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What is This?

Research Article

You Wear Me Out

The Vicarious Depletion of Self-Control

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ABSTRACT—*Acts of self-control may deplete an individual's self-regulatory resources. But what are the consequences of perceiving other people's use of self-control? Mentally simulating the actions of others has been found to elicit psychological effects consistent with the actual performance of those actions. Here, we consider how simulating versus merely perceiving the use of willpower can affect self-control abilities. In Study 1, participants who simulated the perspective of a person exercising self-control exhibited less restraint over spending on consumer products than did other participants. In Study 2, participants who took the perspective of a person using self-control exerted less willpower on an unrelated lexical generation task than did participants who took the perspective of a person who did not use self-control. Conversely, participants who merely read about another person's self-control exerted more willpower than did those who read about actions not requiring self-control. These findings suggest that the actions of other people may either deplete or boost one's own self-control, depending on whether one mentally simulates those actions or merely perceives them.*

Does life take self-control? The producers of TV reality shows appear to think so. Each week, individuals on popular shows such as "Survivor," "Fear Factor," and "The Biggest Loser" encounter difficult situations in which they must use self-control to resist tempting foods or eat disgusting things, endure anxiety-provoking and sometimes painful circumstances, and generally overcome frustration. Surely these situations are difficult for the individuals involved, but what about for the viewers? What are the consequences of perceiving other people exert a high degree of self-control?

From the perspective of goal-pursuit research, and priming research more generally, the answer appears straightforward. Regardless of the medium (e.g., visual observation, reading), perceiving an individual pursue his or her goal of resisting temptation is likely to automatically activate that same goal in the perceiver. In fact, this goal-contagion effect (Aarts, Gollwitzer, & Hassin, 2004; Dik & Aarts, 2007) underlies many of the experimental manipulations used in priming research (e.g., participants may read about the goal-directed actions of a target and "catch" this goal). Intriguingly, however, other perspectives allow for the possibility that perceivers' experiences will extend beyond the mere activation of a goal.

One such perspective, simulation theory, suggests that people understand and react to the mental and physical states of others by internally replicating them (for a review, see Goldman, 2006). Indeed, recent evidence has demonstrated that imagining or actively perceiving other people's actions can elicit many of the same neural and embodied responses that would occur if one performed those actions oneself (e.g., Decety & Sommerville, 2008; Mitchell, 2008; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Rizzolatti & Craighero, 2004). Simulation theory, along with other perspectives positing some form of inclusion of the social environment within the individual (e.g., Aron, Aron, Tudor, & Nelson, 1991; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Goldstein & Cialdini, 2007), suggests that people may sometimes treat the actions of others, and the effects those actions entail, as their own. What would this imply in the context of a self-control goal? Within the individual, self-control has been found to require the expenditure of a limited self-regulatory resource, which is depleted after use (e.g., Muraven & Baumeister, 2000). If perceivers experience the successful self-control of others as their own, they may show depletion effects akin to those demonstrated in studies of intrapersonal self-control.

In the experiments reported in this article, we investigated whether the actions of other people may both prime a self-control goal in perceivers and reproduce the downstream effects of that goal pursuit. That is, can resisting temptation deplete self-regulatory abilities not only in the individual who resists temptation, but also vicariously, in perceivers?

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DEPLETION OF SELF-CONTROL

Self-control refers to the inhibition of dominant tendencies, presumably for the purpose of achieving more rewarding long-term outcomes (Muraven & Baumeister, 2000). For example, dieters may exert self-control to avoid tasty but calorie-rich foods, whereas students may exert self-control to persist in studying important but uninspiring material. The act of regulating one's immediate urges requires effort and is thought to draw on a limited but replenishable resource (Muraven & Baumeister, 2000). Thus, using self-control in one setting can reduce the use of self-control in a subsequent (and unrelated) setting. Prior investigations of self-control have focused primarily on the intrapersonal triggers of depletion. However, researchers have begun to highlight the interplay between internal self-regulatory processes and the social environment (e.g., Finkel et al., 2006; Fitzsimons, Shah, Chartrand, & Bargh, 2005; Heatherton & Vohs, 1998), setting the stage for investigating potential vicarious depletion of self-control.

