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Book Review

George Ainslie (2001) *Breakdown of Will*. Cambridge: Cambridge University Press.

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Breakdown of Will is presented as a model of decision making that is based on two interrelated phenomena, "hyperbolic discounting" and "intertemporal bargaining". These are interesting phenomena, and I would have enjoyed reading about them in a theoretical review paper, but they did not make for a good book about decision making. The phenomena are not actually linked together into a coherent model, they are presented in contradistinction to weak alternative models, and like other economic-style theories of human behavior, they are descriptive rather than explanatory, and as such they cannot be directly applied to change or help people. Befitting the audacious title, Ainslie seems to simply use hyperbolic discounting and intertemporal bargaining as a starting point for a long series of armchair introspections on the nature of human behavior. It would have been much more satisfying to see Ainslie couch these two interesting descriptive phenomena within an explanatory, rigorously supported, biopsychological model of decision making.

The first two chapters review previous theories and models of the will. This would have been useful, but most of the descriptions are oversimplified and seem to exist only as straw men for his argument. Moreover, Ainslie does not return to these theories after presenting his own model, to compare their various strengths and weaknesses.

The third and fourth chapters are the meat of his model; they explain hyperbolic discounting and intertemporal bargaining, which were devised to explain the following finding: If subjects are offered fifty dollars now, or two hundred dollars five years from now, most take fifty dollars now. In contrast, they are offered fifty dollars in 10 years, or two hundred dollars in 15 years, most take two hundred dollars later. According to Ainslie, this seems illogical and cannot be explained by existing theories of decision making, since the preference changes even though the absolute reward (fifty or two hundred) and the distance between the two rewards (5 years) is constant. Ainslie explains these shifts with "hyperbolic discounting" by transforming the traditional exponential relationship between time and value into a hyperbolic relationship such that value increases more steeply as the distance to the reward approaches. The decision-making process that subjects engage in is described as an "intertemporal bargain" between different selves, across different time scales. For example, the instant gratification part of me is compelled to take a doughnut off of the cart in the hallway because it tastes sweet and may increase my arousal; on

the other hand, the long-range planner in me does not want the fattening pastry because it will spoil my long-range goal to be thin and healthy. Thus, decisions are battles between these different time-range selves.

While this all seems fairly straightforward, these chapters were obtuse and it took a great amount of effort to understand these phenomena well enough to explain them here (if I even got it right). His main points are made without good examples, the depictions of the model are counterintuitive, and he does not explain well how hyperbolic discounting is related to intertemporal bargaining. This is even more a problem in the later chapters because extensions to the two ideas begin to pile up without being linked explicitly to a main model or to each other (e.g. a prisoner's dilemma among your different selves, the recursive effect of future decisions on current ones). The book is a self-proclaimed "long line of inference from the simple fact of hyperbolic discounting," to "admittedly sketchy" (p. 186) theories of negative empathy, scapegoating, *schadenfreude*, and why old people continue to read despite the fact that their minds are feeble and their lives are over (I wish I were kidding about this last one). While chapters three and four would have made for a nice theoretical review paper, these disorganized and poorly researched extensions of the model caused me to lose track of the big picture and even brought his scholarship into question.

Even without these extensions to the model, hyperbolic discounting and intertemporal bargaining are unsatisfying. Ainslie's model is presented in contradistinction to economic and conditioning models, which are unable to explain why people change their preference depending on the time scale, or why people indulge addictions despite great cost to their life. This is an unimpressive defeat because these traditional models are simplistic and descriptive, rather than complex and explanatory. Ainslie is able to account for both of these phenomena, but he does it by piling many simplistic, descriptive models on top of each other. A truly modern, interdisciplinary theory of decision making could explain these findings with a traditional cost/benefit model that incorporates existing knowledge in biopsychology. This would include how organisms evolved to deal with their environment and how nervous systems work, and as such the model would be explanatory and could be applied to help resolve destructive tendencies. For example, there are four main biopsychological reasons why people change their preferences in Ainslie's experiments:

1). Pragmatics A bird in the hand is worth two in the bush. The longer you have to wait for the payoff, the more likely there is going to be a problem so it is better to have less money now than a bit more later (ask any creditor about this one…).

2). Salience I am drawn to the immediate option because I can make a mental picture of getting the money now; I know what I would be wearing, how I would feel, what I would buy etc. Once the event is in the future, such that the circumstances are abstract, this is no longer a factor.

3). Meta-memory I know that I will be remembering and thinking about the money between now and later, so it is better to take less now and not have to worry about it. In a few years, I know that I will forget about the money altogether, so the anticipation between the two choices goes away, and I have the added benefit of pleasant surprise when the larger check comes in the mail.

4). Time classification The money now is relevant to me, whereas the money later is not (due in part to salience and meta-memory). Time is not psychologically continuous as it is on his graph, but it classified into functional categories such as "now and "later," that depend on what is relevant to the context. In a video game, "now" is the few hundred milliseconds in which your response would be relevant, in a soccer game it is a few seconds, and in life-changing events such as moving or marrying, it can be months or years.

