12 What Science Tells Us about Free Will

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The very first act of a will endowed with freedom should be to sustain the belief in the freedom itself. I accordingly believe freely in my freedom. I do so with the best of scientific consciences. . .

—William James (James, 1899/1946, p. 192)

Advances in the science of thought and action put undeniable constraints on traditional notions of free will. As we come to understand the unconscious processes that drive behavior (e.g., Bargh & Ferguson, 2000), the neurocognitive mechanisms that underpin it (e.g., Crick, 1994), and the discrepancies between intentions and actions (e.g., Wegner, 2002), it seems ever more difficult to conceptualize what role the experience of personal agency might play. Indeed, on the basis of such challenges many scientists (e.g., Bargh, 2008; Blackmore, 1999; Wegner, 2002) and philosophers (e.g., Churchland, 1995) have argued that the time has come for us to abandon the notion of the self as a free agent. As Francis Crick (1994) put it:

> You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. Who you are is nothing but a pack of neurons.

The suggestion that advances in the mind sciences necessarily force us to abandon long-held notions of free will raises important questions regarding the impact of communicating this message. The philosopher Smilansky (2000) suggests that: "Humanity is fortunately deceived on the free will issue, and this seems to be a condition of civilized morality and personal value. . .there would be considerable room for worry if people became aware of the absence of libertarian free will" (p. 505). On a brighter side, others have suggested that an appreciation of the lack of genuine free will may lead people to be more forgiving of criminal behavior, viewing punishment more from the pragmatic perspective of correction and deterrence, and less from a vengeful perspective of retribution (Greene & Cohen, 2004).

Although challenging, the question of what impact changing views on free will might have on people's moral behavior and judgments need not be confined to the philosopher's armchair. Rather, we can investigate the impact of exposing people to arguments regarding the absence of free will and assess whether those arguments have any impact on their ethical behavior or judgments. As will be discussed, recent studies taking this approach have found evidence that telling people they lack free will not only impacts on their belief about free will, but also influences their ethical behavior and judgment.

The finding that people's moral appraisals and actions may be influenced by hearing that science has ruled out the existence of free will adds increased urgency to the question of whether or not this conclusion is warranted. Addressing the age-old issue of whether or not free will exists is far less straightforward (particularly for behavioral scientists) than assessing the consequences of a belief in free will. Nevertheless, given that scientists' views on free will can impact on people's ethical behavior, it seems appropriate that scientists with diverging opinions chime in on this important issue. Having now spent a fair bit of time reviewing this topic, I find myself struck by how compelling seemingly contradictory arguments appear to be. Hard determinists' assertions that free will is a mere illusion are difficult to dismiss. Compatabilists' claims that we can maintain personal responsibility even in a universe ruled by cause and effect seem compelling. Yet it also seems premature to rule out libertarians' arguments that there might still be some way in which conscious choice could have a genuine causal impact. In the second section of this chapter, I review a selection of arguments from various alternative camps with the goal of illustrating my sympathy with many of the disparate views that have been presented. Given the cogence of the many alternative views of free will, I conclude that while the argument that science rules out free will is certainly a tenable hypothesis, at present it should be treated as such, and not as an irrefutable truth upon which all sensible people must necessarily agree. In short, I suggest that a belief in free will is still an option for those so inclined to choose it.

THE VALUE OF A BELIEF IN FREE WILL

Given how entrenched the notion of free will is to our sense of ourselves, each other, and our legal institutions, it does not require a huge leap of imagination to worry that exposure to the argument that free will is an illusion could have significant consequences. If personal responsibility depends on a sense that one could have behaved differently, then it stands to reason that people's sense of personal responsibility might be undermined by the conclusion that a combination of genetic and environmental factors compels them to behave as they do. And if people lose the sense of personal responsibility, then it follows that they might feel less compunction to act in an ethical manner themselves, and less indignation when others behave badly. After all, it is not really their fault.

Although philosophers have long speculated about the impact of a belief in free will on moral behavior and judgments, it is only recently that experimentalists have begun to empirically examine the issue. Experimental philosophers were the first to empirically address this question by asking people to assess personal responsibility within the context of imagining a purely deterministic universe. Nahmias, Morris, Nadelhoffer, & Turner (2005) had subjects assume that determinism is true and then judge whether an agent was blameworthy under those circumstances. They found that subjects tended to say that the agent was blameworthy despite living in a deterministic world. However, using a somewhat different design, Nichols and Knobe (2007) presented subjects with a description of an alternate universe that is deterministic, and they found that subjects tended to say that agents were not responsible in that universe. The apparent disparity between these studies was at least partially resolved by Roskies and Nichols (2008), who compared people's assignment of responsibility when the universe that was characterized as deterministic was either our own or some imaginary alternative universe (see also Roskies, Chapter 10, this volume). Participants were more likely to find agents culpable when the deterministic universe was our own (replicating Nahmias et al.), and less culpable when it was some imaginary other universe (replicating Nichols & Knobe).

The finding that participants in these studies tended to continue to hold people responsible when considered in the context of a deterministic universe (at least when it is our own) ameliorated these researchers' concerns about the impact of scientific dismissals of free will. As Roskies and Nichols (2008) observed:

> The upshot of this is that these worries about how neuroscientific understanding will undermine the social order are misplaced . . . if

> people came to believe in determinism, it seems likely that they would not significantly change their practices of attributing responsibility. (378)

While these conclusions are seemingly reassuring, there are important limitations to these investigations. First, these studies involve hypotheticals—asking people to imagine the universe being one way or another, and to imagine how they would feel under those situations. Given that people are notoriously bad at predicting their future feelings (Gilbert, 2006), it is quite possible that their conjectures about possible assignments of responsibility could be markedly different from how they would really feel were they to actually believe the world was deterministic. Furthermore, these studies merely asked people to speculate about responsibility, they did not assess what impact a belief in free will versus determinism had on actual moral behavior. Thus, while an important first step, these initial studies leave open the possibility that encouraging people to genuinely believe that free will is an illusion could have important effects on their actual moral behavior.

