Journal of Experimental Social Psychology 47 (2011) 403–410

Contents lists available at ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

Reports

Resisting the temptation to compete: Self-control promotes cooperation in mixed-motive interactions

Oliver J. Sheldon [a,*], Ayelet Fishbach [b,*]

[a] Rutgers Business School, Rutgers University, 94 Rockafeller Road, Piscataway, NJ 08854, USA
[b] University of Chicago, Booth School of Business, 5807 South Woodlawn Avenue, Chicago, IL 60637, USA

ARTICLE INFO

Article history:
Received 22 April 2009
Revised 3 November 2010
Available online 4 December 2010

Keywords:
Self-control
Illusory control
Cooperation
Competition
Mixed-motive interaction
Social dilemmas
Bargaining

ABSTRACT

This article provides a self-control analysis of mixed-motive interactions, including 2-person social dilemmas and bargaining encounters. We propose that mixed-motive interactions pose a self-control conflict between pursuing immediate benefits through competition and pursuing long-term benefits through cooperation. As such, anticipating high (vs. low) barriers to successful outcomes triggers counteractive self-control operations that increase cooperation, so long as people believe that by doing so they can influence others to reciprocate.

Mixed-motive interactions, including social dilemmas and bargaining encounters, pose a conflict between securing immediate personal benefits through competition and pursuing long-term benefits for the self and others through cooperation with other people. For instance, in his classic discussion of the tragedy of the commons, Hardin (1968) describes a community situation in which each member's short-term interest is to graze as many cows as possible on a shared plot of land, but in the long-term, such self-interested behavior will damage the commons for both the individual and others (see also, Dawes, 1980; Messick & Brewer, 1983). Similar conflicts characterize people's decision making across a variety of real world situations, ranging from interpersonal relations between colleagues to international diplomacy between countries (Komorita & Parks, 1995).

Although people often recognize that the long-term benefits of cooperation outweigh the short-term payoffs of selfishness and competition in mixed-motive settings, they nevertheless opt to compete quite frequently (Komorita & Parks, 1995; Schroeder, 1995). This failure to cooperate is associated with dramatic consequences across many domains, including retaliation in interpersonal conflicts (Komorita & Mechling, 1967), the failure of environmental programs (Dawes, McTavish, & Shaklee, 1977), and overpopulation (Hardin, 1968). We propose that mixed-motive interactions pose a self-control conflict and that individuals exercise self-control in order to cooperate. We thus argue against the notion that individuals perceive competition as a normative response that maximizes long-term interests (Weber, Kopelman, & Messick, 2004), but rather, suggest that competition is tempting in the short run. Accordingly, we seek to demonstrate that factors that promote self-control, such as anticipating barriers in advance, will increase cooperation in mixed-motive contexts.

A self-control analysis of mixed-motive interaction

A self-control problem emerges when individuals face a choice between an action that offers short-term benefits and one that offers long-term benefits (Baumeister & Heatherton, 1996; Loewenstein, 1996; Mischel, Shoda, & Rodriguez, 1989), with various social interactions potentially posing such a problem (Finkel et al., 2006; Vohs & Ciarocco, 2004). To explore whether mixed-motive interactions pose a self-control conflict and, in particular, whether cooperation relies on the exercise of self-control, we examine whether individuals in such contexts identify their long-term interest as cooperation and view competition as tempting. We then investigate whether anticipating barriers to achieving long-term interests triggers a counteractive self-control response, thereby increasing the likelihood that individuals in mixed-motive settings will cooperate.

From a rational choice perspective (cf. Ledyard, 1995; Luce & Raiffa, 1957), it may seem plausible that individuals identify their long-term interests in mixed-motive settings as competition, believing that competition (vs. collaboration) is the response that will best

* Corresponding authors.
E-mail addresses: osheldon@business.rutgers.edu (O.J. Sheldon), ayelet.fishbach@chicagobooth.edu (A. Fishbach).

0022-1031/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.jesp.2010.11.003

maximize such interests. If this is the case, then anticipating barriers to achieving one's interests in mixed-motive settings should decrease cooperation further. Specifically, when anticipated barriers lower the probability of successfully achieving one's interests, individuals should be more inclined to opt for the benefits of competitive actions. For instance, a manager who anticipates that a successful resolution of a union–management negotiation will be difficult (vs. easy) to achieve should choose to act more competitively, thus cooperating less when the going gets tough.

In contrast to this perspective, our self-control analysis holds that people recognize cooperation—and the norm of reciprocity it can engender (Axelrod, 1980, 1984)—as an effective strategy for achieving their long-term interests, but nevertheless feel tempted to compete. Therefore, individuals may actually increase (rather than decrease) cooperation when they anticipate barriers to success so as to counteract the effect of upcoming barriers. Consistent with this possibility, research on *counteractive self-control* attests to the fact that when people expect obstacles or temptations will threaten the attainment of long-term interests, they engage in strategies to offset the influence of such temptations on behavior (Fishbach, Zhang, & Trope, 2010; Trope & Fishbach, 2000). For instance, students counteract upcoming leisure temptations by elaborating upon what makes studying for their courses valuable, thereby increasing their tendency to study. Similarly, health-conscious individuals counteract food temptations by bolstering the perceived value of alternative, healthy options, thus increasing their desire to eat healthily (Myrseth, Fishbach, & Trope, 2009).

In mixed-motive interactions, we accordingly expect that if people detect threats to their long-term interest to cooperate (e.g., being tempted to retaliate), they will strategically increase their level of cooperativeness to counteract the effect of the threat. For instance, when managers enter a union–management negotiation expecting the likelihood of success to be low, they should plan to adopt a more cooperative strategy (and try harder to induce reciprocity) than they would when they expect a smooth success.

