

# Reconciling pro-social vs. selfish behavior: On the role of self-control

Peter Martinsson\*    Kristian Ove R. Myrseth<sup>†</sup>    Conny Wollbrant<sup>‡</sup>

## Abstract

We test in the context of a dictator game the proposition that individuals may experience a self-control conflict between the temptation to act selfishly and the better judgment to act pro-socially. We manipulated the likelihood that individuals would identify self-control conflict, and we measured their trait ability to implement self-control strategies. Our analysis reveals a positive and significant correlation between trait self-control and pro-social behavior in the treatment where we expected a relatively high likelihood of conflict identification—but not in the treatment where we expected a low likelihood. The magnitude of the effect is of economic significance. We conclude that subtle cues might prove sufficient to alter individuals' perception of allocation opportunities, thereby prompting individuals to draw on their own cognitive resources to act pro-socially.

Keywords: self-control, pro-social behavior, altruism, dictator game.

## 1 Introduction

Lured by temptation, individuals may find themselves acting against their better judgment. Self-control failure, famously termed *akrasia* in Plato's Protagoras (Plato, 1986/B.C. 380), persists throughout domains of daily life and represents a central issue of both philosophy and modern-day social sciences. For example, the dieter faced with the opportunity to indulge in a delicious creamy cake may perceive a conflict between indulging and maintaining a good figure. The student may feel conflicted between the desire to go to the cinema and her better judgment to stay home and study. And, similarly, the fashionista might feel conflicted between the temptation to purchase new boots and her better judgment to maintain a responsible budget.

Perhaps less intuitively, but no less importantly, the question of pro-social versus selfish behavior may be un-

derstood in similar terms. This conceptualization may help reconcile conflicting notions in economics of selfish and pro-social motivations. That individuals should care much about their own self-interest seems almost tautological and requires little further exposition, but that individuals also should care about the interest of others—at the expense of that of their own—has attracted considerable attention (for an overview on social preference, see Fehr and Schmidt, 2006). For example, many individuals voluntarily contribute to charity or to public goods (e.g., recycling), and they pay their taxes despite low likelihood of punishment for failing to do so.<sup>1</sup> Nonetheless, one could imagine that even individuals of generally pro-social inclination on occasion may feel tempted to act selfishly and hence underreport income to the authorities. That is, pro-social preferences potentially fly in the face of basic urges for personal gain—or greed—and the individual may thus experience a self-control conflict between better judgment to act pro-socially and the temptation to act selfishly.

Self-control—our capacity to overrule temptation—is no less complex than it is important. A multitude of conceptualizations exist, many of which are complementary. Typically, and in line with classic ideas of the conflict between reason and passion, authors view self-control as a “cold” executive function that guides behavior in the face of “hot” impulses to act against better judgment (see e.g., Loewenstein, 1996; 2000; Metcalfe & Mischel, 1999; O'Donoghue & Loewenstein, 2007;

Financial support from the Swedish Research Council (*Vetenskaprådet*) the Swedish International Development Cooperation Agency (Sida) to the Environmental Economics Unit at the University of Gothenburg and Jan Wallanders and Tom Hedelius Foundation is gratefully acknowledged. We are grateful to Fredrik Carlsson, Gary Charness, John Hey, Martin Kocher, Katarina Nordblom, Olof Johansson-Stenman, and Johan Stennek; to conference participants at SJDM 2009, ESA 2009, and IMEBE 2009; to seminar participants at the University of Gothenburg; and to Jean-Robert Tyran, Jonathan Baron, and two anonymous referees for helpful comments, suggestions, and discussions. Horacio Antonio Villegas Rivera provided excellent logistical support and Angela Maria Gonzales provided excellent research assistance. Authors are listed alphabetically.

\*Department of Economics, University of Gothenburg

<sup>†</sup>Corresponding author: ESMT European School of Management and Technology, Schlossplatz 1, 10178 Berlin, Germany. Email: myrseth@esmt.org.

<sup>‡</sup>Department of Economics, University of Gothenburg

<sup>1</sup>There exists an extensive literature on the motivation behind pro-social behavior. For example, Bénabou and Tirole (2006) classify the motivations into three broad categories: intrinsic, extrinsic and image motivation, and Ariely et al. (2009) employ a similar classification.

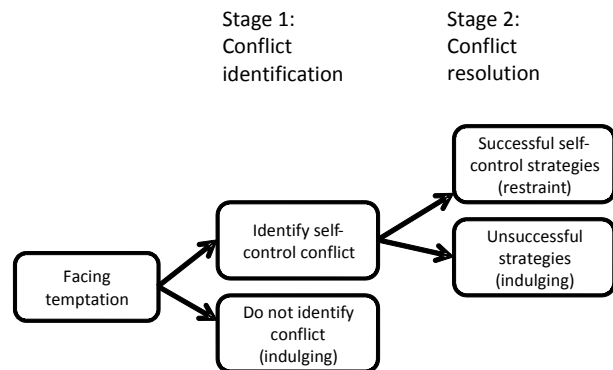
Hofmann et al., 2009). Willpower, then, represents the combined resources that the executive function—or the Planner, in the parlance of Thaler and Shefrin (1981)—brings to bear in a deliberate struggle against temptation (see, e.g., Baumeister, et al., 1998; Baumeister, 2002). Such resources may include cognitive strategies to divert attention away from temptation (Mischel et al., 1989), strategies of pre-commitment (Thaler & Shefrin, 1981; Schelling, 1984), or possibly the sheer strength of mind to hold back from the song of the sirens. Our conceptualization of self-control mirrors these.<sup>2</sup>

