

The premature dismissal of the problem posed by genetic influences on behaviour for freedom and moral responsibility

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The aim of this paper is two-fold. The first part of the paper will hopefully unpack the idea of genetic determinism; I will look briefly at the primarily biological arguments used to refute it and examine and critique in more detail the philosophical arguments used to dismiss any possible threat that genetic influences pose to human freedom. I will argue that those arguments are flawed and that therefore the possible threat has been dismissed prematurely. The second part of the paper will briefly explore and elucidate some possibilities of how genetic influences could pose a threat to freedom. In particular I will look at three approaches suggested as possibilities by the philosopher Patricia Greenspan.

When the worry of genetic determinism is discussed with reference to human behaviour in popular debate, there seem to be three separate ideas which constitute it:

- i) the idea that the way in which genes give rise to phenotypic traits is deterministic (or at least more deterministic than the way environmental causal factors give rise to behavioural characteristics),
- ii) the idea that genetically-based traits are immutable (or at least less mutable than environmentally-caused characteristics), and
- iii) the idea that because of the way genes influence human behaviour, human beings are not free.

Most often, discussions of genetic determinism are based in biology and the philosophy of biology and deal with the first two ideas.

To look at some examples of how these ideas are discussed in the literature we will start by looking at Dan Dennett who starts off his discussion of the threat of genetic determinism in his book *Freedom Evolves* by defining it as the 'ineluctability' of genetically based traits (with the concept of ineluctability seeming to encompass both the first two ideas of GD - the inevitability and immutability of genetically based traits). He argues a) that no contemporary thinkers endorse genetic determinism and b) that there are only very rare cases such as Huntington's disease where a gene will definitely give rise to a trait which is unchangeable. Marcia Baron, in her paper 'Crime, Genes and Responsibility,' emphasises that if a person had a particular genetic makeup which is correlated with criminal behaviour then they "would simply be genetically predisposed towards such behavior. He or she would, as philosophers say, be inclined but not necessitated to act violently."¹ Here, Baron is arguing against the first idea, the idea that the way in which the genotype gives rise to behavioural phenotypic traits is deterministic in nature.

Dawkins, in his paper 'Genetic Determinism and Gene Selectionism,' also uses this tactic, observing: "The belief that genes are somehow superdeterministic, in comparison with environmental causes, is a myth of extraordinary tenacity."² He also argues against the idea that genetically-caused traits are more fixed, asking: "Why are genetic determinants thought to be any more ineluctable..... than

¹ Marcia Baron, 'Crime, Genes and Responsibility', *Genetics and Criminal Behavior* edited by David Wasserman and Robert Wachbroit, (Cambridge: Cambridge University Press, 2001), 202.

² Richard Dawkins, *Genetic Determinism and Gene Selectionism*, in *Genethics*, ed. Justine Burley and John Harris (Oxford: Blackwell Publishing, 2002), 254.

'environmental' ones?"³ One of the aims in his paper is to examine the reasons why people may have been under the impression that he, and sociobiologists in general, endorsed GD, and explaining why and how this impression is false. Firstly, Dawkins talks about the metaphors he used in *The Selfish Gene*, such as the metaphor of a person being like a survival machine for genes or a robot vehicle programmed by its genes. Insisting that he did not himself associate "rigid inflexibility"⁴ with robots and that "from being synonymous in the popular mind with a moronically undeviating, jerky-limbed zombie, 'robot' will one day become a byword for flexibility and rapid intelligence."⁵ Dawkins looks at how talk of a 'gene for' such and such a trait could mislead people into believing that there are simple and straightforward causal links between a gene and behavioural traits associated with it and moreover that the gene's sole task is to bring about a particular behavioural effect. He explains that "'genetic variation in the population for' a trait X is exactly what we mean when we talk, for brevity, of a 'gene for' X."⁶

