuals automatically self-regulate such thoughts and their influence. For example, Mauss, Evers, Wilhelm, and Gross (2005) found that individuals favoring the emotion-regulation of anger, in a modified implicit association task

(Greenwald, McGhee, & Schwartz, 1998), were in fact less reactive to hostility-related inductions, most impressively in physiological terms.

An implicit cognitive perspective on individual differences in anger and aggression has also been pursued by the first author's graduate students. Meier and Robinson (2004) found that aggressive and non-aggressive individuals had equally accessible hostile thoughts, but that non-aggressive individuals were less influenced by such thoughts. This set of facts gave rise to research showing that non-aggressive individuals self-regulate their activated hostile thoughts, but do so in implicit processing rather than effortful terms (Meier, Robinson, & Wilkowski, 2006; Wilkowski, Robinson, & Meier, 2006). We subsequently showed that non-aggressive individuals differentially recruit cognitive control (as measured by tasks such as the Stroop task), but only in the specific context of hostile thought activation (Wilkowski & Robinson, 2008b; Wilkowski, Robinson, & Troop-Gordon, 2009). Finally, a recent study found that is possible to train all individuals to self-control their hostile thoughts, implicitly so, with a consequent reduction in physical aggression (Meier, Wilkowski, & Robinson, 2008).

In their introduction to the Handbook of Self-Regulation, Baumeister and Vohs (2004) contrasted effortful theories of self-control with more recent sources of data suggesting that self-control may not always operate in such an effortful manner. Since then, support for the idea of automatic self-control processes has systematically accumulated (Ferguson, Hassin, & Bargh, 2008). We suggest that a cognitive control perspective of self-control has considerable merit in this context. A key consideration likely involves a monitoring mechanism implicitly tuned to potentially problematic situations or behaviors, whether cognitive or social.

Additional considerations

In positing an entity such as self-control strength, it would be useful to measure it independent of the phenomena the construct is meant to explain (e.g., depletion effects). An important set of studies along these lines was recently conducted by Gailliot et al. (2007). In these studies, it was shown that acts of self-control reduce glucose levels and that the ingestion of glucose mitigates self-control depletion effects. It is probable that glucose levels influence the processes highlighted here, particularly task motivation (Thayer, 2001). Thus, the findings of Gailliot and colleagues are potentially amenable to present analysis. We admit that this suggestion is speculative at the present time. In any case, we will be interested in further developments of this glucose model of self-control strength.

Even more recently, the importance of motivation to self-control depletion effects has been highlighted in a review by Baumeister and Vohs (2007). The present review can be viewed in terms of furthering this suggestion of the importance of motivational factors. What the cognitive control literature has tended to emphasize is motivation to perform a task well (e.g., Falkenstein et al., 2000). What Baumeister and Vohs additionally suggested was that people are motivated to preserve their self-control resources for possible future use. Thus, there may be an inverse relation between task motivation and motivation to preserve one's self-control resources.

The strength-based view of self-control (e.g., Muraven & Baumeister, 2000) emphasizes capacity considerations, perhaps irrespective of motivational factors. The motivational override posited by Baumeister and Vohs (2007), instead, emphasizes processes that we suggest are not capacity-based, an important limitation to the strength-based model in

our view. A further question should be considered – namely, whether self-control strength can be viewed in motivational rather than capacity-related terms, a possibility hinted at by some sources of data (Moller et al., 2006; Muraven & Slessareva, 2003). Regardless, further work concerned with this motivational-capacity interface seems desirable in better understanding it.

Conclusions

The initial literature review of self-control by Baumeister et al. (1994) can be credited multiple times over. The executive capacities of the self had been neglected, a clear and important theory was offered, relevant findings were subsequently amassed (Baumeister et al., 2000; Muraven & Baumeister, 2000; Schmeichel & Baumeister, 2004), and new directions of self-control research were charted. The present authors were inspired by Baumeister et al.'s theory in multiple ways, probably too numerous to mention. The present analysis of self-control strength and its depletion contends that there is value to understanding self-control strength from a cognitive control perspective, particularly in relation to task motivation, task monitoring, operating processes, and context-specific recruitment. There is value to other perspectives of self-control as well, such as those based on construal-level theories (Fujita & Han, 2009). In any case, it is clear that the self-control strength construct has invigorated an exciting and vital literature tackling key questions concerning optimal and suboptimal human functioning.

Short Biographies

Michael Robinson's research is located at the interface of personality, social, cognitive, and emotion-related areas of study. He has published numerous articles in recent years, received several research awards, and is an associate editor for *Journal of Personality and Social Psychology* and *Cognition and Emotion*. Before coming to North Dakota State University, where he presently teaches, he received his BA from the University of California, Santa Cruz, his PhD from the University of California, Davis, and completed post-doctoral training in emotion at the University of Wisconsin and the University of Illinois, Champaign. More information can be found at: http://www.psych.ndsu.nodak.edu/robinson/.

Brandon Schmeichel is an Assistant Professor in the Department of Psychology at Texas A&M University. He received his PhD in social psychology from Florida State University in 2005. Schmeichel has authored over 20 professional publications on the topics of self-control, working memory capacity, and the drive some people have for more and higher self-esteem. He enjoys playing rock and roll on his guitar and hanging out with his family in his free time.

Michael Inzlicht is an Assistant Professor of Psychology at the University of Toronto Scarborough and the director of the Toronto Laboratory for Social Neuroscience. He conducts research that sits at the boundaries of social psychology, neuroscience, and education and has published papers on the topics of stigma, self-regulation, and religion. He completed his BSc in Anatomical Sciences at McGill University, his MSc and PhD in Experimental Psychology at Brown University, and his post-doctoral fellowship in Applied Psychology at New York University. He is the 2006 winner of the Louise Kidder Early Career Award (APA Div 9). More information can be found at: http://www.utsc.utoronto.ca/~inzlicht/.

Endnote

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