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The Sticky Anchor Hypothesis: Ego Depletion Increases Susceptibility to Situational Cues

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ABSTRACT

Self-control depletion has been linked both to increased selfish behavior and increased susceptibility to situational cues. The present research tested two competing hypotheses about the consequence of depletion by measuring how people allocate rewards between themselves and another person. Seven experiments analyzed behavior in standard dictator games and reverse dictator games, settings in which participants could take money from another person. Across all of these experiments, depleted participants made smaller changes to the initial allocation, thereby sticking closer to the default position (anchor) than non-depleted participants. These findings provide support for a "sticky anchor hypothesis," which states that the effects of depletion on behavior are influenced by the proximal situational cues rather than by directly stimulating selfishness *per se*. Copyright © 2017 John Wiley & Sons, Ltd.

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When people use self-control, do they subsequently seek to gratify selfish desires, grabbing what they can for themselves? Much research would seem to suggest so (Achtziger, Alós-Ferrer, & Wagner, 2016; Halali, Bereby-Meyer, & Ockenfels, 2013; Moore & Loewenstein, 2004; Osgood & Muraven, 2015; Gino, Schweitzer, Mead, & Ariely, 2011; Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009; Cantarero & Tilburg, 2014; Vohs, Baumeister, & Ciarocco, 2005; DeWall, Baumeister, Gailliot, & Maner, 2008). Some of us began with that hypothesis but were led to entertain a competing hypothesis. The current experiments tested the hypothesis that people who use self-control subsequently become less able to overcome the influence of circumstance, so they act in accordance with what the situation impels.

Abundant evidence indicates that self-regulation functions as if dependent on a limited resource. After initial acts of self-control, subsequent self-control suffers (for a meta-analysis, see Hagger, Wood, Stiff, & Chatzisarantis, 2010[1]), indicating that some psychological or physiological resource has been reduced. The state of reduced capacity for self-control following initial exertion has been dubbed "ego depletion" (Baumeister, Bratslavsky, Muraven, & Tice, 1998). For instance, after individuals regulated their emotions during a poignant video, they were subsequently more likely to give in to an ice cream temptation (Vohs & Heatherton, 2000). After overcoming a temptation to eat chocolates, participants were subsequently less persistent when solving puzzles (Baumeister et al., 1998). After writing an essay while taking care to avoid forbidden letters, participants were also more likely to engage in a temptation to cheat (Mead et al., 2009). Other studies have also documented effects of ego depletion in impairing self-presentation, in interfering with executive control, and in increasing susceptibility to social influence techniques (Janssen, Fennis, Pruyn, & Vohs, 2008; Schmeichel, 2007; Vohs et al., 2005). The ego depletion effect has been replicated in a wide range of contexts in which prior exertion of self-control renders participants less able to subsequently override their impulses (see Baumeister & Vohs, 2016b, for a recent overview).

The present investigation tested competing hypotheses about the state of ego depletion by exploring its effects on how people allocate rewards between themselves and another person. Both hypotheses assume that mental executive control would be weakened by depletion. This state could loosen the restraints barring selfishness and thus hinder prosociality, such that people would do whatever benefits themselves even at the expense of others. Alternatively, it could increase their susceptibility to situational cues, so that people would behave in line with what salient cues prescribe.

[1]There is concern that the depletion effect may be smaller in magnitude than reported in many published papers owing to small-study effects (Carter & McCullough, 2014). Additionally, the depletion effect was not replicated in a large scale pre-registered replication project (Hagger et al., 2016). We believe that the results of both papers should be interpreted with caution owing to methodological issues (Baumeister & Vohs, 2016a; Dang, 2016; Inzlicht et al., 2016). Nonetheless, we aimed to address these concerns in the current paper by replicating several experiments with large sample sizes. We are optimistic that a clearer picture of the true effect size of depletion will emerge over time as additional replication projects and meta-analyses are conducted.

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Selfishness hypothesis

One way of understanding the benefits of self-control is that it enables humans to overcome natural, presumably innate, patterns of selfishness so as to follow rules that enable society to function via doing what is best for the group. Self-control can be regarded as a "moral muscle" (Baumeister & Exline, 1999), especially insofar as morality is a set of rules to curb selfishness in favor of other-focused patterns of behavior. By this view, selfishness is likely to emerge when self-control breaks down. Hence, the *selfishness hypothesis* holds that ego depletion increases self-serving behaviors, including doing what benefits the self even at the expense of others. The present experiments studied money and therefore the selfishness hypothesis would predict that depleted people would allocate more money to themselves (and less to another person), compared with non-depleted people.

Past work has provided some support for the selfishness hypothesis (e.g., Achtziger et al., 2016; Halali et al., 2013; Moore & Loewenstein, 2004; Osgood & Muraven, 2015). Depleted people act on impulses rather than restraining them (Gailliot & Baumeister, 2007; Hofmann, Baumeister, Förster, & Vohs, 2012; Vohs & Faber, 2007; Vohs & Heatherton, 2000). Depleted people score higher than others on narcissism, a state characterized by inflated self-views and a strong sense of entitlement to obtain what they want (Vohs et al., 2005). They show heightened willingness to lie and cheat in order to acquire money (Gino et al., 2011; Mead et al., 2009), but they are less likely to be dishonest when it would benefit others (Cantarero & Tilburg, 2014). An increase in indulging one's own needs is accompanied by a decreased concern for others, such as a reduction in helping (DeWall et al., 2008). These findings support the selfishness hypothesis by demonstrating a focus on satisfying and indulging one's own needs while neglecting or willfully disregarding others'.

Sticky anchor hypothesis

A second hypothesis is that ego depletion weakens central executive control, thereby increasing susceptibility to salient cues. Those can be external, situational features of the environment or of the decision problem at hand. We termed this the *sticky anchor hypothesis*. That is, ego depletion should intensify the effects of external cues (anchors) on behavior.

Within this rubric, past findings that depletion makes people buy more (Vohs & Faber, 2007) and eat more (Vohs & Heatherton, 2000) may reflect the fact that those experiments gave people strong cues to eat and spend via the presence of tempting foods and goods for purchase. Other work speaks more directly to the sticky anchor hypothesis. Neal, Wood, and Drolet (2013) found that people engaged in both their good and bad habits more often when depleted than in other times. Fennis, Janssen, and Vohs (2009) found that depleted — but not non-depleted — people became more susceptible to social influence techniques, leading them to donate more time. In an economic trust game setting, Evans, Dillon, Goldin, and Krueger (2011) found that depleted participants transferred more money to others when effort was needed in order to keep money for oneself. Pitesa, Thau, and Pillutla (2013) also found that depleted participants engaged in more socially desirable behavior when cues regarding the interpersonal impact of one's actions were made salient. These data support the notion that depletion increases the influence of situational cues, in line with the sticky anchor hypothesis. In other words, rather than stimulating selfishness *per se*, depletion may instead lead people to rely more on external cues when strong internal impulses are absent.