In their book *Sex and Death*, Sterelny and Griffiths explain genetic determinism as the idea that the "central role of genes in development implies that these characteristics are resistant to change by the manipulation of the developing individual's social environment."⁷ They also say that "A trait would be literally genetically determined if it could not be altered by changing nongenetic factors, a situation that we can be sure never arises. More realistically, a trait may be said to be genetically determined when altering it by changing nongenetic factors is difficult or impractical."⁸ They also point out that ANOVA scores have no bearing on whether a trait is genetically determined. Using the statistical technique 'analysis of variance' or ANOVA we get a score - given as a percentage - which describes whether everyone with a trait has a particular gene and nobody without the trait has it (100%) or whether the "possession of the trait is random with respect to possession of those genes"⁹ (0%), or somewhere in the middle. Then they explain that "high scores for genetic factors in an analysis of variance do not show that it is hard to alter the trait by nongenetic means and hence do not show genetic determinism."¹⁰ Sterelny and Griffiths provide an example to illustrate this point: the disorder Phenylketonuria (PKU). They say: "under standard conditions, possession of the PKU mutation accounts for 100% of the variance between those who suffer PKU retardation and those who do not."¹¹ However, they explain, the phenotypic trait of PKU retardation is not determined by the presence of the mutation because it can be prevented if the person with the PKU mutation sticks to a diet low in Phenylalanine which the disorder prevents them from metabolising. In other words, many or most phenotypic traits, such as PKU retardation, are the result of a combination of factors; genetic, nongenetic biological and other environmental factors which interact to produce and develop the phenotype of an organism. This is known as the interactionist consensus in biology and it "admits not only that both genetic and environmental factors are needed to produce a finished product, but also that changes in either can produce changes in the finished product."¹² The upshot of this, according to Sterelny and

³ Dawkins, 254.

⁴ Dawkins, 258.

⁵ Dawkins, 259.

⁶ Dawkins, 262.

⁷ Sterelny and Griffiths, *Sex and Death: An Introduction to Philosophy of Biology*, (University of Chicago Press 1999) 13.

⁸ Sterelny and Griffiths, 98.

⁹ Sterelny and Griffiths, 98.

¹⁰ Sterelny and Griffiths, 98-99.

¹¹ Sterelny and Griffiths, 99.

¹² Sterelny and Griffiths, 15.

Griffiths is that genes are "context-sensitive difference makers"¹³ and interactionism makes genetic determinism unlikely.

So as we have seen, there is a lot of effort put into showing why genetic determinism is untrue and unlikely from a biological perspective, and many arguments from both biology and philosophy of biology to say that the way in which genotype affects phenotype isn't normally deterministic - it is unusual for a phenotypic trait to be inevitable given a particular gene - and to say that phenotypic traits, once established, are not usually fixed and unchangeable via some kind of environmental influence.

My aim in this paper is not to try and challenge these kinds of arguments, instead I assert that even if the ways in which genes influence behaviour are not deterministic and even if those behavioural traits are mutable and dependent on various environmental factors, there could still be a sense in which genetic influences on behaviour could be a threat to freedom. I will critique the philosophical arguments that dismiss the third part of the overall idea of genetic determinism. I will argue that on the basis of these arguments (or arguments very like them) we have dismissed the possible threat that genetic influences on behaviour poses for freedom and moral responsibility too early.

The first argument used to dismiss any possible threat to freedom:

Argument One (A1): The Parity of Reasoning Argument, which says there is no principled difference between a) environmental causal influences and b) genetic causal influences on behaviour. We either have to worry about both a) and b) and their implications for freedom and moral responsibility or neither. We accept the fact that there are environmental causal influences on human behaviour and we don't worry about their implications for freedom and moral responsibility, so we should take the same attitude about genetic causal influences.

