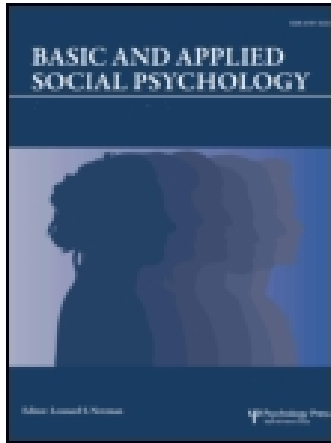


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Publisher: Routledge

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Basic and Applied Social Psychology

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/hbas20>

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Published online: 12 Feb 2015.



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To cite this article: Jeffrey M. Osgood & Mark Muraven (2015) Self-Control Depletion Does Not Diminish Attitudes About Being Prosocial But Does Diminish Prosocial Behaviors, *Basic and Applied Social Psychology*, 37:1, 68-80, DOI: [10.1080/01973533.2014.996225](https://doi.org/10.1080/01973533.2014.996225)

To link to this article: <http://dx.doi.org/10.1080/01973533.2014.996225>

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Self-Control Depletion Does Not Diminish Attitudes About Being Prosocial But Does Diminish Prosocial Behaviors

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In three studies, ego-depleted participants reported the same level of affective/cognitive concern for others as control participants, but behaved less prosocially. In Study 1, participants had to sustain cooperation to increase the joint payout to themselves and another player. In Study 2, participants had to restrict their use of a shared resource. In Study 3, ego-depletion failed to produce effects on several measures of concern for others despite large effects found with other manipulations. Results suggest ego-depletion influences behavior by reducing one's ability or motivation to overcome egotistic desires when helping others comes at a cost to the self.

Much is known about how diminished self-control impacts prosocial behaviors; however, little is known about the effect of diminished self-control on prosocial affects and cognitions. Here we suggest that individuals may experience a motivational conflict between a preference to do what is in the interest of others and a temptation to act selfishly. To act prosocially, individuals may need to use self-control to override their selfish urges and work toward the common welfare. Specifically, we argue that although self-control contributes to prosocial behaviors, low self-control does not necessarily imply a lack of prosocial affect and cognitions. Rather, when faced with the decision to help either oneself at a cost to others or others at a cost to the self, individuals experience a conflict between competing prosocial and proself motivations. To act on their prosocial motivation, individuals must overcome or suppress their competing proself motivation. Doing so requires exerting self-control. Thus, if one's ability or motivation to exert self-control is compromised, individuals will be less able or willing to suppress their proself motivation and will act less prosocially yet still harbor prosocial affect/cognitions.

THE DEPLETION MODEL OF SELF-CONTROL

Within social psychology, the depletion model of self-control has dominated much thought on self-control since the late 1990s (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012). According to the original depletion model, acts of self-control draw on a common and limited cognitive resource (Muraven, Tice, & Baumeister, 1998). This resource is commonly referred to as ego-strength, and it is hypothesized that ego-strength is needed for many active uses of the self (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Unlike attention, which is also limited but not depletable, ego-strength temporarily decreases with use such that if a person exerts self-control in one instance, he or she is less likely to succeed in using self-control in a following instance. Ego-strength is also unique to acts of self-control. Other taxing cognitive activities (even difficult ones) that do not require a great exertion of self-control will not produce a depletion effect (Muraven et al., 1998). The effects of ego-depletion have been widely validated across many situations and using a variety self-control tasks (see de Ridder et al., 2012). In more recent developments of ego-depletion theory, it has been suggested that ego-depletion does not exhaust one's ability to exert strong self-control but diminishes one's motivation to do so (Inzlicht & Schmeichel, 2012). In the present studies, we use the

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theory and procedures developed by depletion theory to test a causal relationship between self-control and social-cooperation/prosocial behavior. We predict that individuals who have undergone depletion will lack sufficient motivation or ability to exert self-control to suppress proself urges to act prosocially.

SELF-CONTROL AND PROSELF BEHAVIOR

Prior empirical research provides support for a link between low self-control and proself (vs. prosocial) behavior. For example, in one study, experimenters found that participants with reduced self-control were less willing to provide their contact information for volunteering opportunities as well as reported being less willing to offer help in a number of other hypothetical scenarios (DeWall, Baumeister, Gailliot, & Maner, 2008). In another study, researchers tested the effects of ego-depletion on behavior in an ultimatum game (Achtziger, Alós-Ferrer, & Wagner, 2011). In the ultimatum game, one player is allowed to decide how a reward (e.g., points or money) will be divided between him- or herself and one other player. For anyone to receive any reward, both players must agree to the allocation. The authors found that individuals who had undergone ego-depletion chose to allocate a greater reward to themselves as compared to participants who had not undergone ego-depletion. Finally, other researchers have found a significant correlation between low trait self-control and trait proself social value orientation (Balliet & Joireman, 2010).

Although we are proposing that self-control often contributes to cooperative behavior by resolving prosocial versus proself conflict, other models exist that posit different mechanisms. In particular, the majority of prior research investigating the role of self-control in cooperation has focused on delayed gratification. Indeed, cooperation often requires delaying gratification (Dewitte & DE Cremer, 2001). Therefore, it is prudent to conclude that delayed gratification failure, brought about by diminished self-control, is responsible for the breakdown of cooperation in many scenarios.

Although the role of delayed gratification should not be understated, many cooperation situations do not involve any delayed gratification (e.g., single play prisoner's dilemma). Therefore, we suspect that focusing on delayed gratification alone does not account for the entire relationship between self-control and cooperation. We hypothesize that the role self-control plays in contributing to cooperation will persist even in situations where delayed gratification is a nonissue. Those few authors who have considered the role self-control plays in reconciling proself versus prosocial conflicts (e.g., DeWall et al., 2008; Martinsson, Myrseth, & Wollbrant, 2010) either have relied heavily on

correlational methods using trait self-control scales or have not directly tested the underlying role self-control plays in resolving this conflict in sustained cooperation.

