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PERSUASION BY PROXY: EFFECTS OF VICARIOUS SELF-CONTROL USE ON REACTIONS TO PERSUASION ATTEMPTS

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Why do people sometimes struggle to say "no" to persuasion attempts? Research suggests that individual self-control use can deplete people, reducing those individuals' resistance to persuasion attempts. The current investigation instead tests whether the experience of mental connection between self-control users and observers can make observers more agreeable and compliant. Greater connection led observers to exhibit more positive attitudes and decisions toward persuasive messages and advertisements containing centrally processed arguments. This research identifies an important and commonly overlooked factor in self-regulatory contexts and helps to advance our mechanistic understanding of vicarious self-control processes. Thus, in social settings marked by high mental connection, as in many group meals or shopping trips, people may suffer the depleting consequences of others' decisions.

Keywords: self-control, self-regulation, perspective-taking, mental stimulation, social influence

Each day, people are exposed to an abundance of persuasive messages, from relatively innocuous advertisements to direct requests from friends, colleagues, and others seeking time or money (Rosselli, Skelly, & Mackie, 1995). On the face of it, attempts to alter a person's preferences or decisions tend to violate that person's self-interest or free will, and thus persuasion attempts should be quite difficult to execute successfully. This is often not the case. The conclusion of many decades

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of research is that sophisticated methods are often unnecessary to elicit compliance (Cialdini, 2007; Flynn & Bohns, 2012; Flynn & Lake, 2008). People seem to be generally agreeable by nature. In fact, the act of resisting persuasion attempts often requires self-regulatory effort to reject or counter-argue initial claims (Burkley, Anderson, & Curtis, 2011; Knowles & Condon, 1999).

Given such findings, one way researchers have examined this tendency to say "yes" is by using self-regulatory depletion manipulations to impair a target's ability or willingness to remain unswayed in the face of persuasion. For instance, individuals using self-control to first suppress thoughts or to overcome physical exhaustion subsequently exhibited greater agreement with influential proposals and requests (Burkley, 2008; Burkley et al., 2011; Wheeler, Briñol, & Hermann, 2007). This depletion may undercut the perceived strength of counterarguments (Petrocelli, Williams, & Clarkson, 2015) or lead targets to rely on heuristics in the persuasion environment (Fennis, Janssen, & Vohs, 2009), thereby elevating compliance.

Despite advances made in this work, investigations have largely focused on impairments experienced by *individual* decision makers (Finkel & Fitzsimons, 2011). People's daily lives are largely not spent alone, however (Larson & Richards, 1991; Larson, Zuzanek, & Mannell, 1985). Up to 80% of our waking hours involve interactions with others (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). This social exposure, in combination with the high frequency with which people exert self-regulatory effort (e.g., Vohs, Baumeister, Schmeichel, Twenge, Nelson, & Tice, 2008), means that we are continually exposed to the self-control actions of other people. Yet, a striking lack of research has considered how such actions affect *observers'* regulation of their own behavior. For example, during a group shopping trip to the mall, a friend with a sweet tooth may avoid temptation by speeding up and intentionally looking in the other direction while walking by a bakery. This simple act of impulse control has implications for how that friend will make decisions at the next store, but is it possible that you as the observer might also be affected? If so, would you become more or less likely to comply with later messages, such as an advertisement to buy shoes?

Here, I investigate these questions in the context of vicarious self-regulatory depletion. Drawing from research on vicarious processing and other models of social perception, three alternative predictions are contrasted. These are tested by manipulating features of the social, self-control, and persuasion contexts. By taking this approach, the current work can inform our understanding of individual depletion processes as well as contribute to the literatures on interpersonal mental connection and perspective taking (e.g., mimicry, contagion, mental simulation processes).

SOCIAL PERCEPTION AND VICARIOUS PROCESSING

Human beings are naturally social creatures (Ackerman, Huang, & Bargh, 2012; Baumeister & Leary, 1995) whose preferences and behaviors are implicitly shaped by the beliefs and practices of nearby others (e.g., Allcott, 2011; McFerran, Dahl,

Fitzsimons, & Morales, 2010). A variety of mechanisms have been proposed to explain these subtle interpersonal influences as a function of varying levels of mental connection between actor and perceiver (Ackerman & Bargh, 2010). First, social perception can automatically change thoughts and actions through the process of mimicry (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001). Mimicry can lead people to select specific foods they observe another person eating (Tanner, Ferraro, Chartrand, Bettman, & van Baaren, 2008), prefer the same romantic partners (Place, Todd, Penke, & Asendorpf, 2010), and express similar emotions (Chartrand & Bargh, 1999; Hess & Fischer, 2014). Applying a mimicry framework to our earlier example of self-control use, seeing a friend avoid the lure of a bakery should lead an observer to avoid that bakery as well. A mimicry framework would be relatively silent on the implications of this observation for behavior in unrelated contexts such as a response to a subsequent advertisement.

Another well-studied mechanism of social perception involves the social transmission of mental constructs, such as emotions and goals, to observers. Individuals experience goal contagion when watching or reading about a person pursuing a certain goal (e.g., being helpful, earning money, seeking casual sex) and themselves subsequently acting in goal-consistent ways on unrelated tasks (Aarts, Gollwitzer, & Hassin, 2004; Dik & Aarts, 2007). Such actions follow from the larger goal but do not directly mimic the behaviors of the original actor. Applying this type of contagion framework to the mall example, seeing a friend avoid a bakery is likely to lead an observer to avoid temptations of other sorts (e.g., resisting the persuasive message in a shoe store advertisement), not merely the bakery itself.

A third inclusion of social information into the self can occur through the process of mental simulation. Simulation involves the evoking of mental (or embodied) representations of actions as a consequence of imagining or perceiving those actions (Gallese, Keysers, & Rizzolatti, 2004; Markman, Klein, & Suhr, 2012; Saxe, 2009). That is, "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). Simulation lies at the heart of vicarious experiences, which in turn rely to a degree on perspective taking—putting oneself into the shoes of another (Goldstein, Vezich, & Shapiro, 2014). Perspective taking creates "as if" experiences that can result in the perceiver experiencing both the current states of the target person and, interestingly, the sensory and conceptual *consequences* of those states. In fact, taking another's perspective can produce downstream cognitive dissonance (Cooper & Hogg, 2007; Norton, Monin, Cooper, & Hogg, 2003), change performance on aptitude tests (Galinsky, Wang, & Ku, 2008), and elicit perceptual and decision-making biases (Goldstein & Cialdini, 2007; Gunia, Sivanathan, & Galinsky, 2009). Applying a mental simulation framework to our example, taking the perspective of a friend who avoids a bakery is likely to lead an observer to feel depleted by the self-regulatory effort expended by that friend.

One investigation provided an initial demonstration that others' self-control actions can influence perceivers through a simulation process. After taking the perspective of a person using self-control in a written scenario, individuals were willing to pay more for hedonic products (e.g., digital cameras) and gave up more

readily on an (unexciting) anagram task (Ackerman, Goldstein, Shapiro, & Bargh, 2009). Additionally, Egan, Hirt, and Karpen (2012) paired individual-level (i.e., non-vicarious) depletion with the vicarious experience of restorative activities to show that taking the perspective of someone sleeping or consuming caffeine can improve anagram and handgrip-holding performance. These findings suggest that simulation can influence various stages of the self-control process, but they leave unanswered several important questions regarding the vicarious experience of self-control. Existing research has focused largely on non-social contexts and on outcomes related to impulsivity (e.g., performance and persistence on unpleasant tasks, reward-based decisions). Yet, many self-regulatory struggles involve interpersonal causes and consequences as well as decisions that call for less impulsivity and more deliberation. Here, I consider the vicarious experience of self-control within a context of deliberative action and social relevance—resistance to persuasive messages. I propose that how one person's self-control use will affect another's depends in part on the degree of mental connection between actor and observer. A closer connection will be more likely to elicit detailed simulation of the original self-control activity, leading to heightened accessibility of the consequences of self-regulation—depletion and lowered persuasion resistance.

CURRENT RESEARCH

Three studies test these ideas. All studies use a classic "two-study" cover story in which depletion induction and measurement are framed as unrelated studies. Sample sizes for the studies were determined based on recruitment ability for the given sample source (e.g., larger samples for online studies) and a preliminary power analysis. I meta-analyzed the effect sizes from studies of vicarious self-control use in Ackerman et al. (2009) following the procedure for weighted estimates suggested by Rosenthal and Rosnow (2007). Effects comparing perspective-taking versus no perspective-taking conditions (the elicitor of mental connection between actor and perceiver) in the presence of self-control cues were used. This overall effect size was $r = 0.308$. A power analysis using G*Power 3.1 for a one-way ANOVA indicated a sample size of 78 for 80% power to detect the effect of mental connection. The primary studies met or exceeded this number (the pilot does not as it was run prior to the power analysis). Additionally, for space purposes, non-focal measures, manipulations, and analyses are reported in the Supplementary Material section.