WHAT YOU DO, I DO TOO

As indicated by an ever-expanding array of findings, social perception can automatically and nonconsciously influence, or prime, a person's thoughts and actions (for reviews, see Dijksterhuis & Bargh, 2001; Ferguson & Bargh, 2004). For instance, seeing another person's behavior (e.g., foot shaking, face rubbing) can elicit those same behaviors in oneself, even without one's knowledge (Chartrand & Bargh, 1999). The same is true for goal-directed actions, which are automatically encoded in terms of the goals they represent (e.g., Decety & Sommerville, 2008; Hassin, Aarts, & Ferguson, 2005). For instance, studies have found that participants presented with an actor exhibiting a goal on one task (e.g., being helpful, earning money, seeking casual sex) subsequently act in goal-consistent ways on unrelated tasks (Aarts et al., 2004; Dik & Aarts, 2007). Thus, perception can allow goals represented in the social environment to become active within the individual.

The social environment can also become incorporated in the self, possibly in a more profound manner, through simulation. Simulation occurs when perceiving or imagining actions evokes mental (or embodied) representations of those actions that are in many ways identical to the representations that occur when people engage in those actions themselves (Gallese, Keysers, & Rizzolatti, 2004). In essence, "simulated action can elicit perceptual activity that resembles the activity that would have occurred if the action had actually been performed" (Decety & Grèzes, 2006, p. 5). When people truly engage in an action, they encode associations between the action and its sensory and affective consequences (Hommel, 2004; Niedenthal, 2007). Mental simulation of an action can therefore generate a multi-modal response (e.g., muscle movements, facial expressions, concept activation) through retrieval of such past experiences.

For example, if you were to mentally simulate a person stubbing his or her toe, you might grimace and feel pain (Jackson, Brunet, Meltzoff, & Decety, 2006).

We propose that a similar outcome may occur when an individual simulates the experience of someone using self-control. How might this come about? One method of inducing simulation entails taking another person's perspective (e.g., Ruby & Decety, 2001). Through perspective taking, a perceiver attempts to put him- or herself in the shoes of an actor, thereby imagining the behaviors, thoughts, and feelings of that person. This simulation, though purportedly only about the actor's experience, calls on the perceiver's past experiences (including autonomic and somatic responses) in situations that involved similar events, much as simulating future situations depends on retrieval of past ones (Schacter & Addis, 2007). Perspective taking can therefore induce a variety of vicarious experiences. For instance, taking the perspective of another person can produce corresponding outcomes, such as feelings of pain (e.g., Jackson et al., 2006) and cognitive dissonance (e.g., Norton, Monin, Cooper, & Hogg, 2003), and can even lead people to attribute qualities associated with that person's behavior to themselves (e.g., people who take the perspective of a self-sacrificing person may rate themselves as more self-sacrificing than people who do not take this other's perspective; Goldstein & Cialdini, 2007).

Therefore, if one were to take the perspective of an actor who is exercising self-control, the resulting simulation would likely lead one to retrieve one's own similar experiences and activate these mental representations. This process theoretically could result in the natural consequence of the use of self-control—self-regulatory depletion.

Can perceiving another person's use of self-control result in vicarious depletion? We conducted two studies to investigate the influence of perceiving other people's self-control exertion on individuals' own self-regulatory abilities. In both studies, we assessed indicators of depletion that have been used effectively in previous studies of intrapersonal self-control. However, we used perspective-taking instructions to induce the simulation of an actor's behavior. In Study 1, we tested the influence of simulation on self-control depletion within the context of purchasing decisions. In Study 2, we considered a dependent variable from an entirely different domain—word production—and, to better discriminate the circumstances under which vicarious depletion occurs, we compared responses to an activity requiring self-control with responses to an activity not requiring self-control.

STUDY 1

The availability of self-regulatory resources has been found to predict restraint from impulsive spending (Vohs & Faber, 2007). Depleted individuals are willing to spend more money on desirable goods than nondepleted individuals. We drew upon this idea to investigate the occurrence of vicarious depletion. Would

taking the perspective of a person exerting self-control (in an unrelated domain) lead participants to willingly spend more money?

