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Brief article

# Believing there is no free will corrupts intuitive cooperation

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ABSTRACT

Regardless of whether free will exists, believing that it does affects one's behavior. When an individual's belief in free will is challenged, one can become more likely to act in an uncooperative manner. The mechanism behind the relationship between one's belief in free will and behavior is still debated. The current study uses an economic contribution game under varying time constraints to elucidate whether reducing belief in free will allows one to justify negative behavior or if the effects occur at a more intuitive level of processing. Here we show that although people are intuitively cooperative, challenging their belief in free will corrupts this behavior, leading to impulsive selfishness. If given time to think, however, people are able to override the initial inclination toward self-interest induced by discouraging a belief in free will.



## 1. Introduction

It is easy to believe that many debates among scientists and philosophers have little bearing on the world outside of academia. This, after all, is the basis for the pejorative use of the term *ivory tower*. The debate on free will, however, is one area where advances in knowledge and theory bear on the "real world." The implications of the debate can have crucial effects on the behavior of both individuals and society as a whole. Challenging a person's belief in free will can cause them to act unethically; they become more aggressive, express more racism, and are more likely to cheat and even steal (Baumeister & Brewer, 2012; Baumeister, Masicampo, & DeWall, 2009; Stillman & Baumeister, 2010; Vohs & Schooler, 2008; Zhao, Liu, Zhang, Shi, & Huang, 2014).

What is not known, however, is how inducing a disbelief in free will operates. There is a long history of evidence showing that behavior and decision making engage two mental processes (e.g. Kahneman, 2011; Stanovich, 2009). One process is intuitive and relies on heuristic information; it is quicker and more prone to error. The second process is slower, more deliberate, and avoids certain heuristic biases. At first blush, it might reasonably be expected that inducing a disbelief in free will would operate at this deliberate level of processing. In deciding how pro-socially to behave, individuals who have discounted the existence of free will may engage in a train of reasoning that exonerates bad behavior (Nahmias, 2011). Accordingly, they may reason that without free will, they cannot be held accountable for their actions; acting in their self-interest is perfectly acceptable (Smilansky, 2000).

If the effects of anti-free will messages on behavior are the product of such deliberative reflection, then they would be expected to be sensitive to time pressure manipulations. A substantial body of research suggests that requiring participants to make very quick decisions encourages them to rely more on intuitive processes and less on deliberative processes (Wilson, Lindsey, & Schooler, 2000). Pertinent to the present discussion, speeded decisions can mediate the engagement of intuitive processes involved in cooperative decisions. Specifically, Rand, Greene, & Nowak, 2012; Rand et al., 2014 examined the impact of speeded judgments in an economic contribution game, known as the Public Goods Game (PGG). During the PGG, participants are ostensibly assigned to a group of four players and must anonymously decide how much money to donate to the public pot. Requiring participants to make decisions in the PGG under time constraints substantially increased the amount that they contributed relative to a delayed choice condition. This indicates that time constraints discouraged self-interested deliberation and encouraged participants to draw on their more intuitively generous instincts.

The demonstrated efficacy of the PGG paradigm for disentangling the role of intuitive and deliberative processes in cooperative decisions makes it as an ideal venue for discerning the process at which anti-free will messages influence behavior. In the present study, we assessed the impact of anti-free will messages on intuitive versus deliberative processing by using speeded and delayed choice versions of the PGG after discounting the existence of free

*Abbreviation:* PGG, Public Goods Game.

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will. If inducing a disbelief in free will leads to uncooperative behavior through a deliberative process of self-exoneration, we would expect to have an impact on decisions under conditions in which participants have time to consider the exonerating implications of a lack of free will. In contrast, if inducing a disbelief in free will operates at a more intuitive level of processing, then we would expect to see a greater impact of anti-free will messages when participants are required to make cooperative decisions under time pressure.

## 2. Materials and methods

### 2.1. Participants

We recruited participants using Amazon MechanicalTurk (MTurk; Horton, Rand, & Zeckhauser, 2011) to participate in an economic contribution game played through Qualtrics, selecting only participants in the United States whose first language was English and who were relatively new to taking online studies. Subjects were paid $0.50 for participating. We stopped collecting data after 1 week of data collection, when no more participants were signing up to take the study. We ran 144 participants randomized in a $2 \times 2$ design. This study was approved by the University of California, Santa Barbara Office for Research. All materials, data exclusion rules, methods, and procedures were pre-registered before data collection began.