PROSELF VERSUS PROSOCIAL CONFLICT AND COOPERATION IN DILEMMAS

The competing urges of selfish desires versus collective concern may be particularly strong in commons (Hardin, 1968) and public goods dilemmas (Komorita & Parks, 1996; Messick & Brewer, 1983). Commons dilemmas involve a resource (like the world's oceans) that is shared by many people who are mostly free to use it as they please (either in a responsible and sustainable way or in an unrestrained way). Public goods dilemmas involve a common resource that all members of a community work to create for their joint welfare (such as a public school system). In a public goods dilemma, the community-created resource will benefit each member of the community regardless of the size of their contribution. In these scenarios, people are often faced with the choice of helping to sustain a common resource or to exploit it for personal gain. Although any individual would profit most from exploitation of the resource, if too many individuals make this choice, the resource will collapse or fail to be provided (Dawes, 1980). Thus, in such scenarios, individuals are likely torn between their simultaneous feelings that they should act prosocially and their selfish desire to maximize their own gain.

There is much reason to expect that losses of self-control would disrupt one's ability to inhibit competing selfish desires. First, a host of research has found that low self-control is culpable in failures to resist egotistic temptations in a wide array of domains (e.g., Baumeister, 2002; e.g., Gino, Schweitzer, Mead, & Ariely, 2011). Second, basic research into self-control has revealed that self-control primarily operates by suppressing the influence of strong emotional reward centers in the brain (Heatherton & Wagner, 2011) that are associated with self-directed gratification. Thus, when one's ability and/or motivation to exert self-control are compromised, the influence of self-gratifying centers increases. Indeed, the findings of some research studies have suggested that the desire for a tempting stimulus may actually increase as self-control wanes (Hofmann, Baumeister, Förster, & Vohs, 2012; Hofmann, Vohs, & Baumeister, 2012). Finally, if the issue is that ego-depleted people lack sufficient ability or motivation to overcome their competing egotistic motives in order to cooperate, then ego-depletion should most effect people previously identified as having strong egotistical motives but not influence those with weak egotistic motives as much. Whereas, if ego-depletion primarily reduces prosocial behavior by reducing prosocial

motives, then ego-depletion ought to reduce cooperation levels in all individuals, regardless of the strength of their egotistic motives. Indeed, Balliet and Joireman (2010) found that ego-depletion reduced cooperative behaviors in social dilemmas only among those individuals who had been previously identified as holding strong prosocial motivations, whereas the cooperation levels of those with weak prosocial motivations were not strongly impacted by ego-depletion.

Thus, self-control (and thereby ego-depletion) should influence prosocial behavior in a complex way. Losses of self-control reduce prosocial behaviors not by reducing the immediate affective experience of concern for others or by changing cognitive beliefs about helping other people but by disrupting one's ability or willingness to ignore competing selfish desires when helping others would come at a cost to the self. This is because ignoring or suppressing a competing prosocial urge requires the use of self-control, which is compromised following ego-depletion. In sum, when helping others comes at a cost to the self, individuals experience a conflict between competing prosocial concerns and prosocial desires. To act on their prosocial concerns, individuals must exert self-control to suppress the influence of prosocial desires. Thus, if self-control is compromised, individuals should be less able to ignore their prosocial desires. Furthermore, past research suggests that if self-control is not available to suppress prosocial desires, such desires might actually become stronger. However, we do not explicitly predict or test this last nuance.

This explanation can be contrasted with recent work that only considered the role of self-control on the behavioral aspects of prosocial concern (e.g., Martinsson et al., 2010) while appearing to tacitly assume that such behavioral changes likely indicate underlying affective or cognitive changes in concern for others. We theorize an alternative explanation that the affective and cognitive components of concern for the well-being of others, operationalized as self-reported concern for the well-being of others, does not vary greatly with self-control. Instead, people must use self-control to suppress the competing influence of prosocial urges to act on their concern for others when doing so would be at odds with their self-interest. It is this inability or unwillingness to suppress those competing selfish urges, not the lack of prosocial affect/cognitions, that leads to less prosocial behavior when self-control is compromised. In the current study, we ask participants to report their level of affective/cognitive concern for others as well as measure their actual behaviors.

THE PRESENT RESEARCH

In the present research, we seek to accomplish two distinct goals. Most important, we seek to test our

model that self-control does not affect individual's affective/cognitive levels of concern for the well-being of other people. Rather, self-control is required to overcome competing selfish desires so to allow for prosocial behavior. This would represent a valuable theoretical advancement as prior research of this kind has considered only the behavioral component of prosocial concern while not measuring the effects of ego-depletion on the underlying affective/cognitive concern. Second, we seek to expand the causal relationship between self-control and cooperation to areas beyond the delay of gratification. To date, the vast majority of research linking self-control to social cooperation has considered only how self-control operates through delayed gratification. The current research seeks to demonstrate that the effects of self-control persist even under conditions where the delay of gratification is not an issue. Thus, we make three specific predictions (the latter two being novel to this research):

- Prediction 1: Consistent with prior research, ego-depletion should reduce cooperative (prosocial) behaviors.
- Prediction 2: Self-reported affective/cognitive concern for the welfare of others will not differ with more than small effect sizes between ego-depletion and control groups.
- Prediction 3: The predictive power of self-reported concern for the welfare of others on cooperative behavior will be weaker for those participants who had undergone ego-depletion. This prediction is based on the logic that if the influence of prosocial urges increases, then the influence of prosocial affect/cognition on behavior would decrease.