Method

Participants
Participants included 32 women and 26 men (median age = 20 years) from a mixed undergraduate-community sample. Each person was paid $2.00 for participating.

Procedure
Participants completed a questionnaire that purportedly involved "the evaluation of different types of consumer and business-related products." First, all participants read a story about a waiter or waitress (matched to the sex of the participant) who worked at a restaurant that sold high-quality food and who arrived to work hungry, but unable to eat on the job (which would result in being fired). This story was written in the first person and described in acute detail the delectable courses being served and how difficult it was for the actor to resist giving in to temptation. Half of the participants were asked to simply read the story, and the other half were instructed "to take the perspective of the person who wrote [the story]. That is, try to really imagine yourself in his or her shoes, and concentrate on trying to imagine what the person was thinking and how he or she was feeling" (instructions adapted from Goldstein & Cialdini, 2007).

Participants then completed the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988), an instrument that is used in most studies of self-regulatory depletion (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven & Slessareva, 2003) to measure mood valence and arousal. Next, a price-assignment task (which provided the primary dependent measure) was given. Following the procedure used by Vohs and Faber (2007), participants viewed images of 12 mid- to high-priced products (e.g., watches, cars, and major appliances) and listed how much they would be willing to pay for each. These items were selected so that participants would not have accurate knowledge of their true cost, to allow for reasonable variance in price estimates. Finally, participants completed several items that checked the manipulation and probed for suspicion (e.g., "How did the writer of the story feel?" on a scale from 1, *frustrated*, to 7, *calm*). They were then debriefed and paid.

Results

We expected that taking the perspective of an actor using self-control would decrease participants' willingness to regulate their spending. Following Vohs and Faber (2007), we first averaged prices for the 12 products to create a composite pricing index. A one-way analysis of variance (ANOVA) on this index revealed the predicted main effect of perspective taking, $F(1, 56) = 4.94$, $p < .05$, $p_{rep} = .935$. Participants who took the

perspective of the waiter were willing to spend over $6,000 more ($M = \$14,906.46$, $SE = \$1,910.32$) than participants who simply read the waiter's account and did not engage in perspective taking ($M = \$8,686.44$, $SE = \$2,046.94$).

This effect was not accounted for by differences in mood across conditions. Perspective taking did not affect either the valence composite ($F < 1$) or the arousal composite ($F < 1$). Finally, the manipulation-check item indicated that people were aware that the writer of the self-control story found the situation frustrating ($M = 2.12$, $SD = 1.27$), $t(56) = -11.17$, $p < .001$, $p_{rep} > .99$ (one-sample t test against the scale's midpoint). The perspective-taking instructions did not affect this evaluation ($F < 1$).

Discussion
In Study 1, people who took the perspective of an actor using self-control in one situation were willing to spend more money on products in an unrelated situation than were people who simply read about the actor. This effect was not due to changes in mood. The results are suggestive of vicarious depletion: Simulating self-control use likely activated a multimodal representation of that activity, which subsequently led to decreased self-regulatory restraint. However, an alternative possibility is that the data were driven not by depletion in the perspective-taking condition, but rather by goal contagion (i.e., contagion of the goal of self-control) in the non-perspective-taking condition. These two effects may even have occurred simultaneously. Study 2 was designed to address these possibilities.

STUDY 2

In Study 2, participants read either the same self-control story used earlier or a similar story in which the actor did not resist any urges. The non-self-control story provided a comparison condition that allowed us to (a) identify the circumstances under which the goal will be transmitted (i.e., contagion of the self-control goal) and the circumstances under which the consequence of that goal will be transmitted (i.e., vicarious depletion), and (b) rule out the possibility that depletion is a general result of perspective taking. We expected that simulation of self-control would again deplete participants, but that simulation of an activity not requiring self-control would not be depleting. Additionally, we expected that merely perceiving the use of self-control (without simulating it) would improve participants' self-control, which would be consistent with recent research indicating that perceiving a high degree of effort increases the likelihood of goal-contagion effects (Dik & Aarts, 2007).