Some examples of philosophers using this kind of reasoning to dismiss GD in the philosophic literature include Dan Dennett, Marcia Baron, Richard Dawkins, Susan Oyama and Janet Radcliffe-Richards. Dennett, in his book *Freedom Evolves*, asks: "Besides, what would be so specifically bad about genetic determinism? Wouldn't environmental determinism be just as dreadful?"¹⁴ Marcia Baron observes that some people "might feel that, although they are not sure why, a gene linked to criminality would render the person less free to refrain from committing crimes of the sort to which he is disposed than would environmental factors."¹⁵ But, she insists, "there is no good reason to believe that genetic predispositions to criminality undermine responsibility more than environmental predispositions do."¹⁶ Dawkins raises this kind of issue when he asks "Why are genetic determinants thought to be any more ineluctable, or blame-absolving, than 'environmental' ones?"¹⁷ Susan Oyama points out: "Biological causation is not the only factor that diminishes personal responsibility. The language of environmental causes apparently eliminates agency altogether."¹⁸ Richards argues that "if you are a materialist.....you still believe that everything about us is ultimately a product of genes and environment in some combination, and we are clearly no

¹³ Sterelny and Griffiths, 99.

¹⁴ Daniel C. Dennett, *Freedom Evolves*, (London and New York: Penguin Books, 2003). 157.

¹⁵ Baron, 205.

¹⁶ Baron, 213.

¹⁷ Dawkins, 254.

¹⁸ Susan Oyama, *Evolution's Eye: A Systems View of the Biology-Culture Divide*, (Durham and London: Duke University Press, 2000), 170.

more responsible for the formative environment part than we are for the genes." ¹⁹

So this is a pretty common line of argument to take against the view that genetic determinism or genetic influences on behaviour could pose a threat to freedom. I argue that The Parity of Reasoning argument tacitly assumes that it is incompatibilist freedom (ultimate freedom) that we should be concerned with, and that if one assumes that then one can agree that there is no principled difference between environmental and genetic causal influences. However, I will argue that this may not be the case if we are concerned with compatibilist freedom.

First, a few definitions: Compatibilist freedom, or basic freedom is the kind of freedom one has iff one can deliberate in a particular kind of way about one's desires and the choice one has to make, choose based on those deliberations, and act based on those choices. Basic Freedom is a kind of mesh theory. Robert Kane, in his introduction to *The Oxford Handbook of Free Will*, explains that: "Mesh theories insist that the freedom required for responsibility is a function of the appropriate 'mesh' or connection between agents' choices and actions, on the one hand, and their reasons or motives for acting, on the other." ²⁰

Kane explains in broad brushstrokes what the notion of Incompatibilist freedom or Ultimate Freedom is supposed to mean to us: "we believe we have free will when a) It is 'up to us' what we choose from an array of alternative possibilities and b) the origin or source of our choices and actions is in us and not in anyone or anything else over which we have no control." ²¹

A concept mentioned here which is an important one in the debate and is closely associated with ultimate freedom, is the principle of alternative possibilities (or PAP). This is basically the principle that one is free to perform action A at time T iff there were genuine alternatives to action A that could've been performed at time T. Now whereas compatibilists might interpret this 'could've' in a counterfactual way (in other words they would add a phrase like 'if one had wanted'), incompatibilists interpret this factually. 'One is ultimately free to perform action A at time T iff there were genuine alternatives to action A that could've been performed at time T given exactly the same antecedent conditions. Or 'given exactly the same facts of the matter right up until time T'.

So being ultimately free involves being the author and ultimate originator or source of one's own choices and character, as opposed to being able to trace chains of causation back into external factors or factors not under one's control; and it also involves there being genuine alternative possibilities (not merely counterfactual possibilities).

If it is true that all human behaviour is ultimately traceable to environmental influences then human beings could not have ultimate freedom. So I agree that if it were UF we are interested in it would not matter if the influences were genetic or environmental. If we are just interested in incompatibilist freedom/ UF, then there is no principled way of distinguishing between different kinds of causal factors; any causal factor which is the ultimate explanation for an agent's choice

¹⁹ Janet Radcliffe Richards, *Human Nature after Darwin: a philosophical introduction*, (London: Routledge, 2000), 134.

²⁰ Robert Kane, 'Introduction: the Contours of Contemporary Free Will Debates' in *The Oxford Handbook of Free Will*, E d. Robert Kane, (Oxford and New York: Oxford University Press, 2002, 19.

