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Author(s): P. S. Greenspan

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P. S. GREENSPAN

Free Will and the Genome Project

Along with the many practical ethical problems posed by the U.S. Human Genome Project, a recent National Institutes of Health report of the Working Group on Ethical, Legal, and Social Issues indicates an interest in research on the project's philosophical implications for the concept of human responsibility and the issue of free will versus determinism.¹ The idea that behavioral tendencies (for example, criminal tendencies) might be linked to genetic endowment reliably enough to allow them a place in a map of the human genome raises the specter of control by external forces. At least one popular reply is that the sorts of results the project is likely to come up with, like current results linking personality traits such as shyness to genetic endowment, leave room for environmental influence.² But this question, familiar in the social sciences, of "nature versus nurture" seems to be beside the point: genes *in conjunction with* environmental factors pose the same threat to individual autonomy where the individual lacks the requisite sort of control over his environment, even supposing that his parents and other members of society might

An earlier version of this article was delivered at a symposium arranged by the APA Committee on Philosophy and Medicine at the annual meeting of the American Philosophical Association, Eastern Division, December 1991. I am grateful to Bernard Gert for providing that opportunity to carry further the project on free will that I began in 1975–1976 during my year as Mellon Postdoctoral Fellow at the University of Pittsburgh. Let me also thank David Wasserman for providing me with some further readings from the scientific literature, Lindley Darden for a factual correction, and Christine Korsgaard for discussion of my final point.

1. See the pamphlet put out by the U.S. Department of Health and Human Services and the Department of Energy *Understanding Our Genetic Inheritance* (Springfield, Va.: National Technical Information Service, U.S. Department of Commerce, April 1990), pp. 65–69, esp. p. 69.

2. See Jerry E. Bishop, *Genome* (New York: Simon and Schuster, 1990), pp. 318–19.

have been able to control his environment for him. Whether his behavior is causally determined depends on whether there is—as it may be even if it is not *genetically* determined.

For reasons that this example begins to bring out, though, I want to argue that the Human Genome Project itself poses no *special* problem for human freedom, understood in relation to the philosophical issue of free will versus determinism. It seems to pose a problem only if one muddles the interpretation of the issue or of the project that is supposed to bear on it. There is a need for conceptual clarification to point this out, perhaps, but I see no need for “research” in the sense that implies original investigation.

However, I also want to probe a bit deeper to identify a distinct set of philosophical worries about freedom that seem to have been misplaced onto the standard issue, the issue of freedom versus determinism, in this discussion and elsewhere. After arguing that the genome project has *no* real bearing on free will versus determinism, I shall attempt to identify the threat it poses to freedom partly by detaching it from this standard version of the free will question. I shall argue that the worrisome forms of genetic influence that the project might uncover do not really presuppose determinism. But what they do presuppose—some form of internal or psychological constraint on behavior—suggests an alternative version of the free will question as the source of popular fears about scientific explanation of human behavior. What is under threat on this version of the question is the Aristotelian notion of character formation and self-control.

Why might genetic influence *seem* to raise the question of determinism, first of all—more so, that is, than the various sorts of environmental factors that might be taken as causes of behavior external to the agent’s decision-making processes (the processes we have in mind by “will” in “free will”)? Let us understand determinism on a simple definition as the view that every event has some prior cause from which it follows necessarily. With the definition taken to cover human *acts* its upshot is commonly summed up as the determination of our acts by events “before our birth”—a time at which our apparent exercise of choice could not possibly have been effective. Pure genetic influence (nature rather than nurture) of course provides the most clear-cut instance of causal factors operating before birth. But the reason is just that it provides the most *direct* instance—a causal chain whose immediately prior link (at least on a sim-

plified version of the story) takes us back to a stage preceding the existence of an agent with developed decision-making capacity. However, a chain with some intervening links—one that explains an agent's behavior by reference to his parents' treatment of him, say, and then traces the latter back to causes before his birth—would be no less deterministic. The relevance of the genome project to the question of determinism on this account is just its tendency to raise the question in the popular imagination by raising the possibility of causal explanation in stark and simple form.