Depletion of self-regulatory resources affects self-control abilities across a wide range of domains (Muraven & Baumeister, 2000), and in this study, we tested whether vicarious depletion affects people's expenditure of effort in a domain different from the one we focused on in Study 1. Specifically, Study 2 tested vicarious depletion in a performance-based do-

main—constructing new words out of old ones. Superior performance on active problem-solving tasks involving word comprehension and intellectual functioning (e.g., anagrams, logical and analytic tests) requires controlled processing, sustained motivation, and concentration, and self-regulatory depletion has been shown consistently to produce decrements in performance on such tasks (e.g., Baumeister et al., 1998; Finkel et al., 2006; Schmeichel, Vohs, & Baumeister, 2003).

Method

Participants

Participants included 59 women and 64 men (median age = 19 years) from a student pool. They completed the study on individual computers and were awarded course credit.

Procedure

Participants took part in a study on "the way people tell and comprehend stories." They first read either the same hungry-waiter story from Study 1 (in which the waiter had to use self-control) or a revised version in which the waiter was not hungry and sold low-quality food (and so did not have to use self-control). Again, half of the participants were simply asked to read the story, and the other half received the perspective-taking instructions used in Study 1. After completing the BMIS, participants were told that their linguistic problem-solving abilities would be measured by a lexical generation task in which they would have to construct new words using the letters from presented words. Five source words were presented, one at a time in random order. These words were *answer*, *behavior*, *bimodal*, *igneous*, and *raincoat*. Each word was presented for 1 min, during which participants attempted to construct as many new words as possible using at least four letters from the source word. Thus, for the word *answer*, a participant might generate *swan*, *wear*, and *swear*.

Next, we included two retrieval-based measures to evaluate whether our manipulations affected, in addition to performance, accessibility of experiences relevant to self-control. The first was the Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004), which includes items such as "I refuse things that are bad for me." Although this scale was designed as a trait-based measure of self-control, it is well known that priming manipulations (such as those used in this study) can create temporary versions of chronic states, thus altering responses on scales that are typically trait based (Bargh & Chartrand, 2000). The second measure was an item assessing whether participants ever felt fatigued (in daily life) from watching someone use self-control in a difficult situation (the response scale ranged from 1, *never*, to 7, *all the time*). Participants then completed a number of manipulation-check items (e.g., feelings of similarity with the actor, perceived use of self-control by the actor, perceived difficulty of perspective taking). Finally, participants were probed for suspicion, debriefed, and dismissed.

Results

Performance-Based Effects

The number of correct words generated was averaged across the five words to create a composite score. A 2 (perspective taking: yes, no) × 2 (self-control: depicted, not depicted) ANOVA on this score revealed only a significant interaction (see Fig. 1), $F(1, 129) = 8.73$, $p < .01$, $p_{rep} = .97$, which we then explored with planned comparisons. Results from the first comparison replicated Study 1. When participants read the story in which the waiter used self-control, taking the waiter's perspective led to generating fewer words than did not engaging in perspective taking, a result indicative of a vicarious depletion effect, $F(1, 129) = 6.32$, $p = .01$, $p_{rep} = .98$. Indeed, participants generated significantly fewer words if they took the perspective of the waiter who exercised self-control than if they took the perspective of the waiter who did not exercise self-control, $F(1, 129) = 4.00$, $p < .05$, $p_{rep} = .926$.

In the non-self-control condition, perspective taking did not reduce performance (in fact, means pointed in the opposite direction), which rules out the possibility that the process of perspective taking alone was depleting. We also uncovered evidence of a goal-contagion effect: Among participants who did not receive the perspective-taking instructions, those who read the self-control story generated more words than those who read the non-self-control story, $F(1, 129) = 4.74$, $p < .05$, $p_{rep} = .921$.