Under this hypothesis, the depleted state resembles the anchoring heuristic (Ariely, Loewenstein, & Prelec, 2003; Tversky & Kahneman, 1974). That is, the presence of a prior cue or "anchor" can shape one's preference through its increased accessibility in mind (Epley, 2004; Mussweiler & Strack, 1999; Strack & Mussweiler, 1997). Indeed, depleted people engage in more confirmatory information processing and are less likely to actively engage in reasoning when depleted (Fischer, Greitemeyer, & Frey, 2008; Schmeichel, Vohs, & Baumeister, 2003). They respond more passively to persuasion attempts and change their views in accordance with the information presented to them (Otgaar, Alberts, & Cuppens, 2012; Wheeler, Briñol, & Hermann, 2007). The shortcuts that depleted individuals apply to form judgments can also subsequently manifest in increased stereotyping (Gailliot, Plant, Butz, & Baumeister, 2007) because depletion leads people to favor the use of heuristic rules.

Depletion may facilitate selective accessibility in particular by narrowing the focus of depleted participants on options consistent with the cue and leading to a failure to consider options contradictory to the suggested value (Mussweiler & Strack, 1999; Strack & Mussweiler, 1997). Prior research has shown that executive control impairments under depletion make people less able to monitor the sources of their memories, so participants become more willing to accept external suggestions as if they were internally generated (Otgaar et al., 2012). In addition, depletion may impair the individual's ability to consider options counter to the suggestion (Wheeler et al., 2007). After all, counteracting a suggestion involves actively processing the cue, retrieving or generating new contradictory information, and applying it to the cue to refute it — all of which require effort and cognitive resources. As a result, depleted people may not actively search for information consistent with the cue but instead may fail to consider information that runs counter to the cue, thereby exacerbating the effects of selective accessibility. Thus, insofar as depletion increases the influence of situational cues, loss of self-control may engender more selfish *or* more prosocial decisions, depending on what the situational cues advocate. The depleted individual may in this way become more malleable and susceptible to the suggestion of salient external cues.

THE PRESENT EXPERIMENTS

In the present investigation, we pitted the two hypotheses of selfishness and sticky anchor against each other, mainly by

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measuring monetary allocation decisions for which we relied on the dictator game. In the typical version of the game, the participant is initially given an amount of money and instructed to divide it between self and other(s), however he or she desires.

Two experiments employed a standard dictator game (Experiments 4a and 4b reported in the Appendix). They showed that, as predicted, depleted participants keep more money for themselves than non-depleted participants. These results, however, conflate the selfishness hypothesis with the stickiness one, as both predict the results obtained. Hence, we focused the paper on the experiments that pitted these hypotheses against one another. We used a reverse dictator game, a strategically equivalent game in which we instead told participants that the money had been initially allocated to the other person and they could take any amount of it for themselves. The allocation of the money to the other person provides a situational cue or "anchor" that may influence participants' decision about how to divide the money. In the reverse dictator game, the selfishness hypothesis would still predict that depleted participants would allocate more to self than non-depleted participants, whereas the sticky anchor hypothesis would predict that depletion would lead to taking less for oneself.

EXPERIMENT 1

Experiment 1 pitted the selfishness hypothesis versus sticky anchor hypothesis using a reverse dictator game procedure (modified from Bardsley, 2008; List, 2007). The sticky anchor hypothesis predicted that depleted, compared with non-depleted, participants would leave more money with the other player. The selfishness hypothesis predicted taking more for oneself.

Method

Participants

Fifty-four adults (28 women, age $M = 34.1$ years, standard deviation (SD) = 14.0) came to the laboratory for \$5, knowing they could earn additional bonus money.

Procedure

The depletion manipulation required attention control. Participants were instructed to write a response to three questions, including "Describe what you do on a typical weekday. Begin with the moment you wake up and end with the moment you go to sleep." Participants also described their hometown and current residence. In the depletion condition, the letters A and N were forbidden. Because many English words contain those letters, participants could complete the task only by controlling their attention. In the non-depletion condition, the letters X and Z were forbidden. These letters occur relatively infrequently, and therefore, less attention control was required to complete the task. Participants were urged to type continuously and were allotted 2 minutes to respond to each prompt. This manipulation has been used successfully in past research to deplete self-control (Mead et al., 2009; Pocheptsova, Amir, Dhar, & Baumeister, 2009; Schmeichel, 2007).

Next, participants completed the reverse dictator game. The "reverse" in the name refers to its departure from the standard dictator game. In a standard dictator game, the participant ("dictator") is allocated a pot of money and must decide how to divide the money between the self and another person. The dictator may give none, some, or all of the money to the other person. In a reverse dictator game, the money is initially allocated to the other person rather than to the dictator, but the dictator still decides how to divide the money. That is, the dictator can take money from the other person and reallocate it to the self. Thus, both games involve a decision about how to divide the money between self and other. The only difference between a standard and reverse dictator game is to whom the money is initially allocated. In the current experiment, participants were told (truthfully) that an initial endowment of \$5 had been allocated to an anonymous player with whom they had been matched. Participants were instructed to report how much, if any, of the endowment they were taking for themselves in increments of \$0.25. This decision was binding, and participants were paid according to their choices.

Next, participants rated how much the writing task required them to control their behavior, exert effort, and override responses (1 = *not at all*, 7 = *very much*). Participants' responses to these questions were averaged to provide a self-report check of depletion ($\alpha = .87$). The Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988) assessed mood valence and arousal. We measured mood to assess whether it changed as a function of condition. We predicted it would not.

We had dictator decisions be manifested and real, such that participants left the experiment with final payoffs that were determined as the result of one reverse dictator game decision (as described), and one in which participants were the recipient (making no decisions). Participants were only aware of the game in which they were the dictator until the end of the experiment.

Results

Manipulation check. Participants in the depletion condition ($M = 6.20$, $SD = 0.90$) reported that their task was more demanding than did those in the non-depletion condition ($M = 2.85$, $SD = 1.17$), $t(52) = 12.0$, $p < .01$, $d = 3.21$. The manipulation was successful.

Allocation. Depleted participants took on average \$2.62 (SD = \$1.76) for themselves. while non-depleted participants took \$3.69 (SD = \$1.41) from the \$5.00 allocated to another person. The difference was significant, $t(52) = 2.42$, $p < .02$, $d = .66$ with bootstrapped 95% CI [.09, 1.23] from 10 000 samples, favoring the sticky anchor hypothesis over the selfishness hypothesis.

We tallied the number of participants who took nothing for themselves, thereby leaving the initial default allocation unchanged. Depleted participants took nothing for

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themselves 20% of the time, while participants in the non-depletion condition took nothing only 4% of the time. This difference was marginally significant, $\chi^2(1, 54) = 3.32$, $p < .07$.

Emotion. It was possible that the depletion task could have produced mood differences, which in turn could have altered participants' choices. As expected, there were no differences between conditions on valence or arousal, *t*s (52) < 1.

Discussion

Experiment 1 provided initial support for the sticky anchor hypothesis. Whereas the selfishness hypothesis predicts that depleted participants will take more money for themselves than non-depleted participants, we observed the opposite pattern. Participants who had previously controlled their attention took less money from another person than participants who had not controlled their attention. In other words, depleted participants made choices that deviated less from the initial amount of money allocated to another person, in comparison with non-depleted participants. Depleted participants were also more likely than non-depleted participants to stick with the status quo by taking no money for themselves.