Importantly, a self-control analysis would also suggest that people will only exercise self-control (and thus decide to cooperate when anticipating barriers) when they have a reasonable sense of interpersonal control in the situation. That is, individuals are only likely to increase cooperation to counteract anticipated barriers to success if they believe that their efforts to cooperate will be noticeable, efficacious, and induce reciprocity (Bandura, 1977; Kerr, 1983;1989), thereby securing their long-term interests. Such a sense of control, even when illusory, can be reassuring that expressing trust in a counterpart through cooperation will actually pay off (Abele, Bless, & Ehrhart, 2004; Fast, Gruenfeld, Sivanathan, & Galinsky, 2009; Morris, Sim, & Girotto, 1998; Shafir & Tversky, 1992).

In the present research, we focus on illusory interpersonal control as a precondition for the hypothesized effect of anticipated barriers on increasing cooperation. We define illusory control as people's false impression that their actions can somehow influence others' actions (Morris et al., 1998). On the basis of research by Morris et al. (1998), we manipulate illusory control by varying whether participants in mixed-motive interaction act first versus simultaneously or second. When participants act first, they experience greater illusory control over their counterparts, even when the second player acts before viewing the first player's response and thus cannot be subject to any real influence (Morris et al., 1998; see also Abele et al., 2004). We predict that in mixed-motive settings, a sense (including an illusion) of interpersonal control is a prerequisite for people to exercise self-control. We thus expect that anticipated high (vs. low) barriers to success should increase cooperation when people act first and have a sense of interpersonal control, but not when they act simultaneously or second.

The flipside of this should also be true. That is, absent interpersonal control, not only will anticipated barriers not increase cooperation, but they should actually reduce it. This is because in the face of barriers, individuals with low control ought to feel considerably less certain that cooperation on their part will ultimately be noticed and induce reciprocity. This, in turn, should increase their tendency to lock in short-term benefits of competition (Stephens, McLinn, & Stevens, 2002). We thus predict that absent perceived interpersonal control, people will cooperate less when they anticipate achieving success is going to be harder. In this way, their behavior will reflect (rather than counteract) their perceived odds of achieving successful outcomes through mutual cooperation.

Overview of the present research

In three studies, we employed three different types of mixed-motive settings (two different two-person iterated social dilemmas and a sequential bargaining paradigm), each of which required counterparts to choose between competition and collaboration. We predict that individuals will identify such situations as posing a self-control conflict. Specifically, they will identify their short-term interest as involving competition and their long-term interest as involving collaboration. This, in turn, should lead them to exercise self-control by increasing cooperation in response to anticipated barriers to successful performance.

In each mixed-motive setting, we accordingly manipulated the existence of a perceived barrier to success and tested whether people who anticipated such barriers would cooperate more than those not anticipating barriers. We predicted that individuals would strategically increase their cooperation to counteract barriers, but only when they perceive themselves as having interpersonal control. Absent such a sense, anticipated barriers should instead dampen cooperation.

Study 1: The Centipede Game

Participants in Study 1 engaged in a 6-round, increasing sum Centipede Game (Bornstein, Kugler, & Ziegelmeyer, 2004; Rosenthal, 1981) with an alleged counterpart. In this game, two players take turns choosing either to take a slightly larger share of an increasing pile (corresponding to a competitive move), or to pass the pile to a counterpart (corresponding to a cooperative move). The payoffs are arranged such that if Player 1 passes the pile and Player 2 passes it back, the size of the pile increases for both players, but if Player 1 passes and Player 2 takes on the next round, Player 1 receives less than if she had taken the pile the round before (Fig. 1 displays this payoff structure). In this game, there is a long-term incentive to trust that one's counterpart will not take immediately and to cooperate (pass), but on each round, a player feels tempted to compete (take) in order to secure current earnings. A player that is engaging in backward induction may thus choose to take the pile as soon as possible.

The Centipede Game represents a self-control dilemma to the extent that players feel tempted to take as soon as possible to secure current earnings, but believe that by passing and trusting their counterpart to do likewise, expected payoffs increase for both sides. We conducted a pretest ($n = 38$) to test whether the game indeed poses such a dilemma. Participants in our pretest read a scenario in which they imagined themselves as Player 1 in the exact same version of the Centipede Game undertaken by those in our main study (further details of which are provided below). They then indicated which course of action on Round 1, taking or passing, "seemed less risky in the short-run," and which would, on average, "increase their total gain for the study."

In support of our self-control analysis, most players (87%) agreed taking (vs. passing) seemed less risky in the short run ($\chi^2 = 20.63$, $p < .001$). Additionally, the majority (76%) agreed passing (vs. taking) on Round 1 would increase on average their total gain for the study ($\chi^2 = 10.53$, $p < .01$). Hence, players of this game experience a self-control conflict and identify their long-term interest as passing.

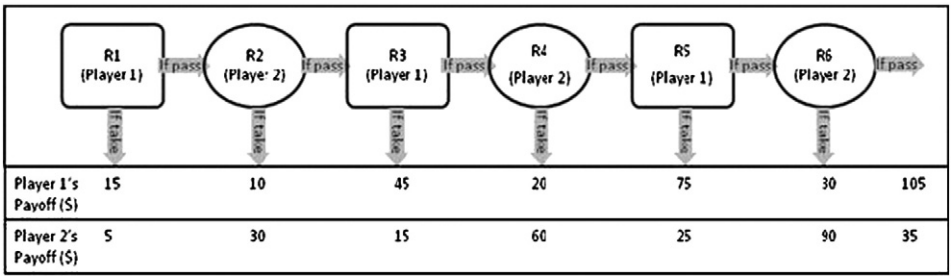

Fig. 1. The increasing-sum Centipede Game: Graphical presentation of the choice and payoff structure for the 6-round game (Study 1). *Note*. R = Round.

