Cognition 133 (2014) 502–516

Contents lists available at ScienceDirect

Cognition

journal homepage: www.elsevier.com/locate/COGNIT

It's OK if 'my brain made me do it': People's intuitions about free will and neuroscientific prediction

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ARTICLE INFO

Article history:
Received 9 April 2013
Revised 17 July 2014
Accepted 22 July 2014

Keywords:
Free will
Responsibility
Agency
Neuroscience
Prediction

ABSTRACT

In recent years, a number of prominent scientists have argued that free will is an illusion, appealing to evidence demonstrating that information about brain activity can be used to predict behavior before people are aware of having made a decision. These scientists claim that the possibility of perfect prediction based on neural information challenges the ordinary understanding of free will. In this paper we provide evidence suggesting that most people do *not* view the possibility of neuro-prediction as a threat to free will unless it also raises concerns about manipulation of the agent's behavior. In Experiment 1 two scenarios described future brain imaging technology that allows perfect prediction of decisions and actions based on earlier neural activity, and this possibility did not undermine most people's attributions of free will or responsibility, except in the scenario that also allowed manipulation. In Experiment 2 the scenarios increased the salience of the physicalist implications of neuro-prediction, while in Experiment 3 the scenarios suggested dualism, with perfect prediction by mindreaders. The patterns of results for these two experiments were similar to the results in Experiment 1, suggesting that participants do not understand free will to require specific metaphysical conditions regarding the mind–body relation. Most people seem to understand free will in a way that is not threatened by perfect prediction based on neural information, suggesting that they believe that just because "my brain made me do it," that does not mean that *I* didn't do it of my own free will.

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> Imagine a perfect neuroimaging device that would allow us to detect and interpret the subtlest changes in brain function…. the experimenters knew what you would think and do just before you did it. You would, of course, continue to feel free in every present moment, but the fact that someone else could report what you were about to think and do would expose this feeling for what it is: an *illusion*.
>
> [Sam Harris *Free Will* (2012, pp. 10–11)]

1. Introduction

In recent years, a number of prominent scientists have argued that free will is an illusion, claiming that research in neuroscience and psychology shows that our ordinary experience of and beliefs about free will are systematically

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http://dx.doi.org/10.1016/j.cognition.2014.07.009
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mistaken (e.g., Bargh, 2008; Cashmore, 2010; Coyne, 2012; Greene & Cohen, 2004; Harris, 2012; Montague, 2008; Tancredi, 2007; Wegner, 2002). Following Nahmias (2009), we will call those scientists who think free will is an illusion "willusionists." When willusionists challenge free will, they do so by explicitly claiming that we lack free will as it is understood by laypersons, that free will *as it is ordinarily understood* is incompatible with the naturalistic assumptions and the experimental evidence of the modern mind sciences. The willusionists advance a variety of arguments and evidence to defend this conclusion. In some cases, they suggest that neuroscience demonstrates that there is no non-physical soul or mind and assume that people think such a soul is required for free will (e.g., Cashmore, 2010; Montague, 2008). In other cases, they suggest that neuroscience is showing that people do not really make choices and assume that free will requires the ability to make choices (e.g., Coyne, 2012). In other cases, they suggest that neuroscience and psychology show that consciousness is epiphenomenal and assume that free will requires a causal role for conscious mental states (e.g., Libet, 1999; Wegner, 2002). And in some cases, they suggest that these sciences provide evidence for determinism or for mechanism and assume that free will is incompatible with determinism or mechanism (e.g., Bargh, 2008; Greene & Cohen, 2004; Tancredi, 2007). These arguments often overlap, but in every case, the willusionists refer to evidence demonstrating that information about brain activity can be used to predict behavior before people are aware of having made a decision (e.g., Bode et al., 2011; Libet, 1999; Soon, Brass, Heinze, & Haynes, 2008; Soon, He, Bode, & Haynes, 2013), and they use these findings as evidence of a naturalistic worldview that allegedly challenges our ordinary beliefs about free will.