Although not directly relevant to our hypotheses, it is noteworthy that depleted participants took slightly more than half of the money and non-depleted participants took over half for themselves. The difference in the amounts taken for the self supports the sticky anchor hypothesis, but other motives, such as the desire to maximize personal economic gain, also influenced decisions. Depleted participants did not behave in a generous manner. Instead, the situational cue appeared to reduce the tendency to allocate the money in the self-serving manner found among non-depleted participants.

EXPERIMENT 2

Experiment 2 conceptually replicated Experiment 1, with alternate procedures. Depleted participants in Experiment 1 reported that the writing task was more demanding than non-depleted participants. This may have led depleted participants to feel that they performed poorly on the task and were therefore less deserving of the endowment than non-depleted participants. We therefore elected to employ an experimental setup that held performance constant in the first task, in this way ensuring that participants in the depletion condition would not feel any less deserving of the endowment during the second task. Experiment 2 used a vicarious depletion manipulation in which some participants took the perspective of another person exerting self-control. This manipulation has been shown to produce effects parallel to depletion as induced by one's own exertions (Ackerman, Goldstein, Shapiro, & Bargh, 2009; Egan, Hirt, & Karpen, 2012; Macrae et al., 2014). Subsequently, participants played a reverse dictator game, with binding decisions as in Experiment 1. We predicted depleted participants would take less for themselves than non-depleted participants. Experiment 2 was actually run twice (2a and 2b). To ensure the pattern that we observed is robust, we conducted a replication study with a larger sample in Experiment 2b.

Method

Participants

Experiment 2a: A US national online sample of 95 participants (45 women, age $M = 33.3$ years, $SD = 11.0$) from Amazon Mechanical Turk completed the study for a small monetary payment plus a chance to win an additional $10.

Experiment 2b: As a replication, we conducted a power calculation on the basis of the results of Experiment 2a to determine that a sample size between 220 and 300 participants was required to achieve 80–90% power with a two-tailed *t*-test. We recruited a sample of 281 participants (120 women, age $M = 35.0$, $SD = 12.3$) located in the US to complete the study through Amazon Mechanical Turk in exchange for a small monetary payment plus a chance to win an additional $10.

The analyses reported below use the combined sample from Experiments 2a and 2b ($N = 376$, 165 women, age $M = 34.6$, $SD = 12.0$) in; allocation results were directionally similar within each individual sample at significant or marginally significant levels.

Procedure

Participants completed two ostensibly unrelated tasks: a vicarious depletion manipulation and then a reverse dictator game. The vicarious depletion manipulation involved participants taking the perspective of a vignette's narrator and then answering questions about the text. The vignette described a restaurant waiter. In the depletion condition, the waiter arrived at work hungry and had to resist the impulse to eat the tasty food served there. In the non-depletion condition, the waiter arrived at the restaurant full and its food was bad tasting anyway, so little self-control was required.

Next, participants completed a reverse dictator game. They were instructed that they were matched with an anonymous player to whom 10 lottery tickets had been allocated. Participants could use the lottery tickets to enter a raffle for $10. Participants then indicated how many tickets (if any) they would be taking for themselves by selecting a number 1 through 10 on a scale. The procedure for Experiment 2b was almost identical to Experiment 2a, except that participants typed their decision about how many lottery tickets to allocate rather than selecting a point on a scale.

Last, participants rated how much control and how much effort the waiter had to exert (1 = *not at all*, 7 = *very much*); we averaged the two items as a manipulation check ($\alpha = .79$). Participants also completed the BMIS (Mayer & Gaschke, 1988) as a mood assessment.

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Results

Manipulation check. Participants reported that the waiter had to use more control and effort in the depletion condition ($M = 6.67$, $SD = .68$) than in the non-depletion condition ($M = 4.24$, $SD = 1.59$), $t(374) = 19.7$, $p < .01$, $d = 1.99$). The manipulation was successful.

Allocation. We tested the hypothesis that depleted participants would take fewer tickets from the other person than would non-depleted participants. This hypothesis was supported. Those in the depletion condition took on average 5.61 tickets ($SD = 3.02$), while participants in the non-depletion condition took on average 6.51 tickets ($SD = 2.76$). The difference was significant, $t(374) = 2.98$, $p < .01$, $d = .31$ with bootstrapped 95% CI [.10, .51] from 10 000 samples and was robust to the inclusion of study-level random effects. The sticky anchor hypothesis was supported.

We tallied how many participants decided to take none of the original allocation for themselves. More depleted participants (11%) than non-depleted ones (4%) left the allocation untouched. This difference was significant, $\chi^2(1, 376) = 6.51$, $p = .01$.

Emotion. Conditions did not differ on either mood valence ($t(374) < 1$) or arousal, ($t(374) = 1.52$, $p = .13$, $d = .16$). Allocation results showed a similar pattern of significance when including mood valence and arousal as covariates in the analyses. The results were not due to mood differences.

Discussion

Experiment 2a and a well-powered replication in Experiment 2b provided additional support for the sticky anchor hypothesis and ruled out the alternative hypothesis that depleted participants took less money because they felt less deserving than non-depleted participants. Imagining oneself in a situation that required resisting temptation led participants to take fewer lottery tickets from another person than imagining oneself in a similar situation that did not require resisting temptation. Consistent with the sticky anchor hypothesis, vicariously depleted participants were less likely to deviate from the number of lottery tickets initially allocated to the other person than non-depleted participants. We also found that vicariously depleted participants were more likely to leave the initial allocation unaltered by taking zero lottery tickets. Additionally, both depleted and non-depleted participants took on average at least half or more than half of the lottery tickets for themselves.

Several possible mechanisms may explain how the simulation of self-control is associated with similar effects as exertion of self-control. In line with research on goal contagion and satiation, engaging in vicarious self-control may lead participants to acquire the goals of the person who is exerting self-control (McCulloch, Fitzsimons, Chua, & Albarracin, 2011; Aarts, Gollwitzer, & Hassin 2004). Thus, participants who simulated the experience of resisting temptation may change their beliefs about the availability of their own self-regulatory capacity, thus becoming more motivated to conserve and less willing to expend additional effort on a subsequent task (Muraven, Shmueli, & Burkley, 2006). Additionally, the brain recruits the same computational processes regardless of whether one is imagining engaging in a behavior or actually engaging in a behavior (Goldman, 2006). Thus, vicarious depletion may lead a person to use computational processes that have limited ability to be deployed, which may increase the perceived opportunity costs of continued task performance (Kurzban, Duckworth, Kable, & Myers, 2013).

EXPERIMENT 3

The previous experiments showed that depleted participants took less money from another person in the reverse dictator game, compared with non-depleted participants. The prior experiments also provided evidence that depleted participants were more likely than non-depleted participants to leave the endowment untouched (i.e., by taking nothing for themselves). This raises the possibility that depletion does not increase reliance on salient situational cues per se but instead leads to a greater willingness to accept the status quo (i.e., the partner once possessed the entire resource). In other words, the initial allocation of money to the other person may not influence decisions because it provides a situational cue but rather because it represents the status quo. Prior work has provided some suggestions that depletion increases passive acceptance of the status quo. As examples, after completing a depleting task, participants are more prone to giving up on tasks, they fail to provide counterarguments, and they comply more with requests (Baumeister et al., 1998; Janssen et al., 2008). Thus, depleted individuals may have been more inclined to simply leave things as they are, making no attempt to change or act in a way that contradicts the starting endowment.