PILOT STUDY

The pilot study offers a proof-of-concept regarding vicarious depletion and its effect on persuasion susceptibility. Student participants first read about the actions of a self-control user (a waiter/waitress) and then read a persuasive essay advocating for a shift at the university from a merit-based grading system to a grading curve. Two alternative mechanisms to depletion were considered. First, it is pos-

sible that changes in mood could affect agreeableness to such policies. Second, it is conceivable that individuals who simulate the positive behavior of self-control use might feel license to "behave badly" by not investing mental effort to counter-argue policies. Licensing effects (Khan & Dhar, 2006; Kouchaki, 2011), in which people first engage in or are reminded of a positive behavior, are associated with increases in the belief that one is a good person. Therefore, licensing was assessed through use of a typical indirect measure—changes in self-concept (Khan & Dhar, 2006). See Supplementary Material for details on these measures as well as ancillary analyses.

Fifty-nine undergraduate students (29 female) received $2 for participating in a single-factor design (Perspective taking: present, absent). Following standard procedures in depletion research, participants were run individually and told they would be taking part in two unrelated studies. The first study required participants to read a short scenario (see Appendix A), which described a waiter or waitress (matched to participant sex) who arrived at work without having eaten that day and who, throughout the shift, was surrounded by an unending array of tempting foods. This waiter therefore needed to exert a large amount of self-control to keep from eating on the job and risk being fired. Prior to reading, participants were randomly assigned to either read the scenario without further instruction or were told "While you read the story, try to take the perspective of the person who wrote it. 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" (see Goldstein & Cialdini, 2007).

The second purported study examined scholastic grading issues. Participants read a persuasive essay, written by an ostensible expert, titled "The Normal Grading Curve as a Solution to Grade Inflation" that advocated use of normal curve grading on campus (Tiedens & Linton, 2001). Participants then rated their attitudes about this grading policy using a five-item semantic differential measure (bad/good, unfavorable/favorable, negative/positive, against/in favor, and harmful/beneficial) with responses made on an 11-point scale (e.g., -5 = extremely bad, 0 = neutral, 5 = extremely good; see Burkley, 2008). Next, as the primary choice measure, participants were asked, "Would you support a change to a curved grading system on campus?" (yes/no response).

A univariate ANOVA on a composite of the five attitude items ($\alpha = .96$) showed that participants in the perspective-taking condition reported more positive policy attitudes ($M = .25$, $SD = 2.88$) than did participants in the reading-only condition ($M = -1.44$, $SD = 2.34$), $F(1, 57) = 6.04$, $p = .017$, $\eta_p = .10$, 95% CI: [-3.054, -.312]. Chi-square analysis of the choice measure revealed that reading about the waiter led 24.1% of participants to support the grading change, whereas taking the waiter's perspective led 50.0% of participants to support the change, $\chi^2(1) = 4.22$, $p = .040$, OR = 3.14. Thus, the pilot study demonstrated that a situation encouraging vicarious depletion can make individuals more susceptible to persuasive messages. See Supplementary Material for additional details.

STUDY 1

Study 1 built upon the pilot in several ways. First, instead of reading a scenario, participants watched videos that re-created one of the original tasks found in the limited resource model of self-control literature (Baumeister, Bratslavsky, Muraven, & Tice, 1998). In this task, a person is presented with two foods, a highly tempting option (fresh cookies) and a relatively aversive option (radishes). Those individuals who exert self-control must eat only radishes while the indulgent cookies sit close by. In the current study, participants watched others engage in these actions, with the expectation that participants could mentally simulate the effort necessary for target persons to up-regulate the motivation to eat radishes and down-regulate the impulse to eat cookies.

Second, unlike the explicit perspective-taking directions in the pilot, Study 1 used a more subtle manipulation that creates incidental similarity between individuals and thus fulfills the minimal conditions necessary to elicit perception of mental connection. This manipulation leads one person to believe that a second person shares the same birthday (Miller, Downs, & Prentice, 1998). Despite the fact that being born on the same day has no real relevance for the relationship between any two people, this heuristic indicator has been shown to elevate compliance with salespeople, increase cooperation in prisoner's dilemmas, and reduce self–other differentiation (Jiang, Hoegg, Dahl, & Chattopadhyay, 2010; Miller et al., 1998). Incidental similarity encourages the psychological connectedness necessary for perspective taking and has been shown to prompt some forms of vicarious experience (e.g., Gunia et al., 2009). Here, it was expected that having the same birthday would prime participants to simulate the self-control actions of others.

Finally, Study 1 included a condition in which self-control use was absent (the cookie video). This provided the ability to test whether simulating any action of another person would lower persuasion resistance or whether this is dependent on simulation of self-control. Further, this design allowed for a test of the possibility that vicarious self-control might sometimes produce positive (non-depleting) consequences for observers. As reviewed earlier, events and actions in the social environment can act as primes that automatically make conceptual and goal representations mentally accessible (Dijksterhuis & Bargh, 2001), which can in turn produce mimicked decisions and goal-consistent behaviors (Aarts et al., 2004; Bargh, Schwader, Hailey, Dyer, & Boothby, 2012; Chartrand & Bargh, 1999; Dik & Aarts, 2007). Thus, under certain conditions, others' self-control use should inspire similar control in observers. According to a mental simulation perspective, the key moderating factor that determines whether observers will exhibit increased self-control or vicarious depletion is the extent of the active representation. Fully simulating the experience (e.g., through perspective taking or active rumination) should produce the downstream consequences of self-control use—depletion—whereas more surface-level perception of behavior should activate only the surface-level representation—increased control.

PARTICIPANTS AND DESIGN

Eighty-one individuals (38 female, 2 unreported) from a mixed community/student sample received $10 for participating. The study used a 2 (Similarity Cue: present, absent) × 2 (Video Self-control Cue: present, absent) between-participants design.

PROCEDURE

The first component of the study was completed online at least one week prior to the primary study session. Participants filled out several demographic items including date of birth. This item was used to manipulate similarity in the next part of the study.

Upon arrival to the lab session, participants were told they would be taking part in two unrelated studies. The first study investigated how effective people are at understanding the experiences of others. To this end, participants would evaluate the experience of a video-taped person (an actor) taking part in an unrelated taste-test study. Prior to the evaluation, participants received an information sheet purportedly filled out by this other person. The sheet included irrelevant background information (consistent across participants) as well as the target person's date of birth. Two possible DOBs were used, one matching the day and month of the actual participant (similarity-present condition) and one 5 months and 10 days after that of the actual participant (similarity-absent condition). The year of the target's birth was held constant for believability. Participants wrote their personal ID codes on the information sheet immediately above the birth date so that "the experimenters can later determine which videos were being evaluated by which people," but no explicit attention was drawn to the DOB.

Next, participants watched one of two videos, one in which the actor ate a radish and one in which the actor ate a chocolate-chip cookie. This radish-cookie procedure replicates the classic paradigm by Baumeister and colleagues (1998), although here in a vicarious context, with the radish representing the self-control condition and the cookie representing the non–self-control condition. Plates of these foods were simultaneously present in both videos, as in the original paradigm, though only in the radish video did the actor have to resist the tempting cookies. Following the video, participants answered several manipulation checks and questions regarding their interpretation of the experience (e.g., How much did you like the person in the video?; How difficult was it for the person to eat the food?; How much did the person like eating the food?; How much self-control do you think it took for the person to eat the food?; How difficult was it to watch the person eat the food?) on 7-point Likert-type scales.

The second purported study involved market research on a corporate advertising campaign. Here, participants evaluated one electronic advertisement that

a company was considering running in the future. The ad featured information about the company and highlighted how its flagship products were made with simple ingredients. To reduce concerns about idiosyncratic, company-related responses, an advertisement was created for each of two different companies (Frito-Lay and Nabisco) with each ad listing five large brands from the respective company (see Appendix B). The ads closed with a request to "Get some today!" Participants evaluated the advertisement using a three-item semantic differential measure (bad/good, unfavorable/favorable, unlikeable/likeable) with responses made on 7-point scales (e.g., 1 = extremely bad, 7 = extremely good). They also rated the ad on clarity (1 = not at all, 7 = very much) and were asked if they remembered the name of the company in the ad. See Supplementary Material for additional details.

