



Linking Genetics and Political Attitudes: Reconceptualizing Political Ideology

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In this paper, we trace the route by which genetics could ultimately connect to issue attitudes and suggest that central to this connection are chronic dispositional preferences for mass-scale social rules, order, and conduct—what we label political ideology. The need to resolve bedrock social dilemmas concerning such matters as leadership style, protection from outgroups, and the degree to which norms of conduct are malleable, is present in any large-scale social unit at any time. This universality is important in that it leaves open the possibility that genetics could influence stances on issues of the day. Here, we measure orientation to these bedrock principles in two ways—a survey of conscious, self-reported positions and an implicit association test (IAT) of latent orientations toward fixed or flexible rules of social conduct. In an initial test, both measures were predictive of stances on issues of the day as well as of ideological self-labeling, thereby suggesting that the heritability of specific issue attitudes could be the result of the heritability of general orientations toward bedrock principles of mass-scale group life.

KEY WORDS: Biology, genes, ideology, political attitudes, IAT, bedrock principles

For decades, research employing the standard techniques of behavioral genetics has presented evidence that political and social issue attitudes are heritable (Bouchard & McGue, 2003; Eaves et al., 1999; Martin et al., 1986) and for decades students of political attitudes remained largely unperturbed by that provocative finding. The failure to engage behavioral genetics allowed the sources of political attitudes to be viewed narrowly as consisting entirely of postnatal experiences such as parental socialization (Campbell, Converse, Miller, & Stokes, 1960; Jennings and Niemi, 1968, 1991; Jennings, Stoker, & Bowers, 2009), economic conditions (Fiorina, 1981), socioeconomic status (Leighley & Nagler, 1992), social context (Huckfeldt & Sprague, 1995), and media influence (Iyengar & Kinder, 1987). Events and situations were alleged to be the sole source of political attitudes; indeed, they had to be the sole source given the widely held assumption that people are born with politically blank slates.

Still, the more general blank slate assumption has been thoroughly debunked (Pinker, 2002) and the evidence is now clear that certain phobias, preferences, and behaviors are innate (Garcia & Koelling, 1966; Hammock & Young, 2005; Marks & Nesse, 1994; Mineka & Cook, 1986). Phobias, maybe, but could humans be born with *political* predispositions, particularly predispositions concerning the specific, context-dependent individual issues analyzed in the aforementioned behavioral genetics work? Research in political science is beginning to take seriously that this is indeed the case. A small but growing literature in the discipline has found consistent evidence that political attitudes and behaviors are at least partially heritable (e.g., Alford, Funk, & Hibbing, 2005; Hatemi, Gillespie, Hibbing, Alford, & Martin, 2008; Hatemi et al., 2010), and other studies have reported correlations between specific genes and political phenotypes (e.g., Fowler & Dawes, 2008; Settle, Dawes, Christakis, & Fowler, 2008).

This empirical evidence, however, has not been accompanied by a theoretical or conceptual model that can comprehensively account for the causal chain that links genes with attitudes on specific issues. Though politics of the sort generated by interpersonal dominance hierarchies is as old as mammalian social life, many of the central political issues of today pertain to the organization of extremely large units and therefore are of relatively recent vintage. In short, it is much easier to understand the evolutionary logic for “slates” containing programmed reactions to ancient dangers than it is to understand the reason we might possess biological predispositions toward school prayer, foreign aid, federal housing, and capitalism.

Mass-scale societies vary widely; some exist in conditions of plenty, others in relative scarcity; some survive under constant threat from nearby groups, others in virtual isolation; some experience frequent disasters, others are more fortunate. Consequently, the particularities of political issues are quite different from one culture to another and from one time period to another. How could there be a genetic basis for attitudes toward the Iraq War, busing to achieve racially desegregated schools, or a “draft” into military service when these issues are only relevant in certain societies and for certain periods of time? For that matter, the

left-right continuum that spatially defines political spectra in so many countries today is itself a cultural product, arising as it did from legislative seating arrangements in revolutionary France (Freeden, 2003, p. 4; Heywood, 1992, pp. 16–17). The issues that drive the public agenda and create competing ideological camps are typically parochial and frequently come with a limited shelf life.

In light of the arguments just summarized, resistance to the possibility that political attitudes are heritable is understandable. But just because issues and ideologies shift constantly does not mean a universal basis for political predispositions cannot be present. Linking genes to political attitudes and behaviors undoubtedly requires explicating a long and complex causal chain to connect the former to the latter. In this paper we provide a basic conceptual model to clarify this causal chain and to empirically test some of the key causal relationships it specifies. While our empirical tests do not comprehensively cover genotype to phenotype, they do suggest that political issue attitudes can connect back to timeless social concerns, a connection that suggests our model functions as at least a starting point for building a theoretical bridge to link biology and genes to political attitudes and behaviors.

Connecting Genes to Specific Political Attitudes

Research on the heritability of political preferences typically has analyzed specific positions on reasonably salient issues in a given culture at a given time (see Alford, Funk & Hibbing, 2005; Funk et al., 2009; Hatemi et al., 2008). For example, participants in these studies—twins—are asked if they support or oppose censorship, gay rights, the death penalty, abortion, and property taxes. To the extent the results reveal heritability, the impression might be given that genetics directly affects these highly specific issue preferences in the fashion depicted in Figure 1, thereby calling into question the veracity of the empirical findings.

Though the possibility that issue attitudes have a connection to genetics is frequently denounced for this very reason (e.g., Charney, 2008; Beckwith & Morris, 2008; but see Merelman, 1969), a more appropriate response is to think carefully about the nature of genetics, the nature of politics, and the ways the two could be connected—however circuitous that connection may be. Figure 2 presents one depiction of the possible intermediary steps between genetics and political issue attitudes (see also Carmen, 2007). As simplifying as it is, Figure 2 does serve the function of indicating that genes are unlikely to affect issue attitudes



Figure 1. Simplistic Vision of the Connection between Genetics and Political Attitudes.

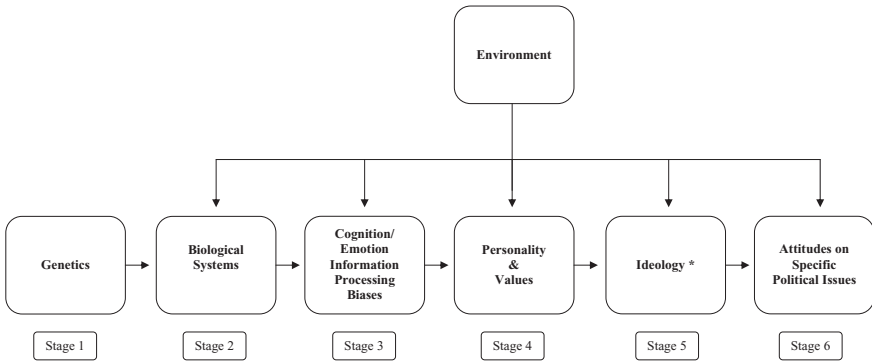


Figure 2. More Realistic Vision of the Connection between Genetics and Political Attitudes. (Greater detail provided in Figure 3).

directly but rather genes affect biological systems that in turn affect cognitive processing tendencies that in turn affect personality and value traits that in turn affect an aspect of ideology that we call political ideology (or general bedrock political orientations—see the detail of this portion of Figure 2 that we provide in Figure 3) that in turn affect stances on issues of the day.

Each of these intermediary steps deserves substantial empirical work, and we are pleased that such efforts are already being made. For example, in addition to an increasing number of heritability studies that empirically link stage 1 (genes) to stage 6 (attitudes), Oxley et al. (2008) link stage 2 (biological systems) and stage 6; Madsen (1985) links stage 2 to stage 4 (personality and values); Marcus (2002) links stage 3 (cognition and emotion) to stage 6; Caprara, Schwartz, Capanna, Vecchione, and Barbaranelli (2006) and Gerber, Huber, Doherty, Dowling, and Ha (2010) link stage 4 to stage 6; other studies conceptually and/or empirically examine more than one of these causal links (e.g., Fowler & Schreiber, 2008; Mondak, Hibbing, Canache, Seligson, & Anderson, 2010). One link in the process, however, is particularly noteworthy in the lack of attention it has received and in some respects it is the link with the most potential to inform the immediate concerns of students of political attitudes, concentrated as these concerns have tended to be on the proximal rather than distal causes of political attitudes. Specifically, we refer to the stage immediately preceding political attitudes: preferences on bedrock political issues such as leadership, defense, punishment of norm violators, devotion to traditional behavioral standards, and distribution of resources. The existence of these bedrock principles is crucial to our account of potential genetic influence since, if there are no universal principles of social organization that connect to preferences on issues of the day, it is difficult to imagine a sensible route by which genetics could link to specific political issue preferences. Therefore, in this paper we investigate the nature and relevance of bedrock political principles. Before doing so, however, we place this treatment in