If successful, the current study would expand the current understanding of how self-control relates to cooperation in non-delay-of-gratification scenarios while directly testing underlying mechanisms. In addition, the current study would provide a theoretical extension to the literature by demonstrating that lowering self-control does not impact the affective/cognitive aspects of concerns for others per se but reduces the extent to which people are directly influenced by those concerns.

STUDY 1

Overview

The purpose of Study 1 was to test our predictions in a classic economics decision-making game. During Study 1, participants played a version of the centipede game (Rosenthal, 1981) where they repeatedly could choose either to cooperate with a confederate (actually a computer) or to defect. Payouts would continue to

increase until either player defects, which ends the game. Prior to playing the game, half of the participants completed a thought suppression self-control task to deplete their self-control resources.

Methods

Participants and Design

Thirty-six students (22 female; ages 18–48, *Mdn* age = 19) from an introductory psychology course completed this experiment for partial course credit. Subjects were also paid for their participation in an amount contingent on their decisions during the economic decision-making game. All participants were randomly assigned to either a self-control depletion or control condition.

Task

Participants played a version of the centipede game (Rosenthal, 1981). In the original conception of the game, two people take turns making decisions about money offers. In the first round (and in every round until the game ends), one player is presented with two sums of money (one much smaller than the other) and two options: take or pass. If the player selects “take,” the larger of the two sums of money goes into his or her personal account and the smaller amount goes to the other player’s account; the game ends when a player “takes.” If the player selects “pass,” then the \$2 amounts are presented to the other player and that player is faced with the same choice and set of consequences that the first player had confronted. Every time a player passes, both pools of money increase by a known (and unequal) amount of money, with the larger sum increasing much more rapidly than the smaller sum. Thus, the more often players pass, the more money is at stake for both of them. The game is designed to end either when a player takes or (in the event that no one takes) after a certain number of rounds (100 rounds in the original version, hence the name “centipede”). In most experimental versions of the game, the maximum number of allowable turns ranges from four to eight (e.g., Bornstein, Kugler, & Ziegelmeyer, 2004; McKelvey & Palfrey, 1992).

In our version, participants were told they would be playing against another person in an adjoining room via computer. In reality, there was not another person; participants played against a computer posing as a person. The starting dollar amounts were \$0.10 and \$0.50. With each pass, the smaller amount increased by \$0.10 and the larger amount increased by \$0.50. The game was capped at \$10 (as the maximum payout for one person; that cap was communicated to participants).

The computer was programmed to always pass back to the real participant so that we could measure how

long the participant would cooperate (pass). The real participant always made the first choice. This was done so to reduce the extent to which participants would form an impression of the “other participant’s” style or strategy (i.e., as a cooperator, competitor, or altruist) from the start of the game. Each participant played the game only once, so he or she would not be able to formulate a strategy based on previous experiences playing the game with this computer.

Procedure

Upon entering the lab, all participants were given informed consent. Following this, each participant was randomly assigned to either a self-control depletion or control activity. Those assigned to the self-control depletion activity were instructed to suppress their thoughts of a white bear for 5 min, whereas those in the control condition solved moderately difficult math problems for 5 min. This set of manipulations has been widely validated in previous research (e.g., Muraven, Shmueli, & Burkley, 2006) as accepted techniques either for depleting self-control (i.e., white bear task) or as an equally difficult task not requiring much self-control (i.e., arithmetic; Muraven et al., 1998). Everything following this manipulation was the same for both groups. After completing their respective activities, participants played the centipede game. Before starting the game, each participant had to successfully complete a quiz ensuring that he or she fully understood the instructions of the game. After the game, every participant completed self-report measures and was probed for deception.

Measures

After completing their primary manipulation, participants were asked to respond to the following question on an 11-point scale: “While performing the previous task, how difficult was it?” We measured task difficulty to rule out the possibility that differences in task difficulty (not self-control use) caused any effects. Prior theoretical publications on ego-depletion discuss the importance of distinguishing between task difficulty and self-control (see Muraven & Baumeister, 2000).

Following the centipede game, participants were also asked to report (on an 11-point scale) the extent to which they desired to maximize the joint payout for both players as a measure of concern for others or pro-social motivation (i.e., “While playing the game, to what extent were you motivated maximize the *joint* payout for you and the other player?”). Participants also had to report the amount of trust they felt toward the other player in the game on an 11-point scale: “While playing the game, how much did you trust the other player?” In both of the preceding self-reports, participants were

reassured that all responses would be kept anonymous and reminded that honest answers are vital for the success of the study. Furthermore, all participants were asked to respond to attitude items retrospectively (how they felt while playing the game, i.e., “While playing the game . . .,” not how they presently felt). We decided to measure attitudes this way as opposed to prior to or during the game to reduce the chance of participants seeing through the deception or inferring the experimenters intentions or desires.

Cooperation/prosocial behavior was measured in two ways. First, cooperation was measured in terms of the overall number of passes made. Second, cooperation was measured by counting the number of individuals in each group who, upon receiving the largest offer allowed to them by the game, chose to pass back to the other player. Specifically, if participants continued to pass until they reached the \$9.50 offer, they were once again given the opportunity to pass; however, doing so would result in their forfeiture of the money to the other player. This would happen because the game would automatically end at the start of the other player’s turn, as the \$10 cap would be met. Thus, those participants who chose to pass after receiving the \$9.50 offer would receive only \$2, whereas the “other player” would receive \$10. Before playing, all players had to verify that they understood the game would automatically end as soon as either player received the \$10 offer.

Results

Self-Report Items

As expected, there was only a very small difference in reported trust of other players (white bear $M=6.0$, $SD=2.9$; arithmetic $M=6.1$, $SD=2.6$, $d=.04$). With respect to the manipulations (white bear thought suppression and arithmetic), there were only small differences in reported task difficulty (white bear $M=2.6$, $SD=2.0$; arithmetic $M=2.2$, $SD=2.0$, $d=.20$).

