

The Limits and Lies of Human Genetic Research

Dangers For Social Policy

Jonathan Michael Kaplan



Reflective Bioethics

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Dangers for Social Policy

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CHAPTER 1

EXPLAINING DIFFERENCES

Differences That Make a Difference

This book is primarily about the differences between people, and the stories that we tell to explain these differences. That people are different, and different in ways that matter to us, is obvious. But the reasons that people differ from each other are not so obvious, and explanations for these differences vary by culture, by time, and by the individual or group offering the explanation. In the United States, explanations that revolve around genetics and make appeals to our genes have been popular for some time. While explanations appealing to genes have suffered the occasional setback, their popularity has been on the rise in recent years. Over the past decade, there has been an increase both in the number and in the boldness of explanations that attribute the differences between people (both physical and behavioral) to the genetic variations between them.

Explanations of human variation do not occur in a vacuum; the cause of variation in complex traits is explored because people think it is worthwhile, and the explanations that are generated are put to various uses. Sometimes they are used quite literally in social and political discussions; at other times, the way these considerations are brought to bear on various issues is more subtle. But in either case, the force of such explanations extends beyond their obvious domains and into the domains of various political and social issues. In these different domains, explanations premised on the importance of genetic differences have changed not only the sorts of considerations that are brought to bear on the political and social issues, but have also helped to determine the kinds of outcomes considered reasonable.

How do these kinds of explanations, explanations of differences that primarily refer to genetic differences, change the sorts of considerations brought to bear, and the outcomes considered reasonable, in the discussions and debates that surround political and social issues? In this work, I argue that explanations of this sort do at least the following things: they increase our tendency to view the traits involved in these explanations as real (a reification of the traits in question); they make the explanations appear to arise not out of contingent and contestable social organizations but out of the natural order of things (a naturalization of the traits in question); and they create and reinforce expectations about the proper perspective from which to view such issues as modifications to the traits in question. These changes constitute a change in the discourse that surrounds these traits, and the issues wrapped up in them. But why are such explanations popular? How are these explanations supposed to work? Does the research purporting to support such explanations really do so? What other kinds of explanations could account for these differences, given the available evidence about their causes?

There are any number of ways one could go about answering these and similar questions. Here I approach answering these questions in two ways. First, I look at genetic explanations of differences in both behaviors and physical attributes generally, in order to understand the strengths and the weaknesses of the techniques used in contemporary human genetic research. Then I explore the research that has been done in six different areas that seem to be important to us, at least as a culture if not necessarily as individuals. That these areas involve issues that are generally seen as important is revealed in part by the amount of media attention the traits wrapped up in the issues generate, as well as the attention paid to them by researchers interested in explaining their causes. In some of the cases, such as explanations for differences in rates of violent crime or the causal history of medical conditions like clinical depression, the reasons for the high levels of interest are relatively easy to understand. In other cases, such as sexual orientation, it is harder to see why the traits in question have generated the level of interest that they have. Part of understanding why genetic explanations are popular in these cases will involve trying to get clear on why these traits are of interest at all, and what role attempting to “explain” them has within our culture.

In the end, I argue against accepting the role that genetic explanations often play in these cases. The reasons I argue why we should reject these explanations differ in the different cases, though. There is no *one* reason why we should reject these explanations, and no argument is given to a general conclusion that all such explanations *must* be wrong. Rather, I

argue that we ought to consider each case on its own merits, and strive to understand the similarities and the differences that each individual case might have to other issues we've confronted before. In some cases, it will turn out that we should reject the explanations given in terms of genetics because the research cited as supporting the explanations simply doesn't do so. In other cases, even if the research is technically impeccable, it emerges out of a perspective that is itself questionable; change the assumptions, and the very point of the research can vanish, leaving barren technical results with no social or policy implications at all.

