Genes and Ideologies

Evan Charney

There is a trend among behavioral scientists to view ever more complex attitudes or systems of belief as in some sense genetically determined (or "heritable"). Consistent with this trend is the recent article of Alford, Funk, and Hibbing titled "Are Political Orientations Genetically Transmitted?" in which the authors claim to have demonstrated that when it comes to the transmission of political ideologies, genes count for more than environment. Their article has received an enormous amount of attention among political scientists and in the popular press. I critically evaluate the research technique on the basis of which the authors' support their claims and argue that it suffers from significant methodological flaws. Such flaws notwithstanding, I demonstrate that the authors' data do not clearly support their conclusions. I then question the cogency, from an historical and theoretical perspective, of proposing the existence of "liberal" and "conservative" "phenotypes" and "genotypes." My argument has implications beyond the findings of Alford, Funk, and Hibbing, and applies to all studies that claim to have demonstrated the heritability of complex and politically relevant attitudes.

Researchers in human behavioral genetics have taken an overly simplistic view of human social behaviors and aptitudes. The failure to consider more complex views of the interactions both between genes and between genes and environment may explain the absence of any bona fide findings of genes associated with the behaviors they study. Nevertheless, the studies have often been presented by scientists as if conclusive, thus attracting considerable media and public attention. Journalists have moved from conclusions based upon the simplistic assumptions underlying the studies to present to the public simplistic views of human social problems and human social arrangements. This translation is sometimes encouraged by scientists themselves, providing journalists with provocative statements for their newspapers and magazines.[1]

There is a growing trend among behavioral scientists (particularly psychologists) and now, political scientists, to view more and more of human behavior as in large measure attributable to our genes. In the old debate of "nature v. nurture," nature now seems to have regained the ascendancy it once held when William Galton, author of *Hereditary Genius,* wrote in 1875 after one of the first "twin studies," that as regards behavioral, psychological, and cognitive characteristics, "There is no escape from the conclusion that nature prevails enormously over nurture."[2] A popular book on genetics asserts triumphantly (on behalf of nature): "Genes not only determine how we look, but how we act, feel, and experience life. In case after case discovered by researchers, nature won out over nurture."[3] Almost every month a new study appears purporting to show that ever more complex aspects of human intellect, belief, and behavior—everything from intelligence (i.e., IQ) to the level of such complex attitudes or beliefs as altruism, criminality, religiosity, and conservatism—can be explained largely, and in some instances exclusively, by an individual's genetic makeup.[4]

Consistent with this trend to view complex aspects of human belief as "heritable" is the argument recently presented by Alford, Funk, and Hibbing in their article, "Are Political Orientations Genetically Transmitted?"[5] In this article, the authors claim to have demonstrated that the answer to this question is unambiguously *yes,* and that "political attitudes are influenced much more by genetics than by parental socialization."[6] Specifically, they claim to

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have discovered that when it comes to political conservatism, "genetics accounts for approximately half of the variance in ideology, while shared environment including parental influence accounts for only 11%."[7] Understandably, this astonishing claim has garnered a great deal of attention among both political scientists and in the popular press. As the editor of the *American Political Science Review* has recently commented, the 2005 article of Alford, Funk, and Hibbing, "has set a new standard for political science in terms of the media attention and public discussion that its publication has provoked," and he goes on to wonder "whether it will emerge among the most important articles the *APSR* has ever published."[8]

The claim of Alford, Funk, and Hibbing is indeed astonishing, because if true, it would require nothing less than a revision of our understanding of all of human history, much—if not most—of political science, sociology, anthropology, and psychology, as well as, perhaps, our understanding of what it means to be human. True to Beckwith's quote (cited above), the study of Alford, Funk, and Hibbing (hereafter AFH) has been presented by the authors as conclusively demonstrating that political orientations are genetically transmitted, and most of the press coverage has accepted the authors' claims at face value.[9] As yet, there has been no critical response to the authors' article in any scholarly journals (or in the press), and given the enormous attention their claims have received, and the extraordinary nature of the claims themselves, such a response is sorely needed. It is my objective in this paper to present such a response. In sum, my argument is that the authors have in no way demonstrated their hypothesis concerning the heritability of political ideologies, and that such a hypothesis is, in and of itself, extremely implausible (if not incoherent). Although this paper focuses on the article of AFH, as should be clear, most of the criticisms presented here have a much broader applicability, and could apply equally to many recent claims regarding the heritability of complex human beliefs and attitudes.

My argument appears in five sections. First, I present some brief comments concerning the concept of heritability, a concept which is easily (and commonly) misunderstood. Next, I critique the research technique on the basis of which AFH make their claims. I then consider the data presented by AFH and the extent to which it supports the authors' claims. Following this, I examine a number of issues relating to liberalism and conservatism as political ideologies, both historical and conceptual, and examine the conceptual plausibility of assumptions concerning the heritability of specific political beliefs.

This article is eclectic, intentionally so., I present arguments referring to genetics, biology, neurology, research methodology, the nature and history of liberalism and conservatism as political ideologies, political psychology, and the nature of morality and reason. It is my hope here not simply to open up a dialogue on the subject of the relationship, if any, between genes and political ideology, but to open up a dialogue that can effectively cross subdiscipline boundaries within political science itself, and perhaps even spark a much-needed public dialogue on this subject.

I would like to emphasize that many of the claims concerning the heritability of complex human beliefs and attitudes have obvious and profound policy implications. For example, claims concerning the heritability of criminal behavior and the existence of a so-called "criminal gene" have profound implications for the criminal justice system.[10] According to Lindsay Elkins, "the discoveries of the Human Genome Project are already shaking the foundations of our legal system, particularly in the area of criminal law."[11] Claims concerning the heritability of IQ have profound implications for how we view the aims of public education, as well as questions of social and economic justice more generally. The controversy sparked by the claims of Herrnstein and Murray in *The Bell Curve* concerning the supposed relationship between IQ—which the authors assume to be largely heritable—and race, is well known to all social scientists.[12] While no contemporary author, to my knowledge, has discussed in any detail the policy implications of an assumption that political ideology is heritable, they are profound indeed (consider the political ideology of, e.g., a member of al-Qaeda).

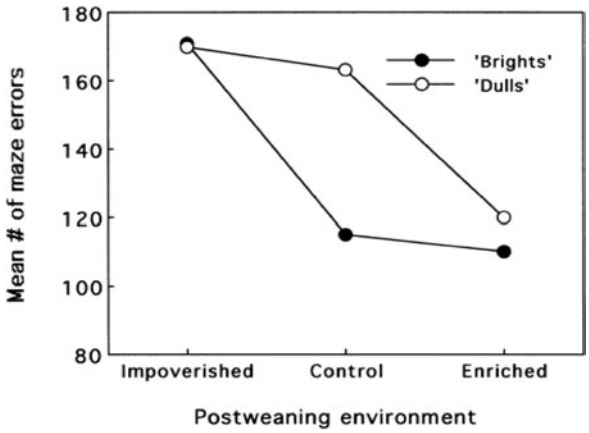
The Meaning of Heritability

Heritability is an estimate of the amount of variation in a given trait (phenotype) in a given population at a given time that is due to genes (genotype). A heritability estimate of .50, for example, does not mean that for any given individual 50 percent of that trait is due to or caused by one's genes. Rather, it means that 50 percent of the variation in a given trait *across an entire population at a given time* is the result of differences in persons' genotypes. Heritability is thus a population-specific estimate; estimates of heritability within a given population do not indicate the causes of phenotypic variation *between* populations.

It is a common misunderstanding that estimates of heritability are fixed and invariable, usually based on the assumption that they reveal something fixed and inevitable (or deterministic) about human biology (as expressed through human genes). To the contrary: *The heritability of a trait can change with changes in the environment.* In a classic early experiment by Cooper and Zubek, "maze-bright" and "maze-dull" mice were separated on the basis of their performance in repeatedly running a maze and then selectively bred for this trait.[13] Over several generations the strains diverged in their maze running abilities indicating a genetic basis for the differences in learning and memory involved in this task, and for mice raised in a "standard" environment heritability of this trait was high. The researchers then raised the offspring of the genetically

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Figure 1
Gene-environment interdependence among maze-bright and maze-dull rats



Source: Meany 2001, 54.

selected lines in two "extreme environments," a cognitively poor one (dull colors all around, no toys) and a cognitively enriched one (bright colors and patterns, many toys). Both the bright and dull lines behaved "stupidly" in the poor environment and "smartly" in the enriched one, with the result that *the heritability of the trait dropped to zero in both extreme environments.* The bright and dull mice may well have inherited whatever genes are linked to intelligence (or maze running aptitude) in mice (which is what they were bred for), but the *heritability* of the trait of intelligence was shown to be highly dependent upon postnatal environment (see figure 1).[14]

While the heritability itself of a trait can change significantly with environmental changes, environment can significantly influence traits that are themselves highly heritable. *The high heritability of a trait does not entail that it is resistant to environmental influences*: "High heritability therefore does not mean low malleability."[15] An interesting example of this is height. The heritability of height in most populations is about .9, that is, 90 percent of the variation in height can be attributed to genetic factors. The average height of Japanese has increased significantly since WWII with changes in diet, standard of living, and health care, while Americans, who were once three inches taller than their European counterparts, are now surpassed by Europeans, with the Dutch on average three inches taller than Americans.[16]

Twin Studies

I begin my analysis of the study of AFH with a consideration of the experimental technique—"classical twin studies"—on the basis of which they make their claims. The importance of beginning here should require no justification: *Any conclusions derived from empirical research stand or fall on the basis of the soundness of the research methods employed.* Inasmuch as I write as a political scientist by training, not a behavioral geneticist (and in this, I do not differ from AFH), it is my goal in this section to allow geneticists, as much as possible, to "speak for themselves." I do not claim that anything that I present in this section is original. Nonetheless, it is vital that those who have read or heard of the findings of AFH (as well as all other studies that rely wholly upon the methodology of twin studies) understand just how little consensus there is *in the scientific community* concerning the soundness of such studies.

