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Differences in negativity bias underlie variations in political ideology

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Abstract: Disputes between those holding differing political views are ubiquitous and deep-seated, and they often follow common, recognizable lines. The supporters of tradition and stability, sometimes referred to as conservatives, do battle with the supporters of innovation and reform, sometimes referred to as liberals. Understanding the correlates of those distinct political orientations is probably a prerequisite for managing political disputes, which are a source of social conflict that can lead to frustration and even bloodshed. A rapidly growing body of empirical evidence documents a multitude of ways in which liberals and conservatives differ from each other in purviews of life with little direct connection to politics, from tastes in art to desire for closure and from disgust sensitivity to the tendency to pursue new information, but the central theme of the differences is a matter of debate. In this article, we argue that one organizing element of the many differences between liberals and conservatives is the nature of their physiological and psychological responses to features of the environment that are negative. Compared with liberals, conservatives tend to register greater physiological responses to such stimuli and also to devote more psychological resources to them. Operating from this point of departure, we suggest approaches for refining understanding of the broad relationship between political views and response to the negative. We conclude with a discussion of normative implications, stressing that identifying differences across ideological groups is not tantamount to declaring one ideology superior to another.

Keywords: attitudes; conservatives; liberals; negativity; physiology; psychology; politics

1. Introduction

John Stuart Mill called it "commonplace" for political systems to have "a party of order or stability and a party of progress or reform" (1991). Ralph Waldo Emerson agreed, noting that "the two parties which divide the state, the party of conservatism and that of innovation, are very old, and have disputed the possession of the world ever since it was made," and he inferred that this "irreconcilable antagonism must have a correspondent depth of seat in the human condition" (1903). The antagonism between two primal mindsets certainly pervades human history: Sparta and Athens; optimates and populares; Roundheads and Cavaliers; Inquisition and Enlightenment; Protagonus and Plato; Pope Urban VIII and Galileo; Barry Goldwater and George McGovern; Sarah Palin and Hillary Rodham Clinton. The labels "liberal" or "leftist" and "conservative" or "rightist" may be relatively recent (etymologically they are typically assumed to date to the French Revolution, but they appear to be much older; see Laponce 1981) but the political division they describe is ancient and universal (Bobbio 1996; Jost 2006; Jost & Amodio 2012; McCarty et al. 2006). Is Emerson right in his claim that this division springs from a deep, possibly innate part of the human condition? Does political temperament vary from person to person because the physiology and psychology constituting human nature also varies from person to person? If so, how are the individuals who support parties of stability and order psychologically and physiologically different from those who support parties of progress and innovation?

Existing research offers only incomplete answers to these questions. All too often, the questions are not even asked. Folk wisdom and much scholarly research assumes

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political orientations are products of socialization, learned from parents and family, acquired by osmosis from sociodemographics, or conditioned exclusively by environmental situations and cultural contexts. The logic here is reasonable; authority figures encountered at impressionable early stages of life, as well as broader circumstances experienced later seem obvious sources of influence on a range of personal and social orientations including those relating to politics. Yet the effects of parental socialization on political orientations are fairly meager (bivariate correlations typically running between 0.1 and 0.3) with the exception of identification with social groups such as a political party (Jennings & Niemi 1968; Niemi & Jennings 1991). Adding sociodemographic variables such as age, education level, and family income to models of political attitudes and behavior only modestly increases explanatory horsepower (Plutzer 2002). Moreover, sociodemographic variables in and of themselves do not explain the precise factors at work in structuring preferences. In sum, political orientations do not seem to be the automatic result of parental socialization and sociodemographic circumstances.

To the surprise of many (but see Merelman 1971), it is increasingly clear that Emerson's intuition was right. Politics might not be in our souls, but it probably is in our DNA. More than 25 years ago Nicholas Martin and Lindon Eaves (Martin et al. 1986), using a standard twin design on a large sample, produced heritability estimates between 0.2 and 0.4 for attitudes on a wide variety of political issues (e.g., capital punishment, disarmament, abortion). More recent twin studies consistently confirm these findings and extend them to behaviors such as voter turnout (Alford et al. 2005; Bell et al. 2009; Bouchard & McGue 2003; Fowler et al. 2008; Hatemi et al. 2007; 2009; 2013; Klemmensen et al. 2012; Smith & Hatemi 2013). Given the many assumptions undergirding twin studies, it is important to note that alternative techniques for estimating heritability that do not rely on twins report slightly smaller but still statistically significant effects of genetics on political orientations (Benjamin et al. 2012).