But rejecting explanations in terms of genetic differences in these cases shouldn't lead to immediately accepting other explanations either. Attempting to explain those differences in terms of environmental differences would also be a mistake. In the cases that follow, it will turn out that claims of that sort are unsupportable as well. Some people may be unhappy being told that we currently have *no* explanation that is adequate in these cases; however, I think it is unarguable that, at least as far as policy decisions are concerned, we do more harm, and make more tragic mistakes, when we accept bad explanations than when we admit that we simply don't know what the right answer is. In large part, this work will be arguing that for many of the questions that matter to us at the intersection of human differences and social policy, we simply don't know what the right answer is, nor even how to go about figuring it out.

The Ascension of the Genetic

Gene Discovery May Yield Test for Glaucoma . . .

Brain-Tied Gene Defect May Explain Why

Schizophrenics Hear Voices . . .

Finding Genetic Traces of Jewish Priesthood . . .

People Haunted by Anxiety Appear to Be Short on a Gene . . .

Scientists Identify Site of Gene Tied to Some Cases of Parkinson's . . .

Gene May Be Clue to Nature of Nurturing . . .

Researchers Track Down a Gene That

May Govern Spatial Abilities . . .

Variant Gene Tied to Love of New Thrills . . .

It is hard to open a newspaper and not see headlines like the above.¹ With each week, if not each day, there seems to be a new announcement. A gene is found for a trait, either physical or behavioral (though rarely is a well-understood pathway from the gene to the trait known), an association is found between some genetic variation and some trait (although the

gene itself has not been located or sequenced), variation in a trait is found to have some genetic component (though no gene has been found), or a story about how genes must be at the heart of something is told (though no gene has been found and no genetic component to variation demonstrated).

Walter Gilbert thinks that three different questions are raised by the current possibilities in genetics research (1992, 84). At the most general level, there is a question about how human beings (or for that matter any sophisticated multicellular organism) develop from a fertilized egg into their adult form (a question about developmental biology generally). A more specific question asks how that developmental process differs between different complex organisms (between, for example, humans and other primates). Finally, at the most specific level, we might wonder "how do we differ from one another?" (84). Plomin et al. make a similar point when they claim that the most specific questions, questions about differences *within* a species, are those that "most often confront scientists studying human behavior" and those which "genetics . . . is uniquely qualified to aid us in analyzing" (1990, 9–11).

Plomin et al. go on to point out that "the behavioral issues of greatest relevance to society are issues of individual differences" (246) and that it is "the study of things that make a difference: the description, prediction, explanation, and alteration of individual differences" that drive "societal interest in the behavioral sciences" (247). While there is certainly some intellectual interest in such things as the answers to Gilbert's first two questions, it is really the promise of answers to questions of the third sort that generates "societal interest" (and with such interest, funding). But it is, of course, only some of the individual differences that "make a difference." Researchers have not been inspired to spend time and money trying to account for many of the traits that vary between people, such as, for example, our particular tastes in food and clothing. And some projects that have been undertaken (e.g., measuring the heritability of height: see Plomin et al. 1990, 320) have aroused relatively little interest or controversy. The issues at the heart of things are, indeed, those that involve the promise to explain, predict, and control what are generally thought of as, in one way or another, important, and often behavioral, differences.² It is the hope of being able to predict and control such things as intelligence, mental illness, alcoholism (and other "addictive behaviors"), "criminal" behavior, violent behaviors, obesity, and the like, that make the promise of human genetic research so tempting.

Relatively recent advances made in genetic research have been instrumental in contemporary work in gene mapping (finding where on the

human genome—on what chromosome and where on that chromosome—a gene correlated with a trait is located) and gene sequencing (finding the sequence of base-pairs in the gene[s] in question). The creation of these sets of modern abilities has created a flurry of interest in mapping and sequencing genes correlated with various traits, so far mostly genetic diseases. However, results have begun to emerge in research into the genetic bases of some behavioral traits, and other complex traits, including those considered part of normal human variation.