Note that this argument against any real *philosophical* bearing of the project on free will versus determinism does not depend on "soft" determinism—the acceptance of a notion of freedom that is compatible with determinism, or *compatibilism*—as in most philosophers' discussions of the issue.³ It allows that determinism might indeed undermine free will, as *incompatibilists* hold, but makes the point that purely genetic causal factors pose no *more* of a threat than the mixture of causal factors that the genome project is more likely to help identify. There is also an independent question to be raised—still without questioning the popular opposition between free will and determinism—about whether the project or its successful application to behavioral traits really presupposes *determinism*, the sort of thoroughgoing causal explanation of behavior that is presupposed by the philosophical problem of free will.

Determinism is often thought of as an assumption required by scientific explanation, at least until one gets to the micro level, where physicists can allow for randomness of a sort that the explanation of rational behavior rules out. However, the behavioral generalizations cited as examples of the sorts of results we might get from the genome project do not really apply directly to behavior—specific dated acts of the sort that

3. See my "Behavior Control and Freedom of Action," *Philosophical Review* 87 (1978): 225–40, reprinted in *Moral Responsibility*, ed. John M. Fischer (Ithaca, N.Y.: Cornell University Press, 1986), pp. 191–204. See esp. p. 233 for the extension of my argument to incompatibilism.

For the classic statements of soft determinism see Thomas Hobbes, *Leviathan* (Oxford: Basil Blackwell, 1957), pt. 1, chap. 6; and David Hume, *An Inquiry Concerning Human Understanding* (Indianapolis: Library of Liberal Arts, 1955), sec. 8. A central contemporary version of the view appears in Harry G. Frankfurt, "Alternate Possibilities and Moral Responsibility," *Journal of Philosophy* 66 (1969): 828–39, and "Freedom of the Will and the Concept of a Person," *Journal of Philosophy* 68 (1971): 5–20. My own view was formed more immediately by reflection on a related piece by Wright Neely that allows for degrees of freedom; see Neely, "Freedom and Desire," *Philosophical Review* 83 (1974): 32–54.

determinism is meant to cover—but rather to behavioral or personality *traits*, which amount to *tendencies* to act, typically based on emotional reactive tendencies. Shyness, for instance, might be held to make certain acts or omissions more likely without strictly making it impossible for the agent to do otherwise in the way that determinism entails. And a general behavioral tendency such as that presumably manifested in criminal behavior may have a similar basis—say, in a low threshold for control of aggressive impulses.⁴ The outcome of the genome project will still be enlightening and useful (and in some ways still unnerving) even if it is limited to mapping genes onto such reactive traits, leaving their precise link to behavior a matter for further speculation and debate. Insofar as it is mediated by something *besides* genes, however, the link need not be strictly deterministic; and perhaps this is what the common appeal to environmental factors, or nature versus nurture, is really meant to suggest.

The alternative sort of influence I have in mind here depends on taking reactive traits 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. That is to say, instead of simply making us act, they make us more likely to act in a certain way by making alternatives harder for us. Thus, for instance, in order to explain why someone who is shy is unlikely to raise a question in discussion, we need not go so far as to say that raising a question is literally *impossible* for him. We can content ourselves with a claim that his shyness makes talking in a group extremely upsetting for him—this is part of what it *means* to be shy—and conclude that he is unlikely to talk, on the basis of some sort of general assumption about the probability of an agent's taking the "path of least resistance" in deciding among behavioral alternatives. There may be more than one way of defending such an assumption, but my own suggestion is that it makes sense as part of the notion of basic rationality: negative feeling states such as nervousness or other forms of emotional

4. Research on hormonal and other biological causes of aggressive behavior picks out "impulsivity" as a broader personality trait exhibiting simpler correlations than the tendency to aggressive behavior *per se*; see, for example, Diana H. Fishbein, David Lozovsky, and Jerome H. Jaffe, "Impulsivity, Aggression, and Neuroendocrine Responses to Serotonergic Stimulation in Substance Abusers," *Biological Psychiatry* 25 (1989): 1064; and Gerald L. Brown and Markku I. Linnoila, "CSF Serotonin Metabolite (5-HIAA) Studies in Depression, Impulsivity, and Violence," *Journal of Clinical Psychiatry* 51 (April 1990): 34.

upset are seen as “motivating” insofar as they constitute pressure on the agent toward ameliorative action.⁵ On this view an agent motivated by shyness appeals to that trait at least subliminally as part of his reason for action—he is avoiding a bad state of feeling (and resultant deficiencies in the sort of action he can manage to perform) by declining to speak. There may also, of course, be a deterministic explanation of his action that could substitute for this appeal to rationality *in light of* his reactive propensities; but my point here is just that the explanatory force of the appeal to rationality does not *require* determinism.