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Though twin studies are valuable for assessing the general roles of heritability and various categories of environmental influence (shared and unshared), they say little about the specific sources of influence within those broad categories. Accordingly, efforts are underway to identify particular genetic regions or even particular genes that might relate to politics (Fowler & Dawes 2008; Hatemi et al. 2011; McDermott et al. 2009; Settle et al. 2010). Yet although intriguing, it is not clear genopolitics research can comprehensively illuminate the source of the "irreconcilable differences" that Mill, Emerson, and others have long suspected to be the basis of political beliefs. Any given candidate gene (or genetic region) is likely to explain only a small fraction of the variance in a complex quantitative trait like political temperament and statistically isolating meaningful relationships amongst such marginal impacts is difficult. That situation is reflected in the poor replication record of candidate gene association studies, particularly when they involve interactions with any of a large number of possible environmental influences. For example, Fowler and Dawes (2008) identified allelic variation in two genes involved in the serotonin system (the transporter 5-HTT and the degrader MAO-A) that systematically correlated with political participation. A reanalysis of the same data by Charney and English (2012) using different procedures did not reproduce that finding, and replications have fed the controversy as much as resolved it (see Deppe et al. 2013; Fowler & Dawes 2013). So although twin studies suggest that political orientations may be heritable, identifying the particular genetic pathways that lead to political orientations constitutes a daunting challenge.

The same could be said, however, about identifying the particular environmental pathways that lead to political orientation. Twin studies repeatedly point to a strong influence of the unshared environment and a fairly weak role of the shared environment on political orientations. Traditional research on the correlates of political temperament backs twin study conclusions, finding a weak role of the shared environment (e.g., minimal influences of parental socialization; Jennings & Niemi 1968), and efforts to identify specific environmental influences other than the "usual suspect" sociodemographics (age, education, gender, and the like) have met with at best mixed success.

The conclusion that political orientations are shaped by a combination of largely unspecified genetics and only slightly better specified features of the (mostly unshared) environment does not constitute much of an advance. Is this the best that can be done in describing the nature and derivation of political orientations that are so diverse and strongly held that they can lead to paralyzing societal divisions and sometimes violence? Here we explore the correlates of variation in political orientations at an intermediate level that is neither as proximate and overtly political as parents' political preferences nor as distal as genetic polymorphisms. This level includes the physiological and psychological processes relevant when particular classes of stimuli present themselves. The logic for our approach is straightforward. Life is about encounters: sights, sounds, smells, imaginings, objects, and people. These encounters are indisputably physiological and psychological because the systems employed to sense, process, formulate, and execute a response to stimuli are psychological and

physiological. Equally indisputable is the existence of individual-level variation in these physiological and psychological mechanisms. Even if a stimulus is identical, one individual will sense, process, and respond to it differently than another.

Those measurable and variable physiological and psychological signatures constitute valuable and crucial constructs in and of themselves, regardless of whether their causes are genetic, environmental, or (more likely) a combination of both. They are the tangible residue of all the genetic and experiential influences that have been retained and then incorporated for future guidance. As such, the embodied predispositions constitute inertial psychological and physiological set-points that serve as baselines for behaviors and attitudes. Individual-level variation in those predisposed response patterns goes some distance toward defining who we are as people, including the nature of our political orientations.

In this article we make the case that variations in physiological and psychological responses to a particular category of stimuli – those that are negative (or aversive) – correlate with political orientations. It is well-known that on the average people respond and pay more attention to negative than to positive stimuli (Baumeister et al. 2001). Our interest, however, is in individual variation around the "average." Certain individuals respond strongly and attend concertedly to negative stimuli; others less strongly. We reason that this variation is likely to correlate with the political positions endorsed by each individual.

Hypothesizing a connection between political orientations and psychological/physiological responses is encouraged by the intraperson longitudinal stability of each. Political scientists have documented the role of unspecified long-term forces in structuring political orientations and decisions, referring to them, alternatively, as antecedent conditions (Marcus et al. 1995), long-term predispositions (Zaller 1992), or ingrained habits (Gerber et al. 2003; Plutzer 2002). A recent study even notes that when it comes to an interest in politics, "you've either got it or you don't" (Prior 2010; see also Alwin & Krosnick 1991; Sears & Funk 1999). For their part, psychological and physiological response sets are also relatively stable over time (Cohen & Hamrick 2003; de Weerth & van Geert 2002; Huizenga et al. 1998; Lykken 1999) and therefore – in theory at least – could help to explain the longitudinal stability of political orientations.

Considerable evidence suggests that liberals and conservatives are distinct on a wide variety of psychological and physiological variables. In the main sections of this article, we summarize that evidence and argue that a surprising amount of it can be integrated around the theme of differences in physiological and psychological responses to negative events and stimuli. An important preliminary step, however, is to show that political decisions in many cases are influenced by factors people do not believe are involved. Some may reject the assertion that deep physiological and psychological differences distinguish liberals and conservatives because they believe that higher level decision-making, such as that involving politics, is the product of rational, conscious responses to the objective world and therefore not influenced by forces outside of conscious awareness. This flattering view of human decision-making in the area of politics is most likely unwarranted.

