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Give Me Attitudes

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Abstract

Explorations of political attitudes and ideologies have sought to explain where they come from. They have been presumed to be rooted in processes of socialization; to be imposed by elites through partisan affiliations, the social milieu, and experiences; or to result from psychological traits. Far less attention has been focused on the inherent component of attitudes and where attitudes lead. Synthesizing research across academic fields, we propose that attitudes are a core constituent element of individual temperament, with far-reaching influence on many aspects of psychological and social functioning. Once instantiated, political values guide human behavior across domains, including affiliation into social networks, mate selection, physiological perception, psychological disposition, personality characteristics, morality construction, decision making, and selection into the very environments that influence political preferences. Here, we reconceptualize the ontology of political attitudes and ideologies from both a top-down and bottom-up perspective and as a combination of biological and environmental processes that drive an entire suite of coordinated downstream effects across the life course.

INTRODUCTION

Humans are political by nature. Rarely can scholars support such bold claims, yet the totality of human history provides incontrovertible evidence that human societies revolve around politics. And regardless of regime type, the choices that govern modern social living are driven by political attitudes. These choices infuse every aspect of a human being's central values, as well as all the policies, norms, and laws that determine how the collective regulates both individual and social behavior. Political attitudes influence abstract notions of what constitutes equality, freedom, and tolerance, as well as more specific decisions, such as when and how people engage in political violence (including war and terrorism), how resources are distributed and allocated across members of society, who constitutes an in-group worthy of protection and who is relegated to the out-group deserving derogation, exclusion, and discrimination, and regulation of sex and reproduction (such as the sanctioning of abortion and gay marriage).

When it comes to attitudes, people tend to like their own and to hold onto them for dear life, and too often try to beat the life out of others who espouse divergent opinions. Political attitudes have historically been conceptualized to derive almost entirely from processes of socialization and to exist solely in abstract psychological domains, devoid of any physical embodiment. Such a view can no longer be considered valid under the cumulative weight of evidence showing that attitudes exert a profoundly physical effect on those whose behavior we seek to control, including ourselves. Political attitudes are genetically instantiated and biologically manifested, making them physical properties of the human organism.

Questions surrounding the origin and meaning of political attitudes and ideologies have long interested scholars and the politically engaged public. Two approaches have dominated the discussion, each of which offers important insights into the source and maintenance of ideological preferences. Here we offer a third perspective, which we believe provides a more comprehensive integration of extant research. In the first approach, which remains the most common, attitudes, ideologies and orientations are conceived as dependent variables derived from processes of political socialization, such as parental influence, education, media, religion, social identity, political parties, and other social forces, operating through partisan cues and information provided by elites (e.g., Campbell et al. 1960, Jennings & Niemi 1968). Debates persist as to which environmental forces are more important, but in its most basic form, this approach focuses nearly exclusive attention on situational and environmental determinants as the driving forces in shaping political orientations.¹ A second approach, which a growing number of researchers advocate, supports the notion of a biological component in the formulation of political attitudes and ideologies but suggests that these processes operate only through other psychological traits. Such traits then drive the development of attitudes in turn (e.g., Mondak 2010, Smith et al. 2011).

We advocate a third approach, which offers a more comprehensive model to explicate the formation, structure, and function of political attitudes. We argue that although attitudes constitute some function of social forces, they also represent neurological systems and biological processes, which, once instantiated, take on a life of their own and update the cognitive, emotive, psychological, and neurobiological processes humans use to select into environments, and perceive, view, and evaluate their social world.

The culmination of findings from the last century of research in the life sciences, and from the last decade within political science, supports this third view. While acknowledging the importance of social forces, we provide evidence that genetic, hormonal, neurobiological, and physiological

¹This includes evidence that views are updated in response to events, experiences, and new information (Druckman & Lupia 2000).

factors, in conjunction with environmental cues and interactions, operate on nearly all facets of the development and maintenance of political attitudes and ideologies. Furthermore, these forces are not necessarily mediated by other organizing psychological processes (for reviews, see Fowler & Schreiber 2008, Hatemi & McDermott 2012, Hibbing & Smith 2007, Jost et al. 2014).

In this view, it is not that an individual is born with a fixed attitudinal disposition, but rather all those elements of the individual's psychological architecture, including perception, emotion, cognition, reasoning, affect, affiliation, and countless other attentional categories, are to varying degrees a function of inherited and developed biological mechanisms. These mechanisms play an important role in the probabilities of selecting into, experiencing, interpreting, and responding to social experiences. Although biologically informed psychological differences are often stable, they are not fixed, and they exert variegated influences throughout the life course. Indeed, even though substantial changes occur over the life course, political attitudes become less malleable as people age and increase in sophistication (Alwin et al. 1991, Jennings & Niemi 1981). The reasoning processes that guide political attitudes also remain remarkably stable (Eagly & Chaiken 1993). And attitudes, whether considered to be implicit or to result from some form of motivated social reasoning or antecedent dispositions, once ingrained, become a core part of our reasoning and can be observed in our neurological patterns. For example, from a simple card game designed to assess risk and reward strategies, encompassing no political cues whatsoever, Schreiber et al. (2013) predicted party affiliation with >80% accuracy by viewing the participants' neural patterns during the game. The accuracy of this prediction is more than double what social or environmental models have produced.


But one need not look into the brain or genome to recognize that political attitudes are part of who we are and thus can predict a myriad of our social, perceptual, psychological, and behavioral characteristics. Our attitudes drive our interpretation, response to, and construction of our social world, perhaps more than the other way around. Whom we choose as our life partner, with whom we have children, what friendship networks we join or avoid, where and how we choose to educate ourselves and our children, our occupations, where we live, and so many of the signals we send to others, which decisively affect our interpersonal interactions, as well as countless other physical and social experiences, are guided in part by our political values (Alford et al. 2011, Motyl et al. 2014, Rubinson 1986).