The Impact of Anti–Free Will Sentiments on Cheating

A recent series of studies by Vohs and Schooler (2008) addressed the above concerns by examining the impact of exposing participants to *genuine scientific claims* that science has shown that people lack free will on their *actual moral behavior*—willingness to cheat. In the first experiment, participants read one of two excerpts from Francis Crick's *The Astonishing Hypothesis*. In one excerpt, people were exposed to an expansion of the quote mentioned earlier in which Crick espouses the view that science has definitively shown that free will is an illusion. In a second excerpt, Crick talks about consciousness but makes no mention of the merits of the concept of free will. After reading one of these passages, participants completed a questionnaire regarding their beliefs about free will and then engaged in what they believed was an unrelated activity of completing mental arithmetic problems. Drawing on a cheating paradigm developed by von Hippel, Lakin, and Shakarchi (2005), participants were told that there was a glitch in the program and that after the problem was presented, they needed to press the space bar in order to prevent the computer from inadvertently giving them the answer before they had solved it themselves. Furthermore, participants were told that

although the experimenter would not know whether they had pressed the space bar, they should try to solve the problems honestly on their own. In short, a failure to press the space bar enabled them to get the answer without solving it themselves, in effect, to cheat.

The results revealed several ways in which participants were impacted by reading the Crick essay dismissing the existence of free will. First, participants who read the anti–free will passage revealed a reduced degree of belief in free will relative to participants who read the control passage. Most importantly, those individuals who were exposed to the anti–free will passage were significantly more likely to cheat on the mental arithmetic test, and this increase in amoral behavior was mediated by a reduced belief in free will.

A second experiment conceptually replicated the first while addressing several possible concerns. In Experiment 1, amoral behavior was assessed by failure to press the space bar. While participants were explicitly told that they needed to press the space bar in order to perform honestly, it is possible that their failure to press it in the anti–free will condition was not due to an increased tendency for amoral behavior so much as a greater degree of passivity. Experiment 2 addressed this issue by introducing an active measure of amoral behavior—enabling participants to overpay themselves for their performance. A further innovation of Experiment 2 was the introduction of a pro–free will condition.

In this second experiment, participants received one of three treatments. In one condition, participants read a series of statements designed to induce a feeling of determinism. Sample statements included, "Ultimately, we are biological computers—designed by evolution, built through genetics, and programmed by the environment." The participants' task was to read each statement and think about it, and then when instructed, they were to turn the page and read another statement. This task is modeled after the oft-used Velten mood induction task (Velten, 1968). In another condition, participants read statements that were designed to bolster beliefs in free will, such as "I am able to override the genetic and environmental factors that sometimes influence my behavior." A third group of participants read neutral statements. The cheating opportunity was set up such that participants self-scored a cognitive test on which they were to be paid $1. Ostensibly because of an unexpected errand, the experimenter left the room and allowed participants to score their exam and then pay themselves for their performance on the test. The money that participants paid themselves thus served as proxy for their claimed scores on the exam, and could be compared to veridical scores from participants who took the exam and were not allowed to self-score. The

research question was whether participants would give themselves differential amounts of money as a function of whether they had been encouraged to believe in free will, or determinism, or whether their beliefs were left unchanged.

The results showed that after participants read statements that told them their actions were predetermined and therefore not under their control, they cheated more—as evidenced by more money taken in this condition compared to the control condition and the free will condition. Reading statements that bolstered participants' belief in free will did not affect cheating behavior, as these participants paid themselves as much money as did participants whose scores were known. Once again, we found that participants' beliefs changed, with people who were exposed to the anti–free will passage expressing a reduced belief in free will relative to the other conditions. Interestingly, there was no effect of exposure to the pro–free will passages on participants' belief in free will, suggesting that people's default belief is in free will.

There are a number of important lessons to extract from Vohs and Schooler's experiments. First, the results suggest that individuals' beliefs about free will can be significantly influenced by exposure to claims that science has cast doubts on the existence of free will. Such a finding is in and of itself of importance as it was far from clear a priori that participants' opinion about an issue as fundamental as the existence of free will could be influenced by exposure to relatively brief arguments against the concept. Although we did not assess the long-term impact of anti–free will passages, the ease with which we were able to at least temporarily influence people's attitudes on the subject suggests that regular exposure to scientific claims that free will is an illusion could lead to enduring changes to their attitudes about free will.

Clearly, the most striking finding of the Vohs and Schooler study was that exposure to anti–free will sentiments increased their amoral behavior—inducing passive cheating in Experiment 1 and active cheating in Experiment 2. These findings suggest that prior arguments that exposure to scientific refutations of free will could negatively impact on moral behavior may have some merit after all. Of course, allowing a computer to provide answers for problems or slightly overpaying themselves for problems solved are relatively mild moral infractions that in no way constitute the type of "unprincipled nihilism" (Smilansky, 2000, p. 189) that some have feared dismissal of the concept of free will might induce. None of the participants exposed to the anti–free will message assaulted the experimenter or ran off with the payment kitty. Nevertheless, these findings do suggest that discouraging a belief in free will can lead to demonstrable increases in certain amoral behaviors.

The Impact of Anti–Free Will Sentiments on Helpfulness and Aggression

Given the potential implications of the Vohs and Schooler study, it is important to assess the degree to which other types of antisocial behaviors might be encouraged by discouraging a belief in free will. Recently a series of studies by Baumeister, Masicampo, and Dewall (2009) provided evidence that reading anti–free will statements undermines prosocial behavior in several additional ways, including reducing participants' willingness to help others and increasing their tendency to behave aggressively.

In Experiment 1 of Baumeister et al., participants engaged in one of the three statement-reading conditions used in Experiment 2 of Vohs and Schooler. They then read hypothetical scenarios in which they had to indicate how likely they would be to help out in each situation at the present moment. The scenarios included situations such as giving money to a homeless person and allowing a fellow classmate to use one's cellular phone. The results revealed that participants who had read the anti–free will sentiments reported being significantly less likely to help out in these situations than individuals who read the pro–free will or control statements. No differences were found on either helpfulness or belief in free will between the control and pro–free will participants, suggesting again that people's pre-existing views are generally pro–free will.