One might conclude, then, that a mapping of genes onto reactive traits of the sort envisioned as the likely outcome of the genome project for questions of human behavior should give us no pause at all as regards freedom. Basic traits like shyness are not chosen anyway, whether or not they are genetically or otherwise determined. There are sometimes long-term strategies for changing them, of course, on the model of Aristotelian habituation; but, if anything, the genome project is likely to provide further possible strategies for change. So why worry? Whether *action* is determined—the issue of free will versus determinism—will remain a point of contention. But I think there is still a problem, a problem about free will in some *nonstandard* sense, though philosophers’ preoccupation with the standard question in combination with popular confusion about the issues keeps it from being distinguished clearly.

First of all, on the explanation I have given in terms of emotional pressure an act can be *unfree*—and unfree by reason of lack of control, let us say—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’ treat-

5. See my discussion of how emotions function as reasons in *Emotions and Reasons: An Inquiry into Emotional Justification* (New York: Routledge, Chapman and Hall, 1988), esp. pp. 153–75; cf. my “Behavior Control and Freedom of Action.” Though noncausal, this approach to rational motivation essentially makes out *unfreedom* in terms of a kind of internal coercion. It thus stands in contrast to other ways of understanding free will without reference to the question of determinism, such as that provided by Bernard Gert and Timothy J. Duggan in “Free Will as the Ability to Will,” in *Moral Responsibility*, ed. Fischer, pp. 205–24 (see esp. p. 214); cf. note 7 below. For present purposes it is important that the view attempts to stay within the phenomenal realm: it introduces talk of rationality but makes this out in terms of components of self and experience that scientific theories also are concerned with and could conceivably reorder in our picture of the human personality.

ment of cases in defense of soft determinism. Besides humdrum cases like that of constraint by personality traits such as shyness, the literature abounds with cases of hypnosis and psychosurgery in which the subjects' consequent lack of freedom is explained independently of determinism, though determinism is assumed to be true. But again, the non-deterministic explanation of unfreedom does not *imply* soft determinism. Instead, it allows for the popular assumption of incompatibilism and to that extent remains neutral on the free will question, if that is taken to mean the standard philosophers' question of free will versus determinism. On the other hand, it brings out independent reasons for worry about freedom, popular but also properly philosophical, on the assumption that the nondeterministic explanation of unfreedom may be extended beyond extraordinary cases to the cases that the genome project covers.

In other words, it seems possible that morally significant aspects of personality of the sort summed up by the notion of moral *character* are genetically determined and in turn control behavior to a degree that undermines freedom, even supposing that individual dated acts are not similarly subject to deterministic explanation, so that determinism is false. The philosophical literature on freedom as moral autonomy often deals with questions of character-causation that are relevant here even without the usual implications for compatibilism.⁶ We can see how an ordinary trait like shyness might occasionally be morally important to the extent that it restricts an agent's possibilities of self-control—for example, if it keeps him from speaking out forcefully in a group to prevent some evil scheme. But we might do better to turn for illustration to the suggested explanation of criminal tendencies in terms of the inability to control aggressive impulses.