The ramifications of this somatic view of political attitudes have rarely been discussed, much less systematically reviewed. It is time for a thorough reconceptualization of the nature, function, and purpose of political attitudes. We depict attitudes not only as dependent variables, or simply as predictors of vote choice or party affiliation, but as independent drivers of a wide array of physiological, psychological, and behavioral sequelae of great personal and societal consequence. These include how we self-select into environments and social networks while eschewing alternatives, often to our disadvantage; how political attitudes appear to drive our visual and auditory attention toward some stimuli and away from others; and how individual differences in psychological traits, such as morality and personality, result from attitudes perhaps more than attitudes result from such traits. In short, the data suggest that individuals update their evaluation of the social world through the often unconscious screen of their political values. Thus, in counterpoint to the dominant research program, attitudes are not merely responses to topics of the day or reflections of social forces. Once they become instantiated, attitudes serve a deeper and more universal biological process of providing a fundamental orienting function for individuals to understand and interpret the world around them.

In support of our contentions, we proceed in five sections prior to our concluding comments. We begin by defining political attitudes, both in terms of modern issues of the day and as reflections of evolutionary forces. We then review how political attitudes reflect biological mechanisms. Next, we examine how political attitudes can, and often do, alter our physical perception of experience and

stimuli, and how these processes can then guide a vast array of psychological dispositions, including morality and various aspects of personality. Finally, we discuss how attitudes guide our self-selection into social environments, including mates, friendship networks, and a variety of situations.

Our discussion comprises an analysis and integration of over 200 articles and books. Only half are specifically cited, owing to space constraints. To access the greater bibliography, follow the **Supplemental Material** link from the Annual Reviews home page at <http://www.annualreviews.org>.

 Supplemental Material

WHAT ARE POLITICAL ATTITUDES AND WHERE DO THEY COME FROM?

The concept of political attitudes can generate unnecessary confusion because different people use it to refer to different things that are often measured in different ways. The notion of political attitudes thus has numerous definitions; attitudes can be measured in terms of discrete items (e.g., gay marriage), as groups of opinions on specific topics (e.g., social, economic, sexual, or defense issues) or in larger omnibus terms. A single liberal–conservative continuum; general world views, such as those that focus on collectivism, individualism, egalitarianism, freedom, and equality; measures of authoritarianism; and left–right scores derived from large scales of attitudes and associated subdimensions are only a few of the ways to measure and describe political attitudes and the ideologies associated with them.

While recognizing there are important subtleties and differences in meaning and measure, we do not separate out each of these definitional distinctions in our review of the literature, nor in the construction of our thesis on the overall nature of attitudes, because it is not necessary to do so in order to advance our larger argument. Individual political attitudes, and their various ideological constructions and subdimensions, share parts of the same underlying psychological foundation, and we focus on this shared component. We do not discount that groupings of attitudes and larger ideologies have unique components and that these positions in part reflect political and social constructions, institutional forces, partisan and coalitional politics, and world events (Bawn et al. 2012). In advancing our argument, we do not in any way intend to conflate these forces or dismiss their unique roles; we recognize that many components of ideologies remain distinct from specific attitudes and attitude constellations and thus, despite sharing many properties, are not analogous. Here, we focus on the components of political attitudes and ideologies that are not conflated with political parties or identities; we believe it is analytically critical to distinguish these components of political attitudes so that they are not confused with how political parties adopt their preferences and use them to mobilize the public.

However, many elements of political attitudes and ideologies are not captured by institution- and elite-driven forces. We note this not to dismiss the importance of these approaches but rather to suggest that all models of human behavior must build on a universal evolutionary foundation supported and entrained by a human cognitive architecture that is biologically instantiated. And there are individual differences within these architectures, which are shaped by biological, ecological, developmental, environmental, social, economic, and physical factors. To be clear, we are not claiming that our approach explains everything in ways that other approaches do not; we certainly do not deny, for example, that education, economic interests, and elite cues matter. We are saying that previous models have missed a comprehensive understanding of this underlying foundation revolving around the central importance of human agency. Individual people matter in more ways than previously identified.

The existence of individual variation within the context of human universals may initially appear unfamiliar to scholars not steeped in the intricacies of evolutionary biology, but the overall

notion should be familiar. Consider height: Normal adults stand between about four and three-quarters and seven feet tall—this is a human universal, yet enormous variation exists within this universal range. Similarly, human brain structure is universal, but within that structure there is great variation that falls into detectable patterns of cognitive and emotional reasoning styles and eventual preferences. Regardless of the many specific and accurate formulations of superstructure built around them, political attitudes and ideologies emerge from a platform of neurobiologically informed dispositional variance in human psychological architecture intertwined with social and environmental experiences.²

The attitudes and ideologies we discuss share some part of the same foundation. Political attitudes represent not only what an individual believes but also how she or he believes others in society ought to think, feel, and act (Lockyer & Hatemi 2014). These common socially, environmentally, and biologically informed psychological components of all the constructions of political attitudes and ideologies are the focus of our discussion. We recognize that labels have changed throughout history, particularly when conflated with the party-driven ones from which we distinguish our central argument. Therefore, we reiterate our one critical distinction: Whether we use the label attitudes, orientations, ideologies, or left or right, we are referring to political attitudes and not to party politics or partisan identifications, identities, or vote choice.

Social forces, parenting, parties, elite direction, personal experiences, and self-interest all have a role in attitudinal development and formation, as noted above. And indeed, the literature is already so extensive that it would be nearly impossible to earn a degree in political science or take a course in political behavior without locating a substantial part of the origins of attitudes in such socialized experiences and institutions. However, one of the most important additions to explicating political attitudes is the inclusion of evolutionary theory. Political attitudes fundamentally encompass issues of group living—that is, all those issues surrounding survival, cooperation, and reproduction. These are the same concerns that confronted our ancestors.

The nuances of such issues certainly change, as do the relative mean positions, resulting from social forces, environmental conditions, historical events, and local ecology. Indeed, modern institutions, path dependency, elite manipulation, globalization, trade, and capitalism all have powerful roles in guiding the public agenda. Nevertheless, the psychological processes of attitudinal formation remain the same today as they did in the Pleistocene because today's issues revolve around the same core concerns (Axelrod 1984, Lumsden & Wilson 1981, Ridley 1993). Modern-day views on immigration, though more complex, are similar to the primitive need to recognize and assimilate the potential gains and risks posed by different or unknown outsiders (e.g., resource security, different social norms, the introduction of new pathogens, greater diversity of mating pool). Political issues surrounding parenting, sexual liberties, and marriage rights are reflected in the basic need to ensure access to suitable mates and the ability to have offspring. The complex modern world of economic regulation, taxes, and welfare programs essentially addresses the basic questions of how to share resources for group living. Foreign policy issues and decisions to use force are matters of protecting the in-group. Name a divisive modern political issue and there are numerous evolutionary processes that map to it.