In our main experiment, the alleged "counterpart" passed on all rounds, leaving the decision about whether to cooperate or defect to the participant. Moreover, we had all participants move first, thereby facilitating a belief that they had high interpersonal control. We predicted that anticipating barriers to success would increase the number of rounds participants pass before choosing to take the pile.

Methods

Participants

Thirty-seven students participated in our main study in return for $1, plus an additional variable amount (between $2 and $6), based upon their performance.

Procedure

This study employed a "weak" versus "strong" anticipated barriers, between-subject design. Participants and a counterpart, allegedly seated in an adjacent room, completed the above-mentioned version of the Centipede Game, framed as an "investment decision-making task." Participants read that during the task, they and their counterpart would serve as investment officers at competing venture capital firms and make a series of choices between two differentially lucrative investment opportunities.

Participants then read that they would alternately get a chance to take a larger portion of a continually growing pile of money (representing the two investment opportunities). As soon as one player decided to "take" the pile, the game would end with that player getting the larger portion of the pile, and the other player getting the smaller portion. Passing would decrease a player's payoff if the opponent were to take the larger portion on the next move. However, if the opponent were to also pass, then the two players would move on to the next round and be presented with the same choice situation, with larger payoffs for both.

All participants were assigned the role of Player 1 (the first mover), and learned that their counterpart would be Player 2 (the second mover). As mentioned, this ordering was intended to hold participants' level of perceived control constant and high.

To manipulate barriers to success, those in the *weak anticipated barriers* condition were asked to list several reasons why one might feel *secure* during the upcoming task (e.g., one participant listed "I know what the other person expects of me"). Those in the *strong anticipated barriers* condition were asked to list reasons why one might feel *fearful* during the task (e.g., one participant listed "It's a little scary not to know whether I can trust the other player.").

Participants then played the game. They indicated their Round 1 choice (take/pass) on a slip of paper. If a participant passed (everyone but one participant passed on Round 1), the participant waited while the counterpart supposedly chose for Round 2. In this instance, the experimenter returned within a few minutes, bearing a counterpart slip with the choice option "pass" checked. The experimenter repeated the procedure until participants either took and ended the game on or passed on Round 5. At that point, they were paid $1 plus 5% of their earned task money (rounded up to the nearest dollar) and administered a funnel debriefing. No participant indicated suspicion that their counterpart's responses were controlled by the experimenter and all indicated that they believed they had interacted with another student.

Results and discussion

An initial pilot study ($n = 40$) designed to assess the effectiveness of our manipulation indicated that listing reasons reliably influenced experience. In this study, participants were led to expect they would undertake the experimental task and then completed the listing reasons manipulation in one of the conditions. Following this, they completed a 5-item composite measure of how secure they felt going into the task (composed of the items *Secure*, *Calm*, *Hopeful*, and (reverse coded) *Anxious*; *1 = not at all*, *9 = very*). Participants in a weak-barriers condition felt more secure about the upcoming task ($M = 6.34$, $SD = 1.27$) than those in a strong-barriers condition ($M = 5.22$, $SD = 1.50$), $t(38) = 2.54$, $p < .05$.

To test our primary hypothesis, we analyzed the number of rounds participants chose to pass the pile (between 0 and 3), which indicates cooperation. Supporting our prediction, those who anticipated strong barriers to success passed on more rounds ($M = 2.0$, $SD = 0.58$) than those who anticipated weak barriers ($M = 1.55$, $SD = 0.70$), $t(35) = 2.10$, $p < .05$. Similarly, an analysis of participants' earned compensation (between $2 and $6) revealed that participants in the strong anticipated barriers condition earned more ($M = \$4.75$, $SD = .87$) than those in the weak-barriers condition ($M = \$4.08$, $SD = 1.06$), $t(35) = 2.10$, $p < .05$. Hence, perceived barriers to success increased cooperation and improved performance—at least under conditions where cooperation was automatically reciprocated.

These results suggest that people respond to anticipated barriers in mixed-motive interaction by increasing their level of cooperation. Whereas a rational choice perspective might suggest that actors in Centipede Games will recognize competing as a "rational" and therefore desirable response, we find that actors identify cooperation as the desirable response (pretest) and are therefore more likely to cooperate when they believe it is more difficult to succeed. Next, we report a study that extends these findings to a different mix-motive situation, while testing whether the effect of anticipated barriers on enhanced cooperation depends upon people's perceived interpersonal control.

Study 2: The Prisoner's Dilemma

Participants in Study 2 played a finite 2-party iterated Prisoner's Dilemma game with an alleged counterpart, choosing between competition and cooperation across several rounds. Specifically, they completed an airfare pricing game in which they and a counterpart played airline executives at different airlines and made a series of decisions between setting their weekly routing prices according to a "standard scheme" or a "discounted scheme." The payoffs were set such that a standard scheme reflected a cooperative choice whereas a discounted scheme reflected a competitive choice.

On any given week (i.e., round) of this simulated pricing war, each party might feel tempted to compete to secure moderate benefits, yet over the long run, both benefit more from trusting each other and establishing mutual cooperation (Komorita & Parks, 1994).

Importantly, such a game only poses a self-control conflict to the extent that players actually feel tempted to compete. We thus conducted a pretest ($n = 23$) similar to that in Study 1 to test whether participants in the game would indeed perceive competition as tempting and hence, the game itself as posing a self-control dilemma. In this pretest, participants first read a scenario mirroring the airfare game actually undertaken by those in our main study, imagining themselves in the role of one of two executives charged with setting weekly routing prices. They then indicated which price scheme (standard vs. discounted) was "more tempting" and which was "more attractive in the short run." In support of our hypothesis, most players (78%) stated they would feel tempted to choose the discounted (vs. standard) scheme on the first week ($\chi^2 = 7.35$, $p < .01$). Similarly, the majority (87%) agreed that choosing the discounted (vs. standard) scheme would be most attractive in the short-run ($\chi^2 = 12.57$, $p < .001$). Hence, players of this game identify competition as tempting and thus, as posing a self-control conflict.