Social Cooperation

In Study 1, our main dependent variable was cooperation as measured by the number of passes during the economic decision-making game. As predicted, the participants who had been depleted of self-control passed fewer times ($M=6.8$, $SD=2.3$) than individuals in the control condition ($M=8.3$, $SD=1.4$). This behavioral effect was large ($\Delta=1.07$).¹ Consistent with Prediction 2, self-reported concern for others did not

differ greatly between the ego-depletion condition ($M=3.4$, $SD=2.9$) and the control condition ($M=4.2$, $SD=3.7$), producing only a small effect ($d=.24$). Moreover, the relationship between concern for others and passes was stronger for the control condition ($r=.53$) than for the depletion condition ($r=.22$).

Moreover, only one individual in the ego-depletion condition who reached the maximum payout option chose to pass that amount to the other player in exchange for a smaller payout, whereas four individuals in the control condition chose to pass at this juncture. This produced a medium effect size ($V=.26$).

Discussion

The results of Study 1 were consistent with all three of our predictions. We predicted that lowering self-control would cause participants to behave less cooperatively. The results of Study 1 supported this hypothesis. This effect was also very strong; there was a 1 standard deviation difference between low self-control participants and control participants. Consistent with the other predictions, self-reported prosocial motivation/concern for the other player did not vary greatly with self-control. Although there was a small effect size on this self-report, this was much smaller than the behavioral effect. This suggests that ego-depletion does not greatly decrease affective/cognitive concern for others directly. Moreover, the relationship between concern for others and cooperation was much weaker for participants who had undergone ego-depletion. This suggests that although participants with low self-control experience affective concern for others at comparable levels to those with high self-control, they are either unable or unwilling to act on them.

STUDY 2

Study 1 demonstrated that individuals who have had their self-control depleted by completing a previous self-control task played an economic game less cooperatively. In Study 2, we sought to conceptually extend the findings of Study 1 to situations involving cooperation between more than two people or at least to situations involving cooperating with what one perceives to be a group. This is not a trivial extension. There are reasons to suspect that the results may turn out differently. For example, in two-person cooperation scenarios, each individual’s actions have a greater impact on the overall outcome than in larger group situations, which might motivate individuals to cooperate more in smaller settings. Perhaps in a larger group, low self-control individuals’ behaviors will be even more disconnected from their prosocial attitudes. In Study 2, participants played

¹Glass’s Δ rather than Cohen’s d was used in this case because of heterogeneity of variance. Cohen’s d in this case would be .79; however, the use of Cohen’s d without homogeneity of variance assumed is generally not advised.

a commons dilemma game in which they were given opportunities to draw from a community resource in either a responsible way or an exploitative way. Study 2 also tested the theory that self-control influences cooperation by means of failing to resist proself temptations by giving all players an opportunity to make some personal sacrifice to benefit others. More important, Study 2 sought to demonstrate that differences in proself versus prosocial behavior was not due to changing levels of affective concern for others.

Methods

Participants and Design

Sixty-two students (61% female; ages 17–31 years, *Mdn* age = 18 years) from an introductory psychology course participated in the study for partial course credit. All participants were randomly assigned to either a self-control depletion or control condition. The depletion and control procedures were the same used in Study 1. All participants then completed a simulated resource dilemma game.

Task

Students were told that they would be participating in a simulated fishing community and that they would be playing with three other players (all in different rooms). In reality, there were no other players. Participants played a fishing game via a computer, where they had multiple turns to fish on a lake. They were told that each player could continue to fish on the lake, in turns, until all the fish had been taken (the resource had been depleted). The participants were told that the lake had a starting fish population of 40 and that at the completion of every round the remaining fish population would increase by 25%. During each round, participants would occasionally be presented with a fish on their computer screen as well as the option to either harvest the fish or release it back into the pond. All participants received eight opportunities to take a fish per round. This was accomplished by programming the computer running the experiment to present the participant with eight opportunities to keep fish in each round. Participants were not told the number of fish remaining after each round but were given a fishing recommendation at the start of the game (two fish per round). They were told that the recommended number of fish to harvest was based on a calculation to determine a sustainable rate of fishing so that there would be plenty of fish for everyone playing the game. Although participants were told that the game would continue until the resource had been depleted, we measured behavior only across two rounds, which amounted to 16 opportunities to keep or release fish.

Participants were told that, following the completion of the fishing game, they would be required to write a 20-min essay describing the carpet and walls of the experimentation room. They were told that the essay task had been described by previous participants as frustrating, boring, and generally very unpleasant. However, they could earn 30 s off of the essay task for each fish they harvested (up to a maximum of 15 min). This way, participants would be motivated to harvest fish, as it earned them time off of an unpleasant activity, but they were not motivated to take their reward early (by delay of gratification) or to act in a way that ends the game quickly, as even if the maximum number of fish is harvested, some unpleasant activity will still follow.

Finally, following Round 2, participants were asked if they would be willing to donate some of their fish harvest to be released back into the pond so as to increase the available pool size such that it might grow and support the group as a whole. Participants were informed that for each fish they donated, they would also lose the 30-s reward associated with that fish.

Measures

Self-reports. Following the game, participants were asked to report (on 11-point scales) “How much did you trust the other players to cooperate?” and “To what extent were you interested in cooperating with the other players?” Participants were also asked to report their levels of affective concern for other players by responding to the following questions on an 11-point scale: “How concerned were you for the number of fish that would be available for other players?” and “To what extent were you interested in the other players’ well-being?” Finally, participants were asked to report on an 11-point scale how motivated they were to avoid the postgame activity so as to confirm that they were not motivated to end the game quickly (by delay of gratification). In each of the preceding self-reports, participants were reassured that all responses would be kept anonymous and reminded that honest answers are vital for the success of the study. Furthermore, all participants were asked to respond to attitude items retrospectively (how they felt while playing the game, not how they currently feel). Following either the depletion or control activity, all participants responded to the following 11-point item: “How difficult was the previous task?” Task difficulty was measured to rule out the potential differences in task difficulty.

