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Determined to Be Humble?

Exploring the Relationship Between Belief in Free Will and Humility

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Abstract

In recent years, diminished belief in free will or increased belief in determinism have been associated with a range of antisocial or otherwise negative outcomes: unjustified aggression, cheating, prejudice, less helping behavior, and so on. Only a few studies have entertained the possibility of prosocial or otherwise positive outcomes, such as greater willingness to forgive and less motivation to punish retributively. Here, five studies (open data, materials, and pre-print at <https://osf.io/hmy39/>) explore the relationship between belief in determinism and another positive outcome or attribute, namely, humility. The reported findings suggest that relative disbelief in free will is reliably associated in our samples with at least one type of humility—what we call ‘Einsteinian’ humility—but is not associated with, or even negatively associated with, other types of humility described in the literature.

*Keywords*:  free will, determinism, humility, pride

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1. Introduction

Philosophical debates about the nature and existence of free will have persisted for centuries without end—and without consensus. These debates, as lively today as ever before, are important for mapping out the conceptual territory concerning free will and related ideas, such as determinism and moral responsibility (Nichols & Knobe, 2007; Warfield, 1996). Fortunately, philosophers do not have to agree about the precise nature of these ideas in order to help us think more clearly about the concepts involved, and to guide us toward more plausible accounts of the relationships among them (Chalmers, 2015; Moody, 1986).

A lack of philosophical consensus about the metaphysical and moral status of free will also does not preclude the possibility of making progress on other important questions about free will and associated concepts (Nahmias, Morris, Nadelhoffer, & Turner, 2005). For example, what do ordinary people believe about free will, determinism, and moral responsibility? Are folk conceptions similar to the conceptions endorsed by philosophers, or are they substantively different (Monroe & Malle, 2010)? And how do folk beliefs affect behavior? More generally, what are the real-world consequences of believing that free will exists, does not exist, or exists to various degrees under different descriptions, both folk and philosophical (Baumeister & Brewer, 2012; Bargh & Earp, 2009; Earp, 2011, 2013)?

As we will discuss, a glut of recent studies suggests that relative disbelief in free will among laypeople has primarily negative, anti-social associations and consequences. This has led some authors to propose that even if scientists and philosophers somehow conclusively showed that free will does not exist, it might nevertheless be necessary to foster widespread belief in free will as a noble fiction—to keep society from fraying at the seams (see Baumeister & Monroe, 2014; Smilansky 2000). In this paper, we critically analyze some of the original studies that purport to show negative consequences for free will skepticism, and suggest that their results, and others like them, are not sufficient to justify such extreme measures.

We then ask whether free will skepticism might also be associated with *positive* traits or behaviors, such as greater forgiveness, less retributive punishment, and more humility. With respect to the last of these, across five studies (open data and materials available at https://osf.io/hmy39/), we show that relative disbelief in free will is reliably associated with at least one type of humility—what we call ‘Einsteinian’ humility for reasons to be discussed—but that it is not associated with, or is even negatively associated with, other types of humility that have been described in the literature.

Thus, although we share the concerns of those who believe that the prosocial value of believing in free will has been in some respects overstated, we find evidence from our own studies that free will skepticism does not have straightforwardly positive associations either. Instead, the relationship between belief in free will and/or determinism and a putative virtue such as humility depends, in the samples we surveyed, on how each of these concepts is defined and operationalized. We conclude by calling for more nuance in research on the practical consequences or correlates of believing relatively more or less in free will, and urge that generalizations about long-term, society-wide effects of such belief, whether positive or negative, be approached with greater caution.

*1.1. A classic study*

One of the first attempts to study the empirical consequences of relative disbelief in free will was undertaken a decade ago by Vohs and Schooler. In their now-classic paper, “The Value of Believing in Free Will: Encouraging a Belief in Determinism Increases Cheating,” Vohs and Schooler (2008) reported a pair of experiments in which they ostensibly manipulated participants’ belief in free will and then subtly gave them a chance to engage in unethical behavior. Specifically, they made it possible for participants to cheat on a problem solving task, framed either as a mental arithmetic task (Experiment 1), or a problem-solving task (Experiment 2).

Their hypothesis was that diminished belief in free will would increase cheating. This expectation appears to have been based on the idea that participants would gain a perceived excuse for bad behavior.[[1]](#endnote-1) If a person’s behavior is caused by factors outside of their control, participant might reason, then they can hardly be blamed for their unethical actions. And if they cannot legitimately be blamed for their unethical actions, then there is less need for compunction about committing them in the first place.

To manipulate participants’ belief in free will, Vohs and Schooler had them read one of two passages from Nobel Prize-winner Francis Crick’s 1994 book, *The Astonishing Hypothesis* (Crick, 1994). In the anti-free-will condition, the passage suggested that “rational, high-minded people,” including most scientists, see free will as an illusion (Vohs & Schooler, 2008, p. 50). In the control condition, the passage was also penned by Crick, but it was about consciousness, and did not address free will issues.

Using an unpublished scale developed by Paulhus and Margesson (1994), Vohs and Schooler confirmed that participants’ beliefs in free will shifted in the expected direction in the experimental condition. Consistent with their hypothesis, they then reported far more cheating by participants in that condition compared to the control condition (Cohen’s *d* = .88). On the basis of these and similar findings from a second experiment, Vohs and Schooler (2008) claimed that, although the metaphysical status of free will remains “scientifically in question,” their results pointed to “a significant value in believing that free will exists.” Moreover, they suggested that if “exposure to deterministic messages increases the likelihood of unethical actions, then identifying approaches for insulating the public against this danger becomes imperative” (p. 54).

Such bold conclusions, however, may be too hasty. For one thing, the Vohs and Schooler experiments relied on relatively small convenience samples: 30 university students divided between two conditions in Experiment 1, and 119 students divided between five conditions Experiment 2. Thus, the generalizability of their findings cannot be taken for granted. Indeed, in recent years, the robustness and reliability of the original findings have been called into question, with at least four research groups reporting an inability to replicate them (Carey & Roston, 2015; Nadelhoffer et al., 2019; Open Science Collaboration, 2015; Zwaan, 2013; see also Crone & Levy, 2018). While these apparently unsuccessful replication attempts must, themselves, be interpreted with caution—among other reasons, there is no consensus among psychologists about what should count as an unsuccessful replication attempt (Cova et al., in press; Earp, 2016; LeBel et al., 2018)—they do strike a consonant note with more general concerns about challenges with replication in the field (for overviews, see Earp & Trafimow, 2015; Earp, in press; Pashler & Wagenmakers, 2012; see also Camerer et al., 2018). Thus, the long-run reproducibility of the findings remains uncertain.[[2]](#endnote-2)

*1.2. Practical consequences*

Regardless of whether the balance of evidence ends up supporting a relationship between diminished belief in free will and cheating behavior, Vohs and Schooler can certainly be credited with inspiring a rich line of research into the practical consequences of believing relatively more versus less in free will. For example, Baumeister, Masicampo, and DeWall (2009) provided evidence that participants who were exposed to anti-free-will prompts—sometimes erroneously described as ‘primes’[[3]](#endnote-3)—behaved more aggressively than participants exposed to neutral or pro-free will prompts. They also showed a negative correlation between diminished belief in free will and hypothetical helping behavior toward strangers.