Retrieval-Based Effects

Two self-report measures allowed us to test the effect of our manipulations on the retrieval and activation of relevant mental representations. First, we conducted a 2 (perspective taking) × 2 (self-control) ANOVA on the summary scores for the Brief Self-Control Scale. Consistent with our previous findings, this analysis revealed a significant interaction, $F(1, 129) = 3.85$, $p = .05$, $p_{rep} = .875$. The pattern of results largely resembled that from the lexical generation task, with the self-control story improving the self-control abilities of participants who did not engage
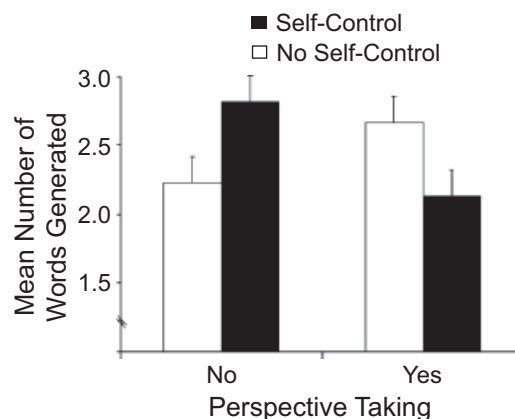

Fig. 1. Mean number of words produced in the lexical generation task as a function of perspective-taking and self-control condition in Study 2. Error bars show standard errors.

in perspective taking, but depleting the self-control abilities of participants who did engage in perspective taking (see Fig. 2a).

Second, we conducted a 2 (perspective taking) × 2 (self-control) ANOVA on the fatigue measure, which revealed an interaction consistent with the previous patterns (as expected given the dependent measure, the overall pattern was reversed; see Fig. 2b), $F(1, 129) = 7.77, p < .01, p_{rep} = .962$. Among participants who merely read the story, those in the self-control condition reported feeling tired in the past less frequently than did those in the non-self-control condition, $F(1, 129) = 5.09, p < .05, p_{rep} = .926$. However, in the self-control condition, perspective takers reported feeling tired somewhat more frequently than did non-perspective takers, $F(1, 129) = 3.51, p < .06, p_{rep} = .901$.

These two sets of findings indicate that our manipulations affected the accessibility of experiences in a manner consistent with predictions—merely perceiving someone use self-control can improve one's self-reported self-control ability and reduce one's feelings of fatigue, but simulating that person's actions (through perspective taking) reverses these effects. We also investigated whether these retrieval-based self-perceptions played a mediating role in the behavioral outcomes. They did not: When these retrieval-based measures were entered as covariates in the analysis of lexical generation performance, the interaction of perspective taking and self-control was not reduced, $F(1, 127) = 7.70, p < .01, p_{rep} = .962$.

Ancillary Analyses

Univariate analyses indicated that participants' feelings of similarity with the actor in the story were increased by both the perspective-taking instructions, $F(1, 129) = 4.55, p < .05, p_{rep} = .941$, and the self-control manipulation, $F(1, 129) = 4.80, p < .05, p_{rep} = .944$. Participants also thought that the waiter in the self-control story found restraint much more difficult than

the waiter in the non-self-control story, $F(1, 129) = 22.55, p < .001, p_{rep} > .99$. Additionally, participants who took the perspective of the waiter found that perspective taking to be equally difficult in the self-control and the non-self-control conditions ($F < 1$), which suggests that the depletion effect was not a result of effort expended on perspective taking.

Mood arousal did not differ significantly across the conditions, though a marginal interaction emerged for mood valence, $F(1, 129) = 3.64, p < .06, p_{rep} = .865$. In the perspective-taking condition, participants reported more negative mood after reading the self-control story than after reading the non-self-control story, whereas in the non-perspective-taking condition, participants reported more negative mood after reading the non-self-control story than after reading the self-control story (the only adjective from the mood measure to show this pattern significantly was the word *jittery*). Although the results for general mood resembled the lexical generation results, entering mood valence as a covariate did not affect the interactive effect of perspective taking and self-control on lexical generation performance, $F(1, 127) = 8.02, p < .01, p_{rep} = .966$.