Only recently has the psychological literature started to explore how the question of pro-social versus selfish behavior relates to that of self-control. Loewenstein (1996; 2000) suggests that selfish behavior may be motivated by visceral urges or drive-states, resembling cravings for relief from hunger, pain, and sexual deprivation. O'Donoghue and Loewenstein (2007) argue that such selfish urges may conflict with the “colder”, more abstract preferences for altruism, as visceral urges for sweets may conflict with more abstract preferences for a fine figure or good health. At present, there is but indirect evidence for this idea. For example, Pronin et al. (2008) show that decisions about others resemble decisions about “future selves”, both classes of which contrast to decisions about less abstract “present selves”. Albrecht et al. (2011) report consistent results; individuals who choose between immediate and delayed rewards for themselves exhibit less patience and more affective involvement (activation in the dopaminergic reward system) than do individuals who make such choices for others—or for themselves in the future. Moreover, Curry et al. (2008) find in a standard public goods game that individuals' discount rates are negatively associated with their contributions to the public good. That is, more “impatient” individuals contributed less to the public good than did “patient” ones. Arriving at similar results, Fehr and Leibbrandt (2011) report that patient (vs. impatient) fishermen, whose time preferences were elicited in the lab, exhibited more cooperative behavior in a common resource problem and were in the field less likely to over-exploit the common pool resource. Furthermore, Burks et al. (2009) find that “short-term” patience—the  $\beta$  in the  $\beta$ - $\delta$  model—is positively associated with cooperative behavior in a sequential prisoner's dilemma.<sup>3</sup> However, Duffy and Smith (2012) report no effect of cognitive load—a manipulation intended to deplete cognitive resources and thereby

<sup>2</sup>For details on a related formalization of self-control, see Myrseth and Wollbrant (2011).

<sup>3</sup>For more on self-control and time inconsistency in economics, see e.g., hyperbolic and quasi-hyperbolic discounting models by Strotz (1955), Ainslie (1975; 1992), and Laibson (1997), the “planner-doer” model by Thaler and Shefrin (1981), and the dual-self model by Fudenberg and Levine (2006). For work on procrastination, see e.g. O'Donoghue and Rabin, (1999) and Burger et al. (2011).

Figure 1: The two-stage model of self-control (from Myrseth and Fishbach (2009, p. 248).



impair self-control—on outcomes across treatments in a repeated multi-player prisoner's dilemma.

An emerging literature on the “default” response in games of trust and reciprocity lends further credence to the notion that altruistic responses require self-control. Achtziger et al. (2011) subjected players in an ultimatum game to cognitive resource depletion, and show that depleted proposers made lower offers—they became less altruistic. Moreover, depleted responders were more likely to reject offers that were unfair to themselves—they exhibited “altruistic punishment”. Halali et al. (2011) report the same for responders, but with a different depletion task. Crockett et al. (2008) subjected responders to acute tryptophan depletion—a procedure that temporarily reduces serotonin levels in the brain and thereby impairs self-control (Schweighofer et al., 2008); reduced serotonin levels raised rejection rates and this reduction is positively correlated with impulsive choice in a delay-discounting task (Crockett et al., 2010).<sup>4</sup>

Using a trust game, Knoch et al. (2009) subjected trustees' right lateral prefrontal cortex to transcranial magnetic stimulation, which reduces functioning in the targeted brain region. Trustees, though cognizant that returning a share of the investments was both strategic and norm-compliant, were unable to do so under impaired executive functioning; self-control seems necessary to act on the better judgment to resist the temptation to keep the received investment entirely for oneself.

Closest to our domain of inquiry, Piovesan and Wengström (2009) measured response times of participants in a repeated dictator game, lasting 24 periods.<sup>5</sup>

<sup>4</sup>Notably, Knoch et al. (2006), report diametrically opposed results. Subjecting participants' right dorsolateral prefrontal cortex—the neural region for executive control (Miller & Cohen, 2001)—to low-frequency repetitive transcranial magnetic stimulation, they find that responders under impaired executive functioning exhibit substantially lower rejection rates—less altruistic punishment.

<sup>5</sup>For a general discussion of the utility and merit of response times in economics, see Rubinstein (2007).

They find both across and within participants that lower response times are associated with more selfish choices. One interpretation of their results is that the default behavior is to act selfishly and that pro-social behavior requires the successful resolution of a self-control conflict, which slows the response time. Such successful resolution of conflict would require cognitive resources, but Hauge et al. (2009) report no effect of cognitive load on players in one-shot dictator games.

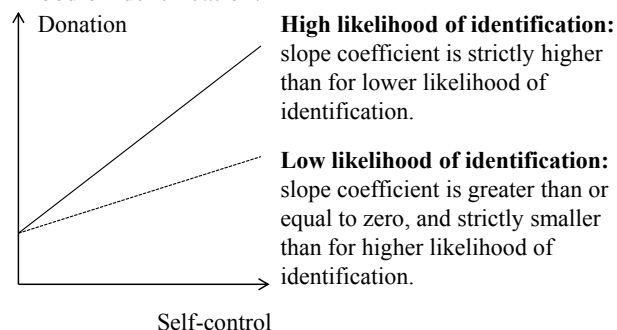
In this paper we attempt a more direct test of the hypothesis that pro-social versus selfish behavior may represent a self-control problem. We employ a standard measure of pure pro-social behavior, the one-shot dictator game, which invokes neither concerns for strategy nor for reciprocity; and a well-grounded psychometric measure of self-control, the Rosenbaum Self-Control Schedule (1980a). Further, we explore the conditions under which we expect an association between self-control and pro-social behavior. In so doing, we rely on two conditions necessary for successfully exercising restraint in the face of temptation; Myrseth and Fishbach (2009) propose a two-stage model of self-control, which postulates that an individual in the face of temptation first identifies conflict or not between indulging and pursuing a higher-order goal and, second, that the individual next employs self-control strategies if and only if conflict was identified at the first stage (see Figure 1). Critically, self-control strategies are relevant to the decision to indulge only when the individual has identified self-control conflict. Therefore, one strategy for investigating whether the problem of pro-social versus selfish behavior resembles one of self-control is to test whether the tendency to apply self-control strategies is positively associated with pro-social behavior when individuals have identified self-control conflict, but less so or not at all when individuals have not.

