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"Pay the piper": It helps initially, but motivation takes a toll on self-control

Jeffrey D. Graham*, Steven R. Bray, Kathleen A. Martin Ginis

Department of Kinesiology, McMaster University, 1280 Main St. W., Hamilton, Ontario L8S 4K1, Canada

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ABSTRACT

Objective: To investigate the aftereffects of anticipating future self-control and motivation on self-control strength depletion patterns.
Design: Single blind, randomized 2 (autonomy-supportive motivation/controlling motivation) × 2 (anticipation/no anticipation) factorial.
Method: Participants ($N = 72$) performed four sequential self-control strength challenges: an initial endurance handgrip squeeze followed by the Stroop task and two additional endurance handgrip squeezes. A sequential randomization procedure was used to allocate participants to one of four conditions: anticipation/autonomy-supportive motivation ($n = 19$), anticipation/controlling motivation ($n = 17$), no anticipation/autonomy-supportive motivation ($n = 18$), and no anticipation/controlling motivation ($n = 18$).
Results: Participants who anticipated future self-control depletion conserved resources on the second task by completing fewer words on a Stroop task compared to controls. Participants who received autonomy-supportive instructions performed significantly better than controls on a third task (endurance handgrip squeeze), but worse than controls on the fourth task (another endurance handgrip squeeze). There were no significant interactions between anticipation and motivation ($p > .05$).
Conclusions: Results support previous findings reflecting conservation and motivation effects on self-control strength. This was the first study to show that autonomy-supportive instructions may assist self-control performance in the short term but ultimately depletes self-control strength and impairs performance in the long term.

Self-regulation or self-control refers to the self's capacity to override behaviors, thoughts, or emotions and replace them with alternative actions or responses (Baumeister & Heatherton, 1996). The self-control strength model suggests self-control is dependent upon a finite but renewable internal resource that is expended when one regulates his or her emotions, thoughts, or behaviors (Baumeister, Bratslavsky, Muraven, & Tice, 1998). An abundant literature supports the notion that when self-control strength resources are utilized in the performance of an initial task, a self-control strength depletion effect occurs, and deficits are seen in performance on subsequent tasks that require self-control (Hagger, Wood, Stiff, & Chatzisarantis, 2010a, 2010b). Depletion of self-control strength shows aftereffects within similar domains (e.g., cognitive control–cognitive control ES = .59) as well as across dissimilar domains (e.g., cognitive control–behavioral control; ES = .63) (Hagger et al., 2010a).

Hagger et al. (2010b) provide a compelling discussion of how the strength model may have important implications for understanding self-control in sport and exercise contexts and may be integrated with psychosocial theories that have been applied in these areas. For instance, athletes and exercisers routinely perform strenuous physical tasks one after another, often for prolonged periods of time, when competing and training. People involved in such behaviors utilize self-control strength to override and inhibit the temptation to quit while attempting to exert additional physical resources to achieve greater performances, such as running a faster time in a race or performing an extra set of exercises at the end of an already exhausting workout. Although scenarios like these are common in sport and exercise the research examining self-control depletion effects within the sport and exercise domain remains relatively scarce (e.g., Dorris, Power, & Kenefick, 2012; Englert & Bertrams, 2012; Graham & Bray, 2012; Martin Ginis & Bray, 2010; McEwan, Martin Ginis, & Bray, 2013).

* Corresponding author. Tel.: +1 289 339 9687.
E-mail address: grahajd2@mcmcaster.ca (J.D. Graham).

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The present study investigated the self-control strength depletion effect on exercise performance in the context of two moderators that have been found to affect the direction and magnitude of self-control strength depletion: conservation of self-control resources and motivation (Hagger et al., 2010a, 2010b). Based on the assumption that self-control strength is a limited and important resource within the human body, researchers have theorized that people may consciously or unconsciously conserve strength depending on task or environmental demands and their internal states. In a series of studies, Muraven, Shmueli, and Burkley (2006) found that when participants in an experimental group were forewarned such that they anticipated having to exert self-control on a distal task, they performed worse than control participants on proximal tasks requiring self-control. In contrast, control group participants who had no advance warning of distal self-control demands performed better than the experimental groups on the proximal self-control tasks. The researchers reasoned that participants purposely conserved self-control strength when they knew they had to exert it later on. These findings were later reproduced in a series of studies by Tyler and Burns (2009).

Together these findings suggest that self-control strength is a resource that may be strategically managed depending on the self-control demands of a given situation ($d = 1.04$, Hagger et al., 2010a). However, as far as we are aware, only one study (Muraven et al., 2006, Study 4) has gone on to show that participants who conserved self-control on the proximal task exhibited better performance than controls on a distal self-control task ($d = 0.61$). Thus, in order to understand how conserving self-control strength can alter one's self-control performance capabilities, further research investigating the aftereffects of self-control strength conservation should be undertaken.