RESULTS

Two participants did not accurately identify the company from the ad and were removed from the analyses (see Supplementary Material). Inclusion of these cases did not affect the interaction effect on attitudes reported below.

Preliminary Analyses. As expected, no differences emerged across conditions in reported ad clarity, *p*s > .33, time spent reading the ad, *p*s > .24, or liking of the actor, *p*s > .13. This latter (non)finding helps to rule out any possible effect of the similarity manipulation for a known compliance heuristic—liking.

Three manipulation check items (difficulty for actor to eat the food, actor liking of the food, self-control used by actor when eating the food) were averaged into a single perceived task difficulty composite (α = .93). Participants watching the radish video judged the actor to have more difficulty than did participants watching the cookie video, $F(1, 75) = 312.64$, $p < .001$, $\eta_p = .81$, 95% CI: [-5.064, -3.756]. Consistent with a simulation account, participants also reported that watching the actor eat the radish was more difficult than watching the actor eat the cookie, $F(1, 75) = 7.34$, $p = .008$, $\eta_p = .09$, 95% CI: [-2.281, -.213].

Primary Analyses. A Similarity (birthday cue) × Self-control (video cue) ANOVA on an advertisement attitudes composite (α = .93) revealed a significant interaction (see Figure 1), $F(1, 75) = 8.19$, $p = .005$, $\eta_p = .10$, 95% CI: [.529, 2.951]. Pairwise comparisons showed a significant effect of the similarity manipulation when participants watched someone use self-control to eat a radish, $F(1, 75) = 7.36$, $p = .008$, $\eta_p = .09$, 95% CI: [.325, 2.120], but not when they watched someone eat a tempting cookie, $F(1, 75) = 1.61$, $p = .21$. Additionally, among participants in the similar birthday condition, those who watched the radish video professed more positive attitudes toward the ad than participants who watched the cookie video, $F(1, 75) = 4.26$, $p = .042$, $\eta_p = .05$, 95% CI: [.031, 1.765]. Interestingly, the opposite was true among participants in the different birthday condition, $F(1, 75) = 3.93$, $p = .051$, $\eta_p = .05$, 95% CI: [-.004, 1.688].

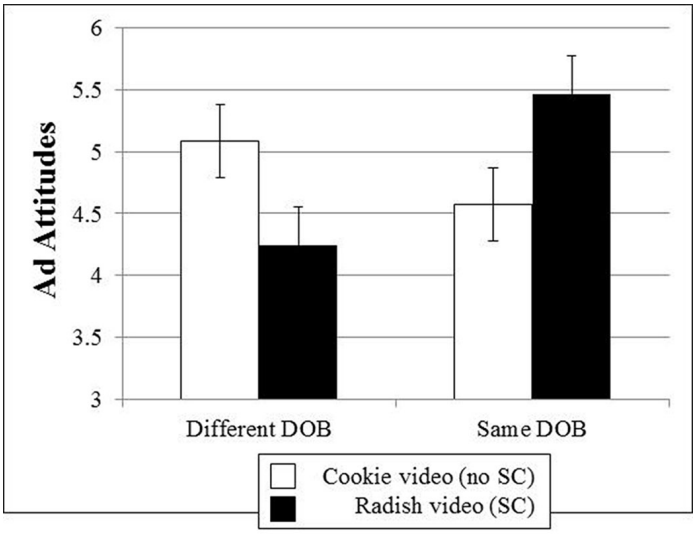

FIGURE 1. Effects of date-of-birth similarity cue and self-control video on advertisement attitudes in Study 1. Error bars represent standard errors. Observing someone use self-control led people cued with incidental similarity to be more positive toward subsequent advertisements and to purchase more corresponding products.

DISCUSSION

Study 1 expanded on the process of vicarious self-control by demonstrating that the consequences of vicarious depletion emerge both when individuals visually observe others' actions and when cues to similarity are trivial. Participants similar to self-control users exhibited more positive attitudes toward a persuasive advertisement, but dissimilar participants showed somewhat greater resistance following exposure to self-control use. The last study further develops these ideas by considering the impact of situational factors known to affect persuasion susceptibility.

STUDY 2

At what level of processing does the influence of vicarious depletion occur? Dual-process models of information processing, such as the elaboration likelihood model (Petty & Cacioppo, 1986a) and heuristic-systematic model (Chaiken, 1980), show that the persuasion process acts either through relatively automatic and effortless (peripheral, heuristic) or deliberative and effortful (central, systematic) channels. Prior research in the individual depletion literature has examined the influence of persuasion effort and finds mixed evidence about the conditions under which this positive effect emerges. For instance, Wheeler and colleagues (2007)

found that depleted individuals were more persuaded by weak arguments than strong arguments. In contrast, Burkley (2008) and Clarkson, Hirt, Jia, and Alexander (2010) found depleted people were more persuaded by strong than weak arguments. Finally, Fennis and colleagues (2009) showed that depleted people were more compliant with requests made in the presence of compliance heuristics, though these heuristics were not compared with the presence of deliberative persuasion information. One explanation for these mixed findings is that multiple mechanisms could be involved (e.g., generation vs. implementation of counterarguments), despite the similarity in experimental procedures in these studies (e.g., Burkley, 2008; Wheeler et al., 2007). Clearly, the contradictory nature of these findings indicates the need for further research.

Study 2 used advertisements varying in either strong (high-effort, central channel) or weak (low-effort, peripheral channel) persuasive content relevant to the focal product. If vicarious depletion increases susceptibility to all levels of persuasion effort or simply increases impulsivity, then people who simulate another's self-control use should express positivity toward the product regardless of message content. However, if vicarious depletion saps some of the motivation to process or respond to persuasive requests, the degree of attitude change should depend on the strength of the message. The direction of this effect could help inform prior confusion about the interpretation of depletion on message processing. Of course, one might argue that depletion (vicarious or not) could suppress information processing more generally, producing failure to distinguish between messages of varying strength. Prior research has shown, however, that not only do depleted individuals process message strength (Burkley, 2008; Wheeler et al., 2007), depletion primarily affects cognitively demanding tasks (e.g., Schmeichel, Vohs, & Baumeister, 2003; Vohs et al., 2008). Forming an impression about a product is a common task, one people engage in daily (even automatically; Fitzsimons et al., 2002) and one which often involves distinguishing strong from weak messages (e.g., in product advertisements). Thus, this general type of impression formation process is unlikely to be cognitively demanding, particularly for familiar products. Resisting strong arguments, however, should be substantially more demanding than resisting weak arguments.

Finally, Study 2 assessed mental connection through measurement rather than manipulation. Participants reported the extent to which they felt similar to, close to, and took the perspective of a target. This change allows us to investigate whether vicarious depletion occurs "naturally," in undirected contexts, at least for those people likely to mentally connect with others.

DESIGN AND PROCEDURE

One hundred and three individuals (43 female, 4 unreported) from a mixed community/student sample received $8 for participating in a 2 (Message Strength: weak, strong) × continuous predictor (Mental Connection) design. Participants read the high self-control scenario from the pilot study without explicit perspec-

tive-taking instructions. In order to measure mental connection with the self-control user, therefore, participants reported degree of perspective taking, felt similarity, and felt closeness with the target (1 = not at all, 7 = very much).

Next, participants were presented with an Edge disposable razor advertisement (taken from Petty, Cacioppo, & Schumann, 1983) featuring two smiling people, a razor schematic, and several statements describing either functional benefits of the razor such as "Handle is tapered and ribbed to prevent slipping" (strong messages) or heuristically appealing but functionally irrelevant aspects such as "Comes in various shapes, sizes, and colors" (weak messages; Petty et al., 1983). Participants rated this advertisement and the razor brand using a three-item semantic differential measure (bad/good, unfavorable/favorable, unlikeable/likeable) with responses made on 11-point scales (e.g., -5 = extremely bad, 0 = neutral, 5 = extremely good). Next, one item asked about willingness to purchase the product (-5 = definitely would not buy, 0 = neutral, 5 = definitely would buy). At the end of the study, a subset of participants (N = 32) was asked the degree to which they took the perspective of the people shown in the ad (1 = not at all, 7 = very much). This was done to rule out the possibility that any effect of mental connection on purchase intentions and attitudes was due to participants taking the perspective of the people shown in the ad (versus taking the perspective of the waiter in the earlier scenario). See Supplementary Material for additional details.