In order to distinguish between these alternatives, Experiment 3 introduced non-extreme anchor values within the reverse dictator game paradigm. Participants decided how many points to take after first considering whether that amount would be higher or lower than an anchor value. Some participants were given a high anchor and others a low anchor. If depleted participants favor the status quo, then they should be more likely than non-depleted participants to leave the endowment untouched or take relatively few points, regardless of the anchor value. Alternatively, if depletion increases reliance on the salient situational cues, the number of points taken by depleted participants should be closer to the anchor value than the number taken by non-depleted participants. We predicted the latter pattern, in line with the sticky anchor hypothesis.

We also further examined potential processes by which depletion may have affected choices by measuring several potential mediating variables. Because depletion impairs executive control, depleted participants may exhibit exacerbated effects of selective accessibility by narrowing their consideration of different options to be consistent with the cue and by failing to consider options that contradict the cue (Mussweiler & Strack, 1999; Otgaar et al., 2012;

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Strack & Mussweiler, 1997; Wheeler et al., 2007). We therefore assessed participants' consideration of alternative amounts by measuring the range of money they considered taking from the other person. In order to assess the salience of the cue value to each individual, we measured the extent to which participants relied on the anchor when deciding how much money to take from the other person. Iterative and effortful adjustment processes may also be involved in anchoring effects when the direction of adjustment is certain (Simmons, LeBoeuf, & Nelson, 2010). To gauge whether the prior exertion of self-control led to an earlier termination of the decision process, we recorded the amount of time participants spent deciding how much money to take from the other person. We also accounted for possible differential attention or retention of the anchor value by recording whether participants could accurately recall the anchor value. To assess whether depletion influenced perceptions of the legitimacy of the anchor, we included questions about perceived response norms and distributional norms (e.g., to what extent did participants view their decision as fair). Finally, to directly assess concerns of differential attrition between experimental conditions, we conducted a replication in Experiment 3b to measure how many participants started but did not finish the study.

Method

Participants

Experiment 3a: A sample of 574 participants located in the US completed the study on Amazon Mechanical Turk for a small monetary payment plus a chance to win additional money. Sample size was determined by assuming an interaction effect size of $f = .15$ and an attention check failure rate of 30%. This implied that a sample of approximately 580 participants would power the test at 85% in the case of 30% of participants failing the attention check. Indeed, 37% of participants did fail the attention check, leaving an eligible sample of 362 participants (227 women, age $M = 36.1$, $SD = 13.0$). The attention check was administered prior to random assignment of experimental condition and required participants to read instructions carefully in order to provide a code word. As expected, attention check failure rates were the same among participants assigned to the depletion (35.3%) and non-depletion conditions (39.7%), $\chi^2(1, 580) = 1.19$, $p = .27$.

Experiment 3b: The aforementioned sample included only participants who completed the study. To assess the possibility of differential attrition between experimental conditions in the online study, we conducted a replication study to measure attrition levels. Following identical procedures in Zhou and Fishbach (2016), we also provided both prewarning and appeal-to-conscience instructions at the start of the study. An independent sample of 580 Amazon Mechanical Turk participants located in the US was recruited. Sample size was determined identical to Experiment 3a. Four participants were excluded for accessing the survey on a mobile device, and 196 additional participants (34%) were excluded for failing the attention check. One participant was excluded from analysis for providing a non-numerical response in the dictator game. Thus, a total of 379 participants were included in the analysis (58% women, age $M = 38.6$, $SD = 12.4$). Among participants who did not access the survey through a mobile device and otherwise passed the attention check, attrition rates were slightly higher in the depletion condition (30%, 62 participants) compared with the non-depletion condition (26%, 45 participants, $\chi^2(1, 486) = 5.06$, $p = .02$). These values were lower than average attrition rates (Musch & Reips, 2000).

Together, Experiments 3a and 3b offered a well-powered test of the sticky anchor hypothesis, and we used the combined sample ($N = 741$, 448 women, age $M = 37.4$, $SD = 12.7$) in the analyses reported below. An identical pattern of significance was observed in the main allocation analyses when including all participants who failed the attention check. In addition, all allocation results exhibited directionally identical effects within each individual sample at significant or marginally significant levels.

Procedure

Participants completed two ostensibly unrelated tasks: a depletion task and then a variation of the reverse dictator game. The depletion manipulation was based on the writing task used in Experiment 1. Participants typed continuously for a total of 10.5 minutes in response to three different prompts. Those in the depletion condition were instructed to avoid any word containing the letters A or N, whereas those in the non-depletion condition avoided words containing X or Z, thus requiring greater attention control in the depletion condition.

Next, participants received instructions for the reverse dictator game. Participants were informed that they were matched with an anonymous player and that the experimenter had set aside 1000 points for the other player, in which every 30 points corresponded to a 1 cent payoff bonus. No points were set aside for the participant. Participants were informed that the choices they made would determine both their own and the other person's payoffs. Additionally, they were told that the decisions of 10 randomly selected participants would be implemented for payment. Participants then indicated how many (if any) points to take from the other player and keep for themselves.

Crucially, the reverse dictator game differed from the previous experiments in that the decisions were made in two steps. Participants first indicated whether they would like to take more or less than an anchor value. This anchor value was randomly assigned to be either high (750 points) or low (250 points). Subsequently, participants responded with the exact number of points they would take for themselves. As in the prior two experiments, decisions were consequential and binding.

We measured how much time participants spent making their allocation decision to determine whether depletion led to an early termination of the choice process. Following the decision, we asked participants several follow-up questions in order to gain additional insight into the processes that may lead to anchor stickiness. To understand consideration

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of alternatives, participants were asked to respond with a response range (i.e., maximum and minimum amounts) that they would consider taking from the other person. We also asked participants to recall the anchor value they were shown to check whether depletion led to differential attention or retention of the anchor information. Furthermore, participants answered three questions (1 = *strongly disagree*, 7 = *strongly agree*) to evaluate the extent to which they relied on the anchor when making decisions. These items were based on Epley and Gilovich (2005, 2006): "I relied on this initial value when determining the exact amount that I decided to take", "This initial value was helpful for me to figure out how much I wanted to take", reversed: "I already knew my final decision before being asked whether I wanted to take more or less than the amount" (α = .78).

To understand whether participants interpreted the anchor values as being legitimate suggestions for their decision, we asked participants about how the anchor influenced their perception of response norms: "The initial amount helped me to figure out the normal number of points most people take" (1 = *strongly disagree*, 7 = *strongly agree*). The following questions assessed participants' concern for complying with distributional norms: "The amount of points I took was fair", "I deserved the amount of points I took", reverse: "I took more points than I deserved", reverse: "My partner deserved more points than I left for him or her" (1 = *strongly disagree*, 7 = *strongly agree*; α = .83).