The point to note is that if supplemented in the right ways, a genetic explanation of the relevant traits might tend to exonerate the offender. He is not responsible for his genetic makeup—whether he has an extra Y chromosome, for instance—and such strategies as may exist for modifying either it or his behavior in light of it are not available to *him*. Even as supplemented by the techniques of genetic engineering that might be

6. See my discussion of the character and control models of unfreedom in "Unfreedom and Responsibility," in *Responsibility, Character, and the Emotions: New Essays in Moral Psychology*, ed. Ferdinand Schoeman (Cambridge: Cambridge University Press, 1987), pp. 63–80.

developed as a result of the genome project, they may not be strategies that we can reasonably expect the agent himself to know about and set into operation. The trait that makes it hard for him to restrain himself is out of his control in the way that an incapacitating illness is—not completely (there are remedies one can take, if a medical expert prescribes them), but enough at least to mitigate responsibility for what he does. And it has that status at least partly *because* it is “in his genes,” a matter of genetic endowment.

This is not to say that environmental influences could not yield personality traits that were similarly resistant to self-control. The point is just that a trait determined by genetic endowment *or* by certain environmental factors—for example, prenatal environment, or conditions in early infancy, or traumatic events in adult life—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. The Aristotelian model demands a degree of intellectual cooperation from the agent, if only in discerning occasions for manifesting a trait that is initially inculcated in him by rote learning. Developing the virtue of *good temper*, for instance—the Aristotelian mean with respect to anger—involves more than a passive shaping of behavior from without.⁷ The cultivation of a settled disposition to respond with a degree of anger suited to the circumstances depends on a normal ability to attend to reasons for controlling anger, even under situations of practical stress. Without this capacity the agent could not be said to merit *blame* for his personal defects; but as a feature of emotional makeup the capacity for self-control might well turn out to have a genetic basis.

The genetic case stands out from *most* environmental influences with the same outcome in that there is rarely anyone else to blame either. And though the explanation does not depend on determinism in the philosopher’s sense of universal event-causation, it may have a similar upshot

7. See Aristotle, *Nicomachean Ethics*, trans. David Ross (Oxford: Oxford University Press, 1987), bk. 4, sec. 5; cf. esp. bk. 2, secs. 1 and 3. My ensuing argument will allow for a roughly Aristotelian notion of responsibility, though in fact my own view differs from Aristotle’s in its distinction between positive and negative influences on decision. For Aristotle voluntariness depends rather on the distinction between internal and external influences; cf. *ibid.*, bk. 3, sec. 1, esp. his account of coerced acts as voluntary at 1110a4–19ff. (cf. also his account of anger as voluntary at 1111a24–b5). However, the contrast he later draws between cowardice and self-indulgence suggests that he thinks some sort of positive/negative distinction is derivable from his account; see esp. 1119a22–34 (cf. 1117a34–35).

for an agent's general *patterns* of behavior over time—arguably the proper focus of concerns about self-control. It might be argued, that is, that even if determinism is false, on the assumption that it is hard but *possible* for an agent incapable of acquiring good temper as a general trait to control aggression on a given occasion, the temperament of such an agent does rule out an overall record of controlled response. The psychological pressures on him are intense enough to ensure that he will commit a violent act at some time or other, though when and how are subject to variation of a sort that strict determinism rules out. This amounts to a modification of determinism, limiting causal explanation to broader units of behavior than individual acts. It is a legitimate object of philosophical worry insofar as it seems to undermine common attributions of responsibility.

However, it does not yield a formally similar variant of the standard free will question unless it also extends beyond special or extreme cases of pathological emotional makeup, so that whether *anyone* commits a crime comes out as causally determined, in a way that does not afford a pivotal role to rational self-control. That is, even if normal emotional makeup is found to be a matter of genetic endowment, this “enabling condition” of moral education will *allow for* responsibility for action rather than undermining it, according to the argument just sketched. What will turn out to be genetically determined on this account (as so far stated) is just that it is *not* impossibly hard for the *normal* agent to learn to exercise control over aggressive impulses. So we do not yet have a threat to freedom in the normal case, or at least not as a consequence of genetic mapping.

What the popular picture, or one such picture, adds to my sketch of the sense in which violent or criminal tendencies may be unfree independently of determinism seems to be not just a looser variant of determinism for abnormal cases but, more importantly, a way of making out normal propensities as *incapacities* rather than capacities. The underlying worry, I think, is that what passes for receptiveness to moral education or its upshot in self-control really amounts to a kind of moral *timidity*, understandable by analogy to our other example, shyness: a fear of disobeying authority, deviating from the group, or something similar. The thought is that we *all* might be unfree with respect to our patterns of law-abiding behavior—not because our behavior is determined but because it is constrained by reactive traits that exert psychological pressure

toward action, making it emotionally difficult for us to behave in any but our characteristic ways.