For the main study, we manipulated whether participants in a computer-based version of the above airfare game anticipated barriers to success, along with their sense of interpersonal control in the situation. We predicted that participants with high perceived control would be more likely to cooperate on their initial move when they anticipate strong (vs. weak) barriers to success—a pattern indicative of counteractive self-control. In contrast, we predicted that those low or medium in perceived control would be less likely to initiate cooperation in the face of high (vs. low) barriers.

Methods

Participants

Students (142) participated in our main study in return for $5 plus a chance to win $50.

Procedure

This study employed a 2 (anticipated barriers: weak or strong) × 3 (perceived interpersonal control: high, medium, low) between-subjects design.

Participants and an alleged counterpart, supposedly seated in an adjacent room, engaged in a 20 round computer-based version of the 2-person Prisoner's Dilemma game, designed to simulate an airfare pricing war. The game presented participants with two choice options: a competitive and a cooperative choice.

The payoff matrix for each round is shown in Fig. 2. The "Standard Scheme" represented the cooperative choice and the "Discounted Scheme" represented the competitive choice. Participants read that they and their counterpart would play two, high-level executives at different airlines. As such, their primary duty would be to set the weekly airfare prices for their respective airlines, choosing one of two pricing schemes. They further read that the players with the best performance would be entered into a lottery for $50. The counterpart in this study was in reality a computer-based program, designed to compete on Round 1 and play "Tit-for-Tat" thereafter. This design enabled us to test whether perceived barriers increase cooperation when such behavior can facilitate one's long-term interests (on Round 1), but not once it becomes unclear whether such behavior will continue to do so (once the counterpart defected).

We manipulated anticipated barriers to success by providing participants with the following advice (*weak anticipated barriers* condition in brackets): "doing well on the task is very difficult (very manageable). In fact, only a small (a rather large) percentage of participants in the study thus far have turned in what might be considered a stellar performance."

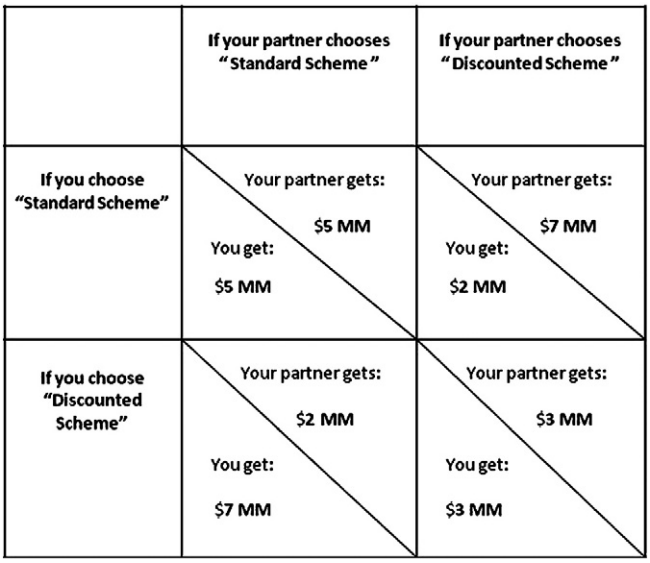

Fig. 2. Payoff matrix for iterated Prisoner's Dilemma game (Study 2).

To manipulate perceived interpersonal control, we informed participants in the *high-control condition* that their counterpart would choose directly after them on each round, those in the *medium-control condition* that their counterpart would choose at the same time, and those in the *low-control condition* that their counterpart choose before them. Going first in such settings engenders an illusion of control, even though participants were explicitly informed that their counterparts would not know of their decision before making their own (Morris et al., 1998).

Participants then played the game. The purpose of having them play multiple rounds was two-fold: first, we wanted to emphasize the long-term consequence of achieving mutual collaboration; second, we wanted to test whether self-control would be associated with greater cooperation on the first round (initiation), before the counterpart defected, but not afterward, when it has no clear long-term benefit. Following the game, participants were given a funnel debriefing. No participant indicated suspicion that their counterpart's responses were controlled by the experimenter and all indicated that they believed they had interacted with another student.

Results and discussion

An analysis of the percentage of participants who cooperated on Round 1 yielded the predicted interpersonal-control × anticipated-barriers interaction, $\beta = -1.47$, Wald $\chi^2(1, N = 142) = 9.77$, $p < .01$. As shown in Fig. 3, in the high-control condition, a greater percentage of participants cooperated in the face of strong barriers to success (83%) than weak barriers (52%), $\chi^2(1, N = 52) = 4.74$, $p < .04$. However, the opposite occurred in the medium- and low-control conditions: A smaller percentage of participants cooperated in the face of strong barriers than in the face of weak barriers (50% vs. 81% in the medium-control condition, $\chi^2(1,42) = 4.73$, $p < .05$; 54% vs. 84% in the low-control condition; $\chi^2(1,47) = 5.21$, $p < .05$).

Recall that participants' counterpart was programmed to compete on Round 1. Therefore, in Rounds 2–20, there was no apparent value to cooperation, since the extent to which such behavior would serve participants' long-term interests was less certain. Consistent with our self-control interpretation, an ANOVA performed on the number of times participants cooperated across rounds 2–20 did not replicate the above interpersonal-control × anticipated-barriers interaction, $F(2,134) = 1.37$, $p = .26$.