As a manipulation check, participants rated how much the writing task involved exerting control, making effort, and overriding their typical way of responding (1 = *not at all*, 7 = *very much*). The items were averaged to provide a check of depletion (α = .87). Mood valence and arousal were assessed using a standard mood measure (Mayer & Gaschke, 1988).

Results

Manipulation check. Participants in the depletion condition indicated that the writing task was more demanding (M = 6.45, SD = .82) than in the non-depletion condition (M = 3.06, SD = 1.41), $t(739) = 39.7$, $p < .01$, $d = 2.94$. The manipulation was successful.

Allocations. We predicted an interaction between depletion and anchor value, such that the anchor value would be stickier in a depleted state than in a non-depleted state. We conducted a 2 (depletion vs. non-depletion) × 2 (high anchor vs. low anchor) analysis of variance; all results were robust when including study-level random effects. The analysis of variance revealed a significant main effect of anchor condition on points taken, $F(1, 737) = 44.9$, $p < .01$, $d = .48$ with bootstrapped 95% CI [.34, .64], indicating that the anchor value did indeed guide decisions in the direction expected (high anchor M = 614, SD = 245 vs. low anchor M = 492, SD = 259). Consistent with the sticky anchor hypothesis, we did not observe a main effect of the depletion condition, $F < 1$, suggesting that depletion did uniformly not lead to more selfish or prosocial decisions.

Crucially, we observed the predicted interaction between anchor value condition and depletion condition, b = 23.1, $F(1, 737) = 6.27$, p = .01, 95% CI [4.99, 41.3], f = .09. To deconstruct this interaction, we examined the effect of depletion with the low anchor condition and within the high anchor condition. Within the low anchor condition, depleted (M = 463, SD = 250) participants took significantly less than non-depleted participants, (M = 520, SD = 265), $F(1, 737) = 4.81$, p = .03, d = .22 with bootstrapped 95% CI [.02, .42] from 10 000 samples. Consistent with predictions from the sticky anchor hypothesis, the opposite pattern of results was found within the high anchor condition. Depleted participants (M = 633, SD = 233) took nominally more than non-depleted participants (M = 598, SD = 255), although the difference was not significant, $F(1, 737) = 1.82$, p = .18, d = .15 with bootstrapped 95% CI [−.06, .35] from 10 000 samples. This finding is in line with research indicating that high anchors can be less effective than low anchors (Jung, Perfecto, & Nelson, 2016). We also assessed the effect of the anchor within the depletion and non-depletion conditions. Depleted participants exhibited a relatively large anchoring effect by taking significantly less in the low anchor condition (M = 463, SD = 250) compared with the high anchor condition (M = 633, SD = 233), $F(1, 737) = 40.7$, $p < .01$, d = .71 with bootstrapped 95% CI [.48, .92] from 10 000 samples. Comparatively, participants in a non-depleted state exhibited an anchoring bias of a smaller magnitude (low anchor M = 520, SD = 265 vs. high anchor M = 598, SD = 255), $F(1, 737) = 9.16$, $p < .01$, d = .30 with bootstrapped 95% CI [.09, .50] from 10 000 samples. See Figure 1.

Adjustment. The interactive effect of depletion and anchor conditions was not due to differential changes in the direction of adjustment. Depleted participants did not choose to adjust downward from the low anchor value any more often than did non-depleted participants (20% vs. 18%, $\chi^2 < 1$), and they did not adjust upward any more often from the high anchor value (39% vs. 32%, $\chi^2 < 1$). Regardless of anchor condition and adjustment direction, depleted participants generally made smaller absolute deviations (M = 250, SD = 160) from the anchor compared with non-depleted participants (M = 278, SD = 196), $t(739) = 2.13$, p = .033, d = .16 with bootstrapped 95% CI [.02, .30] from 10 000 samples.

Sticking with the status quo. We once again assessed how many participants chose to maintain the status quo by tallying the number of participants who left the endowment unchanged by taking zero points. Although choices to make no change to the initial allocation occurred more frequently among depleted participants (6%) than non-depleted participants (4%), this difference was not significant, $\chi^2(1, 741) = 2.11$, p = .14.

Acceptable response ranges. An analysis of the acceptable response ranges considered by participants (i.e., maximum — minimum amount) revealed that depleted participants did not generally narrow their consideration of options to a smaller range (M = 249 points, SD = 251) compared with

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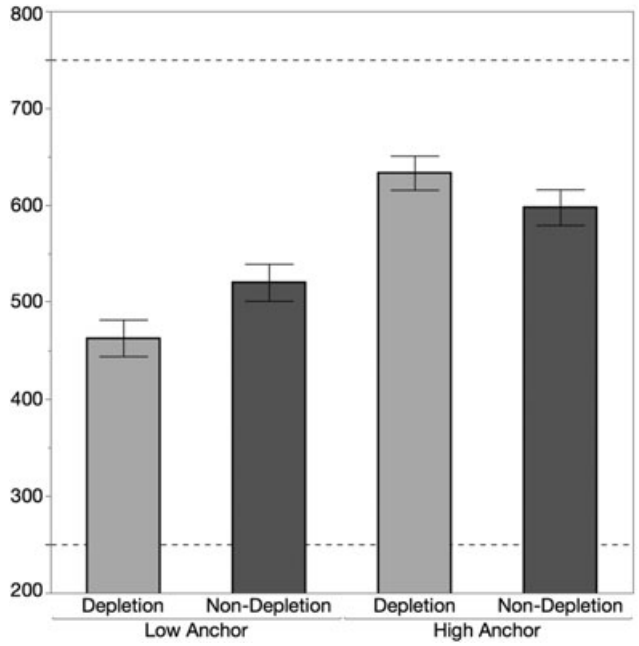

Figure 1. Experiment 3: Compared with non-depleted participants, depleted participants took amounts closer to anchor values in the reverse dictator game. The dashed lines depict the high and low anchors. $N = 741$

non-depleted participants ($M = 261$, $SD = 268$), $F < 1$. In addition, participants who received a low anchor ($M = 262$, $SD = 260$) did not generally narrow their consideration sets relative to those who received a high anchor ($M = 248$, $SD = 260$), $F < 1$. However, our data revealed a significant interaction between the depletion condition and anchor condition on the range of responses considered, $b = 20.2$, $F(1, 737) = 4.47$, $p = .03$, 95% CI [1.45, 38.9]. Although response ranges among depleted participants did not differ when they were faced with a low ($M = 235$, $SD = 226$) or high anchor ($M = 263$, $SD = 275$), $F < 1$, response ranges among non-depleted participants significantly increased when they were provided with a low ($M = 288$, $SD = 245$) rather than high anchor ($M = 234$, $SD = 287$), $F(1, 737) = 4.06$, $p = .04$, $d = .20$. This finding suggests that non-depleted participants considered a wider range of options when provided with a cue that favored others rather than a cue that favored the self. In contrast, depleted participants entertained a similar, narrow range of acceptable responses regardless of the anchor value.