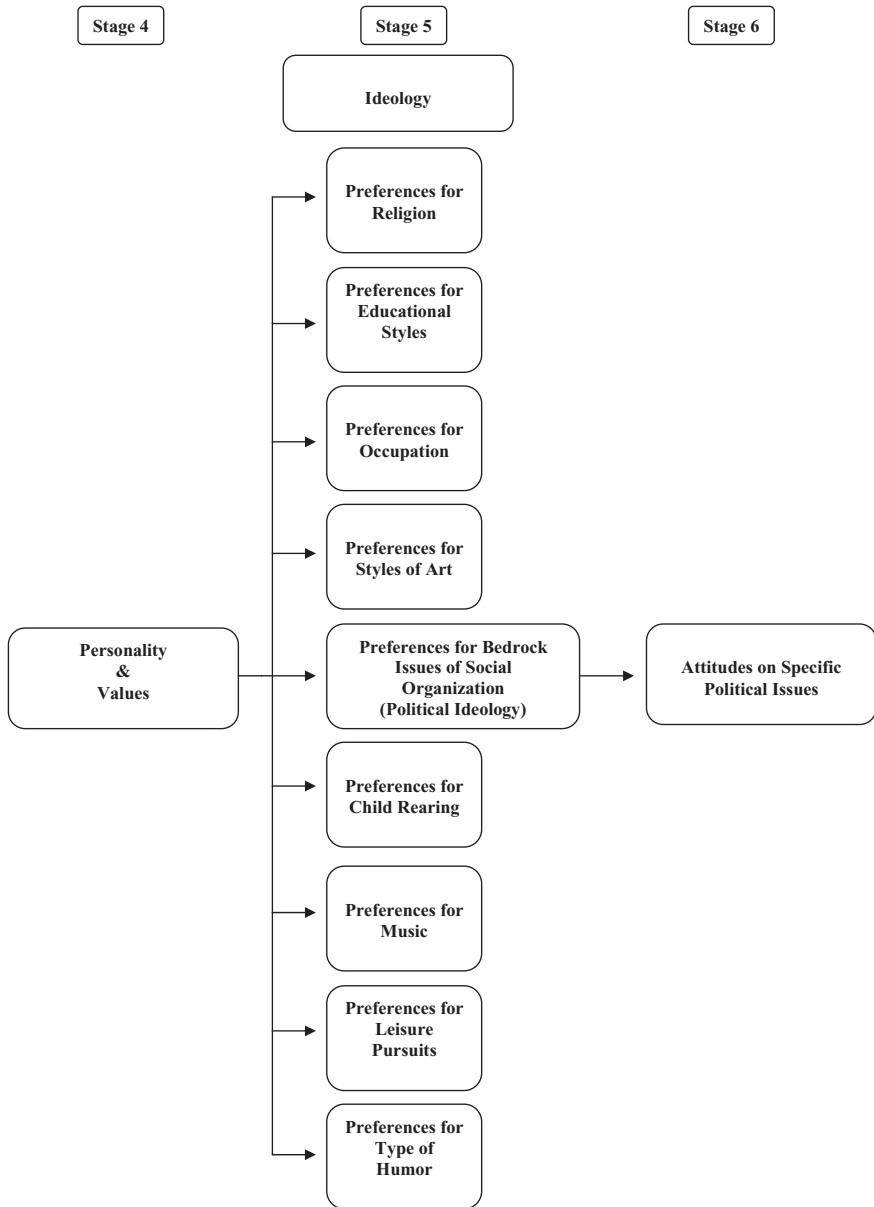


Figure 3. Ideology, Political Ideology, and Issue Attitudes.

context by providing a brief discussion of each of the other steps, with special emphasis on the initial stage: genetics.

Individual genes are made up of thousands of nucleotide base-pairs. At most places in the genome, these nucleotide sequences are identical for all human beings (because we all have the genetic sequences necessary to create a central nervous system and a digestive tract, for example) but at some important locations “polymorphisms” are in evidence. In other words, different people will have different versions of the nucleotide sequence (alleles)—and still other important variations will come from epigenetic differences (i.e., variations in the genome other than altered nucleotide sequences). Because social scientists care primarily about variation, these polymorphisms are of particular interest; but if the genetic component of behavior is to be fully understood, social scientists must move beyond outdated conceptions that stop with the binary polymorphisms characteristic of Mendelian genetics. While sweet pea color may appear to be largely dichotomous and determined by the expression of a single gene, the kinds of phenomena that social scientists study (voting behavior, ideological variations, etc.) are complex and continuous, what geneticists refer to as quantitative traits. For most phenotypes (observable characteristics) that interest social scientists, a large number of different genes are likely to interact with the environment and with other genes and epigenetic markers to shape the behavior of interest. Genetic influence is more about differential vulnerability than direct causation, and the influence of environmental circumstances, and variation elsewhere in the genome can mitigate or even negate any predicted effect tied to the original gene of interest.

To further complicate matters, the influence of genetics is not always additive. Often, specific interactions of genes are necessary for a phenotype to be produced. Lykken (1998) illustrates this point with the case of genius, a phenotype known to be related to genes but which does not run in families. Many of the discrete genetic requirements of genius may be present in the offspring of a genius, and these progeny are likely to have high cognitive abilities as a result, but the precise configuration necessary for true genius is absent should even one of these parts be lacking and so is rarely replicated even in individuals who are closely related genetically. One common indication of the presence of interaction effects occurs when adoption studies, which compare phenotypes of those with 0% and those with 50% shared genetic heritage (adoptive and nonadoptive siblings), produce lower heritability estimates than twin studies, which compare phenotypes of those with 50% and those with 100% shared genetic heritage (dizygotic and monzygotic twins).

Even without genetic interactions, a single gene rarely determines the presence of a particular trait or condition. Penetrance is the degree to which a specific genotype (genetic material at a particular locus) manifests itself in the expected phenotype. A penetrance level of 1.0 indicates genetic determinism. Such genes are quite rare but one example is located near the tip of the short arm of Chromosome 4. This gene causes (and this is one of the few times such a verb can be used

in discussions of genetic influence) Huntington's Disease, a tragic affliction leading individuals first to lose their balance, then to experience a mental decline, depression, delusions, jerking limbs, and ultimately a premature death. The disease has been traced to an abnormally high number of repeats of a particular nucleotide sequence (C-A-G) within the gene in question and no environmental influence can help (Plomin, DeFries, McClearn, & McGuffin, 2008). The near-total genetic determinism characteristic of Huntington's Disease, however, is the exception, not the rule. Most genes display much lower levels of penetrance.

Penetrance is diminished when epigenetic variation is relevant (as it typically is; see Charney, 2010) and when the connection between genes and the phenotype of interest is indirect, as would be expected with the complex social behaviors that concern social scientists. Genotype and phenotype are usually linked by various *endophenotypes*—of the sort indicated by the intermediary steps in Figure 2. Complications become more severe when it is recalled that at each stage environmental influences are substantial, as represented by the nonhorizontal arrows in Figure 2 (the composition of genes is largely impervious to the environment so the figure does not show an arrow from the environment to genes but even here it should be remembered that the environment is intimately involved in the *expression* of genes—i.e., in the production of proteins). In sum, the real picture of genetic influence is more complicated than is typically imagined, thereby making the topic challenging to study but also allowing for a possible fit between genetics and the nuances of complex social behaviors and attitudes.

Bearing in mind these general points regarding the subtleties of genetic influence, we now turn to the numerous links in the chain between genes and politically relevant attitudes. Beginning on the far left of Figure 2, heritability estimates say nothing about the particular genes that may be relevant to the biological processes ultimately leading to issue attitudes so one necessary task is identifying these genes. Modern biological science has made such a task more feasible by mapping the human genome. Knowledge of the general biological function of many genes, combined with the existence of large groups of individuals for whom both DNA and political attitudes now have been collected, as well as the refinement of established techniques, such as allelic association and genome-wide scans, that test for the connection of genotype and phenotype, has already led to early efforts to identify politically relevant genes (see Hatemi et al., 2008; Settle et al., 2008), though it should be recognized that single gene allelic association studies for diseases, mental illnesses, and personality traits have not replicated well and it is unlikely that the pattern will be different for political orientations.