RESULTS

Three participants were removed for suspicion or not completing the procedures correctly (see Supplementary Material). Including all cases slightly weakened the marginal interaction effects reported below but did not alter the main effects.

Preliminary Analyses. Consistent with research connecting perspective taking with other markers of self–other connection (e.g., Goldstein & Cialdini, 2007; Hodges, Clark, & Myers, 2011; Myers & Hodges, 2012), the face valid perspective-taking item correlated highly with both felt closeness (r = .61) and similarity (r = .55), and so a composite was established by averaging these items (α = .80). This composite was used as the primary measure of mental connection with the waiter in subsequent analyses.

The correlation between this mental connection with the waiter composite and the item assessing perspective taking with people in the product advertisement was not significant (r = -.032, *ns*), indicating that any vicarious self-control effect was not due merely to increased identification with the advertisement actors.

Attitudes. All attitude items correlated highly, and so a single attitude composite was constructed (α = .91). This composite was regressed on message strength, (centered) mental connection, and their interaction. A main effect of mental connection emerged, β = .24, t = 2.41, p = .018, 95% CI: [.042, .439], indicating that the more participants took the perspective of people in the advertisement, the more favorable they were to the ad and brand. A marginal mental connection × message strength interaction was also present (see Figure 2), β = .18, t = 1.76, p = .081, 95% CI: [-.022, .374]. Although interpreting marginal findings should be done with cau-

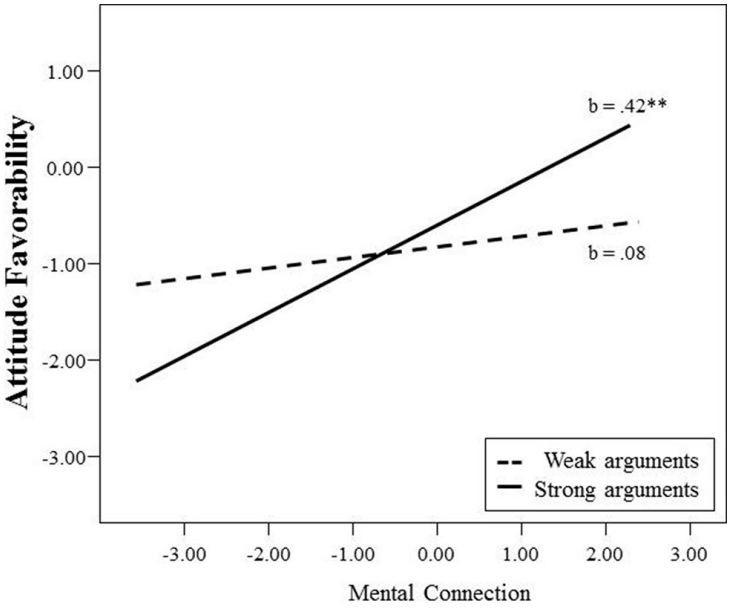

FIGURE 2. Effects of message strength on advertisement attitudes at high and low levels of mental connection in Study 2. Simple slopes tested at +/-1 standard deviation from the mean. High connection produced more positive attitudes following strong persuasive messages.

tion, probing at +1 *SD* (Hayes & Matthes, 2009) suggested that when message arguments were strong, a higher degree of mental connection with the waiter led to more positive attitudes, β = .42, t = 3.13, p = .002, 95% CI: [.152, .681]. This was not true when messages were weak, t < 1. Thus, being depleted by another person's actions impaired resistance to strong more so than weak persuasion attempts.

Purchase Intentions. To test the role of vicarious depletion on prospective behavior, purchase intention was regressed on message strength, (centered) mental connection, and their interaction. A marginal interaction of message strength and mental connection emerged, β = .33, t = 1.98, p = .051, 95% CI: [-.001, .658]. Matching the attitude results, when messages were strong, a higher degree of mental connection with the waiter led to increased willingness to purchase an unrelated product (the razor), β = .53, t = 2.39, p = .019, 95% CI: [.090, .969]. When messages were weak, mental connection had no effect on intentions, t < 1.

DISCUSSION

Study 2 demonstrated that a heightened tendency to feel connected to another person is associated with increased susceptibility to persuasive advertisements. This was true primarily when ads contained strong messages, not weak messages, consistent with certain prior findings on individual self-control use (Burkley, 2008; Clarkson et al., 2010) but not others (Wheeler et al., 2007). Further, these results indicate that vicarious self-control users did not simply become more impulsive (i.e., exhibiting an overall increased desire to buy), but were specifically influenced by the informational content of the persuasive messages.

GENERAL DISCUSSION

Encounters with persuasion attempts are part and parcel of our everyday experience, yet resisting such attempts requires sustained effort at which people often fail. The current studies suggest that these failures are influenced not only by an individual's own willpower, but also by the actions of others. Being directed to, or naturally taking the perspective of, others led participants observing or reading about those others to become more positive toward policies and advertisements, at least when persuasive messages used strong arguments. Thus, this research provides the first evidence that perceiving one person's effortful use of self-control can change *another* person's attitudes and choice of policy support following persuasive messages.

A number of possible explanatory models were considered at the outset of this research, including mimicry, contagion, and depletion. Direct mimicry did not account for the present findings because the self-control actions that participants perceived were not identical to the attitude and choice outcomes, and the success of targets in exerting self-control was not reliably matched by "success" in persuasion resistance. Psychological contagion also did not appear to play a strong role because, again, participants often showed decrements in persuasion resistance following perception of successful self-control use. If the goal of using self-control had been caught by participants, they should have exhibited increased resistance.

Additionally, a number of other alternative explanations were inconsistent with the data, including licensing, mood, effort expended by perspective taking itself, and dyadic connection (see Supplementary Material for further detail on licensing and mood). Licensing, for example, involves interpreting one's decisions as internally motivated moral actions and results in a positive change in self-concept (Khan & Dhar, 2006)—essentially, "I did something good so I now have license to be bad." This framework does not fit the current studies because participants perceived externally motivated self-control actions (i.e., targets were made to resist temptation either by the experimenter or by their boss in the waiter scenario), and they showed no evidence of self-concept change (Pilot Study). Second, all studies ruled out mood-based effects as contributing to the attitudinal and decision-making outcomes. Third, mental connection itself did not deplete participants (Fennis, 2011), as the simulation of an activity not requiring self-control did not elevate compliance (Study 1). Finally, an intriguing possibility is that people represent self-control use as relevant to the actor-perceiver dyad more than to individuals. Some research suggests that the effort exerted toward goal pursuit shifts depending on the goal-related actions or expectations of close others (e.g., Bohns et al., 2013; Fitzsimons & Finkel, 2011), as when feeling that a partner is likely to pick up the slack increases the tendency for social loafing (Plaks & Higgins, 2000). Whether such a mechanism was at play in the current studies requires further investigation, although this seems unlikely. In none of the studies were participants dyadically engaged with actors, and taking an actor's perspective did not increase liking for that actor (Study 1), which would be expected if perceivers treated these targets as partners.

Instead, the findings are supportive of a mental simulation of self-control account in which early use of self-regulatory effort reduces later expenditure of effort. Failures of self-control, such as those that occur when people comply with uninvited persuasion attempts, commonly have been attributed to the depletion of a limited self-regulatory resource (Baumeister, Vohs, & Tice, 2007; Burkley, 2008; Hagger, Wood, Stiff, & Chatzisarantis, 2010). Recent approaches have called aspects of this model into question (Kurzban, 2009; Molden et al., 2012). These other approaches have stressed factors such as motivational and attentional shifts associated with self-control use (Inzlicht & Schmeichel, 2012; Molden, Hui, & Scholer, 2018) and resulting from goal reprioritization (Inzlicht, Schmeichel, & Macrae, 2014), opportunity cost calculations (Kurzban, Duckworth, Kable, & Myers, 2013), and sensitivity to extraneous incentives (Kitayama & Thompson, 2015). The current findings also raise important questions about whether any internal resource is being depleted by self-control use, or here, simulation of self-control use. The effects found here emerged despite no actual exertion of self-control on any task, and the fact that persuasive messages produced little support when recipient resistance was high is inconsistent with a model that construes depletion as a true lack of self-regulatory resources. Instead, the current findings are consistent with a motivational perspective (e.g., high levels of resistance effort prevented increased compliance), though more work remains to flesh out this possibility and to distinguish any attentional shifts that follow vicarious self-control use. An additional possibility is that neural processes associated with self-control overlap with those involved in perspective taking and social cognition (Soutschek, Ruff, Strombach, Kalenscher, & Tobler, 2016), making vicarious processing an especially useful context for examining questions about self-regulation.