Overall then, we find that participants cooperated more when it seemed harder (as opposed to easier) to do well, but only when they

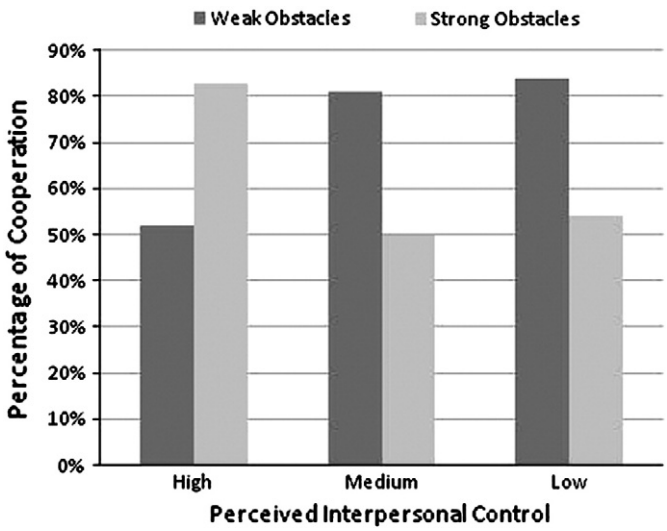

Fig. 3. Effects of anticipated barriers and perceived interpersonal control on participant's percentage of cooperation in Round 1 of the Prisoner's Dilemma game (Study 2).

sensed that by cooperating they could somehow influence their counterpart to follow. Absent such a sense, anticipated barriers led participants to compete more. As in the previous study, these findings contrast with a purely rational choice perspective, which would predict that control or no control, anticipated barriers ought to enhance the pull of backward induction and increase competition, not as a temptation, but as a rational strategy.

Interestingly, we did not find a main effect for perceived control in the present study, suggesting that a sense of control influences how people respond to barriers to success, rather than increasing cooperation uniformly. Specifically, a sense of control increased cooperation when participants anticipated strong barriers to success, but absent such barriers, a sense of control actually decreased cooperation. One possible explanation for this latter finding may be that absent significant barriers to success, people become overconfident when their sense of control is high (vs. medium or low) and believe that they can induce counterparts to cooperate and help themselves, even if they themselves do not cooperate (Bazerman & Neale, 1982; Neale & Bazerman, 1983).

Also worth noting is that when participants' sense of control was low or medium, those who anticipated few barriers to success actually cooperated just as frequently as did those with high control who anticipated significant barriers to success. Given that the former's circumstances essentially made self-control irrelevant, perhaps they derived their motivation to cooperate from elsewhere. One possibility, for instance, is that with little sense of interpersonal control in the situation, a lack of anticipated barriers led such participants to expect they could more easily achieve their long-term objectives through cooperation than through competition. Acting on these expectations did not require self-control.

Next, we conducted a third and final study to test whether the same pattern of counteracting barriers by increasing cooperation observed in this and the previous study would hold in another, very different type of mix-motive interaction, one in which actors are less focused on striving to achieve an outstanding performance (i.e., a promotion goal, Higgins, 1997), but wish to cut their losses. Specifically, to protect their financial interests, participants in this last study had to cooperate with a competitive counterpart over a series of rounds in which they lost money the longer it took to reach an agreement.

Study 3: Union–management negotiation

Study 3 examined whether anticipated barriers increase cooperation over a sequence of interactions with a competitive counterpart. We employed a mix-motive bargaining dilemma in which (unlike in Study 2) to do well, participants had to continue cooperating with a non-cooperative counterpart and overcome their increasing desire to retaliate. Specifically, participants assumed the role of manager in a repeated sequential wage negotiation (modeled after Lax & Weeks, 1985). In this task, a union representative and a company manager exchange bids for an hourly wage over the course of a strike period. The payoff structure is such that the strike is costly for both sides (though mostly for the management) and the final payoff is affected by the number of strike days more than the agreed upon wage. Successful managers end the strike early, even at the cost of giving high wages to a non-cooperative union who makes minimal concessions.

The above union–management negotiation poses a self-control conflict if players realize that in order to maximize their long-term interests, they need to make concessions even to an uncooperative union. Once again, we conducted a pretest ($n=21$) to test whether participants in the game indeed identify their long-term interests as cooperating, even if the union fails to reciprocate. Participants in this pretest read a scenario mirroring the main experimental task (further details of which are provided below) and imagined themselves as management in a union–management wage negotiation with a stubborn union counterpart. In this negotiation, their counterpart had made little if any concessions over the course of the first three rounds (came down only 2 cents, from $11), while they themselves had conceded 30 cents (up from $10). Moreover, they learned that their counterpart had just decided to strike, a state of affairs which, if prolonged, would end up costing them significantly more than it would their counterpart, as well as more than it would to simply agree in full to their counterpart's wage demands. We then queried participants about which course of action, making further concessions or not doing so, would best maximize their long-term interests, and to what extent each of two different courses of action, making the union pay and minimizing their own costs, were in their long term interest ($1=$ *not at all*, $7=$ *very much so*).

In support of the hypothesis, most participants (71%) stated that making further concessions (vs. withholding concessions) would maximize their long-term interests in negotiating with an uncooperative union ($\chi^2=3.86$, $p<.05$). Additionally, when asked to rate their long-term financial interests, participants rated minimizing their own costs as highly reflective of their long-term financial interests ($M=6.19$ compared to the midpoint of 4, $t(20)=8.03$, $p<.001$), and making the union pay as not all that reflective of such interests ($M=3.0$ compared to the midpoint of 4, $t(20)=-2.16$, $p<.05$).

For the main study, participants played an interaction-based version of this same game, but with no prior information on the union's moves. We manipulated perceived barriers to success and interpersonal control, predicting that only when interpersonal control seems high will anticipated barriers increase cooperation.

Methods

Participants

Students (142) participated in our main study in return for monetary compensation, based on their performance.

Design

The study employed a 2 (anticipated barriers: weak or strong) × 3 (perceived interpersonal control: high, medium, low) between-subjects design.