Genetics, of course is just the beginning. Genes code for variation in protein structures that then serve as an important basis for biological differences in key neurotransmitter systems (the second stage in Figure 2) such as the dopamine reward system, which in turn affect cognitive/emotion information processing patterns as evident in conflict monitoring, gaze attention, and threat aversion (the third stage in Figure 2), to name a few. These cognitive/emotion processing

tendencies, in turn, are likely to affect basic personality and value traits (stage four in Figure 2) such as whether people see themselves as extroverted, agreeable, and conscientious (personality; see, for example, McCrae & Costa, 1999) and whether they are desirous of security and tradition or hedonism and achievement (values; see, for example, Schwartz, 2007; Caprara et al., 2006). Intermediary stages in the process, such as values, personality traits, and varying cognitive orientations to conflict, threat, affiliation, and disorder are more likely than genetics to be accepted as an influence on specific political attitudes and evidence providing empirical support for these hypothesized links is growing (on personality, see Gerber, Huber, Ha, Dowling, & Doherty, 2009 and Mondak & Halperin, 2008; on values, see Caprara et al., 2006 and Schwartz, 2007; and on cognitive tendencies, see Dodd, Hibbing, & Smith, 2009) but, in light of the aforementioned context-dependent nature of political issues, even here the connection is probably indirect. It is unclear, for example, that being conscientious or valuing order would directly affect an individual's attitudes toward support for federal housing, capitalism, the Iraq War, or bailing out the auto industry during a severe economic downturn. Rather, these traits are likely to work indirectly through bedrock political principles such as preferences for a society that is run with an assertive and declarative leadership style or that upholds traditional, unchanging norms of conduct. These general preferences for societal structure are in turn likely to lead to predispositions toward certain stances on specific political issues (the final stage in Figure 2), given how they are framed. For example, individuals more eager to be protected from outgroups were probably more likely in the post 9/11 days of the United States to support the Iraq War and domestic surveillance programs.¹

Ideology and Political Ideology

Students of political attitudes have long recognized that people's stances on individual political issues do not arise in isolation from larger organizing elements, but perceptions of the nature and origins of these organizing elements are often lacking in coherence and focus too much on narrow political precursors. This is particularly true in political science, where broader constellations of political attitudes typically are taken to be the product of "childhood socialization and direct involvement with the raw ingredients of policy issues" (Zaller, 1992, p. 23). The possibility that politics may originate at a deeper level than this is rarely considered. Psychologists, not surprisingly, have been more likely to connect political beliefs to personality (Caprara et al., 2006; Tomkins & Izard, 1965), moral foundations (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007; Jost, Glaser, Kruglanski, & Sulloway, 2003), life choices (Carney, Jost, Gosling, &

¹ Since stances on issues of the day (like the Iraq War) are more salient than stances on bedrock social orientations (after all, the latter are rarely discussed overtly), the heritability levels of many issues of the day are likely to be higher even if bedrock principles come first in the sequence.

Potter, 2008; Jost, 2006), tastes (Inbar, Pizarro, & Bloom, 2008; Inbar, Pizarro, Knobe, & Bloom, 2009), and values (Schwartz, 2007). Even here, though, serious discussion of the link between values, personality, and emotions is largely ignored. One reason, we would argue, is a failure to delineate explicitly the universal features of politics and the concomitant confusion over the meaning of ideology.

In most past research, ideology's meaning as a political gyroscope is divined from the degree to which discrete issue packages meaningfully cohere and/or the degree to which self-perceptions of "conservative" and "liberal" represent these issue packages. Converse's trendsetting treatment of ideologies (or belief systems) suggested that people possess a political ideology if they hold consistent views on issues of the day, if their stance on one issue "constrains" their stances on other issues, and if they are aware of the meaning of commonly employed ideological labels (1964, 1970). Thus, in the modern United States, in order to be considered ideological, an individual would need to understand what it means to be a liberal or a conservative and would need to have a collection of political beliefs that is consistent, fits together, and can logically be placed under one of those labels (Abramowitz & Saunders, 1998; Achen, 1975; Ansolabehere, Rodden, & Snyder, 2008; Brown, 1970; Campbell et al., 1960; Carmines & Stimson, 1989; Carmines & Wagner, 2007; Conover & Feldman, 1981; Converse, 1964, 1970; Erikson, Luttbeg, & Tedin, 1980; Hayduk, Ratner, Johnson, & Bottorff, 1995; Holm & Robinson, 1978; Jacoby, 1986, 1991; Jost, 2006; Klingemann, 1979; Levitin & Miller, 1979; Lewis-Beck, Jacoby, Norpoth, & Weisberg, 2008, pp. 245–247; Luttbeg & Gant, 1985; Sears, 1983; Sears & Citrin, 1985). The implications of this approach are that whatever ideology is, its ultimate cause is environmental and any particular ideology can only make sense in the context of a unique political culture (individuals in another polity presumably would need to be familiar with other ideological labels and would need to demonstrate views that cluster in alternative ways).²

Perhaps more troubling, confusion abounds over the causal order of the connection between ideological labels and issue preferences. In some studies issue preferences are modeled as the dependent variable and ideological self-placement as the independent variable (Jacoby, 1991), and in other studies ideological self-placement is the dependent variable and issue preferences are the independent variable (Conover and Feldman, 1981). In still other studies—especially in the measurement literature—no causal distinction is drawn. Instead, issue indexes and self-placement scales are viewed as more or less interchangeable, with one measure validated by its correlation with the other, an approach that only makes sense if both are treated as different measures of the same underlying psychological construct (Treier & Hillygus, 2005; Zaller 1992, p. 27). The end result is a promiscuous treatment that often puts ideology on a dangerously tautological

² Converse (1964) did speculate briefly on the possible psychological basis of ideology but then promptly dropped the topic.

plane: “I perceive of myself as a conservative (liberal) because of my issue preferences, and I hold particular issue preferences because I perceive of myself as a conservative (liberal).”

In sum, the influence within political science of the Conversionian view that ideology is optional (and in fact largely absent in most people), is merely a (special) collection of issue positions, and is not reliant on deeper, perhaps universal, psychological tendencies resulted in a shallow and narrowly political conceptualization of the term and hindered the ability of political scientists to integrate their findings with those of psychologists working on the same topic. Fortunately, efforts are under way in both disciplines to reorient thinking about the organization of political life away from circular and uniquely political conceptualizations. This happy trend has led John Jost (2006) to declare “the end of the end of ideology” (p. 651).

We agree fully with Jost but it is important that his clever turn of phrase not be misunderstood. If the concept of ideology is to be revived, it is not enough to argue that the traditional political science conceptualization is empirically meaningful after all. The end of the end of ideology does not simply mean that (as argued by Nie, Verba, & Petrocik, 1976) people are now more politically ideological than they were in the Ozzie-and-Harriet 1950s or that Fukuyama (1992) is incorrect when he asserts that divisions such as those at the heart of the Cold War are on their way to being irrelevant. Instead, ideology needs to be reconceptualized as something more than a collection of specific political issue preferences or the ability to describe the political world in the vocabulary popular among politicians (is it any wonder that, given such operationalizations, elites are consistently found to be markedly more “ideological” than ordinary citizens?). If ideology is to become meaningful and useful, it is necessary to accept that ideology is not a superficial label or bundle of topical positions but rather is a central component of an individual’s general life orientations. In the past, political scientists have measured ideology in ways that ensure it could only be seen as emanating from particular cultures, and it is this unfortunate vision of ideology that must end.

Perhaps the place to start in facilitating the needed shift is to distinguish ideology in general from political ideology in particular. As indicated in Figure 3 (which in essence is an enlargement of stage 5 in Figure 2), people’s ideology can be seen as extending into every facet of their lives, including tastes in art, educational philosophies, humor, religion, occupation, leisure pursuits, child rearing, and of course politics.³ Political ideology then is the *political* manifestation of these deeper inclinations toward a variety of features of our existence, not merely a superficial and arbitrary summation and labeling of issue attitudes. Much confusion has resulted from a failure to clarify the difference between ideology and

³ To clarify a distinction that is easy to confuse, values are conditions/states prized in personal life while ideology is composed of broad preferences guiding and reflected in life choices. Contrast “I value security” with “I prefer my social unit to be secure.”

political ideology. The tendency of those with particular political ideologies also to hold similar preferences in art (Wilson, Ausman, & Matthews, 1973), humor (Wilson, 1990), and religion (Lienesch, 1982) should not be assumed to spring exclusively from socialization and group pressures, since like other nonpolitical elements of ideology it is quite possibly also the result of particular personalities and values which are traceable to cognitive and biological tendencies and traits (see Figure 2). Just as personality traits and values flow from a combination of the environment and cognitive/biological tendencies, people's broad preferences (ideology), flow from their values and personality traits.⁴

Dispositional Preferences on Bedrock Social Issues

Though helpful, recognizing that political ideology is only a part of a person's overall ideology still does not explain the distinction between political ideology and stances on culture-bound issues of the day. In other words, political ideology can be distinguished from overall ideology without reconceptualizing political ideology away from the time-honored Converse tradition of collections of specific issue positions. But if this is all political ideology is, politics would remain entirely culturally dependent and the leap from stages 1–4 in Figure 2 to stage 6 (stances on issues of the day), would be too far. **It is still necessary to explicate a universal basis for political attitudes and that basis is preferences on bedrock issues of mass-scale social organization.**

It is understandable that commonalities across polities are often missed as a result of the numerous and important political variations from country to country and from time to time. Nonetheless, the fact remains that all mass-scale social units face common dilemmas of the sort referenced earlier. Peterson (2009) provides a good start to a list of these dilemmas: "sharing, collective action, punishing free-riders and exploiters, managing intergroup relations and negotiating hierarchies" (pp. 368–369). Moreover, extensive cross-cultural survey work by Schwartz (2007) indicates that values fit together in predictable ways, so it seems likely that the broad-scale bedrock political preferences that flow (in part) from these values would also go together in predictable patterns regardless of the political culture being studied. Indeed, previous scholars have detected such commonalities. Referring to the most commonly employed modern political ideological labels, Bobbio (1996) writes:

'Left' and 'right' . . . indicate opposing programs in relation to many problems whose solution is part of everyday political activity. These

⁴ Personality and values of course are quite different but both lead to general ideology, so we follow Caprara et al.'s (2006) approach and list them beside each other at the same stage of the overall process. Future research will want to sort out the relationship between values (what people claim to put an emphasis on as they live their personal lives) and personality (how they see themselves).

contrasts concern . . . interests and judgments on which direction society should be moving in; they exist in all societies, and it is not apparent how they could disappear. (p. 3)

Our core hypothesis is that, along with environmental occurrences, **individual variation in dispositions toward social rules, order, and conduct shape issue attitudes and self-identification with ideological labels in a given political context.** Connecting earlier stages in the process (see Figure 2) to issue attitudes has been done too rarely in political science but is increasingly apparent in a number of empirical studies. Yet, in these recent studies a substantial jump is always made from personality (the fourth stage in Figure 2), cognitive (the third stage), biological/physiological (the second stage), or even genetic (the first stage) traits directly to specific issue positions (see Alford, Funk, & Hibbing, 2005; Amodio, Jost, Master, & Yee, 2007; Hatemi, Medland, Morley, Heath, & Martin, 2007; Mondak & Halperin, 2008; Oxley et al., 2008; Settle et al., 2008). The crucial intermediary link of bedrock principles of social organization is always skipped since it is not routinely acknowledged and operationalized. We intend to remedy this situation by focusing directly on assessing individuals' preferences concerning these bedrock principles. Assuming valid measures can be constructed, they should be predictive of issue attitudes and whatever ideological labels hold currency at the time the data are collected.