In contrast to these willusionists' view, most philosophers hold that free will is compatible with the naturalistic worldview of science, even if the laws of nature turned out to be deterministic (e.g., Dennett, 2003; Fischer & Ravizza, 1998; Frankfurt, 1971; Wolf, 1990; see Bourget & Chalmers, 2013, for data on views held by philosophers). However, willusionists generally dismiss these accounts of free will as radical revisions to the ordinary understanding of free will. Coyne (2012) writes that compatibilists "have concocted ingenious rationalizations for why we nevertheless have free will of a sort. It's all based on redefining 'free will' to mean something else." Harris (2012, p. 16) writes, "the 'free will' that compatibilists defend is not the free will that most people feel they have." Greene and Cohen (2004, p. 1780) write, "intuitive free will is libertarian, not compatibilist. That is, it requires the rejection of determinism and an implicit commitment to some kind of magical mental causation." However, the willusionists' assumption that compatibilists are simply "changing the subject" is questionable. Existing evidence on non-philosophers' intuitions about free will suggests that many, perhaps most, people do *not* understand free will to be incompatible with determinism (Murray & Nahmias, 2014; Nahmias, Morris, Nadelhoffer, & Turner, 2006; cf. Nichols & Knobe, 2007). Furthermore, existing evidence suggests that most people do *not* understand free will to be incompatible with naturalism or physicalism (Mele, 2012; Monroe & Malle, 2010; Monroe, Dillon, & Malle, 2014; Stillman, Baumeister, & Mele, 2011).

It could be the case, as Harris (2012) argues, that people do not really understand what the neuroscientific evidence or the naturalistic worldview suggests. He writes, "If the laws of nature do not strike most of us as incompatible with free will, that is because we have not imagined how human behavior would appear if all cause-and-effect relationships were understood" (p. 11). Harris here offers an error theory for why it may *appear* that most people judge free will to be compatible with our actions being governed by the laws of nature, though they would not if they appropriately envisioned what this would mean. Harris helpfully offers a scenario that he thinks would get most people to appreciate how human behavior would appear if it could be understood in terms of law-governed neural activity. His scenario involves the specter of a "perfect neuroimaging device"—a device that can perfectly predict in real time everything a person will think or do even before the person is aware of what she is about to think or do. The device can accomplish this feat through the information provided by brain scans. The device allows neuroscientists to predict with 100% accuracy everything a person will decide and do, including any attempts to try to trick them or to be unpredictable. We will refer to this ability to perfectly predict decisions and behavior based exclusively on neural activity as "neuro-prediction." According to Harris, this neuro-prediction scenario is a useful way to help people understand that free will is "an illusion," because neuro-prediction makes salient what it would mean if all of our actions were completely governed by law-like relationships between brain and behavior (2012, pp. 10–11; see also Greene & Cohen, 2004, p. 1781).[2]

On the view favored by many willusionists, the possibility of neuro-prediction should conflict with people's view of free will for at least two reasons, though they are not always clear about whether they take these two reasons to be equivalent. First, willusionists often claim that neuro-prediction appropriately highlights the cause-and-effect relations entailed by the fully law-governed relationships between brain and behavior and claim that people take free will to be incompatible with behavior being fully law-governed in this way (Bargh, 2008; Cashmore, 2010; Coyne, 2012; Greene & Cohen, 2004; Harris, 2012; Tancredi, 2007). Second, willusionists often claim that neuro-prediction suggests the inexistence of a causally relevant non-physical mind or soul (Cashmore, 2010;

[2] For the purposes of this paper, we will not address potential objections to the possibility of *perfect* prediction of *all* behavior based on neuroimaging data. We are dubious that such technology will be possible *in practice*, though not for reasons that conflict with the potential truth of physicalism or determinism. Note that the existing experiments willusionists present as allowing prediction of decisions based on neural information do not provide real-time information that allows anything near perfect prediction of decisions of any complexity. For instance, Soon et al. (2008, 2013) were able to use information from fMRI scans to locate specific brain activity that occurred 4–7 s before participants were aware of making a decision and that correlated with their decisions about which of two buttons to press (2008) or about whether to add or subtract two numbers (2013), with an accuracy of roughly 10% above chance. These are impressive results, though nothing like what is described in Harris' scenario or our scenarios below.

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