In other work, Stillman, Baumeister, Vohs, Lambert, Finchman, and Brewer (2010) provided evidence that people who believe less strongly in free will perform worse at their jobs (as rated by bosses and co-workers) than those who believe more strongly in free will, while Stillman and Baumeister (2010) provided evidence that discouraging free will belief undermines learning from negative emotions. More recently, Zhao, Liu, Zhang, Shi, and Huang (2014) reported that participants exposed to anti-free-will prompts, compared to pro-free-will prompts, exhibited more negative attitudes toward out-group members.

These and related findings suggest that belief in free will may be important for sustaining at least some moral attitudes and behavior. Indeed, some commentators have gone so far as to claim that diminished belief in free will, or an increased belief in determinism (often simply characterized as the ‘opposite’ belief—but see later discussion), might be threatening to the very fabric of society. As one author summarized such views in *The New York Times*, “the death of free will, or its exposure as a convenient illusion, some worry, could wreak havoc on our sense of moral and legal responsibility … it would mean that people are no more responsible for their actions than asteroids or planets” (Overbye, 2007). Thus, some researchers have suggested that even if philosophers, scientists, or other relevant experts *did* reach a consensus that free will was ‘just’ an illusion, it might be necessary to hide this information from the public, so that society did not begin to fall apart (see Baumeister & Monroe, 2014; Smilansky 2000).[[4]](#endnote-4)

*1.3. Public policy implications*

This conclusion, while troubling, would also be too hasty. For even if there were abundant evidence to suggest that unethical actions were rendered more likely by exposure to messages conveying skepticism about free will, it would not be clear that “insulating the public” from such messaging—to quote Vohs and Schooler (2008, p. 54) again—would be the appropriate policy. First, one would need to determine the scope and magnitude of unethical actions that increased on the basis of such messaging, as well as the degree of increase under various conditions and with respect to different types of people. For example, are some people more susceptible to free will skepticism and/or associated behavioral changes than are others? Are some deterministic messages more effective in changing beliefs, attitudes, or behavior than are others? Does the effectiveness of such messages differ depending upon how they are communicated or framed? Can people be educated to resist or neutralize the negative effects of free will skepticism while nevertheless endorsing its central thesis?[[5]](#endnote-5)

More generally, one would need to demonstrate that relatively low-stakes findings concerning, e.g., cheating on a pretend examination, obtained via contrived methods in highly controlled study environments, translated to higher-stakes immoral behavior in the real world. As Vohs and Schooler (2008, p. 53) acknowledge, “Our experiments measured only modest forms of ethical behavior, and whether or not free-will beliefs have the same effect on more significant moral and ethical infractions is unknown.” But even if more serious misbehavior were encouraged by diminished belief in free will, alternative means of mitigating the problem would also need to be considered, apart from ‘hiding’ certain viewpoints, scientific discoveries, or philosophical theories (i.e., those suggesting that free will may be illusory) from the public.[[6]](#endnote-6)

Finally—and critically for the empirical work we pursue here—there is a small but growing body of evidence suggesting that certain *positive* effects (at least according to some views) may follow from free will skepticism or an increased belief in determinism.[[7]](#endnote-7) If these effects turn out to be robust and replicable, they, too, would need to be factored into the equation.

*1.4. An upside to free will skepticism?*

In some respects, it is surprising that evidence of such effects exists at all: the possibility of there being an upside to diminished belief in free will has rarely been entertained in the empirical literature. However, that may be beginning to change. In a recent study, Shariff et al. (2014, p. 1563) found that people with relatively weak belief in free will “endorsed less retributive, but not consequentialist, attitudes regarding punishment of criminals.” They also found that learning about the neural bases of human behavior, whether through lab-based manipulations or actual attendance at an undergraduate neuroscience course, similarly reduced people’s support for retributive punishment.

These findings suggest that prosocial or welfare maximizing punishment may not necessarily be undermined by free will skepticism, whereas punishment inspired by the notion that ‘that’s what people deserve’ (even if such punishment entails worse outcomes for society overall) may indeed be threatened by such skepticism. For those of a consequentialist bent, such a shift in attitudes concerning the basis or justification for punishment would most likely be welcomed as a moral improvement, although others would presumably disagree. For example, those who believe that punishment must be tied to—and justified by—genuine moral desert would likely not be inclined to regard the associations observed by Shariff et al. (2014) as evidence of an upside to diminished belief in free will.

Nevertheless, considered from at least one plausible moral perspective (i.e., consequentialism), these recent findings raise the possibility that skepticism about free will can indeed have positive consequences or be associated with prosocial attitudes or behavior. Other positive outcomes may be possible as well. For example, Carmody and Gordon (2014) have recently shown that, in the context of interpersonal relationships, belief in scientific determinism—roughly, the view that current events and circumstances result from fixed antecedents and causes—may be associated with a greater tendency toward emotional forgiveness. Emotional forgiveness occurs when a victim of mistreatment “actively replaces negative thoughts, feelings, and motivations regarding an offender with more positive ones, and experiences renewed warmth toward [the] offender” (Carmody & Gordon, 2014, p. 248). Since deterministic theories typically emphasize behavioral influences that exist outside a person’s direct control, it is reasonable to think that those with relatively greater belief in such theories would be less likely to hold an offender personally accountable for their bad behavior, which, in turn, could pave the way for a more forgiving attitude. Whether in the context of friendships, family relations, romantic partnerships, or other long-term committed relationships, a capacity to forgive (under appropriate conditions), rather than clinging indefinitely to unproductive grudges, is unquestionably an asset (McCullough et al., 1998).

To summarize, few beliefs, like other mental states, are likely to be all good or all bad—even beliefs that seem to favor determinism over free will. Instead, most beliefs have aspects that are good as well as aspects that are bad, either intrinsically or in terms of consequences, depending on—among other things—the circumstances, one’s goals or values, and the outcomes in which one is interested. If an increased belief in determinism (or a decreased belief in free will) may reduce punitive motivations as well as inspire a more forgiving attitude or demeanor, as recent research seems to suggest, then what other potentially positive qualities might correspond to a more deterministic worldview?

*1.5. Determinism and humility*

One such possible quality is *humility*. In simplest terms, if one tends to believe that current events are largely determined by factors outside one’s control, one may be less likely to take personal credit for the successes and achievements in one’s life—a common mark of a humble attitude. To see how a stance of humility in this sense may follow from a belief in determinism, consider the case of Albert Einstein, one of the most accomplished scientists ever to have lived. Referring to his discovery of the theory of relativity, one writer gushed that Einstein’s achievement “required perseverance and enormous creativity, as he struggled over a rough and winding road for eight years to formulate the theory” (Smeenk, 2015). Surely, one might think, if anyone should feel proud of his achievements, or take credit for them, it would be Einstein—a person who solved some of the most difficult puzzles that had faced physicists for decades, leading to insights that have fundamentally transformed the way we understand the universe around us.