Twin studies have been deemed, largely by psychologists, who most commonly undertake such studies, the "new workhorse" of behavioral genetics.[17] From reading the conclusions of many such studies purporting to demonstrate the heritability of one or another complex human trait or system of belief, including those of AFH, one would assume that twin studies are a scientific procedure as unproblematic as, say, carbon dating is as a means of determining the age of organic matter (within an acknowledged range of error). To determine the age of certain kinds of organic matter, one performs a carbon dating test; to determine the percentage of a given trait due to genes as opposed to environment, one performs a "twin test" (i.e., conducts a twin study). Were this the case, twin studies would indeed be a research tool of unprecedented power in unraveling the etiology of complex traits (or attitudes or belief systems) and in revealing to what extent such traits may be said to be the product of genes as opposed to environment. Such may be the assumption of some who employ twin studies, but it is a view by no means uncontested in the scientific community.

In fact, it is not simply the technique of twin studies that is increasingly questioned by scientists, but many of the basic assumptions that underlie such studies, for example, whether the influences of genes as opposed to environment on a given trait can be neatly partitioned into percentages, or whether viewing nature and nurture as contrasting entities or causal forces is a paradigm that is still plausible in light of recent advances in the biological sciences. Here are several select quotes addressing this issue from prominent researchers in neurology, genetics and biobehavioral health:

> Nature-Nurture. What a clever phrase. . .but regrettably, in its nature versus nurture version, it has probably had the negative effect of facilitating, in some quarters, the distorted perception of genetic and environmental factors as antagonistic, competitive factors in a simplistic, either-or causal scheme.[18]

> It is not nature *or* nurture. Nor is it nature *and* nurture. . . The search for main effects is a fool's errand. In the context of modern molecular biology, it is a quest that is without credibility. Nature and nurture do not exist in a manner that can ever be considered independently quantifiable. There is, instead, simply a continuing process of development that emerges from the

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> constant dialogue between gene and environment . . . Scientific journals, regrettably, continue to provide examples of research attempts to quantify the relative contribution of genetic versus environmental factors to the development of a specific trait, often intelligence.[19]

> Environment influences the actions of genes, and genes via changes in the nervous system influence the sensitivity of an organism to changes in the environment. The two causes are not separable. Statistical procedures that appear to separate variance according to genetic and environmental causes do not provide a valid representation of physiological reality.[20]

For example, biologists, geneticists, and medical researchers commonly emphasize the importance of gene-environment interaction in the development of the human brain (including cognitive capacities such as intelligence and language acquisition). To begin with, there are well known facts concerning the role of postnatal environment in normal brain development. Most myelination in the brain is postnatal and synaptogenesis occurs at a high rate during the first year of life, with each neuron developing on average 15,000 synapses by age three.[21] Normal brain development does not occur spontaneously or in a vacuum. It develops in an environmentally dependent maturation process, that is, although its developmental stages are genetically determined they must be triggered by specific environmental inputs, known as species-specific experiences, within critical periods of development.[22] Language acquisition, for example, is an environmentally-dependent neurobiological window-of-opportunity phenomenon. Studies of so-called "feral" children demonstrate that if children are not exposed to language it cannot be successfully acquired after ages 8–11.[23] Disruptions of environment-dependent neurochemical signals during early life may lead to major abnormalities or deficits in neurodevelopment. Disruption of critical neurodevelopmental cues can result from a lack of sensory experience during sensitive periods (e.g., lack of sufficient tactile, auditory, and visual stimulation) or atypical or abnormal patterns of necessary cues due to extremes of experience (e.g., prolonged or traumatic stress).

Beyond these well-known features of human brain development and its environmental dependence, cutting-edge research on gene/environment interaction presents a significant challenge to the cogency of the view that there could be such a thing as genes for such features of human cognition as, e.g., intelligence, creativity, or a conservative political orientation:

> *Simple, direct mappings between genes and cognitive-level outcomes are not sustainable.* In fact, genes are likely to contribute to much more general constraints, such as developmental timing, neuronal migration, neuronal type/size/density/orientation, myelination, lamination, ratio of gray matter to white matter, firing thresholds, neurotransmitter differences, and so forth . . . Moreover, once one thinks from a truly *developmental* neuroconstructivist perspective, it is easy to imagine how even a tiny asynchrony or impairment early on in development can have a huge, cascading impact on the phenotypic outcome.[24]

It is because of the growing number of claims of this sort that a recently published book on behavioral genetics, the result of a project undertaken by The Hastings Center and the American Association for the Advancement of Science, notes the following in the Introduction:

> Perhaps most surprising, and perhaps in some ways most difficult for the non-scientist editors of this volume, was the degree of the disagreement of the facts of the matter that we found *among the scientists* . . . While disputes within science are certainly the norm, not the exception, these disagreements seemed particularly important. It finally appeared to us that we were in what might be called a "transformative" moment in behavioral genetics, in which an awareness of complexity at a variety of levels is causing a reexamination of many terms and assumptions, as well as some hard thinking about whether it will turn out to be true that identifying statistical correlations between genotypes and phenotypes will help us to *influence* or *predict* behavior [emphasis in original].[25]

My aim here is not to examine in any detail this "transformative moment" in behavioral genetics—transformative, that is, for those who acknowledge that it is even occurring. Rather, as noted, it is to focus on one particular aspect of this transformative moment that is crucial for an evaluation of the claims of AFH: questions concerning the validity of twin studies.

Studies of Twins Raised Together

Classical twin studies compare the similarity of identical or monozygotic (MZ) twins and fraternal or dizygotic (DZ) twins in regard to a particular trait of interest (in the case of AFH, political ideology). MZ twins share 100 percent of their genes while DZ twins share 50 percent of their genes, on average. The underlying assumption of twin studies is that greater concordances in a given trait (or phenotype) among MZ twins, as opposed to DZ twins, are evidence of a genetic influence or component of the trait in question. The greater the level of concordance in MZ as opposed to DZ twins for a given trait, the greater the genetic component of that trait.[26]

The conceptual simplicity underlying the methodology of twin studies requires that a number of empirical preconditions be met, the most basic and important of which is the Equal Environment Assumption (EEA), i.e., that MZ twins and DZ twins experience similar environments. As Hettema, Neale, and Kendler explain, "the validity of the EEA is crucial because, if incorrect, excess resemblance of MZ twins compared to DZ twins, usually ascribed to genetic factors, could be partly or entirely due to environmental factors."[27] There is ample evidence that the EEA, if taken literally, does not hold. For example, in one review Evans and Martin state that there is overwhelming empirical evidence to support the claim that MZ twins are treated more alike than DZ twins. As children, MZ

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twins are more likely to have the same playmates, share the same room, and dress alike. As adults, MZ twins are more likely to keep in contact than same-sex DZ twins.[28] Studies have indicated higher rates of interaction among MZ as opposed to DZ twins;[29] Joseph notes large differences between MZ and DZ twins in experiences such as identity confusion (91 percent versus 10 percent), being brought up as a unit (72 percent versus 19 percent), being inseparable as children (73 percent versus 19 percent); and having an extremely strong level of closeness (65 percent versus 19 percent)[30]. Studies have also shown that parents "hold more similar expectations for their MZ than DZ twins with respect to social responsibility and independence."[31] Furthermore, it is well established that physical appearance can have a profound effect upon how individuals are treated.

> Differences in physical attractiveness affect the social desirability judgments which people form of others. . . . From infancy to old age, there is a strong tendency to attribute more positive qualities to those who are physically attractive relative to those who are physically unattractive. Attractiveness may be used as a cue to signal status.[32]

This fact is particularly significant for twin studies, inasmuch as MZ twins are much more likely to closely resemble one another than DZ twins and are therefore much more likely to experience the same social treatment that comes with "social desirability judgments" based upon physical appearance:

> Physically attractive people receive more cultural rewards than physically unattractive people, . . . a response that develops from social as well as genetic reasons. Because monozygotic twins have greater physical resemblance to each other than dizygotic twins, they could have a greater chance of receiving similar social reactions, which in turn can affect a variety of outcomes.[33]

Greater environmental similarities by themselves, however, do not negate the validity of twin studies, since it is possible that "some environmental exposures that MZ twins share more often than DZ twins may simply have no effect on the trait in question."[34] In fact many, if not most researchers who support the validity of twin studies accept that the EEA, if conceived as requiring environments that are "actually" similar, does not hold.[35] Proponents of a modified, or what is sometimes referred to as trait-relevant EEA, "recognize that identical twins are treated more similarly and spend significantly more time together than fraternals, but claim that the evidence shows that greater environmental similarity does not lead to higher concordance [for the specific trait under consideration]."[36]

The problem with studies in support of this proposition is that they have been shown to have significant methodological flaws. For example, studies of a tiny subpopulation of DZ twins mistakenly thought by their parents to be MZ twins purport to show that the degree of correspondence between MZ twins still exceeds that of DZ twins.[37] Most of these studies of "reverse zygosity," however, relied upon parental accounts of how they raised their twin children many years later. Because of problems with biased impressions,[38] poor memory, and poor reliability, studies that rely upon parental recall of their child rearing practices have been shown to be notoriously unreliable, typically showing reliability measures of only 0.3–0.5.[39]