FUTURE DIRECTIONS

A number of questions on the vicarious experience of self-control await future study.

In the present studies, vicarious depletion produced changes in attitudes and choice behavior in response to persuasive messages. The attitude objects used in Studies 1 and 2 (i.e., consumer products) were relatively neutral, or perhaps even pro-attitudinal, to participants. Thus, the current findings demonstrate that vicarious depletion can make people more open to such messages, but the extent of these effects is not yet clear. Does vicarious depletion make resistance to counter-attitudinal positions difficult as well? This appears to be the case when people experience individual (non-vicarious) depletion (e.g., Burkley, 2008; Wheeler et al., 2007). Here, the policy advocated in the pilot study message study was likely to have been unwelcome to the student participants, and vicariously depleted students did become more agreeable to this policy. However, more remains to be done investigating this question. One possibility is that as the degree of resistance to an attitude position increases, vicarious depletion will have less effect. Existing work shows that factors producing shifts in motivation can overcome the effects

of depletion (Inzlicht & Schmeichel, 2012; Kurzban et al., 2013; Molden et al., 2018; Muraven & Slessareva, 2003), and the strength of held attitudes may be one such factor that motivates resistance to change.

In addition, the degree to which effects like those shown here persist is unknown. To the extent that interpersonal depletion approximates intrapersonal depletion effects, the patterns shown here should be relatively robust. However, once attention shifts from the vicarious experience, or once beliefs about regulatory recovery become accessible (e.g., Egan et al., 2012), depletion-related influences on compliance may be mitigated. In the current research, several moderators and boundary conditions on these effects also were investigated, but the large literature on self-control depletion suggests that many additional influences may be relevant to simulations of control.

The contexts in which vicarious self-control is most likely to occur would also benefit from future study. The current research highlighted contexts in which self-control use is necessary, and where the process (rather than the outcome) of this use is clear for perceivers. If evidence of this process is necessary to elicit detailed mental simulations of self-control, then vicarious depletion is primarily liable to emerge in true interpersonal settings where people can observe the impulse struggles of others, such as social shopping trips, communal meals, or support group meetings (see Finkel & Fitzsimons, 2011; Fitzsimons, Shah, Chartrand, & Bargh, 2005). Many occupational settings include a substantial degree of interpersonal communication regarding self-control struggles (e.g., psychotherapy appointments, medical examinations, and courtroom sessions) and thus are candidates for problems resulting from vicarious processing (e.g., Danziger, Levav, & Avnaim-Pesso, 2011; Linder et al., 2014). Future study of how vicarious processing affects self-regulatory effort also may help inform recent findings regarding the spread of self-control failures through social networks (e.g., Christakis & Fowler, 2007; VanderWeele, 2011).

Finally, the decrements in persuasion resistance found here do indicate that the consequences of simulating another's self-regulatory activity are highly accessible in perceivers' minds. This interpretation is consistent with other, non-vicarious evidence showing that subjective appraisal of depletion (independent of any actual depletion) can produce "failures" of self-control (e.g., Clarkson, Hirt, Jia, & Alexander, 2010; Job, Dweck, & Walton, 2010; Martijn, Tenbült, Merckelbach, Dreezens, & de Vries, 2002; see also Macrae et al., 2014). The comparability of such outcomes with those found in vicarious settings supports the conclusion that interpersonal simulation of self-control involves many of the same mental mechanisms, and thus results in the same psychological outcomes, as those relevant to intrapersonal self-control use. Further research on these issues would contribute not only to a more fully developed theory of self-control but also help identify points of similarity and difference between enacted and simulated self-regulatory activity.

CONCLUSION

As social beings, many of the innumerable persuasion attempts and resulting decisions that people face each day occur within social contexts. The current research shows that responses to those attempts depend not only on one's own actions, but on the actions of others. A theoretical understanding of self-control has largely focused on intrapersonal cognition and behavior. By integrating interpersonal insights and mechanisms, however, we may build a more comprehensive framework of self-regulation.

REFERENCES

Aaker, J. L., & Williams, P. (1998). Empathy versus pride: The influence of emotional appeals across cultures. *Journal of Consumer Research, 25*(3), 241-261.

Aarts, H., Gollwitzer, P. M., & Hassin, R. R. (2004). Goal contagion: Perceiving is for pursuing. *Journal of Personality and Social Psychology, 87*(1), 23-37.

Ackerman, J. M., & Bargh, J. A. (2010). Two to tango: Automatic social coordination and the role of felt effort. In B. J. Bruya (Ed.), *Effortless attention: A new perspective in the cognitive science of attention and action* (pp. 335-371). Cambridge, MA: MIT Press.

Ackerman, J. M., Goldstein, N. J., Shapiro, J. R., & Bargh, J. A. (2009). You wear me out: The vicarious depletion of self-control. *Psychological Science, 20*(3), 326-332.

Ackerman, J. M., Huang, J. Y., & Bargh, J. A. (2012). Evolutionary perspectives on social cognition. In S. T. Fiske & C. N. Macrae (Eds.), *The handbook of social cognition* (pp. 451-473). Thousand Oaks, CA: Sage.

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics, 95*(9), 1082-1095.

Bargh, J. A., Schwader, K. L., Hailey, S. E., Dyer, R. L., & Boothby, E. J. (2012). Automaticity in social-cognitive processes. *Trends in Cognitive Sciences, 16*(12), 593-605.

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., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*(6), 351-355.

Bohns, V. K., Lucas, G. M., Molden, D. C., Finkel, E. J., Coolsen, M. K., Kumashiro, M., et al. (2013). Opposites fit: Regulatory focus complementarity and relationship well-being. *Social Cognition, 31*(1), 1-14.

Burkley, E. (2008). The role of self-control in resistance to persuasion. *Personality and Social Psychology Bulletin, 34*(3), 419-431.

Burkley, E., Anderson, D., & Curtis, J. (2011). You wore me down: Self-control strength and social influence. *Social and Personality Psychology Compass, 5*(7), 487-499.

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39*(5), 752-766.

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology, 76*(6), 893-910.

Christakis, N. A., & Fowler, J. H. (2007). The spread of obesity in a large social network over 32 years. *New England Journal of Medicine, 2007*(357), 370-379.

Cialdini, R. B. (2007). *Influence: The psychology of persuasion*. New York: HarperCollins.

Clarkson, J. J., Hirt, E. R., Jia, L., & Alexander, M. B. (2010). When perception is more than reality: The effects of perceived versus actual resource depletion on self-regulatory behavior. *Journal of Personality and Social Psychology, 98*(1), 29-46.

Cooper, J., & Hogg, M. A. (2007). Feeling the anguish of others: A theory of vicarious dissonance. *Advances in Experimental Social Psychology, 39*, 359-403.

Danziger, S., Levav, J., & Avnaim-Pesso, L. (2011). Extraneous factors in judicial decisions. *Proceedings of the National Academy of Sciences, 108*(17), 6889-6892.

Decety, J., & Grèzes, J. (2006). The power of simulation: Imagining one's own and other's behavior. *Brain Research, 1079*(1), 4-14.

Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. In M. Zanna (Ed.), *Advances in experimental social psychology* (pp. 1-40). Cambridge, MA: 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*(5), 727-737.

Egan, P. M., Hirt, E. R., & Karpen, S. C. (2012). Taking a fresh perspective: Vicarious restoration as a means of recovering self-control. *Journal of Experimental Social Psychology, 48*(2), 457-465.

Fennis, B. M. (2011). Can't get over me: Ego depletion attenuates prosocial effects of perspective taking. *European Journal of Social Psychology, 41*(5), 580-585.

Fennis, B. M., Janssen, L., & Vohs, K. D. (2009). Acts of benevolence: A limited-resource account of compliance with charitable requests. *Journal of Consumer Research, 35*(6), 906-924.

Finkel, E. J., & Fitzsimons, G. M. (2011). The effects of social relationships on self-regulation. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2nd ed., pp. 390-406). New York: Guilford.

Fishbach, A., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not into temptation: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology, 84*, 296-309.

Fishbach, A., & Zhang, Y. (2008). Together or apart: When goals and temptations complement versus compete. *Journal of Personality and Social Psychology, 94*, 547-559.

Fitzsimons, G. M., & Finkel, E. J. (2011). Outsourcing self-regulation. *Psychological Science, 22*(3), 369-375.