Furthermore, we compared the percentage of participants whose response ranges included values of over 50% of the endowment, which could be considered selfish responses. Whereas depleted and non-depleted participants similarly considered selfish responses when provided with a high anchor (60% vs. 56%, $\chi^2 < 1$), when participants were provided with a low anchor, depleted participants (29%) were significantly less likely to report considering response ranges that would involve taking over half the endowment, as compared with non-depleted participants (46%), χ^2 (1, 375) = 12.4, $p < .01$. This evidence suggests that depleted participants did not consider alternative options that were contradictory to the cue when it favored the other person.

Emotion. Depleted participants, compared with non-depleted participants, reported less positive mood ($M = 8.47$ vs. 11.20, $SD = 9.63$ vs. 8.35), $t(739) = 4.13$, $p < .01$, $d = .30$, and no difference in arousal ($M = 15.96$ vs. 15.63, $SD = 4.24$ vs. 3.80), $t(739) = 1.10$, $p = .27$, $d = .08$. Mood valence and arousal were not correlated with either the absolute amount of adjustment from the anchor value ($rs < .03$, $ps > .43$) or the number of points taken ($rs < .06$, $ps > .10$). Furthermore, all results showed similar pattern of significance when including mood valence and arousal as covariates in the analyses. Thus, the findings were not due to mood differences.

Decision times. Did depleted participants simply rush through the decisions, suggesting that they failed to make a thoughtful response? Decision times suggested that this was not the case: Depleted participants instead spent more time on average making decisions ($M = 14.3$ seconds, $SD = 9.86$) compared with non-depleted participants ($M = 13.1$, $SD = 9.89$), $t(738) = 1.65$, $p = .10$, excluding one participant displaying a response time over 23 SDs from the mean. A nonparametric Mann–Whitney U-test further supported this conclusion ($U = 1391356$, $Z = 2.42$, $p = .02$, including all participants). Depletion did not lead participants to hurry through their decisions.

Normative considerations. Did depletion impact either the legitimacy of anchors or the motivation to comply with response norms? We found no evidence to support either notion. Depleted participants found the anchor value to be slightly less informative of response norms as did non-depleted participants ($M = 3.05$ vs. 3.27, $SD = 1.82$ vs. 1.92), $t(739) = 1.65$, $p = .099$, $d = .12$. Depleted participants also were just as concerned about distributive norms ($M = 5.09$, $SD = 1.41$) as were non-depleted participants ($M = 5.02$, $SD = 1.36$), $t(739) < 1$.

Anchor recall. Did depletion bias attention toward the anchor value? Depleted and non-depleted participants (79% and 77% recall) were equally likely to recall the anchor, $\chi^2 < 1$, indicating that depletion did not lead to greater encoding or recall of the anchor.

Anchor reliance. Overall, depleted participants did not report being consciously more reliant on the anchors in order to form their decision about how many points to take. Depleted participants reported being no more dependent on the anchor than non-depleted participants on the anchor-reliance scale ($M = 3.42$ vs. 3.48, $SD = 1.71$ vs. 1.74), $t(739) < 1$.

Discussion

In Experiments 3a and 3b, participants were provided with a high or low anchor value before making their decision in the reverse dictator game. This design allowed us to differentiate between the sticky anchor hypothesis and the alternative (albeit similar) status quo explanation. Previous experiments provided evidence that depletion (vs. non-depletion) led to taking less money from the initial endowment allocated to the other person and increased the likelihood of maintaining

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the status quo by taking no money for the self. If depletion increases adherence to the status quo, then depletion should lead to less deviation from the initial endowment regardless of the anchor value. What we found, however, was that depleted participants deviated less from the anchor value than non-depleted participants. In line with Jung et al. (2016), we also found that low anchors were more effective than high anchors in guiding the choices of depleted participants. In total, this evidence provides support for the sticky anchor hypothesis over the status quo alternative explanation because decisions were influenced more by the salient anchor values rather than the status quo (i.e., the amount initially allocated to the other person).

Furthermore, we included several measures to explore the process through which depletion increased the influence of anchor values. Depleted participants were no more likely than non-depleted participants to report that they consciously relied on the anchor value when deciding how many points to take for themselves. There was also no evidence suggesting that the results were affected by early termination of the decision process, differential encoding or recall of the anchor value, differences in in the extent to which the anchor values were viewed as legitimate, or differences in the extent to which the participants' considered their decision to be fair.

The range of acceptable responses did not differ overall for depleted and non-depleted participants, but interesting effects emerged when considering anchor values. The range of acceptable responses reported by depleted participants did not depend on whether they received the high anchor or the low anchor. Non-depleted participants, however, entertained a wider range of acceptable responses when they were assigned a low anchor than a high anchor. In other words, the range of acceptable responses was wider for non-depleted participants when they received an anchor that would favor taking a smaller amount of money for themselves (low anchor) than when they received an anchor that would favor taking a larger amount for themselves (high anchor). Thus, non-depleted participants considered a wider range of response options only when it was in their monetary self-interest to do so. In contrast, depleted participants entertained a comparably narrow range of responses when provided with a low anchor, and they were more likely to not even consider a selfish response. This evidence is consistent with a selective accessibility interpretation by which depletion impairs the individual's ability to consider information contradictory to the suggested anchor.

The design of the current experiment did not include a no-anchor control condition. To provide a baseline comparison for allocation decisions in a reverse dictator game in the absence of anchors or depletion manipulations, we surveyed a pool of undergraduate students in exchange for partial course credit ($N = 103$, age $M = 23.6$, $SD = 4.9$, 33 women). Participants completed the reverse dictator game identical to that in Experiment 3 except that no anchors were present, participants had not completed a prior depleting or non-depleting task, and points were not linked to an additional financial bonus. Behavior in the reverse dictator game revealed that on average, participants chose to take 612 points from the other player ($SD = 329$). The data also suggest that the low anchor of 250 in the main experiment corresponded to a relatively extreme 15th percentile, while the high anchor of 750 corresponded to a less extreme 63rd percentile. This baseline comparison suggests that the high anchor may have been less effective in guiding decisions because it overlapped with typical choices, rather than providing a more extreme cue that would bias the information considered by participants (Mussweiler & Strack, 1999).

Taken together, Experiment 3 provides additional evidence in support of the sticky anchor hypothesis by providing a more direct manipulation of a situational cue through the anchor value provided to participants. Results again indicated that depletion does not uniformly reduce prosocial behavior. Instead, depletion increased prosocial behavior when a situational cue promoted generosity but nominally reduced prosocial behavior when a situational cue pointed toward selfishness.

Last, although rates of attrition were slightly higher among participants assigned to the depletion rather than non-depletion condition, they were lower than average attrition rates (Musch & Reips, 2000; Zhou & Fishbach, 2016). We anticipate that participants who lack motivation to continue through the full study would be even more susceptible to the influence of the situation, lacking the motivation to adjust away from the salient cue. Thus, differential attrition may in fact weaken the effects observed, so the true effect size may be somewhat larger than what we obtained.

POOLED ANALYSIS OF THE STICKY ANCHOR HYPOTHESIS

We conducted an additional test of the sticky anchor hypothesis by pooling the dictator game choices made by participants, including both reverse dictator game (Experiments 1, 2a, 2b, 3a, and 3b) and standard dictator games (Experiments 4a and 4b, reported in the Appendix). Results are summarized in Figure 2. In total, 1290 participants made dictator game decisions in a depleted or non-depleted state.