Determinants of conflict identification in the face of temptation have been explored only recently. In some contexts, the question is almost trivial and identification of conflict virtually obvious. For example, the diabetic dieter probably knows that having even a single, tempting chocolate may incur major costs. However, the question of self-control conflict is more ambiguous for the non-diabetic dieter, who faces the same chocolate. Having this one chocolate alone will not incur major costs, but doing so regularly might. Similarly, the good citizen may find that a general failure to act generously would represent a major threat to his self-image, but being stingy on just a couple of occasions is a more ambiguous matter. Myrseth and Fishbach (2010) use the term *epsilon cost temptation* to denote tempting opportunities that incur nothing but trivial costs when consumed in small amounts, but potentially serious costs when consumed extensively. They argue that individuals identify

self-control conflict in the face of *epsilon cost temptation* if and only if two conditions are met: (a) the focal consumption opportunity must be viewed in relation to multiple additional opportunities, and (b) the decision maker must assume that similar choices are made for each opportunity (as suggested by Ainslie, 1975). That is, considering the question of whether or not to have a delicious creamy cake will evoke self-control conflict in the dieter if the dining opportunity is viewed in relation to future opportunities for dessert consumption, but not if the dining opportunity is viewed in isolation, as a singular episode. Similarly, the question of whether or not to be generous—to donate to a charitable organization—may elicit self-control conflict if the decision is viewed in relation to future decisions, but not if the decision is viewed in isolation. If viewed in relation to future decisions, the question of how much to donate on a single occasion may have bearing on the decision maker's self-image; donating now—and in the future—indicates a generous character, whereas keeping the money for oneself does not. However, if viewed in isolation, the question of how much to donate has little bearing on self-image; the present decision of how much to donate is considered only in light of immediate consequences, leaving self-image out of the equation. Because a consistent self-image represents an important motivator for pro-social behavior (see e.g., Bénabou & Tirole, 2011; Gneezy et al., 2012), we expect that individuals are more likely to identify self-control conflict between selfish and pro-social behavior if the allocation decision is seen in relation to future opportunities than if it is seen in isolation.

Myrseth and Fishbach (2010) show that subtle framing manipulations are sufficient to influence identification of self-control conflict in the face of *epsilon cost temptation*. They find that presenting a calendar displaying the current month, with a grid separating the dates, raised participants' subsequent consumption of potato chips relative to that of participants whom were presented a calendar without a grid. They argue that the gridded calendar activated an isolated (versus interrelated) frame of the choice opportunity; it made participants more likely to isolate the date in question and thus less likely to see the decision task in relation to similar future opportunities. Consequently, the grid reduced the likelihood that participants would identify a conflict between the temptation to have chips and the better judgment to maintain a fine figure and good health. Indeed, participants who viewed the gridded calendar reported experiencing less conflict during their decision to have chips or not than did those who viewed the non-gridded calendar. Furthermore, participants' trait ability to implement self-control strategies, measured by Rosenbaum's (1980a) psychometric scale, was positively associated with chips consumption for those who viewed the calendar without the grid

Figure 2: Prediction illustration: The relationship between self-control and donations under high and low likelihood of identification.



(and who were more likely to identify conflict), but not for others who viewed the calendar with (and who were less likely to identify conflict).<sup>6</sup> That is, participants who viewed the calendar without the grid, more likely than those who viewed the calendar with, identified self-control conflict and therefore leveraged their self-control strategies to resist the tempting chips.

To explore our hypothesis that the problem of pro-social versus selfish behavior may represent one of self-control, we have applied the empirical strategy from Myrseth and Fishbach (2010) in the dictator game—a participant is granted an endowment and asked to split it between herself and a recipient (for an overview, see Camerer, 2003), and in our case the Red Cross featured as recipient (as in e.g., Eckel & Grossman, 1996). The game thus pits pro-social motivations against self-interest. If pro-social versus selfish behavior could represent a self-control conflict, we would expect participants' trait self-control, as measured by Rosenbaum's (1980a) scale, to correlate positively with pro-social behavior for participants who have just previously viewed a calendar without a grid, but less so or not at all for participants who have viewed a calendar with.

The graph in Figure 2 displays donation, as a function of level of self-control, for two different levels of identification likelihood. In the case of low likelihood, the slope is expected to be weakly positive. In the case of the higher likelihood, however, the slope is expected to be strictly greater than that in the case of low likelihood. This means that for a given level of self-control, one might observe substantially different donation behavior depending on whether conflict was identified or not. Furthermore, raising likelihood of identification will only increase donations among those with relatively high levels of self-control.

<sup>6</sup>The Rosenbaum scale is discussed further in the experimental design section.

## 2 Experimental design and procedure

### 2.1 Participants and recruitment

We recruited participants from various undergraduate and graduate classes at two universities in Medellín, Colombia, in 2008. At each university, the head administrator sent to the respective schools' email lists invitations to participate in economic experiments. In addition, the experimenter appeared in classes to introduce himself and repeat the information from the emails. We held six sessions, with 18–31 participants per session. Nobody participated in more than one experimental session, and none was a student of mathematics, psychology, or economics.

### 2.2 Overview of procedure

Upon entering the room, participants were given an experimental id-number to ensure anonymity. The experiment started with the experimenter distributing instructions for the dictator game (see appendix A). When all participants had finished reading the instructions, decision sheets for the dictator game were distributed. The first page of the decision sheet was blank for all participants. The second page was either blank or contained a calendar, depending on treatment. The third page contained the answer sheet for the dictator game; here the participant reported the amount she wished sent to the recipient. Once participants had made their decisions, the experimenter collected the decision sheets and distributed a final questionnaire, which contained the Rosenbaum Self-Control Schedule and some socioeconomic questions. Upon completing the final questionnaire, participants exited the room and claimed their payment in a building adjacent to that in which the session had been conducted. Participants were paid in private by the experimenter.

To ensure credibility, the head administrator posted experimental id numbers, their respective donations, and a receipt displaying the total amount donated to the Red Cross Colombia, within five days of a completed session, on a bulletin board in the building adjacent to that in which the experiment was conducted. This procedure was outlined as part of recruitment invitation, and in the instructions for the game itself.

### 2.3 Dictator game

We employed a dictator game, where a participant is given an endowment and is asked to split it between herself and a recipient. We designated the Colombian Red Cross as recipient, and each student was granted an endowment of 15,000 Colombian Pesos (e.g., similar to

Eckel & Grossman, 1996).<sup>7</sup> A session lasted on average about one hour, and average session earnings were 12,000 Colombian Pesos (including a 5,000 Peso show-up fee).