GENERAL DISCUSSION

The ability to control the self has often been portrayed as a means of achieving group cohesion and efficient social functioning (e.g., Finkel et al., 2006; Heatherton & Vohs, 1998). Here, we considered how perceptions of another person's use of self-control might affect one's own self-functioning. In two studies, we found that taking the perspective of another person who exhibits self-control leads participants to exercise less restraint in spending estimates (Study 1), perform worse on a lexical generation task (Study 2), and report having less self-control (Study 2). This pattern was evident relative to participants who read about self-control use but did not take the actor's
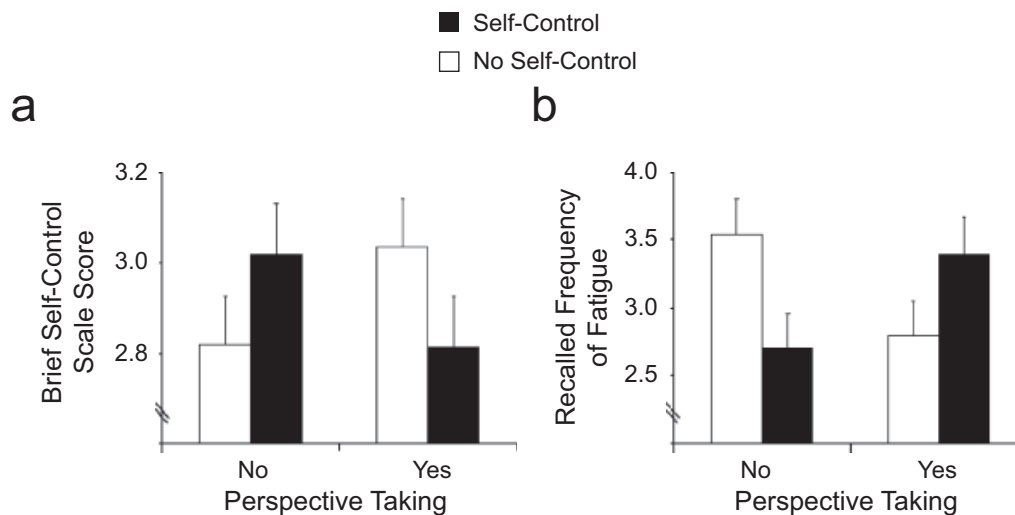

Fig. 2. Scores on the Brief Self-Control Scale (a) and recalled frequency of fatigue (b) as a function of perspective-taking and self-control condition in Study 2. Error bars show standard errors.

perspective (both studies) and also relative to participants who took the perspective of an actor who did not use self-control (Study 2). Mere perception of self-control use (i.e., simply reading about another person's use of self-control) did not deplete participants. To the contrary, among participants who did not receive the perspective-taking instructions, reading about a waiter who exerted self-control boosted performance compared with reading about a waiter who did not use self-control, a result indicative of a priming, or goal-contagion, effect. The results of Study 2 also help to resolve the question of whether vicarious depletion or goal contagion drove the outcomes found in Study 1; it appears that *both* depletion and contagion exert influence, depending on the degree to which individuals process the actions of others.

The depletion effects we observed are equivalent to those found in studies of intrapersonal depletion, although in this case they emerged vicariously, in an interpersonal context. This suggests that mental simulation makes the consequences and implications of the self-control activity relevant to the person doing the simulating. Further consideration of the simulation process may provide a window into one of the dilemmas currently facing priming researchers—how a single prime can elicit qualitatively different effects, from goals to emotions to behaviors (Bargh, 2006). Simulation becomes even more pertinent to goal-pursuit research if one accepts the somewhat contentious proposal that simulation can sometimes function as an automatic, nonconscious process (e.g., Gallese, 2003).

These results also raise important questions about the mediators of vicarious depletion and about the nature of self-control more generally. Researchers investigating intrapersonal depletion have suggested a range of mechanisms that may drive depletion effects, from reduction in a physical resource (e.g., blood glucose; Gailliot et al., 2007) to conservation of self-control resources (Muraven, Shmueli, & Burkley, 2006) and depletion expectancies (Martijn, Tenbült, Merckelbach, Dreezens, & de Vries, 2002). Though simulation may sap glucose through activation of mental processes relevant to actual self-control, another possibility is that simulating an actor's self-control use might implicitly activate expectancies about depletion and encourage one to adopt that depleted quality (see also Goldstein & Cialdini, 2007), in effect setting one's internal fuel gauge to "low" when in fact there is still plenty of fuel left in the tank. Because people automatically evaluate the outcomes of simulations (Bargh & Morsella, 2008), the "low" reading would likely lead to conservation of the supposedly depleted resource. However, the fact that the self-perceptions measured in Study 2 did not mediate the behavioral effects suggests that actual resource depletion may indeed play a part in vicarious depletion.