²When biological mechanisms are introduced as having some role in social processes, it may be useful to consider the role of human agency. Common definitions of human agency refer to how individuals, both consciously and unconsciously, reproduce their social world. We suggest that individual variations in biological systems, despite existing within a superstructure of universal human brain architecture, continue to reflect this agency, to no lesser degree than if preferences were simply a function of social forces—and maybe even more so, given that they are an inherent part of an individual, unique to themselves, and not a function of outside forces.

The manifestation of political attitudes certainly is more complicated today owing to a more complex world that includes governments, political parties, social groups, institutions, and advances in technology. Nevertheless, when people face issues regarding how to manage societal life today, they utilize the same cognitive and emotional processes that their ancestors did. The meanings and labels of issues differ across time, locations, and cultures (McDermott & Hatemi 2013); political structures and institutions impose their own coercion and incentive structures on the public's understanding and organization of political thoughts; and the medium through which attitudes are communicated has changed from direct and personal to indirect and impersonal. But the underlying issues that are important to humans, including defense, reproduction, and the allocation of resources, remain the same.

A political orientation would not have become instantiated genetically unless it served, across millennial time, to facilitate the survival of its possessors more than alternative heritable structures that did not include thought processes that organized one's world view. Although the content may differ, the structure of espousing a political ideology has moved close to fixation. Consider the analogy of vision: All healthy people have eyes; some are blue, some are brown, but all healthy eyes see. Similarly, healthy people have attitudes and espouse various forms of political ideologies; depending on the political system, some are interpreted as liberal, some conservative, and others not easily categorized, but all people use beliefs to organize their political and social world. As a universal characteristic, the possession of political attitudes and some means to organize them (i.e., political ideologies) confers a decided fitness advantage by orchestrating a suite of distinct perceptual, physiological, and preferential consequences. These organizational effects enhance the abilities of humans to accomplish the challenging tasks associated with survival and reproduction. In short, having political attitudes and ideologies renders the allocation of human energy more efficient, facilitating survival and reproduction at the expense of potentially distracting and diverting tasks.

Yet no one kind of attitude is destined to move to fixation within or across human populations. Variation persists precisely because human populations adapt to a wide variety of circumstances, including diverse climates and ecologies, environmental resources and constraints, population pressures, in-group and out-group challenges, and differential threats from predators and pathogens (McDermott & Hatemi 2013, Rushton et al. 1986). In order to flourish across the globe, humans depend on biological systems that elicit, and respond to, critical information from the environment at both the individual and population levels. This results in a plethora of discrete attitudes that emerge within a universal structure that not only supports the existence of such values and beliefs regarding one's own personal preferences, but also informs judgments about how others in society should behave toward oneself and others.

ATTITUDINAL AND IDEOLOGICAL DIFFERENCES ARE REFLECTED IN CORE BIOLOGICAL PROCESSES

A substantial body of research has noted that, on average, those who are more socially liberal (those in favor of gay marriage, women's liberties, minority rights, immigration, etc.) are more creative; more open to new experiences; and more responsive to uncertainty, informational complexity, and novelty. They demonstrate activation-based approach motivations and are more focused on advancing positive outcomes.³ Moreover, they see a larger role for the environment in influencing

³Correlations range between 0.20 and 0.44 (e.g., Carney et al. 2008; Jost et al. 2003, 2007).

behaviors and focus more on fairness. They tend to believe that society is responsible for individual welfare, and they endorse social justice; they also believe that competition can be unfair, that evaluations of equality should be based on outcome, and that security is best achieved through cooperation.⁴ They also tend to espouse moral relativism. On the other hand, those who hold more conservative opinions on social issues have more structured and rigid cognitive styles, have a greater need for cognitive closure, are less comfortable with ambiguity, and rely more upon quick, efficient, and lower-cognitive-load thought processes. In addition, they are more authoritative, score higher on intuitive thinking and self-deception, and demonstrate higher inhibition-based avoidance motivations. They are more risk avoidant and react more strongly to, and learn better from, negative cues and stimuli. They are more focused on preventing negative outcomes. They tend to believe more in independence, personal responsibility, self-reliance, and equal justice, while showing more in-group preference and hierarchy.⁵ They tend to believe that competition is good, that equality should be based on opportunity, and that security should be assured through strength. They also tend to espouse absolute standards of right and wrong (Altemeyer 1981, Carney et al. 2008, Eidelman et al. 2012, Haidt 2012, Janoff-Bulman 2009, Jost et al. 2007, Shook & Fazio 2009, van Hiel et al. 2000). These differences have been found not merely to reflect socialized preferences (although they have a role) but to be inseparable from biological differences.

Evolutionary theory makes it possible to understand how and why political value formation would entrain biological elements. A core tenet of evolutionary theory is that traits are passed down from generation to generation through both culture and genetics (Lumsden & Wilson 1981, McDermott & Hatemi 2013, Rushton et al. 1986). More than 40 years ago, Eaves & Eysenck (1974) provided the first empirical evidence that genetic influences operate on individual differences across a diverse scale of social and political attitudes. Today, the combined evidence from an array of approaches—including sophisticated modeling techniques of extended kinships, molecular data, and genome-wide approaches—employing just about every measure and type of political attitude and ideology, across different countries, time periods, and cultural conditions, indicates that genetic influences account for a substantial portion of the variation in political attitudes (see **Figure 1**; for a review see Hatemi & McDermott 2012, Hatemi et al. 2014). Such influences are present not only in the direction of attitudes but also in their intensity and level of polarization.⁶

Structural differences in our DNA are also reflected in our neurobiological architecture and in the downstream psychological constructs that influence, depend on, or coconstitute with political values. For example, greater liberalism is associated with stronger anterior cingulate cortex (ACC) activity measured by event-related potentials; liberals were also found to have larger gray matter in the ACC (Amodio et al. 2007, Kanai et al. 2011, Weissflog et al. 2013).⁷ The ACC is associated with error detection, conflict monitoring, evaluation and weighing of different competing choices, emotion regulation, and cognitive control, such that individuals with a larger ACC have a higher capacity to tolerate uncertainty and conflicts. On the other hand, the right amygdala is larger and more active in conservatives than in liberals. The amygdala is part of the limbic system, the area of the brain associated with emotion, emotional memories and learning, and management of fear

⁴Correlations range between 0.13 and 0.58 (e.g., Janoff-Bulman et al. 2008).