Procedure

The self-control depletion and control activities were the same as in Study 1. Following, the informed consent

and depletion/control manipulation, participants were provided with a description of the fishing game and proceeded to play the simulated fishing game via computer. During the game, participants were given scrap paper for taking notes, if they chose to do so, but were not given specific instructions to do so. They were told that “there is scrap paper available on your desk if you would like to use it.” The scrap paper was given to allow participants to keep notes on the game so that they would not have their working memory taxed. This was done to rule out the possibility that ego-depletion related effects on behaviors in this game were due to depletion related effects on working memory. Following the game, participants completed self-reports (see previous section) and were debriefed. There was not really a boring essay component to the study; the essay task was only a deception told to participants. During the debriefing section, participants were probed for suspicions about the deception.

Results

Self-Reports

There were only very small differences in the amount to which depletion and control participants reported trust of the other players ($M=4.1$, $SD=3.5$ and $M=4.0$, $SD=2.7$, respectively; $d=.03$) or in desire to cooperate ($M=4.6$, $SD=3.4$ and $M=5.2$, $SD=3.2$, respectively; $d=.18$).

Self-Control Depletion and Social Cooperation in Commons Game

Social cooperation was measured as a function of the overall number of fish kept for personal harvest, where a larger harvest indicated less social cooperation. We justify the interpretation of harvest in this way as it correlated with reported interest in cooperating ($r=-.39$) as well as reported concern that there would be enough fish for other players ($r=-.41$). Participants who had their self-control resources depleted before playing the game harvested more fish ($M=10.1$, $SD=4.4$) than participants in the control condition ($M=8.1$, $SD=3.9$), producing a medium effect ($d=.48$).

As a second measure of cooperation, participants were given the option to make a self-sacrificing donation to benefit the group. We found that 84.3% of control condition participants agreed to make a donation to benefit the other players, whereas only 53.3% of subjects who had undergone ego-depletion chose to make a donation, producing a medium effect ($V=.34$). Moreover, individuals in the low self-control condition, on average, donated a smaller fraction ($M=.15$, $SD=.21$) of their overall harvest to the rest of the group than

participants in the control condition ($M=.26$, $SD=.22$), producing a medium effect ($d=.51$).

Self-Control and Concern for Others

Participants' reported affective concern for others as measured by their response to the question “How concerned were you for the number of fish that would be available for other players?” did not differ greatly between depletion condition ($M=6.0$, $SD=3.4$) and control condition ($M=5.2$, $SD=3.0$), producing only a small effect size ($d=.25$). However, the correlation between this item and willingness to make a donation was stronger for the control condition ($r=.53$) than for the depletion condition ($r=.29$). Moreover, this self-report measure for concern for others (measured on an 11-point scale) did not display signs of either ceiling or floor effects.

Similarly, participants reported concern for others as measured by their response to the question “To what extent were you interested in the other players' well-being?” predicted overall harvest ($r=-.35$) but differed only slightly between the depletion condition ($M=4.3$, $SD=3.3$) and the control condition ($M=3.8$, $SD=2.8$, $d=.16$). As before, this self-report measure for concern for others (measured on an 11-point scale) did not display signs of either ceiling or floor effects. This item more strongly correlated with willingness to donate for the control condition ($r=.39$) than for the depletion condition ($r=.22$).

Self-Control and Delay of Gratification Within Experiment

Participants did not report being motivated to end the game early ($M=6.7$, $SD=3.5$; min = 1, max = 11). Similarly, there was only a small difference on this measure between the ego-depletion ($M=6.9$, $SD=3.4$) and control groups ($M=6.4$, $SD=3.6$, $d=.14$). That is, neither group was rushing through the experiment or trying simply to end the game early. This suggests that the larger number of fish taken by participants in the depletion condition was not merely a desire to get as many fish as quickly as possible.

Discussion

The results of Study 2 are consistent with all three of our initial predictions. Prediction 1 (that ego-depletion would reduce cooperative behaviors) was observed in terms of both overall fish harvest (depleted participants kept more fish) and donation (depleted participants were less likely to donate and donated a smaller fraction of their harvest). Consistent with Prediction 2, ego-depletion did not appear to influence either self-reports

for concern for others with more than small effect sizes. Indeed, although a small effect size was found for self-reports of affective concern for others, this was much smaller than the behavioral effects observed. Finally, Prediction 3 was generally supported. We predicted that self-reported concern for others would serve as a strong predictor for cooperative behavior only for nondepleted participants. This was the case, as our self-report items for concern for others was a strong predictor of cooperative behavior only in the non-depletion condition.

The results of Study 2 also suggest that the relationship between self-control and cooperation persists outside of delayed gratification. Delayed gratification paradigms traditionally involve choosing between a smaller reward (to be provided immediately) and a larger reward (to be given later). Our paradigm does not fit this description, as taking early would actually result in experiencing a larger punishment earlier (writing a longer boring essay). On the other hand, waiting would result in a lesser punishment later (writing a shorter boring essay). We propose that the difference in behavior between those with high and low self-control is due to those with low self-control being less able or willing to act on their prosocial desires (because they are unable or unwilling to overcome their selfish desires). This is not to say that the delay of gratification is not an important mediating factor between self-control and social cooperation under some circumstances. Rather, the present research demonstrates that self-control plays an important role in social cooperation, even in the absence of the delay of gratification. Overall, we found that lowering a person's self-control might lead the person to succumb to temptations to maximize their payout even at the expense of others, despite not changing their relative level of affective/cognitive concern for others.

