

Money, Depletion, and Prosociality in the Dictator Game

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Abstract

We study the effects of ego depletion, a manipulation which consumes self-control resources, on social preferences in a dictator game. Depleted dictators give considerably less than non-depleted dictators and hence exhibit strong preferences for selfish allocation.

In contrast to earlier studies, participants were explicitly paid for completing the ego-depletion task (with either a flat rate or strictly performance-based payment). We studied the dynamics of decisions by repeating the dictator game 12 times (anonymously). Depleted dictators start with much lower offers than non-depleted ones, but, strikingly, offers decrease in time for both groups, and more rapidly so for non-depleted dictators. We conclude that, while depleted dictators neglect fairness motives from the very first decision on, non-depleted dictators initially resist the tendency to act selfishly, but eventually become depleted or learn to act selfishly. Hence, prosocial behavior may be short-lived, and ego depletion uncovers the default tendencies for selfishness earlier.

Keywords: self-control; ego depletion; social preferences; dictator game

1. Introduction

Public opinion in developed countries increasingly supports the view that egoistic, self-centered behavior is at odds with generally accepted standards of social responsibility and fairness. Indeed, the recent economic turmoil in western countries has given rise to many episodes of public outrage at the behavior of individuals in the financial sector. According to Owens (2011), public animosity towards banks, financial institutions, and “Wall Street” reached a 40-years high in 2011. Justified or not, the image of protesters holding signs with slogans as “People, Not Profits” indicates an increasing moral indignation of regular citizens who perceive management practices as selfish. This goes hand-in-hand with attributions of corporate social irresponsibility, which can be highly damaging for firms and for society as a whole (see e.g. Lange & Washburn, 2012).

Are human beings inherently selfish? Does a focus on monetary rewards make us more selfish? These questions are especially important because economic decisions often reflect a conflict between other-regarding concerns and purely monetary ones. The resolution of this conflict is at the heart of behavioral economics paradigms such as the ultimatum game (Güth, Schmittberger, & Schwarze, 1982) and the dictator game (Forsythe, Horowitz, Savin, & Sefton, 1994). Behavioral models motivated by these paradigms (Fehr & Schmidt, 1999; Bolton & Ockenfels, 2000; Charness & Rabin, 2002) postulate preferences balancing multiple motives, but remain silent on whether egoism or social concerns are the “default motive” in humans.

To identify default motives, we consider a dual-process approach. Dual-process theories postulate that human behavior is the result of the interplay of two broad kinds of decision processes (see Alós-Ferrer and Strack, 2014, for a recent review). The first kind of decision processes, called automatic or impulsive, are fast, unconscious, associative, and effortless. The second kind, called controlled or deliberative, are (relatively) slow, effortful, at least partly conscious, rule-based, and consume cognitive resources. Automatic processes most closely correspond to the decision maker's default mode, which might however be inhibited when more high-level, controlled processes conflict with impulsive reactions.

To determine whether selfishness is the default mode in (non-strategic) decision making, we rely on the dual-process view of self-control. Overriding default or automatic responses requires the exercise of self-control. According to the strength model of self-control (e.g., Muraven, Tice, & Baumeister, 1998; Baumeister, 2002), the same resource is used for many different tasks requiring self-control, including thought control, inhibition of impulses, and persisting in complex tasks. This resource is limited and acts of self-control consume it, eventually inducing a state of ego depletion in which people are temporarily less able or less willing to exert self-control (see meta-analysis by Hagger, Wood, Stiff, & Chatzisarantis, 2010). Depleted participants are more likely to

give up in tasks requiring persistence (Baumeister, Bratslavsky, Muraven, & Tice, 1998), shop impulsively (Vohs & Faber, 2007), rely on heuristics in decision making (Masicampo & Baumeister, 2008), and cheat when reporting their own performance (Mead et al., 2009).

There is increasing evidence that self-control also plays a role for the interplay between egoistic and prosocial concerns. Human beings display a strong affiliation motive (Baumeister & Leary, 1995) which conflicts with selfish impulses (Heatherton & Vohs, 1998), and self-control might help restrict the latter to increase acceptance by others (Baumeister, 2002). Accordingly, people high in self-control report better interpersonal relationships than people low in self-control (Baumeister, 2002; Tangney, Baumeister, & Boone, 2004). Vohs, Baumeister, and Ciarocco (2005) reported that ego-depleted participants described themselves as more egoistic than non-depleted participants, and DeWall, Baumeister, Gailliot, and Maner (2008) showed that depletion reduces helping behavior. These findings imply that, under ordinary circumstances, people inhibit their egoistic tendencies and, instead, present themselves as suitably social.

In summary, our working hypothesis is that selfish behavior corresponds to a default mode of behavior in humans and, accordingly, it is implemented more automatically than prosocial behavior. Hence, impairing self-control resources through ego depletion should result in more selfish behavior, as decision makers have more difficulties inhibiting the default responses.

From a dual-process point of view, additional evidence in support of this interpretation has been provided by research in response times. Piovesan and Wengström (2009) showed that more selfish decisions are associated with shorter response times in a variant of the dictator game. Consistently, Ubeda (2014) finds that faster decisions tend to be self-interested in a different paradigm. Both results are consistent with the view that monetary concerns are more automatic than prosocial motives.