Before moving to measurement issues, it is appropriate to remind readers that even as our intent is to demonstrate the manner in which biological characteristics could help to shape political attitudes on issues of the day, the important role of environmental factors should not be ignored. In fact, to a large extent, interest in the deeper shapers of attitudes was buoyed by the recorded increases in conservative positions on several issues subsequent to an extremely salient environmental occurrence: the tragic events of 9/11. Given that situational changes can heighten feelings of threat thereby producing shifts in preferences on issues such as the advisability of domestic surveillance and the Iraq War (Feldman, 2003; Huddy, Feldman, Taber, & Lahav, 2005; Stenner, 2005), then it seems logical that those people who by disposition tend to experience threats more viscerally would be somewhat more likely to adopt similar issue stances (Oxley et al., 2008; Vigil, 2008). As such, the exclusively environmental explanations of political preferences that have been favored are not so much incorrect as incomplete.

Measuring Dispositional Preferences on Bedrock Social Issues

To support our argument that preferences on these baseline matters likely shape attitudes on specific political issues of the day in a particular culture, we utilize original data drawn from 200 adult individuals. This sample was generated by a survey research organization commissioned in May 2007 to contact a random telephone sample of the population of a medium-sized U.S. city. Individuals were

then screened on the phone for strong political interests and, if eligible, asked to participate in a research project in exchange for a fee of \$50. This sample of 200 came to a computer lab and answered an extensive battery of survey questions. The recruited sample was not truly random as it was intentionally skewed toward more politically interested individuals but it is a nonstudent group and is fairly representative in many respects: the mean age of subjects is approximately 42, the gender split was 48% male, 52% female, and the median family income was \$40,000–\$60,000. However, because of the demographics of the city as well as the screen for political interest, it is disproportionately white and educated.

Our subjects completed a typical battery of “issue-of-the-day” survey items and a separate self-placement on the standard ideological spectrum. More importantly, these individuals also completed a novel survey index of conscious attitudes on bedrock principles of social organization and conduct (see Appendix A) and an implicit association test (IAT) designed to tap latent orientations toward fixed as opposed to flexible rules of social conduct (see Appendix B).

Given the novelty of these operationalizations, a few words of explanation are in order. The 14 items in Appendix A required respondents to pick one of two completions of the stem “Society works best when. . . .” **The content of the items was selected because it seemed to address the core dilemmas facing all mass-scale societies such as those delineated by Peterson (2009) and others. In other words, the questions were designed to tap preferences on bedrock aspects of social rules, order and conduct. As can be seen by perusing Appendix A, these questions therefore address (1) the appropriate role of traditional values and moral codes in social conduct, (2) the treatment of outgroups and ingroup rule breakers, (3) the proper contours of group leadership, (4) the appropriate role of individuals within the group, and (5) whether compromise or absolutism is the best approach to human relations. Since the measurement of universal political preferences (as opposed to universal values or personality traits) is new, this set of items is clearly a work in progress and revising, extending, and/or pruning this battery on the basis of results obtained from samples in a variety of cultures is necessary. This being said, we believe this list is reflective of dilemmas facing all human societies as they organize and operate. In drafting these items, we have consciously avoided reference to issues that would only make sense in a particular culture as this is the purview of stage 6 (see Figure 2).**⁵

⁵ One of the possible benefits of separating values, ideology, and attitudes is that it could clarify a thicket of concepts and confusing terminology. For example, authoritarianism is often treated in quite different fashions partly because the most common measurement techniques combine items that are value based, preference based, and (specific) issue based. As pointed out by Feldman (2003; see also Feldman and Stenner, 1997; Ray, 1987), the items traditionally employed to measure authoritarianism (see Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950; Altemeyer, 1981, 1996) include several that tap issue attitudes themselves, thus creating a circular argument. Of what use is it to say that authoritarianism is connected to political attitudes if authoritarianism is measured by asking political attitudes? A clearer distinction between values, ideologies, and attitudes will allow more meaningful tests of relationships. Further, authoritarian positions cover only a small range of concerns relevant to

From these items, we first built a simple additive index that had a theoretical range of -14 to 14 . A -14 on this index indicates preferences for a society that takes care of its neediest members, has a tolerant approach to outgroups, promotes forgiveness of rule breakers, and favors egalitarian leadership practices as well as a flexible approach to moral codes of behavior. A $+14$ indicates preferences for individualism, protection against outgroups, stern punishment of rule breakers, strong leadership, and enduring moral codes as the basis for social behavior. The index is distributed normally and has reasonable scores on standard tests of psychometric reliability: Cronbach's alpha of $.7$ and a split-half correlation coefficient of $.72$. We take this as preliminary evidence that we have a survey battery that is tapping into the psychological construct we seek to measure.

We next conducted a factor analysis of these 14 items and this procedure indicated five factors with eigenvalues greater than 1.0 . To separate and isolate these dimensions we performed an orthogonal (varimax) rotation of the factors, which showed the questions mapping quite well onto the core components of social life described above. Specifically, based on the items that loaded on them, we labeled these five factors **traditional values/moral codes, outgroups/rule breakers, individualism, leadership styles, and absolutism**. Appendix A lists the 14 items by their highest loadings on these dimensions.

Even though it deals with universal features of politics, our social principles instrument is built from conscious responses to survey probes and as such may reflect culturally elaborated choices rather than deep-seated dispositions operating at a subconscious level. Psychologists and political scientists have long known that more than conscious thought enters into preferences (Jost, 2006; Lodge & Taber, 2005; Marcus, 2002; McDermott, 2004; Zaller, 1992), and it is important to tap into these sub-conscious orientations. To tap the likely deep-rooted dispositions to bedrock principles, we formulated a second measure of orientations toward the fundamental organizing principles of social life by constructing an Implicit Association Test (IAT) aimed at capturing latent orientations towards codes of social conduct.

Developed by Anthony Greenwald and various colleagues, the IAT is predicated on the assumption that many cognitive processes shaping behavior and attitudes are unconscious (Greenwald, Nosek, & Banaji, 2003; Nosek, Greenwald, & Banaji, 2007). An IAT requires respondents to rapidly classify stimuli into positive or negative categories. For example, a respondent may be asked to classify racial stimuli with positive or negative descriptors. Latencies in this classification process—for example being able to more rapidly classify white racial stimuli with positive descriptors than negative descriptors—are taken as evidence of implicit conceptual associations.

the structure and organization of mass-scale social life, something that is also true of the literature on social dominance orientation (Sidanius & Pratto, 1996, 1999).

Our IAT was constructed in an effort to tap into subconscious dispositions toward one central component of social rules and order; specifically, whether individuals are disposed towards **fixed or flexible social rules**.⁶ Though only one part of bedrock preferences, psychological research has consistently found flexibility to correlate with variations in ideology (see Amodio et al., 2007; Jost, 2006; Mondak & Halperin, 2008), and thus a subconscious disposition towards fixed or flexible social norms seems to be a good candidate to tap into the broader dispositions we seek to measure.

Respondents were given four categories of words: “good” (words such as joy, love and happy), “bad” (agony, evil, terrible), “fixed” (traditional, duty, command), and “flexible” (options, compromise, diversity). The main thrust of the IAT comes when respondents are asked to classify combined categories (e.g., “bad or flexible”). The essential argument is that implicit associations will show up in differences in the latencies of these tasks. So, for example, someone who prefers a flexible disposition toward social rules, order and conduct should respond quickly to “good or flexible” because this association is already there. They will be slower to respond to “bad or flexible.” The different relative latencies in these responses are the essence of the IAT.