²¹ Kane, 'Introduction: the Contours of Contemporary Free Will Debates', 5.

that isn't the agent himself would rule out freedom. Patricia Greenspan, in her paper 'Genes, Electrotransmitters and Free Will,' introduces compatibilist or basic freedom by explaining the kind of distinctions that it allows us to make that incompatibilist freedom/ UF does not. Compatibilist/ basic freedom allows us to make a principled distinction between different 'modes of influence' or ways that a causal influence can work. On the one hand there are modes of influence that "allow the agent the usual causal role in generating behavior, via deliberation, choice, and other exercises of what we call 'the will' even if these are ultimately traceable to external factors"²² (we'll call this type of 'mode of influence' Type A) and on the other hand "another mode of influence that essentially shortcuts the will and bypasses normal agency, by linking behavior more directly to external causes"²³ (we'll call this type of 'mode of influence' Type B). The idea is that if we are interested in basic freedom, then just as some environmental causes are thought to 'shortcut the will' and undermine freedom, so may some genetic causes. In other words, if the causal mechanism via which genes affect behaviour is a causal mechanism of the second type B, rather than the first A, then we may have a principled way to differentiate between genetic and environmental influences. More likely is the idea that just as environmental influences *per se* do not undermine basic freedom, since most operate via a causal mechanism of type A, but there are some kinds of environmental factors which do undermine freedom, and operate via a causal mechanism of the type B, so it will also be for genetic influences.

A2: The argument that whatever view one takes on the compatibility of determinism and freedom, "the insertion of the word 'genetic' is not going to make any difference."²⁴ In other words i) if you are a hard determinist then specifying kinds of determinism won't add anything to your case for universal determinism and its incompatibility with freedom. ii) if you are a Libertarian then freedom is already ruled out by environmental influences. iii) if you are a compatibilist and you think that universal determinism is compatible with freedom, then you must think that any specific kind of determinism must also be compatible.

I argue that while parts i) and ii) of A2 seem right, part iii) goes wrong in categorising genetic causal influences as a species of determinism somehow contained within the idea of universal determinism and thereby assuming its compatibility with freedom. Instead, it should be recognised that there are many kinds of causal influence regarded by compatibilists as ruling out freedom, and the possibility considered that genetic influences on behaviour could be similar to these causal influences in salient ways and might therefore pose a threat to compatibilist freedom. This goes back to the idea that with compatibilist freedom we can distinguish between different types of causal mechanism and some genetic influences could work in such a way so as to undermine freedom.

So, we have left open the possibility that there might be circumstances in which a genetic influence on a person's behaviour might mean that behaviour is not free. And we have supposed that the reason that the behaviour is not free is not because it has been determined - it's not because the behaviour had to take place given the genetic situation or because once the gene has given rise to the behavioural trait that trait is fixed. So what is the reason that genetically-based traits may make people unfree?

²² Patricia S. Greenspan, 'Genes, Electrotransmitters, and Free Will' in *Genetics and Criminal Behavior* edited by David Wasserman and Robert Wachbroit, (Cambridge: Cambridge University Press, 2001), 245.

²³ Greenspan, 245.

²⁴ Dawkins, 255.

Patricia Greenspan, an American philosopher who is most well-known for her contributions to the philosophy of the emotions and the philosophy of psychiatry, is pretty unique insofar as she has written a few papers considering just that question.

I will present her two main suggestions here, and hopefully say something useful about each, as well as present a third idea that takes the problem in a different and unusual direction.