But Einstein did not believe in free will. As he explained to a reporter for a 1929 interview for *The Saturday Evening Post*, “I am a determinist. As such, I do not believe in free will…. I believe with Schopenhauer: We can do what we wish, but we can only wish what we must” (Viereck, 1929, p. 114). Einstein goes on to state: “My own career was undoubtedly determined, not by my own will but by various factors over which I have no control…. I claim credit for nothing. Everything is determined, the beginning as well as the end, by forces over which we have no control. It is determined for the insect as well as for the star. Human beings, vegetables or cosmic dust, we all dance to a mysterious tune, intoned in the distance by an invisible player” (Viereck, 1929, p. 117).

Einstein is an extraordinary case; few people are unqualified determinists. But even laypeople exhibit varying degrees of belief in free will, with some tending more toward the free will end of the spectrum, others toward the deterministic side of the spectrum, and still others believing in (or forming judgments consistent with) aspects of both views (Nichols & Knobe, 2007). The aim of the present investigation, then, is to see whether the constellation of beliefs and attitudes exhibited by Einstein—i.e., between (relative) disbelief in free will and a disinclination to take personal credit for one’s successes and achievements—exists among ordinary people.

*1.6. Assessing belief in determinism, free will, and humility: a first pass*

The most commonly used measure for assessing belief in free will and determinism is the Free Will and Determinism Plus (FAD-Plus) scale developed by Paulhus and Carey (2011). This scale is a 27-item measure of lay beliefs in free will and three closely related constructs: namely, scientific determinism (defined above), fatalistic determinism (roughly, the view that everything is determined by fate), and unpredictability (events are often due to luck or chance). Following work by Stroessner and Green (1990), Paulhus and Carey noted that free will and determinism can and should be measured separately, as they are not simple opposites on a bipolar dimension. Rather, it is possible for a person to believe, or have intuitions supporting, one, the other, both, or neither. This view is supported by experimental research showing that laypeople often see free will and determinism as being compatible, depending on the context (e.g., Nahmias, Morris, Nadelhoffer, & Turner, 2006).

With respect to humility, although various scales have been developed, none has emerged as a clear standard. One reason for this is that the concept of humility is difficult to pin down, with different senses of humility preferred by different researchers depending on their aims. Historically, humility was associated with self-abasement, seen as the appropriate attitudinal stance to adopt given one’s subsidiary relationship to God, nature, and even (some) other mere mortals (see Nadelhoffer & Wright, 2018). However, some philosophers regard such self-abasement as a negative trait, suggesting that humility, if defined in this way, “ought to be criticized rather than exalted” (Nadelhoffer & Wright, 2018, p. 273). A more positive view of humility, such as that proposed by Richards (1988, p. 256), suggests that it is “an inclination to keep one’s accomplishments, traits, abilities, etc., in perspective,” which is more consistent with the sense alluded to above using the example of Einstein. To reflect this sense, a novel measure was created by the present researchers, in an attempt to tie humility to the stated theoretical expectations vis-à-vis a belief in determinism: namely, that it should involve a relative disinclination to take personal credit for one’s successes and achievements. The following pilot study makes use of this measure (described below), in conjunction with the FAD-Plus.

2. Study 1A[[8]](#endnote-8)

*2.1. Participants*

Forty undergraduate students from the University of Oxford in England (22 male, 18 female), ages 18-24 (*M* = 19.80, *SD* = 1.18), were recruited via email to take part in the study and received chocolate in exchange for their time. Twenty-eight participants classified themselves as Atheist or Agnostic (70%), 8 as Christian (20%), 3 as Other (7.5%), and 1 as Buddhist (2.5%).[[9]](#endnote-9)

*2.2. Procedure*

Participants filled out a questionnaire in-person on a computer which asked about their successes or achievements and their responsibility for bringing them about. Participants went on to complete a measure of belief in free will and determinism, along with some basic demographic measures.

*2.3. Measures[[10]](#endnote-10)*

*Humility.* Participants were asked to record what they saw as their three biggest successes or achievements in life. Participants were then asked to rate how “personally responsible” they saw themselves for bringing about each of these successes on a 1-7 Likert scale (1 = Not at all responsible, 7 = Completely responsible). The inverse of the mean of these scores was used as a measure of Humility.

*Belief in Free Will and Determinism.* Participants’ beliefs in free will and determinism were measured using Paulhus and Carey’s (2011) FAD-Plus. This scale consisted of 27 items, with four subscales: Free Will (Cronbach’s α = .77), Scientific Determinism (α = .55), Fatalistic Determinism (α = .68), and Unpredictability (α = .70). Participants were asked to rate how much they agreed or disagreed with each statement on a Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Example items are: “People have complete control over the decisions they make” (Free Will), “I believe that the future has already been determined by fate” (Fatalistic Determinism), “People’s biological makeup determines their talents and personality” (Scientific Determinism), and “Chance events seem to be the major cause of human history” (Unpredictability).

*2.4. Results*

For the studies reported in this paper, the alpha criterion for statistical significance was set by convention at .05. Correlations were assessed for Humility and each of the subscales from the FAD-Plus. As expected, there was a significant positive correlation between Humility and Fatalistic Determinism, *r* = .42, *p* = .007, whereby participants who had stronger beliefs in fatalistic determinism were more humble (i.e., took less personal responsibility for their successes and achievements). This correlation remains significant when correcting for multiple comparisons using the highly conservative Bonferroni method (.05/4 = .013). While not statistically significant, there was a negative correlation between Humility and Free Will, *r* = -.30, *p* = .063: participants who had stronger beliefs in free will were less humble. There were no other significant correlations with Humility (see Table 1).

**Table 1.**

*Correlations for Study 1A*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | | 2 | | 3 | | 4 | |
| 1. Free Will |  |  | |  | |  | |  |
| 2. Determinism (S) |  | -.013 | |  | |  | |  |
| 3. Determinism (F) |  | -.376\* | | -.073 | |  | |  |
| 4. Unpredictability |  | .224 | | -.159 | | .033 | |  |
| 5. Humility |  | -.297 | | .089 | | .422\*\* | | -.052 |
| \*\* *p* < .01 | | | | | | | | | |
| \* *p* < .05 | | | | | | | | | |

*2.5. Discussion*

These results provide preliminary support for the stated hypothesis, namely that relatively greater belief in determinism—here, Fatalistic Determinism—should be associated with a decreased inclination to take credit for one’s successes and achievements (construed here as an indication of humility). In addition, the relationship between Humility and belief in Free Will, while not statistically significant according to our pre-set alpha level, was of a similar strength and in the expected negative direction. Taken together, then, this pattern of results is consistent with the relationship espoused by Einstein whereby belief in determinism leads to a lack of belief in free will, which in turn corresponds to a disinclination to see oneself as personally responsible for bringing about the successes and achievements in one’s life.

Nevertheless, as is to be expected for a pilot study, there were clear shortcomings to this initial investigation as well as several open questions left remaining. First, the sub-scale for Scientific Determinism showed limited reliability (α = .55), suggesting possible irregularities in responses from this sample. Second, there was some uncertainty about the strength of the relationship between Free Will and Humility, given the slightly smaller apparent effect size compared to the other correlations, and the associated *p* value just above our alpha criterion (uncorrected). To clarify these issues, we conducted a replication study.