Studies of Twins Raised Apart

It has been argued that objections regarding possible confounding effects of environment on the results of twin studies have received their most effective refutation from so-called *studies of twins raised apart.*[40] The idea behind studies of twins raised apart is that inasmuch as the MZ and DZ twins being studied are not raised in the same environment, any possible confounding effects that could result from the possibility that MZ twins are treated more alike than DZ twins will be eliminated. But studies of twins raised apart suffer from the same possibility or probability of significant environmental confounding effects as studies of twins raised together. Here are five more commonly cited possible (or probable) effects (which by no means comprises a complete list of all of the objections that have been raised concerning environmental confounding effects in such studies):

1. In no study to date of twins raised apart is it the case that all of the twins being studied were separated at birth; most often, in fact, they have not. In some well-known studies, twins who have been raised together up until ages 4, 6, and 11 were held to be "twins raised apart" for the purposes of the study.[41] This astonishing (and oddly unnoticed) fact means that so-called studies of twins raised apart are in fact no such thing; at best, they are studies of twins raised partially apart. This leaves open the possibility of many years of confounding environmental influences during the most formative period of development in a child's life.[42]
2. In no twin study to date is it the case that all of the twins studied have had no contact after separation. Often, many of the twins have had ongoing relationships lasting for many years. The potential confounding effects here are significant because given the demonstrated greater levels of contact between MZ as opposed to DZ twins—"MZAs ["monozygotic twins raised apart"] are more likely to be aware of each others' existence and to have had more pre-study contact than DZAs ["dizygotic twins raised apart"]—there is a greater opportunity for MZ twins to influence each other's attitudes.[43]
3. Studies of twins raised apart depend upon the assumption that the environments in which the separated twins are raised are "dissimilar." But over thirty years ago, researchers found this not to be the case:

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> [Kamin] found that twins who were placed in new homes by adoption agencies tended to end up in similar environments; for example, the adopting families tended to be from the same social class. Second, in many cases the separated twins were placed by family members in the homes of relatives, so that they often went to the same school, and interacted with each other frequently.[44]

Because of such problems, in more recent studies researchers have attempted to "quantify" various aspects of the home environment into which members of the adopted pair were placed, undertaking such "measures" as counting the number of books and the availability of household "facilities" such as power tools and original artwork.[45] But the problem with such (crude) attempts to quantify environmental influences is summed up by Beckwith as follows:

> How do we know what combination of factors both in the home and in the outside environment may provide the appropriate mix for development of the complex capabilities or behavioral problems that are being measured? How can researchers assess the less tangible features of such environments, such as the daily interactions between the parent and the child, that cannot be so easily quantified? While they have taken into account retrospective impressions of family environment by separated twins, such retrospective impressions are often thought to be subject to distortion.[46]

It might be argued that none of this constitutes a problem unless it could be shown that separated MZ twins are more likely to be placed in more similar homes than DZ twins, which might be considered unlikely,[47] but in the absence of knowledge as to what the relevant environmental "similarities" might be, and whether or not they could affect the trait in question, it is impossible to judge the correctness of this assertion. But beyond this, Kamin and Goldberger note that in one of the well-known studies of twins raised apart, the investigators submitted results of two questionnaires dealing with childhood family environment to a factor analysis. For one factor, labeled *Support,* the average MZA and DZA *r* was 0.41 and *–0.01,* respectively. These results might be interpreted as indicating that selective placement was substantially greater for MZAs than for DZAs, leading to more similarity of outcomes for the MZAs.[48]

4. In all studies of twins raised apart, the potential confounding effects of the much greater physical resemblance of MZ twins remains a significant problem: "Aside from the environment in which they are raised, the identical appearance of [MZ] twins, even though they are separated, can mean that their interactions with the outside world are much more similar than for any two randomly selected people [and for any randomly selected pair of DZ twins]."[49]
5. Studies of twins raised apart are particularly vulnerable to selection bias. In many studies, twins "were self-recruited, attracted by reports of reunited twins appearing in the press."[50] Inasmuch as such stories were full of accounts of the uncanny similarities among MZ twins, there is the potential that those who either volunteered for, or agreed to participate in such studies, did so out of a pre-existing belief in their own "uncanny similarities."[51]

I have not, of course, demonstrated that any of the confounding effects I have noted above are responsible for the concordances observed by Alford, Funk, and Hibbing which they deem to be statistically significant—in the case of AFH, the confounding effects are those associated with studies of twins raised together—*but neither have AFH proved that genes rather than confounding effects are responsible.* As with most twin studies, all that AFH have observed are a series of concordances in the self-reported attitudes of twins which they deem to be statistically significant. On the basis of these observed concordances, *they then hypothesize that the cause of these concordances is genes.* They have not discovered a set of genes corresponding to their hypothesis of genetic causation (nor have any other researchers in regard to complex cognitive and psychological traits). What I am hypothesizing—or presenting as a counter-hypothesis—is that *the cause of these concordances is one or more of the environmental concordances noted above,* a causal explanation that seems a good deal more obvious and intuitive than one which invokes genes.

I cannot, of course, employ what I have argued is a fundamentally flawed methodology to prove that the concordances observed by AFH are in fact due to environment as opposed to genes (i.e., are due to what amount to confounding effects from the perspective of the methodology).[52] It might appear at this point that we have two equally valid explanations for a phenomenon and that, embracing the principle of *lex parsimonae,* we should embrace the less complicated formulation. But we need not go so far as to ask which explanation is less complicated, for the principle of *lex parsimonae* depends upon an assumption that both explanations are equally valid.[53] As I shall argue in what follows, such is not the case.

The Findings of Alford, Funk, and Hibbing

In my opinion, the problems with classical twin studies, if applied to as complex a system of belief as a political ideology, are overwhelming.[54] But now I would like to proceed as if there were no such problems, and turn to a consideration of the results of the twin study of AFH. AFH essentially replicate (with a different study population) an earlier study by Bouchard et al., in which separated MZ and DZ twins were administered the Wilson-Patterson Attitude Inventory (W-P), which is

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intended to provide an "overall index of conservatism."[55] In administering the inventory, subjects are presented with a word or phrase, such as "pajama parties" or "computer music," to which respondents must select from the responses "yes," "no," and "uncertain." AFH selected 28 items from the 50-item W-P inventory that they considered to be more politically relevant.[56] From these responses the authors worked out estimates of the heritability of "political ideology" (in this case, conservatism) by comparing the responses for MZ pairs with those of DZ pairs. The conclusion the authors draw from the comparison of MZ and DZ twin responses is that "political attitudes are influenced much more by genetics than by parental socialization."[57]

In characterizing the data from W-P inventory the authors state that "we see from [the table of responses to the W-P items] that the impact of shared environment exceeds that of heritability in only four of the twenty eight items and the mean estimate of heritability for the 28 W-P items is .32, compared to a mean estimate of shared environmental influence of .16."[58] They further comment that "while the individual items provide interesting variations, the purpose of the W-P is to provide an overall index of conservatism."[59] To this end, they compute a simple index by assigning a value of +1 to any "conservative" response, like a "no" on modern art, and a −1 to any "liberal" response, like a "yes" on modern art. Hence, in calculating conservatism, attitudes toward astrology, modern art, and military drills are afforded precisely the same weight as attitudes toward abortion and gay rights. Furthermore, an examination of the table of "Attitude Items" from the W-P scale reveals that the four items for which, according to the authors' estimates, environment exceeds heritability, are attitudes toward *abortion, gay rights, liberals, and living together* (see table 1).

It is not entirely clear what the authors intend by the term "conservative," nor does the term, taken by itself, have a single and unambiguous denotation or connotation (a point I shall return to). For the moment and for simplicity's sake, I will identify the term "conservative" with those distinct political views held by voters *at the present time in the United States*[60] who are self-identified as "social-conservatives" (as opposed to, e.g., "fiscal conservatives"); this includes such groups as "right" or "conservative" Republicans and "Christian conservatives." Among groups such as these, perhaps no issues are held to be of greater importance at the present time in the United States, or more sharply divide conservatives from liberals, than their views concerning abortion and gay rights. For example, consider the results of a Zogby poll of voters conducted just before the last presidential election (table 2). In response to the question "Which of the following moral issues most influenced your vote in this election?," 32.8 percent of conservative voters ranked the Iraq war first, followed by abortion (21.4 percent) and same sex marriage (18.7 percent); and in response to the question, "Which is the most urgent moral problem in American culture?," the largest percentage of conservatives (30 percent) responded that it was abortion, followed by same sex-marriage (26.5 percent). Recent debates over the views of Supreme Court nominees on abortion, along with the new push among conservatives for a "marriage amendment" to the Constitution, demonstrate that abortion and gay rights are *the* central concerns of conservatives which divide them from liberals at the present time in the United States.

According to AFH, "it has long been known that certain issues seem 'hard' to people, while others seem 'easy,' presumably because some issues trigger 'gut responses' while others do not," and they conjecture that "in light of the new findings, one distinct possibility is that easy 'gut' issues tend to be those that are more heritable."[61] If by easy the authors intend something like "obvious" or "unambiguous" or clear to those who hold them (as opposed to "easy to resolve politically"), then it is indeed true that persons often feel most impassioned—as in having a "gut response"—about those issues that they consider both to be critically important and to be, from their perspective, unambiguously right or wrong. I can think of no two issues at the present time in the United States that more accurately fit this description of a "gut issue" for conservatives (*more* heritable as AFH conjecture) than abortion and gay rights (*less* heritable according to their data).