In her paper 'Behavior Control and Freedom of Action,' Greenspan outlines an account of psychological compulsion – “What it is to have to do something, and hence to do it unfreely, on psychological grounds.”²⁵ The account isn't given in terms of determination by psychological causes, where a particular behaviour has to occur given the psychological cause (i.e. psychological determinism). Instead, Greenspan gives an account that allows a central role for the agent's rationality and makes cases of psychological compulsion similar in important respects to cases of coercion. Her main example in this paper is Alex, the central character in *A Clockwork Orange*, who goes through a special program to recondition violent offenders, and is conditioned to feel extreme discomfort when confronted with images of violence. Greenspan tries to explain why we think of Alex as unfree after going through this reconditioning process, and does so in terms of psychological compulsion. She explains: “He has to refrain or suffer the consequences – consequences which make it unreasonably hard for him to do otherwise. He is unfree, in short, because he is faced with a kind of threat, like a robbery victim coerced at gunpoint, with intense discomfort as his only option to compliance.”²⁶ Refraining from violence, complying with the compulsion, becomes the reasonable thing to do, under the circumstances: “The action he is compelled to take will be reasonable – reasonable in light of an unreasonable threat – and hence that this case of psychological compulsion can be given a rational explanation.”²⁷ This explains why we do not need to ask whether Alex's actions are psychologically determined in order to show why he is unfree: “Though the agent's reactions are deranged, in a way, his actions are rationally influenced by them; so we need not refer to any nonrational principles of motivation to explain his compulsion to act.”²⁸ So according to this account Alex is unfree to commit acts of violence in the same kind of way as a robbery victim is unfree to keep his money. In order to be free on this account “he need not be unable to resist the threat or be completely incapacitated by fear.”²⁹ Greenspan continues: “We say he has no choice because he has no real choice – no real or reasonable option to turn to instead – and not because there is literally only one thing he can do.”³⁰ I would argue that this gels with normal real-life intuitions about responsibility attribution, that just because the robbery victim literally could have kept hold of his money, it doesn't mean that he freely handed it over. Similarly, just because Alex can commit a violent act, doesn't mean his refraining from doing so is entirely free.

Greenspan elaborates on this by saying “Perhaps an act is unfree if it would be unreasonable to expect the agent to do otherwise, even when he has good reason to – so that unreasonable discomfort, the amount sufficient for unfreedom, is

²⁵ Patricia S. Greenspan, 'Behavior Control and Freedom of Action', *Philosophical Review*, Volume 87, 1978, 225.

²⁶ Greenspan, 1978, 231.

²⁷ Greenspan, 1978, 231.

²⁸ Greenspan, 1978, 231.

²⁹ Greenspan, 1978, 231.

³⁰ Greenspan, 1978, 232.

discomfort too intense to expect the agent to bear, relative to some presumed or standard set of circumstances."³¹

Again, I would argue that this idea mirrors how responsibility is thought about in everyday life. It would be unreasonable for us to expect the robbery victim / bank teller to take a bullet in order to save some (insured) money. On the other hand there might be some (extreme) circumstances where it would not be unreasonable for us to expect someone to take a bullet, (in a situation where the consequences of not doing so are dire). In everyday life we often weigh the consequences of an action against an individual's discomfort at not doing it.

Greenspan further develops these ideas in her paper 'Free Will and the Genome Project,' and uses them to explain how genetic influences on behaviour could make people unfree whether they determine behaviour or not, (i.e. without taking a stand on the free will vs. determinism debate.)

She sees psychological compulsion as a kind of internal constraint on behaviour which threatens "the Aristotelian notion of character formation."³² Greenspan gives an account of reactive traits, e.g. "a low threshold for control of aggressive impulses"³³ not as "strict causes of action in the sense implied by determinism, or even as generating such causes under specific circumstances, but rather as conditions affecting the difficulty of a given action for some agent."³⁴ So in other words, the reactive traits don't 'make us' or directly cause us to act in a particular way, but they make it more likely that we will behave in such a way "by making alternatives harder for us."³⁵ Greenspan reiterates in this paper the role of rationality in this picture: "negative feeling states such as nervousness or other forms of emotional upset are seen as 'motivating' in so far as they constitute pressure on the agent toward ameliorative action."³⁶

Greenspan comments that "On the explanation I have given in terms of emotional pressure an act can be unfree . . . even if it is not causally determined. If the psychological difficulty of performing certain actions is thought of as an internal form of constraint, or psychological compulsion, then this point is essentially an application in a different direction of contemporary philosophers' treatment of cases in soft determinism."³⁷ What Greenspan means by this is that although an action is not necessarily unfree on a compatibilist account just because it is determined, there are still some actions that a compatibilist would categorise as unfree, if whatever influenced that action somehow bypassed normal agency, and worked outside of normal motivational channels. Popular examples include, actions performed due to hypnosis and psychosurgery. These types of action are considered unfree independently of determinism. Similarly, behavioural traits which amount to a psychological compulsion making other types of behaviour unreasonably difficult for an agent would make the agent unfree whether or not his behaviour is determined.

