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LETTER

Choice Isn't Simple. Reply to Pickard

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Abstract Pickard's contribution reminds me that conceptualizing choice is no simple matter. Pickard sees choice as entirely voluntary, while I argue that choice is only partially voluntary. Choices are based on appraisals of situations, which fluctuate due to external circumstances and internal states such as emotion and mood. Habit itself competes with volition, and all these parameters vary with development. Psychological factors such as delay discounting and especially one's belief in one's agency are critical for volitional choice as well.

Keywords Choice only partly voluntary · Psychological biases · Appraisal and circumstances · Mood and emotion · Predispositions · Role of self-efficacy · Neurobiology of disconnection · Resurgence of volition · No truce with disease model · Responsibility and change

I found this commentary [1] to be clear, insightful, and partly challenging, partly accommodating, to my own view of addiction [2]. Hanna Pickard's essay helped me put a few things in perspective, like the variability with which choice is understood and misunderstood across a wide variety of models of addiction, if not in the social sciences more generally. I can now see that there are several false dichotomies on the table. In his commentary, Nick Heather [3] identifies a false dichotomy between the disease model and the view that addiction is a moral failing: both are plain wrong. Pickard advances a somewhat different dichotomy: addictive acts are either voluntary (thus, chosen) or they are involuntary (thus, disease). She chooses choice rather than disease, and spends much effort explaining why such choice isn't blameworthy (with which I agree). But Pickard equates choice with voluntary choice, whereas Heather takes a more nuanced approach and incorporates both voluntary and involuntary processes in his idea of choice. I'm with Heather on this one. Choice is only partially voluntary, so Pickard's dichotomy is also false. The truth lies between the two poles.

Pickard starts off by saying that I reject the notion of choice. No, I don't think I do. What I reject is the classical idea that choice means voluntary choice. Later, in a footnote near the end of her article, Pickard presents my position in a more moderate light: "although he purports to be hostile to traditional choice models, it is possible he would not be hostile to a more nuanced choice model." [1] That's true. I think that choice models are too simplistic. The idea that any human act can be completely voluntary makes no sense according to current thinking in cognitive science and neuroscience. To understand choice in more detail, we must examine how a multitude of cognitive, emotional, environmental, and temporal variables impact on volition in decision making. Then we'll begin to see how much of choice is voluntary and how much is not.

First, we should consider whether voluntary (free) choice even exists. Philosophical and neuroscientific arguments suggest otherwise. Can free choice exist in a deterministic universe, where every event is a consequence of previous events? What do we make of experiments that

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show that the brain has already decided what it's going to do before our conscious decision to do it [4]? What about studies that show how choice can be perceived as free, even though it has already been biased by experimental manipulations [5]? Is free choice just a handy way of summarizing events that we'd like to repeat again in the future? I'm no philosopher, so I'm not going to try to tackle these existentially horrifying questions. Let's just say, for now, that some degree of volition is possible, that volition affects behavioral outcomes, and that volition is an intrinsic feature of that thing we call "choice." I think that Pickard and I could agree on that as a starting point.

Yet, unlike Pickard, I don't want to assume that choice is completely or even mostly voluntary. I think that volition interacts with other factors when we make choices. Here are some of those other factors, as I've outlined them in the target article and in *The Biology of Desire* [6].

Choices are based on appraisals of situations. I choose whether to sit on the right or left side of the train, based on my appraisal of which side will be the victim of direct sunlight. But the train changes its direction without informing me, and so my action becomes more arbitrary, based on a faulty appraisal. Addicts choose whether to get high or abstain based on appraisals of the quality of the high, the consequences of indulging, the proximity of other people who might approve or disapprove, and so forth. Since our appraisals are determined by factors outside our volition or awareness, especially in a complex situation changing moment by moment, the choice we make in that situation is less a function of individual volition and more a function of luck and circumstance.

Appraisals are also strongly affected by internal variables: mood states, present emotions, beliefs, one's (biased) recollection of the outcomes of previous (similar) events. But this list doesn't yet scratch the surface. There is my sense of emptiness and dislocation at this moment, compared with how I think I'll feel after getting high, compared with how much drug I possess or can afford, in the context of building excitement and/or building anxiety and shame. (In the target article I mention how loss and anxiety following a drug high can precipitate more drug seeking.) These internal state variables, as psychologists call them, are highly complex and dynamic. They look that much more complex and nuanced from a neural perspective, where good or bad moods depend on the self-modifying interaction of myriad elements. From either perspective, the constellation of internal factors changes from moment to moment. Since that constellation will certainly affect one's choice (e.g., to indulge or abstain), I can't see how that choice can be entirely voluntary.