Much of the current excitement in the search for genetic explanations for variation in complex human traits comes out of the possibility of using those techniques that have emerged from the concentration of resources into molecular genetics to study the traits in question. The hope is that the sort of gene finding and gene sequencing that is becoming increasingly feasible with respect to physical diseases will make equally plausible the explication of the genetic bases of those variations in, for example, behaviors in human populations that have a partial genetic etiology. However, as we shall see, finding, sequencing, and tracing the pathways from the purported genes to the behavioral traits of interest has proven difficult for researchers in human behavior genetics, who for the most part have therefore had to content themselves with studies that attempt to show merely that there is a genetic component to human behavioral variation in some instance, and to give some estimate of the extent of the genetic influence on that variation. And, I will argue, even when researchers do find genes associated with variations in complex traits, it is often difficult to know what to make of this. Using this information to make predictions or give certain kinds of explanations is very difficult at best, and often impossible.

The techniques for estimating the extent of the role of genetic differences in the variation in various traits have serious limitations, however. When used in ordinary human populations, the maximum accuracy that can be expected from these methods is fairly low. And the techniques have serious conceptual limitations, which put fundamental limits on the proper interpretations of any results achieved. Attempting to make use of these results without fully acknowledging their limitations will be revealed as a major source of errors, errors that lead to very dubious arguments about the role of genetic differences in framing discussions about issues of public policy and social justice.

Here is where I hope the force of this work will be felt. The rise of the popularity of these kinds of genetic explanations wouldn't be very important if these explanations weren't linked to political and social issues that matter. Whether the explanations followed from good research or bad,

whether the interpretations of the research were legitimate or not, whether the research itself relied on culturally contingent assumptions that could be undermined or not—none of these questions would be of interest outside a narrow set of scientists and people interested in the study of science if it weren't for the links between these kinds of explanations and social policy choices. But once we see what the limits of these implications really are, what the research can and cannot show, and how easy misinterpretations are to make (as well as how they can be avoided), the claimed policy implications will look much more questionable, and in many cases will be revealed to be best discounted entirely. With the limits of these kinds of genetic explanations displayed, the room will be created for other considerations—many of which speak in directions different from the genetic—to influence our views of these issues.

The Six Arenas

The goal of this work, then, is to demonstrate that the rise of explanations premised on the importance of the genetic to explain many the differences in behaviors and physical characteristics that we find important has inappropriately influenced our views of issues that matter to us. Conversely, certain views of these issues—that is, certain kinds of purported solutions—make the appropriation of genetic research to do political work both more likely and rather more dangerous than do other views. The work of demonstrating these points is done primarily through a series of case studies, each of which shows in a different way how human genetic research has influenced, and how the interpretation of such research has been influenced by, specific kinds of political and social issues in contemporary society.

The first cases examined are narrowly focused on the use of human genetic research in supporting claims about social policies. In chapter 4 I discuss some of the history behind arguments surrounding race, socioeconomic status, and average IQ scores. Arguments from the supposed high heritability of intelligence and the disparities in average IQ scores between various “races” to the conclusion that it is genetic differences that drive these disparities, have a long and ignoble history. In analyzing both the traditional and more modern counterarguments, I attempt to make clear what sorts of errors most often get made in this form of research and how these mistakes interact with the technical limitations of the research used. More recent research attempting to find genes associated with scores on IQ tests is also critiqued. Both the broadest conclusions that I argue for in that chapter—namely, that neither heritability

estimates in human populations for complex traits nor molecular-level associations between genes and such traits are in the least bit useful for making policy decisions unless huge numbers of unargued-for (and for the most part insupportable) assumptions are made—and the more detailed analyses of how technical results in human behavior genetics are often misunderstood and misused, will inform the rest of the work.

Next I explore the way in which genetic research into the causes of criminality and violence has been instrumental in defining individuals and delineating the bounds of discourse around the issues. Specifically, in focusing on causation at the level of individual differences, such research detracts attention from wider environmental differences. The next chapter, on research into the genetics of sexual orientation, more directly confronts the issue of the interaction of the social construction of behavioral traits and ways of organizing behaviors within a culture with research into possible genetic bases for those traits.

The next chapters move to a more general level of analysis. In the case of the medicalization of mood-affective disorders, the focus of the chapter is on the use of genetic models to create the clinically depressed as a type of individual and to locate the illness within the individual. This, I argue, makes certain forms of social critique difficult or impossible. A similar argument is made in the next chapter, on obesity, although in this case there is an additional wrinkle, namely that the research that purports to show obesity as a dangerous disease is itself problematic, irrespective of the research into the causes of obesity.