### 2.2. Method

We used two manipulations to answer the question *why* do people's behavior changes after learning there is no free will. The first manipulation was a no free will/control manipulation which was presented in the guise of an unrelated pilot study to see if reading certain passages alters mood.[1] Participants were first administered a mood scale (Watson, Clark, & Tellegen, 1988) followed by either the no free will reading passage or a control passage (randomly assigned). The no free will passage argued that neuroscience had recently proven that our decisions (or what we perceive as decisions) are made by complex brain interactions before we have conscious access to them. Control participants read an article on whether nuclear energy is environmentally friendly. To ensure that participants read and understood the passages, we asked them to write several sentences paraphrasing the article. Participants then repeated the mood questionnaire to maintain the cover story.

Participants then engaged in the PGG. During the PGG, subjects were given $0.50 and asked to choose how much to contribute to a common pot which would then be doubled and split equally among four group members. This way, participants believed they could receive as little as $.25 or as much as $.75 as a bonus. In reality all participants were paid an additional $.88 for participating.

Our second manipulation was the amount of time participants were given to decide how much to contribute to the public pot. This consisted of two conditions: the speeded condition, in which participants were told they must read the instructions and decide how much to donate within 10 s; and the delayed choice condition, in which participants were told they must wait at least 10 s to decide how much to contribute. At the end of the whole study, we asked participants how much they believed in free will on a 1–100 scale as a manipulation check.

[1] This was implemented because the effects of a no free will manipulation are sensitive to whether participants consider the paradigm to be one continuous study or two separate studies (Schooler, Nadelhoffer, Nahmias, & Vohs, 2014).

## 3. Results

We included all participants regardless of whether they conformed to the time constraints or not (see Tinghög et al., 2013).[2] As a manipulation check we assessed the degree of belief participants had in free will. When asked to rate on a 1–100 scale on their agreement with the statement "I have free will", those in the no free will condition believed significantly less ($M = 76.541$, $SD = 24.227$) than if they had read the control passage ($M = 86.676$, $SD = 16.045$, $p < .001$).[3] Our free will manipulation was successful. In addition, there was no effect or interaction of whether participants were in the speeded or delay conditions (both $F$s < 1), meaning that the act of making a speeded judgement itself had no effect on belief in free will.

There was no main effect of either the no free will manipulation or the speed constraint on how much money participants contributed to the group (both $p$s > .13). The expected interaction, however, was statistically significant ($F(1, 140) = 6.105$, $p < .015$). Specifically, when given time to think, participants did not differ in their contributions as a function of whether they were exposed to anti-free will message; both groups donated around $.34 ($SD = 17.809$). When confronted with decisions they must make on impulse, however, participants contributed 30% less to the public pot after having their belief in free will challenged ($.28, $SD = 21.074$ v. $.40, $SD = 14.482$; **d** = −.67, 95%CI = −1.14 to −.2; see Fig. 1).

Previous research suggests that the default behavior in these types of economic contribution games is to contribute (Rand et al., 2012, 2014). We replicate this finding in the control condition by showing participants who were made to decide quickly donated more money ($.40, $SD = 14.482$) than those who given time to think about their donation ($.32, $SD = 18.391$; **d** = .495, 95%CI = .985 to .005).

## 4. Discussion

Our study tests why discounting a belief in free will increases the likelihood of uncooperative behavior. If reading anti-free will messages enables participants to engage in a deliberate process of self-exoneration, then they should have donates less money to the public pot when given time to reason about this newfound excuse. On the other hand, if discounting a belief in free will operates on intuitive processes, we should see effects only in the speeded condition; that is what we observed.

Challenging a person's belief in free will does not seem to provide them with a conscious justification for uncooperative behavior. If it did, we should have observed fewer contributions when people were given adequate time to think about their decision on the amount to contribute. Instead, challenging a person's belief in free will apparently corrupts the more automatic and intuitive mental processes. Despite previous research demonstrating that people are indeed intuitively cooperative (e.g. Rand et al., 2012), our study suggests that a challenge to an individual's belief in free will can shift this default mechanism, at least temporarily, to become intuitively uncooperative and cause an individual to act in their own self-interest.

[2] In an earlier version of this paper we used the exclusion criteria following Rand et al., 2012 which included removing the 10 participants who did not follow the rules of the speed manipulation: either not waiting the full 10 s in the delay condition or taking longer than 10 s in the speeded condition. An anonymous reviewer pointed out the criticism of this method (outlined in Tinghög et al., 2013). Although we present this full analysis, we note the results are nearly identical using the exclusion criteria following Rand et al. (2012).

[3] Results remain the same when using tobit regression to take into account the upper censoring of the data ($b = -15.049$, $p < .001$).