3. Study 1B

*3.1. Participants*

Forty-one new undergraduate students from the University of Oxford in England (14 male, 27 female), ages 18-23 (*M* = 20.20, *SD* = 1.10), were recruited via email to take part in the study and received a chocolate bar in exchange for their time. Twenty-seven participants classified themselves as Atheist or Agnostic (65.9%), 11 as Christian (26.8%), 1 as Muslim, 1 as Jewish, and 1 as Buddhist (2.4% each).

*3.2. Procedure and measures.*

These were the same as in Study 1A.[[11]](#endnote-11) Reliability scores for the FAD-Plus subscales were as follows: Free Will (α =.86), Scientific Determinism (α =.83), Fatalistic Determinism (α = .86), and Unpredictability (α = .70).

*3.3. Results*

Consistent with Study 1A, there was a significant positive correlation between Humility and Fatalistic Determinism, *r* = .39, *p* = .011, such that participants who reported stronger beliefs in fatalistic determinism were more humble. This relationship survives a Bonferroni correction (.05/4 = .013). This time, the negative correlation between Free Will and Humility was statistically significant using the uncorrected alpha, *r* = -.37, *p* = .017, but not the corrected alpha. That is, participants who reported stronger beliefs in free will were less humble. There were no other significant correlations (see Table 2).

**Table 2.**

*Correlations for Study 1B*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 | | 2 | | 3 | 4 |
| 1. Free Will |  |  | |  |  |  |
| 2. Determinism (S) |  | .123 | |  |  |  |
| 3. Determinism (F) |  | -.223 | | .122 |  |  |
| 4. Unpredictability |  | -.042 | | -.213 | .233 |  |
| 5. Humility |  | -.370\* | | .138 | .394\* | .048 |
| \* *p* < .05 | | | | | | | |

*3.4. Discussion*

This replication study gave some grounds for greater confidence in our findings from Study 1A, namely, (1) the predicted positive relationship between Humility and Fatalistic Determinism, and (2) the predicted negative relationship between Humility and Free Will, again supporting our ‘Einsteinian’ thesis. However, both studies were conducted in 2011 and suffered from small samples with a high degree of demographic homogeneity, which limits generalizability to an absolute minimum. Upon re-starting this line of work in 2017, therefore, we decided to conduct one more replication study with a much larger and more demographically diverse sample.

4. Study 1C

*4.1. Participants*

US-based workers from Amazon’s Mechanical Turk (MTurk) were recruited and paid $1 for their time; *N =* 143 completed the survey. Twelve participants were excluded for failing an embedded attention check.[[12]](#endnote-12) This left a final *N* of 131 participants (76 Male, 53 Female, 1 Other), ages 20-71 (*M*= 38.06, *SD* = 11.51). Fifty-five participants classified themselves as Christian (42.0%), 32 as Atheist or Agnostic (24.5%), 30 as None (22.9%), 5 as Other (3.8%), 4 as Buddhist (3.1%), and 2 as Jewish (1.5%).[[13]](#endnote-13)

*4.2. Procedure and measures*

These were the same as in Studies 1A and 1B. Reliability scores for the FAD-Plus subscales were as follows: Free Will (α =.83), Scientific Determinism (α =.77), Fatalistic Determinism (α = .90), and Unpredictability (α = .79).

*4.3. Results*

In contrast with the previous studies, there was no correlation between Humility and Fatalistic Determinism, *r* = .08, *p* = .381. However, there was a positive relationship between Humility and Scientific Determinism, *r* = .16, *p* = .076, but it was not statistically significant. Finally, the negative correlation between Free Will and Humility observed in the previous studies was replicated here: *r* = -.41, *p* < .001, this time remaining statistically significant after correcting for multiple comparisons (.05/4 = .013). There were no other significant correlations of interest (see Table 3).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table 3.**  *Correlations for Study 1C* | | | | | | |
|  | | 1 | 2 | 3 | 4 |  | |
| 1. Free Will |  |  |  |  |  |  | |
| 2. Determinism (S) |  | -.113 |  |  |  |  | |
| 3. Determinism (F) |  | -.081 | .450\*\* |  |  |  | |
| 4. Unpredictability |  | .027 | .315\*\* | .298\*\* |  |  | |
| 5. Humility |  | -.412\*\* | .155 | .077 | -.041 |  | |
| \*\* *p* < .01 | | | | | | |

*4.4. Combining samples*

Because the methods and materials for Studies 1A, 1B, and 1C were nearly identical, despite a different sampling procedure for Study 1C, we decided to combine the three data sets for an interim summary analysis, treating each as a separate cohort, so that we could run a single statistical test on the data collected so far. In addition to the Bonferroni corrections already applied, this allows us to further reduce the risk of a Type 1 error and clarify which relationships are really the strongest. Subject and cohort number were entered as random effects in a linear regression, in which Free Will, Scientific Determinism, Fatalistic Determinism, and Unpredictability were simultaneously regressed as fixed effects on Humility, thereby eliminating unnecessary pairwise comparisons between the predictors. In this analysis, only Free Will predicted Humility, with a highly significant negative relationship between these variables. See Table 4.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 4.**  *Regression on Humility: Studies 1A, 1B, IC combined* | | | | | | | |
|  | *B (SE)* | | *t* value | *p* value |  |
| 1. Free Will |  | -0.35 (0.06) | -5.57 | <.001 |  | |
| 2. Determinism (S) |  | 0.11 (0.08) | 1.36 | 0.18 |
| 3. Determinism (F) |  | 0.11 (0.06) | 1.70 | 0.09 |
| 4. Unpredictability |  | -0.07 (0.08) | -0.84 | 0.40 |
|  |  |  |  |  |
| Note: SE is standard error. | | | | | | | |

*4.5. Discussion*

The most robust relationship emerging from Studies 1A, 1B, and 1C appears to be a negative correlation between belief in free will and humility, which is consistent with our theoretical expectations. The predicted positive relationship between belief in determinism (of one kind or another) and humility is not as strongly supported. Nevertheless, having reassured ourselves that at least some of the basic findings from the pilot studies were reliable and would generalize to a new a population, we decided to look further into the observed phenomenon to see how it might best be explained.

Recall that humility was defined as a relative disinclination to take credit for one’s successes and achievements. In the studies so far, belief in free will consistently showed a negative relationship with humility defined this way. But successes and achievements are not the only life events for which one might take personal credit. Rather, one might also take credit for the failures and disappointments in one’s life, and this, too, could be related to belief in free will. Imagine that a person said, “Like Einstein, I do not believe in free will. Therefore, I do not feel personally responsible for bringing about the successes or achievements in my life; rather, I recognize that they were caused by various factors outside of my control.” This person sounds rather humble.

But now imagine that she says, “At the same time, however, and by the very same token, I also do not take responsibility for my failures.” Although the person would not be any less humble, according to our definition of humility, her attitude would seem to be rooted, not in some special attitude concerning successes and achievements, but rather, a more fundamental set of beliefs about personal responsibility in general. For the next study, then, we performed an additional replication of the pilot studies, adding a ‘failure’ measure to complement the ‘success’ measure we were already using. Given this important addition to the previous design, we will call this Study 2, rather than Study 1D.