If our theory is correct, these IAT scores and the “society works best” index of self-reported bedrock principles should be tapping into the same basic underlying psychological construct. Evidence suggesting our measurement approach is triangulating on that psychological construct comes from the correlation between the single additive bedrock principles index and the IAT ($r = .52, p < .01$, 2-tailed test). The IAT is also significantly correlated with three of the five dimensions extracted from the factor analysis of the bedrock principles items: traditional values/moral codes ($r = .52$), outgroups/rule breakers ($r = .19$) and leadership styles ($r = .25$; all r s $p < .01$, 2-tailed test). Because the IAT focuses on fixed or flexible social rules, it makes sense that it correlates most strongly with the traditional values/moral codes subfactor of bedrock principles. These findings, however, also suggest that core preferences on bedrock principles of social organization center on a fairly compact set of predispositions relating to social rules and order; specifically, whether rules of social behavior are relatively inviolable or merely guidelines, how to treat those who violate those rules, and the relative power of leaders to unilaterally set these rules. What is notable about the two factors that did not significantly correlate with the IAT (individualism and absolutism) is that the items underlying these factors reflect individual as much as social perspectives.

While the IAT and the bedrock principles items clearly seem to be triangulating on a core underlying psychological construct, for our purposes the real test

⁶ As such, our IAT avoids the major problems attending those IATs where respondents have a motivation to make themselves appear to be a certain way, such as the ones dealing with racial attitudes (Mierke & Klauer, 2001).

of these measures is not in mutual validation, but in whether they reliably predict issue preferences, i.e., whether they can empirically confirm the causal hypothesis that stage 5 of our conceptual model predicts stage 6.

Do Dispositional Preferences on Bedrock Issues Predict Political Attitudes?

As dependent variables, we use versions of the standard measures of specific political preferences: **an additive issue-based index and self-placement on a liberal-conservative continuum**. The issue index is a form of the widely used Wilson-Patterson Inventory modified to focus exclusively on political issues (see Wilson & Patterson 1968). This index was constructed using responses to 21 issues of relevance to American politics at the time the survey was administered (see Appendix C). Answers were scored so that “conservative” responses in the U.S. sense (for example, agreeing with “tax cuts,” disagreeing with “welfare”) were coded as “1,” liberal responses (for example, agreeing with “foreign aid” and disagreeing with “death penalty”) were coded as “0,” and uncertain responses were coded as “.5.” Responses were then summed across the 21 items, giving a theoretical range from zero (representing extreme liberals) to 21 (extreme conservatives). The mean for our respondents was 10.65 (SD 3.85), with a range of 2 to 18.5. The distribution was approximately normal and the scale had a Cronbach’s alpha of .74 and a split-half correlation coefficient of .74. We also used an ideological self-report measure in which subjects were asked to place themselves on a standard 7-point Likert scale ranging from 1 (strongly liberal) to 7 (strongly conservative). The mean score on this scale was 4.12 (SD 1.77), and the range was 1 to 7.

Bivariate correlations (Pearson’s r) provide initial strong support for our hypothesis that stances on political issues and labels particular to a specific context are closely related to preferences for deeper bedrock principles of social life. A single additive index of orientations toward bedrock issues as captured by the items in Appendix A correlate at .66 with the Wilson-Patterson issues index and at .56 with self-reported ideology (for both, $p < .01$, 2-tailed t -test). Latent orientations to fixed/flexible codes of conduct as measured by the procedures described in Appendix B correlate at .66 with the Wilson-Patterson issues index and .59 with self-reported ideology (for both, $p < .01$, 2-tailed t -test). We also correlated our bedrock principles index with each of the individual items in our issue index and found significant correlations for 18 of the 21 items (Pearson’s r , $p < .01$ 2-tailed t -test).

Of the five components derived from the factor analysis of these bedrock principles, three are positively and significantly ($p < .05$) correlated with the overall Wilson-Patterson index: traditional values/moral codes ($r = .60$), outgroups/rule breakers ($r = .30$), and leadership ($r = .28$). These three dimensions are also the most strongly correlated with self-reported ideology (traditional values/moral codes $r = .51$, outgroups/rule breakers $r = .16$, and leadership $r = .24$;

all $p < .05$ 2-tailed test). This supports the inference (discussed above) that these three dimensions represent core principles of social order. The other two dimensions, however, were also correlated with self-reported ideology, individualism (.16, $p < .05$) and absolutism (.13, $p < .10$), suggesting that all of our “society works best” items are in some fashion tapping into the underlying stage 5 construct we are seeking to capture.

Bivariate analysis, however, is a relatively weak test of our hypothesis. Nothing in our theory suggests that the environmental basis of specific political preferences fails to play a significant role in determining issue attitudes and ideological self-reports. Accordingly, we constructed a multivariate regression model to account for such influences and to better isolate the impact of preferences for universal social structures. The covariates included in our model as controls are gender (a dummy variable where 1 = male, 0 = female), age (year born), family income (a 6-point scale moving in \$20,000 increments from “under \$20,000” to “over \$100,000), and education (a 6-point scale ranging from “did not finish high school” to “college plus”). These variables are used to control for certain of the central markers of ideology and issue preference according to past research (e.g., Zaller, 1992, p. 23).

The results of this multivariate analysis are presented in the first two columns of Table 1 where, for ease of comparison across variables, we present standardized regression coefficients and t -scores. In the interests of parsimony, we do not report the results where the five factors replace the single index of bedrock principles. The substantive inferences taken from this latter model remain the same as those reported for the bivariate analysis, i.e., the individual dimensions of traditional values/moral codes, outgroups/rule breakers, are consistent positive and significant predictors of self-reported ideology and Wilson-Patterson scores, and the individualism and absolutism factors are also positive and significant predictors of self-reported ideology ($p < .05$).⁷ As can be seen, the single index of preferences on bedrock social principles performs well in a multivariate model. Indeed, this variable far outperforms the demographic variables. Standardized coefficients indicate that preferences on bedrock social principles have a far greater impact on political issues and identifications—by a factor of 10 or more—than the control set. Furthermore, our bedrock principles index is the only statistically significant variable for both the current political issues index and for self-reported ideology, and accounts for virtually all of the variance explained. These results are perfectly consistent with our key hypothesis.

An even sterner test involves accounting for variations in political attitudes not with overtly expressed preferences on bedrock principles of mass-scale social

⁷ If anything, the individualism and absolutism dimensions perform better in the multivariate analysis. Both factors are within relaxed alpha level assumptions ($p < .10$) for the Wilson-Patterson index, though the standardized coefficients are small (in both cases, approximately .08). The overwhelming pattern, in short, is that even if bedrock principles are multidimensional, they all generally correlate with broad ideological measures.

Table 1. Accounting for Variation in the Wilson-Patterson Issues Index and Self-Reported Ideology

	Composite		Ideological		Composite		Ideological		Composite		Ideological		Composite		Ideological		Composite		Ideological			
	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report	Issue Index	Self-Report
Social Principles Index	.66*	.57*			.437*	.36*			.356*	.29*			.356*	.29*			.356*	.29*			.356*	.29*
	(12.1)	(9.57)			(7.92)	(5.7)			(4.91)	(4.6)			(4.91)	(4.6)			(4.91)	(4.6)			(4.91)	(4.6)
Fixed-Flexible IAT			.66*		.438*	.41*			.22*	.48*			.22*	.48*			.22*	.48*			.22*	.48*
			(12.2)		(7.96)	(6.57)			(3.0)	(7.6)			(3.0)	(7.6)			(3.0)	(7.6)			(3.0)	(7.6)
Education	-.11	-.102	-.08	.600*	-.07	-.07			-.11	.05			-.11	.05			-.11	.05			-.11	.05
	(1.91)	(1.63)	(1.38)	(10.25)	(1.18)	(1.21)			(1.75)	(.93)			(1.75)	(.93)			(1.75)	(.93)			(1.75)	(.93)
Income	-.05	.07	.007	.12	-.02	.09			.01	-.02			.01	-.02			.01	-.02			.01	-.02
	(.85)	(1.10)	(.11)	(1.93)	(.47)	(1.64)			(.21)	(.39)			(.21)	(.39)			(.21)	(.39)			(.21)	(.39)
Gender	-.05	-.09	.05	-.002	-.02	-.06			.01	-.01			.01	-.01			.01	-.01			.01	-.01
	(.81)	(1.44)	(1.01)	(.04)	(.45)	(1.19)			(.09)	(.20)			(.09)	(.20)			(.09)	(.20)			(.09)	(.20)
Age	.004	.06	-.06	.00	-.05	.009			.07	-.06			.07	-.06			.07	-.06			.07	-.06
	(.06)	(1.00)	(1.13)	(.04)	(1.06)	(.16)			(1.05)	(-1.07)			(1.05)	(-1.07)			(1.05)	(-1.07)			(1.05)	(-1.07)
N	200	200	200	200	200	200			200	200			200	200			200	200			200	200
Adj. R ²	.44	.32	.44	.35	.57	.44			.27	.43			.27	.43			.27	.43			.27	.43

* = *p* < .05
Standardized coefficient (*r*-score) reported.

organization but rather with latent, subconscious attachments to a single central bedrock social principle: fixed as opposed to flexible moral codes of behavior. As described above, we created an original IAT designed to tap latent orientations on this important principle of social life. It is important to remember that this IAT is not measuring respondents' stated preferences for fixed as opposed to flexible moral codes but rather records only the rapidity with which they associate flexible (fixed) prompts with positive (negative) referents.

