



Between genes and addiction: a critique of genetic determinism

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The quest for a genetic component to addiction is promising and its evidence irresistible. But just how resistible? What does it tell us about the condition of heroin addiction or why some people drink to excess and others don't? Writer and academic Craig Reinerman believes that our thirst for the simplicity of determinism is thwarting our understanding of addiction. Here, Reinerman explains why addiction will continue to be a complex and misunderstood phenomenon, with or without genetic research.

The New Yorker magazine once published a cartoon in which a genetic scientist, replete with lab coat, clipboard and genome chart, rushes into a lab and announces to his colleagues, *'I've found it! I've found the gene that makes us think everything is determined by a gene!'* We can be grateful for recent advances in genetics, but this cartoon succeeded in getting laughs because these advances are often stretched to the silly extreme of genetic determinism. In the drug and alcohol field, this can lead to a lot of misunderstanding.

Geneticists themselves are usually circumspect in their claims, but the media and the public are often less careful in what they *infer* from geneticists' findings. When 'the gene for' something is identified, there is an unsettling tendency to think this is determinative, that cause and cure come with it. This is rarely the case. Most often, a gene tells us only about part of the risk and then only in probabilistic terms.



The actual onset or presence of a disease is typically contingent on many other variables (including other genes) with which the gene must interact in a certain way to effect cause. Type-2 diabetes, for example, has a genetic component (Wade, 2006), but its prevalence is also influenced by poverty, education and the density of fast food outlets in a group's social environment.

Even with discrete diseases, the population-attributable risk of a variant gene usually does not account for all or even most of the observed cases. Genes may determine 100% of hair colour, but there is nearly always a large 'environmental contribution' to any more complex behavioural phenomena.

Distinguishing one cause from many effects

With the protean set of behaviours that are lumped under the heading 'addiction' (Reinerman, 2005) the environmental variables loom larger still, which makes for greater indeterminacy. Social scientists are trained to beware of all monocausal explanations for good reason: human behaviours are always influenced by many factors on many levels. Single alleles or genes

Is genetics science making it easier or more difficult to understand and break the cycle of addiction?

almost never directly determine specific behaviours. While there are cross-drug similarities in addictive behaviour, no one 'addiction gene' can account for all the disparate forms of deviance now lumped under the addiction umbrella: alcoholism, workaholism, crack binges, daily benzodiazepine use, compulsive gambling, obsessive shopping, codependency, cigarette smoking and what is now being called 'internet addiction disorder' (suffered by 'onlineaholics') (Kershaw, 2005).

Yes, habits are hard to break. But just because the treatment industry offers similar forms of help for all these problems does not mean that they share the same aetiology, genetic or otherwise.

Genes generally do not change very much or do so very quickly in a given population, but the social conditions under which populations live do (Duster, 2005). Such conditions take us further toward understanding the prevalence of 'addictive' behaviours in a population than genes do – for example, the spread of crack cocaine in ghettos in the 1980s or of crystal methamphetamine in the de-industrialised small towns of the rust belt at present.

Cocaine misuse is far more prevalent in the USA than in the Andes region where the cocaine is produced and where the coca plant has flourished for millennia. Does this mean that Americans have a gene that increases the risk of cocaine addiction, or that Peruvians have a gene that protects them from it? It seems likely that such differences have more to do with the frenetic pace and mass consumption culture of the USA versus the embedded rhythms and rituals of the agrarian culture of the Andes.

Resisting determinism among alcoholics

The addictive behaviour that has been most carefully studied is alcoholism. In their classic cross-cultural study of drunken comportment, MacAndrew and Edgerton (1969) found divergent drinking patterns and problems across groups who came from the same genetic stock but who, by accidents of history, developed very different cultural rituals around drinking.

There is little doubt that alcoholics have a higher likelihood of having come from alcoholic parents, and twin studies show concordance rates of drug abuse and dependence higher among identical than fraternal twins (Kender & Prescott, 1998). But it is also true that alcoholism is found in

millions of people whose family trees show zero signs of alcoholism and alcoholism is *not* found in millions of people whose family trees are full of alcoholics.

So, in scientific terms, this means that even if geneticists someday discover a set of genes that make some people more susceptible to alcoholism, this susceptibility is neither necessary nor sufficient to explain the presence of the condition. There is no reason to doubt that the same is true for other varieties of addictive behaviour.

Do humans vary in their physiological responses to alcohol and other drugs? Of course. Does this physiological variation mean that some people are more likely to use excessively and develop problems? Probably. Does this mean there is a 'gene for addiction'? It is not yet clear, but drug and alcohol professionals would be well advised not to sit on a hot stove while waiting for it to be discovered.

For even if such a gene were finally identified, it seems unlikely that it would by itself provide a causal explanation of addictive behaviours. Come the genomic utopia, we will still be faced with the complex, troubled human beings whose lives and behaviours have been forged in the same old messy melange of interacting variables – biological, yes, but also sociological, cultural, and psychological – such that at some point in their lives they drink or take drugs too much.

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