## 2.4 Experimental treatments

To test our hypothesis, we employed three between-subject treatments—the isolated, the standard, and the interrelated treatments. Individuals were randomly assigned within a session to one of the three treatments. The isolated and interrelated treatments were manipulated with the procedure from Myrseth and Fishbach (2010). Participants viewed a calendar showing the present month, and the calendar contained either a grid that separated the dates or no such grid (see Figure 3). Moreover, in the gridded calendar, the date of the experiment was highlighted in grey; the date was not highlighted in the non-gridded calendar. Because we expected those who saw the gridded calendar to adopt a more isolated view of their subsequent choice opportunities, we refer to this treatment as the isolated treatment. Conversely, because we expected participants who saw the calendar with no grid to adopt a less isolated view—the choice opportunities perceived more related to each other—we refer to this as the interrelated treatment. We denote as the standard treatment that which features no calendar and otherwise resembles the typical presentation of the dictator game.<sup>8</sup>

## 2.5 Measuring self-control

To capture individuals' self-control, we used the Rosenbaum Self-Control Schedule (Rosenbaum, 1980a). The psychometric scale measures individuals' cognitive skills for exercising self-control in the face of temptation. Each participant is asked to respond to 36 statements using a 6-point Likert-scale.<sup>9</sup> Cognitive skills, such as willpower, have been found to be relatively stable within individuals across time, and thus may be said to represent a personality trait, which we refer to as trait self-control. The Rosenbaum Self-Control Schedule has been validated against several criteria, most notably resisting pain (Rosenbaum, 1980b) and coping with stress (Rosenbaum & Smira, 1986; Rosenbaum 1989), and mental disability

(Rosenbaum & Palmon, 1984). Henceforth, we refer the outcome of the Rosenbaum Self-Control Schedule only as the Rosenbaum score.

We expected pro-social behavior to depend on the interaction between identification of self-control conflict (induced by the treatments) and success at the conflict stage (see Figure 1). The isolated treatment should yield a lower probability of conflict identification relative to that of other treatments. Hence, trait self-control, as measured by the Rosenbaum score, was expected to exhibit a weaker correlation with pro-social behavior. In contrast, the interrelated treatment yields a higher probability of conflict identification. Hence, trait self-control was expected to exhibit a stronger positive correlation with pro-social behavior.

## 3 Results

In Table 1, we summarize the descriptive results from the dictator game. Participants donated 8691, 8321, and 7892 pesos in the interrelated, standard, and isolated treatments, respectively. That is, donations rates were on the order of 50% of participants' endowment. Further, participants' Rosenbaum scores were 30, 33, and 33 in said treatments. We cannot reject the null hypothesis of no difference in donations across treatments ( $p = 0.646$ ; Kruskal-Wallis test). Similarly, we cannot reject the null hypothesis of no difference in Rosenbaum score across treatments ( $p = 0.595$ ).

We hypothesized that participants' trait Rosenbaum score would exhibit a stronger positive correlation with charitable giving in the interrelated treatment; participants in the interrelated treatment more likely would identify self-control conflict than would participants in the other two treatments. One way of testing this hypothesis is to examine mean donations by treatments, for different levels of the Rosenbaum score. Figure 4 displays mean donations for varying thresholds of the Rosenbaum score, set at the mean of the Rosenbaum score ( $>32$ ), one standard deviation below ( $>8$ ) and one standard deviation above ( $>56$ ). In line with our hypothesis, the differences in mean distributions grow larger as we raise the Rosenbaum restriction threshold. Applying Kruskal-Wallis tests for the null hypothesis of no difference in distributions, we obtain  $p$ -values 0.646 (no Rosenbaum restriction), 0.194 ( $>8$ ), 0.086 ( $>32$ ), and 0.031 ( $>56$ ).<sup>10</sup> That is, only for participants' whose Rosenbaum score is greater than 56 is the difference in distributions significant at the 5%-level.

We also tested our hypothesis with three OLS regressions, as reported in Table 2. All have donation as the dependent variable, and each includes a main effect for

<sup>7</sup>The exchange rate at the time of the experiment was approximately 1 USD = 1,762.00 Colombian Pesos.

<sup>8</sup>A priori, we could not be sure how the view of participants in the standard treatment would compare to those of participants in the other two treatments—this would depend on the “default” view they had coming into the experiment and on the framing of the standard treatment itself. However, a reasonable guess was that the participants in the standard treatment would fall somewhere between the narrow view in the isolated treatment and the wide view in the interrelated treatment.

<sup>9</sup>Each statement is graded from  $-3$  to  $+3$ . Thus, “perfect” self-control corresponds to  $+108$  and no self-control at all to  $-108$  (see Appendix C).

<sup>10</sup>Consistent results attained also with corresponding ANOVAs.

Figure 3: Calendar treatments.

**Before we continue with the experiment, please take a moment to consider this month's calendar:**

**The isolated treatment**  
(the highlighted date is the same as today's date).

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

**The interrelated treatment**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

What is today's date? \_\_\_\_\_

What is today's date? \_\_\_\_\_

Table 1: Descriptive statistics (standard deviations in parentheses).

Variable	Isolated treatment		Standard treatment		Interrelated treatment		HO: No difference in distributions (Kruskal-Wallis $p$ )
	n	Mean	n	Mean	n	Mean	
Donation	51	7892.16 (4158.50)	49	8321.43 (4608.642)	46	8691.30 (4959.91)	0.646
Rosenbaum score	47	33.47 (26.18)	48	32.58 (23.77)	45	30.20 (22.04)	0.595

the Rosenbaum. We have set up the regressions such that we may compare directly the slopes of the Rosenbaum in the three conditions, in particular highlighting the difference between the slopes in the interrelated and isolated treatments. Accordingly, specification (1), which takes the standard treatment as the baseline, includes a dummy for the isolated treatment and an interaction between the isolated treatment and the Rosenbaum. Specification (2) also takes the standard treatment as the baseline, but includes a dummy for the interrelated treatment and an interaction between the interrelated treatment and the Rosenbaum. In contrast, specification (3) takes the interrelated treatment as the baseline, and includes a dummy for the isolated treatment and an interaction between the isolated treatment and the Rosenbaum. It is this latter specification that represents the crucial test of our hypothesis. We expected that the Rosenbaum would exhibit a positive association with self-control in the interrelated treatment, and that this association would be smaller, if

present at all, in the isolated treatment.