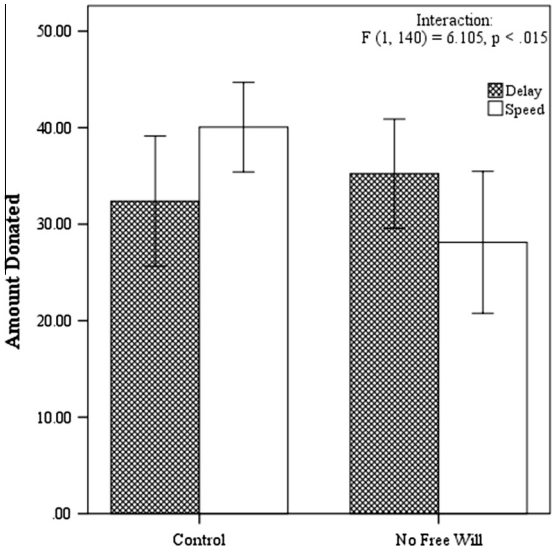


**Fig. 1.** Amount of money contributed by group. Error bars are 95% CI.

Other research is converging on the implicit impact of undermining a belief in free will. When people see their behaviors matched with outcomes, they bind the two actions together and infer that they caused the action (Wegner, 2004). Challenging the belief in free will prevents people from such binding when the task is performed implicitly but not explicitly (Lynn, Muhle-Karbe, Aarts, & Brass, 2014). This suggests that effects of believing in free will operate at an implicit and not explicit level of conscious awareness. Furthermore, neuropsychological evidence shows that inducing a disbelief in free will alters strength of neural activation before making a choice. When participants are asked to press a button at any time they wish, their conscious experience of intentionality is unaffected by exposure to the notion that free will is an illusion; nevertheless, following such anti-free will messages, the neural activity in the motor cortex about making that decision is dampened (Rigoni, Kühn, Sartori, & Brass, 2011). The study here contributes to this growing evidence for implicit effects of beliefs about free will by demonstrating that discounting belief in free will specifically alters judgements that are made on an intuitive rather than reasoned basis.

In trying to better understand the mechanism here, we reasoned that making judgments under time delays could encourage a "go with the herd" mentality (cf. Cone & Rand, 2014). Were this the case, we reasoned that participants who had their belief in free will challenged would reason that the other players would contribute less to the public pot. Therefore the interaction of inducing a "go with the herd" mentality, along with a belief that others would contribute less, would explain our pattern of results. To this end, we ran two follow up studies where participants were either told what the "average" contribution of past players was vs. no information, followed by a delay/speed manipulation. In both studies we found that participants adjusted their contributions upward or downward to match the 'average', but in neither case did speeded judgments increase this tendency (both $ps > .903$; data available at https://osf.io/advhn/). Therefore, we maintain that inducing a disbelief in free will substantively alters intuitive cooperative behavior, does not allow people to deliberately rationalize unethical behavior, and does not operate by forcing a simple "go with the herd" mentality.

One could also argue, that the effects of the anti-free will message are the result of being exposed to bad news more generally. Learning that free will is an illusion might represent a deeply disconcerting discovery that simply made people feel bad. This predicts that participants in the anti-free will condition would show a worse mood, which was not observed. Of course, mood measures may be insensitive to the effects on mood if they are subtle. Eliciting negative affect has been shown to alter decision making by decreasing heuristic processing (see Schwarz & Clore, 1983; also see Horn, 2012). If undercutting a belief in free will acted as a bad news effect, we would expect participants in the no free will condition to use deliberate processing, contributing less money, and there being little to no additional effect of the speed or delay manipulations. This is not the case. After controlling for the interaction, there was no effect of the no free will condition on amount of money contributed ($p > .13$). In fact, as can be seen in Fig. 1, participants forced to wait actually gave numerically *more* in the no free will condition opposed to the control (a result far from statistical significance ($F < 1$; $p > .51$)). Therefore, we have little reason to believe the results are driven by exposure to bad news. In addition, since mood was assessed before participants learned about the PGG, it is not possible that participants alleviated their mood with selfish behavior.

Instead, in the context of an intuitive versus a calculated mindset, these results conform to the notion of a corrupting influence on people's cooperative intuitions. People's behavior when prevented from deliberating reflects their intuitive self (Rand et al., 2012). Discounting free will alters this intuitive self; the new unreflective behavior becomes one of self-interest.

The primary contribution of this finding is twofold. First it demonstrates that discouraging a belief in free will affects behavior at an intuitive level. Secondly, it illustrates how, contrary to previous formulations (e.g. Rand et al., 2012), when participants are constrained to their intuitive gut responses, they do not necessarily behave in a more pro-social in manner. To the contrary, they can actually become more self-serving. Based on previous work, people's intuitive behavior is ethical and cooperative—requiring time and resources to override and become selfish. We now see that this cooperative default behavior is affected by a belief in free will. Rather than providing a conscious justification for selfish behavior, undermining people's belief in free will reverses people's intuitions, at least temporarily creating an uncooperative default mode that requires time and resources to override.

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