Implications for Group Coordination and Functioning

Failures of social coordination often result in impaired group functioning and social interactions (e.g., Finkel et al., 2006).

Our findings suggest that such impairments may also occur when social coordination works "too well." That is, when group members' actions are synchronized (e.g., by mutual perspective taking), the self-regulatory depletion of one group member may impair others' abilities as well. Though this conclusion may appear counterintuitive (many groups attempt to increase the closeness and camaraderie felt between their members), we suspect that this effect is all too common. Police officers, hospital staff, military units, and addiction support groups often find themselves in situations requiring self-control, and vicarious depletion in these situations could result in small breakdowns of self-control, such as speaking out improperly during a meeting, as well as in catastrophic ones, such as responding to an emotionally charged encounter with deadly force.

Our data also suggest, however, that if people are able to maintain a degree of psychological separation, the effortful use of self-control can actually improve overall group performance. Whether through goal-contagion effects or similar mechanisms, one person's effort may inspire other people to expend more effort than they otherwise would. The need for a balance between interpersonal separation and similarity within a group provides a conceptual analogue to the opposing needs for individual uniqueness and social connection found in intrapersonal identity models, such as Brewer's (1991) optimal-distinctiveness model. This balance may be especially important for those groups whose functioning frequently requires self-control.

Conclusions

Despite its name, self-control is inherently a social enterprise (Heatherton & Vohs, 1998). The continued expansion of self-control research into interpersonal domains is therefore likely to yield important insights (e.g., Finkel et al., 2006; Fitzsimons et al., 2005). Indeed, the findings from the current research suggest that the ability to control one's own thoughts, feelings, and behaviors is influenced by the self-control of other people, and by how closely one's mind mirrors the minds of others, in ways one might not generally expect.

REFERENCES

Aarts, H., Gollwitzer, P.M., & Hassin, R.R. (2004). Goal contagion: Perceiving is for pursuing. *Journal of Personality and Social Psychology, 87,* 23–37.

Aron, A., Aron, E.N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology, 60,* 241–253.

Bargh, J.A. (2006). What have we been priming all these years? On the development, mechanisms, and ecology of nonconscious social behavior. *European Journal of Social Psychology*, *36*, 147–168.

Bargh, J.A., & Chartrand, T.L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H.T. Reis & C.M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253–285). New York: Cambridge University Press.

Bargh, J.A., & Morsella, E. (2008). The unconscious mind. *Perspectives on Psychological Science*, *3*, 73–79.

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.

Brewer, M.B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, *17*, 475–482.

Chartrand, T.L., & Bargh, J.A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology*, *76*, 893–910.

Cialdini, R.B., Brown, S.L., Lewis, B.P., Luce, C., & Neuberg, S.L. (1997). Reinterpreting the empathy-altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology*, *73*, 481–494.

Decety, J., & Grèzes, J. (2006). The power of simulation: Imagining one's own and other's behavior. *Brain Research*, *1079*, 4–14.

Decety, J., & Sommerville, J.A. (2008). Action representation as the bedrock of social cognition: A developmental neuroscience perspective. In E. Morsella, J.A. Bargh, & P.M. Gollwitzer (Eds.), *The Oxford handbook of human action* (pp. 250–275). New York: Oxford University Press.

Dijksterhuis, A., & Bargh, J.A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. In M.P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 1–40). San Diego, CA: Academic Press.

Dik, G., & Aarts, H. (2007). Behavioral cues to others' motivation and goal pursuits: The perception of effort facilitates goal inference and contagion. *Journal of Experimental Social Psychology*, *43*, 727–737.

Ferguson, M.J., & Bargh, J.A. (2004). How social perception can automatically influence behavior. *Trends in Cognitive Sciences*, *8*, 33–39.

Finkel, E.J., Campbell, W.K., Brunell, A.B., Dalton, A.N., Scarbeck, S.J., & Chartrand, T.L. (2006). High-maintenance interaction: Inefficient social coordination impairs self-regulation. *Journal of Personality and Social Psychology*, *91*, 456–475.

