

X Addiction II: Incentive Salience

Is withdrawal really the problem? Addictive behaviors happen before withdrawal can set in; and formerly addicted patients remain vulnerable to re-addiction long after it has finished.

MODELLING THE PATHOLOGY I: WAYWARD PLEASURE

An early view: addictive drugs hijack the pleasure system. By interfering with the dopamine system they give intense pleasure; so addicts, wanting pleasure, form instrumental desires for them.

MODELLING THE PATHOLOGY II: INCENTIVE SALIENCE

Wanting is relatively isolated from liking (separate behavioral measures for each), from anticipated liking, and, in human beings, from beliefs about what is best. Dopamine regulates (one kind of) wanting.

IS THIS LEARNING?

Two kinds of learning:

Learning about the world: learning + *wb* (learning who, what, where); changes instrumental wants; Learning to like, want etc. Not finding out anything. Simply acquiring intrinsic wants.

AN ANALOGY: A SELF-TRAINING NOXIOUSNESS ALARM

A sensing module; an alarm module. The sensing module sends a training signal to the alarm module using standard reinforcement learning algorithms:

$$\text{mean}_{n+1} = \text{mean}_n + (1/(n+1)) [\text{value}_{n+1} - \text{mean}_n]$$

The alarm module, with its own recognitional capacities, would become sensitized to whatever kind of thing it was seeing when it received the training signal. It would acquire a dispositional response, triggered when it saw other instances of that thing. The cue would cause it to release the alarm signal.

But the two systems shouldn't be as independent as this suggests. A strong response from the sensing module should result in the alarm signal going off even if the substance had never before been sensed as noxious. How to achieve this: training signal also acts as alarm; training signal boosts alarm signal; training system leads to large temporary gain in sensitivity.

LEARNING TASTES

Our taste for foods work in a similar ways (like rats we are opportunistic, and so have to acquire our tastes).

Addictive substances might artificially boost or imitate the training signal, giving rise to wanting without liking. Effects on both immediate wanting and long-term wanting. Wyvell findings. Long term wanting is neither a standard disposition nor an occurrent state; it is more like a disposition

to enter an occurrent state given a certain cue. And it in turn is regulated by other features of the creature's internal state e.g. level of hunger, salt deprivation.

WHY DOESN'T THIS RESULT IN COMPELLED ACTION?

In human beings wanting (craving) does not lead immediately to acting. Addictive desires are not undermined by the knowledge that they will bring no pleasure; but they may be resisted by self-control.

Hard work: Baumeister etc.

Ideal would be to ignore them (Mischel; Gollwitzer) but that isn't available (esp. if dopamine works also as a gating signal). Reconceptualization; distraction; toughing it out.

WHY DOES ADDICTION WANE? THREE OBVIOUS POSSIBILITIES

- Either: the desire gets less (the long march to Parkinson's).
- Or: the motivation to employ the self-control gets stronger.
- Or: the self-control gets stronger.

Or some combination of these.

In any case, the interesting question isn't: Is the agent free to resist?

It is: How much hard work does it take to resist?