⁵Correlations range between 0.14 and 0.70 (e.g., Eidelman et al. 2012, Jost et al. 2003, Tetlock et al. 2013).

⁶The road from DNA to attitudes is remarkably complex, and although statistical estimates are by nature reductionist, the influences of genes and environments are codependent. Genes are passed down from parents, but environmental conditions regulate gene expression, and there is a constant interaction between genes and environments.

⁷The correlations between neurological activity and political orientations are substantive. For example, they have been reported as 0.23–0.27 (Kanai et al. 2011), 0.30–0.59 (Amodio et al. 2007), and 0.13–0.45 (Weissflog et al. 2013).

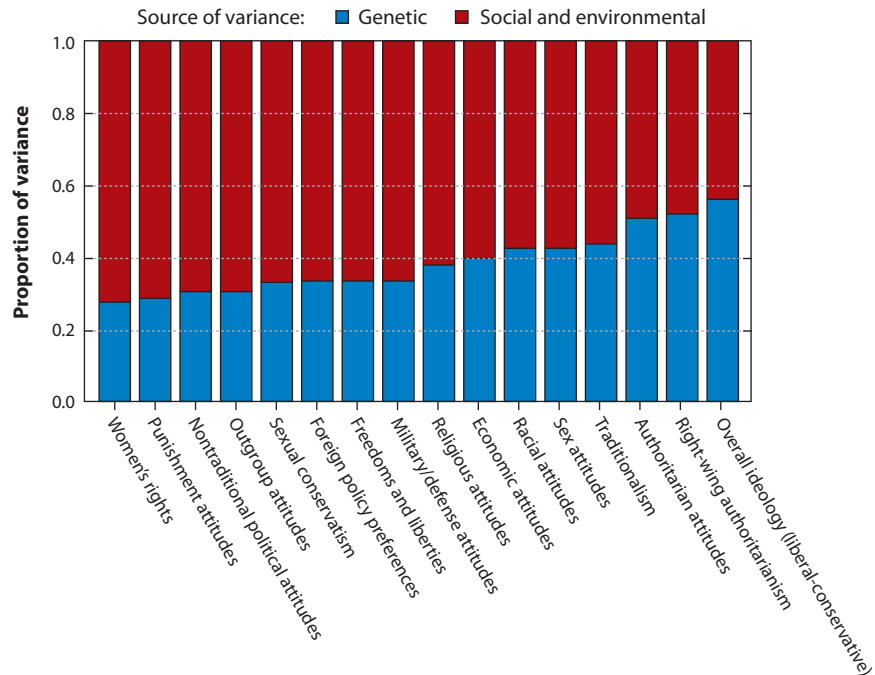


Figure 1

Summary of relative genetic and environmental influences on political attitudes and ideologies. The chart displays the relative proportion of variance on each trait explained by the aggregate effect of all genetic influences and the combination of all environmental influences. Data are derived from Hatemi & McDermott's (2012) aggregation of all reported twin and kinship studies that provided estimates of genetic and environmental influences from 1974 to 2012.

and uncertainty (Adolphs 2008). This is particularly interesting as emotions significantly impact how we perceive, interpret, and recall information.

Additional research combining functional magnetic resonance brain imaging and experimental interaction identified distinctive patterns of neural activation for specific political attitude dimensions (Zamboni et al. 2009). Individualism was found to be reflected in the ventromedial and dorsomedial prefrontal cortex (VMPFC/DMPFC) and temporoparietal junction (TPJ); these regions are activated when inferring the mental state of others in self-referential processing. Social conservatism was found to be reflected in activity in the dorsolateral prefrontal cortex (DLPFC), a region associated with working memory, response inhibition, emotion, moral judgment, and evaluation of fairness. Radicalism was found to be reflected in the ventral striatum and posterior cingulate, regions that regulate reward reinforcement and cooperation in competitive situations. In combination with Dennis et al.'s (2014) study introducing a threat context, the findings suggest that individual differences in neurocognitive responses to conflict reflect a general pattern of individual differences in political attitudes and ideologies. And although those who are more liberal or more conservative do not necessarily differ in their risk-taking behavior, the neurological processes accessed when making risky decisions differ: Those who are more liberal have greater activity in the left insula, which has been implicated in disgust sensitivity, and those who are more conservative have greater activity in the right amygdala, which is centrally involved in fear conditioning (for a review, see Jost et al. 2014).

Differences in genetic and neurological processes are also reflected in different physiological and nervous system responses dependent on political orientations. Individuals who showed a more extreme sympathetic nervous system response to threatening and aversive stimuli were more likely to show support for policy positions that were perceived to protect the group, including higher endorsement of capital punishment and defense spending (Oxley et al. 2008, Renshon et al. 2014). Conversely, those with lower reactivity to threatening images were more likely to support increased gun control and open immigration. These kinds of physiological responses can also have political consequences. For example, Smith et al. (2011) show that those who display more negative responses to disgusting stimuli are much more likely to demonstrate opposition to issues such as gay marriage and abortion (while also self-identifying as conservative). Hibbing et al. (2014) argue that these differences in physiological reactivity to negative stimuli constitute a basic organizing difference within a given society; that is, those who have a stronger negativity bias support what we label as more conservative positions on a host of social issues.

The deep-seated differences between those who are liberal and conservative on both specific issues and larger ideological measures not only appear in subjects' responses to political stimuli but also emerge in the context of behavior completely devoid of politics. A novel set of experiments using games that measure risk, which made learning contingent on sampling new information and discovering its associated positive or negative meaning, found remarkable asymmetry in learning between those who espoused liberal and conservative positions (Shook & Fazio 2009). In the game BeanFest, for example, a player is presented with a variety of cartoon beans in different sizes and shapes. A player must choose whether or not to accept a new type of bean when presented, without knowing in advance if the type of bean will be one that gives points or takes them away. In the games, liberals tried out a greater variety of beans and often ended up with big point gains but also big losses, learning along the way about all the different kinds of beans and what they provided. Those who were more conservative in their political views played defensively, testing fewer beans, being risk averse, gathering less information, and losing fewer points. These strategies are represented in different neural activation patterns. In an imaging study, Schreiber et al. (2013) was able to predict partisan orientations using a card game that assessed risk.