STUDY 3

Studies 1 and 2 demonstrated that a thought-suppressing ego-depletion activity could produce medium to large effects in reducing behaviors that help others while producing only small or no effects on self-reported affective/cognitive concern for the well-being of others. However, one potential shortcoming of the previous studies may have been that self-report measures of concern for others may have too much variance to capture large effects. Thus, an alternative explanation could be that ego-depletion may cause large effects in prosocial attitudes but that our measures were invalid to detect them or that ego-depleted participants were simply lying. To address this possibility, in Study 3, participants completed several self-report measures of concern for others after

completing the same ego-depletion activity used in Studies 1 and 2. The goal was to demonstrate that such ego-depletion does not produce large effects on any of them. Moreover, to further address the possibility that the measures are inadequate to detect effects, we had some participants perform alternative manipulations (mortality salience and pessimistic life prediction) expected to produce large effects on concern for others to demonstrate that our measures are indeed sensitive enough to detect changes in concern for others.

Methods

Participants

Sixty students (38 female; *Mdn* age = 19) from an introductory psychology course completed this experiment for partial course credit.

Measures

Participants completed nine experimenter-created self-report measures for attitudinal concern for others organized into two scales. One scale was a general-purpose, prosocial attitudes measure, whereas the other scale specifically asked questions about concern for the homeless. In the instructions for the homeless prosocial concern scale, participants were told the following: "According to the Center for Public Interest Research, Inc., in the U.S.A., more than 3.5 million people experience homelessness each year with 23% of the homeless population being military veterans." This was done to promote greater prosocial concern for the homeless prior to answering questions. In total, each participant responded to nine self-report items (each on 5-point Likert-type scales) of prosocial concern for others. Items and statistics for these scales can be found in Tables 1 and 2.

Procedure

Upon arriving at the lab, participants were administered informed consent and randomly assigned to receive an ego-depletion, high mortality-salience, pessimistic life prediction, or no manipulation. After this, all participants completed the self-report measures of affective/cognitive prosocial concern listed in Table 1. The order of the measures was counterbalanced across participants. The ego-depletion manipulation was the same as was used in Studies 1 and 2 (white bear thought suppression). The high mortality salience manipulation was the same manipulation used by Jonas, Schimel, Greenberg, & Pyszczynski (2002). For that manipulation, participants were asked to write a paragraph about what will happen to their bodies when they physically die and about what emotions that thought makes them feel. This manipulation was chosen because

TABLE 1
Means and Standard Deviations for Study 3

<i>Measure and Item</i>	<i>Control</i>	<i>Ego-Depletion</i>	<i>Mortality Salience</i>	<i>Negative Life Prediction</i>
General prosocial attitudes				
It is important to help someone who needs it.	4.2 (1.1)	4.2 (1.2)	4.4 (1.1)	4.4 (0.5)
I want to help others.	4.5 (0.6)	4.5 (0.5)	4.9 (0.4)	4.6 (0.6)
The well-being of others is important.	3.7 (1.0)	3.7 (0.9)	4.0 (0.8)	3.8 (0.6)
It is important that others are happy.	3.9 (0.9)	3.9 (1.0)	4.1 (1.2)	4.2 (0.6)
It is important that all people are happy.	4.0 (0.8)	3.9 (0.9)	4.3 (1.0)	4.2 (0.4)
The needs of others are important.	3.5 (1.0)	3.4 (1.1)	4.1 (0.7)	3.9 (0.8)
Overall ($\alpha = .76$)	23.7 (3.8)	23.6 (3.9)	25.8 (3.3)	25.1 (2.6)
Concern for homeless				
Charities that help the homeless are important.	3.9 (0.8)	4.0 (0.9)	4.2 (0.4)	4.1 (1.0)
I care about the homeless.	3.5 (0.9)	3.6 (0.7)	3.7 (1.2)	4.0 (0.7)
I care about the health of the homeless living on the street.	3.5 (0.8)	3.7 (0.8)	4.0 (0.8)	4.0 (0.8)
Overall ($\alpha = .67$)	11.0 (2.0)	11.3 (2.0)	11.9 (2.0)	12.1 (1.6)

Jonas et al. (2002) found that this form of mortality salience priming increased concern for the well-being of others. In the pessimistic life-prediction condition, we used the same set of procedures used by Twenge, Baumeister, DeWall, Ciarocco, and Bartels (2007). In this manipulation, participants complete a bogus “life-prediction survey” and are given a prepared set of negative feedback, which reads as follows:

You’re likely to be accident prone later in life—you might break an arm or a leg a few times, or maybe be injured in car accidents. Even if you haven’t been accident prone before, these things will show up later in life, and the odds are you will have a lot of accidents. Even if you have not started experiencing this yet, people with this personality type are also prone to suffer from bouts of depression throughout their adult life years and tend to be unhappy.

This was done because it was thought that providing individuals with a pessimistic outlook toward their

own future might make them more sympathetic to those in need today. Finally, participants in the control condition received no manipulation and simply completed the prosocial concern measures on the computer. Upon completion of the self-report items, participants were debriefed, probed for deception (if applicable), and excused from the lab.