To be sure, there are other items on the edited W-P index presented by AFH that one would tend to correlate with contemporary social conservatism in the United States, the most important of which at the present time is, perhaps, school prayer. But even an issue such as school prayer trails behind abortion and gay rights in terms of importance to conservatives. Opposition to abortion and gay rights is so central and defining for social conservatives at present in the United States that it is not entirely clear that one could be a social conservative and agree with either of these. And this is even more obviously the case concerning whether or not one "agrees with liberals," another attitude item from the W-P index found not to be heritable by AFH. Liberals are, in effect, the "antithesis" of conservatives, an opposition exploited by AFH themselves in working out their dichotomous liberal-conservative phenotypes/genotypes. Could one ever conceivably be a conservative and simultaneously *agree with liberals*?

The problem with assigning an equal numeric value (+1, −1) to all of the attitude items on the edited W-P index should now be apparent. If we are using an additive model in which overall conservatism is calculated by adding up one's plus (+1) or minus (−1) responses to the items on the W-P index, such an equal numerical weighting allows for the following anomalous result: One could agree with abortion rights, agree with gay rights, disagree

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Table 1
Genetic and environmental influences on political attitudes: The 28 individual Wilson-Patterson Items

	Polychoric Correlation							
	MZ		DZ		Heritability	Shared Environment	Unshared Environment	Z for (MZ – DZ)
Attitude Item	Corr.	n	Corr.	n	2 ∗ (MZ – DZ)	(2 ∗ DZ) – MZ	1 – MZ	Difference*
School prayer	0.66	2,687	0.46	1,774	0.41	0.25	0.34	9.83
Property tax	0.47	2,643	0.46	1,774	0.41	0.06	0.53	7.66
Moral Majority	0.42	2,614	0.22	1,717	0.40	0.03	0.58	7.16
Capitalism	0.53	2,609	0.34	1,720	0.39	0.14	0.47	7.85
Astrology	0.48	2,631	0.28	1,721	0.39	0.09	0.52	7.39
The draft	0.41	2,641	0.21	1,753	0.38	0.02	0.59	6.94
Pacifism	0.34	2,576	0.15	1,686	0.38	–0.04	0.66	6.43
Unions	0.44	2,661	0.26	1,752	0.37	0.07	0.56	6.89
Republicans	0.48	2,627	0.30	1,734	0.36	0.12	0.52	6.91
Socialism	0.43	2,616	0.25	1,726	0.36	0.07	0.57	6.53
Foreign aid	0.41	2,669	0.23	1,771	0.35	0.06	0.59	6.42
X-rated movies	0.63	2,685	0.46	1,783	0.35	0.28	0.37	8.15
Immigration	0.45	2,658	0.29	1,784	0.33	0.12	0.55	6.20
Women's liberation	0.46	2,666	0.30	1,779	0.33	0.13	0.54	6.27
Death penalty	0.56	2,684	0.40	1,775	0.32	0.24	0.44	6.83
Censorship	0.40	2,629	0.25	1,718	0.30	0.10	0.60	5.36
Living together	0.67	2,679	0.52	1,771	0.30	0.37	0.33	7.54
Military drill	0.38	2,625	0.24	1,733	0.29	0.09	0.62	5.24
Gay rights	0.60	2,658	0.46	1,767	0.28	0.32	0.40	6.26
Segregation	0.38	2,653	0.24	1,743	0.27	0.11	0.62	4.83
Busing	0.43	2,670	0.30	1,766	0.26	0.16	0.57	4.92
Nuclear power	0.42	2,646	0.29	1,744	0.26	0.16	0.58	4.84
Democrats	0.47	2,639	0.34	1,726	0.26	0.21	0.53	4.96
Divorce	0.47	2,659	0.34	1,765	0.26	0.21	0.53	4.99
Abortion	0.64	2,668	0.52	1,768	0.25	0.39	0.36	6.23
Modern art	0.43	2,662	0.30	1,765	0.25	0.18	0.57	4.69
Federal housing	0.36	2,665	0.26	1,766	0.20	0.16	0.64	3.61
Liberals	0.44	2,629	0.35	1,734	0.18	0.26	0.56	3.40
28-item mean	0.47	2,648	0.31	1,748	0.32	0.16	0.53	

Source: Access to the data provided by Eaves et al., principal investigators, Virginia 30k twin study.

*The MZ-DZ correlation difference is statistically significant for all the table items at the 0.01 level or above.

with prayer in public schools, disagree with the moral majority, agree with women's liberation and in general, agree with liberals, *and still be considered a conservative* because one's responses on the remaining items would still add up to a number greater than the sum of one's "non-conservative" responses. Conservatism (at the present time in the United States) cannot accurately be measured by assigning an equal numeric value to one's attitudes concerning gay rights, abortion, school prayer, and for liberals, one's attitudes toward astrology, modern art, federal housing, and military drills.

It might be objected that none of this matters because according to AFH all of the items on the W-P index showed, as they assert, a "statistically significant" genetic component.[62] But the problem with this objection is that what the authors are claiming to have demonstrated is that genes count for more than environment when it comes to the transmission of *political ideologies*. Their claims do not concern the heritability of "discrete" and potentially disconnected attitudes of political relevance. To the extent that their claim does concern the heritability of political ideologies, it is not obviously supported by their own data.

Liberal and Conservative "Phenotypes"

Central to evaluating the claim that political ideologies are heritable, or have a heritable component, is an understanding of precisely what is intended by such a claim. What Alford, Funk and Hibbing say in this regard is neither entirely clear nor consistent. For example, they assert that "the connection between genes and attitudes may not involve specific attitudes as much as the flexibility of attitudes"[63] and, "individual genes for individual behaviors

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Table 2
Zogby Poll, 2004 presidential election

	All voters	Liberals	Moderates	Conservatives?
Which of the following most influenced your vote in this election?				
Iraq War	42.3%	54.6%	47.2%	32.8%
Abortion	12.8%	3.3%	6.4%	21.4%
Same-Sex Marriage	9.3%	2.8%	4.7%	18.7%
Poverty	7.4%	16.6%	7.8%	0.9%
Health Care	5.6%	9.1%	9.0%	1.3%
Preventing Stem-Cell Research	2.1%	1.5%	3.1%	2.0%
None	7.0%	2.4%	12.0%	9.0%
Other	13.3%	1.9%	9.1%	13.3%
Which of the following is the most urgent moral problem in American culture?				
Greed/Materialism	32.6%	34.9%	40.8%	24.3%
Poverty/Economic Justice	30.6%	61.4%	37.6%	6.0%
Abortion	15.7%	0.3%	5.8%	30.0%
Same-Sex Marriage	12.3%	1.5%	6.7%	26.5%
None/No Response	8.9%	1.9%	9.1%	13.3%

Nat National survey of 10,660 who voted in last week's presidential election. Survey was conducted Nov. 3–Nov. 4. Sample drawn from voters of all parties. Margin of error 1 percentage point.

Source: Zogby International.

do not exist."[64] Yet at the same time, they set forth the features of what they term liberal and conservative phenotypes (corresponding to liberal and conservative genotypes), which are largely *a collection specific of attitudes;* for example, a favorable attitude toward unbending moral and behavioral codes and swift and severe punishments for violations of that code (conservative phenotype), or an unfavorable view of preset punishment, hierarchy, and social inequality (liberal phenotype). They also propose specific genes for these specific attitudes.[65] I shall examine each of what appear to be two distinct claims or proposals in turn—specific attitudes *are not* heritable, but rather a "flexibility of attitudes," and specific attitudes *are* heritable, namely the specific attitudes that comprise the liberal-conservative phenotypes. I begin with the latter.

In positing the existence of liberal and conservative "phenotypes" (and genotypes), AFH claim to have answered the following question:

> Why is a reasonably standard left-right spectrum widely applicable cross-culturally and over time? The universal left-right elements of belief systems around the world and over decades are difficult to explain . . . [T]he package of attitudes held, for example, by conservatives in the United States is remarkably similar to that held by conservatives in other cultures and at earlier times in American history.[66]

But if this is the problem that the authors claim to have solved, then they have solved a non-existent problem, for their characterization of a standard left-right spectrum as universal, existing in all cultures in all times, is completely historically inaccurate.

The left/right political divide, in the sense AFH intend, is a decidedly modern phenomenon, with distinct historical origins in the eighteenth century. Originally, the defining point on the ideological spectrum was attitudes toward the *ancien regime* in France; the right implied support for aristocratic, royal, or clerical interests, while the left implied radical and egalitarian sympathies, as well as support for laissez-faire capitalism and free markets.[67] Liberalism, in an identifiably modern form, has its origins in the seventeenth and eighteenth centuries in England, France, and America, while conservatism, as a self-conscious political ideology defined, in part, by its opposition to Enlightenment liberal principles, was born in the aftermath of the French Revolution.[68]

Nor is it the case that the "package of attitudes" held by liberals and conservatives today is remarkably similar to those held in the seventeenth and eighteenth centuries. Consider conservatism:

> Modern American conservatism is very different from European conservatism, or from conservatism traditionally understood. For one thing, conservatism in this country is "modern," and for another, it is "American." Ours is not the "throne and altar" conservatism that once defined European conservatism, and that is still characteristic of many Europeans on the right. These conservatives were true reactionaries. They sought to preserve the ancien regime and the prerogatives of king and church against the arrival of modern science, modern capitalism, and modern democracy.[69]

Modern liberalism differs in fundamental respects from what is sometimes called classical liberalism. For example, classical liberals, associated with early modern figures such

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as Locke and Smith were much more tolerant of economic inequality. By contrast, by the end of the nineteenth and early twentieth century, a growing body of liberal thought held that the maintenance of "liberal freedom" required a certain amount of government intervention in the economy and the creation of social welfare programs of one form or another[70] (an idea turned into partial political reality in the United States during the Roosevelt administration[71]). It is this latter conception of liberalism—"egalitarian" or "welfare state" liberalism—given canonical formulation in the late twentieth century by John Rawls's in *A Theory of Justice*—that today is commonly associated with liberalism in contemporary American society.