Experiment 2 of Baumeister et al. examined the relationship between anti–free will sentiments and participants' willingness to engage in actual helping behavior. In this study, participants' beliefs in free will were assessed using the same free will scale used in the other experiments, and then participants read about a fellow student whose parents had been killed in a car accident and who was going to have to drop out of school unless she could find someone to help her out financially. Following a false debriefing, participants were given the opportunity to engage in volunteer behavior to help out this student. The results revealed that disbelief in free will was associated with a lower tendency to volunteer to help. This study thus demonstrated that the negative relationship between anti–free will sentiments and helping behavior generalize to pre-existing beliefs and to situations in which participants believe that they will actually be called on to help.

Experiment 3 of Baumeister et al. examined the relationship between anti–free will sentiments and aggression. In this study, participants read either the pro– or anti–free will passages and then were given an opportunity to add varying amounts of hot sauce to crackers that they believed were going to be eaten by another participant who did not care for spicy food. The results once again revealed a relationship between belief in free

will and prosocial behavior, such that those participants who read the anti–free will statements endorsed more anti–free will sentiments on the free will scale and served up more hot sauce to participants who they knew would not like it.

Accounting for the Negative Impact of Anti–Free Will Sentiments on Prosocial Behavior

The above studies suggest a variety of situations in which encountering and/or endorsing anti–free will sentiments reduces prosocial behaviors, raising the important question of what the mechanism of this effect might be. Although there are several mechanisms that remain viable alternative accounts of this important effect, several of the less interesting interpretations have been ruled out. One possibility is that reflecting on the notion that free will does not exist is a depressing activity, and that the results are simply the consequence of increased negative affect. However, both Vohs and Schooler and Baumeister et al. assessed mood and found no impact of the anti–free will statements on mood, and no relationship between mood and prosocial behavior. Another possibility is that participants were responding to demand characteristics. Perhaps they inferred that if the experimenter was having them read statements dismissing free will that the experimenter expected them to behave badly. However, Baumeister et al. specifically addressed this issue by including an additional validation study in which participants read the pro– or anti–free will statements and then indicated their judgments regarding the possible expectations of the author of those statements, including "The person who wrote those statements probably would want me to be kind and helpful," and "The person who wrote those statements would probably want me to be mean and cruel." Reading these statements had no effect on participants' beliefs about experimenter expectancies, arguing against the suggestion that the impact of these manipulations were due to demand characteristics.

Regarding the conceptually more interesting (i.e., nonartifactual) accounts of the impact of anti–free will statements, some progress has been made in isolating the mechanism, but again more research is required. Two related possibilities are that discouraging a belief in free will reduces participants' sense of personal accountability or agency. To address this issue, Baumeister et al. included an additional validation study in which they examined the impact of reading the pro– or anti–free will sentiments on both participants' belief in free will (using the same scale mentioned in the earlier studies) and their perceived accountability and feelings of agency. Perceived accountability was assessed by

statements such as "I am held accountable for my actions" and agency by statements such as "Right now, I feel active." The result revealed that whereas the pro– versus anti–free will statements significantly impacted people's reported belief in free will, they neither affected their perceived accountability nor agency.

Baumeister et al. argue that the absence of an impact of anti–free will sentiments on participants' reported accountability and personal agency argues against a role of either of these constructs in mediating the relationship between endorsing anti–free will statements and prosocial behavior. Nevertheless, it might still be the case that some implicit sense of these constructs might be involved. Just as priming achievement-oriented goals can influence participants' tacit sense of achievement without them explicitly realizing it (Bargh, 2005), so too might discouraging a belief in free will tacitly minimize individuals' sense of accountability or agency, without people explicitly realizing this change. Future research might profitably explore this issue by examining whether implicit measures of these constructs are affected by anti–free will sentiments.

Another possible way in which encountering anti–free will sentiments might reduce prosocial behavior is by reducing the energy that individuals are willing to expend. As Baumeister et al. (2009) observe:

> Volition and self-control require the person to expend energy, and these expenditures enable them to act prosocially. Apparently disbelief in free will subtly reduces people's willingness to expend that energy. Hence, disbelief in free will serves as a cue to act on impulse, a style of response that promotes selfish and impulsive actions such as aggressing and refusing to help. (p. 267)

Although it may be premature to conclude that this is necessarily the mechanism underlying these effects, the notion that encountering anti–free will sentiments subtly reduces the energy that people have available to expend in the service of prosocial behavior seems quite plausible. In the future, this hypothesis might be more directly tested by examining the relationship between encountering anti–free will sentiments, and other measures known to be sensitive to "ego depletion" (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister, Chapter 3, this volume; Vohs, Chapter 5, this volume) that do not have any explicit moral element. For example, it has been found that when individuals resist eating chocolate chip cookies, they experience a reduced capacity to persevere on anagrams that (unbeknownst to them) are unsolvable. If encountering anti–free will sentiments produces a similar reduction in available mental energy, then it might have

comparable reduction in the effort individuals are willing to expend on solving anagrams.

While more research will be needed to isolate the precise psychological mechanisms underlying the impact of encountering anti–free will statements, two conclusions so far seem clear: *(1)* a belief in free will leads to a variety of prosocial behaviors, and *(2)* encountering anti–free will sentiments can undermine the advantages of this belief. These conclusions naturally lead to the question that is likely to be burning in at least some reader's minds. If discouraging a belief in free will is such a potent psychological manipulation, are its effects necessarily all bad, or might there be at least some contexts in which a benefit to anti–free will views might be observed? I consider this question in the next section.