2. Politics and the subconscious

Extraneous or even subthreshold factors affect a wide range of day-to-day decisions and opinions and moral, religious, and political decisions, and beliefs are not immune to such forces. People sitting in a messy, malodorous room tend to make harsher moral judgments than those who are in a neutral room (Schnall et al. 2008), and disgusting ambient odors decrease approval of gays (Inbar et al. 2009b; see also Inbar et al. 2009a; 2012a). Sitting on a hard, uncomfortable chair leads to less flexible attitudes than those offered when sitting on something soft and comfortable (Ackerman et al. 2010). People reminded of physical cleansing – for example, by the presence of hand sanitizer – render sterner judgments than those who are not given such a reminder (Helzer & Pizarro 2011). Moral judgments can change as a result of hypnotic suggestion (Wheatley & Haidt 2005), and prompting analytical thinking lowers religiosity (Gervais & Norenzayan 2012). Focusing exclusively on political variables, when churches are employed as polling places people's tendency to cast votes for right-of-center candidates and ballot propositions increases compared with when public schools serve as polling places (Berger et al. 2008; Rutchick 2010). Mortality prompts – images of tombstones, hospitals, and the elderly – foster the adoption of conservative political positions (Jost et al. 2004; Landau et al. 2004; although see Castano et al. 2011). Italians who implicitly associated symbols of the United States with negative concepts were more likely to vote against the proposed expansion of a U.S. military base even though they believed themselves undecided on this issue (Galdi et al. 2008).

In a series of studies following the lead of Zajonc (1980), political scientist Milt Lodge and his colleagues demonstrated the importance of hot cognition or automaticity in political judgments (Lodge & Hamill 1986; Lodge & Taber 2005). Political stimuli often produce extremely quick emotional reactions that affect more deliberate cognitive processes such as memory recall, attention, and information processing. In one study, images of a happy face flashed for too short a time to register in conscious awareness resulted in participants offering fewer reasons to oppose immigration (Lodge & Taber 2013), indicating that quick, preconscious responses color political judgments. These concepts receive extensive development in the work of psychologist John T. Jost and colleagues. Jost refers to preconscious biases as motivated social cognition and repeatedly demonstrates that people do not come into political situations unconstrained (Carney et al. 2008; Jost 2006; Jost & Amodio 2012; Jost et al. 2003). These constraints typically operate outside of conscious awareness though people often insist that their political decisions are solely the result of conscious considerations. Even neuroscientists sometimes express surprise that political orientations are influenced by subthreshold factors (Wade 2011).

The relevance of subthreshold factors allows for the possibility that political temperament is systematically related to a range of psychological and physiological response patterns. In the following sections we summarize research showing this possibility is in fact a reality. First, we examine liberal-conservative psychological differences as reflected in (survey) self-reports. Second, we review psychological differences that are not fully accessible to the participants themselves. Third, we describe evidence

of physiological differences between liberals and conservatives. Finally, we synthesize the research by arguing that many of the correlations described are tied together by the common thread of differences in response patterns to negative stimuli.

3. Politics and self-reported psychological differences

Mass-scale political preferences systematically correlate with an astonishing variety of psychological characteristics. Perhaps the best known is authoritarianism. *The Authoritarian Personality,* by Adorno et al. (1950), claimed that characteristics such as conventionalism, submission to authority and anti-intellectualism clustered into a distinct, measurable personality trait, and developed the F-scale to measure that trait. Variation on this scale correlated with a wide range of political attitudes, including self-placement on a liberal-conservative dimension. Similarly, McCloskey (1958) concluded that traits such as confidence, social behavior, mood, cognitive complexity, social behavior, and preferred leadership styles also distinguished liberals and conservatives.

Since then, some research explicitly rolls politics into personality, whereas other research treats politics as conceptually distinct from personality. A prominent example of the former is Altemeyer's development of a scale to measure Right-Wing Authoritarianism or RWA (Altemeyer 1981; 1996). To illustrate, one RWA item asks whether respondents agree that "God's laws about abortion, pornography, and marriage must be strictly followed before it is too late, and those who break them must be strongly punished." Altemeyer's blending of life and political tendencies to capture a personality trait of broad social relevance is part of a pattern in post-Adorno research. Wilson and Patterson (1968) measure conservatism by combining explicitly political stands on issues such as school prayer and the death penalty with preferences on broader lifestyle issues such as modern art and pajama parties (see also Wilson 1973). Bouchard urges combining religion, politics, and authoritarianism into a single concept (2009). Tomkins (1963) and Tetlock and Mitchell (1993) also conflate personality and politics. Others, however, go out of their way to tap authoritarian tendencies without explicitly invoking politics – for example, by measuring nonpolitical authoritarianism with survey items on child rearing (Feldman & Stenner 1997; Hetherington & Weiler 2009; Stenner 2005). Those who favor more authoritarian parenting styles are significantly more likely to be political conservatives. Another longstanding concept merging politics and personality is Social Dominance Orientation (SDO) (Pratto et al. 1994; Sidanius & Pratto 2001) which is based on the observation that people vary in their comfort levels with group-based discrimination and dominance, with some embracing the vision of a hierarchy of groups.