This view, however, is not uncontroversial. Zaki and Mitchell (2013) review recent evidence and conclude that, in many cases, prosocial behavior (and not selfishness) might be automatic. Halali, Bereby-Meyer, and Meiran (2014) show that prosocial reciprocity is increased for depleted participants. Cappelletti, Güth, and Ploner (2011) observed that cognitive load, which should impair controlled processes, had no effect on behavior in an ultimatum game. On the contrary, Schulz, Fischbacher, Thöni, and Utikal (2014) considered mini-dictator games and found that subjects under high cognitive load choose fair allocations more often than those under low cognitive load. At this point, evidence is still mixed.

1.1 The Present Research

Our aim was to clarify whether selfishness or rather prosocial attitudes reflect the default behavior mode in humans, and to which extent monetary concerns result in increased selfishness. We manipulated ego depletion to induce a state of diminished self-control before exploring decisions in an economic game. Our design departs from the literature in three specific dimensions.

First, we isolated the conflict between selfish behavior and prosocial motives, eliminating potential confounds. For this, we relied on the dictator game (DG), an economic paradigm which was designed with precisely this objective. In the DG, one player (the dictator) is asked to allocate a certain amount of money among (her)-himself and a second player (the receiver). Her/his decision is final and actually implemented as decided. The receiver is fully passive. In contrast, most of the evidence on prosocial behavior comes from the ultimatum game (UG), where the receiver has the power to reject the allocation, in which case both players receive nothing. In the UG, the initial player often allocates positive amounts of money. However, this apparently prosocial behavior might be motivated by egoistic, strategic concerns (to avoid rejection by the receiver). The DG removes this confound, isolating the conflict between selfishness and social preferences. Still, positive dictator giving is frequently observed (List, 2007; Engel, 2010). We predicted that dictators with weakened self-control capacity would be less able to control the impulse (automatic process) to selfishly keep the money, resulting in lower offers compared to dictators with full self-control resources.

Second, contrary to previous studies, participants faced the same decision repeatedly. The motivation for this is the well-known fact that behavior in the UG changes with repetition, with participants becoming more selfish as they gain experience with the setting (Roth, Prasnikar, Okuno-Fujiwara, & Zamir, 1991; Cooper & Dutcher, 2011). Hence, prosocial behavior is not stable over time and it becomes important to understand the effects of (depleted) self-control on medium- and long-run behavior, and not just on one-shot decisions. With our design, we can test our hypothesis for one-shot decisions (first-period behavior) and for repeated interactions. The analysis of giving patterns over time delivers novel insights on the stability and dynamics of social preferences and whether the effects of ego depletion wear off (or even increase) over time (Vohs et al., 2008). Indeed, our study is the first to study ego-depletion effects when (financially motivated) participants make a series of decisions sequentially.

Third, we specifically target the effect of monetary incentives for the ego-depletion manipulation itself. Depletion in the workplace is presumably caused by work itself, and work is remunerated. In the vast majority of ego-depletion studies, however, participants are not explicitly paid for the ego-depletion task, because

remuneration (if any) is described as payment for the whole experiment, including both the depletion and the main task. Further, in paradigms involving economic decisions, one could argue that participants who completed an effortful task without being explicitly compensated for it might feel entitled to more money than participants in a non-depleting condition. Hence their behavior might not result from a lack of self-control only. To control for this, participants were explicitly told which part of the payment corresponded to the depletion task. The payment method was varied between participants, because performance-based pay might increase motivation compared to flat rates, and hence could potentially interact with the depletion manipulation.

2. Materials and Methods

2.1 Design and Participants

A total of 128 students (49 females; age $M = 21.6$, $SD = 3.45$) from a large Spanish university, excluding majors in economics or psychology, participated in exchange for payment. The sample size was fixed prior to data collection and was chosen in order to be comparable to previous UG/DG studies. It corresponds to 4 sessions with 32 participants each. No participants were excluded from the analysis. Each session lasted about 50 minutes. Average earnings were 14.84 Euros. Data from all participants were used in the analysis. The study followed a 2 (ego-depletion vs. non-depletion) \times 2 (performance-based payment vs. flat rate) between design.

2.2 Procedure

Participants were seated in individual, isolated workstations. The experiment was run in Spanish and computer-implemented using z-Tree (Fischbacher, 2007). It consisted of an ego depletion stage followed by a repeated dictator game (12 decisions). Following Baumeister et al. (1998), we manipulated ego depletion by letting participants work on two consecutive, non-interactive tasks. Participants were provided with a number of different text paragraphs, each containing around 8 rows of text taken from a physics textbook. In each (paper and pencil) task participants had 5 minutes to cross out certain instances of the letter “e” in the text according to a precise rule, before they entered the number of counted “e”s for each paragraph into the computer.

In the first task (habituation), participants counted every letter “e” in as many text paragraphs as possible for a flat payment of 4 experimental currency units (ECU). In the subsequent ego-depletion task, the rule for counting “e”s was randomly assigned to participants. In the high ego-depletion treatment (HED), “e”s had to be crossed unless either there was another vowel at a distance of exactly two letters (in either direction) from it (e.g., do not cross the “e” in “frenar”, but cross it in “veo”), or a vowel different from “u” preceded the letter (e.g., do not cross the “e” in “niebla”, but cross it in “pueblo”). This task is a slight variation of a task by

Baumeister et al. (1998), with the second exception rule changed to account for the differences in diphthong frequencies between English and Spanish. A correct application of this rule requires a high amount of self-control (to break the impulsive response, established in task 1, to cross out every “e”). In the low ego-depletion (LED) treatment, each participant used the same rule as in the habituation task, which is easier and requires far less self-control allowing to automatically execute well-learned responses (finding the letter “e”). The aim of this control treatment was keeping participants busy for five minutes without overly exhausting their self-control resources.