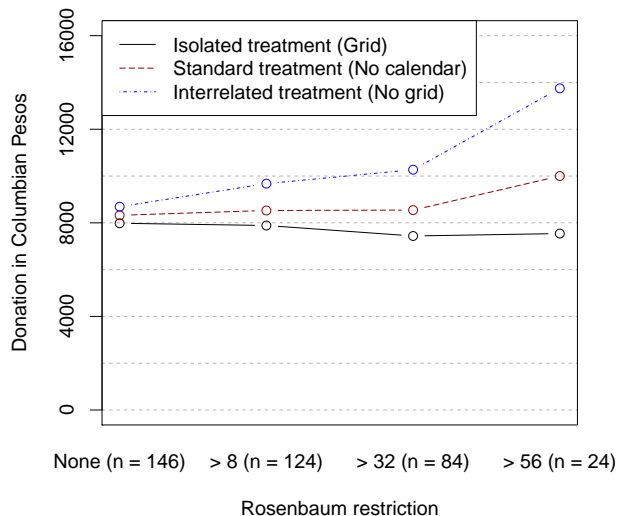
Consistent with our predictions, specification (3) reveals that the Rosenbaum is positive and significant ( $p < .01$ ), and that the interaction between the Rosenbaum and the isolated treatment is negative and significant ( $p < .05$ ). That is, we find in the interrelated treatment a positive and significant association between donations and trait self-control, and that this association is weaker in the isolated treatment. Examining specification (1), which takes the standard treatment as the baseline, the Rosenbaum is positive, but not significant, and the interaction indicates that the Rosenbaum exhibits a weaker association with donations in the isolated than in the standard treatment, though this interaction is not significant. Moving to specification (2), which also takes the standard treatment as the baseline, the interaction indicates that the Rosenbaum exhibits a stronger association with donations in the interrelated than in the standard treatment, though this interaction is not significant. In other words, although we

Table 2: OLS regression results.

Model specification:	(1)	(2)	(3)
Baseline:	Standard treatment	Standard treatment	Interrelated treatment
Dependent variable:	Donation	Donation	Donation
Isolated	1323.7 (0.84)		2307.8 (1.54)
Rosenbaum · Isolated	-55.7 (-1.39)		-99.9** (-2.53)
Rosenbaum	41.0 (1.35)	41.3 (1.36)	86.0*** (2.89)
Interrelated		-1025.8 (-0.67)	
Rosenbaum · Interrelated		47.2 (1.13)	
Constant	7157.0*** (5.74)	7194.3*** (5.72)	5896.6*** (5.18)
n	95	93	92
R <sup>2</sup>	0.031	0.100	0.095

Note: *t* statistics in parentheses, \*\*\* denotes significance at the 1%-level, \*\* at the 5%-level, \* at the 10%-level (all two-tailed); robust standard errors. The regression controls for location of the experiment. Results are robust to gender and academic major.

Figure 4: Mean donations by treatment and varying restrictions on the Rosenbaum score.



observe in the standard treatment a positive association between Rosenbaum and donations, it is not statistically different from zero. However, it is also not statistically different from that obtained in the interrelated treatment, and the association obtained in the interrelated treatment is statistically different from zero. Nevertheless, the set of regressions provide evidence for our hypothesis that trait self-control exhibits a stronger positive correlation with donations in the interrelated treatment (calendar without a grid) than it does in the isolated treatment (calendar

with a grid).<sup>11</sup> Furthermore, the estimated effect is of economic significance. The marginal effect of the Rosenbaum score in the interrelated treatment is 86 pesos. In the interrelated treatment, a one standard deviation increase in the Rosenbaum score (approximately 24 units in the test score) raises donations by about 2,064 Colombian Pesos. Compared to the predicted contribution of 8,649 pesos from a mean-level Rosenbaum score, in the interrelated treatment, this corresponds to a 24% increase in donations.

To illustrate our results, we plot predicted donations based on estimated parameters for three values of the Rosenbaum score: the mean, one standard deviation below, and one standard deviation above. The predicted values for donations are calculated for each treatment and presented in Figure 5.<sup>12</sup>

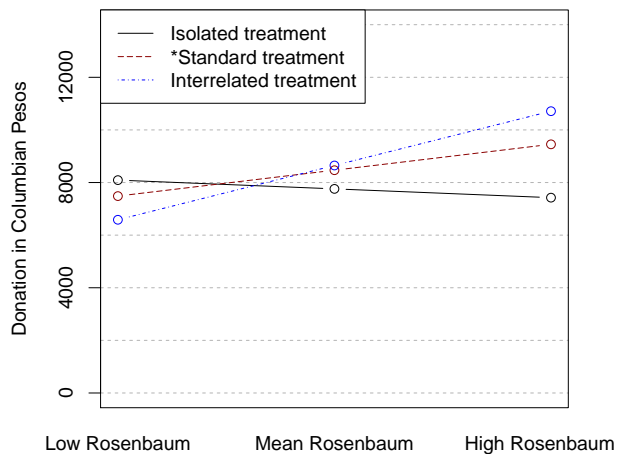
## 4 Discussion

Our objective was to explore the hypothesis that individuals may experience a self-control conflict between acting in the interest of self or in that of others. We did so by adapting the empirical strategy of Myrseth and Fishbach (2010) to a dictator game. Trait self-control and donations were positively correlated for participants who, prior to playing the game, viewed a calendar without a

<sup>11</sup>The correlations (Spearman's rhos) between donations and Rosenbaum score are 0.40 ( $p < .01$ ), 0.18 ( $p = .23$ ), and -0.11 ( $p = .47$ ), for the interrelated, standard, and isolated treatments, respectively.

<sup>12</sup>For the standard treatment, we use the parameters obtained in specification (1). For the isolated and interrelated treatments, we use specification (3).

Figure 5: Predicted values of donation by treatment and level of Rosenbaum score.