The Impact of Anti–Free Will Sentiments on Retribution

In an influential review, Greene & Cohen (2004) speculated that as society increasingly comes to understand the true basis of human behavior, legal judgments will decreasingly rely on antiquated concepts of free will. Rather than endorsing retributivist views of punishment as a worthy end in itself, the abandonment of a belief in free will lead, they suggest, to an increasingly consequentialist approach to punishment, focusing on social benefits such as the prevention of future transgressions through deterrence. As Greene and Cohen put it:

> As more and more scientific facts come in, providing increasingly vivid illustrations of what the human mind is really like, more and more people will develop moral intuitions that are at odds with our current moral practices. . . The law will continue to punish misdeeds, as it must for practical reasons, but the idea of distinguishing the truly, deeply guilty from those who are merely victims of neuronal circumstances will . . . seem pointless. (p. 1778)

The speculation that reduced beliefs in free will may discourage retributive thinking suggests a context in which anti–free will statements might have positive consequences—namely, encouraging people to be more forgiving and behave less vindictively.

A recent study by Shariff, Greene, and Schooler (2009) addressed this issue. In this study, participants first read the anti–free will or control Crick passage originally used by Vohs and Schooler (2008). Subsequently, they read one of two murder scenarios. In one scenario, a high school senior loses

his temper in a bar and beats another man to death. The second scenario is exactly the same except that it is revealed during the trial that the defendant has a "rare genetic condition" that prevents him from controlling his aggression the way other people can. Participants then read sentencing arguments by the defense and prosecutor that were designed to reduce the consequentialist impact of prison sentencing. Specifically, they read an argument by the defense team in which it is argued that instead of being sent to prison, he should be sent a treatment facility that has demonstrated a 100% success rate at curing youths of their aggression and preventing recidivism. The defense team reminds the court that no deterrence benefits will be gained from additional detention beyond the time spent at the treatment facility. The prosecution agrees but nonetheless argues for prison time as an appropriate (retributive) punishment. Finally, participants were asked to indicate the amount of prison time, if any, that they would recommend for the defendant, following his time in the treatment facility.

The results revealed a significant impact of reading the anti–free will sentiments. Participants who read the anti–free will passage recommended on average between 2 and 5 years additional imprisonment following the 5 years in the treatment facility, whereas those reading the control passage recommend between 5 and 10 years. Remarkably, the reduction in sentencing time associated with reading the anti–free will passage was comparable to that associated with learning that the perpetrator suffered from a rare genetic disorder. The finding that anti–free will sentiments can significantly temper people's retributive tendencies can reasonably be characterized as a positive impact of endorsing anti–free will sentiments. Although some may feel that revenge for revenge's sake is an appropriate human reaction, many, I expect, would view the advancement of a worldview that enables forgiveness as a genuinely positive development.

Summary of the Impact of a Belief in Free Will

Collectively, the above findings demonstrate that the issue of whether or not free will exists is not simply an obscure philosophical debate confined to the ivory tower. Rather, beliefs on this issue have important effects on both people's own moral behavior and their assessment of the behavior of others. On the negative side, exposure to anti–free will sentiments can lead to detrimental effects on a variety of moral behaviors, including increasing cheating (both passive and active), reducing helpfulness (both hypothetical and actual), and increasing aggression. On the positive

side, anti–free will sentiments reduce retribution, suggesting that it may enable people to be more forgiving.

Were the relationship between beliefs in free will and morality exclusively limited to people's enduring pre-existing beliefs, and were such beliefs found to be resistant to influence, then these findings might easily be dismissed as being of little relevance to the old debate regarding the possible impact of scientific claims of discrediting free will. But, to the contrary, the present findings suggest that people's views about free will are volatile and highly sensitive to the messages of scientists. Given that these views also appear to influence their moral behavior (see also Pizarro and Helzer, Chapter 7, this volume), it seems appropriate that we carefully assess what science can currently tell us about the existence of free will.

THE STATUS OF FREE WILL

In the following section, I review what I find to be some of the most compelling cases both for and against the existence of free will. Let me be up-front about my conclusion. In my view, there are many extremely compelling arguments on all sides of this issue. Those who have concluded that science simply leaves no room for free will (hard determinists) have some very good arguments. But then again, those who claim that at least some version of free will can exist within a purely deterministic world (compatibilists) also make a good case. While the libertarian view that conscious deliberation can have a causal role in adjudicating between actual alternative futures is perhaps the hardest case to defend, in my view it, too, cannot be ruled out. Thus, the conclusion that I find myself reaching is that scientists are entirely justified in expressing their opinions regarding the implications of science for conceptualizing free will. However, I believe that scientists should express those conclusions as representing their personal interpretation of the evidence and not as an articulation of indisputable scientific fact. To do otherwise is to make the very same mistake that religions have made over the millennia–articulating faith as fact, and potentially vilifying those who do not see the world as they do.

Hard Determinism–Free Will Is an Illusion

From a logical standpoint, the case that free will is merely an illusion is probably the easiest to make. The arguments for a hard determinist perspective are both numerous and compelling. These include:

Argument by Analogy

Everything else in the universe appears to follow the law of cause and effect. Why then should conscious choice be the one exception to this rule? If we can explain all other phenomena without recourse to deliberate intention, then surely we can do the same for human behavior. As Dennett (1991, p. 251) put it, "in biology, we have learned to resist the temptation to explain *design in organisms* by positing a single great Intelligence that does all the work ... We must build up the same resistance to the temptation to explain *action* as arising from the imperatives of an internal action-orderer who does too much of the work."

Argument from Neuroscience

Neuroscience is increasingly demonstrating the direct correspondences between thoughts and brain activity. Given that all thoughts are the product of brain activity, it follows that human choices can be understood simply as the product of the neural activity that underpins it (Crick, 1994).

Argument from Genetics

Human behavior is powerfully determined by genetic influences. Twins separated at birth share startling correspondences not only in their temperaments but also in their likes and dislikes (Segal, 1999). Even moral behaviors have a fundamental genetic component as evidenced by the heritability of qualities such psychopathology (Jang, 2005) and addiction (Loughead et al., 2008). If people's choices and moral behavior can be traced to their genetics, then people are no more in control of their actions then they are of their inherited genetic code.