Model specifications

To assess the sticky anchor hypothesis, choices were coded as the absolute adjustment from the situational cue as a percentage of total endowment (where 0% corresponded to sending/taking exactly the anchor value). In order to determine the effect of depletion on the stickiness of situational cues, we conducted a linear regression analysis to examine how the percentage change from the starting point differed between conditions of depletion and non-depletion. The model included study-level random effects to account for differences in variance across experiments.

Percent change in allocations

We analyzed the extent to which depletion biased participants toward situational cues across both standard

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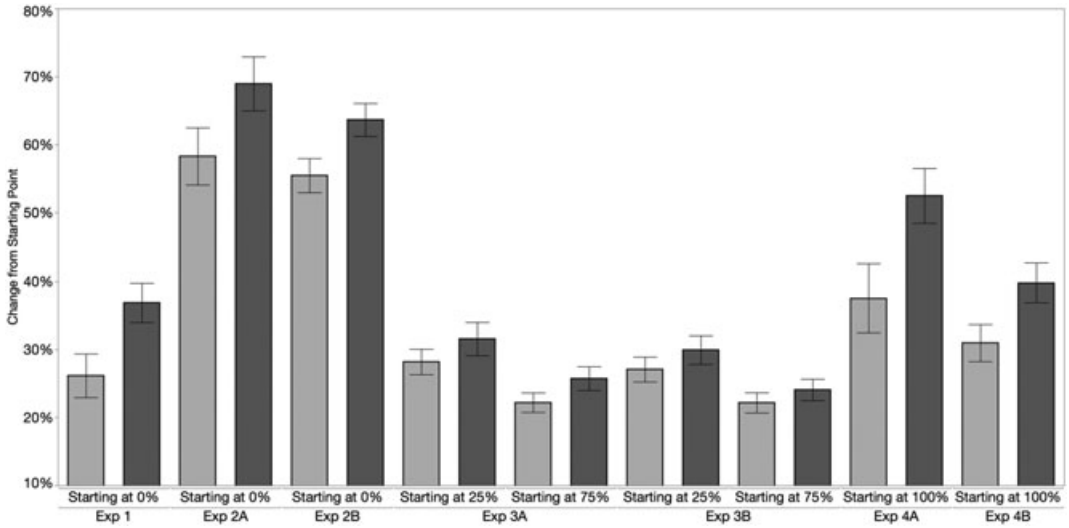

Figure 2. Dictator game results: Across seven studies including both standard dictator games (Experiments 4a and 4b) and reverse dictator games (Experiments 1, 2a, 2b, 3a, and 3b), depleted participants (light bars) compared with non-depleted participants (dark bars) made smaller deviations from the starting point, plotted as percent of endowment. $N = 1290$

and reverse dictator games. Linear regression results indicated that depleted participants made choices significantly closer to the initial allocation than non-depleted participants. Under depletion, participants' adjustments to the anchor shrunk on average by 2.8% of the endowment, 95% CI [1.6%, 4.0%], $F(1, 1282) = 21.5$, $p < .001$. Taking a simple average across all studies, depleted participants made an average adjustment of 35% (SD = 26%) from the starting point compared with a 40% (SD = 27%) average change exhibited by non-depleted participants ($d = .17$ with bootstrapped 95% CI [.06, .28] from 10 000 samples). This effect corresponds in magnitude to effects elicited by other dictator game variations, such as providing a concealment opportunity or manipulating the deservingness of the recipient (for a meta-analysis, see Engel, 2011).

GENERAL DISCUSSION

Following brief initial exertion of self-control, behavior has been shown to change toward becoming more impulsive, heedless, irrational, and antisocial. These changes are presumably based on a group of cognitive, motivational, and energetic shifts. The present investigation began with the hypothesis that one key to understanding them is an increase in selfishness. Although some findings in the literature suggest support for the selfishness hypothesis, the current work has suggested that situational cues must also be considered when assessing the effect of depletion on prosocial behavior.

Our main outcome variable was how participants divided money between self and another person (a stranger). Across these experiments, depleted participants made smaller changes to the initial allocation than non-depleted participants. Experiments 1, 2a, 2b, 3a, and 3b reversed the typical dictator game procedure so that the money was initially allocated to the other person and participants were welcome to take some for themselves. Experiment 3 showed that depleted participants gave estimates that were closer to anchors rather than simply the status quo.

In Experiment 3, we also examined several potential processes to understand in what way self-control depletion leads to greater situational susceptibility. We did not find evidence that depletion influenced the perceived legitimacy of the anchor, increased attention or retention of the anchor, or generally increased reliance on the anchor value. In addition, depletion did not lead participants to become more rushed when making choices; they in fact spent more time making decisions than non-depleted participants. Response range results indicated that depleted individuals may be more susceptible to the effects of selective accessibility than non-depleted individuals (Mussweiler & Strack, 1999; Strack & Mussweiler, 1997). Depleted participants reported a similar, narrow range of acceptable responses regardless of whether they received the high or low anchor value. Non-depleted participants, however, were willing to consider a wider range of acceptable results when the anchor favored the allocating more money to the other person than when it favored allocating more money to the self. In addition, depleted participants were more likely to not even consider the possibility of making a selfish decision. This suggests that the responses considered were selectively biased by the presence of the low anchor to a greater extent among depleted rather than non-depleted participants.

The variations in experimental design allowed us to address key interpretive issues. All experiments provided evidence that differences in positivity or negativity of mood or in emotional arousal did not explain the findings. Three experiments (2a, 2b, 4b) used vicarious depletion manipulations, thus ruling out any explanation that depleted participants felt less deserving because they had performed worse on the initial task. Additionally, participants in Experiment 3b did not exhibit large differential rates of attrition and were instead below average attrition rates.

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Although our results contradicted selfishness as an explanation for the effects of depletion, they do not mean that depleted people were unselfish. Au contraire, the results indicated that depleted people will often behave selfishly, although presumably because of the widespread and frequent salience of selfish inclinations rather than enhancement of selfish motivations *per se*. In almost all of our dictator game studies, the final allocations by depleted persons still gave themselves more money or resources than the other person. In Experiments 1, 2a, and 2b, in which the situational cue involved assigning all the money to the other person, the average depleted participant still took slightly more than half the money for himself or herself.

Recent work has begun to examine motivational changes during the depleted state (Inzlicht & Schmeichel, 2012). Our initial hypothesis of enhanced selfishness would have fit well with that view. Our findings, however, have failed to show motivational increases. Instead, they fit the view that ego depletion fosters compliance through the passive acceptance of situational cues (e.g., Muraven et al., 2006; Tyler & Burns, 2008).

Indeed, we note that ego depletion has recently attracted two sets of challenges. One is the set of alternative explanations, for which the Inzlicht and Schmeichel (2012) theory has led the way. The other challenge has questioned whether the phenomenon exists at all (e.g., Carter, Kofler, Forster, & McCullough, 2015; cf. Cunningham & Baumeister, 2016, and Inzlicht, Gervais, & Berkman, 2016). To be sure, the two challenges contradict each other, insofar as alternative explanations cannot be correct for a nonexistent phenomenon. In view of the over 600 published ego depletion findings, we find the second (nonexistent) phenomenon implausible but remain keenly interested in alternative explanations. Still, these controversies make it all the more imperative to publish any new findings relevant to ego depletion. The present studies repeatedly found significant ego depletion effects, including with large samples and nearly exact replications, so they should increase confidence in the phenomenon itself. As noted earlier, we also failed to find evidence of motivational change. Hence, in addition to the specific focus of our investigation, our findings can inform current debates about ego depletion.