Much recent research takes advantage of personality psychology's growing acceptance of a standard package of five core personality traits, known as the Big Five: conscientiousness, agreeableness, openness to new experiences, extraversion, and emotional stability (Gosling et al. 2003; McCrae 1996; Mondak et al. 2010). Though Big Five personality batteries are not overtly political, two traits consistently discriminate political orientation across a broad range of studies: Conservatives tend to score higher on conscientiousness and liberals tend to score higher on openness to new experiences (see Caprara et al. 1999; Gerber et al. 2010; Mondak & Halperin 2008; Rentfrow et al. 2009). Other Big Five traits do not correlate as consistently with political orientations but extraversion and emotional stability have been associated with economic (though not social) conservatism (Gerber et al. 2010; Young 2009) and elements of agreeableness have also been linked to ideology, with conservatives being more polite and liberals more empathetic (Hirsh et al. 2010). These personality differences encourage researchers to explore the possibility that liberals and conservatives construct and occupy different individual and social environments. For example, consistent with their tendency to report being more conscientious, conservatives' "life spaces" tend to have more cleaning supplies and organizing elements, including calendars, postage stamps, and laundry baskets, and, consistent with their penchant for new experiences, liberals tend to have more art supplies, travel materials, and greater varieties of books and music (Carney et al. 2008).

Personality traits are far from the only psychological characteristics that discriminate political orientations. Shalom Schwartz's research focuses on the values that guide an individual's personal life, such as conformity, tradition, security, power, achievement, hedonism, stimulation, self-direction, universalism, and benevolence (Schwartz 1992; for a good overview, see Feldman 2003). Relationships among these values are stable across cultures (Piurko et al. 2011; Schwartz 2006) and are consistently related to individual-level variation in political preferences. Conservatives tend to value security and conformity and liberals tend to value self-expression and stimulation – and those values even turn out to be powerful predictors of voting behavior (Schwartz et al. 2010).

Jonathan Haidt and colleagues demonstrate convincingly that liberals and conservatives tend to employ different considerations when making moral judgments. Liberals rely primarily on concerns for equality and harm avoidance, whereas conservatives are more likely to take into account considerations such as purity, authority, and in-group/out-group status (Graham et al. 2009; Haidt & Graham 2007; Haidt & Joseph 2004). As was the case with personality traits and core values, these connections of moral foundations to politics apply in numerous countries (Graham et al. 2009; for additional work on the political relevance of selected moral foundations, see Petersen 2009). The connection between purity concerns and conservatism is consistent with the previously mentioned finding that conservatives tend to have more cleaning supplies in their living spaces (Carney et al. 2008). It is also consistent with the finding (replicated cross-nationally) that people with stronger self-reported disgust are more conservative (Inbar et al. 2009a; 2012b; but see Tybur et al. 2010).

Jost et al.'s (2003) extensive meta-analysis examining the core differences between the left and the right concludes that comfort with change and attitudes toward equality are the two central variables distinguishing liberals and conservatives. The relevance of these traits argues strongly against assertions that ideology has little meaning for most people and is decreasingly relevant to modern life (Bell 1960; Converse 1964; Fukuyama 1992). Jost (2006) suggests ideology is no more likely to end than personality

traits given that ideology is the political reflection of aspects of broader psychology.

Liberal-conservative differences even extend to tastes and preferences. Compared to liberals, conservatives are more likely to prefer simplicity and realism as opposed to complexity and abstractions in art (Wilson et al. 1973) and puns as opposed to unexpected incongruity in humor (Wilson 1990). A recently collected sample of our own shows statistically significant relationships between political conservatism and preferences for familiar as opposed to unfamiliar foods and music, for poetry that rhymes, and for novels that come to closure (Neiman 2012).

This last finding is consistent with a substantial body of research investigating the relationship between political beliefs and the "need for cognitive closure." In 1993, Kruglanski et al. introduced a battery now widely used to tap preferences for closure. It includes items such as "I do not like situations that are uncertain," "I like to have friends who are unpredictable," and "even after I've made up my mind about something, I am always eager to consider a different opinion." Cross-nationally this battery consistently suggests individuals who desire cognitive closure tend to self-identify as conservative (Chirumbolo et al. 2004; Federico et al. 2005; Golec 2002; Golec et al. 2010; Kossowska & van Hiel 2003; Rock & Janoff-Bulman 2010; van Hiel et al. 2004), identify with conservative political parties (Kemmelmeier 1997), and adopt conservative positions on specific topics such as the death penalty and general punitiveness (Jost et al. 1999), immigration (Chirumbolo et al. 2004), and a variety of other social and economic topics (Golec 2002). A meta-analysis (Jost et al. 2003) reports relationships between political conservatism and desire for cognitive closure (or related concepts such as intolerance of ambiguity and preference for order) in 20 different samples in an array of countries. As both are consistent with a desire for clear and definite answers, it is not surprising that religious fundamentalism also is related to preferences for closure (Lienesch 1982).