Procedure

Participants and an alleged counterpart, supposedly seated in an adjacent room, completed a computer-based simulated union–management wage negotiation. In this task, participants learned that they had been randomly assigned to the role of management, whose objective was to keep wages low (close to $10) to minimize

Table 1
The union–management negotiation structure of sequential bargaining interaction and counterpart concessionary behavior (Study 3).

Strike day (round)	Cost of a strike to the participant (management) ($)	Cost of a strike to the counterpart (union) ($)	Union's offer
−1	0	0	11.00
0	0	0	11.00
1	115,000	55,000	10.98
2	260,000	120,000	10.95
3	435,000	195,000	10.94
4	640,000	280,000	10.94
5	875,000	375,000	10.94
6	1,140,000	480,000	10.90
7	1,435,000	595,000	10.90
8	1,760,000	720,000	10.90
9	2,115,000	855,000	10.90
10	2,500,000	1,000,000	10.90
11	2,915,000	1,155,000	10.90
12	3,360,000	1,320,000	10.90
13	3,835,000	1,495,000	10.90
14	4,340,000	1,680,000	10.89
15	4,875,000	1,875,000	10.85
16	5,440,000	2,080,000	10.85
17	6,035,000	2,295,000	10.85
18	6,660,000	2,520,000	10.85
19	7,315,000	2,755,000	10.85
20	8,000,000	3,000,000	10.85

company costs. Additionally, they learned that their counterpart had been assigned to the role of a union representative, whose objective was to keep wages high (close to $11). Participants' task was to reach a wage agreement with their counterpart between $10 and $11, through the exchange of up to 22 offers.

During this negotiation, there are two costs which management potentially incurs and should therefore attempt to minimize: costs associated with any increase over $10 in worker wages agreed to, and penalties associated with a worker strike, set to commence should the parties fail to reach agreement after 2 bargaining rounds. Strike costs increase exponentially on each round (see Table 1), and are more severe for management. In learning about the task, participants received information about the cost structure for management, which is influenced more by the strike's length than the agreed wage.[1]

To increase participants' incentive for minimizing costs, they learned that their personal pay for the study would be a function of the total costs they incurred, ranging from $4, should they let the negotiation drag out and incur more than $8 million in costs, to $7, should they reach a quick agreement and incur less than $5 million in costs.

Just before starting the task, participants were exposed to the same two experimental manipulations (anticipated barrier and perceived control) employed in Study 2. Participants then started negotiating via a computer program supposedly designed to allow them to send numerical offers back and forth with their union counterpart. All participants actually interacted with a preprogrammed counterpart, who behaved stubbornly throughout the exercise, making small concessions if at all (see Table 1 for the Union's moves). Making wage concessions to a stubborn union is emotionally difficult and evokes a desire to retaliate by holding off making concessions. However, concessions were necessary in order to do well in this task.

The task ended either once participants made an offer equal to or higher than their union counterpart's offer, or once they reached the 22nd round, in which case, the final wage offered by management was the wage agreed upon. Participants were then paid and administered a funnel debriefing. As in previous studies, no participants evidenced suspicion that they had bargained with an experimenter-controlled counterpart.

[1] Management's cost for every ¢1 above $10 that they agreed to =$500,000*($10 + ¢*X* above $10) − $10.

Results and discussion

We assessed participants' cooperativeness by the number of bargaining rounds it took them to reach an agreement. The more quickly they reached agreement, the more cooperative they were. In support of our hypothesis, an ANOVA on the number of rounds yielded an anticipated barriers × perceived interpersonal control interaction, $F(2,136) = 7.64$, $p < .001$ (see Fig. 4). When participants had a high sense of control, they took fewer rounds to reach an agreement in the face of strong anticipated barriers ($M = 9.85$, $SD = 7.72$) compared to weak barriers ($M = 15.14$, $SD = 6.43$), $F(1,70) = 8.29$, $p < .01$. However, the opposite pattern emerged when participants felt they had either medium or low interpersonal control. Then, participants took fewer rounds to reach an agreement when they faced weak barriers ($M = 11.50$, $SD = 8.29$ for *medium perceived control*; $M = 12.71$, $SD = 8.97$, for *low perceived control*) than when they anticipated strong barriers ($M = 16.36$, $SD = 7.24$, for *medium perceived control*, $F(1,46) = 4.61$, $p < .04$; $M = 17.2$, $SD = 5.08$, for *low perceived control*, $F(1,40) = 3.82$, $p = .06$). No main effects were observed.

An analysis of the amount of compensation participants earned yielded a similar pattern of results, indicating that participants' cooperativeness influenced their payoffs in the task, $F(2,136) = 10.29$, $p < .001$. In particular, when participants had a high sense of control, those who anticipated strong barriers earned more money ($M = \$6.04$, $SD = 1.34$) than those who anticipated weak barriers ($M = \$4.86$, $SD = 1.24$), $F(1,53) = 11.34$, $p < .01$. However, just the opposite pattern emerged when participants felt they had either medium or low perceived control. Under the latter conditions, participants who anticipated weak barriers earned more money for the study ($M = \$5.77$, $SD = 1.51$ for *medium perceived control*; $M = \$5.52$, $SD = 1.66$ for *low perceived control*) than those who anticipated strong barriers ($M = \$4.84$, $SD = 1.31$ for *medium perceived control*, $F(1,46) = 5.14$, $p < .03$; $M = \$4.60$, $SD = .88$ for *low perceived control*, $F(1,40) = 4.87$, $p < .05$). Again, no main effects were observed. Thus, by overcoming the desire to retaliate, participants actually helped themselves financially.