Fitzsimons, G. J., Hutchinson, J. W., Williams, P., Alba, J. W., Chartrand, T. L., Huber, J., et al. (2002). Non-conscious influences on consumer choice. *Marketing Letters, 13*(3), 269-279.

Fitzsimons, G. M., Shah, J. Y., Chartrand, T. L., & Bargh, J. A. (2005). Friends and neighbors, goals and labors: Interpersonal and self-regulation. In G. M. Fitzsimons, J. Y. Shah, & J. A. Bargh (Eds.), *Interpersonal cognition* (pp. 103-125). New York: Guilford.

Flynn, F. J., & Bohns, V. K. (2012). Underestimating one's influence in help-seeking. In D. T. Kenrick, N. Goldstein, & S. L. Braver (Eds.), *Six degrees of social influence: Science, application, and the psychology of Robert Cialdini* (pp. 14-26). New York: Oxford.

Flynn, F. J., & Lake, V. K. (2008). If you need help, just ask: Underestimating compliance with direct requests for help. *Journal of Personality and Social Psychology, 95*(1), 128.

Galinsky, A. D., Wang, C. S., & Ku, G. (2008). Perspective-takers behave more stereotypically. *Journal of Personality and Social Psychology, 95*(2), 404-419.

Gallese, V., Keysers, C., & Rizzolatti, G. (2004). A unifying view of the basis of social cognition. *Trends in Cognitive Sciences, 8*(9), 396-403.

Goldstein, N. J., & Cialdini, R. B. (2007). The spyglass self: A model of vicarious self-perception. *Journal of Personality and Social Psychology, 92*(3), 402-417.

Goldstein, N. J., Vezich, I. S., & Shapiro, J. R. (2014). Perceived perspective taking: When others walk in our shoes. *Journal of Personality and Social Psychology, 106*(6), 941-960.

Gunia, B. C., Sivanathan, N., & Galinsky, A. D. (2009). Vicarious entrapment: Your sunk costs, my escalation of commitment. *Journal of Experimental Social Psychology, 45*(6), 1238-1244.

Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. (2010). Ego depletion and the strength model of self-control: A meta-analysis. *Psychological Bulletin, 136*(4), 495-525.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford.

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods, 41*(3), 924-936.

Hess, U., & Fischer, A. (2014). Emotional mimicry: Why and when we mimic emotions. *Social and Personality Psychology Compass, 8*(2), 45-57.

Hodges, S. D., Clark, B. A., & Myers, M. W. (2011). Better living through perspective taking. In *Positive psychology as social change* (pp. 193-218). Springer Netherlands.

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*(5), 450-463.

Inzlicht, M., Schmeichel, B. J., & Macrae, C. N. (2014). Why self-control seems (but may not be) limited. *Trends in Cognitive Sciences, 18*(3), 127-133.

Janssen, L., Fennis, B. M., & Pruyn, A. T. H. (2010). Forewarned is forearmed: Conserving self-control strength to resist social influence. *Journal of Experimental Social Psychology, 46*(6), 911-921.

Jiang, L., Hoegg, J., Dahl, D. W., & Chattopadhyay, A. (2010). The persuasive role of incidental similarity on attitudes and purchase intentions in a sales context. *Journal of Consumer Research, 36*(5), 778-791.

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.

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science, 306*(5702), 1776-1780.

Khan, U., & Dhar, R. (2006). Licensing effect in consumer choice. *Journal of Marketing Research, 43*(2), 259-266.

Kitayama, S., & Thompson, S. (2015). A biosocial model of affective decision making: Implications for dissonance, motivation, and culture. In J. M. Olson & M. P. Zanna (Eds.), *Advances in experimental social psychology, Vol. 52* (pp. 71-137). Cambridge, MA: Academic Press.

Knowles, E. S., & Condon, C. A. (1999). Why people say "yes": A dual-process theory of acquiescence. *Journal of Personality and Social Psychology, 77*(2), 379-386.

Kouchaki, M. (2011). Vicarious moral licensing: The influence of others' past moral actions on moral behavior. *Journal of Personality and Social Psychology, 101*(4), 702-715.

Kurzban, R. (2009). Does the brain consume additional glucose during self-control tasks? *Evolutionary Psychology: An International Journal of Evolutionary Approaches to Psychology and Behavior, 8*(2), 244-259.

Kurzban, R., Duckworth, A., Kable, J. W., & Myers, J. (2013). An opportunity cost model of subjective effort and task performance. *Behavioral and Brain Sciences, 36*(06), 661-679.

Larson, R., & Richards, M. H. (1991). Daily companionship in late childhood and early adolescence: Changing developmental contexts. *Child Development, 62*(2), 284-300.

Larson, R., Zuzanek, J., & Mannell, R. (1985). Being alone versus being with people: Disengagement in the daily experience of older adults. *Journal of Gerontology, 40*(3), 375-381.

Linder, J. A., Doctor, J. N., Friedberg, M. W., Nieva, H. R., Birks, C., Meeker, D., & Fox, C. R. (2014). Time of day and the decision to prescribe antibiotics. *JAMA Internal Medicine, 174*(12), 2029-2031.

Macrae, C. N., Christian, B. M., Golubickis, M., Karanasiou, M., Troksiarova, L., McNamara, D. L., & Miles, L. K. (2014). When do I wear me out? Mental simulation and the diminution of self-control. *Journal of Experimental Psychology: General, 143*(4), 1755-1764.

Maner, J. K., Luce, C. L., Neuberg, S. L., Cialdini, R. B., Brown, S., & Sagarin, B. J. (2002). The effects of perspective taking

on motivations for helping: Still no evidence for altruism. *Personality and Social Psychology Bulletin, 28*(11), 1601-1610.

Markman, K. D., Klein, W. M., & Suhr, J. A. (Eds.). (2009). *Handbook of imagination and mental simulation*. New York: Psychology Press.

Markman, K. D., Klein, W. M., & Suhr, J. A. (Eds.). (2012). *Handbook of imagination and mental simulation*. New York: Psychology Press.

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*(6), 441-460.

Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology, 55*(1), 102-111.

McFerran, B., Dahl, D. W., Fitzsimons, G. J., & Morales, A. C. (2010). Might an overweight waitress make you eat more? How the body type of others is sufficient to alter our food consumption. *Journal of Consumer Psychology, 20*(2), 146-151.

McGraw, A. P., & Warren, C. (2010). Benign violations: Making immoral behavior funny. *Psychological Science, 21*(8), 1141-1149.

Miller, D. T., Downs, J. S., & Prentice, D. A. (1998). Minimal conditions for the creation of a unit relationship: The social bond between birthdaymates. *European Journal of Social Psychology, 28*(3), 475-481.

Molden, D. C., Hui, C. M., & Scholer, A. A. (2018). What limits self-control? A motivated effort-allocation account. In D. de Ridder, M. Adriaanse, & K. Fujita (Eds.), *Routledge international handbook of self-control in health and wellbeing*. London: Routledge

Molden, D. C., Hui, C. M., Scholer, A. A., Meier, B. P., Noreen, E. E., D'Agostino, P. R., & Martin, V. (2012). Motivational versus metabolic effects of carbohydrates on self-control. *Psychological Science, 23*(10), 1137-1144.

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*(7), 894-906.

Myers, M. W., & Hodges, S. D. (2012). The structure of self–other overlap and its relationship to perspective taking. *Personal Relationships, 19*(4), 663-679.

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.

Oswald, P. A. (1996). The effects of cognitive and affective perspective taking on empathic concern and altruistic helping. *The Journal of Social Psychology, 136*(5), 613-623.

Petrocelli, J. V., Williams, S. A., & Clarkson, J. J. (2015). The bigger they come, the harder they fall: The paradoxical effect of regulatory depletion on attitude change. *Journal of Experimental Social Psychology, 58*, 82-94.

Petty, R. E., & Cacioppo, J. T. (1986a). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology, 19*, 123-205.

Petty, R. E., & Cacioppo, J. T. (1986b). Methodological factors in the ELM. In R. E. Petty & J. T. Cacioppo (Eds.), *Communication and persuasion* (pp. 25-59). New York: Springer.

Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research, 10*, 135-146.

Place, S. S., Todd, P. M., Penke, L., & Asendorpf, J. B. (2010). Humans show mate copying after observing real mate choices. *Evolution and Human Behavior, 31*(5), 320-325.

Plaks, J. E., & Higgins, E. T. (2000). Pragmatic use of stereotyping in teamwork: Social loafing and compensation as a function of inferred partner-situation fit. *Journal of Personality and Social Psychology, 79*(6), 962.