Historical and cultural context plays an important role in these relationships. In some postcommunist countries individuals with a strong preference for closure are more likely to support socialist economic arrangements (Golec 2002; see also Kossowska & van Hiel 2003). Thorisdottir et al. (2007) find that psychological preferences for traditionalism and rule-following lead to right-of-center preferences in both Eastern and Western Europe. On the other hand, preferences for security lead to right-of-center orientations in the West but left-of center orientations in the East (they also find that the effects of openness on politics are particular to region). Presumably the security and familiarity associated with a particular regime style (whatever the ideology) that long shaped people's lives appeals to certain personality traits. Thus, psychological tendencies may be generally related to political beliefs but the particular features and history of a polity undoubtedly modify these relationships from country to country and era to era.

In addition to a desire for cognitive closure, variations in preference for cognitively involved activity (a different concept than cognitive ability) also seem to relate to political preferences. Cacioppo et al. (1996) developed an instrument suitable for assessing attitudes toward cognition and Sargent (2004) reports that, in two separate samples, those more comfortable with cognitive effort and attributional complexity are less supportive of punitive responses to lawbreaking.

4. Politics and implicit psychological differences

The studies summarized above show liberal-conservative differences in psychological traits and tendencies but they rely almost exclusively on self-reports. It turns out that differences correlating with political orientations also extend to measures tapping implicit, subthreshold tendencies. Such measures are designed to index variation in the manner in which individuals see, pay attention to, and process stimuli (Wahlke 1979; for a good summary, see Nosek et al. 2010). As such, they tap concepts that are much broader than politics.

A variety of measures of directed attention are available. Common protocols such as the "Emotional Stroop," "Dot-Probe," and "Flanker" tasks find that threatening stimuli are consistently more distracting for conservatives (Carraro et al. 2011, McLean et al., in press). Negative stimuli such as angry faces appear to grab the attention of conservatives more than they do liberals. Eyetracking is an even more direct way to measure attention. Dodd et al. (2012) asked participants to "free view" collages of images (selected from the widely used IAPS collection) that had been pre-rated as positive (sunsets, happy children, cute animals) or negative (vomit, houses on fire, dangerous animals). They found conservatives spent significantly more time looking at negative images and were significantly quicker to "fixate" on those images, as well. In sum, across research methods, samples and countries, conservatives have been found to be quicker to focus on the negative, to spend longer looking at the negative, and to be more distracted by the negative.

Some evidence suggests conservatives have a lower bar for deeming stimuli and situations negative. When "emotionally ambiguous" faces are shown to research participants, individuals on the political right are more likely to report that the face is expressing a threatening or dominant emotion, such as anger. Those on the political left are more likely to "see" a subordinate emotion such as surprise (Vigil 2010). In a study of our own, a sample of 340 U.S. adults were shown a series of pre-rated IAPS images and asked to report their evaluations from favorable to unfavorable. Consistent with expectations, conservatives perceived the negative images more negatively than did liberals ($p < 0.01$).

Research also reports liberal-conservative differences in word usage, implicit association tests (IATs), object categorization, and exploratory behavior. Linguist George Lakoff observes that people on the left use the language of the nurturing parent and those on the right the language of the strict parent (Lakoff 2002; see also, Graham et al. 2009). Compared with liberals, conservatives tend to have stronger implicit attachments to tradition, stability, long-held values, conformity, and order (Jost et al. 2008). Young (2009) finds conservatives are more likely to be "hard categorizers" and liberals "soft categorizers," suggesting that conservatives have a lower tolerance for ambiguity and are more likely to view the world in strongly defined categories (see also Rock & Janoff-Bulman 2010).

Conservative-liberal differences also appear in the way individuals extract and process information from their environments. "BeanFest" is a computer game where

participants must choose to accept or reject a series of differently shaped and marked beans. If the bean is accepted, the value of beans with that same shape and marking is revealed (it could be +10 or −10) and participants are rewarded for accumulating points. Strategies of play vary widely across people: Some "accept" many beans, risking points in order to acquire information, whereas others play it safe, accepting only those beans they know to have a positive value. One of the key correlates of variations in these strategies is political orientation. Liberals are significantly more exploratory than conservatives in that they choose far more unknown bean types even though doing so runs the risk of losing points (Shook & Fazio 2009). Differences also show up in the learning capacities of people with different political orientations. Conservatives are better than liberals at remembering which beans are "bad," but they are also more likely to misremember the positive beans as "bad." In short, conservatives are more likely than liberals to follow strategies that lead them to know less about positive aspects of their environment, possibly leading them to conclude that "the world is a relatively harsh place" (Shook & Fazio 2009).