Not only is it not the case that the "package of attitudes" associated with liberalism and conservatism, left and right, have remained remarkably stable for the past 300 years, it is also not the case that there has ever existed any single "package of attitudes" that define liberalism and conservatism and unite all of their varied historical manifestations. It is doubtful that any ideology possesses an unchanging "core cluster" of political beliefs that effectively distinguishes it from all other ideologies, which makes the assumption of AFH that there exist discrete liberal and conservative "phenotypes" particularly problematic. As evolving and shifting historical modes of thought, ideologies are fundamentally hybrid and interconnecting phenomena. As Jeremy Waldron notes:

> It is fruitless, not only to look for a core of *common* characteristics, but also to think that we can find *distinguishing* or *peculiar* characteristics which differentiate views in one tradition from those in another. Liberal moderatism fades into conservatism; the conservative's concern for community matches the socialist's; the socialist claims to take the liberal concern for freedom more seriously than liberals themselves, and so on.[72]

In a similar vein, Alan Ryan writes:

> Anyone trying to give a brief account of liberalism is immediately faced with an embarrassing question: are we dealing with liberalism or with liberalisms? It is easy to list famous liberals; it is harder to say what they have in common . . . They do not agree about the boundaries of toleration, the legitimacy of the welfare state, and the virtues of democracy, to take three rather central political issues. They do not even agree on the nature of the liberty they think liberals ought to seek (Berlin 1969, 122–34).[73]

The problem with attempting to propose a core cluster of attitudes that distinguishes, in all times and places, one political ideology from another, is evident in AFH's attempt to characterize the liberal and conservative phenotypes, which they do as follows[74]:

> *Conservative phenotype*: Pro-attitudes toward in-group unity, strong leadership, clear and unbending moral and behavioral codes, swift and severe punishments for violations of this code, and "systematization;" a suspicion of out-groups; toleration of social inequality; a pessimistic view of human nature.
>
> *Liberal phenotype*: Pro-attitudes toward out-groups (greater tolerance), context-dependent rather than rule-based approaches to proper behavior, and group togetherness. Con-attitudes toward preset punishments, hierarchy, certainty, strong leadership, and inequality; an optimistic view of human nature; greater empathy.[75]

Not surprisingly, in light of what has just been noted concerning the historical and hybrid nature of political ideologies, much of what AFH classify as distinctive of liberal or conservative attitudes (or phenotypes) could easily characterize either. For example, a "faith in human nature" is characterized as a liberal belief (or attitude), but some of our most basic liberal institutions have been defended on the basis of a thoroughly pessimistic view of human nature, e.g., Madison in the *Federalist Papers* famously wrote that "the latent causes of faction are sown in the seeds of human nature," and "have rendered persons much more disposed to vex and oppress each other than to cooperate for the common good."[76] A desire for "clear and unbending moral and behavioral codes," classified as a conservative attitude, could just as well characterize a liberal supporter of constitutionalism and the rule of law (as opposed to say, the whims of a king, pope, or mullah), or a liberal advocate of an expansive list of international human rights. In fact, liberals from Kant to Rawls have been accused of being "rule worshippers" in their insistence that certain moral principles, such as "rights," be upheld regardless of the consequences,[77] which does not square well with the sweeping characterization of liberals as having a "context-dependent" rather than "rule-dependent" approach to human nature. Taking a context-dependent approach to human nature is, if anything, much more characteristic of conservatism in its varied historical manifestations, inasmuch as one of the defining features of conservatism is a belief that political wisdom is embodied in the particular "context-dependent" beliefs and practices of a particular society rather than in "abstract universal principles."[78] Liberals may or may not be averse to inequality depending upon what type of inequality is being referred to and what type of liberal one considers oneself. As noted, classical liberals, represented in recent decades by such thinkers as Hyeck, Freidman, and Nozick (who are sometimes called libertarians—and even "conservatives"!) have no problem accepting large inequalities in wealth and income and are generally opposed to redistributive taxation. And in any given individual today, one might find a mix of what are listed by AFH as liberal and conservative attitudes. Conservative Catholics, for example, tend to support clear and unbending moral and behavioral codes (conservative phenotype), but are also opposed to capital punishment (liberal phenotype); and while they accept the hierarchy of the Church (conservative phenotype), they oppose large-scale inequalities of wealth and income and historically have been champions of the poor (liberal phenotype).

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Liberalism and conservatism cannot be captured by a distinct and unchanging core "cluster of political attitudes." Any attempt to do so is a distortion of the complex history of these two ideologies. Nor is this problem alleviated if we shift to the more general—and more ambiguous—terms left and right (as when AFH speak of a "left-right divide"). The idea might be that left and right are political "spectra" or "axes" along which all ideologies can be ranked. But the problem here is the same as that with liberalism and conservatism: There exist no clear cut, ahistorical clusters of attitudes that can comprise the endpoints, as it were, of the "left-right spectrum," a spectrum along which we could meaningfully place all of the ideologies that have ever existed. AFH write, in fact, as if left and right are not really a spectrum at all, but rather are terms *equivalent to* liberalism and conservatism. Regardless of what one thinks of the usefulness of the left/right axis as a classificatory scheme, it is customary to characterize ideologies as left of liberalism (e.g., socialism and communism) and right of conservatism (e.g., reactionism). And the usefulness of such a linear left-right spectrum is increasingly challenged.[79] There is no real consensus as to what exactly this spectrum is supposed to be measuring and where precisely to place specific ideologies.

Talk of ideologies and a political spectrum points to another significant problem with AFH's characterization of liberalism and conservatism; for they write as if these two ideologies divide the political universe between them, as if they are the only political ideologies that have ever existed. Far from dividing the political universe, liberalism and conservatism have been pre-dated by, had to share the historical stage with, and had to compete with ideologies as diverse as theocratism, monarchism, anarchism, Marxism, Stalinism, Maoism, socialism, fascism, and totalitarianism. And what of *non-Western* political ideologies throughout history? Ancient Egypt, Buddhism, Confucianism, Hinduism, and Islam have all given rise to manifold and distinctive political ideologies throughout history, all of which could be called liberal or conservative, left or right, only by engaging in extreme procrustean distortion.

In characterizing the liberal-conservative divide as in effect "universal," AFH have committed the fallacy of taking the local and particular for the universal. In characterizing the political attitudes of twenty-first century Americans they assume that they have characterized the political attitudes of all mankind in all times and places (or mankind abstracted from all times and places). The commission of such a fallacy is possible only by paying insufficient attention to both history and culture, and the lack of such attention seems naturally to be fostered by two of AFH's assumptions. The first, already examined, is that there exist trans-cultural and trans-historical liberal and conservative phenotypes/genotypes. The second is that "political attitudes are influenced much more by genetics than by parental socialization."[80] For "parental socialization" can only be socialization within a particular culture in a particular historical period, and if such socialization matters less than genes in the etiology of political attitudes, then the same is true of culture and history.[81]

Yet even if, for the sake of argument, we could agree on a universal set of attitudes that meaningfully distinguishes liberal from conservative ideologies, or the left from the right in all times and places, there remains the difficulty that while AFH acknowledge that heritability is *not* a matter of the genetic transmission of particular attitudes, we are presented with "phenotypes" that are essentially a collection of particular attitudes.[82] In fact, the authors go so far as to tie specific attitudes to specific genes (or groups of genes), conjecturing that while the genes that make up the liberal and conservative phenotypes tend to "move together," they need not always do so:

> Even if the individual genes involved with absolutism or contextualism [the broader "world orientation" phenotypes of which, according to AFH, the liberal-conservative phenotypes are a part] tend to move together, this does not mean that they always do. Some individuals may carry, say, the absolutist's aversion to outgroups but a contextualist's rejection of a universal behavioral code.[83]

This characterization as to how genes—and attitudes—might move warrants comment. It suggests what might be termed a discrete "attitude unit" view of political ideologies. That is, an ideology is composed of a set of distinct attitudes or beliefs, each particular attitude the product of a corresponding gene (or set of genes). These specific genes—and the corresponding attitudes—can, even if they tend to be grouped in certain patterns (as in the liberal-conservative phenotypes), be rearranged in conceivably any pattern (depending on how the discrete genes move). Were this true, ideologies would lack any overarching (or underlying) "themes" or principles that united the beliefs of which they were comprised in some coherent fashion. Ideologies would in effect be a random concatenation of discrete "attitude units."