Rosenthal, R., & Rosnow, R. (2007). *Essentials of behavioral research: Methods and data analysis* (3rd ed.). New York: McGraw-Hill Higher Education.

Rosselli, F., Skelly, J. J., & Mackie, D. M. (1995). Processing rational and emotional mes-

sages: The cognitive and affective mediation of persuasion. *Journal of Experimental Social Psychology, 31*(2), 163-190.

Saxe, R. (2009). The happiness of the fish: Evidence for a common theory of one's own and others' actions. In K. Markman, B. Klein, & J. Suhr (Eds.), *The handbook of imagination and mental simulation* (pp. 257-266). New York: Psychology Press.

Schmeichel, B. J., & Vohs, K. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology, 96*, 770-782.

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*(1), 33-46.

Soutschek, A., Ruff, C. C., Strombach, T., Kalenscher, T., & Tobler, P. N. (2016). Brain stimulation reveals crucial role of overcoming self-centeredness in self-control. *Science Advances, 2*(10), e1600992.

Tanner, R. J., Ferraro, R., Chartrand, T. L., Bettman, J. R., & van Baaren, R. (2008). Of chameleons and consumption: The impact of mimicry on choice and preferences. *Journal of Consumer Research, 34*(6), 754-766.

Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: The effects of specific emotions on information processing. *Journal of Personality and Social Psychology, 81*, 973-988.

VanderWeele, T. J. (2011). Sensitivity analysis for contagion effects in social networks. *Sociological Methods and Research, 40*(2), 240-255.

Vohs, K. D., Baumeister, R. F., & Ciarocco, N. J. (2005). Self-regulation and self-presentation: Regulatory resource depletion impairs impression management and effortful self-presentation depletes regulatory resources. *Journal of Personality and Social Psychology, 88*, 632-657.

Vohs, K. D., Baumeister, R. F., & Schmeichel, B. J. (2012). Motivation, personal beliefs, and limited resources all contribute to self-control. *Journal of Experimental Social Psychology, 48*(4), 943-947.

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Journal of Personality and Social Psychology, 94*(5), 883-898.

Vohs, K. D., & Faber, R. J. (2008). Spent resources: Self-regulatory resource availability affects impulse buying. *Journal of Consumer Research, 33*(4), 537-547.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology, 54*(6), 1063.

Wheeler, S. C., Briñol, P., & Hermann, A. D. (2007). Resistance to persuasion as self-regulation: Ego-depletion and its effects on attitude change processes. *Journal of Experimental Social Psychology, 43*(1), 150-156.

Williams, L. E., & Bargh, J. A. (2008). Keeping one's distance: The influence of spatial distance cues on affect and evaluation. *Psychological Science, 19*(3), 302-308.

SUPPLEMENTARY MATERIAL

The following sections report further study-specific rationales, procedural details, and the results of additional, non-focal analyses. Inclusive with the details in the main paper, all procedures and measures are reported. Data from the studies can be found at: https://osf.io/p8cuy/.

PILOT STUDY

DESIGN AND PROCEDURE

Following the initial waiter scenario, participants completed the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) as a measure of mood state. To test the alternative mechanism of licensing—whether the perspective-taking manipulation would elevate self-concept thereby leading to greater agreeableness—participants rated their self-concept on four items (compassionate, sympathetic, warm, helpful) using 7-point scales (1 = strongly disagree, 7 = strongly agree; Khan & Dhar, 2006) after reporting their policy attitudes. Finally, participants were surveyed for suspicion and debriefed. No participants reported an accurate connection between the tasks in the study.

RESULTS

A bias-corrected bootstrapped mediation test (Model 4 of the PROCESS procedure, 10000 samples; Hayes, 2013) indicated that decisions to support the policy were mediated by policy attitudes (*indirect effect* = 1.714; 95% CI: [.054, 4.257]). Thus, simulating another's self-control appears to deplete resistance to persuasion even when the self-control activity involves an entirely different domain than the persuasion attempt.

Next, the roles of two alternate mechanisms on support for the grading change were tested. ANOVAs on the self-concept composite (α = .90) indicated that self-concept was not associated with condition (p = .32) suggesting that participants did not feel vicariously licensed by the waiter story. Tests of affect revealed that positive affect was not different across conditions (p = .15), but perspective taking did produce higher levels of negative affect, $F(1, 57) = 6.21$, $p = .016$, $\eta_p = .10$, 95% CI: [-6.981, -.760]. Conceptually, feeling more negative should be associated with increased rejection of an unfavorable persuasion attempt, suggesting that affect is not the mechanism leading to increased compliance. Empirically, a bias-corrected bootstrapping test of mediation indicated that the 95% confidence interval included zero (*indirect effect* = .175; 95% CI: [-.179, .810]), and thus negative affect did not satisfy criteria for mediation of policy support decisions.

STUDY 1

PROCEDURE

In addition to the procedural details reported in the main text, participants completed several other measures. Following the video, participants completed the PANAS as a measure of current mood state as well as several manipulation checks (e.g., What was the person in the video eating?). After viewing the advertisement, participants evaluated the relevant company as well as the ad on the primary measures. They also rated the ad on two measures of perceived ad potency: perceived effectiveness and overall persuasiveness (1 = not at all, 7 = very much). Participants then responded to three items concerning snack food consumption (regularity of eating snack food, regularity of eating the specific brand in the ad, preference for sweet or salty snacks; all 1–7 scales), and a suspicion check and debriefing were given. Finally, at the end of the study, participants were given the opportunity to purchase snack pack-sized items from the brands actually listed in the ads.

RESULTS

Two participants did not accurately identify the company seen in the ad (their brief times spent reading the ad, < 9 seconds compared to a median 44.2 seconds, suggested a lack of attention to the study), and so these participants were removed from the analyses (one participant was in the similar-self-control condition and the other was in the dissimilar-no-self-control condition). Two composite attitude measures were created, one for the advertisement ratings (α = .93) and one for the larger company ratings (α = .96). Advertisement company did not moderate the effects below and so this factor was collapsed in the analyses. Further, the primary reported effects emerged solely for advertisement attitudes, not company attitudes (*p*s > .30). This indicates that participants in the vicarious depletion condition (similar birthday and self-control video) were susceptible to the specific persuasive message appearing in the ad, but a general positive halo effect did not occur.

Affect was tested by entering positive and negative PANAS composite scores into a multivariate ANOVA. No effects emerged for negative affect, but a significant interaction of similarity (birthday cue) × self-control (video cue) on positive affect did result, $F(1, 75) = 5.84$, $p = .018$, $\eta_p = .07$, 95% CI: [1.822, 18.944]. This pattern suggested that participants in the similarity-present condition felt more positive affect when watching the actor eat a radish, whereas participants in the similarity-absent condition felt more positive affect when watching the actor eat a cookie. This effect was unexpected, however it does help to rule out the possibility that participants simulating radish eating simply felt worse and thus were motivated to change their state. Controlling for positive affect did not alter the findings reported below, and so it is not discussed further.

One snack food preference (regularity of eating the specific brand) influenced the primary attitude outcomes ($r = .46$). Controlling for this in the primary analysis indicated that, as might be expected, people who reported eating the brand more showed greater positive attitudes to the advertisement, $F(1, 74) = 18.15$, $p < .001$, $\eta_p = .20$, 95% CI: [.171, .470], how-

ever the overall Similarity × Self-control interaction remained, $F(1, 74) = 6.22$, $p = .015$, $\eta_p = .08$, 95% CI: [.278, 2.490].

Advertisement Potency. If similarity induced a vicarious depletion effect, participants should have found the advertisements more difficult to resist. This possibility was tested by considering perceptions of ad potency. Two items, ad persuasiveness and ad effectiveness, were averaged to create a composite ad potency score ($\alpha = .88$). A Similarity × Self-control ANOVA on this score revealed a main effect of similarity, $F(1, 75) = 4.77$, $p = .032$, $\eta_p = .06$, 95% CI: [-2.614, -.636], which was qualified by a significant interaction with self-control condition, $F(1, 75) = 7.11$, $p = .009$, $\eta_p = .09$, 95% CI: [.451, 3.121]. Mimicking the attitude findings above, pairwise comparisons indicated that for participants watching the radish video, having the same birthday made the ad seem more potent ($M = 5.43$, $SD = 1.39$) than having a different birthday ($M = 3.80$, $SD = 1.47$), $F(1, 75) = 10.71$, $p = .002$, $\eta_p = .13$, 95% CI: [.636, 2.614], but for participants watching the cookie video, having a similar birthday ($M = 4.26$, $SD = 1.56$) and having a different birthday ($M = 4.43$, $SD = 1.42$) were equivalent, $p = .72$. Further, among participants in the similarity-present condition, those who watched the radish video perceived the ad to be more potent than participants who watched the cookie video, $F(1, 75) = 5.86$, $p = .018$, $\eta_p = .07$, 95% CI: [.205, 2.115], but this was not true for participants in the similarity-absent condition (a nonsignificant trend pointed in the opposite direction), $F(1, 75) = 1.79$, $p = .19$. These findings confirm that, not only do people experiencing vicarious depletion change their resulting attitudes, they explicitly perceive the persuasive message to be more potent.