Argument from Environmental Influences

Those aspects of human behavior that are not accounted for by genetic influences can readily be posited to be a result of environmental factors. Environmental stressors such as poverty, lack of education, poor nutrition, and history of abuse are all known to have a powerful impact on the unfolding of people's lives, influencing not only the opportunities that people are able to realize, but also even the likelihood that they engage in criminal activity (Cassel & Bernstein, 2007).

Argument from Nonconscious Processes

Increasingly, we are coming to understand the powerful unconscious mental processes that drive many of our actions. Though the actual nature of these processes is only now being appreciated, their existence and implication for free will has long been acknowledged. As Spinoza (1677/1951) put it, "men believe themselves to be free, simply because they are conscious of their actions, and unconscious of the causes whereby those actions are determined" (p. 134). Just a few of the many examples of unconscious mental processes known to influence behavior outside of awareness include the observations that: *(1)* priming goals (e.g., completing an anagram involving cooperation) can unconsciously influence people's behavior (how cooperatively they behave) (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001), *(2)* major life choices (e.g., where people end up locating) can be influenced by similarities between the letters in peoples names and in their choices (e.g., there are more Veronicas in Virginia) (Pelham, Mirenberg, & Jones, 2002), and *(3)* people are often unaware of the actual reasons for their behavior yet nevertheless are readily willing to confabulate justifications (Nisbett & Wilson, 1977). If people are so routinely unaware of the real reasons for their behaviors, then why should we think their behaviors are a consequence of deliberate choices?

Argument from Illusions of Will

Recent research has demonstrated that people can be easily duped into taking responsibility for actions over which they could have had no control. When, for example, people hear the name of an object in close temporal proximity to a cursor landing on that object, they perceive themselves as having deliberately moved the cursor to that location even when they had no actual control (Wegner & Wheatley, 1999). Such findings suggest that the experience of intention causing action is the product of an illusory inference stemming from the frequent co-occurrence of thoughts followed by actions (Wegner, 2002). Thoughts no more cause actions than lightning causes thunder.

Argument from the Timing of Intention and Brain Activity

Accumulating evidence suggests that the brain activity associated with conscious decisions often occurs well before an individual is aware of having made the decision (Libet, 1985). If the brain has already made up

its mind by the time the individual is aware of the decision, then what possible role could the consciousness of the choice have?

This is an impressive set of arguments and far from exhaustive. Admittedly, there are significant counterarguments that can be mustered against at least some of these arguments. For example, Libet (the discoverer of the finding that brain activity often precedes awareness of conscious choices) has argued that conscious will might circumvent its otherwise after-the-fact status by having a capacity for inhibition (sometimes referred to as "free wont") (Libet, 1999, 2003). However, these counterarguments have in turn been countered (for example, to date there is no evidence that the capacity to restrain behavior is any more under conscious control than the capacity to initiate it) (Velmans, 2003). This is not to say that the case for hard determinism is an open and shut case (as will be seen, my argument is quite the contrary), but simply that it is very understandable why so many people would find it so persuasive.

Compatibilism—Free Will and Determinism Are Not Mutually Exclusive

Intuitively, compatibilism makes great sense as it acknowledges two observations that seem very difficult to deny. First, this view recognizes that science is premised on the fundamental notion that all phenomena, both physical and mental, can be understood as the product of a chain of causes and effects. At the same time, compatibilism acknowledges that human existence is riddled with the need to make real decisions about genuine options. Given the seemingly self-evidentiary nature of both the supremacy of the law of cause and effect, and the existence of genuine choosing, it follows that both must be true. The challenge is conceptualizing precisely how these two constructs can coexist. Though a variety of different versions of compatibilism have been proposed, two general elements are often invoked.

Two Sides of the Same Coin

According to this view, causal brain processes and free will represent different facets of the same phenomena. Yes, our brain controls our actions, but yes, we also control our actions because we are our brains. Conscious desire doesn't spawn or lead to neural processes any more than neuronal activity spawns or leads to conscious experience. The experience of conscious free will is the first-person perspective of the neural correlates of choosing (Velmans, 2002).

Emergent Properties

Another complimentary approach to the compatabilists' perspective is to argue that free will is an emergent property that arises from a particular set of conditions surrounding the physical systems of our genetic brains steeped in our environmental culture. For example, Dennett (2003) suggests that free will is a unique capacity that emerged as a consequence of evolution and culture. As Dennett puts it: "Free will is real, but it is not a preexisting feature of our existence . . . it is an evolved creation of human activity and beliefs." (p. 13). A related form of emergence suggests that higher-order mental processes emerge from but are not reducible to lower-level neural processes. These processes occurring at the macrobehavioral level can modulate lower levels and thereby introduce a capacity for genuine agentic control (Bandura, 2008).

The attraction of compatibilism stems at least in part from the inherent appeal of the middle ground. So often when there is a long-standing debate (e.g., nature/nurture), the answer lies somewhere in the middle. Surely, therefore, there must be some way to simultaneously acknowledge that people are susceptible to the same causal forces as all other things in nature, while recognizing that they have the capacity to make real choices. The fact that we cannot precisely explain how these two concepts mesh reflects a significant challenge, but arguably no greater a challenge than that raised by the hard determinists' view that the experience of genuine choice is entirely illusory, or the libertarians' view (to be discussed next) that free will relies on an "extra something."