5. Study 2

*5.1. Participants*

US-based workers from Amazon’s Mechanical Turk (MTurk) were recruited and paid $1 for their time; *N =* 146 completed the survey. None failed an embedded attention check, so none were excluded. This left a final *N*of 146 (84 Male, 60 Female, 2 Other), ages 21-66 (*M*= 33.76, *SD* = 10.23), Sixty-four participants classified themselves as Christian (43.8%), 42 as Atheist or Agnostic (28.8%), 31 as None (21.2%), 5 as Other (3.4%), 3 as Buddhist (2.1%), and 1 as Jewish (0.7%).

5.2. Procedure

Participants filled out an online questionnaire which asked about their successes or achievements and their responsibility for bringing them about. Participants went on to complete a measure of belief in free will and determinism, just as in Studies 1A, 1B, and 1C. However, this time, before filling out the basic demographic measures, they were also asked about their failures and their responsibility for bringing them about. We elected to present the materials in this fixed order—i.e., with the questions about failure coming last—so that the initial part of the study could function as an exact replication of the previous studies.

*5.3. Measures*

*Humility*. This was the same as in previous studies.

*Failure.* Participants were asked to record what they saw as their three biggest failures in life. Participants were then asked to rate how “personally responsible” they saw themselves for bringing about each of these successes about on a 1-7 Likert scale (1 = Not at all responsible, 7 = Completely responsible). The mean of these scores was used as an index of taking responsibility for one’s failure.

*Belief in Free Will and Determinism.* This was the same as in previous studies. Reliability scores: Free Will (α = .85), Scientific Determinism (α = .78), Fatalistic Determinism (α = .90), Unpredictability (α = .78).

*5.4. Results*

Correlations were assessed for Humility, Failure and each of the subscales from the FAD-Plus. In contrast to Studies 1A and 1B, there was no significant correlation between Humility and Fatalistic Determinism, *r* = .10, *p* = .229, supporting the conclusion from the regression analysis combining data from the first three studies, which did not show a significant relationship between these variables. Once again, however, there was the predicted negative relationship between Humility and Free Will, *r* = -.28, *p* = .001, replicating previous results. This relationship survives a Bonferroni correction (.05/5 = .01). See Table 5.

With respect to taking responsibility for one’s failures (Failure), there were no significant correlations with any of the subscales apart from Free Will. While belief in free will was negatively correlated with humility, as noted, it was positively correlated with Failure: *r* = .33, *p* < .001. This suggests that the more participants in our sample believed in free will, the more responsibility they tended to take for their failures. The only other significant correlation was a negative relationship between Humility and Failure: *r* = -.28, *p* = .001. Since Humility is simply the inverse of the tendency to take responsibility for one’s successes, this result could be also be described as a positive correlation between (a) the tendency to take responsibility for one’s successes and (b) the tendency to take responsibility for one’s failures. Thus, the evidence from this study supports the possibility we raised above: insofar as relatively less belief in free will predicts a more humble attitude, this may be due to a consistent set of underlying beliefs concerning personal responsibility in general, rather than a special attitude toward successes and achievements.

**Table 5.**

*Correlations for Study 2*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | | 2 | 3 | 4 | 5 | |  |
| 1. Free Will |  |  |  |  |  |  | | |  |
| 2. Determinism (S) |  | -.153 |  |  |  |  | | |  |
| 3. Determinism (F) |  | -.045 | .477\*\* |  |  |  | | |  |
| 4. Unpredictability |  | -.083 | .180\* | .221\*\* |  |  | | |  |
| 5. Humility |  | -.278\*\* | -.032 | .100 | -.081 |  | | |  |
| 6. Failure |  | .329\*\* | -.146 | -.048 | .107 | -.284\*\* | | |  |
| \*\* *p* < .01 | | | | | | |
| \* *p* < .05 | | | | | | | | | | |

*5.5. Discussion*

In this replication and extension study, the positive relationship observed in Studies 1A and 1B between Humility and Fatalistic Determination did not obtain. Nor did the non-significant relationship between Humility and Scientific Determinism observed in Study 1C. These results suggest that the hypothesized relationship between humility and belief in determinism (of one sort of another) may not be as well supported as the initial pilot studies seemed to indicate. However, as we noted in the Introduction, belief in determinism and belief in free will are not simply two ends of one pole; rather, laypeople sometimes endorse elements of both views. This suggests that, even if greater belief in determinism does not positively predict a more humble attitude, (relative) denial of free will may still do so, given our theoretical expectations. In this respect, and consistent with our hypotheses, the results of Study 2 further reinforce the results of Studies 1A, 1B, and 1C in showing a negative relationship between belief in free will and humility.

As discussed, a relationship was also observed between Free Will and Failure—albeit a positive one. This suggests that the more one believes in free will, the more responsibility one tends to take, not only for one’s successes (i.e., the inverse of Humility on our operationalization) but also for one’s failures. In other words, belief in free will appears to predict a tendency to view oneself as personally responsible for bringing about important life outcomes generally, regardless of whether those outcomes are positive (successes) or negative (failures). Similarly, the relative denial of free will predicts a tendency not to view oneself as personally responsible for such outcomes, again whether positive or negative.

This observation highlights the limited, ‘Einsteinian’ sense of humility we have been assuming in the studies so far. Perhaps believing less in free will really does correspond to a decreased inclination to take personal credit for one’s successes and achievements (as well as one’s failures), as Einstein exemplified, but there is plausibly more to humility than that.

*5.5.1. Other measures of humility*

In a recent article, Nadelhoffer and Wright (2018) describe a new, validated measure for assessing humility that draws on two underlying dimensions identified by factor analyses (for the measure, see Wright, Nadelhoffer, Ross, & Sinnott-Armstrong, 2018). These dimensions are “epistemic humility” and “ethical humility.” Epistemic humility refers to having an accurate perception of one’s place in the universe: it involves acknowledging that, in the grand scheme of things, one is really not so special after all. Ethical humility refers to “understanding and experiencing … oneself as only one among a host of other morally relevant beings, whose interests are as legitimate, and as worthy of attention and concern, as one’s own” (p. 273). In this way, humility is conceived of as a corrective to the natural human tendency to prioritize oneself even at the cost of negatively affecting others. To see whether a belief in determinism, or a decreased belief in free will, may correspond to a wider, more robust sense of humility—along these epistemic and ethical dimensions—we decided to conduct an additional study employing the measure from Wright et al. (2018).

In the course of developing this measure, Wright and colleagues discovered a separate dimension that is related to, but conceptually and psychometrically distinct from humility, namely, *modesty* (Wright & Nadelhoffer, unpublished). The items measuring this construct in their work included statements such as “Like most people, I am just an ordinary person” (internal or private modesty) and “I do not like it when others pay attention to my accomplishments” (external or public modesty). Although this notion of modesty is not the same as humility, neither in the Einsteinian sense, nor in the epistemic and ethical senses described by Nadelhoffer and Wright (2018), it is clearly in the same family of ideas and thus of interest given our research aims. The measure has been validated but not yet been published. We nevertheless decided to include it given the exploratory nature of the following study.