Purchasing. A total of 32% of participants purchased snack packs (purchase information was not recorded for 4 participants). A Similarity × Self-control ANOVA on the natural log of purchase frequency (to correct for skew and kurtosis) revealed a nonsignificant but directionally consistent interaction, $F(1, 71) = 2.58$, $p = .113$, $\eta_p = .04$. As with the attitude results, pairwise comparisons showed that, among participants watching the radish (self-control present) video, having a similar birthday led to an average of more items purchased ($M = 1.80$, $SD = 3.86$) than having a different birthday ($M = .29$, $SD = .61$), $F(1, 71) = 4.26$, $p = .043$, $\eta_p = .06$, 95% CI: [.013, .732]. Means are provided in untransformed numbers for interpretability.

STUDY 2

Wheeler et al. (2007) suggest that depleted people are more open to weak arguments because, compared to strong arguments, these naturally stimulate counter-arguments, and depletion interferes with such unfavorable cognitions. Burkley (2008) suggests that weak arguments are relatively more easily counter-argued or disregarded, and depletion should primarily affect the use of high-effort cognition associated with counter-arguing strong arguments. The present study provides evidence speaking to the direction of this effect within a vicarious context.

PROCEDURE

Following the initial scenario task, the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988), a commonly used mood measure in depletion research that contains subscales for valence and arousal (e.g., Schmeichel & Vohs, 2009; Vohs & Faber, 2007), was used as an alternative to the PANAS.

Following the advertisement persuasiveness item, one-item measures were given for ad message persuasiveness (-5 to 5 scale), perceptions of waiter feelings at the end of the story (1 = frustrated, 7 = calm), and self-perceived feelings after reading the waiter story (1 = tired, 7 = energetic). Finally, all participants were surveyed for suspicion and debriefed.

Additional Manipulation. Study 2a began with a spatial proximity priming manipulation (McGraw & Warren, 2010; Williams & Bargh, 2008) intended to elicit either a close or a distant mindset and thus drive perspective-taking effects. However, this manipulation did not affect either the perspective-taking measure ($p = .69$) or the composite measure of mental connection ($p = .65$). It also did not moderate the message strength × mental connection interaction reported in the main article ($p = .93$). Therefore, this factor was collapsed in the primary analyses. Below, results are reported for the proximity manipulation when it was included in the analyses with the other predictors.

The spatial proximity manipulation did influence attitudes through a main effect of the distance prime, $\beta = -.36$, $t = -2.62$, $p = .010$, 95% CI: [-.627, -.086], and through an interaction of proximity and mental connection, $\beta = -.29$, $t = -2.96$, $p = .004$, 95% CI: [-.488, -.096]. When cued with closeness, a higher degree of mental connection led to more positive ad/brand attitudes, $\beta = .51$, $t = 3.87$, $p < .001$, 95% CI: [.246, .765]. However, when cued with distance, mental connection had no effect on attitudes, $t < 1$. Similar effects emerged for purchase intentions. A main effect of the spatial proximity manipulation, $\beta = -.57$, $t = -2.47$, $p = .015$, 95% CI: [-1.032, -.112], was qualified by a marginal interaction of proximity and mental connection, $\beta = -.31$, $t = -1.83$, $p = .071$, 95% CI: [-.638, .026]. As before, when cued with closeness, a higher degree of mental connection led to increased interest in purchasing the razor, $\beta = .50$, $t = 2.25$, $p = .027$, 95% CI: [.059, .943]. Yet, when cued with distance, mental connection had no effect on intentions, $t < 1$. These findings suggest that a distant mindset can inhibit the downstream consequences of vicarious self-control, although this does not occur through a reduction in perspective taking (mental connection).

RESULTS

One participant was removed for relatively accurate suspicion (weak message strength condition) and two participants were removed for plotting points incorrectly on the distance priming task (both in the weak message strength condition).

The role of affect was tested by regressing both BMIS composite scores (valence and arousal) on (centered) mental connection. No effect of mental connection emerged, ps > .25, and thus affect is not discussed further. The items for perceptions of waiter feelings and self-perceived feelings were correlated ($r = .23$, $p = .02$), and so these were entered into a multivariate regression using the GLM proce-

dure. No effects of message strength or mental connection emerged, however (all *p*s > .14).

Advertisement Persuasiveness. If mental connection induced a vicarious depletion effect, participants should have found the advertisements more difficult to resist. To test this, perceptions of ad persuasiveness were examined. Reported persuasiveness was regressed on message strength, (centered) mental connection, and their interaction. A significant main effect of message strength, β = .58, t = 2.19, p = .031, 95% CI: [.054, 1.10], was qualified by a marginal interaction of message strength and mental connection, β = .35, t = 1.87, p = .064, 95% CI: [-.021, .710]. Strong messages were viewed as more persuasive at high levels of mental connection, β = 1.07, t = 2.87, p = .005, 95% CI: [.331, 1.816], though not when mental connection was low, t < 1.

APPENDIX A

I work as a waiter in a good restaurant. Not too fancy, but really tasty food. It's a good job. Unfortunately, when I arrive at work today, I am starving. Haven't eaten anything since a quick bite at breakfast, and I definitely won't be able eat on the job. We are hosting a banquet celebration, which means a lot of meals to bring out. When I walk into the kitchen, my stomach growls loudly and I know it's going to be a long night. The food is ready to go right away, and so I start carrying trays loaded down with every type of delicious dish imaginable. Platters chock-full of steaming dumplings, nachos with salsa and sour cream, succulent sausages, ciabatta bread with dipping sauces, and gourmet sesame crackers topped with French spreads. And those are just the appetizers!

My mouth is watering as we bring out the chicken alfredo. This is one of our restaurant's specialty dishes—the perfect blend of spices and herbs mixed in a buttery, creamy sauce over free-range chicken and homemade pasta. I am literally almost drooling like a dog I am so hungry. And I can't eat anything. We are too busy and I would probably be fired if my boss saw.

All around me, people are piling food onto their plates. The aroma from their plates fills the room—beef tenderloin, sweet corn, buttered potatoes, and just-baked French bread. I try to keep my eyes focused on the floor and tables in front of me and not on the food. I think I am beginning to hallucinate that the cheese tray is calling my name.

But then it is time for dessert. A series of cakes are on the menu, and the one in front of me looks so delicious with its layered, rich chocolate frosting. I think about dipping my finger into the frosting when no one is looking, but I am able to control myself. The tables are now piled high with chocolate and vanilla cupcakes, angel's food cake with berries and real whipped cream, just-out-of-the-oven pies filled with raspberries and peaches and topped with a flaky crust, and a decadent array of chocolate-covered strawberries. How much longer do I have to go on like this?

APPENDIX B

Founded in 1932, today Frito-Lay, Inc. is a leader in the world's snack market. Our success is a tribute of our core philosophy: Producing foods that are Naturally Delicious. We believe that real flavor starts with real farm-grown ingredients. You might be surprised at how much good stuff goes into your favorite snack. Good stuff like potatoes, which naturally contain vitamin C and essential minerals. Or corn, one of the world's most popular grains, packed with Thiamin, vitamin B6, and Phosphorous—all necessary for healthy bones, teeth, nerves and muscles.

Our classic Lay's potato chips are made with three simple ingredients. The selective process begins with Grade A potatoes that we harvest from over 80 farms across America. These potatoes are washed, peeled, sliced, and cooked to crispy crunch in all-natural oils like sunflower and corn oil, which contain 0g trans fat. Finally, we season the chips with a sprinkle of salt.

Do you know how many of your favorite snacks are made with these three naturally delicious ingredients? We are proud to use the best nature has to offer in making snacks you all love such as **Doritos** tortilla chips, **Cheetos** cheesy crunch, **Sun Chips** multi-grain snacks, **Lay's** potato chips, and **Cracker Jack** caramel coated popcorn. Why? Because our snacks go from our home to yours. Get some today!