Libertarianism—The Existence of Genuine Choice

As Samuel Johnson observed long ago, "All theory is against the freedom of the will; all experience for it." (Boswell, 1924). Experientially, the sense of having a causal role in one's actions is overwhelming. If I want to lift my hand up, I do. And if I don't, I don't. Even more striking are the acts of will in which I must apply enduring effort. While there are many actions where one experiences ambiguity regarding the source (did I really mean to scratch that itch?), there are others in which it feels overwhelmingly evident that my experience of exerting will was causally involved. In such cases, people have the distinct sense of being "the ultimate creators (or originators) and sustainers of their own ends and purposes" (Kane, 1996, p. 4). While some are prepared to accept such experiences as mere illusions, others feel there has to be something real about them. Although the libertarian view appears to be the default view among laypeople (Baumeister et al., 2009; Vohs & Schooler, 2008), it is

often characterized as a minority view among both scientists and philosophers (Bloom, 2004).[1] Nevertheless, there are a number of compelling arguments for keeping it in the running. These include:

The Experience of Free Will

The experience of free will is overwhelmingly compelling. As Searle (1984) observes, "The experience of freedom, that is to say, the experience of the sense of alternative possibilities, is built into the very structure of conscious voluntary, intentional human behavior" (p. 98). Although subjective experience is often considered a rather dubious source of evidence, it does inform our views of reality. For example, from a scientific perspective there is really no direct evidence that subjective experience exists at all, leading some to conclude that qualia itself is an illusion (Dennett, 1991). Nevertheless, many feel that despite the lack of objective evidence, experience is self-evident, as even the illusion of experience would itself have to be experienced (Schooler & Schrieiber, 2004; Searle, 1997). Although clearly not as self-evident as experience, volition has a similar self-evident subjective quality. The evidentiary significance of the experience of volition has weighed differently in various authors' speculations about free will. Some (e.g. Searle, Chapter 8, this volume; Shariff, Schooler, & Vohs, 2008) have considered it an important observation that gives teeth to the potential genuineness of free will but not necessarily proof of its existence. Others, however (e.g., Griffin, 1996; Whitehead, 1929), view it as a pivotal fact in the case for a libertarian view of free will. For example, Griffin distinguishes between hard-core and soft-core common sense with the former corresponding to notions that are so intrinsic to our nature that "they cannot be consistently denied" and the latter to "merely parochial notions that can be denied without pain of implicit inconsistency" (p.16). Examples of hard-core common sense include such things as the reality of the external world, the past, the future, and conscious experience, whereas soft-core commons sense include now defunct claims (such as the notion that the world is flat), as well most current scientific theories, which, while compelling, could in principle be similarly overturned by new evidence. In keeping with Whitehead, Griffin concludes that the experience of personal agency is so intrinsic to our day-to-day experience that it must be considered a hard-core common sense, giving it greater ontological status than the soft-core intuition of determinism. As Griffin puts it:

> "if we cannot really give up our intuition about freedom because it is inevitably presupposed in practice, we should instead turn our critical

> eye to those (soft-core) intuitions that seem to 'force us' to deny freedom in our scientific and philosophical theories" (p. 166)

The Functionality of Libertarianism

Closely related to the experiential argument for libertarianism is that of pragmatism. A belief in free will is a very useful thing. It underpins both the sense of moral culpability (see Pizarro and Helzer, Chapter 7, this volume) that prevents us from doing what we think we shouldn't and personal agency that gives us the get-up-and-go to do what we think we should. Although the utility of free will alone is clearly insufficient to justify its acceptance, if one is faced with deciding between alternative metaphysical views, each of which are irresolvable based on the extant evidence alone, then considering the pragmatics of the alternative views is a reasonable, if not fail-safe, approach. If a particular view is one that feels right to me, if it affords significant functionality, and if it remains a logically viable alternative, then this is a reasonable justification for me to maintain that view as long as I can. This call to pragmatism was one of the key reasons that William James (James, 1907) remained sympathetic to the libertarian view despite acknowledging the viability of the deterministic perspective.

Indeterminism

A precondition for the self to have a causal role in its actions is that it be possible that the individual could have done otherwise. If all of one's future actions are already 100% determined, then it seems the experience of making a genuine decision between real alternatives has to be illusory. Thus, a necessary precondition for free will is that the future not be written in stone. In recent years, libertarians have suggested that the degree of freedom necessary for genuine free choice might be provided by quantum indeterminacy. As Searle (Chapter 8, this volume) observes:

> . . . It looks as if, if there is any factual reality to the conscious experience of non-determinism, that is to say freedom, there must be some connection between consciousness and quantum indeterminacy.

It is often pointed out that quantum indeterminacy offers little solace for libertarians because having one's choices influenced by a combination

of deterministic forces and some random quantum element still leaves no room for the conscious chooser. However, Searle (Chapter 8, this volume) argues that this is a "fallacy of composition" by which it is assumed that "what is true of the elements of a system will be true of the entire system." Accordingly, it is at least possible that human choice could be subject to the nondeterminism observed at the quantum level without necessarily also acquiring the randomness associated with that level of analysis. As Searle observes,

> What I am suggesting is the logical possibility, though empirical unlikelihood, that the higher-level consciousness of voluntary, free decision-making would manifest the lack of causally sufficient conditions characteristic of the quantum level without inheriting the randomness of that level.

In short, by demonstrating the reality of indeterminacy in at least one level of nature, quantum mechanics reveals the possibility that free will could in principle be able to select between genuine alternative futures. If free will introduces a principled, rather than random way of adjudicating between these alternatives, then the possibility of individuals being at least occasionally "the ultimate creators (or originators) and sustainers of their own ends and purposes" remains viable.

The Importance of Effort

If genuine free will does exist, given all the evident influences that are outside of our control, it clearly must be highly constrained in the situations to which it could even conceivably apply. For William James (1899/1946), the existence of genuine free will was limited to situations that depend on voluntary attention, which *"consists in the effort of attention by which we hold fast an idea"* (p. 187). According to James, these incidences of sustained voluntary attention necessary for careful deliberation provide the window for the introduction of genuine free choice: "Our acts of voluntary attention, brief and fitful as they are, are nevertheless critical, determining us, as they do, to higher or lower destinies" (p. 189). Kane (1996) similarly suggests that the impact of genuine free will might be limited to relatively rare difficult decisions, what he refers to as "self-forming actions," in which individuals are torn between competing visions of what they should do or become. Ultimately, for Kane, James, Searle, and others sympathetic to the libertarian perspective, it is at these

critical junctures in which individuals willfully sustain attention in the service of making conscious deliberate decisions that individuals are most likely to have a truly causal impact on the direction of their lives.