Finally, to cover our bases, we added another measure of humility, the “dispositional humility” measure designed by Landrum (2011). This measure was created to address what might be called the “humility measurement paradox.” According to this paradox, a truly humble person should be relatively unlikely to respond to self-report items such as the ones used in the new Wright et al. (2018) measure in such a way that their humility would fully manifest. This is because it is not very humble to describe oneself as having humble attributes. To get around this problem, Landrum has participants rate *other* people on traits that correspond to humility, based on the assumption that humble people will be more likely than others to view other humble people favorably (while also being more willing to say so than to describe themselves in humble terms).

*5.5.2. Possible confound*

Before turning to our final study, we must address a potential issue with the current and previous studies that concerns the existence of a possible confound. The FAD-Plus, used to measure belief in free will, determinism, and related notions, includes several items that explicitly refer to the notion of responsibility. For example, in the Free Will sub-scale, one of the items is: “People must take full responsibility for any bad choices they make.” Another is, “Criminals are totally responsible for the bad things they do.” But in the pilot studies and Study 2, the Einsteinian measure of humility *also* referred to the notion of responsibility. In fact, humility was simply defined—and operationalized—as a decreased tendency to take personal responsibility for one’s successes and achievements. Thus, both measures may have been at least partially measuring the same underlying construct, which raises the possibility of a spurious and uninteresting correlation.

To investigate this possibility, we re-analyzed the data from Study 2, dropping the potentially confounding items from the Free Will sub-scale—i.e., the ones that explicitly mentioned responsibility—to see if the negative relationship between Free Will and Humility would still obtain. The individual items in the subscale are as follows, with the items mentioning responsibility in bold:

Free Will 1 - People have complete control over the decisions they make

**Free Will 2** - People must take full responsibility for any bad choices they make.

Free Will 3 - People can overcome any obstacles if they want to.

**Free Will 4** - Criminals are totally responsible for the bad things they do.

Free Will 5 - People have complete free will.

Free Will 6 - People are always at fault for their bad behavior.

Free Will 7 - Strength of mind can always overcome the body's desires.

To see whether dropping items 2 and 4 would adversely affect subscale reliability, we first performed a reliability analysis on Free Will items 1, 3, 5, 6, and 7. This yielded α = .83, so we continued with running the correlations. Free Will was still negatively correlated with Humility, *r* = -.23, *p* = .004 (compared to *r* = -.28 and *p* = .001 with the full sub-scale), and still positively correlated with Failure, *r* = .28, *p* = .001 (compared to *r* = .33 and *p* < .001 with the full sub-scale). Thus, although the relationships are slightly weaker with the ‘confounding’ items removed, they are both still highly statistically significant, with or without a Bonferroni correction, and in the same directions. This suggests that the predicted—and observed—negative relationship between belief in free will and humility in this study was not entirely due to a confound (i.e., not spurious).

Nevertheless, to play it safe, we elected to use a different measure of belief in free will and determinism in the third study. This measure, the Free Will Inventory (Nadelhoffer, Shepard, Nahmias, Sripada, & Ross, 2014), was designed specifically to eliminate the possible ‘responsibility’ confound, and therefore improve upon, and replace, the FAD-Plus.

6. Study 3

*6.1. Participants*

Similar to Study 2, a sample of US-based MTurk workers was recruited and paid $1 for their time; *N* = 237 completed the survey. Two participants were excluded for failing an embedded attention check. This left a final *N* of 235 participants (111 Male, 120 Female, 3 Other), ages 19-77 (*M*= 37.03, *SD* = 12.72). One hundred and eight (108) participants classified themselves as Christian (46.0%), 60 as Atheist or Agnostic (28%), 46 as None (19.6%), 7 as Other (3.0%), 4 as Jewish (1.7%), and 1 as Buddhist (0.4%).

*6.2. Procedure*

Participants took part in an online questionnaire which asked about their successes in life and their responsibility for bringing them about—to assess what we will now label “Einsteinian Humility” to distinguish it from the new measures, described below—followed by randomized measures of belief in free will and determinism. They then completed the two new measures of humility, “Ethical/Epistemic Humility” from Wright et al. (2018) and “Landrum Humility” from Landrum (2011), followed by the unpublished “Modesty” measure from Wright & Nadelhoffer (unpublished). They finished with an item asking about their failures in life and their responsibility for bringing them about. Participants then completed several demographic measures, including a new question asking how successful they regarded themselves as compared to others their age.

*6.3. Measures*

*Einsteinian Humility (Success) and Failure*. Participants were asked to record what they saw as their three biggest successes in life. Participants were then asked to rate how “personally responsible” they were for bringing each of these successes about on a 7-point Likert scale (1 = Not at all responsible, 7 = Completely responsible), how much credit they took for bringing them about (1 = No credit, 7 = All the credit), and how much praise they felt they deserved for them (1 = No praise, 7 = A great deal of praise).[[14]](#endnote-14) The “responsible” and “credit” items were highly intercorrelated (*r* = .691, *p* < .001), and were therefore averaged. The inverse of this average was used as a measure of Einsteinian Humility. Later in the survey, participants were asked to record what they saw as their three biggest failures in life, with the same questions and scales, except that “praise” was replaced with “blame” in the final question. The average of these scores was used as a measure of (taking responsibility for one’s) Failure.

*Epistemic/Ethical Humility*. Participants’ epistemic and ethical humility was measured with the new measure by Wright et al. (2018). This was a 10-item measure (adapted from a larger set of items), consisting of two subscales: an “Epistemic Humility” subscale (α = .81), and an “Ethical Humility” subscale (α = .92).[[15]](#endnote-15) Example items included “I often find myself pondering my smallness in the face of the vastness of the universe” (Epistemic Humility), and “I often place the interests of others over my own interests” (Ethical Humility). Responses were on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).[[16]](#endnote-16) The full set of items across the two subscales were highly intercorrelated (α = .87), so we decided to use a single measure of Epistemic/Ethical Humility.

*Landrum Humility*. As noted, a second measure of humility developed by Landrum (2011) was also employed; we will refer to it as “Landrum Humility” to distinguish it from the measure by Wright et al. (2018). This measure asks participants to rate their agreement with a series of 17 statements beginning with “I like people who …” and ending with a trait that is consistent or inconsistent with a humble disposition, e.g., “I like people who are able to admit to others when they are wrong” (versus, “I like people who are close-minded,” reverse scored). Responses were on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Responses across items were highly intercorrelated (α = .90) and were mean-averaged into a single scale.

*Modesty.* Participants’ modesty was assessed using the above-referenced measure by Wright and Nadelhoffer. This was a 10-item measure consisting of two subscales: an “Internal Modesty” subscale (α = .94) and a “Public Modesty” subscale (α = .93). Since the measure is not yet published, for purposes of reproducibility, we will list all of the items for each subscale, as follows: Internal Modesty: (1) “Like most people, I am just an average person.” (2) “I am just an ordinary person like everyone else.” (3) “At the end of the day, I am no better than anyone else.” (4) “I am a run-of-the-mill individual, like most people.” (5) “I am just your average ‘Jill or Joe.’” Public Modesty: (1) “I often try to change the subject when people say good things about me.” (2) “I do not like it when others pay attention to my accomplishments.” (3) “I feel embarrassed when other people praise me in public.” (4) “It makes me uncomfortable to talk about my successes and strong points with others.” (5) “It makes me feel uncomfortable when others talk about my successes.” Responses were on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). All ten items across the two subscales were highly intercorrelated (α = .91), so were mean-averaged into a single measure of Modesty.