Note: Low Rosenbaum (mean Rosenbaum—one standard deviation of Rosenbaum) =  $32 - 24 = 8$ . Mean Rosenbaum = 32. High Rosenbaum (mean Rosenbaum + one standard deviation of Rosenbaum) =  $32 + 24 = 56$ .

grid, which was intended to raise the likelihood of conflict identification. However, trait self-control and donations were not correlated for participants who viewed a calendar with a grid, which was intended to reduce the likelihood of conflict identification.

We have explored a hypothesis that would help reconcile conflicting ideas in economics about selfish and pro-social preferences. Although the literature to date has documented the existence of both selfish and pro-social preferences (for an overview, see Fehr & Schmidt, 2006), we have here explored how the conflict between the two matters. We found evidence that individuals may experience a conflict between their better judgment to act in the interest of others and a temptation to act in their own interest. Our findings are consistent with prior evidence from psychology (Curry et al., 2008; Pronin et al., 2008; see also Sheldon & Fishbach, 2011) and also with recent work in economics on motivations in trust and ultimatum games (Knoch et al., 2006; 2009; Achtziger et al., 2011; Halali et al., 2011), on time preferences in public goods games (Fehr & Leibbrandt, 2011) and in sequential prisoner's dilemmas (Burks et al., 2009), and on reaction times in dictator games (Piovesan & Wengström, 2009).

To conceptualize the question of selfish versus pro-social behavior as a problem of self-control problem may prove insightful at a number of levels. The literature on self-control is extensive, and it offers a substantial conceptual toolkit. The application of models of intrapersonal conflict (e.g., Thaler & Shefrin, 1981; Schelling, 1984; Fudenberg & Levine, 2006) may advance the study of pro-social behavior. For example, one could imag-

ine application to strategic settings, where the question of pro-social versus selfish behavior determines predicted equilibria. How the “rational self” strategizes against her own impulses, which in part may be determined by her beliefs about others' beliefs, may prove crucial for understanding pro-social outcomes. Furthermore, and at a more practical level, the conceptual toolkit for the study of self-control may provide useful prescriptive measures. The application of self-control strategies, such as commitment devices, may help promote pro-social behavior.

Our findings also reveal that subtle cues in the environment may prove sufficient to alter an individual's perception of an allocation opportunity between self and others. The cues may thereby determine the extent to which individuals use their own cognitive resources to promote pro-social behavior. We demonstrated this in the context of charitable giving and show that the results are of economic significance. We therefore conclude that relatively costless measures may influence individuals to use their cognitive resources to promote pro-social behavior.

Though we have provided preliminary evidence for the conceptualization that temptation to favor self-interest may conflict with better judgment, we do not claim universality. Rather, we believe our conceptualization applies in situations where feelings of greed dominate those (if any) to act pro-socially. Of course, as O'Donoghue and Loewenstein (2007) suggest, there is good reason to think that the pattern in other circumstances may reverse. Specifically, when empathetic emotion is particularly strong, individuals may feel tempted to be pro-social even knowing that they ought not. For example, one could imagine a face-to-face interaction with a suspected con artist, seeking quick cash for an “emergency”. One knows better, but one cannot help yielding to the sorry gestures. Similarly, but in the context of Salvation Army solicitations, Andreoni et al. (2011) show that individuals actively avoid being asked to make donations. This is consistent with an interpretation that individuals anticipate an impulse to give and pre-commitment to avoid it. Because our present space of inquiry concerned the relationship between self-control and feelings of greed, we deliberately designed our study to minimize feelings of empathy by keeping the recipient of pro-social behavior relatively abstract (the Red Cross). Had the recipient been a lively baby, we would of course have expected a different emotional reaction.

Furthermore, structural situational features, such as defaults, may influence how self-control relates to pro-social behavior. Because cognitive resources are helpful for overcoming behavioral “inertia”, defaults are more likely to influence the behavior of individuals with low rather than high levels of self-control. In the context of a trust game (also known as the investment game), Evans et al. (2011) find evidence for this idea: “trustors” (in-



vestors) with low self-control—either so induced by cognitive resource depletion or so endowed in personality—are more susceptible to default effects than are trustors with high self-control.

With this paper, we have attempted not to settle a matter, but rather to open a door. Future research may explore the effect of tuning up feelings of empathy, while tuning down those of greed. Extending the study to other games may prove insightful, as might interactions with different defaults. Formal modeling could also help improve our understanding of the role of self-control in social interaction. Opportunities for fruitful extensions abound.