Independently of the depletion treatment, participants were assigned randomly to either a performance-based incentive condition (P) or a flat-payment condition (F) for the depletion task. In the latter, task earnings were 4 ECU, independently of results. In the former participants received 4 ECU for a correctly solved paragraph and 2 ECU if they stated an almost correct number of “e”s (one unit above or below the correct one). Feedback on the number of correctly solved paragraphs and earnings was not provided before the end of the experiment. Participants were explicitly informed about the payment method for the depletion task before they started.

The game stage started immediately after the ego-depletion task, as a delay might reduce the effects of this manipulation. All participants acted as dictators, that is they decided on how to split (an integer value) the fixed endowment of 7 ECU in 12 consecutive, sequentially implemented rounds.

After all decisions were made, the payment for this stage was determined as follows: each participant received her proposed dictator share for 6 randomly drawn rounds and acted as the receiver of dictator offers by other participants for other 6 rounds. The design allowed collecting dictator data from all participants while keeping the dictator game structure with two real players (one dictator and one receiver) who interacted anonymously. The matching rule ensured that a participant interacted at most once with each other player.

Earnings were summed up and converted into Euros (exchange rate: 4 ECU = 1 Euro). Before participants received their payments privately at the end of the experiment, they completed a questionnaire eliciting demographic information and various personality attitudes and motivations.

3. Results

3.1 Depletion manipulation

The HED task was significantly more difficult than the LED one, as reflected by the number of blocks worked (HED: $M = 1.41$, $SD = .48$, 95%-level $CI = [1.29, 1.54]$; LED: $M = 2.56$, $SD = .45$, $CI = [2.45, 2.67]$; Cohen's $d = 2.47$; two-sample Wilcoxon rank-sum (WRS) test, $z = 8.87$, $p < .001$). This was also reflected in the number of correctly solved blocks across treatments (where an almost-correct answer counted as half a block). In the HED treatment, 73% of participants solved zero blocks, 11% solved half a block, and 16% solved one block correctly. In the LED treatment, 33% of the participants solved zero blocks, 25% solved half a block, 27% solved one block, and the remaining 15% solved between 1.5 and 3 blocks correctly. The average number of correctly solved blocks was significantly lower in the HED treatment (HED: $M = .21$, $SD = .38$, $CI = [.12, .30]$; LED: $M = .68$, $SD = .67$, $CI = [.51, .85]$; $d = .86$; WRS, $z = 4.68$, $p < .001$). In the pay-for-performance condition, average performance-based earnings were significantly higher for non-depleted dictators (HED: $M = .63$, $SD = 1.29$, $CI = [.16, 1.09]$; LED: $M = 3.44$, $SD = 3.10$, $CI = [2.32, 4.56]$; $d = 1.18$; WRS, $z = 4.42$, $p < .001$).

3.2 Incentives

The number of blocks worked by participants in the LED treatment was not significantly different between the flat payment (F) and the pay-for-performance (P) conditions (F: $M = 2.50$, $SD = .44$, $CI = [2.34, 2.67]$; P: $M = 2.63$, $SD = .46$, $CI = [2.46, 2.79]$; $d = .29$; WRS, $z = -1.26$, $p = .21$), but the number of correctly solved blocks was significantly larger under performance-based earnings (F: $M = .50$, $SD = .49$, $CI = [.32, .68]$; P: $M = .86$, $SD = .78$, $CI = [.58, 1.14]$; $d = .55$; WRS, $z = -1.84$, $p = .066$). In the HED treatment, participants worked on average on more blocks in the flat payment than in the pay-per-performance condition (F: $M = 1.56$, $SD = .40$, $CI = [1.42, 1.70]$; P: $M = 1.27$, $SD = .52$, $CI = [1.08, 1.45]$; $d = .63$; WRS, $z = 2.57$, $p = .010$), an attempt to work more carefully in the harder task of the latter condition. However, the number of correctly solved blocks between payment conditions was not statistically different (F: $M = .27$, $SD = .42$, $CI = [.11, .42]$; P: $M = .16$, $SD = .32$, $CI = [.04, .27]$; $d = .29$; WRS, $z = 1.00$, $p = .32$), which is consistent with ceiling effects in cognitively demanding tasks (see meta-analysis by Camerer & Hogarth, 1999).

The incentive conditions in the ego depletion task (F/P) had no effect on average offers in the DG, neither in the HED treatment (F: $M = 2.23$, $SD = 1.17$, $CI = [1.81, 2.65]$; P: $M = 2.23$, $SD = 1.45$, $CI = [1.70, 2.75]$; $d < .001$; WRS, $z = .054$, $p = .957$) nor in the LED treatment (F: $M = 2.58$, $SD = 1.28$, $CI = [2.12, 3.04]$; P: $M = 2.47$, $SD = 1.22$, $CI = [2.03, 2.91]$; $d = .09$; WRS, $z = .83$, $p = .401$). This is an important observation, as it speaks

against the hypothesis that ego-depletion effects are mitigated by monetary incentives. In the next analyses, we thus pooled data across incentive conditions to investigate the main treatment differences in the DG.