Results

Means and standard deviations are reported in Table 1, and effect sizes are reported in Table 2. All effect sizes in Table 2 use the control condition as the comparison group. In general, the thought suppression ego-depletion manipulation yielded either no or very small effect sizes (Cohen, 1977), whereas medium to large effect sizes were found for both the high mortality salience and pessimistic life prediction manipulations for the items on both scales. Regarding the complete scales, the ego-depletion manipulation produced only a very small effect on each of the two scales, whereas medium

TABLE 2
Cohen’s *d* (Relative to Control) Effect Sizes for Study 3

<i>Measure and Item</i>	<i>Control</i>	<i>Ego-Depletion</i>	<i>Mortality Salience</i>	<i>Negative Life Prediction</i>
General prosocial attitudes				
It is important to help someone who needs it.	—	.00	.18	.23
I want to help others.	—	.00	.78	.17
The well-being of others is important.	—	.00	.33	.12
It is important that others are happy.	—	.00	.19	.39
It is important that all people are happy.	—	-.11	.33	.32
The needs of others are important.	—	-.09	.70	.44
Overall	—	-.08	.59	.43
Concern for homeless				
Charities that help the homeless are important.	—	.12	.47	.22
I care about the homeless.	—	.07	.20	.67
I care about the health of the homeless living on the street.	—	.21	.63	.63
Overall	—	.15	.45	.61

to large effect sizes were found for each of the other manipulations on each scale (see Table 2).

Discussion

In Study 3, we sought to address the potential internal validity concern that self-report measures of prosocial concern are inadequate to detect affective/cognitive attitudinal changes. Our results appear to alleviate this concern for two main reasons. First, only very small effects were found for each of the nine self-report measures of prosocial concern following an ego-depletion manipulation. Although it may be reasonable to question the validity of one or a few measures, our interpretation that the null is true (ego-depletion does not diminish emotional/cognitive aspects of prosocial attitudes) seems more likely than a host of post hoc criticisms about all of our measures. Second, the ability of our self-reports to capture medium to large effects for both the high mortality salience and negative life-prediction manipulations suggests that our self-reports are indeed sensitive enough to detect changes in emotional/cognitive aspects of prosocial attitudes. Thus, again, the most parsimonious explanation is that ego-depletion does not create such an effect.

GENERAL DISCUSSION

The results of these studies suggest that self-control is critical to acting on affective/cognitive aspects of prosocial concerns for others. Individuals who are higher in self-control seem to behave more prosocially. Most important, the present research further expands on the role of self-control in selfish behavior. Most earlier theorists have either suggested that ego-depletion reduces affective/cognitive concern for others or have not measured this possibility. The present research suggests that self-control is involved with influencing levels of prosocial behavior without directly changing the underlying levels of cognitive/affective concern for others. Depleted and nondepleted participants reported being equally concerned for others, yet depleted participants behaved much more selfishly. We theorize that this effect occurred because ego-depletion reduced participant's ability or motivation to inhibit the influence of proself urges so to act on prosocial concerns. Although our results and experiments provide indirect evidence for this explanation, it ultimately remains speculative, as we did not test this explanation directly. Rather, we simply demonstrated that self-reported affective/cognitive concern for others remains mostly unaffected while behavioral components change. Future research should seek to more directly measure or manipulate both prosocial and proself motivations,

affects, and cognitions. Indeed, we might expect that doing so could reveal sophisticated nuances to our model. For instance, if, as we propose, self-control is needed to suppress or overcome egotistic motivations, then we may expect such motivations to intensify in strength following ego-depletion.

The results also demonstrate that the role played by self-control in *sustained* cooperation involves more than only the delay of gratification. Individuals whose self-control was depleted remained selfish even when the time to the reward was held constant or they would gain nothing by rushing. Very few previous researchers have considered the role of self-control in cooperation outside of delayed gratification. Those few who have done so considered only single acts of cooperating and not sustained cooperation.

Finally, the use of the centipede game adds a unique perspective on the balance between individuals' selfish desires and desire to cooperate. Unlike many economic games, the "rational" choice in the centipede game is to take the first offer (Aumann, 1995). However, individuals typically play beyond the first round (McKelvey & Palfrey, 1992). Hence, individuals lower in self-control could be expected to display "rational" better than individuals who are not depleted. Moreover, it suggests that trust in others declines over time and depletion may accelerate that process.

Although our findings generally support our hypotheses and suggest that ego-depletion does not decrease one's level of affective/cognitive concern for others but does decrease the likelihood that one will act on that concern, these studies did have several limitations. First, attitudes related to concerns for the well-being of others were measured retrospectively after the participants finished playing the games. This was done to avoid creating suspicion in the mind of the participants. However, participants were asked to retrospectively report the attitudes they felt *while playing the game*; therefore, we do believe these measures are still valid. However, there are inherent limitations to using self-reports, as participants may be susceptible to social desirability biases. For example, it is possible that depleted individuals did not care as much about others but reported that they did so to appear more socially desirable either to others or to themselves. However, if this were the case, we may actually suspect less social desirability (hence lower reported concern) for ego-depleted participants, as they would struggle more with this impression management. Ultimately, although we did not uncover any direct evidence of a social desirability bias, this possibility could never be ruled out completely. Thus, a stronger case could have been made if prosocial affect and cognition had been directly manipulated rather than measured. Future research should consider doing this. Second, although

we measured prosocial attitudes, we did not include a direct measure of selfish affects/cognitions. For this reason, it is difficult to conclude the exact nature of a proself versus prosocial conflict, as the selfish tendency must be inferred from the participant's behaviors. The addition of attitudinal measures specifically related to proself desires would make this conflict more visible and easier to study. This limitation is not unique to our studies. In general, researchers have not measured selfish affect/cognition directly but have inferred it through behaviors (as we did). This may represent a shortcoming of this area of research. Future research should include such measures to compare their predictive effectiveness to those of prosocial measures.