Fitzsimons, G.M., Shah, J.Y., Chartrand, T.L., & Bargh, J.A. (2005). Goals and labors, friends and neighbors: Self-regulation and interpersonal relationships. In M.W. Baldwin (Ed.), *Interpersonal cognition* (pp. 103–125). New York: Guilford Press.

Gailliot, M.T., Baumeister, R.F., DeWall, C.N., Maner, J.K., Plant, E.A., Tice, D.M., et al. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, *92*, 325–336.

Gallese, V. (2003). The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology*, *36*, 171–180.

Gallese, V., Keysers, C., & Rizzolatti, G. (2004). A unifying view of the basis of social cognition. *Trends in Cognitive Sciences*, *8*, 396–403.

Goldman, A.I. (2006). *Simulating minds: The philosophy, psychology and neuroscience of mindreading*. New York: Oxford University Press.

Goldstein, N.J., & Cialdini, R.B. (2007). The spyglass self: A model of vicarious self-perception. *Journal of Personality and Social Psychology*, *92*, 402–417.

Hassin, R.R., Aarts, H., & Ferguson, M.J. (2005). Automatic goal inferences. *Journal of Experimental Social Psychology*, *41*, 129–140.

Heatherton, T.F., & Vohs, K.D. (1998). Why is it so difficult to inhibit behavior? *Psychological Inquiry*, *9*, 212–216.

Hommel, B. (2004). Event files: Feature binding in and across perception and action. *Trends in Cognitive Sciences*, *8*, 494–500.

Jackson, P.L., Brunet, E., Meltzoff, A.N., & Decety, J. (2006). Empathy examined through the neural mechanisms involved in imagining how I feel versus how you feel pain. *Neuropsychologia*, *44*, 752–761.

Martijn, C., Tenbült, P., Merckelbach, H., Dreezens, E., & de Vries, N.K. (2002). Getting a grip on ourselves: Challenging expectancies about loss of energy after self-control. *Social Cognition*, *20*, 441–460.

Mayer, J.D., & Gaschke, Y.N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology*, *55*, 102–111.

Mitchell, J.P. (2008). Contributions of functional neuroimaging to the study of social cognition. *Current Directions in Psychological Science*, *17*, 142–146.

Muraven, M., & Baumeister, R.F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, *126*, 247–259.

Muraven, M., Shmueli, D., & Burkley, E. (2006). Conserving self-control strength. *Journal of Personality and Social Psychology*, *91*, 524–537.

Muraven, M., & Slessareva, E. (2003). Mechanisms of self-control failure: Motivation and limited resources. *Personality and Social Psychology Bulletin*, *29*, 894–906.

Niedenthal, P.M. (2007). Embodying emotion. *Science*, *316*, 1002–1005.

Niedenthal, P.M., Barsalou, L.W., Winkielman, P., Krauth-Gruber, S., & Ric, F. (2005). Embodiment in attitudes, social perception, and emotion. *Personality and Social Psychology Review*, *9*, 184–211.

Norton, M.I., Monin, B., Cooper, J., & Hogg, M.A. (2003). Vicarious dissonance: Attitude change from the inconsistency of others. *Journal of Personality and Social Psychology*, *85*, 47–62.

Rizzolatti, G., & Craighero, L. (2004). The mirror-neuron system. *Annual Review of Neuroscience*, *27*, 169–192.

Ruby, P., & Decety, J. (2001). Effect of subjective perspective-taking during simulation of action: A PET investigation of agency. *Nature Neuroscience*, *4*, 546–550.

Schacter, D.L., & Addis, D.R. (2007). On the constructive episodic simulation of past and future events. *Behavioral and Brain Sciences*, *30*, 331–332.

Schmeichel, B.J., Vohs, K.D., & Baumeister, R.F. (2003). Intellectual performance and ego depletion: Role of the self in logical reasoning and other information processing. *Journal of Personality and Social Psychology*, *85*, 33–46.

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.

Vohs, K.D., & Faber, R.J. (2007). Spent resources: Self-regulatory resource availability affects impulse buying. *Journal of Consumer Research*, *33*, 537–547.