3.3 Dictator giving

The average giving was 34% of the endowment, which is not far from the grand mean of 28% reported in a meta-study by Engel (2010), comprising more than 600 dictator game treatments. The histogram of giving for the HED and the LED treatments is shown in Figure 1. It indicates more unfair giving (offers of 0, 1, or 2 ECU) for depleted than non-depleted dictators, pooled over all periods.

In period 1, the first decision after the depletion task, the average giving of depleted dictators was significantly lower than that of non-depleted ones (HED, $M = 2.33$, $SD = 1.42$, $CI = [1.97, 2.68]$; LED, $M = 2.91$, $SD = 1.28$, $CI = [2.59, 3.23]$; $d = .54$; WRS, $z = 2.42$, $p = .016$). Given that ego depletion increases the reliance on automatic processes as posited by the dual-process literature, this is evidence for selfishness or monetary concerns being more automatic (and fairness or other-regarding concerns more controlled; see e.g. Moore & Loewenstein, 2004).

This result carries over into the first half of the experiment. Differences in average offers on the participant level are highly significant between treatments in the first quarter (period 1 to 3) of the game (HED, $M = 2.23$, $SD = 1.27$, $CI = [1.91, 2.55]$; LED, $M = 2.77$, $SD = 1.23$, $CI = [2.47, 3.08]$; $d = .43$; WRS, $z = 2.70$, $p = .007$), the first third (HED, $M = 2.26$, $SD = 1.31$, $CI = [1.93, 2.59]$; LED, $M = 2.74$, $SD = 1.22$, $CI = [2.44, 3.05]$; $d = .38$; WRS, $z = 2.37$, $p = .018$), and until the first half of the experiment (HED, $M = 2.25$, $SD = 1.29$, $CI = [1.93, 2.57]$; LED, $M = 2.66$, $SD = 1.24$, $CI = [2.35, 2.97]$; $d = .32$; WRS, $z = 1.93$, $p = .054$). In the second half, however, average offers were not significantly different between treatments (HED, $M = 2.21$, $SD = 1.42$, $CI = [1.85, 2.57]$; LED, $M = 2.40$, $SD = 1.40$, $CI = [2.05, 2.75]$; $d = .13$; WRS, $z = .56$, $p = .573$). The difference is also not significant in period 12 (HED, $M = 2.16$, $SD = 1.87$, $CI = [1.69, 2.62]$; LED, $M = 2.23$, $SD = 1.82$, $CI = [1.78, 2.69]$; $d = .04$; WRS, $z = .31$, $p = .758$). This indicates a strong time trend in the differences between depleted and non-depleted dictators, which is illustrated in Figure 2 by depicting the average giving over time for each treatment (HED/LED). Initially, there is a large difference, but both depleted and non-depleted dictators offer less as decisions are repeated, bringing their offers closer to each other. Consequently, differences in average giving between treatments (pooled over all 12 periods) are only weakly significant (HED, $M = 2.23$, $SD = 1.31$, $CI = [1.90, 2.56]$; LED, $M = 2.53$, $SD = 1.24$, $CI = [2.22, 2.84]$; $d = .24$; WRS, $z = 1.68$, $p = .093$).

A similar picture arises if one considers the changes in types of offers over time and treatments. The proportion of unfair offers (give less than 3) was significantly higher for depleted dictators with 45% against

28% for non-depleted ones in the first round (HED, $SD = .50$, $CI = [.33, .58]$; LED, $SD = .45$, $CI = [.17, .39]$; $d = .18$; two-sample test of proportions, $z = -2.02$, $p = .044$). This proportion increased in both treatments, although at a higher rate for LED participants, until the last period where they were virtually identical in both treatments (HED, 56%, $SD = .50$, $CI = [.44, .68]$; LED, 53%, $SD = .50$, $CI = [.41, .65]$; $d = .06$; two-sample test of proportions, $z = -0.36$, $p = .723$). This shift in unfair offers over time is robust to other definitions of unfair offers, e.g. the proportion of zero offers as an extreme case of selfishness. 19% of HED and 8% of LED dictators give nothing in the first period but zero giving increased to 27% for HED and 25% for LED dictators in the last round. Tests for categorical variables showed that zero offers between HED and LED treatment are weakly significant in the first period (Chi-square(1) = 3.32, $p = .068$; coefficient $\Phi = .16$) but not in the last period (Chi-square(1) = .040, $p = .840$; $\Phi = .02$).

The second main finding is that behavior in the two treatments evolves differently over time (see Fig. 2): whereas HED participants' average giving remained stable at a relatively low level (with only a slight downwards trend), LED participants reduced average giving considerably over time. Wilcoxon signed-rank tests confirm that within-treatment average offers did not change between first and second halves of the experiment in the HED treatment ($z = -.07$, $p = .946$), but did so in the LED treatment ($z = -2.43$, $p = .015$).

3.4 Regression analysis

Regression analyses quantified the differences in offers between treatments and their convergence over time, while controlling for individual differences. First, we used tobit regressions with robust standard errors, which account for censored variables (offers were between 0 and 7), to study behavior in the initial period (Table 1). The dependent variable in all regressions is the amount given in ECU and each choice is treated as an individual observation.