Now AFH do say that "for the most part" the beliefs that comprise the liberal-conservative phenotypes do "move together."[84] But *why* do they "move together"? For example, why are libertarians committed to a strong conception of equal (negative) rights and simultaneously accepting of inequalities in wealth and income? Were we to assume that these two sets of attitudes—support for certain basic equal rights, acceptability of unequal wealth and income—as discrete attitude units, just happened to move together, then libertarianism, and every other ideology, would ultimately be *meaningless,* a happenstance concatenation of discrete attitudes.[85] In libertarianism, these two attitudes are linked as part of a *normative system*; to understand libertarianism is to understand the *reason* why these two beliefs cohere. To say that they

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cohere because that's just the way that certain genes tend to move (as part of the libertarian phenotype) is to fail to understand the ideology; or put another way, it is to fail to comprehend the ideology *as an ideology.* Furthermore, could genes move in such a way that an individual ends up holding, for example, mutually exclusive propositions, such as a belief in radical equality and a favorable view of hierarchy? What is to preclude such a possibility on a view in which simply the movement of genes determines which group of beliefs will end up being lumped together to form an ideology? (And if one is inclined to deny that this could ever happen, one should ask oneself if this denial is based upon principles of genetics, or rather, principles of *reason* and *rationality*).

To return to the problem of the genetic transmission of particular political attitudes, what might be the problem with such an assumption? An attitude such as a favorable view of swift and severe punishments presupposes an enormous amount of latent knowledge somehow encoded in our genes—of the existence and characteristics of regulative social norms (e.g., laws, conventions, taboos), of the existence and characteristics of the social practice of punishment for violations of those norms, of the normative significance of both social norms and punishment, of the normative significance of such punishments being swift and severe (as opposed to being slow and lenient). In fact, it presupposes something like an entire culture. Punishment is a normative social practice, an institutional means of maintaining social order and control and, as such, is what John Searle calls an *institutional fact,* like other social institutions and practices such as money, property, and marriage.[86] Institutional facts determine socially defined behaviors, beliefs, and attitudes, and in the words of Sir Michael Rutter, "*genes do not, and cannot, code for socially defined behaviors.*"[87]

Personality and Political Ideology

One way to avoid these difficulties is to assume that AFH do not actually mean that specific political attitudes are heritable (despite all that they say).

This brings us to their suggestion that "the connection between genes and attitudes may not involve specific attitudes as much as the flexibility of attitudes . . . Individual genes for individual behaviors do not exist." It is for this reason, presumably, that AFH invoke the concept of "personality" in explaining the heritability of political ideologies: "We . . . predict that attitudes on political issues tracking most closely to central personality traits are generally heritable since personality traits are generally heritable and since the heritability of social attitudes is likely derivative of the heritability of various personality traits."[88]

The claim appears to be that personality traits are heritable, *not* political ideologies or political attitudes, and that these heritable personality traits are correlated with political beliefs, i.e., political ideologies are "derivative of" heritable personality traits. The idea that it is personality traits and not political ideologies that are heritable might appear to answer some of the objections raised above. We might conjecture that a given heritable personality trait would manifest itself in terms of one political ideology in one culture at a given time and in another political ideology in another culture or the same culture at a different time. Thus we would say that genetically transmitted personality trait X, while correlated with political attitude(s) Z among a specific population, is not itself attitude Z, but in a different, time, place, and culture, would manifest itself as attitude W.

The idea that there is some connection between specific personality traits and the holding of specific political ideologies has a long and venerable pedigree in political science and political psychology, extending back at least as far as Plato's *Republic.* It is also an idea that does not in any way depend upon assumptions concerning the *heritability* of personality traits, i.e., personality traits have often been linked by theorists with political ideologies in the absence of any distinct assumptions as to how those personality traits are acquired (e.g., genes, early childhood experiences, education, parental/societal indoctrination, etc.).

In making causal connections between so-called personality traits and particular beliefs or attitudes there is a constant temptation to define a given trait as simply having the particular set of attitudes for which one is trying to account. But these personality traits, whatever they may be, cannot be defined in circular fashion by the very attitudes to which they are supposed to give rise; we must be able to identify a distinct set of traits that while correlated with a distinct set of beliefs can be characterized apart from those beliefs. As noted earlier, AFH talk of specific genes (or a specific gene) as being associated with specific political beliefs in a quite precise way.[89] If we are to assume that it is personality traits that are heritable then it would be necessary to correlate a distinct personality trait with each of the pro and con attitudes the authors list as comprising the liberal-conservative phenotypes, keeping in mind that the personality trait in question cannot be defined as, e.g., "an aversion to out groups" (conservative phenotype) or "a dislike of universal behavioral codes" (liberal phenotype).

The authors do not attempt this, and it is doubtful that one could ever imagine a distinct personality trait to be correlated with every one of the attitudes listed as comprising the liberal-conservative phenotypes. And any attempt to do so would be extremely problematic, if not silly. What specific (and presumably heritable) personality trait would one propose to correlate with "a desire to take a more context dependent rather than rule-dependent approach to proper behavior" (liberal phenotype) or "a fondness for systematization" (conservative phenotype)?

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And any personality trait proposed would entail that liberal and conservative individuals would have or lack the personality trait in question depending upon whether or not they were liberals or conservatives. Thus, were one to suggest that, e.g., "irascibility"—a tendency to be easily angered—was the heritable personality trait correlated with "a desire for swift and severe punishments," this would entail that there could be no (or very few) "irascible" liberals.

The one suggestion that AFH do give concerning those heritable personality traits that are presumed to give rise to distinct political ideologies is a reference to "openness": "One of psychology's 'Big 5' personality traits is general openness and it seems likely degree of openness is relevant to the political arena. Liberals and conservatives, on average, differ in their openness to atheism, homosexuality, communism, immigration, and counter-cultural activities."[90] Of course, conservatives could be characterized as being more "open" than liberals to, e.g., a theistic worldview, maintaining traditional moral standards concerning sexuality, the institution of private property, immigration quotas, and upholding traditional cultural practices in general. Unless one assumes that one can only be "open" to liberal principles, we need a more informative definition of "openness" to evaluate the authors' claim. And I will simply assert that it is doubtful that any non-tendentious use of the term "openness" as a personality trait will yield the result that only liberals can have an "open" personality.[91]

Conclusion

I have argued the following: First, that the research technique employed by AFH—twin studies—is, according to many prominent scientists, based upon a faulty paradigm, namely, that in studying the origin of complex traits or attitudes or beliefs, genes and environment (or nature and nurture) can be meaningfully partitioned in such a way that the causal effects of each can be precisely quantified by statistical methods. Second, that the same research technique is, according to many prominent scientists, susceptible to so many confounding effects that there are good reasons to be skeptical of claims of heritability based solely upon such studies, particularly in relation to attitudes that are critically dependent upon environment (socialization and culture) for their content and specificity. Third, the defects of twin studies notwithstanding, the results of the study of AFH do not obviously support the conclusions they draw from them. Fourth, the assumption that there could be such a thing as liberal and conservative "phenotypes" depends upon historically incorrect assumptions concerning both the universality and ahistorical nature of liberalism and conservatism, and the mistaken view that liberalism and conservatism can each be reduced to a distinct set of unchanging "core attitudes." Fifth, to the extent that what the authors are really proposing is genetically transmitted personality traits rather than distinct political attitudes, it is highly problematic to assume that there is a distinct personality trait for each attitude that the authors identify as comprising the liberal and conservative phenotypes.

I would like to conclude with the following consideration regarding the value of an explanatory hypothesis (for I consider what AFH have presented—for all of the reasons noted above—to be not a scientific proof, but an explanatory hypothesis). One way to evaluate the soundness of a hypothesis is to ask whether or not it can explain the phenomenon under consideration better than other explanations. In the present case, the assumption that political ideologies are genetically transmitted, rather than explaining the phenomena better than, say, traditional historical and cultural and sociological explanations, render them mysterious, if not incomprehensible. For example, the historical advent, development, and many transformations of liberalism and conservatism as political ideologies are well (but by no means completely) understood as historical phenomenon. If genes count for more than environment in explaining the phenomena of liberalism and conservatism, then these phenomena become utterly incomprehensible. Why should liberalism, as a "phenotype," manifest itself in Europe in the seventeenth, eighteenth and nineteenth centuries? Why should conservatism, as a phenotype, manifest itself (at least in its most well-known form) in the wake of the French Revolution? Why should great liberal and conservative thinkers—Locke, Smith, Burke, de Maistre—suddenly appear on the world stage when and where they do? How to explain the differences between classical liberalism and its modern manifestations, and how one developed out of the other? How to explain the transformation of conservatism from its earlier "reactionary" forms to its modern incarnations? How to explain the birth, spread, and eventual demise of *communism,* one of the most important political ideologies of the twentieth century (and which at one time was viewed as the greatest ideological threat to both liberalism and conservatism)? What of fascism? What of anarchism? What of the resurgence of nationalism in Eastern Europe with the collapse of the Soviet Union? And so on and so forth. What possible "genetic story" could account for these undisputed historical phenomena?

But it is not only history that is rendered incomprehensible by the assumption that political ideologies are genetically transmitted (and that the ideological universe is divided between universal and unchanging "left" and "right" "phenotypes"). A good deal of public opinion data becomes equally incomprehensible. For example, if one looks at conservative self-identification from 1972–2004, one finds some obvious correlations. Income shows a high and persistent correlation with self-identification as a conservative: As of 2004, 18 percent of those in the 0–16 income percentile self identified as conservatives, compared with 48 percent in the 96–100 percentile. In addition, race shows a high correlation with self-identification

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as a conservative: 36 percent of whites as opposed to 15 percent of blacks self-identify as conservatives.[92] Are we seriously to assume, for example, that not only is there a liberal and conservative genotype, but that this genotype which, according to AFH, counts for more than environment in determining a person's political orientation, is somehow associated with *income* and with *race*? And if we do not assume this, what possible genetic explanation could account for such correlations?