Finally, I turn to a yet higher level of analysis. I argue that the current debates and discussions surrounding contract pregnancies, so-called surrogate mother contracts, as well as the law that is emerging from the legal cases involving such contracts, point toward the creation of the genetic as primary to parenthood in a way both insupportable by genetic research narrowly construed and destructive to many important social considerations about what it means to be a parent. The movement in law toward treating genetic parenthood as the most important criterion when making decisions about the legal rights and obligations associated with parenthood could not, I argue, be made without the overblown rhetoric of contemporary genetic research, and the effects of this movement can only be destructive to other, perhaps more useful, ways of conceiving of parenthood within this culture. This section deals with the genetic influence in much broader and more general terms than the others, since there is no one research program being alluded to when there is a legal ruling that, for example, someone who is the genetic but not gestational mother should get the legal rights and obligations associated with parenthood,

and the gestational but not genetic mother should be denied those rights and obligations. This kind of influence, diffuse though it sometimes seems, is important to understanding how the more narrow research projects discussed previously get a rhetorical power and force that extends well beyond their immediate results.

A Few General Observations

For a combination of historical reasons growing out of the development of modern evolutionary theory, conceptual reasons having to do with the technical limitations of certain techniques used in genetic research, and more broadly cultural reasons having to do with contemporary views of the social and political landscape, the environment (especially the social environment) often tends to be viewed as rather more stable and unchanging than a dispassionate view would take it to be, at least within the contexts of these sorts of research projects. And this is important, because a view that takes the social and political landscape to be stable supports the status quo in a particularly devious manner.

The sorts of research projects that are undertaken and the way that these projects are interpreted and appropriated for political ends are influenced by the ways that we think about our relationship to our environment—both our cultural environment and our environment more generally. In displaying this tendency for specific cases, and in providing some general tools for understanding why this is so often the case and what kinds of effects it is likely to have, I hope this book points not toward an automatic rejection of one form of explanation and acceptance of another, but instead toward a way of thinking carefully about the relationship different kinds of explanations have to our ways of thinking about policy. Sometimes we may think that explanations given about the causes of variation are relevant and important to social policy considerations; at other times, however, we may well realize that the explanations are misleading in important ways and ought to be ignored when it comes to making public policy decisions.

It is this kind of complexity and sophistication, I believe, that we need to make sense of this world and problems we face within it.

CHAPTER 2

VARIETIES OF DETERMINISM

Determinism and Determinisms

Almost without exception, those people who write or speak about the relationship between genetics and human traits want to deny that they support “genetic determinism.” However, this denial is often made against a background of deep confidence in the importance of genetic research for understanding and controlling those traits that matter to us. This confidence sometimes results in researchers saying and writing things that, at least on the face of it, certainly seem to support various theses that have a deterministic ring to them. Much of this book is concerned with very specific claims, such as those about the relationship between particular research projects and social issues. But those specific claims emerge out of a background of faith in the relative importance of genetics and the relative lack of importance of the environment in explaining variations in traits that matter to us. Revealing this background, I hope, will help make clear the assumptions that lie behind the claims made by those researchers discussed in later chapters.

In what follows, then, I will try to bring out what researchers understand themselves to be denying when they deny that they support or believe in genetic determinism, and the tensions between these denials and the researchers’ stated beliefs about the importance of genes and genetic research for understanding and controlling human traits. On the one hand, it will turn out that there are some versions of genetic determinism that no one supports (at least when they are being careful); on the other, there are some versions that seem to have wide support. In going through

some researchers' vigorous denials that they support genetic determinism, some of these possible forms of genetic determinism will be explored.