The first regression (Table 1) controlled only for the effect of ego-depletion and the type of payment. We find a large and significant negative effect of ego depletion on dictator giving in the first period. The effect of the incentive condition (F/P) is not significant. Both magnitude and significance of the ego-depletion effect increased when adding a number of individual characteristics and motivational attitudes as controls (second regression). Participants' age had no impact, whereas males gave on average significantly less than females. We also controlled for motivation regarding participation and performance, measured as a response on a 7-point Likert scale to the questions "How much has the possibility of earning money motivated you to participate / perform as well as possible in this experiment?" The participation motive had no significant effect, but the

performance motive was weakly significant and negative, in line with the interpretation that participants with high concerns to perform well (monetary concerns) give less.

Accounting for the effects of dictator giving over time, we used random-effects tobit models. Additionally to the explanatory variables used in the above regressions on first period behavior, we added the period number and an interaction term between time and ego depletion. The first regression (Table 2) found a weakly significant negative relationship between offer and ego depletion when considering all 12 periods. The most pronounced effects in the baseline regression were a highly significant negative effect of period and a relatively small but significant positive effect of the interaction of depletion and period on offers. The latter effect implies that, while the effect of ego depletion is large and negative, depleted dictators do not continue to decrease giving over time (compared to non-depleted dictators). The second regression showed that main effects were even more pronounced concerning magnitude and significance when controlling for gender, age, and participants' motives. The performance motive was clearly significant in the expected direction, confirming that participants with stronger monetary concerns give less.

4. Discussion

4.1 Self-Control and selfishness

The analysis of initial (first-period to first-half) behavior in the game confirmed that monetary concerns are, in absence of strategic motives, more automatically implemented: depleted dictators exhibit stronger preferences for selfish allocations than non-depleted dictators. Whereas non-depleted dictators initially resist the tendency to act selfishly, depleted ones immediately disregard any notion of non-selfish behavior or compliance with social norms. The results are robust to the inclusion of individual characteristics and motivations, as indicated by random-effects tobit regressions. Our findings are consistent with Martinsson, Myrseth, and Wolbrant (2012), who found a correlation between trait self-control and giving in the DG, and with Xu, Bègue, and Bushmen (2012), who reported that after suppressing their emotions while watching a sad video clip, participants left less money for (allegedly) other participants. The point of that study, however, was to show that the effects of the manipulation were moderated by feelings of guilt induced by a third, intermediate task, while our study relies on emotionally neutral tasks.

Our interpretation of these results is that prosocial behavior relies on more controlled processes than egoism, and hence overcoming egoistic tendencies requires self-control. Depleted subjects have diminished self-control capacities and hence find it more difficult to control their default, egoistic tendencies.

In other words, depletion does not cause selfishness per se. Rather, selfishness is the default mode of behavior and is hence implemented automatically. Human beings strive to behave prosocially if social norms demand it, and hence rely on self-control resources to inhibit automatic, selfish responses if necessary. When those resources are depleted, however, and in accordance with dual-process theories, automatic processes take over more often, which in the case of the DG results in more selfish behavior and lower offers. This is in agreement with the view that the affiliation motive (i.e., the desire for interpersonal attachment and positive social relations) conflicts with selfish impulses and self-control is necessary to restrict the latter (Heatherton & Vohs, 1998; Baumeister, 2002).

One could speculate, however, on whether the effects of ego depletion are more of a motivational nature, in line with the recent discussion by Inzlicht and Schmeichel (2012). Our regressions show that a higher motivation to perform (i.e. obtain monetary rewards) led to decreased offers in the DG. An alternative, natural explanation of our results, hence, would be that depletion increased the motivation to perform, hence resulting in lower offers. Under this interpretation, the motivation to perform would mediate the relation between depletion and egoism.

This hypothesis, however, is rejected on the basis of our data. The average motivation to perform was 6.28 (SD = 0.92) for non-depleted subjects and 5.81 (SD = 1.26) for depleted ones (WSR test $z = 2.236$, $p = 0.025$). Indeed, this confirms the natural hypothesis according to the motivational interpretation of depletion by Inzlicht and Schmeichel (2012), namely that depletion decreases motivation. But it is at odds with an interpretation of monetary motivation as a mediator of the link between depletion and egoism.

This result is less puzzling than it might seem at first glance. Our motivational scales measure explicit motives, i.e. they elicit consciously reflected goals that can be self-reported, while “basic motives” as e.g. selfishness correspond to implicit motives, i.e. affectively charged predispositions deeply rooted into an individual’s personality (McClelland, Koestner, & Weinberger, 1989; Brunstein, 2008). Implicit motives of behavior are usually thought of as being activated and translated into behavior automatically (i.e., without conscious intent), while explicit motives correspond to consciously reflected goals whose realization requires more controlled processes (e.g., as involved in planning). It is well established that implicit and explicit measures of a particular motivation are frequently at odds or lack any significant correlation within an individual. In other words, implicit and explicit motives might correspond to the same motivational theme and still differ in their relevance for a decision maker’s behavior (e.g. Schultheiss & Brunstein, 2001). Hence, our interpretation of the study’s findings is that explicit motives as e.g. performing well do not mediate the relation

between self-control and egoism and the effects of ego depletion most likely occur through the implicit-motive route.