Taken together, results of this third study provide further evidence of increased cooperation in response to anticipated barriers to success, contingent upon having a sense of interpersonal control. As in Study 2,

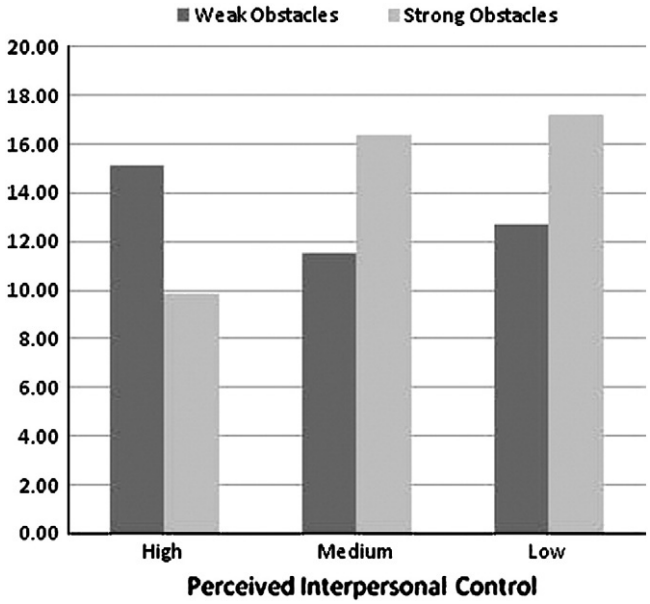

Fig. 4. Effects of anticipated barriers and perceived interpersonal control on the number of rounds participants took to reach a bargaining agreement (Study 2). *Note*. Lower numbers indicate greater cooperation.

participants did not counteract effects of barriers by increasing cooperation when interpersonal control was medium or low, and there was no main effect of perceived interpersonal control on cooperation. Ironically, both studies also show that for weak barriers, people cooperate less when they believe their interpersonal control is high (vs. low). This pattern seemingly reflects that when barriers are insignificant, people become overconfident that they can induce counterparts to cooperate and do well, even if they themselves do not cooperate. Additionally, both studies show that people behave in just the oppose manner in such circumstances when their sense of control is low.

General discussion

In the present research, we argue that mixed-motive interactions pose a self-control dilemma, as people generally believe that their long-term interests are best served by cooperation, but feel tempted to compete. As such, we suggest that one way to increase cooperation is by reminding people of anticipated barriers to achieving their long-term interests. Based on counteractive control theory (see Fishbach & Converse, 2010 for review), we contend that people counteract the temptation to compete in mixed-motive interactions by cooperating more when they anticipate strong versus weak barriers in advance. We contrast this prediction with the alternative, which is that people identify competition as a rational strategy for achieving their long-term interests, and opt to compete more when they expect that achieving their interests will be more difficult.

Using different methods for manipulating perceived barriers to success, we find support for the above prediction across three studies that measured cooperation in different mixed-motive interactions (the Centipede game, the Prisoner Dilemma and the union–management negotiation). Across these studies, we also find that the effect of anticipated barriers is contingent upon people believing that they can induce their counterpart to reciprocate. That is, a sense of interpersonal control, even if illusory, appears to be a necessary precondition for people to counteract the effect of anticipated barriers through increased cooperation. This leads us to conclude that when seeking to understand how people navigate mixed-motive interactions, it is useful to examine the source of the difficulty of achieving mutual cooperation. Whereas factors that decrease the likelihood of success without diminishing one's sense of control (e.g., learning that doing well will require effort) increase cooperation, factors that decrease perceived control over the situation (e.g., communication barriers between actors) decrease cooperation when doing well seems more difficult.

These findings bear a number of noteworthy implications. First, because trust often underlies behavioral cooperation (Pruitt & Kimmel, 1977), it is but a small step to extend our current analysis to trust in mixed-motive interactions. On the basis of the present research, we suggest that when people anticipate barriers to success, they are likely to exercise self-control in order to be able to trust their counterpart and thus be more cooperative. That is, trusting another person is often an act of self-control, designed to promote long-term interests. Second, the present research has more general implications for why people behave as competitively as they do in mixed-motive interactions. Our analysis implies that a critical psychological factor enabling cooperation is the exercise of self-control and that self-control failures may therefore account for competition. Whereas several psychological factors have now been linked to cooperation and competition in mixed-motive settings, ranging from individual differences in social values (Kramer, McClintock, & Messick, 1986; Liebrand, Jansen, Rijken, & Suhre, 1986) to cognitive and perceptual factors affecting actors (for a review, see Ross & Ward, 1995), the present research highlights the unique role of self-control in governing this same behavior.

Moving beyond mixed-motive interactions, the present analysis suggests that self-control may well be the mechanism by which individuals resist the immediate desire to act selfishly and pursue self-serving interests across a variety of social interactions—not simply those characterized by a tension between cooperation and competition. However, notably, we would not suggest that each time individuals refrain from acting in a self-serving way do they rely on self-control. Indeed, to the extent that individuals are not tempted to act selfishly in the first place, actions that are not self-serving might not require self-control.

Finally, it is worth highlighting the implications of the present work for the literature on self-control itself and the distinction between controlling the self and controlling others. We suggest that in mixed-motive interactions, people exercise self-control in order to cooperate, and that cooperation influences their counterparts to do the same. In these situations, controlling the self is a necessary precondition for controlling another person. That is, to control others, one needs to first control oneself. More generally, the bulk of self-control research to date has focused on how self-control processes shape people's decisions with respect to primarily personal outcomes, such as smoking, dieting, studying, and consumer behavior. As a result, little attention has been paid to the role of self-control in governing more interpersonal behavior and outcomes (though see Finkel et al., 2006; Vohs & Ciarocco, 2004). The present work takes an initial, yet significant step toward addressing this gap, demonstrating that self-control shapes not only the personal, but also the interpersonal, playing a considerable role in determining whether people choose to compete or cooperate with others in their everyday lives.

References

Abele, S., Bless, H., & Ehrhart, K. (2004). Social information processing in strategic decision-making: Why timing matters. *Organizational Behavior and Human Decision Processes*, *93*, 28—46.