Even though response latencies constitute a fundamentally different approach to measurement than overt survey self-reports, when latent orientations to fixed versus flexible social rules are substituted for the bedrock principles index the resulting patterns (columns 3 and 4 in Table 1) are quite similar. As was the case with the index of bedrock principles, latent orientations to a fixed as opposed to flexible behavioral code are strongly predictive of stances on specific political issues and labels of the day. In fact, again like the overt index, the "latency-based" measure of bedrock orientations is the only variable in the model to be significant for both of the dependent variables employed here and the size of the standardized regression coefficient for the IAT dwarfs that of the demographic control variables.

We also ran the multivariate analysis including both the index of bedrock principles and the "fixed-flexible" IAT as independent variables in the same model. The results of this analysis are reported in columns 5 and 6 of Table 1. When included in the same model, the fixed-flexible IAT and the index of bedrock principles, as would be expected given that they correlate highly with each other, yield somewhat reduced coefficients, but both remain statistically significant for both dependent variables (in spite of the inflated standard errors accompanying multicollinearity) and have roughly equal impacts.

One potential concern with the results summarized so far is that stances on individual political issues are combined into a unidimensional construct even though some previous research indicates that issue attitudes are multidimensional, with "social" and "economic" issue axes being the most common subindexes suggested (Ansolabehere et al., 2008; Asher, 1980; Carsay & Layman, 2002; Weisberg, 1980). We find modest evidence of a multidimensional structure underlying our political issues index. A factor analysis of the individual issue items produces six factors with eigenvalues over 1.0, though the first factor was clearly dominant (it accounted for approximately a quarter of the variance, and a scree plot showed a significant drop-off after this factor). Even after rotation, 12 of the 21 items in our index had factor loadings of .4 or higher on the first factor. Included in those 12 items were all of the economic items in the index and most of the social issues.

Nonetheless, we considered it important to assess the predictive power of our measures on more focused issue dimensions. Accordingly we constructed two separate indexes, one with three economic items (tax cuts, welfare spending, and small government) and one with three social items (gay marriage, abortion rights, and premarital sex). In a bivariate analysis, our key independent variables were

strongly correlated with both the economic and the social subindexes. The Pearson's r for the index of bedrock principles was .48 (economic) and .53 (social) and for the fixed-flexible IAT was .43 (economic) and .62 (social; all correlations $p < .01$, 2-tailed t -test). We also regressed these subindexes of the Wilson-Patterson Inventory on the same set of independent variables described above and these results are presented in columns 7 and 8 of Table 1. Both the index of bedrock principles and the fixed-flexible IAT are strongly predictive of each of the subindexes. The underlying orientations to principles of organizing social life we present here seem to predict specific categories of political issue preferences as well as broad indices of those preferences.

Conclusion

Biological and sometimes even genetic variables are increasingly being connected to social variables: trust in interpersonal exchange situations (Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005), choice of occupation and leisure activities (Bachner-Melman et al., 2005), marital stability (Walum et al., 2008), generosity in social exchange (Cesarini et al., 2008), offspring rearing (Bales, French, & Dietz, 2002; Hammock & Young, 2005), and openness to new experiences (Caprara et al., 2006). Though sometimes controversial, acceptance of such findings is assisted because of the acknowledged universality of the activities in question. Mating, child rearing, working, and interpersonal exchange take place in any human society at any time—and even to a certain extent in nonhuman societies as indicated by the reference just made to work on voles (Hammock & Young, 2005) and to primates (Bales, French, & Dietz, 2002). Acceptance that there are biological and even genetic precursors to expressly *political* attitudes and behaviors is a tougher sell because the way politics has traditionally been viewed places great weight on narrow issues arising only within a certain cultural context, thereby making it much more difficult to imagine how broad biological forces could be at work.

In this paper, we present the individual steps by which genetics connect to neurotransmitter systems which connect to cognitive and emotional processing tendencies which connect to values and personality traits which connect to orientations to bedrock principles which finally connect to preferences on specific political issues of the day. While recognizing that each of these stages requires substantial future investigation, in this article we concentrated our empirical attention on the stage we believe most limits acceptance of a biological basis for politics: **the existence of a relatively universal set of bedrock principles concerning the organization of mass-scale social life.** We created two original measures to tap into these universal principals, an IAT and a new social principles index. **Both of these seemed to capture the measurement target, cross validated each other, and predicted self-reported ideology and issue attitudes as hypothesized.**

Both of these measurement approaches, then, seem capable of creating valid instruments to quantify predispositions on the organization of mass-scale social life, and we strongly recommend their further use and development. The fixed-flexible IAT is a relatively easy extension of a widely validated measurement approach that offers a robust means to tap into subconscious dispositions towards social order. Future development of this approach could include developing IATs that focus on other dimensions of bedrock principles. Notably, our IAT was, unsurprisingly, most highly correlated with a traditional values/moral order dimension drawn from our broader social principles index. IATs could conceivably be developed that tapped more directly into the outgroups/rule breakers and leadership dimensions. This could offer a more comprehensive means to quantify the stage 5 psychological construct we believe we have identified in this paper.

The social principles index presented here offers a quick and relatively comprehensive approach to measuring this construct, but needs further validation and refinement. As a single index, it is a robust predictor of attitudes in our sample and is consistent with our hypotheses and theoretical expectations. Our analysis, however, also indicates a multidimensionality to this index that warrants further investigation. In particular, three dimensions (traditional values/moral codes, outgroups/rule breakers, and leadership styles) seem to perform consistently better as attitude predictors than the remaining two (individualism and absolutism). Future refinement is warranted, with an obvious direction to focus on development of the former. Overall, however, we believe the two novel instruments described here provide a template for quantifying a central concept in the causal chain that links biology and genes to political attitudes and behaviors, and we urge broad adoption and development of these measurement approaches.

It is unfortunate that issue stances and political labels have been assumed to be entirely context-dependent as this unsubstantiated assertion hinders conceptualization and theorizing within the realm of politics. When politics is taken to be a purely ephemeral and arbitrary social construction, separated from the forces acknowledged to affect the broader personal and interpersonal worlds, the immediate precursors to issue attitudes as well as the nature of political ideology is obscured. Though the issues in any given polity, as framed by politicians and by media outlets, certainly takes on culturally unique spins, does this mean there are no common challenges of mass-scale social life lurking behind this apparent novelty? Might it not be that there are indeed core dilemmas that, in a wide variety of guises, confront all mass-scale social units—dilemmas such as leadership arrangement, punishment of scofflaws, appropriate resource distribution practices, reproduction, and protection from predators and outgroups? If there are relatively universal bedrock dilemmas of mass-scale social organization, as we believe there are, then politics can take its place alongside the other elements of generic ideology.

APPENDIX A. Society Works Best Instrument

Traditional Values/Moral Codes

Society works best when . . .

- 1-People live according to traditional values
- 2-People adjust their values to fit changing circumstances

Society works best when . . .

- 1-Behavioral expectations are based on an external code
- 2-Behavioral expectations are allowed to evolve over the decades

Society works best when . . .

- 1-Our leaders stick to their beliefs regardless
- 2-Our leaders change positions whenever situations change

Outgroups/Rulebreakers

Society works best when . . .

- 1-People realize the world is dangerous
- 2-People assume all those in far away places are kindly

Society works best when . . .

- 1-We take care of our own people first
- 2-We realize that people everywhere deserve our help

Society works best when . . .

- 1-Those who break the rules are punished
- 2-Those who break the rules are forgiven

Society works best when . . .

- 1-Every member contributes
- 2-More fortunate members sacrifice to help others

Role of Group/Individual

Society works best when . . .

- 1-People are rewarded according to merit
- 2-People are rewarded according to need

Society works best when . . .

- 1-People take primary responsibility for their welfare
- 2-People join together to help others

Society works best when . . .

- 1-People are proud they belong to the best society there is
- 2-People realize that no society is better than any other

Leadership

Society works best when . . .

- 1-Our leaders are obeyed
- 2-Our leaders are questioned

Society works best when . . .

- 1-Our leaders call the shots
- 2-Our leaders are forced to listen to others

Absolutes

Society works best when . . .

- 1-People recognize the unavoidable flaws of human nature
- 2-People recognize that humans can be changed in positive ways

Society works best when . . .

- 1-Our leaders compromise with their opponents in order to get things done
- 2-Our leaders adhere to their principles no matter what

Coding

Index construction: All “2s” coded to “-1” (negative 1) except for the first question in the leadership section, which is reverse coded (i.e. 1 is recoded to -1 and 2 to 1). Responses are then summed. In our full sample (N = 200), mean = -0.95, SD 5.6.

APPENDIX B. IAT

In the fixed / flexible implicit association test, each subject is presented with a set of words and images to classify into groups. They are asked to classify items as quickly as possible while making as few mistakes as possible. Here is a list of category labels and words that belong to each of those categories:

Good	Joy, Love, Wonderful, Pleasure, Glorious, Laughter, Happy
Bad	Agony, Terrible, Horrible, Nasty, Evil, Awful, Failure
Fixed	Obedience, Traditional, Duty, Clarity, Command, Structure, Discipline
Flexible	Relativism, Diversity, Evolve, Options, Adaptable, Free Spirit, Compromise

A screen appears with two categories in the upper left and upper right hand sides of the monitor (e.g. “Fixed” or “Bad”). Instructions that are provided to the subjects include:

“Put your middle fingers on the “e” and “i” keys of the keyboard. When a word / image belongs to the category on the left press the “e” key, and when a word belongs to the category on the right, press the “i” key. This is a timed sorting task, so please *go as fast as you can*.”