In summary, on a wide array of attitudinal and ideological measures, conservative-leaning individuals experience stronger physiological responses and attentional focus on aversive stimuli; they pay more attention to threatening stimuli, have stronger emotional reactions to objects and events, and more often process information initially through an emotional pathway. Liberal-leaning individuals appear more reward driven; they also display a greater willingness to engage in a wider variety of experiences. These neural and physiological patterns align with, and are reflected in, the core values of liberal and conservative political ideologies. Conservatives support stability, with slow or no change, and focus on issues related to defense. Such values would support key constituent elements of their biological structure, because predictability and security are less likely to stress an emotionally driven, aversive-conscious decision-making process. Liberals are more likely to pursue change and appear more adaptable in the face of flux. Rather than focusing on potential pain and punishment, they seek and expect rewards from a range of social, emotional, and physical experiences (Janoff-Bulman 2009).

This research stream poses a fundamental challenge to environment-only models of attitudes. Scholars can no longer consider people to be blank slates simply molded by social forces. Nor can we assume parent-child correlation to derive necessarily from socialization. Rather, a program of research that includes both biology and environment provides evidence that differences in DNA, neurological function, and physiology are correlated with differences in political values and in interaction with social and environmental experience. Cognitive and emotional reasoning, as well as selection of and reaction to all the experiences that influence political attitudes, result, in part,

from differences in an individual's biological disposition and functions. Attitudes reflect these processes.

POLITICAL ATTITUDES ALTER PHYSIOLOGICAL PERCEPTION OF ENVIRONMENTS

Perhaps one of the most pervasive and profound influences of attitudes lies in the area of sensory perception itself. Most often, discussions revolve around the uninterrogated assumption that liberals and conservatives physically perceive the same thing but differ in their interpretation of what they see and hear because of their socially determined ideological views. A growing body of evidence finds this assumption is not correct. In fact, people see, hear, and smell different things based on the attentional differences orchestrated by their political ideology (Ahn et al. 2014, Klofstad 2016, McDermott et al. 2014).

Those who are more socially conservative have a higher threshold for perceived similarity and evaluate unlike others on more dimensions than social liberals (Antony et al. 2005). Studies employing eye-tracking and response-time methods find that those on the political right show greater orientation toward aversive stimuli, and they are more likely than those on the left to interpret faces as threatening and expressing dominant emotions, whereas those on the political left pay more attention to pleasing stimuli (Vigil 2010). In addition, political liberals are more likely than conservatives to shift their attention in the direction of another person's gaze, signaling that they are more in tune with, and reactive to, others' perceptions, whereas conservatives are less susceptible to the influence of spatial cues provided by other individuals (Carraro et al. 2015, Dodd et al. 2011).⁸

In this way, political ideology constitutes a psychological mechanism that directs and informs a coordinated suite of physiological and neurological mechanisms, including visual information processing. To illustrate this phenomenon, we present some of our own unpublished work in this area (Hatemi et al. 2012). Using eye-tracking technology, Hatemi et al. (2012) examined whether individuals pay attention to different aspects of their sensory environment based on political orientations. Subjects' gaze was measured when presented with 40 images from several domains where individual differences in political attitudes, moral intuitions, and social norms related to group life would be expected to emerge, including resource allocation, defense, and sex. In addition, verbal narratives were manipulated for each image: In half the narratives, the pictures were described in a positive valence (e.g., promilitary, sex-positive), and in the other half, images were described in negative terms (e.g., antimilitary, sex-negative). The images and verbal narrations were naturalistic and publicly available, as might be seen in magazine ads, billboards, on the internet, or on television, for ecological validity.

Significant effects for ideology and ideology-by-narrative interactions were observed in 36 of 40 images. The gaze patterns of liberals and conservatives differed in all categories tested in each gaze metric analyzed (raw attention, fixation number, rate of return, time to first fixation), reflecting systemic differences in visual attention by ideology. Owing to space constraints, we discuss only two examples. In one example, when viewing the "woman kissing man's buttocks" image, without any narrative, liberals fixated on the man's face sooner than conservatives, while conservatives focused on the buttocks and kiss. When the image was verbally framed as sexual exploitation,

⁸The interaction between image type and ideology, the finding that individuals on the political right pay more relative attention than individuals on the political left to aversive stimuli, the interaction between political temperament and cue validity, and the magnitude of the gaze-cuing effects between liberals and conservatives were substantial and significant.

conservatives fixated on the man's face more than liberals, whereas the reverse was true when the image was framed as sexual exploration. Hatemi et al. (2012) had no strong a priori hypotheses on what the visual differences would be, only that there should be attentional differences based on political positions, and the results both validated our research approach and provided novel information for new hypotheses on the specific attentional differences.

A second example depicts two police officers arresting a male suspect and was narrated as an "arrest" or a "beat-down." Liberals returned to fixate on the suspect's crutch more than conservatives when the image was described as a "beat-down," whereas the reverse was true when the image was simply described as an arrest. In summary, liberals and conservatives experience different sensory aspects of the same reality; that is, political ideology drives physical perception itself and does not merely reflect different interpretations of mutually perceived events.

The combined results from all these studies suggest that political values, whether as discrete attitudes or ideologies, serve a basic orienting function across domains. This is important because political observers typically assume that information processing is not systematically biased by inherent traits subsumed within political positions. Instead of understanding attitudes and ideologies as beliefs that result only from a person's demographics, such as age, race, sex, education, income, and marital status, we see evidence that differences in political values, or different interpretations of the political world, result from people focusing on and extracting different content from what would appear to be the same reality. In this way, political opponents literally attend to, and perceive, different aspects of the same sensory environment. In a complex world saturated with information, it makes sense that orienting heuristics related to political values serve a useful function in helping individuals quickly and efficiently filter, sort, and process information in a consistent manner across domains in order to determine relevance and meaning for action. Such a mechanism can help people decide how to respond effectively to a whole host of repeated challenges related to cooperation, defense, coalitional demands, and reproductive access.