## References

- Achtziger, A., Alós-Ferrer, C., & Wagner, A. (2011). Social preferences and self-control. Working Paper, University of Konstanz.
- Ainslie, G. (1975). Specious reward: A behavioral theory of impulsiveness and impulse control. *Psychological Bulletin*, *82*, 463–496.
- Ainslie, G. (1992). *Picoeconomics: The strategic interaction of successive motivational states within the individual*. New York: Cambridge University Press.
- Albrecht, K., Laibson, D. I., Sutter, M., Volz, K. G., & von Cramon, D. Y. (2011). What is for me is not for you: Brain correlates of intertemporal choice for self and other. *Social Cognitive and Affective Neuroscience*, *6*, 218–225.
- Andreoni, J., Rao, J. M., & Trachtman, H. (2011). Avoiding the ask: A field experiment on altruism, empathy, and charitable giving. Working paper, UC San Diego.
- Ariely, D., Bracha, A., & Meier, S. (2009). Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, *99*, 544–55.
- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, *74*, 1252–1265.
- Baumeister, R. F. (2002). Yielding to temptation: Self-control failure, impulsive purchasing, and consumer behavior. *Journal of Consumer Research*, *28*, 670–676.
- Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *American Economic Review*, *96*, 1652–78.
- Bénabou, R., & Tirole, J. (2011). Identity, morals and taboos: Beliefs as assets. *Quarterly Journal of Economics*, *126*, 805–855.
- Burger, N., Charness, G., & Lynham, J. (2011). Field and online experiments on self-control. *Journal of Economic Behavior & Organization*, *77*, 393–404.
- Burks, S. V., Carpenter, J. P., Goette, L., & Rustichini, A. (2009). Cognitive skills affect economic preferences, strategic behavior, and job attachment. *Proceedings of the National Academy of Sciences*, *106*, 7745–7750.
- Camerer, C. F. (2003). *Behavioral Game Theory: Experiments in Strategic Interaction*. Princeton, NJ: Princeton University Press.
- Crockett, M. J., Clark, L., Tabibnia, G., Lieberman, M. D., & Robbins, T. W. (2008). Serotonin modulates behavioral reactions to unfairness. *Science*, *320*, 1739.
- Crockett, M. J., Clark, L., Tabibnia, G., Lieberman, M. D., & Robbins, T. W. (2010). Impulsive choice and altruistic punishment are correlated and increase in tandem with serotonin depletion. *Emotion*, *10*, 855–862.
- Curry, O. S., Price, M. E., & Price, J. G. (2008). Patience is a virtue: Cooperative people have lower discount rates. *Personality and Individual Differences*, *44*, 780–785.
- Duffy, S., & Smith, J. (2012). Cognitive load in the multi-player prisoner's dilemma game. MPRA Paper No. 35906, LMU.
- Eckel, C. C., & Grossman, P. J. (1996). Altruism in anonymous dictator games. *Games and Economic Behavior*, *16*, 181–91.
- Evans, A. M., Dillon, K. D., Goldin, G., & Krueger, J. I. (2011). Trust and self-control: The moderating role of the default. *Judgment and Decision Making*, *6*, 697–705.
- Fehr, E., & Leibbrandt, A. (2011). A field study on cooperativeness and impatience in the tragedy of the commons. *Journal of Public Economics*, *95*, 1144–1155.
- Fehr, E., & Schmidt, K. M. (2006). The economics of fairness, reciprocity and altruism—Experimental evidence and new theories. In S.-C. Kolm & J. M. Ythier (Eds.), *Handbook on the economics of giving, reciprocity and altruism* (615–691). Amsterdam: Elsevier.
- Fudenberg, D., & Levine, D. (2006). A dual-self model of impulse control. *American Economic Review*, *96*, 1449–1476.
- Gneezy, A., Imas, A., Brown, A., Nelson, L. D., & Norton, M. I. (2012). Paying to be nice: Consistency and costly pro-social behavior. *Management Science*, *58*, 179–187.
- Halali, E., Bereby-Meyer, Y., & Meiran, N. (2011). When rationality and fairness conflict: The role of self-control in the ultimatum game. Working paper, Ben-Gurion University of the Negev.
- Hauge, K. E., Brekke, K. A., Johansson, L., Johansson-Stenman, O., & Svedsäter, H. (2009). Are social preferences skin deep? Dictators under cognitive load. Working Paper, University of Gothenburg.
- Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Per-*

- spectives on Psychological Science, 4, 162–176.
- Knoch, D., Pascual-Leone, A., Meyer, K., Treyer, V., & Fehr, E. (2006). Diminishing reciprocal fairness by disrupting the right prefrontal cortex. *Science*, 314, 829–832.
- Knoch, D., Schneider, F., Schunk, D., Hohmann, M., & Fehr, E. (2009). Disrupting the prefrontal cortex diminishes the human ability to build a good reputation. *Proceedings of the National Academy of Sciences*, 106, 20895–20899.
- Laibson, D. I. (1997). Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics*, 112, 443–477.
- Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes*, 65, 272–292.
- Loewenstein, G. (2000). Preferences, behavior and welfare: Emotions in economic theory and economic behavior. *American Economic Review*, 90, 426–432.
- Metcalf, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Review*, 106, 3–19.
- Miller, E. K., & Cohen, J. D. (2001). An integrative theory of prefrontal cortex function. *Annual Review of Neuroscience*, 24, 167–202.
- Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989). Delay of gratification in children. *Science*, 244, 933–938.
- Myrseth, K. O. R., & Fishbach, A. (2009). Self-control: A function of knowing when and how to exercise restraint. *Current Directions in Psychological Science*, 18, 247–252.
- Myrseth, K. O. R., & Fishbach, A. (2010). Seeing self-control conflict: The problem of isolated versus inter-related temptations. Unpublished manuscript, University of Chicago.
- Myrseth, K. O. R., & Wollbrant, C. (2011). Naïve and capricious: Stumbling into the ring of self-control conflict. ESMT Working Paper No. 11–09.
- O’Donoghue, T., & Loewenstein, G. 2007. The heat of the moment: Modeling interactions between affect and deliberation. Working Paper, Cornell University. <http://www.arts.cornell.edu/econ/edo1/heat.pdf>
- O’Donoghue, T., & Rabin, M. (1999). Doing it now or later? *American Economic Review*, 89, 103–24.
- Piovesan, M., & Wengström, E. (2009). Fast or fair? A study of response times. *Economics Letters*, 105, 193–196.
- Plato. 1986. *Protagoras*. In *The Dialogues of Plato*, Trans. A. F. Hubbard and E. S. Károfsky, New York: Bantam Books. (Orig. pub. 380 B. C.).
- Pronin, E., Olivola, C. Y., & Kennedy, K. A. (2008). Doing unto future selves as you would do unto others: Psychological distance and decision making. *Personality and Social Psychology Bulletin*, 34, 224–236.
- Rosenbaum, M. (1980a). A schedule for assessing self-control behaviors: Preliminary findings. *Behavior Therapy*, 11, 109–121.
- Rosenbaum, M. (1980b). Individual differences in self-control behaviors and tolerance of painful stimulation. *Journal of Abnormal Psychology*, 89, 581–590.
- Rosenbaum, M. (1989). Self-control under stress: The role of learned resourcefulness. *Advances in Behavior Research and Therapy*, 11, 249–258.
- Rosenbaum, M., & Palmon, N. (1984). Helplessness and resourcefulness in coping with epilepsy. *Journal of Consulting and Clinical Psychology*, 52, 244–253.
- Rosenbaum, M., & Smira, B. K. (1986). Cognitive and personality factors in the delay of gratification of hemodialysis patients. *Journal of Personality and Social Psychology*, 51, 357–364.
- Rubinstein, A. (2007). Instinctive and cognitive reasoning: A study of response times. *The Economic Journal*, 117, 1243–1259.
- Schelling, T. (1984). Self-command in practice, in policy, and in a theory of choice. *American Economic Review*, 74, 1–11.
- Schweighofer, N., Bertin, M., Shishida, K., Okamoto, Y., Tanaka, S. C., Yamawaki, S., & Doya, K. (2008). Low-serotonin levels increase delayed reward discounting in humans. *Journal of Neuroscience*, 28, 4528–4532.
- Sheldon, O. J., & Fishbach, A. (2011). Resisting the temptation to compete: Self-control promotes cooperation in mixed-motive interactions. *Journal of Experimental Social Psychology*, 47, 403–410.
- Strotz, R. H. (1955). Myopia and inconsistency in dynamic utility maximization. *Review of Economic Studies*, 23, 165–180.
- Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy*, 89, 392–406.