*Belief in Free Will and Determinism.* Participants’ beliefs in free will and determinism were measured with Nadelhoffer et al.’s (2014) Free Will Inventory (FWI). This scale consisted of 15 items, with three subscales: Free Will (α = .88), Determinism (α = .86), and Anti-Reductionist Dualism (α = .89). Participants were asked to rate how much they agreed or disagreed with each statement on a Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Example items included “People always have the ability to do otherwise” (Free Will), “People’s choices and actions must happen precisely the way they do because of the laws of nature and the way things were in the distant past” (Determinism), and “The human mind cannot simply be reduced to the brain” (Anti-Reductionist Dualism). Responses were on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

*Baseline Success*. Participants were asked, “Compared to others your age, how successful do you consider yourself to be in life?” with answers ranging from 1 (Not at all successful) to 7 (Extremely successful). This question was included to be able to control for ‘baseline’ perceived success.

*6.4. Results*

As in the previous studies, there was a negative relationship between belief in Free Will (this time measured by the FWI) and Einsteinian Humility, *r* = -.15, *p* = .021. This suggests that the more one believes in free will, the less humble one is in the Einsteinian sense. Importantly, this suggests that the correlation observed in previous studies is not spurious, since it is replicated here using a new measure of free will belief that does not suffer from the ‘responsibility’ confound discussed above. However, the remaining correlations did not support a negative relationship between belief in free will and humility. In fact, they supported the very opposite. Specifically, Free Will was positively correlated with Epistemic/Ethical Humility (*r* = .16, *p* = .015), Landrum Humility (*r* = .13, *p* = .049), and Modesty (*r* = .17, *p* = .009). It was also positively correlated with taking responsibility for one’s failures, as in Study 2 (*r* = .15, *p* = . 026). Controlling for Baseline Success did not substantially alter any of these results. Please note that the only relationship between belief in free will and any of the humility measures to remain significant after applying the strict Bonferroni correction (.05/5 = . 01) is that between Free Will and Modesty.

With respect to Determinism, this was negatively correlated with Landrum Humility: *r* = -.14, *p* = .034, but was not significantly correlated with any other measure. This finding suggests that the more one believes in determinism (here, measured by the FWI), the less strongly one agrees with positive statements concerning humble attributes in others. Although this was designed to be an indirect measure of one’s own humility, it is the least face-valid of any of the humility measures, making hard to draw any strong conclusions from this finding; moreover, it does not survive a Bonferroni correction (.05/5 = .01). Finally, Anti-Reductionist Dualism showed a positive correlation with Epistemic/Ethical Humility, *r* = .32, *p* < . 001, remaining significant after correction, but was not significantly correlated with any other measure of humility. See Table 6 for the complete results.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 6.**  *Correlations for Study 3* | | | | | | | | | | | | | | | |
|  | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | |  | | |
| 1. Free Will |  |  |  |  | |  | |  | |  | |  | |  | | |
| 2. Determinism |  | -.073 |  |  | |  | |  | |  | |  | |  | | |
| 3. Dualism |  | .248\*\* | .021 |  | |  | |  | |  | |  | |  | | |
| 4. Einstein Humility |  | -.151\* | .051 | -.048 | |  | |  | |  | |  | |  | | |
| 5. Failure |  | .145\* | -.042 | -.019 | | -.074 | |  | |  | |  | |  | | |
| 6. E+E Humility |  | .159\* | .119 | .318\*\* | | -.101 | | .145\* | |  | |  | |  | | |
| 7. Landrum Humility |  | .129\* | -.139\* | .055 | | -.273\*\* | | .204\*\* | | .281\*\* | |  | |  | | |
| 8. Modesty |  | .170\*\* | -.020 | .078 | | -.018 | | .177\*\* | | .226\*\* | | .096 | |  | | |
| \*\* *p* < .01 | | | | | | | | | | | | | | | |
| \* *p* < .05 | | | | | | | | | | | | | | | |

6.5. *Discussion*

The results from Studies 1A, 1B, 1C, and 2, all of which used similar methods and materials, supported a negative relationship between belief in free will and Einsteinian humility (i.e., a relative disinclination to see oneself as being personally responsible for bringing about the successes and achievements in one’s life), which was consistent with our theoretical expectations. Although we were initially concerned that this might be a spurious correlation due to a confound, a re-analysis of the data from Study 2 with the potentially suspect items removed did not bear this out: the correlation was maintained. Moreover, in Study 3, we observed the same correlation using a new measure of belief in free will from the FWI that was designed in part to avoid the confound in question.

In Studies 1A and 1B, we also observed the predicted positive relationship between Einsteinian humility and belief in determinism (i.e., Fatalistic Determinism as measured by the FAD-Plus). However, this relationship was notreplicated in Study 1C, nor in the larger and more demographically diverse Study 2, suggesting that this additional theory-consistent finding may not be reliable. Further support for this interpretation comes from Study 3, which similarly failed to show a positive relationship between belief in determinism (this time measured by the FWI) and Einsteinian humility, and which actually showed a negative correlation between belief in determinism and so-called Landrum Humility (an indirect measure of humility).

Finally, in Study 3, although the predicted negative relationship between belief in free will and Einsteinian humility was further reinforced, as noted, we also found striking evidence against our theory. Indeed, belief in free will was *positively* correlated with every measure of humility apart from the Einsteinian measure with which we began. That is, it was positively correlated with Epistemic/Ethical Humility, Landrum Humility, and Modesty, as well as with taking responsibility for one’s failures (although only the relationship with Modesty was statistically significant after correcting for multiple comparisons). This suggests that the relative denial of free will, though it may predict a humble attitude with respect to one’s own successes and achievements, does not predict a humble disposition more generally—at least according to available measures. Instead, Einsteinian ‘humility’ may simply be an emergent, belief-consistent implication of more basic commitments concerning the relationship between freedom and personal responsibility.

7. General Discussion and Conclusion

We began by questioning the prevailing message in the literature that relative disbelief in free corresponds to (or even causes) exclusively antisocial traits and behaviors, noting that there may also be positive implications that should be considered as well. In this vein, we cited recent findings suggesting that free will skepticism may be associated with reduced support for retributive punishment and with greater forgiveness (Shariff et al., 2014; Carmody & Gordon, 2014). And in the present studies, we have provided consistent evidence that relative disbelief in free will predicts humility of the kind exemplified by Einstein, which is a novel operationalization of humility that we have introduced with this research.

At the same time, in our final study, we found a positive relationship between belief in free will and several other measures of humility: ethical/epistemic humility, Landrum humility, and modesty, with the last of these remaining significant even with a conservative alpha criterion. Although this is contrary to what we expected, it is consistent with the dominant narrative in the literature according to which belief in free will is associated with pro-social traits and behaviors. We believe we are the first to show a relationship of any kind between belief in free will and this particular trait—modesty—and we hope to explore this relationship in more detail in future work.