This line of research also supports a reinterpretation of a large body of research that suggests liberals and conservatives react to stimuli differently. Conservatives preferentially focus on the threat and thus react more to it. Liberals do not appear to experience the same threat conservatives do because their sensory mechanisms do not attend to it in the same way.

As we all witness in the news every day, liberals and conservatives do not simply disagree about relative priorities around shared concerns; instead, they focus on entirely different issues, and political rancor causes a paralysis in the government's ability to handle crises. One explanation for this impasse may be hidden in plain sight: Liberals and conservatives attend to, and thus experience, different sensory aspects of the same reality. This differential experience of reality itself can help explain why compromise between political opponents proves so continually and intractably challenging (Mayhew 1991).

ATTITUDES GUIDE PSYCHOLOGICAL PROCESSES OF COGNITION, EMOTION, MORALITY, PERSONALITY, AND REASONING

Research over the last several decades has provided substantial evidence that numerous cognitive and emotional mechanisms operate to bias one's perceptions and understanding of information and facts as a result of political values. These predilections include biased assimilation of information, asymmetric evaluation of information, and tendencies toward cognitive closure. Acting under the guise of motivated reasoning, motivated skepticism, motivated bias, and motivated cognitive processing, they all reflect how political values charge emotional and cognitive preconceptions to alter the perception of facts (for a review, see Shapiro & Bloch-Elkon 2008). When presented with the same evidence, individuals who began on different ends of political issues find increased validity

in their own positions and interpret neutral information as supporting their own positions (Lord et al. 1979). They recall confirmatory information far better than counter-attitudinal information (Lodge & Hamill 1986), and the stronger the attitude, the greater the misperception (Berelson et al. 1954). Indeed, as the importance and salience of a political issue increase, so do selective exposure, elaboration, bias, and misperception, resulting in even greater attitude stability (Holbrook et al. 2005). Those with strong political attitudes process contrary information through an emotional lens that biases their perception and interpretation of facts. People seek out information that confirms their attitudes, and if they encounter pro and con arguments, they uncritically accept all confirmatory evidence, generate arguments against opposing facts, and interpret ambiguous information in support of their pre-existing biases. The effects are most pronounced among those with strong attitudes and higher levels of sophistication (Lodge & Taber 2005, Mutz 2006).

Ideological biases operate to such a strong degree that even widely known public facts are often misrepresented, misperceived, or ignored as a result of cognitive dissonance and other processes. And more often than not, ideologues, or those with unyielding political positions, rewrite history. Perhaps one of the best examples is that despite a bipartisan report detailing the lack of weapons of mass destruction (WMD) in Iraq prior to the 2003 US invasion, more than half of those who identify as conservative said in January of 2015 that they believe US forces found an active WMD program in Iraq prior to the invasion (Shapiro & Bloch-Elkon 2008). Assessing more than 5,000 participants, through a novel set of false-memory experiments surrounding fabricated political events, Frenda et al. (2013) found that liberals were much more likely to remember as true a fake picture showing former President George W. Bush in a negative light, and conservatives were much more likely to remember as true a similarly false picture that placed President Barack Obama in a negative light. Importantly, it was the participants who had the best recollection of real news events who were the most likely to be biased in remembering the false images that aligned with their ideological views. That is, the people who are the most knowledgeable are also the most vulnerable to ideologically consistent bias. Motivated beliefs direct the kind of information individuals seek out, including where they seek it, as well as how they process, interpret, and remember it.

The experiences and environments we choose based on our ideology have an impact beyond immediate experience; they even affect our sense of time. For example, when making evaluations, conservatives focus more on the past, utilizing memories in a qualitatively different manner than those who are more liberal. By contrast, liberals are more future oriented in their thought processes (Robinson et al. 2015). Wishful thinking can exacerbate such tendencies, such that people tend to believe that things which cohere ideologically and emotionally are also logically connected, although that may not be the case (Jervis 1976).

These biases operate as part of our neural architecture (Vigil 2010). When political partisans are confronted with information that undermines their political beliefs, the part of the brain most associated with reasoning, the dorsolateral prefrontal cortex, remains relatively dormant, while the regions associated with emotion remain the most active (Westen et al. 2006). “Essentially, it appears as if partisans twirl the cognitive kaleidoscope until they get the conclusions they want, and then they get massively reinforced for it, with the elimination of negative emotional states and activation of positive ones” (Westen quoted by Shermer 2006, p. 36).

A number of elegant theories, focusing on the intermediary role of psychological processes such as personality and morality, have attempted to explain these ideologically driven emotional and cognitive biases with only limited success. Despite a large and growing body of research proposing a strict chain of causality between personality and political orientations (e.g., Mondak 2010, van Hiel et al. 2000), where biological forces are proposed to operate on attitudes only through personality, the majority of personality traits have little correlation to political attitudes and ideologies; most

correlations are not significant, near zero, or inconsistent. The personality trait found to have the largest correlation with political orientations is the Openness to Experience dimension of the five-factor model. This makes sense, given that the Openness dimension was explicitly designed to capture political ideology (Costa & McCrae 1995, van Hiel et al. 2000) and has been described as assessing the readiness to re-examine traditional political values. Nevertheless, longitudinal and genetic studies have provided empirical evidence that the vast majority of genetic influences on political attitudes are unique and not shared with personality traits or other psychological constructs (Verhulst et al. 2012). Across two independent samples over a ten-year period, changes in personality, including Openness, did not predict changes in political values. Political attitudes were at least as stable as, if not more stable than, the personality traits assumed to be predicting them, and rather than finding a significant causal pathway from personality traits to political attitudes, researchers found that genetic influences on political values drove some of the variation in personality traits (Hatemi & Verhulst 2015). Indeed, differences in sociopolitical attitudes have been found to predict how individuals self-report their personality traits. From the perspective of traditional personality theory, these findings constitute blasphemy, yet they make sense. Wars are not fought between introverts and extroverts, and personality traits have little role in the organization of modern society. Rather, people assort on political values, and political attitudes determine how resources are allocated, direct how sex is regulated, dictate the use of force, delineate the scope of liberties and constraints, and define the nature and categorization of social identity.