According to Greenspan traits such as these, whether "determined by genetic endowment or by certain environmental factors – for example, prenatal environment, or conditions in early infancy, or traumatic events in adult life –

³¹ Greenspan, 1978, 233.

³² 'Free Will and the Genome Project,' *Philosophy and Public Affairs*, 22 (1993), 32.

³³ Greenspan, 1993, 34.

³⁴ Greenspan, 1993, 34.

³⁵ Greenspan, 1993, 34.

³⁶ Greenspan, 1993, 35.

³⁷ Greenspan, 1993, 35-36.

would seem to be imposed on the agent in a way that does not fit the Aristotelian model assumed in philosophers discussions of character development.”³⁸ There are two interesting points here. Firstly, that Greenspan is saying that genetic influences pose no special threat that isn't also posed by certain environmental influences. So the aetiology of these behavioural traits which act as internal constraints on behaviour, (in a certain sense) doesn't matter.

The aetiology of a trait matters when we look at whether it fits with our usual picture of character formation. Genetic influences or the types of environmental influences (already mentioned) on a trait bypass normal motivational channels when they don't allow for the kind of intellectual co-operation that Aristotle seems to envisage in his picture of character formation, because, Greenspan says, they seemed to be imposed on the agent. The kind of question about freedom discussed in the nature / nurture debate and which reinforced the nature / nurture dichotomy was “Would environmental influences on behaviour mean that human beings aren't free?” In this particular regard the nature / nurture dichotomy appears to be unhelpful as it may turn out that genetic influences share an important quality / feature with some kinds of environmental influence but not others that makes the behavioural traits that result from them a particular kind.

When I went through some definitions of compatibilist and incompatibilist freedom I mentioned the principle of alternative possibilities.

Compatibilists argue that the 'could have done otherwise' requirement should be interpreted as a counterfactual statement. In other words they say that when we try to see if someone 'could have done otherwise' in order to attribute freedom / responsibility we don't want to stipulate 'given the same antecedent conditions'. When I say “I could have made that shot” after failing to pot a ball in a game of pool, I mean it in a counterfactual sense. I mean, if I had taken more time to cue the shot properly, if my hand hadn't slipped on the cue, if I'd chalked the cue properly. I don't mean given exactly the same antecedent conditions I could've potted it. The compatibilists therefore accuse the incompatibilists of illicitly narrowing the meaning of 'can'. Therefore according to the compatibilists even if the statement 'I could have made that shot' isn't true in the narrow sense, in the wider counterfactual sense it is, and therefore the action was free. The counterfactual interpretation mirrors how people actually talk about and attribute freedom and responsibility in everyday life. Similarly when we say 'I had no choice' we don't necessarily mean that there was literally no alternative choices, just that there were no reasonable alternatives. I would argue that coercion and our intuitions about it is a reflection of this attitude towards counterfactual interpretations of 'could': when a robbery victim says 'I had no choice but to hand over the money' they don't mean it literally, that there really was nothing else that they could've done. They mean that the only other alternative (getting shot in the head) was not a reasonable alternative. Just because in the strictest possible sense they 'could have done otherwise' and had choice, doesn't mean that they were free. This kind of common usage reflects widespread intuitions about freedom and responsibility.

However, there are a number of potential problems with this approach. Firstly, as it isn't directly empirically informed there is the possibility that it will not fit with the empirical results of behavioural genetics. Secondly, can we really interpret the threat of emotional disturbance as the psychological equivalent to the gun pointed at the coercee's head? Thirdly, there is the question of whether coercion actually makes us unfree. On the standard compatibilist view of freedom, coerced

³⁸ Greenspan, 1993, 37.

individuals must be considered free, so long as the threat does not overwhelm their capacity for deliberation. And it is unclear whether any standard account of freedom can account for coercion in a way that meshes with the intuitive idea that coerced actions are unfree. Phillip Pettit, in his 2001 book *A Theory of Freedom*³⁹ says that any view of freedom that cannot account for freedom in this way is lacking plausibility, and tries to give a theory in which one component (discursive control) rules out the possibility that coerced action could be considered free. Other philosophers take the approach of detaching blameworthiness from ideas of freedom and moral responsibility and assert that coerced action is free but not blameworthy. My point is that it is controversial to say that coercion makes agents unfree and if it does there is considerable puzzlement and disagreement as to how. So it seems that the foundations on which this approach of Greenspan's is built are shaky.