But such correlations are well explained when we look at the history of the United States, just as the rise and transmission of liberalism and conservatism are well-understood when we examine European history. In sum, we can understand the world of political ideologies by understanding history and culture, the ultimate "environmental influences." What, if anything, the study of genetics adds to our understanding of political ideologies remains to be seen.

Notes

1 Jonathan Beckwith, American Cancer Society Professor of the Department of Microbiology and Molecular Genetics at Harvard University, 2006, 89. Here is a small sampling (most of the reports listed here have been published in multiple news sources and news services generally supply stories to hundred of newspapers worldwide): "'Angry gene' Could Help Spur Hostility," *Washington Post,* March 9, 2007, reporting on a study by I. Halder, University of Pittsburgh; J. Grisolia, Scripps Mercy Hospital; and E. C. Suarez, Duke University; "Born to be Bad? Genetic Research Says Maybe" *Reuters,* February 7, 2007, reporting on Harden et al. 2007; "Violence Is Blamed on 'Warrior Gene' in the Maoris," *Daily Telegraph,* August 10, 2006, reporting on research of genetic epidemiologist Ron Lea (for the controversy sparked by Lea's claims see, e.g., "Scientist Defends Warrior Gene," *New Zealand Herald,* March 5, 2007; "Maori Gene Claim Stirs Family Violence Debate in New Zealand," *China Daily* and *Global News Wire—Asia Africa Intelligence Wire,* August 15, 2006; "New Zealand's Maori Minister Hone Harawira Arguing that severe poverty and high unemployment are to blame for the violence in Maori communities, and not a "warrior" gene as claimed by geneticist Rod Lea," *New Scientist,* August 19, 2006); "Lives of Crime," *Prospect,* July 27, 2006, reporting on Caspi et al. 2002, "Role of Genotype in the Cycle of Violence in Maltreated Children"; "Conservative or liberal? It may be in the genes," November 2, 2006, *Associated Press,* reporting on Alford, Funk, and Hibbing 2005; "Some Politics May Be Etched in the Genes," *New York Times,* June 21, 2005, reporting on Alford, Funk, and Hibbing 2005; "Genes Contribute to Religious Inclination," *Popular Scientist,* March 16, 2005, reporting on Koenig et al. 2005; "Study Finds Genetic Basis For Human Kindness," *ABC News,* January 12, 2005, reporting on Rushton 2004; "Israeli Researchers Find 'Altruism Gene,'" *Jerusalem Post,* January 20, 2005, reporting on Bachner-Mehlman et al. 2005; "Homosexuality is Genetic," *CanWest News Agency,* January 29, 2005, reporting on Mustanski et al. 2005; "God Gene Discovered by Scientist," *Telegraph Group Limited,* reporting on Hamer 2004; "Of Genes and Exit Polls: Overlooked in recent election commentary was the real reason for the red-state victory. Heavy hint: It's biological," Dan Seligman, *Forbes,* December 13, 2004, reporting on Rice and Hibbing 2004, Jost et al. 2003, and Bouchard et al. 2003; "Happiness is Mostly Genetic," *Forbes,* September 23, 2004, reporting on Lykken 2000; "Smoking Linked to Anger Gene," *Herald Sun,* February 14, 2004, reporting on Fallon et al. 2004; "British Scientists Discover Criminal Gene," *ABC News,* August 5, 2002. In point of fact, not a single gene has been discovered for any of these traits, attitudes, or beliefs.

2 Galton 1875, 397.

3 Hamer and Copeland 1998, 22.

4 For altruism, see, e.g., Rushton, Littlefield, and Lumsden 1986; for criminality, see, e.g., Moffitt 2005, Rhee and Waldman 2002; for "religiosity" see, e.g., Bouchard et al. 1999; for conservatism, see, e.g., Bouchard et al. 2003.

5 Alford, Funk, and Hibbing 2005.

6 Ibid., 164.

7 Ibid., 164.

8 Sigelman 2006, 172. Some of the excitement this article has generated amongst political scientists is doubtless due to the hope that at long last, the dream of some political scientists to have political science become a "true" science on the model of the natural sciences—or rather, on the basis of a somewhat crude conception as to what makes the natural sciences "science"—is about to be realized.

9 See the citations given in n. 1.

10 For the heritability of "criminal behavior" see, e.g. Harden et al. 2007; Moffitt 2005; Caspi et al. 2002.

11 Elkins 2003, 296. See, e.g., "The Impact of Behavioral Genetics on the Criminal Law," special issue of *Law and Contemporary Problems* 69 Winter/Spring (2006); Paul S. Appelbaum, "Law & Psychiatry: Behavioral Genetics and the Punishment of Crime," 56 *Psychiatric Services* 25, 25 (2005); M. Jones, "Overcoming the Myth of Free Will in Criminal Law: The True Impact of the Genetic Revolution," 52 *Duke Law Journal* 1031, 1039–40 (2003).

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12 Herrnstein and Murray 1994. See, e.g., Jacoby and Glauberman 1995; Daniels, Devlin, and Roeder 1997; Gottfredson 1998, 1994.
13 Cooper and Zubek 1958.
14 For more on this kind of gene-environment interaction, see, e.g., McClearn 2004, Meaney 2001, Rampon et al. 2000, Kempermann et al. 1997. The results of this experiment contradict a central assumption of A. R. Jensen 1969, set forth in a famous paper, "How Much Can We Boost IQ and Scholastic Achievement?" Jensen claimed that IQ will in fact vary over environments in the following manner: In impoverished environments all genotypes will do equally poorly, but in enriched environments the higher IQ genotypes/phenotypes will always surpass the lower ones. For a further critique of the assumptions of Jensen, see Lewontin 2000, 22–30.
15 Shonkoff and Phillips 2000, 48.
16 There is speculation that the current "lag" in the height of Americans is due to their "junk food" diet; Komlos and Bauer 2003.
17 Plomin and Kosslyn 2001, 1153. See Meaney 2001, 50: "It is interesting to note that the most fervent practitioners of quantitative human behavioral genetics come not from genetics or even from biology at all. They are very commonly persons trained in psychology. It is unfortunate that psychology has exerted a much greater effort in training its students in statistics than in biology—with the predictable results. It is really nothing more than a convenient myth to believe that one can study the influence of genes without understanding anything of molecular genetics."
18 Gerald E. McClearn, Evan Pugh Professor of Health and Human Development and Biobehavioral Health, Department of Biobehavioral Health, Center for Developmental and Health Genetics, Pennsylvania State University, 2004, 124.
19 Michael J. Meaney, James McGill Professor, Departments of Psychiatry and Neurology & Neurosurgery, Program for the Study of Behavior, Genes and Environment, Douglas Hospital Research Centre, McGill University, 2001, 51.
20 Douglas Wahlstein, Great Lakes Institute for Environmental Research and Professor of Biological Sciences, University of Windsor, former President of the International Behavioural and Neural Genetics Society (was presented with the Distinguished Scientist Award of the International Behavioural and Neural Genetics Society in 2006 for "outstanding lifetime achievement and contributions to the field of behavioural and neural genetics"); Wahlstein and Gottleib 1997, 178.
21 Johnson 2001.
22 Bruer and Greenough 2001; Nelson 2000.
23 Hurford 1991.
24 Karmiloff-Smith 2006, 48 (emphasis added in the first sentence); see Wyman 2005, McClearn 2004, Kahn 2003.
25 Parens, Chapman, and Press 2006, xvi.
26 Plomin 2004.
27 Hettema, Neale, and Kendler 1995, 327.
28 Evans and Martin 2000, 77; see Horowitz et al. 2003, Sandbank 1999, Ainslie 1997.
29 See, e.g., LaBuda et al. 1997, Kendler et al. 1994.
30 Joseph 2000, 544–45; 2004, 54–60, 69–70; cf. Richardson and Norgate 2005, 34.
31 Scarr and Carter-Saltzman 1979, 528; Joseph 2000.
32 Eagly, Ashmore, Makhijani, and Longo 1991; Feingold 1992; and Webster and Driskell 1983 in Perlini et al. 2001, 277.
33 Burns and Farina 1992 and Buss 1994, in Horowitz et al. 2003, 113–14.
34 Guo 2001, 122.
35 Bouchard 1993; Kendler et al. 1994; Rose 1991.
36 Joseph 2000, 545.
37 Bouchard and McGue 2003; Bouchard et al. 1990.
38 Studies have shown that parents' recounts of their rearing practices are often biased to match some ideal of parenting; Bradburn, Rips, and Shevell 1987; Robbins 1963.
39 O'Connor and Deater-Deckard 1998; Ge and Chadoret 1996; McCartney, Harris, and Bernieri 1990.
40 This is the claim made by Alford, Funk, and Hibbing 2005, 155.
41 Penderson et al. 1992; Bouchard et al. 1990; Langinvainio, Koskenvuo, and Kaprio 1984.
42 See, e.g., Bruer and Greenough 2001.
43 Joseph 2004, 131. Consider the following hypothetical experiment: Of a group of 100 people, 50 are told that it has just been discovered that they have identical twins. These 50 meet their "identical twins," who are in fact members of the "study team" recruited to be the same age and gender and look almost identical to each of the 50 participants. For one week they spend all of their time together to get to know one another as well as possible. The 50 other participants are introduced to 50 other study team members of the same age and gender to whom they bear no particular physical resemblance, and are told that they are strangers whom they should spend one week trying to get to know well. Is it not highly likely that the 50 "twins," when tested, would self-report significantly higher concordances to their fake twins than the remaining 50 with their matched "strangers"?
44 Beckwith 2006, 81; see Kamin and Goldberger 2002; Joseph 2004, 125–136.
45 Rowe 1994; Bouchard et al. 1990.
46 Beckwith 2006, 82; cf. Kamin and Goldberger 2002, 86.