Another set of theories proposes that larger innate moral systems determine one's political values, and a substantial body of literature identifies significant correlations between numerous morality measures and political ideologies (Haidt 2012, Janoff-Bulman 2009, Lakoff 2002, McAdams et al. 2008). The empirical record, however, suggests that morality and ideology develop simultaneously and reciprocally (Graham et al. 2009, Narvaez et al. 1999, Raaijmakers et al. 1998). Indeed, political orientations determine what is considered to be moral as much as, and at times more than, the other way around (Emler et al. 1983, Sparks & Durkin 1987). In this way, "moral reasoning communicates a political position" (Emler 2003, p. 267). Studies, using approaches similar to those established for the inquiry into motivated reasoning and cognition, find that prior ideological views encompass both cognitive and affective charges that are automatically activated to appraise issues, information, persons, and symbols, and in so doing update their moral valuation in line with those prior cohesive beliefs and values (Jost & Amodio 2012, Lakoff 2002, Lodge & Taber 2005). As Lane (1962, pp. 15–16) summarized, individuals have "a set of emotionally charged political beliefs" that are "rationalizations of interests" and "serve as moral justifications for daily acts and beliefs." In this way, individuals rationally promote their interests by forming and maintaining moral valuations that reflect their attitudes and loyalty to their identities. This research suggests that the largely stable and dispositional components of ideology and attitudes are unconsciously directing cognition, emotional framing, and reasoning, which in turn drive what appear to be contextualized, conscious deliberations of moral choices. That is, people use morality to justify their pre-existing political values as much as they use morality to inform their political values (Graham et al. 2009, Haidt 2012).

POLITICAL ATTITUDES GUIDE SELF-SELECTION INTO ENVIRONMENTS

Perhaps no choice reigns more important to creating our social world than the decisions we make regarding who inhabits it. The most critical of these is the choice of life partner, spouse, and mate, who inhabit every aspect of our social world. For good or ill, these are the individuals with whom we wake up in the morning, fall asleep at night, eat our meals, and raise our children.

They share our goals, our intellectual and social resources, and our financial future. Indeed, many of the countless day-to-day and long-term environments we experience as adults are a function of our life partners. Of the thousands of traits that spouses and long-term mates assort on, two traits correlate between partners more than any others: political attitudes and religion (Alford et al. 2011, Martin et al. 1986, Stoker & Jennings 2006).⁹ This assortment on attitudes is not due to individuals growing more similar over time. Rather, the opposite appears true: People seek out like-minded others (Luo & Klohnen 2005, Luo & Zhang 2009). To put this in perspective, most personality-trait correlations between spouses are not significant and near zero, with the one exception being Openness to Experience—a values dimension loaded with political content—yet the spousal correlations even for this trait remain much lower than the correlations for political attitudes and ideologies.

The choice of friendship networks and peer groups, and the amount of time spent with particular others, also depends on attitude similarity, not the other way around (Fowler & Christakis 2013, Posner et al. 1996, Watson et al. 2004). Peer influences do offer a form of group identity and promote certain behaviors; however, individuals preferentially gravitate toward like-minded individuals and self-select into groups that hold values similar to their own, both minimizing conflict and reinforcing their own values (Harris 1995). That is, all the social networks in which people find themselves and the downstream influences that result from engagement in such associations are largely due to self-selection, based in part on prior political values.

People strive to achieve a sense of belonging with similar others. The sense of belonging often incorporates derogation toward those who differ along existentially important dimensions, such as sex, ethnicity, and age. This proclivity emanates strongly from the political sphere (Motyl et al. 2014). Political attitudes drive many aspects of the way we choose to orchestrate our lives, including domains where such applications may not seem obvious (Tajfel 2010). They have an important part in how much education we strive to achieve, where we seek to obtain it, what we watch on television, where we get our information, and whether we believe it—based on both the credibility we attach to sources and the scrutiny we apply to evidence (Campbell & Kay 2014, Mutz 2006). The role of political values is so profound that they even govern how much interest students show and how much effort a student is willing to apply to any given class based on the professor's ideological alignment with the student's own views (Kelly-Woessner & Woessner 2008). These effects are consistent with the findings from biologically oriented studies mentioned above: Conservatives are more selective in their avoidance of information that runs counter to their beliefs, whereas liberals tend to be selective in their receptivity to information that supports their views (Garrett & Stroud 2014).

The social and environmental influences attendant on political values are vast. Political values have a role in guiding where we choose to live and in what kind of environments. Ideologues tend to move into communities with similar values (Motyl et al. 2014). Conservatives tend to live in less racially diverse neighborhoods and reside in communities that prioritize safety, with relatively lower crime rates, and are less likely to move far from “home.” For example, for every unit increase in conservatism, Motyl et al. (2014) report a >30% decrease in the log odds of moving. Conservatives tend to choose communities closer to military bases, with more gun stores,¹⁰ sports interests, Protestant churches, and SUVs (Bishop 2008, Motyl et al. 2014). Liberals prefer communities closer to universities, with more bicycle paths, bookstores, organic markets, coffee shops, and hybrid cars. Political attitudes also affect the occupations we choose; the social groups we join; and

⁹On these two traits, correlations range between 0.6 and 0.7 (Alford et al. 2011, Martin et al. 1986, Stoker & Jennings 2006).

¹⁰Half of the residents in “red” America own guns, whereas less than 20% of residents in “blue” America do.

the kinds of art, humor, music, poetry, and food we experience (Wilson 1990). They govern what we deem legitimate science, including belief in evolution (Miller et al. 2006), the nature of sexuality, and climate change (Nisbet et al. 2015). Indeed, many health outcomes at both individual and state levels can be predicted by ideological values, such as obesity, depression, and suicide (Shin & McCarthy 2013, Stephens-Davidowitz 2015).¹¹ In addition, political attitudes influence whether we vaccinate our children (Baum 2011), how we view disease prevention (Niederdeppe et al. 2014), the foods we eat, the products we purchase (Kahn 2007), the homeowners associations' rules that guide our communities, and the tenants we rent to. Such effects extend to business, directing hiring processes, managerial style, and performance evaluations (Tetlock et al. 2013).