The Value of Establishing Habits of Mind

If individuals devote great resources to thinking through their decisions at critical junctures and establishing a policy of how they wish to behave under certain circumstances, then this policy may enact itself automatically in cases in which it applies. In this manner, even if people act automatically at the moment that the choice is made, they may still be implementing an intention that is consistent with a well-thought-out goal. Like a sailor in high seas who can set a general course despite being unable to control the moment-to-moment motion of her craft, the deliberate establishment of personal policies of action may enable the will to exert an impact on one's course of action, despite the unconscious turbulence that moves us at any particular moment.

Agency as a Fundamental Aspect of the Universe

Some have argued that consciousness and agency, like mass and gravity, are fundamental aspects of the universe. The notion, termed "panpsychism" or "panexerperientialism," that all elements of the universe possess varying degrees of consciousness, has been held by a number of distinguished scholars including Leibnitz (1714/1989), Spinoza (1660/1955), James (1907), Whitehead (1929), and more recently, Chalmers (1995) and Griffin (1996). Although not all who favor panexperientialism see volition as a necessary element (e.g. Chalmers, 1995; Spinoza, 1660/1955), this perspective provides a way of conceptualizing how free will might exist, namely, as an inherent property not only of humans but also of all constituents of the universe.

Whitehead and his intellectual heir Griffin propose the existence of a hierarchy of compound individuals with ever-increasing degrees of sentience and volition. Inorganic materials, though constituted by elements each possessing an iota of consciousness, involve aggregations that do not compound into larger experiences. As a consequence, the agency inherent in inorganic material cancels itself out, leaving little trace of its presence (with the possible exception of the atomic level, where randomness can be viewed as the will of individual particles). In contrast, organic structures are assumed to enable the mental combination of constituent elements, creating ever-larger coherent mental experiences. Accordingly,

cell organelles possess a small element of sentience and volition, compounding into the increasingly greater experiences of individuals cells, brain structures, and ultimately human beings. Experience and agency grows as individual sentient elements amass into larger sentient individuals, somewhat akin to the way mass and gravity increase with larger physical compounds. It is well beyond the scope of this chapter to do justice to Whitehead's theory of panexperientialism, but suffice to say that one of the most brilliant philosophers of the twentieth century articulated a comprehensive and highly innovative vision for how free will manifests in the physical world. Readers are encouraged to see Griffin (1996) and Hunt (2009) for recent perspectives on Whitehead's views.

The Limits of Current Understanding

Many readers presented with the suggestion that consciousness and free will might be inherent aspects of matter are likely to believe science long ago dismissed such fanciful notions. However, a final, albeit related, core element of libertarian arguments is an acknowledgment that science is a long way off from a full understanding of the relationship between consciousness and physical reality (Chalmers, 1995), leaving room for the possibility of a host of potential ways in which consciousness might have a causal impact. James believed that this critical window of uncertainty surrounded the exertion of conscious effort in the service of a deliberate decision, noting that "the predetermination of the amount of my effort of attention can never receive objective proof" (p. 192). This led him to conclude that "such psychological and psychophysical theories as I hold do not necessarily force a man to become a fatalist or a materialist" (p. 192). Eccles (1986), Hameroff (2006), Kane (1996), Penrose (1987), Stapp (2007), and others also pin their hopes for a resolution of the causal impact of consciousness on various yet-to-be-determined relationships between consciousness and physical reality.

Increasingly it seems scientists have to be careful about what they claim is impossible. Additional dimensions of reality, parallel universes, time travel, and other concepts that used to be considered exclusively the domain of science fiction now are seriously entertained as physical possibilities (for a review, see Kaku, 2005). If time, as is often suggested, can be thought of as akin to another dimension of space, then perhaps, like space-time, it too is multidimensional. If so, it might be possible to move forward in time to alternative outcomes, each representing a different value in this additional dimension. Accordingly, we might move forward not only in time but also the temporal equivalent of left and right. From this perspective, free will might be the capacity of consciousness to

control, perhaps through effort or interpretation, which direction in time the next moment realizes. Such ideas are admittedly far-fetched, but so too is the notion that universes might be constantly splitting off as is currently suggested by the many-worlds account of quantum physics (Everett & DeWitt, 1973). The point is simply that there is so much still unknown about the nature of reality and its relationship to consciousness, that we must be very careful in imposing constraints on what that relationship will eventually prove to be.

Final Reflections on Alternative Conceptualizations of Free Will

Ultimately, each of the three approaches to conceptualizing the issue of free will has two things in common: each makes a compelling case, and each relies on a promissory note that future evidence will support its particular view. Hard determinism is able to bring an impressive array of empirical evidence to bear on the issue, but it requires one to accept that, in principle, it should be possible to perfectly predict all human behavior. Compatibilism has the strength of offering the middle-ground compromise position but requires one to accept that it will be possible to understand how genuine choice can be exist in a world in which the future is written in stone. Libertarianism fits most naturally with our personal intuitions, but it requires us to accept that some account will emerge for how consciousness can serve as a cause unto itself.

Many, perhaps most, will disagree with the above characterizations, seeing one of these views as clearly more compelling than the others. Importantly, however, those very same people may differ with respect to which view they see as the only reasonable one. The fundamental fact is that smart, well-reasoned people subscribe to all three perspectives. Some might argue that to suggest that we keep an open mind on this issue is akin to keeping an open mind on all scientific facts. Surely, I am not suggesting that we keep an open mind on whether or not the world is flat. If libertarians with their flighty dualist notions are given the same credence as hard-nosed scientifically minded determinists, what is to stop us from giving creationists equal room on the platform with evolutionists?