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47 See Alford, Funk, and Hibbing 2005, 155 n.3.
48 Kamin and Goldberger 2002, 87.
49 Beckwith 2006, 82.
50 Eckert, Heston, and Bouchard 1981, 180.
51 Joseph 2004, 98–104; Kamin and Goldberger 2002, 85; Watson 1982, 48.
52 The study of AFH (2005, 158–61) employs the statistical method of polychoric analysis, whereas most recent twin studies employ a more involved statistical technique called Structural Equation Modeling (SEM); Tomarken and Waller 2005. SEM, however, in no way obviates all of the problems associated with twin studies discussed above: It depends every bit as much as polychoric analysis on the Equal Environment Assumption, unbiased samples, and so forth. As Hettema, Neale, and Kendler 1995 (327) note: "Both traditional analysis of twin data (e.g., Falconer 1989) and more recent structural equation models for twin analysis (Neale and Cardon 1992) are predicated on the equal-environment assumption (EEA)—that monozygotic (MZ) and dizygotic (DZ) twins are equally correlated for their exposure to environmental influences that are of etiologic importance to the trait or disorder under study." As Tomarken and Waller 2005 (56) note of the use of SEM in twin studies, "sophisticated statistical procedures cannot rescue a poorly designed study." As I have argued, twin studies are poorly designed studies; their flaws are of such a nature that they cannot be rescued by statistical procedures applied to the data after the data has been collected. I am indebted to an anonymous reviewer for raising the issue of SEM, and to Ian Morgan for an instructive exchange of e-mail on this topic.
53 See e.g., Holsinger 1981, 144–5: "Since Occam's Razor ought to be invoked only when several hypotheses explain the same set of facts equally well, in practice its domain will be very limited . . . Cases where competing hypotheses explain a phenomenon equally well are comparatively rare."
54 I would like to emphasize, yet again, that this is what my argument concerns: political ideology.
55 The study by Bouchard et al. 2003 was a study of a small sample of *twins raised apart*—54 pairs of monozygotic and 46 pairs of dizygotic twins reared apart, whereas the study of AFH is a study of a large sample of *twins raised together.*
56 AFH 2005, 158
57 Ibid., 164.
58 Ibid., 159.
59 Ibid., 159.
60 The importance of the constant refrain "at the present time in the Unites States" should become clear in what follows.
61 AFH 2005, 164.
62 Ibid., 158.
63 Ibid., 154, emphasis added.
64 Ibid., 163, emphasis added.
65 Ibid., 168.
66 Ibid., 153, 164.
67 Heywood 1992, 16–17.
68 Ryan 1993; Quinton 1993.
69 D'Souza 2002, 4–5.
70 E.g., Hobhouse 1964.
71 See, e.g., Kennedy 1999.
72 Waldron 1993, 36.
73 Ryan 1993, 291.
74 AFH 2005, 164–5.
75 In AFH 2005 they do not employ the expressions "pro" and "con" attitudes, but I do not think they would object to my use of them. The actual language employed by AFH in describing the attitudes that comprise the liberal-conservative phenotypes is revealing. They scrupulously avoid the use of the terms "moral," "ethical," "should," "ought," "right" and "wrong;" but rather, in describing persons' (moral and political) attitudes employ expressions such as "desire for," "fondness for," "yearning for," and "preference for." Thus, they write of a "fondness for swift and severe punishments," "a yearning for in-group unity," "a distaste for preset punishments," and "an aversion to inequality" (164–5). In characterizing "easy" moral/political issues (164), in the sense of issues about which people have very strong and unambiguous opinions, the authors describe persons' strong beliefs as "gut responses." Characterizing moral/political beliefs by terms such as "fondness," "yearning," "distaste," "desire," and "aversion," makes them appear equivalent to, e.g., a fondness for chocolate or an aversion to the smell of blue cheese. To write of "gut responses" makes moral reactions seem on a par with visceral reactions like nausea. Using the language of "tastes" and "desires" to refer to complex moral and political beliefs makes genetic explanations of these beliefs seem less counter-intuitive. The language of "tastes" and "desires" is well suited to genetic explanations of human behavior, since it seems to make more sense to talk of a genetically determined aversion to, e.g., certain odors, then to talk of a genetically determined political ideology or moral belief system. As is well known, the problem with the language of tastes, desires, and aversions is that it fails to account for two central features of morality as experienced by moral agents: First, that for the sake of doing what one believes to be the morally right thing one must at times act against his or her strongest "yearnings," "desires," and "aversions"; and second, that reason plays a role in moral judgment. The denial of any role for reason in moral judgment is implicit in most

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of what AFH say about political attitudes and can be seen quite clearly in their characterization of how one's moral-political beliefs might change (although never using the term "moral"): "An individual with a contextualist genotype who has been repeatedly victimized by an out-group, or who has simply spent a great deal of time listening to persuasive absolutists, may adopt attitudes that run against type" (165). They also comment that political ideologies are more difficult to "manipulate" to the extent that they are inherited (164). Thus, according to the authors, moral beliefs can change as a result of repeated negative reinforcement—as a mouse might avoid a certain type of food after receiving repeated electrical shocks, "persuasion"—as opposed to argumentation, and "manipulation."

76 Madison et al. 1989, 58–9; cf. Shklar 1984.

77 See, e.g., Smart 1973.

78 Burke 1999; Quinton 1993.

79 See, e.g., Lasch 1991.

80 AFH 2005, 164.

81 Oddly enough, at one point AFH (ibid., 165) appear to clearly acknowledge the importance of culture in explaining human behavior: "Gene–culture interaction is the key to understanding the source of political attitudes and behaviors, just as it is the key to understanding most physical and behavioral aspects of the human condition. Genes do not work in isolation and instead generally influence the extent to which organisms are responsive to particular environmental conditions." The problem is that almost everything else they say in their article ignores or contradicts this assertion.

82 Ibid., 154.

83 Ibid., 168.

84 Ibid., 154.

85 In fact, it is not clear that there could be such a thing as "meaning" at all on a view in which discrete or atomic attitude units cohered for "meaningless" reasons. Nor is the idea of a discrete attitude unit coherent in and of itself, since ideas (or "attitudes") can only be defined (or have meaning) in relation to other ideas. To talk of a discrete or atomic attitude unit is like proposing that a single sentence in a given language could be comprehensible (or have meaning) in isolation from the language system of which it is a part.

86 Searle 1995.

87 Rutter 1996, 266.

88 AFH 2005, 157.

89 Ibid., 165.

90 Ibid., 157.

91 It is beyond the scope of this paper to consider the relationship, if any, between personality and political ideology. I shall simply note the following, which is relevant to the present discussion. There exists what might be called (for want of a better term) a "liberal bias" in assorted assessments of personality, a bias that is particularly evident in the Five-Factor Model (FFM) and its characterization of the trait of "openness." FFM is based on the idea that the following five dimensions are necessary and sufficient for characterizing human personality: introversion/extroversion; agreeableness; openness to experience; conscientiousness; and emotionality/neuroticism. The trait of openness is itself broken down into sub-categories used to measure or "score" overall "openness," and one of these subcategories is "liberalism" (as measured by specifically political indicators of liberalism); Costa and McCrae 1992. How one scores on the "liberalism" category can significantly affect how one scores on overall level of "openness." Thus, in a wholly circular fashion, openness is correlated with liberalism *by definition.* The concomitant of such a "liberal bias" in personality assessment is what might be called the "pathologizing" of conservatism; Bailey 2004. For example, in an article entitled "Political Conservatism as Motivated Social Cognition," the authors conclude on the basis of a meta-analysis of a large number of personality test results that "several psychological variables predict conservatism." It is positively correlated with death anxiety, system instability, dogmatism-intolerance of ambiguity, fear of threat and loss; and negatively correlated with integrative complexity, uncertainty tolerance, self-esteem and, not surprisingly, *openness to experience;* Jost et al. 2003, 339. Research psychologist Robert Altemeyer, inventor of the "Right Wing Authoritarian Scale" (RWA), flatly denies that "an authoritarian impressively like the authoritarian on the right reposes on the left end of the RWA scale." Those who score low on the RWA scale are described as "fair-minded, even-handed, tolerant, nonaggressive persons . . . They are not self-righteous; they do not feel superior to persons with opposing opinions"; Altemeyer 1981. To be sure dogmatic, intolerant, arrogant "personality types" must be conservative and cannot be liberal if such a stipulation is included in the *definition* of "authoritarian," "dogmatic," and "aggressive." But it is worth asking whether we are striving to give words a denotation that reflects our own political ideologies, or seeking to uncover a meaningful connection between personality traits and the holding of particular political ideologies? If we can successfully expunge all the prejudicial assumptions that link particular personality traits with particular political ideologies, there will be nothing at all problematic about, e.g., a dogmatic, arrogant, and self-righteous liberal.

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92 Figures from the ANES Guide to Public Opinion and Electoral Behavior, 1972–2004.

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