Motivation is another factor that has been theorized to modify self-control strength depletion effects and is one of the most influential factors affecting self-control depletion effects (Inzlicht & Schmeichel, 2012). The self-determination perspective (Ryan & Deci, 2000) defines motivation in terms of a continuum ranging from controlled regulation to autonomous regulation. Controlled regulation typically occurs when one performs a behavior on account of external influences such as being rewarded or coerced, whereas greater levels of autonomous regulation are thought to be present when performing an action that one freely chooses, or is supported to do, for the inherent satisfaction, enjoyment, or importance of the task itself (Ryan & Deci, 2000).

It has been suggested that when people feel controlled, or pressured, to exert self-control a greater amount of self-control strength is depleted compared to when they feel more autonomous. For instance, when people feel controlled they may have to overcome internal resistance in order to exert self-control (e.g., Moller, Deci, & Ryan, 2006; Muraven, Rossman, & Gagne, 2007). Studies have manipulated motivation through the provision of monetary incentives, perceived choice or autonomy, and performance contingent rewards (Legault & Inzlicht, 2012; Moller et al., 2006; Muraven, 2008; Muraven, Gagne, & Rosman, 2008; Muraven et al., 2007; Muraven & Slessareva, 2003; Vohs, Baumeister, & Schmeichel, 2012). In general, the results from these studies show that when participants are exposed to manipulations designed to enhance feelings of autonomous regulation through rewards, supported choice, or autonomy, their self-control performance is enhanced compared to control participants who show predictable self-control strength depletion effects ($d = 1.05$, Hagger et al., 2010a).

One limitation of the studies investigating the effects of enhanced, or more autonomous forms of, motivation on self-control strength depletion is that they have relied on simple pre-test, post-test designs and have not investigated the distal aftereffects of the motivation manipulations. As mentioned previously, it has been suggested that exerting self-control when feeling greater autonomous regulation is less depleting than when feeling controlled or pressured. However, based on the tenets of the strength model of self-control (cf. Baumeister & Heatherton, 1996; Muraven & Baumeister, 2000) an alternative interpretation could be that greater autonomous motivation may lead people to exert a greater degree of self-control resources that may assist them in the short term but ultimately leave them with less self-control strength to draw upon for subsequent self-control performances. Furthermore, from a resource conservation perspective, it makes sense that people may hold a proportion of their available self-control strength "in reserve" such that they may utilize it if they feel it is necessary or when they are motivated to do so (Baumeister, Vohs, & Tice, 2007), yet, we are not aware of any research that has investigated this premise in a sequential series of self-control consuming tasks. Performing a series of sequential self-control tasks is necessary to determine whether people who are more motivated to expend self-control strength for a task utilize some of their "reserve" strength to allow them to perform better. If this is the case, depletion of the self-control strength reserve should come at some cost. As a consequence, greater motivation may be associated with better self-control performance in the short term, but worse performance in the longer term.

Overall, a greater degree of autonomous motivation has been consistently shown to positively affect self-control performances; however, the research examining the effects of motivation on self-control of an exercise task is limited to a single study (Muraven, 2008). Furthermore, no research has examined how autonomous motivation in concert with strategic conservation of self-control strength may affect physical performance when in a depleted self-control state. The issue of autonomous versus controlled motivation is relevant to sport scientists and practitioners as coaches and trainers often try to motivate their athletes to expend additional effort during competition or over the course of a practice or workout. The issue of conservation is also relevant inasmuch as athletes may need to consider how they pace their utilization of self-control strength as it can be consumed by controlling emotions (e.g., anxiety), cognitions (e.g., decision-making), or behaviors (effortful exercise); all of which come may into play during sport competition (cf. Hagger et al., 2010b).

In the present study we investigated the independent and interactive effects of anticipating future self-control depletion and autonomy-supportive versus controlled motivation on self-control strength depletion patterns. The first purpose was to examine the effects of providing anticipatory information about future self-control depletion on self-control performance. The second purpose was to investigate the proximal effects of autonomy-supportive motivation on self-control strength depletion. The third purpose was to investigate the interaction of resource conservation and motivation on self-control strength depletion. The final purpose was to explore our extension of the conservation of resources hypothesis and investigate the distal aftereffects of autonomy-supportive motivation on self-control performance.

Hypotheses

1) In line with the conservation of resources hypothesis (Muraven et al., 2006), it was hypothesized that individuals who anticipate distal self-control expenditure would conserve self-control strength and, in so doing, perform worse than controls on a proximal self-control task. However, following their initial conservation of self-control strength, we expected those individuals to perform better than controls on a subsequent self-control task.