5. Politics and physiological differences

Liberal-conservative differences in psychology appear in a variety of tasks, samples, and countries – but do these differences extend to the realm of physiology? Research on the relationship between politics and physiology is just starting to take root and often involves neuroimaging. Much of this research focuses on identifying the parts of the brain that are differentially activated by political stimuli regardless of the participant's liberal-conservative orientation (Cacioppo & Visser 2003; Knutson et al. 2006; Lieberman et al. 2003; Westen et al. 2006). Still, some recent research reports liberal-conservative neural differences.

Amodio et al. (2007) analyze conflict-related anterior cingulate cortex (ACC) activity by recording two event related potentials (ERP) for 43 participants. They employ a Go/No-Go task where participants habituate to provide a "Go" response but then have to withhold that response (a situation known to be associated with enhanced ACC activity). Self-identified conservatives in this study made more mistakes in giving the habituated response, suggesting they are inclined toward greater persistence than liberals. Moreover, Amodio et al. find that conservative participants have significantly less conflict-related neural activity than liberals when response inhibition is necessary. This is consistent with research showing that conservatives are more likely to be conscientious and to favor cognitive closure and hard categorization. As Amodio et al. put it, "political orientation, in part, reflects individual differences in the functioning of a general mechanism related to cognitive control and self-regulation" (p. 1247; for parallel findings on individuals with strong religious convictions, see Inzlicht et al. 2009). Schreiber et al. (2013) report that during a risk-taking task, functional magnetic resonance imaging (fMRI) on 54 participants reveals those who tend to vote Republican show greater amygdala activation, whereas individuals who tend to vote Democratic show greater insula activation.

Kanai et al. (2011) provide evidence that there are liberal-conservative differences in neural structure. Using magnetic resonance imaging (MRI), they scanned the brains of 90 college students in London (and 28 more in a replication sample) and found that self-identified liberals tend to have more gray matter in the ACC, whereas self-identified conservatives tend to have increased volume in the right amygdala. Though the amygdala has been connected to intense positive, as well as negative affect processing, these results are consistent with the aforementioned self-regulating, conflict-monitoring differences between liberals and conservatives and with differences in response to threats and facial emotions (responses that have been traced to the amygdala). These similarities lead Kanai et al. to note that their results "converge with previous work to suggest a possible link between brain structure and psychological mechanisms that mediate political attitudes" (p. 677).

Physiological differences between liberals and conservatives are not limited to brain imaging. Electrodermal activity (EDA) is one of the most widely employed measures of sympathetic nervous system activation (Dawson et al. 2007) and several studies report that negatively valenced visual stimuli increase electrodermal activity in conservatives more than in liberals (Dodd et al. 2012; Oxley et al. 2008; Smith et al. 2011). In some of these studies EDA response to specific image categories such as disgust correlates with specific conservative issue positions such as those related to gay marriage (Smith et al. 2011), whereas in other studies EDA response to a wide range of aversive images correlates with broad conservatism (Dodd et al. 2012). Similar research shows that physiological response to outgroup (especially ethnic) stimuli predicts attitudes and behaviors often associated with left-right conflicts on issues like affirmative action (Dambrum et al. 2003; Vanman et al. 2004). Facial electromyography (EMG) is another technique for measuring physiological response and individuals scoring high on right wing authoritarianism tend to have greater muscle activity in the corrugator region (furrowing of the brow) when viewing negative social situations (Fodor et al. 2008). Conservatives also tend to display greater blink amplitude (movement of the orbicularis occuli muscle) in response to sudden, unpleasant, and unexpected auditory prompts (Oxley et al. 2008).

Endocrine levels are another aspect of physiology that may relate to political orientations. Although no study to date has tested and reported a connection to location on the liberal-conservative spectrum, existing research provides an indication of the possibilities. Madsen (1985) finds that whole blood serotonin levels correlate with leadership and assertiveness in group situations. Testosterone levels have been shown to decrease (Stanton et al. 2009) and cortisol levels to increase (Stanton et al. 2010) when favored candidates lose an election (see also Apicella & Cesarini 2011; Waismel-Manor et al. 2011). Testosterone levels have been associated with aggressive (simulated) decision making (McDermott et al. 2007) and oxytocin appears to increase trust toward in-group members (Kosfeld et al. 2005) but may also heighten feelings of ethnocentrism (de Dreu et al. 2011).

6. Negativity bias and politics

As is apparent, the list of empirically demonstrated psychological and physiological differences between liberals and

conservatives is long and diverse. Additional studies are needed, however, because much of the extant physiological work is based on small, geographically constrained samples and much of the psychological work relies on college undergraduates who may have yet to form stable political attitudes. Perhaps an even greater need is for theoretical integration of this burgeoning empirical literature and that is what we hope to provide in this section, though we recognize that any effort to provide a theoretical undergirding for the findings summarized will be unavoidably speculative.

