

The Value of Believing in Free Will:
Encouraging a Belief in Determinism Increases Cheating

Kathleen D. Vohs

University of Minnesota

Jonathan W. Schooler

University of British Columbia

Please address correspondence to:

Kathleen Vohs

University of Minnesota, Carlson School of Management

3-150, 321 19th Ave South, Minneapolis MN 5455

E: kvohs@carlsonschool.umn.edu

P: 612-625-8331

Abstract

Does moral behavior draw on a belief in free will? Two experiments examined whether inducing participants to believe that human behavior is predetermined would encourage cheating. In Experiment 1, participants read excerpts that encouraged a belief in determinism (i.e., behavior as the consequence of environmental and genetic factors) or neutral text. Exposure to the deterministic message increased immoral behavior on a passive cheating task that involved allowing a flawed computer program to reveal answers to mathematical problems that participants should have been solving themselves. Moreover, increased cheating behavior was mediated by decreased belief in free will. In Experiment 2, exposure to deterministic statements led participants to overpay themselves on a cognitive test relative to participants who were exposed to statements endorsing free will as well as participants in numerous control conditions. These findings suggest that the debate over free will has societal, as well as scientific and theoretical, implications.

We are always ready to take refuge in a belief in determinism if this freedom weighs upon us or if we need an excuse. (Sarte, 1956; p. 78-79)

The belief that one's outcomes are determined by one's own doing is strong and pervasive. In a massive survey of people in 36 countries, over 70% agreed with the statement that their fate is in their own hands (ISSP, 1998). Yet, the view from the scientific community is that genes, underlying personality dispositions, brain mechanisms, or features of the environment cause behavior (e.g., Bargh, in press; Crick, 1994; Pinker, 2002). There is reason to think that scientists' sentiment is spreading to nonscientists. The newsmagazine *The Economist* recently ran the headline, "Free to choose? Modern neuroscience is eroding the idea of free will." What would happen if people came to believe that their behavior is the inexorable product of a causal chain set into motion without their own volition? Would people carry on, selves and behavior unperturbed, or might, as Sarte (above) suggests, the adoption of a deterministic worldview serve as an excuse for untoward behaviors.

It is well-established that changing people's sense of responsibility can change their behavior. For example, invoking a sense of personal accountability causes people to modify their behavior to better align with their attitudes (Harmon-Jones & Mills, 1999). Believing that outcomes are based on an inborn trait versus effort also influences behavior. For instance, Mueller and Dweck (1998) observed 10-year-old children who were told that they had been initially successful on a task either as the result of their intelligence or their hard work. In a second round, all children encountered a task that was well beyond their performance level (i.e., they failed at it). When given yet a third task, children who thought of their earlier success in terms of their intelligence put forth less effort and reported lower enjoyment than children who

thought of their initial success as a function of effort. The authors concluded that the children's belief that performance was linked to their intelligence meant that achieving a high score on the difficult problems in the second round was beyond their control.

If impairing people's sense of control reduces the amount of effort they put toward improving performance, then advocating a deterministic worldview that dismisses individual causation may similarly promote undesirable behavior. In this vein, Peale (1999) bemoaned how quickly and consistently deviant behavior is tagged a "disease," a label that obviates personal responsibility for its occurrence. As a recent Washington Post article on neuroscience and moral behavior succinctly put it, "Reducing morality and immorality to brain chemistry - rather than free will- might diminish the importance of personal responsibility" (Vendantam, 5/28/07)

Although some have speculated about the possible societal risks that might result from adopting a viewpoint that denies personal responsibility for actions, empirical exploration of this hypothesis has been absent. In two experiments, we manipulated beliefs related to free will and measured their influence on morality as manifested in cheating behavior. We hypothesized that manipulations of lay beliefs about free will would affect cheating behavior, such that participants induced to believe that human behavior is under the control of scientifically predetermined forces would cheat more than would participants not led to believe that behavior is technically predetermined. The results of two experiments supported this hypothesis.

EXPERIMENT 1

Participants

Participants were 30 undergraduates (13 women).