A further alternative interpretation of our results would be through the emotions associated to selfish behavior. Xu et al. (2012) report that depleted subjects felt less guilt than non-depleted ones, even with an implicit measure of guilt (Implicit Association Test). As these authors remark, this points out that “certain moral, self-conscious emotions can be manipulated due to their dependence on the necessary cognitive resources and mental energy to arouse them” (Xu et al., 2012, p. 3). In other words, depletion might lead to increased egoism because the emotional markers of egoistic behavior are dampened. This explanation is fully aligned with our interpretation, since it essentially specifies one possible route for why diminished self-control capacities result in less prosocial behavior.

This interpretation, however, raises the point of whether depletion effects are generally mediated by mood effects. Completing a task requiring the exertion of self-control is experienced as demanding and sometimes also frustrating (or even annoying; e.g., Tice & Bratslavsky, 2000), and hence negative mood has been occasionally discussed as a possible cause for ego-depletion effects. Coping with negative mood could reduce the motivation (and hence effort) to complete a subsequent task requiring self-control. However, research investigating whether negative affect mediates the relationship between ego-depletion and task performance has not found evidence for this idea (e.g., Baumeister et al., 1998; Bruyneel et al., 2009; Muraven et al., 1998). Hagger et al. (2010) reported that only a few studies in their meta-analysis of ego-depletion effects reported significant relations between negative affect and performance. Hence, there is only weak evidence for negative mood as a possible mediator of the link between ego depletion and task performance. Moreover, it should be noticed that there is no relation between ego depletion and the reduction of self-reported positive mood, and that stronger emotions seem not to be affected by ego depletion manipulations (for instance, Fischer, Kastenmüller, & Asal, 2012, found no differences in reported anger after ego-depletion manipulations).

4.2 Depletion and repeated decisions

Initial effects, however, enable only a partial understanding of the importance of self-control for prosocial behavior. Average offers in both treatments decreased over time, although the rate of decrease was much higher for non-depleted dictators than for depleted ones. As a consequence, average offers became very similar towards the end of the game. In other words, prosocial behavior relies on self-control resources, but a comparable level of selfishness is reached naturally over time even in the absence of the manipulation. Prosocial behavior might be a short-lived phenomenon, and depletion simply lets people reach the “selfish state” more quickly.

To the best of our knowledge, our study is the first to establish that dictator offers decrease over time in the DG. The economics literature has observed an analogous effect in repeated UGs, and the working hypothesis (Cooper & Dutcher, 2011) is that responders learn to accept unfair offers and proposers in turn learn this fact and react by lowering their offers. This explanation, however, has no bearing in the DG, where all offers are forcibly accepted. A natural, alternative explanation is that repeated dictator decisions cause significant depletion. Since HED participants are already depleted to start with, this has little additional effect. In contrast, LED participants lower their offers as they become more depleted. This interpretation is in line with Vohs et al. (2008), who showed that ego-depletion effects become stronger as participants make further choices.

Some authors argue that dictator giving might be driven by either experimenter demand effects (and even misinterpretation of the instructions) or image concerns, i.e., the desire to show that one is not selfish (Bardsley, 2008; Cappelen, Nielsen, Sorensen, Tungodden, & Tyran, 2013). Consequently, dictator giving is strongly reduced if the perception of anonymity is increased (Hoffman, McCabe, Shachat, & Smith, 1994; Charness & Gneezy, 2008; Franzen & Pointner, 2012). Since such (explicit) motives should be associated with controlled processes, the present data is compatible with this interpretation. Non-depleted participants started with high giving in the first period but, as familiarity with the setting increased, they became certain that their decisions were indeed final (eliminating demand effects and possibly reducing image concerns). On the other hand, depleted participants were not able to act on the basis of such higher-order concerns, and fell back on their basic, selfish impulse to take the money.

4.3 Depletion and money

Depleted dictators kept more money for themselves than non-depleted ones, despite being explicitly paid for the first task (ego-depletion manipulation). We hence found no evidence for the idea that ego-depletion effects are mitigated by monetary incentives. These results are of interest for the self-control literature. Muraven and Slessareva (2003) showed that monetary incentives in tasks following the depletion stage can mitigate ego-depletion, mainly because financial rewards increase participants' motivation and thereby, at least partially, override reduced self-control resources. Similarly, Boucher and Kofos (2012) showed that priming the concept of money can already buffer ego-depletion effects. In contrast, our findings indicate that, while high-performance motivation influences behavior, paying explicitly for the ego-depletion task itself does neither reduce its effects nor replenish the participants' reduced self-control resources.

Our findings stand in contrast with Muraven, Rosman, and Gagné (2007), who found that performance-contingent rewards in the depletion task lead to lower performance in self-control tasks than flat rates. Their

interpretation was that feelings of reduced autonomy (linked to performance-based pay) might deplete self-control resources more than freely-chosen self-control acts. We find no support for this idea in our setting, as we did not observe that performance-based or flat-rate payment in the ego-depletion task affected dictator giving differently. However, the experiments are not directly comparable. First, Muraven et al. (2007) tested ego-depletion effects on non-social tasks as for instance the Stroop task (Stroop, 1935), which are not comparable to the DG, as the latter strongly addresses social motives. Second, our experiment might have generated a win frame (participants were paid for finding “e”s), while Muraven et al. (2007) might have created a loss frame (participants received \$5 only if they reached a certain objective in the depletion task).