Liberals and conservatives vary in their tolerance of social equality and change, their moral foundations, their values, and even their perceptions of the nature and perfectibility of the human condition (Graham et al. 2009; Jost et al. 2003; Pinker 2002, Ch. 16; Schwartz et al. 2010; see also Sowell 1987; Tomkins 1963). As valuable as these efforts are, questions immediately arise regarding the precursors of these differences. Why do some people say they value security and some self-expression? Why do some more than others rest their moral judgments on purity and authority? Why do some have a tragic and some a utopian vision of humankind? Why do some embrace change and others avoid it? To answer these questions, it may be useful to incorporate deeper physiological and psychological differences. After all, people's answers to the survey items used to assess moral foundations, personal values, and personality traits must come from somewhere and given the important role of subthreshold forces in political orientations, variations in physiology and deep psychology are likely to play an important role.

We believe a key factor in accounting for people's political predispositions is their orientation to negatively valenced events and stimuli. Negativity bias is the principle that "negative events are more salient, potent, dominant in combinations, and generally efficacious than positive events" (Rozin & Royzman 2001, p. 297; see also Baumeister et al. 2001). Essentially, this principle reflects the fact that humans generally tend to respond more strongly, to be more attentive, and to give more weight to negative elements of their environment. This tendency shows up in a wide variety of socially-relevant characteristics – everything from loss aversion (Kahneman & Tversky 1984) to quick recognition of angry versus happy faces in a crowd (Hansen & Hansen 1988). People generally tend to be more attuned to negative faces, words, and social information, and both the autonomic and central nervous systems tend to have measurably higher levels of activation in response to negative than positive stimuli (Rozin & Royzman 2001). Good evolutionary reasons exist for negativity bias given that negative events can be much more costly in fitness terms than positive events are beneficial; to state the obvious, infection, injury, and death curtail reproductive opportunities.

For our purposes the most notable feature of negativity bias is not that it exists but that it varies so much from individual to individual (Norris et al. 2010). That some people are more attuned to potential threats, more sensitive to sources of contagion, and more desirous of in-group protections is known intuitively and amply demonstrated by a large research literature. These individual differences seem to be stable over time and generalize to a broad category of stimuli (sounds, words, and images; see Norris et al. 2010). Previous research suggests that this individual-level variation also correlates with orientations to the social world, such as risk tolerance (Baumeister et al. 2001). The connection we point out now is that the empirically demonstrated individual variation in negativity bias manifests itself not just in broad social orientations, but also in political preferences.

Negative situations are likely to relate to threats, whether microbial, predatory, or emotional, and people have widely varying orientations to threats. As we have seen, those individuals with politically conservative orientations display elevated physiological response to negative stimuli, devote more attention to negative stimuli, possess distinct self-reported psychological patterns when asked to imagine negative stimuli (i.e., give evidence of high disgust and high threat sensitivity), and perhaps harbor recognizable structural features consistent with elevated responsiveness to negative situations (distinctive substructures of the amygdala and perhaps even genetic differences such as a "short" allele of the dopamine receptor gene DRD4). Consistent with this line of thinking, Schaller and Neuberg observe that "some people seem to go through life more cognizant of threats" (quoted in Culotta 2012; see also Schaller & Neuberg 2008) before going on to suggest that these variations in general threat awareness likely correlate with political orientations.

Documented differences in response patterns extend beyond overtly threatening situations and into those that are more broadly negative. Environmental stimuli that are unexpected, ambiguous, uncertain, or disorderly also appear to generate more response and attention from conservatives than liberals at a variety of levels, including brain activation patterns, sympathetic nervous system response, cognitive behaviors, and self-reports. In many respects, compared with liberals, conservatives tend to be more psychologically and physiologically sensitive to environmental stimuli generally but in particular to stimuli that are negatively valenced, whether threatening or merely unexpected and unstructured. The consistency of these patterns across diverse research designs with diverse samples in different countries is difficult to miss. In fact, we know of no published study pointing in the opposite direction (i.e., that liberals respond more to negative stimuli or are more bothered by ambiguous or unexpected stimuli).

What could explain this connection? It is not surprising that those attuned to the negative in life might take steps to avoid it, perhaps by refraining from taking chances with the unknown, by following instructions, and by sticking to the tried and true. As an illustration, an adult subject in one of psychologist Jerome Kagan's longitudinal studies who was classified as "highly reactive" to novel, unfamiliar stimuli as a result of behavioral patterns detected when she was just four months old, summed up her approach to life by saying "I don't stray from the rules too much" (quoted in Henig 2009). This is exactly the pattern we see in the personality data: Conservatives are less open to new experiences and are more conscientious. As a result, conservatives are less likely both to solicit new, potentially harmful information and to retain positive information concerning an object or perhaps a person or group (Castelli & Carraro 2011; Shook & Fazio 2009). Consequently, not only do political positions favoring defense spending, roadblocks to immigration, and harsh treatment of criminals seem naturally to mesh with heightened response to threatening stimuli but those

fostering conforming unity (school children reciting the pledge of allegiance), traditional lifestyles (opposition to gay marriage), enforced personal responsibility (opposition to welfare programs and government provided healthcare), longstanding sources of authority (Biblical inerrancy; literal, unchanging interpretations of the Constitution), and clarity and closure (abstinence-only sex education; signed pledges to never raise taxes; aversion to compromise) do, as well. Heightened response to the general category of negative stimuli fits comfortably with a great many of the typical tenets of political conservatism.