Ultimately, the progress of science requires a balancing act. On the one hand, scientific progress depends on the accumulation of knowledge. If the gaining of new facts does not enable us to draw new conclusions, then the enterprise of science is fundamentally bankrupt. On the other hand, science needs to be wary of overgeneralizing what it knows and prepared to fundamentally revise preconceived notions in the face of new evidence. The evidence is simply overwhelming that the

Earth is round, and that evolutionary processes take place. However, the evidence in the case of the free will debate is not of this nature, at least not yet.

Were this to be simply an academic issue, then scientists' perennial tendency to overstate the evidence for their respective positions would be of little consequence. But, as the first half of this chapter demonstrates, this debate is not simply limited to the ivory tower. Like it or not, scientists' opinions can influence both what people think and how they behave. Throughout history scientists have made premature claims with dangerous societal ramifications. For sure, we should continue to explore the illusions of free will, and the many ways in which our behaviors are influenced without our knowledge or intention. But we also should explore the potential ways in which conscious choice might have a genuine impact on our futures. The time may come when society will have to adjust itself to the scientifically validated conclusion that the experience of free will is a complete illusion, but that time is not yet upon us, and it may never be.

If science is not yet in a position to give people a definitive answer on the question of free will, what then should we tell them? My view is that scientists should inform the public of the facts but encourage them to make up their own minds. Let's face it: ultimately, the question of free will boils down to some very personal metaphysical questions about the nature of the human spirit and its potential to transcend the limits of physical reality. Beliefs about the nature of one's own being involve deeply personal questions on which all of us must make important leaps of faith. It is an inescapable fact that there are certain metaphysical presumptions that precede empirical observations. For example, there is no way to know that one is not simply dreaming his or her entire life. The determination of whether beings other than oneself are actually sentient is similarly empirically intractable. Ultimately most of us conclude that reality is real and that others have consciousness, not because we can prove these views but because the experience of reality and other minds is so compelling. For many people, the experience of a personal spirit is as phenomenologically evident as reality itself. Not all of us share that intuition, but recognition of the personal assumptions and phenomenological appraisals underlying our own views of reality may give us greater sympathy for how the same facts can be reasonably interpreted from different metaphysical perspectives. Time and time again, history has shown the dangers of metaphysical dogmatism. Rather than using science as a pulpit for indoctrination to our own personal metaphysics, let's simply be frank with the public about what we know as scientists and what we believe as individuals, and then encourage people decide what they think for themselves.

DISCUSSION WITH JONATHAN W. SCHOOLER

For the talk, J. Schooler focused on a metaphor briefly alluded to in the chapter in which free will is likened to sailing. Like a helmsman, free will sets a course but remains at the mercy of forces out of its control. Moment-to-moment actions may appear to be lacking volition, but nevertheless, with effort and good luck people often end up in the vicinity of where they wanted to go. Moreover, it was suggested that all people are all collectively sailing on the equivalent of a giant shock wave moving through a space-time multiverse. Through intention and perhaps interpretation, people may influence which branch of the multiverse they traverse, thereby providing the possibility of genuine alternative futures.

Isn't the helmsman in the sailing metaphor completely controlled by circumstance? If so, does the metaphor really capture the problem of free will?

The sailing metaphor assumes free will. The metaphor was designed to address the question, "If there were such a thing as free will, what would it be like?" The main point of the sailing metaphor is that free will must be constrained in fundamental ways. It must be constrained by environmental and genetic factors, and it must be susceptible to unconscious forces. The metaphor is designed to illustrate how control might operate among strong and persistent forces.

The question of free will is indeed separate and is better addressed by the proposition that there are multiple universes in which people are able, through the choices they make, to cause one of several possible alternatives to unfold.

One thing that is true about sailing is that different helmsmen have different levels of experience sailing. Is it true that there might be experience effects, such that the older one gets, the better one is able to understand one's limitations and motivations?

It is possible that when people become mindful of this metaphor, it may give them the sort of heuristic that will enable them to gain from experience in ways that they might not have otherwise. Regardless of whether the explicit use of the metaphor actually is helpful, the basic idea is to give people a way to think about consciousness and free will in a way that is helpful.

Nature has given people boats that vary to a great extent. Some people have sleek boats, and others clearly do not. However, experience can teach a person how to get the most out of the boat one has.

Can the claim that we are all on the same wave of consciousness be reconciled with the claim that we can all branch off into multiple universes?
The argument is not that there are multiple universes, but that there are multiple potential universes. Making choices and directing attention in one direction or another causes the realization of the possible next *present-time*. There are a variety of possible next present-times, or possible bifurcations. For instance, if a person chooses coffee over tea, he or she pushes everyone over to a universe in which that person consumed coffee.

However, it is still possible to reconcile the idea of a single wave of consciousness with the view that people branch off into their own individual realities as a function of the choices they make. One analogy that may illustrate that the gap between a single wave of consciousness and multiple individual realities can be reconciled is that of the limitation of people's free action in a free society. A free person can do causally anything to the universe that does not put others in a universe they don't like. Harmlessly typing on the computer does have causal consequences on the single wave of consciousness, but those causal consequences do not propagate out far enough to influence others' realities in a meaningful way. In other words, people can be on a single wave of consciousness and still maintain some level of independent reality, if the causal consequences of one's choices do not propagate out far enough to make individual realities a necessity.

Can the helmsman fall out of the boat?
In one way, if consciousness could continue without the body. That would be one way of falling out.

Can a zombie or robot direct the boat?
The sailing metaphor assumes consciousness, which is to say that the sailing metaphor is a model for how consciousness plays itself out in this reality. What consciousness is, in reality, is a separate question. One possible answer to that is that consciousness is actually a wave moving through the multiverse. This wave of consciousness is not to be confused with the sailing metaphor, in which waves are metaphorical.

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NOTE

1. It would be quite interesting to conduct a formal poll of philosophers and scientists to determine precisely what the distribution of opinions on this topic really is. Because libertarianism is such a taboo position, I suspect that there may be more closet sympathizers with it than is currently recognized.

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