So instead of free will versus determinism, what we are worried about on this account is an alternative, motivational rather than causal version of the free will question: free will versus internal constraint. What is at issue here is a different form of *unfreedom*—a possible upshot of genetic (or other scientific) theories that redescribe the human personality rather than of genetic explanation per se. Besides its natural confusion with determinism, this distinct threat may have been kept from clear view because of the influence of the Aristotelian picture and derived accounts of character-causation in moral philosophers' approaches to free will. Its relevance to the genome project is just that an inborn trait of social submissiveness or the like apparently presents an insuperable barrier to Aristotelian training in virtue. It would not allow for a time before which such training or some earlier preparation for it might have had effect. The only way of changing the adult tendency would seem to be by genetic manipulation—another departure from the received account of moral psychology insofar as it grounds moral change on something outside the agent's scope of abilities.

This specter of pervasive unfreedom poses a philosophical problem even if it does not make unfreedom *universal* on the model of hard determinism but instead makes out the responsible moral agent as a rare bird. One might attempt to dismiss its underlying picture of the self as a product of pop Freudianism or some similarly simplified view of human motivation. But it does not require a full-scale alternative to the Aristotelian paradigm. Instead, suppose that the genome project built upon current experimental evidence that people have a tendency to obey authority even when it entails doing harm.⁸ Finding a genetic basis for this tendency would undermine the standard picture of moral agency without appealing to determinism or to any particular overarching theory of

8. See Stanley Milgram, *Obedience to Authority* (New York: Harper & Row, 1969). Milgram's finding is sometimes thought of as involving a conflict between authority and conscience; but it is important that both forces in the conflict he sets up are moral. In fact, obedience to authority apparently amounts to a personalized version of the duty to honor contracts that philosophers take as a prime example of "conscientiousness" (see esp. pp. 63-64, 66). It is explained on Milgram's own suggested model by the requirements of effective group action (cf. pp. 128-34ff.), which sometimes of course has a moral purpose as well.

human motivation but just to an alternative account of morally significant pieces of it.

I take it that the Aristotelian picture of moral agency appeals to philosophers largely because of the scope it allows to rational processes; but the springboard it provides for normative discussion of practical reasoning will still be usable even if its descriptive adequacy for the normal case is challenged. As an idealized picture streamlined to bring out certain aspects of moral motivation, it is surely no less simplified than the Freudian picture—or, ultimately, than the Nietzschean picture that inspired Freud, with its view of normal moral agents as in some sense unfree.⁹

This, then, if I am right, is the *theoretical* threat posed by the genome project. It is a threat to a certain view of the moral personality that is independent of concerns about determinism as a putative presupposition of science. But the threat is to be welcomed if it prompts us to work out a subtler picture of motivation, one that promises to connect the approaches of moral psychology, as a philosophical subfield, and *psychology*. What is under threat might be said to be a psychologically naive optimism about the educability of everyman by means that afford a role to rational self-control, as opposed to means like those involving genetic manipulation, where we treat the agent as an object requiring *external* control.

The thought of control by genetic manipulation brings up a further possible source of worries about the genome project in connection with free will issues that might now be distinguished from the topic under discussion here. I have interpreted the genome project strictly, in theoretical terms, as aimed toward constructing a map of the human genome, particularly with respect to behavioral propensities of the sort that come up in discussions of free will. Its task is a task of explanation rather than control. However, the specter of interference with freedom that it evokes might rest to some extent on fears about its possible practical applications. The various unnerving cases of psychosurgery and the like that philosophers use to illustrate *unfreedom* might be the real connecting link, more than the content of the free will question.