Given these factors, you could change the outcome of the experiment if you took steps to convince the subjects that the payoff in the future was secure, or if you forced subjects to think about what they will be doing and why they will need the money in the future. The reasons people engage in addictive behavior, despite the great costs is more complicated than why well-adjusted college students choose money now versus later. But a biopsychological cost/benefit, winner-take-all model of decision making is still adequate to explain these decisions.

The nervous system evolved mechanisms to make experiences necessary for survival and reproduction nonaversive, if not pleasurable (walking, running, mating, caregiving). Addictive experiences are fast, concentrated versions of these naturally-rewarding phenomena that are immediately and intensely rewarding, but have negative consequences that are displaced in time, and merely probable (e.g. a hangover the day after drinking, cancer decades after smoking). As such, you have a very good representation of the reward for engaging in the behavior, but little representation of the consequences. So, you decide to have that third drink at the bar because in your cost/benefit analysis, you have a strong input for how good it will feel to drink it, but only a weak input for the headache and nausea you will feel tomorrow. Paradoxically, the next day you can access the pain but not the pleasure, so in retrospect you decide it was not worth it. You can face the same situation again and again and still not learn to avoid the third beer because you cannot learn the association between the disparate reward and punishment and because you cannot access the pain at the time of decision. This inability to imagine a state you are not in is called the "hot-cold empathy gap," and explains many addictive behaviors (George Loewenstein, 1996).

There are additional reasons that you are likely to drink a third or a fourth beer, related to the physiological properties of the substances. Substances like alcohol decrease inhibition and alter your ability to read your own body signals, increasing the likelihood that you will have another. Addictive substances that are characterized by binging also follow a progression from a brief high to a compensatory low that feels even worse than baseline and can accumulate over time into intensely aversive withdrawal. These states increase the need for the high, generating a cycle of engaging in the behavior repeatedly until resources or health run out.

In contrast to the negative consequences, the positive rewards of addictive experiences are usually immediate and definite; you learn about the reward easily and can access the reward in response to the stimuli. Since the reward follows immediately from the stimulus and the negative consequences do not, in order to avoid binging and its consequences, you have to avoid the stimulus altogether. Stimuli that are more salient (attended to, immediate, physically present) activate neural structures maximally and prepare a response by the organism. The beer sitting in front of you is very salient and will prime drinking behavior and it's immediate consequences. In contrast, stimuli that are perceptually remote (the beer at the store down the street), that you have not experienced enough (exotic substances), or that have only weak effects will not prime behavior and are easy to resist. Thus, most of us probably resist heroin because we don't really know its effects and it is not readily available in our environment; on the other hand, people with an addiction have to avoid their preferred stimulus altogether and even places and people they associate with the stimulus (read: the reward).

These basic features of biology and psychology explain why people drink despite the hangovers, why people gamble despite eventual poverty, why people shoot heroin despite the loss of friends and relationships and family. But they also beg the question, why don't all people drink excessively, gamble away their savings, and shoot heroin? As mentioned above, different people are exposed to different things, and

exposure determines to a large extent what someone becomes addicted to if an addiction develops. There are also individual differences in the types of things that are rewarding for the individual. If your greatest motivation is to avoid responsibility or conflict, drunkenness actually satisfies short and long-range interests and the consequences are less important than the benefits. If your overriding motivation is to receive the admiration and approval of others, then exercising and doing things for other people require little willpower. Even assuming you are rewarded by a given stimulus, there are still genetic/environmental differences in brain chemistry that affect the extent to which something is rewarding, the extent to which one can modulate their feelings in order to control behavior, and the extent to which one can alter their state in a more positive direction without drugs or artificial stimuli. Ainslie does not discuss individual differences, and doing so would solve many of the problems that economists have in predicting behavior.

Economic theories of decision making are limited by their emphasis on numbers, graphs, and tangible, linear variables. Evolution has produced nervous systems that use neural representations to mediate between stimuli and responses that develop over time to meet the demands of the environment at hand. Inputs that are tightly linked to their outcome are easy to learn and have a greater impact on behavior. Stimuli that are more present prepare responses to a greater extent. People with different developmental experiences will find different things rewarding. The response that "wins" in this winner-take-all neural battle for response will be the one that is more rewarding to the individual, but reward comes in many different shapes and sizes and is only applicable to the experience of the individuals.

I summarize my experience of reading *Breakdown of Will* by applying Ainslie's own model, but augmenting it with the a more effective biopsychological cost/benefit approach. Reading the book was not inherently rewarding, but I completed it with the aid of coffee because I am highly rewarded by social acceptance and approval and punished by accusations of irresponsibility and neglect. Had the book been slightly more boring, my desire to be responsible a little less strong, or my coffee a little less potent, I would not have finished the book and you would not be reading this review. If Ainslie had exercised more of his own willpower in the organization and writing of this book, my own effort could have been spared. Realizing why I completed the book and this review despite the great cost to my time and energy, I think I will choose differently in the future. Decisions are the outcome of a complex, chaotic interaction of competing interests, and knowing what you do is less helpful for changing behavior that knowing why.

Reference

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