5. Conclusion

Self-control plays an important role in a wide range of economic problems, ranging from intertemporal decision making (e.g., Thaler & Shefrin, 1981) to consumer behavior (Baumeister, Sparks, Stillman, & Vohs, 2008). For instance, Kaur, Kremer, and Mullainathan (2010) argue that diminished self-control might decrease worker performance in firms, and Cooper and Sutter (2011) point out that ego depletion might decrease performance in teams. Self-control has also been shown to have strong benefits in a broad range of everyday life issues. As an example, university students high in self-control achieve higher grade-point averages (Duckworth & Seligman, 2005) and experience less stress (Achtziger & Bayer, 2013). Mischel, Shoda, and Peake (1988) and Baumeister, Heatherton, and Tice (1994) maintain that many personal and social problems involve some degree of failure in self-control, including addiction, eating disorders, accumulating debt, failure to save, criminal behavior, underachievement in school and at work, and procrastination, to mention just a few.

We have shown that subtle manipulations of the capability to control oneself can have severe consequences on prosocial behavior. This can have important implications regarding the impact of diminished self-control on social preferences, adding a further dimension to the implications of diminished self-control in the workplace and among decision makers. While the research mentioned above points chiefly at decreased performance, our work and related research point at the moral consequences of exhausted self-control resources, and, in particular, at the implications for social responsibility in the corporate world.

These problems are likely to be far from mild. Earlier research has shown that ego depletion effects intensify as more and more decisions are made (Vohs et al., 2008). Hence, a state of ego depletion might be quite common among decision makers in management or policy-making environments. Since making decisions induces a state of ego depletion by itself, decision makers who complete demanding or even unpleasant tasks

(e.g., firing workers, implementing unpopular policies) will strongly suffer from ego depletion effects in their subsequent decision making. This will result in a number of decisions being made in a rather automatic, and thus possibly less prosocial way.

We should also keep in mind is that the manipulation we employed is rather subtle. The fact that such a mild intervention can affect prosocial behavior indicates that the balance between selfish and prosocial motives is a very fragile one. Depletion of a more severe and prolonged nature than the one we induced is probably widespread in the workplace, and particularly among key decision makers.

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Table 1

Tobit regressions on first-period dictator giving.

Parameter	Model (1)			Model (2)		
	<i>b</i>	<i>SE(b)</i>	<i>p</i>	<i>b</i>	<i>SE(b)</i>	<i>p</i>
Ego depletion (HED=1)	-.66	.27	.02	-.72	.262	.007
Payment type (P=1)	.20	.27	.48	.25	.262	.35
Gender (Male=1)				-.75	.244	.003
Age				-.03	.031	.41
Performance motive				-.29	.155	.06
Participation motive				.20	.136	.14
Constant	2.76	.23	<.001	4.34	1.07	<.001
Number of observations	128			128		
<i>F</i>	3.61			4.03		
Degrees of freedom	<i>df</i> (2)			<i>df</i> (6)		
<i>p</i> -value	<.01			<.001		
Pseudo R ²	.014			.045		
Log pseudolikelihood	-225.53			-218.45		

Note. Tobit regressions with robust standard errors. Dependent variable in both models is dictator giving. There are 17 left-censored observations (zero offers).

Table 2*Random-effects tobit regressions on dictator giving over time.*

Parameter	Model (1)			Model (2)		
	<i>b</i>	<i>SE(b)</i>	<i>p</i>	<i>b</i>	<i>SE(b)</i>	<i>p</i>
Ego depletion (HED=1)	-.66	.37	.073	-.77	.36	.035
Period	-.07	.02	<.001	-.07	.02	<.001
Interaction HED x Period	.05	.02	.040	.05	.02	.040
Payment type (P=1)	-.03	.34	.92	.02	.33	.96
Gender (Male=1)				-.88	.34	.009
Age				-.01	.05	.81
Performance motive				-.39	.17	.02
Participation motive				.162	.16	.31
Constant	2.69	.31	<.001	4.89	1.45	.001
Number of observations	1536			1536		
Number of groups	128 (participants)			128 (participants)		
Wald chi-square	20.87			33.87		
Degrees of freedom	<i>df</i> (4)			<i>df</i> (8)		
<i>p</i> -value	<.001			<.001		
Log likelihood	-2543.12			-2536.84		

Note. Random-effects tobit regressions. Dependent variable in both models is dictator giving. There are 326 left-censored and 27 right-censored observations (offers of 0 and 7, respectively).