## Appendix A: General instructions for the dictator game (variations in parentheses)<sup>13</sup>

You are about to participate in an experiment on decision-making. Regardless of what decision you make, you will receive 5,000 Colombian Pesos (COP) for participating in the experiment.

Now that we have begun, all communication is strictly forbidden. Participants who communicate will be excluded from the experiment and will not receive payment. If you have any questions, please raise your hand and a member of the experimenter team will attend to you.

First you will take part in a decision-making task and then you will have to answer a few questionnaires. Al-

<sup>13</sup>Translated from Spanish.

though some questions may appear strange to you, we ask that you still take them seriously. All your answers remain **confidential and anonymous**. To identify you during and after the experiment, we use only the numbers you received when you entered the room. These numbers will be used to identify you when paying you at the end of the experiment.

**Please note:** You must write your identification number on all your answer sheets in order for us to be able to pay you.

When the experiment is over, you will be asked to leave the room. As you leave the room, you should hand in your identification number to a member of the experimenter team. He or she will place the number in an envelope, seal it and hand it back to you to keep your decision anonymous and confidential. Then please walk to the next room to claim your payment. To receive your payment (about 20 minutes after the end of the experiment), you will need to present the sealed envelope with your identification still inside, just as it was handed to you before leaving the room. The payment will then be given to you in private in another sealed envelope to keep your earnings confidential.

**Decision task:** You have been given an endowment of 15,000 COP. Your task is to decide how to divide the 15,000 COP between Red Cross Colombia and yourself. Write down the amount you wish to donate to Red Cross Colombia and how much you would like to keep for yourself on your decision sheet, which will soon be handed to you. In this experiment, any decision is valid. This means you can donate all, some or nothing.

After the experiment is over, the experimenters will add all donations and send the total amount to Red Cross Colombia within 5 days. A receipt of the total donation will be posted on the notice board of the IDEA (Departamento de Ingeniería Sanitaria).

## Appendix B: The Rosenbaum Self-Control Schedule

Directions - Indicate how characteristic or descriptive each of the following statements is of you by using the code given below.

- +3 very characteristic of me, extremely descriptive
- +2 rather characteristic of me, quite descriptive
- +1 somewhat characteristic of me, slightly descriptive
- 1 somewhat uncharacteristic of me, slightly uncharacteristic
- 2 rather uncharacteristic of me, quite uncharacteristic
- 3 very uncharacteristic of me, extremely uncharacteristic

Note: \* = item is reverse scored.

1. When I do a boring job, I think about the less boring parts of the job and the reward that I will receive once I am finished.
2. When I have to do something that is anxiety arousing for me, I try to visualize how I will overcome my anxieties while doing it.
3. Often by changing my way of thinking I am able to change my feelings about almost everything.
4. I often find it difficult to overcome my feelings of nervousness and tension without any outside help.\*
5. When I am feeling depressed I try to think about pleasant events.
6. I cannot avoid thinking about mistakes I have made in the past.\*
7. When I am faced with a difficult problem, I try to approach its solution in a systematic way.
8. I usually do my duties quicker when somebody is pressuring me.\*
9. When I am faced with a difficult decision, I prefer to postpone making a decision even if all the facts are at my disposal.\*
10. When I find that I have difficulties in concentrating on my reading, I look for ways to increase my concentration.
11. When I plan to work, I remove all the things that are not relevant to my work.
12. When I try to get rid of a bad habit, I first try to find out all the factors that maintain this habit.
13. When an unpleasant thought is bothering me, I try to think about something pleasant.
14. If I would smoke two packages of cigarettes a day, I probably would need outside help to stop smoking.\*
15. When I am in a low mood, I try to act cheerful so my mood will change.
16. If I had the pills with me, I would take a tranquilizer whenever I felt tense and nervous.\*
17. When I am depressed, I try to keep myself busy with things that I like.
18. I tend to postpone unpleasant duties even if I could perform them immediately.\*
19. I need outside help to get rid of some of my bad habits.\*
20. When I find it difficult to settle down and do a certain job, I look for ways to help me settle down.
21. Although it makes me feel bad, I cannot avoid thinking about all kinds of possible catastrophes in the future.\*
22. First of all I prefer to finish a job that I have to do and then start doing the things I really like.
23. When I feel pain in a certain part of my body, I try not to think about it.
24. My self-esteem increases once I am able to overcome a bad habit.

25. In order to overcome bad feelings that accompany failure, I often tell myself that it is not so catastrophic and that I can do something about it.
26. When I feel that I am too impulsive, I tell myself "stop and think before you do anything."
27. Even when I am terribly angry at somebody, I consider my actions very carefully.
28. Facing the need to make a decision, I usually find out all the possible alternatives instead of deciding quickly and spontaneously.
29. Usually I do first the things I really like to do even if there are more urgent things to do.\*
30. When I realize that I cannot help but be late for an important meeting, I tell myself to keep calm.
31. When I feel pain in my body, I try to divert my thoughts from it.
32. I usually plan my work when faced with a number of things to do.
33. When I am short of money, I decide to record all my expenses in order to plan more carefully for the future.
34. If I find it difficult to concentrate on a certain job, I divide the job into smaller segments.
35. Quite often I cannot overcome unpleasant thoughts that bother me.\*
36. Once I am hungry and unable to eat, I try to divert my thoughts away from my stomach or try to imagine that I am satisfied.