This seems to me to rest, as I say, on building extraneous possibilities into our interpretation of the genome project and to be off the main track

9. Cf. Friederich Nietzsche, *On the Genealogy of Morals*, trans. Walter Kaufmann and R. J. Hollingdale (New York: Vintage, 1967), pp. 45–46.

of my discussion; but it is important enough to be worth a few final observations. First, the sort of genetic “engineering” that involves participating in the formation of traits before birth rather than introducing later modifications goes on at the stage of personality *construction*, before there *is* a person or self whose freedom might be threatened by it. The self that emerges lacks control over this initial endowment in any case; so one might ask how modifying it could affect free will.

However, our attribution of free will in the ordinary case for acts manifesting deep-rooted personal traits might be said to rest on the absence of a calculating agent to whom responsibility might shift. Limits on action imposed by nature, or by our individual natures, are presupposed in the normal exercise of responsibility—for instance, as conditions of moral educability in my account of the Aristotelian picture. If they were due instead to another agent’s plans, that might seem at least to qualify free will. The popular image of illusory freedom is of a puppet controlled by strings, though in this case the strings would operate indirectly and at a temporal distance. The fact that they are in the hands of another agent is what worries us on this compatibilist view.

On an *incompatibilist* view, of course, freedom would also be seen as ruled out by natural processes of personality formation, assuming that these determine action. So here is one place where a version of the standard free will question, free will versus determinism, seems to be relevant. But I think we can see that its relevance in fact depends on the motivational version of the question that my argument has tried to distinguish: free will versus internal constraint. The worrisome sort of case is one that yields traits that prevent an agent from exerting genuine self-control—for example, where parents select for the trait of obedience in children in a way that produces more law-abiding adults but also adults unable to challenge basic social values. The result would be unfreedom even if it were *not* the result of another agent’s plans.

On the other hand, it might be said, a motivational structure supporting moral education that did not thus involve psychological compulsion would be perfectly compatible with human freedom, even if it *were* genetically engineered. And the point might be extended to the possibility of engineering after birth. There are of course also abundant possibilities for abuse of this scientific advance among others to the extent that it might be applied without genuinely free and informed consent. But here we move to the issues in practical ethics that the genome project obvi-

ously has to deal with. With respect to free will issues, if the practical problems were solved, the project might even seem to hold forth some promise of *augmenting* self-control by allowing us to design our psychological traits in the way that we can now design our bodies through plastic surgery. This may be an unnerving prospect, but it seems to pose no threat to freedom *per se*.

What it may seem to threaten is the *value* we place on freedom as self-control, insofar as it makes out the exercise of self-control as indirect in the sense of being mediated by something other than the agent's thought processes and their natural behavioral consequences. Self-control via genetic engineering might be said to involve treating *oneself* as an object on the model of current strategies regarding more mundane self-control issues that depend on medical intervention. Consider weight loss via liposuction: the sort of control one exercises by signing up for the operation is not an exercise of "willpower" such as that involved in dieting. Nor is it admirable in quite the same terms. It may be a sign of *courage*, but it does not involve the sort of self-training in temperance as a new trait of character that we have on the Aristotelian account of virtue. It involves giving up on virtue in at least one area.

Would we say the same even of an operation that resulted in moderate eating habits, say, by shrinking the stomach? The sort of temperance achieved thereby would not seem to have quite the same status as a virtue insofar as it would not involve genuine responsiveness to the dictates of reason. The connection between the deliberative processes that led the agent to submit to the operation and his later, more moderate appetite for food would be misdescribed as a case of "listening to reason" where it did not set up a more direct causal link of the usual sort between thought and action.¹⁰

In adult life, at any rate, once there is a fully formed self in question, the admiration accorded to certain character traits might be said to depend on their not simply being given to us by others, even in fulfillment of a contract. I conclude that the forms of genetic manipulation that

10. See Aristotle, *Nicomachean Ethics*, bk. 1, sec. 12, 1102b25–11–3a1. I take it that dieting—at least in a hypothetical case where it amounted to self-training in moderation—would set up a direct link of the requisite sort as long as it got the agent to *perceive* food differently, thinking of a certain quantity as "too much." It need not involve an exercise of *discursive* reason such as learning to apply principles of good nutrition.

might result from the genome project may still be viewed as a threat to free will or autonomy in the sense that is supposed to yield grounds for individual self-*worth*, even assuming a picture of motivation that allows for self-*control*, along with adequate practical barriers to external interference.