Procedure

Participants came to the lab individually, where they were first asked to read one of two passages from a book written by Francis Crick (the Nobel prize winning scientist) entitled *The Astonishing Hypothesis*. In the anti-free will condition, participants read statements claiming that rational, high-minded people – including, according to Crick, most scientists today – readily recognize that actual free will is an illusion and the idea of free will is a side effect of the architecture of the mind. Another group of participants read portions from the same book taken from a chapter on consciousness, which did not discuss free will and therefore served as a control condition. After reading their assigned essay, participants completed the Free Will and Determinism scale (FWD; Paulhus & Margesson, 1994) and the Positive and Negative Affectivity Schedule (PANAS; Watson, Clark, & Tellegen, 1988) to assess changes in their beliefs and mood.

Subsequently, participants were given a computer based mental arithmetic task (von Hippel, Lakin, & Shakarchi, 2005) in which they were asked to mentally calculate equations (e.g., $1+8+18-12+19-7+17-2+8-4=?$). Participants were told, however, that the computer had a programming glitch and that the correct answer would appear onscreen while they were attempting to solve the problem. They were then told that there was a method of stopping the answer from appearing, however, which was to press the space bar after the math problem appeared onscreen. Furthermore, participants were told that the experimenter could not know whether they hit the space bar, but that they should honestly solve the problems on their own. In actuality, the computer had been rigged not only to show the answer but also to record number of space bar presses. A total of twenty problems were presented individually and the number of times participants stopped the answer from appearing was the dependent measure of cheating. Afterwards, participants were debriefed and thanked.

Results

Scores on the Free Will and Determinism scale. We first checked to see whether participants' beliefs about free will were affected by the anti-free will versus control manipulations. As expected, they were: scores on the Free Will subscale from the FWD scale showed that participants in the anti-free will condition reported weaker free will beliefs ($M=13.6$, $SD=2.66$) than participants in the control condition ($M=16.8$, $SD=2.67$), $t(28)=3.28$, $p<.01$. Scores on the other three subscales of the FWD scale (Fate, Scientific Causation, and Chance) were not different as a function of condition, $ts< 1$.

Cheating. Whether participants would allow the answers to the arithmetic questions to be revealed was the dependent measure of cheating. As predicted, participants cheated more after reading the anti-free will essay ($M=14.00$, $SD=4.17$) than after reading the control essay ($M=9.67$, $SD=5.58$), $t(28)=3.04$, $p<.01$.

Does Rejecting the Idea of Free Will Lead to Cheating? In accordance with our hypothesis that cheating would increase after persuading participants that free will does not exist, we first correlated scores on the Free Will subscale and cheating behavior. As expected, a strong negative relationship was found, $r(30)=-.53$, indicating that rejection of the idea that personal behavior is determined by one's own will was associated with more instances of cheating.

We next performed a mediation analysis to test our prediction that variations in free will beliefs determine degree of cheating. Using analysis of covariance (ANCOVA), we found support for this hypothesis: when Free Will subscale scores were entered as a predictor of cheating alongside experimental condition, the effect of condition failed to predict cheating, $F<1$, whereas the effect of free will beliefs remained significant, $F(1,27)=7.81$, $p<.01$.

Ancillary measures: Mood. To ensure that the essays did not inadvertently alter participants' moods, we assessed positive and negative emotions using the PANAS. No differences were found as a function of condition, $t_s < 1.35$, $p_s > .19$.

EXPERIMENT 2

Experiment 1 found that participants cheated more on a simple arithmetic task after reading an essay that refuted the notion of free will as causing human behavior than after reading a neutral essay. Moreover, reading the anti-free will essay reduced participants' belief in free will, a change that accounted for the impact of the essay on cheating behavior.

Although the evidence in Experiment 1 is strong statistically, the operationalization of cheating clouds interpretation of the results. Recall that cheating behavior was measured by number of instances participants allowed answers to math questions to appear when they were supposed to be performing mental calculations. Although this is a well-validated method of assessing cheating (von Hippel et al., 2005), it is also the case that simply doing nothing is coded as cheating. Hence the anti-free will essay may have induced passivity generally rather than immoral behavior specifically.¹ Although participants were instructed to press the space bar to avoid receiving the answers, their failure to do so — while perhaps technically cheating — may not have been deliberately unethical.