The current research is uncommon in the current psychological literature as it is typically easier to create affective or cognitive effects than to create behavioral effects; our research found the opposite. In our studies, we found impressive behavioral effects with nonexistent to modest effects on the psychological constructs presumed to underlie these behaviors; this makes our findings exceedingly rare in the psychological literature. Indeed, much of the novelty of this research is based not on the behavioral effect of ego-depletion on prosocial actions but on the lack of an ego-depletion effect on affective and cognitive components of prosocial concern (i.e., a null effect). This is contrary to much deep-rooted tradition in social psychology that holds that underlying psychological constructs, such as affects and cognitions, should be easier to manipulate than behaviors. Furthermore, conventional social psychology would predict that any change in overt behaviors would most likely be preceded by stronger changes in the psychological constructs thought to underlie that behavior. Therefore, our finding that ego-depletion reduces prosocial behaviors without directly diminishing attitudes about being prosocial has far-reaching implications within and beyond the study of self-control and/or prosocial behavior.

Within the context of prosocial behaviors, these results suggest that prosocial affect and cognition are insufficient to cause prosocial behaviors and that such affects and cognitions may not be consistent with their corresponding behaviors. Individuals may care about the well-being of others but may still be unwilling or unable to exert the effort needed to push past concerns about the self in order to act on their prosocial concerns. Thus, this research suggests that efforts aimed at increasing prosocial behaviors (e.g., green behaviors, charitable giving, etc.) should focus not only on promoting prosocial attitudes but also on reducing the perceived cost and/or inconvenience to the self. Focusing exclusively on promoting prosocial attitudes will not likely succeed as we have seen that many nonprosocially behaving individuals already harbor

prosocial attitudes. This challenges the common characterization of individuals who choose not to act prosocially as being apathetic or cynical. Rather, the decision to act prosocially is likely the result of a complex interplay of competing prosocial and proself feelings, as well as one's ability and motivation to suppress proself temptations.

Beyond the discussion of prosocial behaviors, our findings of strong behavioral effects accompanied by only weak cognitive/affective effects may serve as a challenge to the implications of well-established theories of planned behavior such as Ajzen's (1985) theory of planned behavior/theory of reasoned action. The theory of reasoned action suggests that a person's attitudes toward an action or subjective norm forms his or her intention to perform the behavior, which in turn result in observable behaviors. However, participants in the studies reported here behaved inconsistently with at least some of their reported attitudes. We can identify two plausible reasons for this. First, behaviors may sometimes result as the outcome of a complex competition of incompatible attitudes and intentions that requires executive input to resolve, rather than from single dominant attitude or intention. Thus, the relative strength of these competing motivations as well as one's ability and willingness to suppress the influence of some of them is what ultimately results in overt behaviors. This is the explanation we believe best describes the results of the present studies. Second, it is possible that some individuals (or most people in some cases) do not form strong attitudes before acting. For example, it is possible that the ego-depleted individuals respond to stimuli more quickly and less thoughtfully than nondepleted individuals. Broadly speaking, our findings call for future research to explore the importance of competing, incompatible attitudes and intentions on decision making. Furthermore, the role of executive functions in resolving these conflicts will require careful study and likely lead to many fruitful avenues for future research.

Our findings lay the groundwork for other important lines of future research as well. Future studies should explore how self-control is involved with proself versus prosocial conflicts in other domains such as negotiations, employee citizenship behavior, crime, and deviance. In addition, future studies should seek to explain the nuances of why some cognitive drains, such as our ego-depletion manipulation, reduce cooperative behavior while other procedures such as cognitive load has enhanced cooperation in other experimental situations (e.g., Roch, Lane, Samuelson, Allison, & Dent, 2000). Moreover, to date, most research on ego-depletion and cooperation has used relatively light forms of ego-depletion (a single depletion exercise). It is possible that with high levels of depletion, participants

may feel cognitively drained and become apathetic. Thus, ours (and some others) effects might differ depending on level of depletion. In another vein, future research should investigate decision-making time and impulsivity as it relates to self-control and cooperation. Perhaps those with low self-control care about the well-being of others but respond before they have taken the time to fully consider the extent to which their actions are impacting others adversely. Or perhaps depleted participants act selfishly before they consider how they will feel about their behavior later. Indeed, future research may consider directly manipulating prosocial concern to investigate how this would interact with ego-depletion. Relatedly, self-control may also assist with other-perspective taking such that ego-depletion may reduce affective/cognitive concern for others when empathy is difficult or psychological distance is high. Thus there may be certain circumstances where ego-depletion would reduce the experience of prosocial affect and cognition (e.g., guilt); however, this would be an indirect rather than direct effect. In other words, ego-depletion may disrupt processes that enable an individual to take another's perspective so to empathize when empathy is made difficult such as by high psychological distance. Finally, our results suggest a situation akin to cognitive dissonance, as ego-depleted individuals' behavioral attitudinal components are inconsistent with their reported affective/cognitive attitudinal components. Future research should seek to explore this dissonance and the effects it might have on depleted individuals and others with low self-control. For example, perhaps low self-control individuals develop fewer prosocial attitudes over time to resolve the dissonance or rationalize their self-observed behaviors.

CONCLUSION

The results provide preliminary support of Martinsson et al.'s (2010) idea that cooperation involves a conflict between the desire to be selfish and the desire to cooperate. These theorists suggest that in order to not be selfish, the individual must override a natural selfish urge. Such inhibition takes self-control and hence any process that reduces the individuals' ability or motivation to exert self-control may lead to less cooperation. As previously noted, it may not be a matter of caring about others less but rather being unable or unwilling to act upon one's better nature. Our data suggest that this may be the case. Finally, and perhaps most important, our findings suggest that behaviors may often result not from a single, dominant attitude or intention but from a conflict of competing attitudes and intentions that require executive input to resolve.

ACKNOWLEDGMENTS

We acknowledge the contributions of James Neely, Jeanette Altarriba, Robert Rossellini, Ze Zhu, and Catherine Krug for reviewing and providing feedback on earlier drafts of this article.

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