It is clear that attitudes and ideologies shape life experiences at least as much as life experiences shape attitudes and ideologies. Obviously, the influences between environments and ideologies are bidirectional, interactive, and complex. For example, individuals often choose to join organizations such as churches that they know are more liberal or more conservative in order to match their own values; and such institutions, in turn, provide environments that enforce conformity in return for a sense of belonging, thus further solidifying individuals' pre-existing values. In other cases, there is very strong evidence for a causal order from attitudes to self-selected environments, and it would be almost a functional impossibility for the reverse to be true (consider the examples of vaccination, information seeking, and mortality). In summary, almost all aspects of our personal and social lives, including the experiences and environments we choose, are deeply influenced and shaped by our political values.

DISCUSSION

Only an approach in which attitudes have a primary causal role can accurately account for the myriad effects across multiple domains witnessed in a wide variety of studies using different methods, theories, and questions. This more holistic approach establishes political values, attitudes, and ideologies as central dependent and independent variables that entrain an entire suite of psychological, physiological, perceptual, and personal forces in flexible yet predictable ways. Both universal and individual differences in biological processes, in combination with social, developmental, and environmental conditions, create and maintain dedicated systems that influence downstream preferences, feelings, thoughts, and actions. Once instantiated and given meaning, political attitudes provide the lens through which individuals view their world and other people. Political attitudes influence who is seen as friend or foe and guide self-selection into social networks from which friends and mates are extracted. They also orchestrate differential information processing and shape our cognitive and emotional states and responses.

Perhaps the most poignant example is the finding that people engage in motivated reasoning and information processing through an ideological lens. Indeed, it becomes necessary for people to shut off their rational reasoning processes when confronted with ideological information with which they do not agree; such information is then largely processed emotionally. Because these processes are at least in part biologically entrained, it is no longer possible to remain satisfied that a wholly socialization-based model of attitudes accurately depicts their origin or operation. Rather, attitudes operate within the context of a human biological system designed to provide effective and efficient organizing mechanisms for optimizing chances of success in a complex social world. Attitudes serve as a kind of operating system for the human brain, helping to signal which program

¹¹A 1% increase in county-level support for the Republican candidates corresponded to a 0.02% increase in age-adjusted obesity rates (Shin & McCarthy 2013).

to implement in a given circumstance so as to negotiate social relationships and environmental contingencies in the way that is least costly to the metabolically expensive process of running the brain.

Such a view does not deny the role of social forces, institutions, or other psychological constructs in shaping political preferences, attitudes, and beliefs, but rather creates a more comprehensive understanding of the nature of attitudes. There is no doubt that other psychological traits influence ideology, and social forces such as the media, peers, parties, and elites help set the political agenda, assign labels, and guide discourse. Individuals, however, also self-select into these outlets, networks, and experiences. They differentially perceive and process information as a result of their attitudes and ideological values, which in turn update and influence psychological traits and their biological architecture.

In advocating an embodied view of political attitudes, ideologies, and orientations, we hope to encourage the wider field of political science to begin to incorporate this perspective into future work. As we have shown, this approach is being explored across academic disciplines that do not necessarily possess the deep and detailed knowledge of the different meanings and measurements of attitudes and ideologies that political science has revealed. Political science as a discipline should take the lead in future investigations of the role of attitudes and ideology, incorporating a biological understanding of their ontology and manifestation, and should explore how attitudes change our psychology and guide our self-selection into environments both within and outside the political sphere. Attitudes predict a wide variety of important phenomena. We advocate an approach that begins with a somatic view of attitudes and interrogates the profound ways they influence the social world in which we live.

There remains much work to be done in this area, and the next questions concern how this system operates in the context of political parties, institutions, and economic incentives and the feedback loops within which these decision-making dynamics operate. This research agenda includes a deeper examination of how changes in technology might evoke different social and biological processes of attitude formation, and how social media has created a bottom-up movement of individual attitudes that do not appear to require as much intermediation through established elite channels such as the mainstream media. Indeed, this new perspective adds fuel to established domains of inquiry by political scientists who reside in the discipline best suited to examine the structural influence of attitudes and ideologies on individuals and the broader society. There are many questions yet to be answered. How does this new technology influence political institutions, and how do these institutions serve to reflect, mediate, and moderate the biological factors we argue contribute to their very formulation? How does technology remove institutional barriers and allow more evolution-driven attitudinal processes to become part of the public sphere? How does a biologically informed notion of the ontology of political attitudes further inform our understanding of partisan labels and cultural changes? And, significantly, how do new forms and manifestations of social movements, including internet-based movements, reflect, evoke, and guide the biological processes that in turn modify attitudes? All these interactionist examinations, and many others, deserve more serious treatment.

Those with liberal or conservative values spend much time trying to defend and justify their relative positions, yet they rarely, if ever, seem to convince one another. As both media and scholarly research have shown, whatever arguments are used only serve to rally those with similar opinions, not to convince those with different beliefs to change their views (Lord et al. 1979). Arguably, those on the political left or right regarding issues of defense, immigration, abortion, gay rights, and so many other topics central to group living in human societies are relatively similar in intelligence, or at least have equal access to the same information. Yet their views differ, and people remain entrenched in such views, no matter what novel or additional information is provided.

Delineating some of the basic perceptual, psychological, and emotional differences undergirding the variation in political attitudes may help provide a foundation for the public to recognize that there are real differences in value formation between individuals. This recognition might open at least one avenue by which advocates could begin to move away from merely attempting to prove themselves right in the eyes of their opponents, toward a better understanding of one another, and toward institutional and other structural mechanisms that acknowledge their basic differences. In a perfect world, such a foundation could be used to end the virtual paralysis in many areas of government.

No single analysis, approach, or model can explicate the many ways that political values infuse our daily lives and social worlds. But a more comprehensive understanding of the deeply embodied nature of our beliefs and values can potentiate a greater sense of our universal connectivity. Humans are on this planet together, and increasingly the choices that we make affect others and the future of our species, just as the choices others make affect us. The challenge presented by the common goods we have to learn to manage collectively is not an accident, but rather emerges from the diversity of political ideologies that differ in content but unite us in structure. Leveraging that universality may prove essential for our collective survival. It is only through a combination of environmental and biological factors, which exist in an exquisite eternal improvisational dance, that the inextricably linked influences of nature and nurture can create and sustain life.

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