Experiment 2 addressed these limitations by using a task that required active behavior in order to cheat (Mazar, Amir, & Ariely, 2007) and that made clear the moral ramifications of an infraction. A second improvement was that we included a condition to strengthen free will beliefs to thoroughly test our hypothesis about strength of free will beliefs and moral behavior.

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Third, we created several comparison conditions that involved obtaining veridical scores on the task in order to perform additional comparisons and bolster interpretation of the results.

Method

Participants

Participants were 122 undergraduates (46 women, 1 participant who did not specify gender). Data from three participants were unusable: one participant was a friend of the experimenter; in two of the cases that involved the opportunity to cheat, only one person arrived at the experiment, thereby removing anonymity.

Procedure

Participants were randomly assigned to one of five conditions, three of which were cheating-possible, whereas the other two were not. In the cheating-possible conditions (namely, the free will, determinism, and neutral manipulations), groups of two to five participants arrived at the laboratory simultaneously but all tasks were performed individually. This setting promoted a sense of anonymity, which was relevant for the cheating opportunity. In two non-cheating conditions, participants came to the laboratory individually and were not given an opportunity to cheat.

Participants who were given the opportunity to cheat met at the laboratory in small groups but were immediately shown to individual carrels. The initial task was aimed at manipulating beliefs in a manner similar to the Velten (1967) procedure, which involves reading and considering series of statements meant to change beliefs or feelings. Participants were given a booklet of 15 statements (one per page) and were asked to think about each statement for one minute before turning the page. A tape-recorded voice told participants when to turn the page.

The statements varied in their content so as to manipulate beliefs in free will. In the free will condition, participants read statements such as, “I am able to override the genetic and environmental factors that sometimes influence my behavior,” and “Avoiding temptation requires that I exert my free will.” In the determinism condition, participants read statements such as, “A belief in free will contradicts the known fact that the universe is governed by lawful principles of science,” and “Ultimately, we are biological computers - designed by evolution, built through genetics, and programmed by the environment.” In the neutral condition, participants read statements such as, “Sugar cane and sugar beets are grown in 112 countries.” The neutral statements came from Velten (1967), whereas the free will and determinism statements were created by the authors. After the statements were read and pondered, participants completed the FWD scale (Paulhus & Margesson, 1994) and the PANAS (Watson et al., 1988).

We then orchestrated an opportunity to cheat (e.g., Mazar et al., 2007). Participants were given a set of 15 reading comprehension, mathematical, and logic and reasoning problems taken from the Graduate Record Examination practice tests. This type of task has been used in past research to provide a challenging but solvable set of problems (Schmeichel, Vohs, & Baumeister, 2003). Participants were told that the experimenter was interested in enjoyment of tasks for which there was feedback and rewards for performance and hence they would receive \$1 for each problem they correctly solved.

At this point, the experimenter looked at her cellular phone and announced that she just realized she had a meeting to attend. She said that participants should work for a maximum of 15 minutes and then score their own problems and pay themselves \$1 for each correct answer. The experimenter motioned to several answer sheets and a manila envelop of dollar coins. She told

participants that they should use the mechanical shredder to shred their answer sheets because she did not have permission to keep participants' answer sheets. The experimenter left the room but waited outside to debrief participants as they exited. Although we did not know individual participants' scores on the task nor the amount of money each participant paid him- or herself, this method allowed us to calculate each participant's average payment per trial, which acted as a proxy for claims of number of correct answers.