Our findings also provide insight into effects of self-control depletion on social preferences. While some research has suggested that people must overcome their internalized selfish inclinations in order to display concern for others (e.g., Knoch, Pascual-Leone, Meyer, Treyer, & Fehr, 2006), other evidence has endorsed the opposing perspective that people must override automatic social inclinations to act in an economically rational manner (e.g., Rand, Greene, & Nowak, 2012; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003). The current results provide a more nuanced view of the relationship between self-control and prosocial behavior by providing evidence that depletion may lead people to become more susceptible to the influence of situational cues. This does not imply that internal dispositions do not matter. For instance, strong, established habits are more likely to be triggered when people are in a depleted state (Neal et al., 2013). Instead, the strength of internal dispositions and situational cues may jointly affect decision making. In the current experiments, there was no reason to believe that selfish inclinations would differ across participants randomly assigned to different conditions. Future research could profitably investigate the extent to which strong internal dispositions toward self-interested behavior may reduce the influence of situational cues or interact with situational cues to predict behavior.

Our findings furthermore suggest that ego depletion weakens psychological integration, which is consistent with the abundant evidence that depletion weakens executive control processes that link individual behavior across time, to abstract values, and according to plans. With less such central, integrative control, behavior is increasingly guided by momentary and situational factors, such as the conceptual anchors provided by the initial allocation of the resource — even when that initial allocation is arbitrary and logically irrelevant, as in the present situations. Salient cues or stimuli exert more influence on the depleted person than they logically or ideally should.

APPENDIX : EXPERIMENTS 4A AND 4B

We report two experiments that used a standard dictator game. In the standard dictator game, participants are endowed with a sum of money and can give some or none to another. Chronologically, we had conducted these experiments before Experiments 1, 2a, 2b, 3a, and 3b, and then they acted as tests of the selfishness hypothesis. After we obtained the results, we realized that the method conflated the selfishness and sticky anchor hypotheses. When endowed with the pot of money, both selfishness and sticky anchor hypotheses predict that depleted, compared with non-depleted, participants would keep more for themselves. That is what we found.

This result, while overdetermined, allows us to make several points. One, it is possible from the results of the reverse dictator game that depleted people are in fact somewhat generous and prosocial. Experiments 4a and 4b provide further evidence that this is not the case. Two, we can test the sticky anchor hypothesis by assessing how many participants in each condition fail to deviate from the initial setup, as we have performed in the reverse dictator game. Mirroring them, we predicted that depleted participants would be more likely than non-depleted participants to leave the allocation of money unaltered.

APPENDIX : EXPERIMENT 4A

Method

Participants

Thirty-six students (22 women, age M = 19.9 years, SD = 1.50) participated for course credit.

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Procedure
Participants completed two ostensibly unrelated experiments. The first part constituted the depletion manipulation. Participants performed the Stroop task in either an incongruent (depletion condition) or congruent (non-depletion) manner.

The manipulation continued with the e-crossing task (Baumeister et al., 1998). All participants were instructed to cross 337 instances of the letter "e", in a text to establish a habit. Subsequently, non-depleted participants followed the same instructions, but depleted participants were instructed to cross out every "e" except when there was another vowel two letters before or immediately after the "e" (e.g., store and neon).

Participants then completed a standard dictator game with a same-sex confederate (to reduce suspicion). The computer instructed participants that they would play a game in which they and another person would split up $5. Participants were told (truthfully) that they would receive their share at the end of the game and that the experimenter would not know their response. Participants sealed the amount to be given to the other participant in an envelope.

Finally, participants completed manipulation checks assessing the difficulty of the Stroop and e-crossing tasks and of deciding how much of the money to allocate (1 = *not at all difficult*, 7 = *very difficult*).

Results
Manipulation check. Participants in the depletion condition (M = 4.05, SD = 1.85) rated the Stroop task as significantly more difficult than participants assigned to the non-depletion condition (M = 2.06, SD = .93), $t(34) = 3.92$, $p < .01$. A similar difference obtained with the e-crossing task (M = 5.35, SD = .99 vs. M = 3.56, SD = 1.85), $t(34) = 4.66$, $p < .01$.

Allocation. Consistent with the hypothesis, participants in the depletion condition offered significantly less money (M = $1.87, SD = $1.12) to the confederate than participants in the non-depletion condition (M = $2.63, SD = $0.81), $t(34) = 2.25$, $p = .03$, $d = .75$ with bootstrapped 95% CI [.21, 1.25] from 10 000 samples. No non-depleted participants kept all the money, whereas 25% of depleted participants did, $\chi^2(1, 36) = 6.52$, $p = .01$.

Ratings of the difficulty of allocating the money did not differ by condition, $t(34) < 1$.

Discussion
Depleted participants kept more money for themselves than non-depleted ones. Non-depleted participants divided the money about equally. These results fit the hypothesis that depletion makes people selfish. However, they also fit the sticky anchor hypothesis because the allocation task began with participants holding all the money. The findings from the current experiment indicate that effortful depletion does not lead people to give more to others in general. Rather, the situational cue provided by the initial allocation determines the direction in which depleted individuals exhibit bias.

APPENDIX : EXPERIMENT 4B

Experiment 4b implemented a conceptual replication of Experiment 4a with alternative procedures.

Method
Participants
An online US national sample of 86 participants from Amazon Mechanical Turk completed the experiment for a small payment and a chance to win a $10 bonus from a lottery. Three non-native English speakers were excluded, leaving 83 participants (34 women, age M = 31.3 years, SD = 9.3).

Procedure
Participants were told that the two parts of the experiment were unrelated. They first performed a vicarious depletion task, described in Experiment 2.

Next, participants played a standard dictator game. Participants were given an endowment of $10 and were instructed to select an integer amount from 0 to 10 to give to an anonymous other participant. Choices were incentive compatible: participants truthfully were informed that for each dollar that they kept, they would receive an extra ticket for a raffle to receive an additional cash bonus. Participants also completed the BMIS (Mayer & Gaschke, 1988) to check for mood differences.

Results
Allocation. As predicted, participants in the depletion condition allocated to the other person significantly less money (M = $3.10, SD = 1.74) than those in the non-depletion condition (M = $3.98, SD = 1.87), $t(81) = 2.21$, $p = .03$, $d = .49$ with bootstrapped 95% CI [.05, .93] from 10 000 samples. Moreover, 10% of depleted participants kept all the money, whereas only 5% of non-depleted participants did, although the difference was not significant, $\chi^2(1,83) = .78$, $p = .38$. Still, the difference in mean allocation is consistent with the selfishness hypothesis and the sticky anchoring hypothesis.

Mood. The BMIS has two subscales. The conditions differed on neither mood valence nor arousal, $ts(81) < 1$.

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