Figures

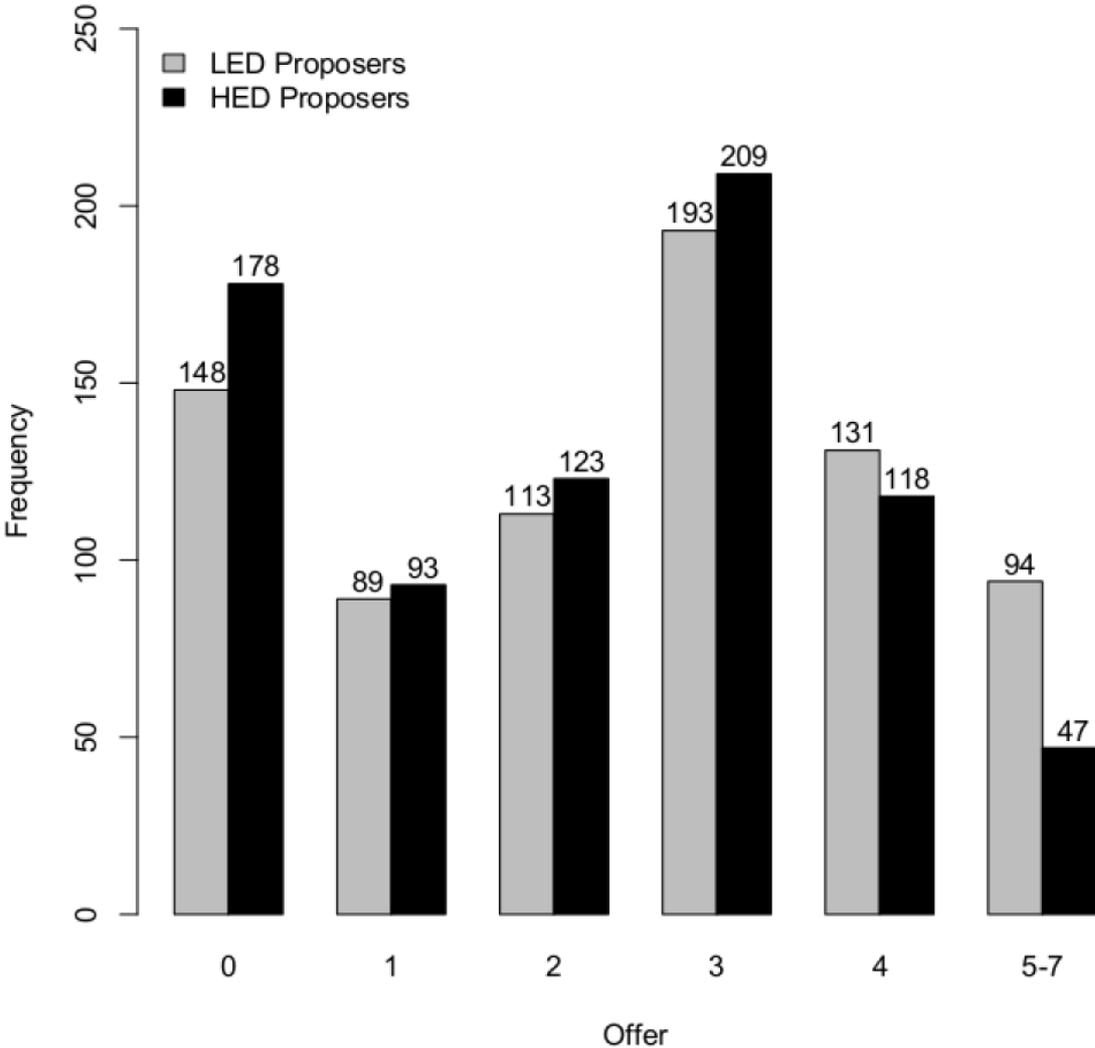


Figure 1. Histogram depicting the number of offers of each type in the dictator game.

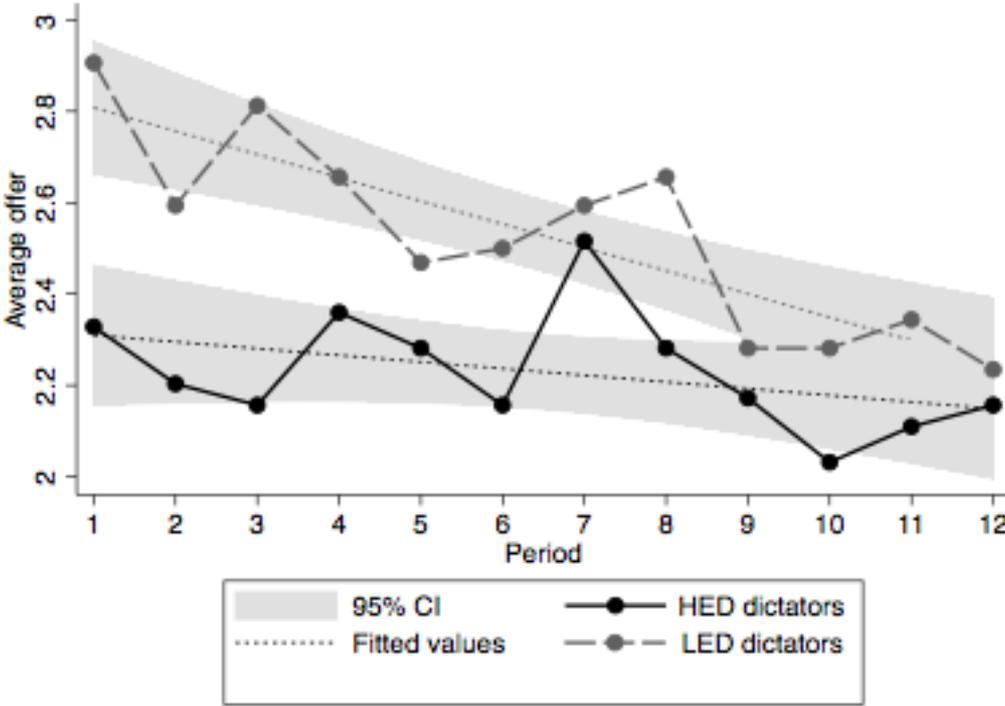


Figure 2. Dictator average giving by depleted and non-depleted dictators over time. HED and LED refer to the high and low ego-depletion conditions, respectively. Shaded areas are the 95% confidence bands for conditional means.