Axelrod, R. (1980). More effective choices in the Prisoner's Dilemma. *Journal of Conflict Resolution*, *24*, 379—403.

Axelrod, R. (1984). *Evolution of cooperation.* New York: Basic Books.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191—215.

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, *7*, 1—15.

Bazerman, M. H., & Neale, M. A. (1982). Improving negotiation effectiveness under final offer arbitration: The role of selection and training. *Journal of Applied Psychology*, *67*, 543—548.

Bornstein, G., Kugler, T., & Ziegelmeyer, A. (2004). Individual and group decisions in the Centipede game: Are groups more "rational" players? *Journal of Experimental Social Psychology*, *40*, 599—605.

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology*, *31*, 169—193.

Dawes, R. M., McTavish, J., & Shaklee, H. (1977). Behavior, communication, and assumptions about other people's behavior in a commons dilemma situation. *Journal of Personality and Social Psychology*, *35*, 1—11.

Fast, N. J., Gruenfeld, D. H., Sivanathan, N., & Galinsky, A. D. (2009). Illusory control: A generative force behind power's far-reaching effects. *Psychological Science*, *20*, 502—508.

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

Fishbach, A., & Converse, B. A. (2010). Walking the line between goals and temptations: Asymmetric effects of counteractive control. In R. R. Hassin, K. N. Ochsner, & Y. Trope (Eds.), *Self control in society, mind, and brain* (pp. 389—407). New York: Oxford University Press.

Fishbach, A., Zhang, Y., & Trope, Y. (2010). Counteractive evaluation: Asymmetric shifts in the implicit value of conflicting motivations. *Journal of Experimental Social Psychology*, *46*, 29—38.

Hardin, G. (1968). The tragedy of the commons. *Science*, *162*, 1243—1248.

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, *52*, 1280—1300.

Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology*, *45*, 819—828.

Kerr, N. L. (1989). Illusions of efficacy: The effects of group size on perceived efficacy in social dilemmas. *Journal of Experimental Social Psychology*, *25*, 287—313.

Komorita, S. S., & Mechling, J. (1967). Betrayal and reconciliation in a two-person game. *Journal of Personality and Social Psychology*, *6*, 349—353.

Komorita, S. S., & Parks, C. D. (1994). *Social dilemmas.* Madison, WI: Brown & Benchmark.

Komorita, S. S., & Parks, C. D. (1995). Interpersonal relations: Mixed-motive interaction. *Annual Review of Psychology*, *46*, 183—207.

Kramer, R., McClintock, C. G., & Messick, D. M. (1986). Social values and cooperative response to a simulated resource conservation crisis. *Journal of Personality*, *54*, 101—117.

Lax, D. A., & Weeks, T. T. (1985). Leckenby Co. Harvard Business Publishing.

Ledyard, J. O. (1995). Public goods: A survey of experimental research. In J. H. Kagel & A. E. Roth (Eds.), *Handbook of experimental economics* (pp. 111—194). Princeton, NJ: Princeton University Press.

Liebrand, W. B. G., Jansen, R. W. T. L., Rijken, V. M., & Suhre, C. J. M. (1986). Might over morality: Social values and the perception of other players in experimental games. *Journal of Experimental Social Psychology*, *22*, 203—215.

Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational and Human Decision Processes*, *65*, 272—292.

Luce, R. D., & Raiffa, H. (1957). *Games and decisions: Introduction and a critical survey.* New York: Wiley.

Messick, D. M., & Brewer, M. B. (1983). Solving social dilemmas: A review. *Review of Personality and Social Psychology*, *4*, 11—44.

Mischel, W., Shoda, Y., & Rodriguez (1989). Delay of gratification in children. *Science*, *244*, 933—938.

Morris, M. W., Sim, D. L. H., & Girotto, V. (1998). Distinguishing sources of cooperation in the one-round Prisoner's Dilemma: Evidence for cooperative decisions based on the illusion of Control. *Journal of Experimental Social Psychology*, *34*, 494—512.

Myrseth, K. O., Fishbach, A., & Trope, Y. (2009). Counteractive self-control: When making temptation available makes temptation less tempting. *Psychological Science*, *20*, 159—163.

Neale, M. A., & Bazerman, M. H. (1983). The role of perspective-taking ability in negotiating under different forms of arbitration. *Industrial and Labor Relations Review*, *36*, 378—388.

Pruitt, D. G., & Kimmel, M. J. (1977). Twenty years of experimental gaming: Critique, synthesis, and suggestions for the future. *Annual Review of Psychology*, *28*, 363—392.

Rosenthal, R. W. (1981). Games of perfect information, predatory pricing, and the chain store paradox. *Journal of Economic Theory*, *25*, 92—100.

Ross, L., & Ward, A. (1995). Psychological barriers to dispute resolution. In M. (Ed.), *Advances in experimental social psychology*, *Vol. 27*. (pp. 255—304). San Diego: Academic Press.

Schroeder, D. A. (1995). *Social dilemmas: Perspectives on individuals and groups.* Westport, CT: Praege.

Shafir, E., & Tversky, A. (1992). Thinking through uncertainty: Nonconsequential reasoning and choice. *Cognitive Psychology*, *24*, 449—474.

Stephens, D. W., McLinn, C. M., & Stevens, J. R. (2002). Discounting and reciprocity in an Iterated Prisoner's Dilemma. *Science*, *298*, 2216—2218.

Trope, Y., & Fishbach, A. (2000). Counteractive self-control in overcoming temptation. *Journal of Personality and Social Psychology*, *79*, 493—506.

Vohs, K. D., & Ciarocco, N. J. (2004). Interpersonal functioning requires self-regulation. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 392—410). NY: Guilford.

Weber, M., Kopelman, S., & Messick, D. (2004). A conceptual review of decision making in social dilemmas: Applying the logic of appropriateness. *Personality and Social Psychology Review*, *8*, 281—307.