The subject is then prompted by a series of words which have to be classified into the two categories (e.g. recognizing “Traditional” as belonging to the Fixed category) as quickly as possible. After doing this two times with two simple categories, subjects are asked to do the same with combined categories (e.g. “Good OR Flexible” and “Bad OR Fixed”). The key test comes when they have to classify prompts with categories when the two are not easily associated in the minds of individuals (e.g. someone with a flexible disposition is given a category of “Flexible OR Bad”).

The data have been analyzed according to the standard procedures for the Implicit Association Test as stated by Greenwald et al. (2003) using the improved scoring algorithm.

APPENDIX C. Modified Wilson Patterson Inventory

Please indicate whether you agree or disagree (or are uncertain) with regard to each topic listed below:

School prayer
Pornography
Illegal immigration
Women’s equality
Death penalty
Patriot Act
Premarital sex
Gay marriage
Abortion rights
Patriotism
Biblical truth
Iraq War
Welfare spending
Tax cuts
Gun control
Military spending
Warrantless searches
Pollution control
Small government
Foreign aid
Free trade

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REFERENCES

- Abramowitz, A., & Saunders, K. (1998). Ideological realignment in the U.S. electorate. *Journal of Politics*, *60*, 634–652.
- Achen, C. (1975). Mass political attitudes and the survey response. *American Political Science Review*, *69*, 1218–1231.
- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The authoritarian personality*. New York: Harper and Row.
- Alford, J. R., Funk, C. L., & Hibbing, J. R. (2005). Are political orientations genetically transmitted? *American Political Science Review*, *99*, 153–167.
- Altemeyer, R. A. (1981). *Right-wing authoritarianism*. Winnipeg: University of Manitoba Press.
- Altemeyer, R. A. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.
- Amodio, D. M., Jost, J. T., Master, S. L., & Yee, C. M. (2007). Neurocognitive correlates of liberalism and conservatism. *Nature Neuroscience*, *10*, 1246–1247.
- Ansolabehere, S., Rodden, J., & Snyder, J. M., Jr. (2008). The strength of issues: Using multiple measures to gauge preference stability, ideological constraint, and issue voting. *American Political Science Review*, *102*, 215–232.
- Asher, H. B. (1980). *Presidential elections and American politics*. Homewood, IL: Dorsey Press.
- Bachner-Melman, R., Dina, C., Zohar, A. H., Constantini, N., Lerer, E., Hoch, S., Sella, S., Nemanov, L., Gritsenko, I., Lichtenberg, P., Granot, R., & Ebstein, R. P. (2005). AVPR1 and SLC6A4 gene polymorphisms are associated with creative dance performance. *PLoS Genetics*, *1*, 394–403.
- Bales, K., French, J. A., & Dietz, J. (2002). Explaining variation in maternal care in a cooperatively breeding species. *Animal Behavior*, *63*, 453–461.
- Beckwith, J., & Morris, C. (2008). Twin studies of political behavior: Untenable assumptions? *Perspectives on Politics*, *6*, 785–792.
- Bobbio, N. (1996). *Left and right: The philosophical basis of a political distinction*. Chicago: University of Chicago Press.
- Bouchard, T. J., Jr., & McGue, M. (2003). Genetic and environmental influences on human psychological differences. *Journal of Neurobiology*, *54*, 4–45.
- Brown, S. (1970). Consistency and the persistence of ideology: Some experimental results. *Public Opinion Quarterly*, *34*, 60–68.
- Campbell, A., Converse, P. E., Miller, W. E., & Stokes, D. E. (1960). *The American voter*. New York: John Wiley and Sons.
- Caprara, G. V., Schwartz, S., Capanna, C., Vecchione, M., & Barbaranelli, C. (2006). Personality and politics: Values, traits, and political choice. *Political Psychology*, *27*, 1–28.
- Carmen, I. H. (2007, April). From genes to mind to politics: Finding the yellow brick empirical road. Paper presented at the meeting of the Midwest Political Science Association, Chicago, IL.
- Carmines, E. G., & Stimson, J. A. (1989). *Issue evolution: Race and the transformation of American politics*. Princeton, NJ: Princeton University Press.
- Carmines, E. G., & Wagner, M. W. (2007). Ideology and economy. In G. Ritzer (Ed.), *Blackwell Encyclopedia of Sociology* (pp. 2232–2235). Malden, MA: Blackwell Publishing.

- Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. (2008). The secret lives of liberals and conservatives: Personality profiles, interaction styles, and the things they leave behind. *Political Psychology, 29*, 807–840.
- Carsay, T., & Layman, G. (2002). Party polarization and conflict extension in the American electorate. *American Journal of Political Science, 46*, 786–802.
- Cesarini, D., Dawes, C. T., Fowler, J. H., Johannesson, M., Lichtenstein, P., & Wallace, B. (2008). Heritability of cooperative behavior in the trust game. *Proceedings of the National Academy of Sciences, 105*, 3721–3726.
- Charney, E. (2008). Genes and ideologies. *Perspectives on Politics, 6*, 299–319.
- Charney, E. (2010, August). Epigenetics and genetic explanations of political behavior. Paper presented at the conference of the Midwest Political Science Association, Uppsala, Sweden.
- Conover, P., & Feldman, S. (1981). The origins and meaning of liberal/conservative self-identification. *American Journal of Political Science, 25*, 617–645.
- Converse, P. E. (1964). The nature of belief systems in mass publics. In D. Apter (Ed.), *Ideology and discontent* (pp. 206–261). New York: Free Press.
- Converse, P. E. (1970). Attitudes and nonattitudes: Continuation of a dialogue. In E. R. Tufté (Ed.), *The Quantitative Analysis of Social Problems* (pp. 168–189). Reading, MA: Addison-Wesley.
- Dodd, M., Hibbing, J. R., & Smith, K. B. (2009). Do you see what I see: Differences in eye movements and gaze behavior in conservatives versus liberals. Unpublished manuscript, University of Nebraska-Lincoln.
- Eaves, L. J., Heath, A. C., Martin, N. G., Maes, H., Neale, M., Kendler, K., Kirk, K., & Corey, L. (1999). Comparing the biological and cultural inheritance of personality and social attitudes in the Virginia 30,000 study of twins and their relatives. *Twin Research, 2*, 62–80.
- Erikson, R. S., Luttbeg, N. R., & Tedin, K. L. (1980). *American public opinion: Its origins, content and impact*. New York: Wiley.
- Feldman, S. (2003). Enforcing social conformity: A theory of authoritarianism. *Political Psychology, 24*, 41–74.
- Feldman, S., & Stenner, K. (1997). Distinguishing threat and authoritarianism. *Political Psychology, 18*, 741–770.
- Fiorina, M. P. (1981). *Retrospective voting in American national elections*. New Haven, CT: Yale University Press.
- Fowler, J., & Dawes, C. (2008). Two genes predict voter turnout. *Journal of Politics, 70*, 579–594.
- Fowler, J., & Schreiber, D. (2008). Biology, politics, and the emerging science of human nature. *Science, 322*, 912–914.
- Freeden, M. (2003). *Ideology: A very short introduction*. New York: Oxford University Press.
- Fukuyama, F. (1992). *The end of history and the last man*. New York: Penguin.
- Funk, C. L., Smith, K., Alford, J., Hibbing, M., Hatemi, P., Krueger, R., Eaves, L., & Hibbing, J. (2009, September). Genetic and environmental transmission of value orientations. Paper presented at the meeting of the American Political Science Association, Toronto, Canada.
- Garcia, J., & Koelling, R. A. (1966). Relationship of cue to consequence in avoidance learning. *Psychonomic Science, 4*, 123–124.
- Gerber, A., Huber, G. A., Doherty, D., Dowling, C. M., & Ha, S. S. (2010). Personality and political attitudes: Relationships across issue domains and political contexts. *American Political Science Review, 104*, 111–133.
- Gerber, A., Huber, G. A., Ha, S. E., Dowling, C., & Doherty, D. (2009). Personality traits and the dimensions of political ideology. Unpublished paper, Yale University.
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Personality Processes and Individual Differences, 96*, 1029–1046.