At a developmental time scale, habits self-organize, evolve, consolidate, and so forth, creating a spiral of increasingly strong predispositions to seek certain rewards while alternative rewards become less salient. Is there any voluntary choice left after that habit congeals? Yes, I believe there is. Which is how people can quit. As Pickard neatly captures it, recovery involves choice, and choice cannot suddenly be imported into a system that has none. Pickard emphasizes the success of contingency management treatment, whereby addicts choose a monetary reward over a drug reward [7]. Satel and Lilienfeld [8] point to the success of this therapeutic approach for achieving recovery or abstinence. Pickard interprets this success as evidence that addicts can and do make choices. I agree, but I also see it as a demonstration that changes in appraisal, motivation, and social factors strongly influence volition. And here the role of belief and self-efficacy cannot be understated. Once addicts tune into the possibility of volitional choices, the mechanism underlying volition grows in strength and availability.

In the target article [2], I emphasize how alternative synaptic networks can compete with each other, but when any of these networks is activated repeatedly, it becomes stronger, more likely to win the competition. This is the case when addiction arises in development, but also when it dissipates, replaced by the desire for and belief in alternative outcomes. I also show that addicts temporarily lose the capacity or at least the familiarity with the capacity to make reflective judgments, and that loss is underpinned by a loss of connectivity between the prefrontal cortex and the striatum. Then I show that this connectivity can return when addicts recover, and I suggest that new connections between these neural systems allow desire and decision-making to work together in the service of nonaddictive goals. To put it simply, I see this as the resurgence of volition in a system overwhelmed by habit.

There are many other goads, nudges, constraints, and impacts on volition especially relevant to addiction. Most important are the psychological mechanisms of delay discounting and ego fatigue, both of which I outline in the target article and elaborate in the book. The passage of time is a critical factor in the sensitive relation between these variables and volitional choice. Ainslie's [9] notion of intertemporal bargaining addresses the interplay of different senses of self in the struggle to make decisions intentionally. I imagine that

volition is present, both in the urge for immediate payoffs and in the urge to trade these for future, longer-term benefits. Which means that volition is not a single vector but a complex array of intentions, in conflict with one another. Also critical are the roles of impulsive action tendencies and compulsive action tendencies, which I trace both in psychological and neurobiological terms. How much volition is available during the impulsive phase of addiction, as one's imagined future slides down a sort of chute into the "now"? Some, I think, but not much. Once the compulsive stage of addiction is reached and held in place by distinct neurobiological changes, how much volition is present? Now the behavioral trajectory is formed before one is even aware of making a choice. Still, as I note in my writings, compulsion is not abnormal or pathological. When we examine more mundane decisions, like whether to check that the stove is turned off, it's clear that volition and compulsion mix together, competing and cooperating, as a behavioral path takes shape.

Pickard states that her clinical work has led to a stance that strikes a middle road between the moral model and the disease model of addiction. But in my thinking and my communication with many addicts, I come to a different conclusion. I see the best way forward as the "third stage" in our understanding of addiction outlined in my article: According to a developmental-learning model, interpersonal, social, emotional, and personality factors all contribute to a developmental trajectory that continues to adjust itself, to consolidate itself, guided by feedback between experiences and neural network modifications. So we don't have to go anywhere near a moral model, nor should we waste another moment conceiving of addiction as a disease. Using personal reports, psychological research and theory, and neurobiological findings as our sources, we can achieve a far more detailed understanding of choice in the context of development, with its phases of relative stuckness and relative flexibility. At the same time we have the potential to specify links between neuroplastic changes and environmental forces, including interpersonal "scaffolding" to help addicts hold onto their goals for a future that's different from their past.

Despite this difference in our outlooks, I am moved by Pickard's discussion of the role of responsibility. I agree that choice implies responsibility, and I agree that this should not be an opening for stigmatization (as she says, we also have a responsibility to adopt the most fair and most honest conceptions of addicts and their behavior). Specifically, Pickard wants to use the concept of responsibility to "identify where there exists capacity for change." [1] In other words, when and how the mechanisms of choice can best be activated to accomplish change. "Agency needs to exist to be mobilized," she says, and I agree. Thus, volition must already be present in the psychological makeup of the addict if it is to be put to use in the service of recovery. Contingency management treatment (and perhaps other approaches that highlight social contracts) can draw attention to the possibility of choice, scaffold future-oriented intentions, and, through repetition, strengthen a capacity that has been weakened by recurrent surrender to habits. This seems very important, because addicts can lose track of their own volition, just as they lose track of future-oriented goals, due to their entrenchment in "now" (delay discounting) and the habit of *not* thinking about what they really want. I review some of these mechanisms in the book and target article, but without Pickard's clinical experience I have been grabbing at straws as to how to implement them in treatment. So I appreciate the new ideas this commentary brings to mind and the invitation to identify and clarify concepts needed to make sense of them.

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