In 'Genes, Electrotransmitters and Free Will,' Greenspan outlines an alternative account of genetic influences and how they might undermine freedom. This account is based on research in Behavioural Genetics which suggests that some individuals lack an adequate supply of various biochemical resources which allow for behavioural control and are at least partly constitutive of what we ordinarily call 'the Will'. Greenspan comments: "The current research attempts to locate causes of criminal behavior in a genetic abnormality in the supply of electrotransmitters and other biochemical factors that regulate self-control. The usual appeal is to serotonin shortage: 'impulsivity' is the associated trait, manifesting itself in aggressive behavior where other factors are in play, but also at issue in other forms of behavioral or mood malfunction such as depressive tendencies."⁴⁰ She goes on to explain that on this model in these kinds of cases the individual is not subject to unusually strong impulses that shortcut his will by constituting a kind of threat that coerces him. Instead, he is subject to the same impulses as everyone else, it's just that his Will (or the biochemicals which constitute it) is depleted and he is unable (or less able) to resist normal impulses. Greenspan explains: "The cause on this account, rather than shortcutting the will, shortchanges it: it denies the agent the very stuff of self-directed agency."⁴¹ If this kind of shortage really does affect the individual's ability to exercise self-control, and really does amount to a depletion of the Will, then it is clear that any individual suffering from an abnormality which causes such a shortage is not free. If we go back to Greenspan's explanation of Compatibilist unfreedom as involving influences that bypass normal agency or work outside of normal motivational channels. It seems reasonable to extend this to influences that undermine normal agency itself and that pre-empt the possibility of normal motivational channels.

What are the benefits of this approach? Firstly, it is informed by empirical results. Secondly, the idea that what we call the Will can be interpreted as a folk psychological concept which is being recast by neuroscience in terms of neurochemical factors means that the process of recasting related concepts like self-control or weakness of will in similar neurochemical terms can begin. If it appears that certain individuals cannot resist normal impulses, then that raises the question of whether those individuals are suffering some kind of neurochemical abnormality. So the approach fits with a general project in neuroscience.

Greenspan's third approach to thinking of how genes affecting behaviour might make human beings unfree is more unorthodox than the main two ideas which I

³⁹ Phillip Pettit, *A Theory of Freedom: From the Psychology to the Politics of Agency*, Polity Press, 2001.

⁴⁰ Greenspan, 2001, 248.

⁴¹ Greenspan, 2001, 249.

just talked about. It construes the problem entirely differently. The idea is this: what if genetic influences on behaviour threaten freedom not because they trace the chain of causation to something outside the agent and outside his control, but the opposite. Greenspan explains: "Tracing the chain of causation to the agent, to his essential self, rather than to something beyond his agency, is the source of worry here. Let me call this "genetic essentialism"."⁴² This seems at least plausible because of the intuition that I would argue is quite common there is a space between the essential self of an agent and that agent's behaviour. We want to make a distinction between someone doing X and them being X. For example we sometimes hear people say of someone who has just been in a fight "He's not a violent person" or something similar. It's worth mentioning that this is not an idea that Greenspan particularly endorses, or unpacks much.

Whether or not any of these particular accounts/approaches is in the end convincing, I think what is clear is that more research needs to be done in examining the implications of the empirical results of behavioural geneticists. I hope I have made the case to say that just because most of the popular worries about genetic determinism arise out of an ignorance of the way that genes work, this doesn't mean that we as philosophers can dismiss the idea that some kinds of genetic influence could pose a threat to freedom and agency in some individuals.

⁴² <http://www.philosophy.umd.edu/Faculty/PGreenspan/>