- Greenwald, A., Nosek, B., & Banaji, M. (2003). Understanding and using the implicit association test: An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*, 197–216.
- Haidt, J., & Graham, J. (2007). When morality opposes justice: Conservatives have moral intuitions that liberals may not recognize. *Social Justice Research*, *20*, 98–116.
- Hammock, E. A., & Young, L. J. (2005). Microsatellite instability generates diversity in brain and sociobehavioral traits. *Science*, *308*, 1630–1634.
- Hatemi, P. K., Gillespie, N., Hibbing, J. R., Alford, J. R., & Martin, N. G. (2008, August). Looking for political genes: Genome-wide linkage on political attitudes. Paper presented at the meeting of the American Political Science Association, Boston, MA.
- Hatemi, P., Hibbing, J., Medland, S., Keller, M., Alford, J., & Smith, K. B. (2010). Not by twins alone: Using the extended family design to investigate genetic influence on political beliefs. *American Journal of Political Science*, *54*, 798–814.
- Hatemi, P. K., Medland, S., Morley, K., Heath, A. C., & Martin, N. G. (2007). The genetics of voting: An Australian twin study. *Behavior Genetics*, *37*, 435–448.
- Hayduk, L., Ratner, P., Johnson, J., & Bortorff, J. (1995). Attitudes, ideology and the factor model. *Political Psychology*, *16*, 479–507.
- Heywood, A. (1992). *Political ideologies*. New York: St. Martin's Press.
- Holm, J., & Robinson, J. (1978). Ideological identification and the American voter. *Public Opinion Quarterly*, *42*, 235–246.
- Huckfeldt, R., & Sprague, J. (1995). *Citizens, politics, and social communication*. Cambridge: Cambridge University Press.
- Huddy, L., Feldman, S., Taber, C. S., & Lahav, G. (2005). Threat, anxiety, and support of anti-terrorism policies. *American Journal of Political Science*, *49*, 610–625.
- Inbar, Y., Pizarro, D. A., & Bloom, P. (2008). Conservatives are more easily disgusted than liberals. *Cognition and Emotion*, *27*, 714–725.
- Inbar, Y., Pizarro, D. A., Knobe, J., & Bloom, P. (2009). Disgust sensitivity predicts intuitive disapproval of gays. Unpublished manuscript, Cornell University.
- Iyengar, S., & Kinder, D. R. (1987). *News that matters: Television and American opinion*. Chicago: University of Chicago Press.
- Jacoby, W. G. (1986). Levels of conceptualization and reliance on the liberal-conservative continuum. *Journal of Politics*, *48*, 423–432.
- Jacoby, W. G. (1991). Ideological identification and issue attitudes. *American Journal of Political Science*, *35*, 178–205.
- Jennings, M. K., & Niemi, R. G. (1968). The transmission of political values from parent to child. *American Political Science Review*, *62*, 169–83.
- Jennings, M. K., & Niemi, R. G. (1991). Issues and inheritance in the formation of party identification. *American Journal of Political Science*, *35*, 970–88.
- Jennings, M. K., Stoker, L., & Bowers, J. (2009). Politics across generations: Family transmission reexamined. *Journal of Politics*, *71*, 782–799.
- Jost, J. T. (2006). The end of the end of ideology. *American Psychologist*, *61*, 651–670.
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, *129*, 339–375.
- Klingemann, H. (1979). Measuring ideological conceptualizations. In S. Barnes et al. (Eds.), *Political action: Mass participation in five western democracies* (pp. 215–254). Beverly Hills, CA: Sage.
- Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, *435*, 673–676.
- Leighley, J. E., & Nagler, J. (1992). Socioeconomic class bias in turnout, 1964–88: The voters remain the same. *American Political Science Review*, *86*, 725–736.

- Levitin, T., & Miller, W. E. (1979). Ideological interpretations of presidential elections. *American Political Science Review*, *86*, 725–736.
- Lewis-Beck, M. S., Jacoby, W. G., Norpoth, H., & Weisberg, H. F. (2008). *The American voter revisited*. Ann Arbor: University of Michigan Press.
- Lienesch, M. (1982). Right-wing religion: Christian conservatism as a political movement, *Political Science Quarterly*, *97*, 402–425.
- Lodge, M., & Taber, C. S. (2005). Automaticity of affect for political candidates, parties and issues: An experimental test of the hot cognition hypothesis. *Political Psychology*, *26*, 455–482.
- Luttbeg, N. R., & Gant, M. (1985). The failure of liberal-conservative ideology as a cognitive structure. *Public Opinion Quarterly*, *49*, 80–93.
- Lykken, D. T. (1998). The genetics of genius. In A. Steptoe (Ed.), *Genius and the mind*. Oxford: Oxford University Press.
- Madsen, D. (1985). A biochemical property relating to power seeking in humans. *American Political Science Review*, *79*, 448–457.
- Marcus, G. E. (2002). *The sentimental citizen*. University Park, PA: Penn State University Press.
- Marks, I. M., & Nesse, R. M. (1994). Fear and fitness: An evolutionary analysis of anxiety disorders. *Evolution and Sociobiology*, *15*, 247–261.
- Martin, N. G., Eaves, L. J., Heath, A. C., Jardine, R., Feingold, L., & Eysenck, H. J. (1986). Transmission of social attitudes. *Proceedings of the National Academy of Sciences*, *15*, 4364–4368.
- McCrae, R. R., & Costa, P. T., Jr. (1999). A five-factor theory of personality. In L. A. Pervin & O. P. Johns (Eds.), *Handbook of personality* (2nd ed., pp. 139–153). New York: Guilford.
- McDermott, R. (2004). The feeling of rationality: The meaning of neuroscientific advances for political science. *Perspectives on Politics*, *2*, 691–706.
- Merelman, Richard. (1969). The development of political ideology: A framework for the analysis of political socialization. *American Political Science Review*, *63*, 750–767.
- Mierke, J., & Klauer, K. C. (2001). Implicit association measurement with the IAT. *Zeitschrift fur Experimentelle Psychologie*, *48*, 107–122.
- Mineka, S., & Cook, M. (1986). Immunization against the observational conditioning of snake fear in rhesus monkeys. *Journal of Abnormal Psychology*, *95*, 307–318.
- Mondak, J. J., & Halperin, K. D. (2008). A framework for the study of personality and political behavior. *British Journal of Political Science*, *38*, 335–362.
- Mondak, J. J., Hibbing, M. V., Canache, D., Seligson, M. A., & Anderson, M. R. (2010). Personality and civic engagement: An integrative framework for the study of trait effects on political behavior. *American Political Science Review*, *104*, 85–110.
- Nie, N. H., Verba, S., & Petrocik, J. R. (1976). *The changing American voter*. Cambridge, MA: Harvard University Press.
- Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The implicit association test at age 7. In J. A. Bargh (Ed.), *Automatic processes in social thinking and behavior* (pp. 265–292). Boca Raton, FL: Taylor and Francis.
- Oxley, D. R., Smith, K. B., Alford, J. R., Hibbing, M. V., Miller, J. L., Scalora, M., Hatemi, P. K., & Hibbing, J. R. (2008). Political attitudes vary with physiological traits. *Science*, *321*, 1667–1670.
- Peterson, M. B. (2009). Public opinion and evolved heuristics. *Journal of Cognition and Culture*, *9*, 367–389.
- Pinker, S. (2002). *The blank slate: The modern denial of human nature*. New York: Viking.
- Plomin, R., DeFries, J. C., McClearn, G. E., & McGuffin, P. (2008). *Behavioral genetics* (5th ed.). New York: Worth.
- Ray, J. J. (1987). Special review: Right-wing authoritarianism. *Personality & Individual Differences*, *8*, 771–772.

- Schwartz, S. H. (2007). Universalism values and the inclusiveness of our moral universe. *Journal of Cross-Cultural Psychology*, 38, 711–728.
- Sears, D. O. (1983). The persistence of early political predispositions. In L. Wheeler & P. Shaver (Eds.), *Review of personality and social psychology* (pp. 79–116). Beverly Hills, CA: Sage.
- Sears, D. O., & Citrin, J. (1985). *Tax revolt: Something for nothing in California*. Cambridge, MA: Harvard University Press.
- Settle, J. E., Dawes, C. T., Christakis, N. A., & Fowler, J. H. (2008). Friendships moderate an association between the DRD4 gene and political ideology. Unpublished manuscript, University of California-San Diego.
- Sidanius, J., & Pratto, F. (1996). Consensual social dominance orientation and its correlates within the hierarchical structure of American society. *International Journal of Interculture Relations*, 20, 385–408.
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge: Cambridge University Press.
- Stenner, K. (2005). *The authoritarian dynamic*. Cambridge: Cambridge University Press.
- Tomkins, S., & Izard, E. (1965). *Affect, cognition and personality*. New York: Springer.
- Treier, S., & Hillygus, S. (2005, September). The structure, meaning, and influence of political ideology. Paper presented at the meeting of the American Political Science Association, Washington, DC.
- Vigil, J. M. (2008). Facial expression processing varies with political affiliation. Unpublished manuscript, University of North Florida.
- Walum, H., Westberg, L., Henningsson, S., Neiderhiser, J. M., Reiss, D., Igl, W., Ganiban, J. M., Spotts, E. L., Pedersen, N. L., Eriksson, E., & Lichtenstein, P. (2008). Genetic variation in the vasopressin receptor 1a gene (AVPR1A) associates with pair-bonding behavior in humans. *Proceedings of the National Academy of Science*, 105, 14153–14156.
- Weisberg, H. F. (1980). A multidimensional conceptualization of party identification. *Political Behavior*, 2, 33–60.
- Wilson, G. D. (1990). Ideology and humor preferences. *International Political Science Review*, 11, 461–472.
- Wilson, G. D., Ausman, J., & Matthews, T. R. (1973). Conservatism and art preferences. *Journal of Personality and Social Psychology*, 25, 286–288.
- Wilson, G. D., & Patterson, J. R. (1968). A new measure of conservatism. *British Journal of Social and Clinical Psychology*, 8, 264–269.
- Zaller, J. R. (1992). *The nature and origins of mass opinion*. New York: Cambridge University Press.