Two comparison conditions, labeled baseline experimenter-scored and determinism experimenter-scored, enabled us to calculate the average number of questions that participants veridically answered correctly independent of the self-scoring, self-payment situation. In the baseline experimenter-scored condition, participants simply completed the cognitive problems, which the experimenter scored; participants then received \$1 for each correct answer. We did not ask participants in this condition to complete the FWD scale so as not to activate the concept of free will. In the determinism experimenter-scored condition, we gave participants the determinism statements and then the logic problems. The experimenter scored the problems and paid participants \$1 for each correct answer. This comparison condition allowed us to assess whether reading the scientific-like determinism statements had the incidental effect of actually aiding in solving the logic problems.

Hence, there are three conditions against which to compare the effects of the determinism and free will manipulations on cheating: a neutral condition, in which participants were allowed to cheat but whose beliefs about free will were left unchanged; a baseline experimenter-scored condition in which participants' veridical scores on the cognitive task were calculated without any manipulation; and a determinism experimenter-scored condition in which participants read

deterministic statements and but were not allowed to cheat and hence their true scores on the problem set were known.

Results

Scores on the Free Will and Determinism scale. Participants in the free will, determinism, and neutral conditions completed the FWD scale to allow us to check whether the manipulations had been effective. Scores on the Free Will subscale scale showed a difference as a function of condition, $F(2,70)=17.03, p<.01$. Planned contrasts revealed that participants in the free will condition (M free will=23.09, $SD=6.42$) reported stronger free will beliefs than did participants in the neutral condition, $t(70)=12.54, p<.01$. A second planned contrast showed that participants in the determinism condition reported weaker free will beliefs (M determinism=15.56, $SD=2.79$) than did participants in the neutral condition (M neutral=20.04, $SD=3.76$), $t(70)=3.52, p<.01$.

The manipulations also affected endorsement of statements on the Scientific Causation subscale, $F(2,70)=5.85, p<.01$. Specific contrasts showed that the determinism condition participants reported higher scores ($M=23.14, SD=2.69$) than the neutral and free will condition participants (M neutral=20.40, $SD=3.40$; M free will =20.78, $SD=3.21$), $t(70)=2.98, p<.01$. The FWD subscales regarding Fate and Chance beliefs were unaffected by the manipulations, $F_s < .2$, $p_s > .30$.

Assessment of Cheating Behavior. Three conditions of participants paid themselves after self-scoring (and self-shredding) their answer sheets, whereas two groups were paid by the researchers according to their actual performance which was known to the experimenter. Hence, we could compare payments in the self-paid group relative to others' true performance to assess cheating behavior. Recall that we did not have participants' answer sheets in the three self-paid conditions, therefore we divided the number of \$1 coins taken by the each group by the number

of group members to yield an average self-payment. These averages, in combination with the known payments from participants the baseline experimenter-scored and determinism experimenter-scored conditions, were subjected to an ANOVA to predict amount of money with which participants left at the end of the experiment.

As seen in Figure 1, one set of participants walked away with more money than the rest, and that was the group that had been given the determinism statements to read and who were allowed to pay themselves for correct answers, $F(4,67)=2.30, p=.068$. Planned contrasts revealed that the determinism group walked away with more money than did the other four groups, $t(67)=2.68, p=.01$. None of the other groups differed from each other, $ts < 1$.

Did Changing Beliefs about Free Will Change Cheating Behavior? In accordance with our hypothesis that discouraging a belief in free will would lead to cheating, we first correlated scores on the Free Will subscale and average payments (i.e., cheating behavior). As expected, a strong and negative relationship was found, $r(71)=-.47^2$, indicating that the more that participants endorsed statements of free will, the less (on average) they paid themselves for the self-scored cognitive test.

We next performed a mediation analysis to assess our prediction that free will beliefs determine cheating. Using analysis of covariance (ANCOVA) in which Free Will subscale scores and condition were entered as predictors of cheating, the effect of condition then failed to predict cheating behavior, $F < 1$, whereas the effect of free will beliefs remained significant, $t(67)=10.72, p < .01$.

Ancillary measures: Mood. To ensure that the essays did not inadvertently alter participants' moods, we assessed positive and negative emotions using the PANAS. No differences were found, $Fs < 1$.