Taken together, our findings support the point we made early on in this paper: few beliefs, like other mental states, are likely to have uniformly positive or negative consequences or associations. Beliefs about free will and determinism are no exception. Although our final study adds to the large literature showing positive associations with increased free will belief, our overall results also suggest that relative disbelief in free will may have a positive association, namely, with Einsteinian humility. Future work should attempt to explore the good as well as the bad of beliefs surrounding free will and determinism, so that a more nuanced picture than is currently available can emerge.

**Supplementary material** All supplementary information, as well as all data and the script for the statistical analyses, is available at osf.io/hmy39.

**Notes**

1. . As Vohs and Schooler (2008, p. 54) speculate near the end of their paper: “perhaps, denying free will simply provides the ultimate excuse to behave as one likes.” [↑](#endnote-ref-1)
2. . For additional criticisms of the Vohs and Schooler findings, see Caruso (forthcoming). [↑](#endnote-ref-2)
3. . Primes typically refer to stimuli that are introduced outside of conscious awareness, or at least whose influence on attitudes or behavior occurs via unconscious routes. Prompts like the book passages typically used in anti-free-will experiments, by contrast, simply convey explicit information that is meant to influence beliefs, etc., via conscious engagement on the part of the participant. [↑](#endnote-ref-3)
4. . For an opposing perspective, see the views of those free will skeptics who are optimistic about life without free will: e.g., Pereboom (2001, 2014), Caruso (2016, 2017, forthcoming), Pereboom and Caruso (2018), Levy (2011), and Nadelhoffer (2011).   [↑](#endnote-ref-4)
5. . Indeed, the experiments we have covered assess primarily short-term effects. But society might adjust, in time, to beliefs that there is no free will—as, for example, Calvinists did. [↑](#endnote-ref-5)
6. . Consider a similar argument as it might concern religious beliefs. Let us imagine that holding religious beliefs yields certain positive consequences for society, at least along some dimension, while disbelieving yields certain negative consequences along that dimension. Would this be a good reason to shield people generally from atheistic beliefs, attitudes, and arguments? Historically, of course, and in some places still today, this is exactly what is argued by extreme religious conservatives; but we doubt a similar argument would be made by psychology researchers given analogous empirical findings. [↑](#endnote-ref-6)
7. . Vohs and Schooler (2008) themselves raise this possibility in their paper. They write: “a deterministic viewpoint may have a host of possible consequences, and 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” (p. 54). [↑](#endnote-ref-7)
8. . Please note that this study and its replication, Study 1B, were conducted by the first and second authors in late 2011 and early 2012, whereas studies 1C, 2, and 3 were conducted by the full research team in 2017 upon re-starting the project. Although the first two studies have obvious shortcomings, including their small and demographically homogenous samples, we have decided to include them in this report to combat the file-drawer problem whereby researchers selectively publish studies from a single line of research. As Carlsson et al. (2017, p. 2) note in introducing the concept of a File-Drawer Report, “the overall goal of … File-Drawer Reports is to correct the scientific record by encouraging researchers to write up and publish findings that otherwise would remain in the file drawer and bias the literature.” Accordingly, this paper contains all of the studies that, to our knowledge, our group conducted on this research question during the entire period 2011 - 2018 for which we have sufficient records of the methods and materials to give a clear and accurate description (see Supplementary File for Studies 1A and 1B for further discussion). [↑](#endnote-ref-8)
9. . We were initially interested in the relationship between free will beliefs, humility, and *religiosity*, which is why we are reporting participants’ religious affiliations. We also wanted to highlight the non-representativeness of our sample in this (and the following) pilot study, wherein the large majority of participants are atheists or agnostics. For consistency and for the sake of comparison, we will report religious affiliation in all subsequent studies, even though we did not pursue that thread in this line of research. [↑](#endnote-ref-9)
10. . Measures of locus of control, religiosity, and spirituality were also administered for exploratory purposes, but the data were not analyzed for this report. [↑](#endnote-ref-10)
11. . An additional exploratory measure was shown to participants, whereby they were asked to rate how personally responsible they saw *others* as being for certain positive and negative aspects of their lives. They were given 6 items, with 3 of these being successes or achievements (e.g., ‘The financial success of investment bankers’) and 3 being negative outcomes (e.g., ‘The material living conditions of the homeless.’) We did not have any particular prediction for this measure and did not pursue this issue in later studies. The data were not analyzed for the present report.   [↑](#endnote-ref-11)
12. . Participants were asked, “What is the answer to the following math problem: 7 - 5 = ” and given the options 1, 2, 3, 4, 5. The same or a similar attention check was used in subsequent studies. [↑](#endnote-ref-12)
13. . See note 9 for a discussion of why we are reporting religious affiliation here and in the subsequent studies. [↑](#endnote-ref-13)
14. . The “credit” and “praise/blame” items were added to address a potential ambiguity with “responsibility.” Caruso (2016) has drawn a distinction between an “attributability” sense of “responsible,” which just means that the relevant outcome can appropriately be *attributed* to the person (even if the person’s free will was not the ultimate cause of the outcome), and an “accountability” sense of “responsible,” which means that the person can or does take credit for the outcome (in the sense that it was caused by their own free will). As noted, the “responsibility” and “credit” items were highly correlated, suggesting that participants interpreted “responsibility” in its “accountability” sense. The “praise” item, by contrast, did not hang together particularly well with the other two items (α = .64), which is understandable upon reflection: even if one feels that it is appropriate to take credit for a given success, this does not simply entail that she should also be praised for it, as that it is a further moral judgment that would have to be made. For the purposes of this report, then, the combined responsibility/credit measure will be used for analyses, treating praise/blame separately (and indeed leaving them for future analyses). Please note that the “blame” item actually did hang together well with the responsibility and credit items for the failure questions (α = .88), but for purposes of consistency with the success questions, blame was set aside with praise for these analyses. [↑](#endnote-ref-14)
15. . In Wright et al. (2018), the concept of epistemic humility is further broken down and measured by “religious low self-focus” and “cosmic low self-focus.” Only the latter was used in the present study. The measure of ethical humility we used is described as “high other-focus” in Wright et al. (2018). [↑](#endnote-ref-15)
16. . Due to a programming error, two of the items for Epistemic Humility (namely, “I frequently think about how much bigger the universe is than our power to comprehend,” and “When I look out at the stars at night, I am often deeply humbled”) had a 6-point rather than a 7-point response scale, with 1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, 5 = Agree, 6 = Strongly Agree. In other words, “Neither Agree nor Disagree” was accidentally deleted from the two items, which would otherwise have been between “Somewhat Disagree” and “Somewhat Agree.” The mean for all the items together is 4.90 (*SD* = 1.16), with α = .87; the mean for all the items minus the two is 5.15 (*SD* = 1.29), with  α = .81. Since the smaller, three-item set still had good reliability, we decided to use only the three items with the full 7-point response scale for Epistemic Humility, and report the corresponding α value above. Please note that when we write “the full set of items across both subscales,” then, we mean the 8 remaining items (3 from Epistemic Humility and 5 from Ethical Humility) after the two associated with the defective response scale are excluded.

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