Next, the story of the genetic disease PKU (phenylketonuria) will be told as a way of examining how these points play out in practice. Here the tension between many writers' and researchers' firm belief in the centrality of the gene both causally and methodologically and their stand against naive forms of genetic determinism will be explored. PKU has become the main example used to deny genetic determinism and delineate the limits of the power of genes with respect to phenotypic variations. The history of this disease, however, has traditionally been rewritten as a story about the power and centrality of the genetic for understanding, predicting, and modifying human phenotypic variations (including behavior). In other words, I will argue that a story that was supposed to show that genetic determinism is false is in fact usually written to make PKU seem far more deterministically genetic and the genetic far more important to explaining, predicting, and controlling the disease than a more careful reading of the history of the disease would permit. Seeing how and why this rewriting occurred is a fascinating entry into how the tension plays out in practice between the conviction that genes are at the "heart" of things (as, for example, Watson would have it; see Watson 1992, 167) and the conviction that genetic determinism must be denied.

Against Genetic Determinism?

What exactly the thesis of genetic determinism is meant to claim is rarely made explicit, especially in the writings of the various researchers and popular writers who state their unequivocal opposition to it. But in denying the thesis of genetic determinism various researchers and other writers make various sorts of claims, and from these claims some ideas about the form of the thesis they are arguing against can be gleaned. The claims these researchers make when standing against genetic determinism, however, sometimes rest uneasily with the claims they put forward when discussing the results and likely benefits of the research they undertake. This section stresses the general tension that results when one attempts to deny a form of genetic determinism while simultaneously engaging in research that is premised on the centrality of genes, and perhaps the deterministic, but at the very least predictable, nature of the pathways between genes and physical or behavioral traits (the pathways between genotype and phenotype).

How, then, do researchers stand against genetic determinism, and what is it they stand against when they do so? One strand of genetic determin-

ism that researchers oppose could be described as the “complete information” strand. Genetic determinism, on this reading of the thesis, would claim that everything about us (including, on some interpretations, our behavior) is predictable, or at least in some way determined or dictated by our genes. So Gilbert, in his much-quoted “A Vision of the Grail,” states that “genetic information does *not* dictate everything about us” and that this sort of “shallow genetic determinism is unwise and untrue” (1992, 96). Plomin et al. state that “genes do not determine one’s destiny” and that they are not “master puppeteers . . . pulling our strings” (1990, 9). Kagan, in his book detailing his research into the heritability of temperament, notes that the “power of genes is real but limited” and “development is a cooperative mission and no behavior is a first-order, direct product of genes” (1994, 37). This strand of genetic determinism, however, is generally (and quite properly) regarded as trivially false, and very little work is done arguing against it.

A more common reading of the thesis of genetic determinism, and one that makes it at least a bit less outrageous, is that for traits with a genetic etiology, environmental interventions are useless: if a trait is genetic, one is (going to be) stuck with it. This might be called the “intervention is useless” strand.¹ So Dawkins, of *Selfish Gene* fame, stands against genetic determinism in a letter published in *Nature* by objecting to “the suggestion that we are stuck with our biological nature and can’t change it” (Dawkins 1981, 528). Wilson, a founder of “sociobiology,” also in a letter in *Nature*, writes of the possible genetic basis of xenophobia that “a knowledge of such a hereditary basis can lead to the circumvention of destructive behavior such as racism” (Wilson 1981, 627). Hamer and Copeland note that while “many core personality traits are inherited at birth,” this doesn’t mean that “people are “stuck” with their personalities from birth” (Hamer and Copeland 1998, 6, 7). Bouchard, of Minnesota Twin Study fame, notes in one of his many articles in *Science* that “intervention is not precluded even for highly heritable traits” (Bouchard et al. 1994, 228), about as pro forma a stand against this strand of genetic determinism as one can take, but still a stand against it. Breakefield, a researcher doing work on the genetic basis of violence, says that people with the “right type of support” often do just fine, even when they have a “syndrome” with “major metabolic consequences.” “The purpose,” she says, “of this kind of research is to discover what that support is, and who needs it” (quoted in Mann 1994, 1689; re research into genetic bases of violence, see also chapter 5). Plomin et al. note that the fact that “heritability does not constrain environmental interventions” is a “corollary of the point that heritability does not imply genetic determinism” (1997,