GENERAL DISCUSSION

In two experiments, we found that weakening free will beliefs reliably increased cheating. We measured cheating in Experiment 1 using a passive cheating opportunity. This measure required participants to actively stop the answer to an arithmetic problem they were supposed to be solving from appearing on the computer screen. This measure is perhaps akin to accidentally receiving an extra \$5 from the store clerk but not returning the additional money. In Experiment 2, we measured active cheating. Compared to a host of control conditions, participants who read statements promoting a deterministic stance on life and who were allowed to pay themselves for each correct answer on a difficult cognitive test took more money (in effect, claiming to have answered more items correctly) than participants in other groups.

One limitation of Experiment 2 is that we did not measure the amount of money that each individual took but rather assessed the total amount of money taken in each group. This aspect of the procedure had the advantage of allowing participants in the cheating-possible conditions to not only self-score but also self-shred their tests, which was crucial in order to introduce the anonymity necessary to measure active cheating in the lab. With this method, it is however possible that only one or two participants in each group cheated, with the remainder taking their fair share of money (or less). We cannot be sure.

What we do know is that the per participant average take-home pay for participants in the determinism condition was far more than participants in any of the other four conditions, including two conditions in which participants also self-scored and self-shredded their tests. Note too that participants who read deterministic statements claimed to have solved more problems correctly than participants who read the same deterministic statements but whose veridical scores on the logic task were known.

The fact that brief exposure to a message asserting that there is no such thing as free will can increase both passive and active cheating raises the concern that advocating a deterministic worldview could undermine moral behavior. Consistent with this hypothesis are the data from these experiments showing that reading deterministic statements decreased people's self-reported belief in free will, and that this change accounted for heightened cheating. Although the default assumption appears to be one of tacitly believing in free will (as evidenced both by participants' responses to the free will subscale and the lack of impact of the free will manipulation on cheating behavior as compared to the neutral conditions), participants' views on this topic were in fact quite pliable. Indeed, brief exposure to the message that they may not have free will was sufficient to alter participants' views (and consequent actions).

The present findings raise the genuine concern that widespread encouragement of a deterministic worldview may have the inadvertent consequence of encouraging cheating behavior. Consistent with this view are recent trends suggesting both a decrease in beliefs about personal control and an increase in cheating behavior. A recent meta-analysis that took into account cohort effects (Twenge, Zhang, & Im, 2004) revealed substantial changes in Locus of Control scores. The Locus of Control scale (Rotter, 1966) assesses lay beliefs about whether the person him- or herself or external factors are responsible for one's outcomes in life (Rotter, 1966). People's beliefs that they do not control their own outcomes jumped over three-quarters of a standard deviation from the 1960s to 1990s.

With respect to cheating, reports from the academic realm indicate levels of cheating increasing in recent times. One scientist who has been tracking cheating across several decades has found heightened self-reports of cheating. The percentage of students who admitted that they had used a cheat sheet on an exam rose from 34% in 1969 to 68% in 1989. Other accounts of

cheating has risen too, including allowing other students to copy work and lifting statements from printed material (Schab, 1991). Although there are numerous reasons why self-reported cheating may have increased in recent years, the concurrent decrease in beliefs in regarding internal locus of control in concert with the present findings raise the ominous possibility that changes in worldviews about free will may contribute to increased cheating.

Although the present findings raise concerns about the possible impact of deterministic views on moral behavior, it is important to not over-interpret these findings. For one, our experiments measured only modest forms of ethical behavior so it is yet unknown whether these results generalize to more significant moral and ethical infractions. In addition, although there are a host of possible consequences that a deterministic viewpoint may encourage, only some of these may be unfavorable. For example, adopting the view that behavior is a consequence of environmental and genetic factors could encourage compassion for the mentally ill and discourage retribution in legal contexts (Greene & Cohen, 2004). A deterministic outlook may also enhance people's sensitivity to the subtle influences known to impact their goals and actions (Bargh, in press).

It is also crucial to emphasize that the present findings do not speak to the larger issue of whether free will actually exists. It is possible that free will is an illusion that nevertheless offers some functionality. It may be that a necessary cost of public awareness regarding the science of human behavior will be the dampening of certain beliefs about personal agency (Wegner, 2002). Conversely, it may prove possible to integrate a genuine sense of free will into scientific accounts of human behavior (see Baumeister, in press; Dennett, 2004; Kane, 1996; Shariff et al., in press). Although the concept of free will remains scientifically in question, the present results point to a significant value in believing that free will exists.

If exposure to deterministic messages increases the likelihood of unethical actions, then identifying approaches for insulating the public against this danger becomes imperative. Ultimately, negating the unfavorable consequences of deterministic sentiments will require a deeper understanding of why a dismissal of free will leads to amoral behavior. Does the belief that forces outside the self determine one's behavior drain the motivation to resist the temptation to cheat, thereby inducing a "why bother?" mentality (cf. Baumeister & Vohs, in press)? Much as thoughts of death and meaninglessness can induce existential angst that can lead to ignoble behaviors (e.g. Arndt et al. 1997; Heine et al., 2006), doubting one's free will may undermine the sense of self as agent. Or, perhaps, denying free will simply provides the ultimate excuse to behave as one likes.

FOOTNOTE

1. Note that the degrees of freedom for this analysis are fewer than in the main analysis because the baseline experimenter-scored and determinism experimenter-scored conditions did not complete the FWD scale.

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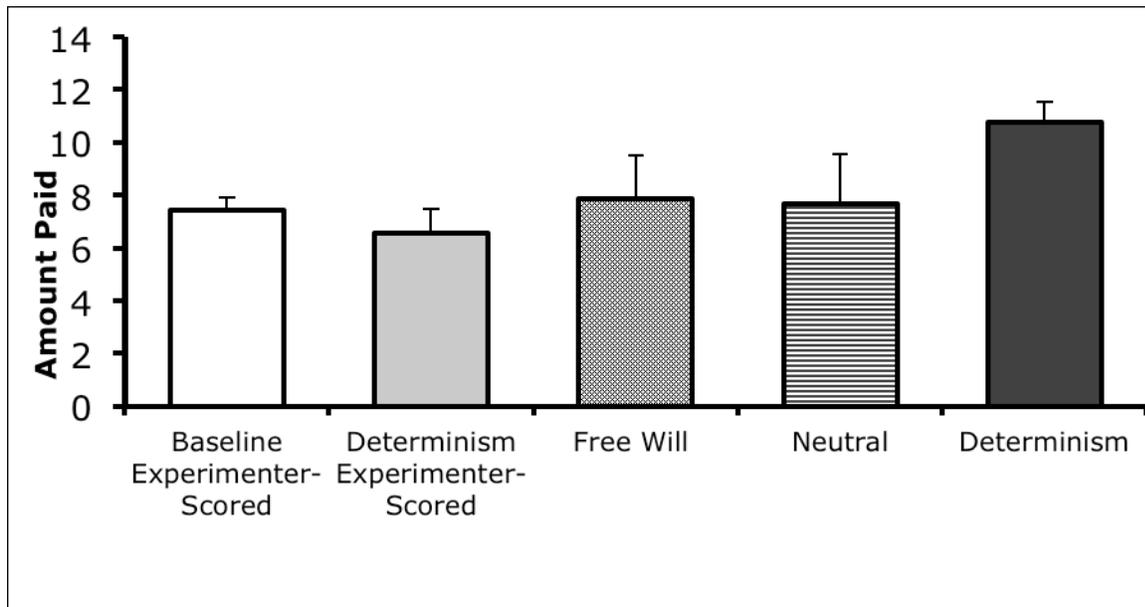
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Address correspondence to Kathleen Vohs: kvohs@carlsonschool.umn.edu.

Figure 1: Amount of money in \$ participants were paid; Experiment 2.



Note. Participants in the Free will, Neutral, and Determinism conditions paid themselves \$1 for each answer they claimed to have solved. Participants in the two experimenter-scored conditions were paid in accordance with the number of true solutions. Per condition means and standard errors are shown. The only cell that differs significantly is the determinism condition, $p < .05$.