People who are highly responsive to negative sensory input may adopt a prevention focus by diminishing the possibility of negative events occurring or at least by mitigating the consequences of those events. The likelihood of negative encounters can be minimized through personal choices (e.g., not venturing into dangerous neighborhoods after dark) but, in modern democratic societies, also indirectly by political choices (e.g., advocating policies that are tough on criminals). Thus, it is reasonable to hypothesize that individuals who are physiologically and psychologically responsive to negative stimuli will tend to endorse public policies that minimize tangible threats by giving prominence to past, traditional solutions, by limiting human discretion (or endorsing institutions, such as the free market, that do not require generosity, discretion, and altruism), by being protective, by promoting in-groups relative to out-groups, and by embracing strong, unifying policies and authority figures (for an excellent discussion, focusing on promotion/prevention differences, see Janoff-Bulman 2009). Such policies generally are associated with conservatism or the political right. On the other hand, individuals who appear to devote fewer psychological and physiological resources to negative encounters may not be as committed to avoiding them and thus may be more willing to condone new lifestyles, reductions in defense and police spending, assistance to out-groups, rehabilitation of criminals, and challenges to traditional authority, positions typically associated with the left (or with liberals as the phrase is used in the U.S.).

In sum, we posit that, due in all likelihood to a combination of genetic, early developmental, and later environmental factors, people's physiological and deep psychological responses to negative life situations vary widely. These variations, in turn, encourage but certainly do not mandate particular social tendencies and, more to the point of this article, particular political beliefs. Both degree of negativity bias and political dispositions obviously can change over the course of a lifetime but both change rather grudgingly and stability is more common than wild fluctuation. Although the theory that variations in negativity bias shape political beliefs has much to recommend it, many valid objections can be raised and we now address several of them.

6.1. Causal order

Do physiological and broad psychological traits shape political dispositions, or might political dispositions actually shape physiological and broad psychological traits? Our theory holds that political preferences are a natural spinoff of physiology and psychology but virtually all of the empirical studies summarized above are correlational and hence incapable of ruling out the possibility that immersion in a particular political climate might be powerful enough to lead to subsequent adjustments in those broader physiological and psychological traits. In theory at least, the role of parents and the general environment in, for example, encouraging or discouraging favorable perceptions of people in other countries and of alternative lifestyles could help to mold or to modify broader personality traits such as openness to new experiences and patterns of cognitive attention and physiological responsiveness to the novel, threatening, and unexpected. Political scientists, perhaps not surprisingly, tend to place politics at the center of social life and are not as likely as psychologists to see politics as emerging from pre-existing broader psychological tendencies. For example, Philip Converse's account of ideology is the most influential of the last half century and defines ideology narrowly, as an understanding of the particular labels that are popular at a given time and location and as a set of beliefs that is consistent with elite-defined, ephemeral, culturally idiosyncratic packages (Converse 1964).

Teasing out the actual causal order requires either longitudinal or experimental data. Though studies containing such data are not numerous, they do exist and all of them provide evidence that politics results from rather than causes physiological and psychological traits such as negativity biases. Longitudinal data are especially difficult to come by but two studies connect early personality tendencies to later political beliefs. Both Block and Block (2006) and Fraley et al. (2012) correlate participant observation of play and other behavior at approximately age 4 with political orientations in early adulthood. Both works conclude that childhood temperament is clearly related to adult political beliefs. For example, the Fraley et al. (2012) study asked mothers of (then) 4-year-old children to report the extent to which their child was afraid of the dark or was upset by sad movies and found, exactly as our theory on negativity biases would predict, that a factor composed of these items was strongly and positively correlated with conservative political beliefs twenty years on. Children who eventually became liberals were more likely, on the other hand to score high on "activity and restlessness."

In addition to findings that infants with stronger negativity biases are more likely to grow up to become political conservatives, a growing experimental literature suggests that manipulating the negative features of an environment can alter political orientations. Evidence indicates that mortality prompts induce greater conservatism (Bonanno & Jost 2006; but see Castano et al. 2011), as do disgusting situations and stimuli (Inbar et al. 2009b; 2012b). Negative outside-the-laboratory events such as the terrorist attacks of September 11, 2001, have also been found to make people more conservative on several issues (Echebarria-Echabe & Fernandez-Guede 2006; Huddy & Feldman 2011; Huddy et al. 2007; Nail & McGregor 2009). Whether manipulated in the lab or the real world, these adjustments in degree of negativity precede changes in political belief and are thus consistent with our theory. Finally, evidence also suggests a positive correlation between parasite load (and perhaps perceptions of parasite load) and conservative religious and social beliefs (Fincher & Thornhill 2012). It seems unlikely that beliefs could cause changes in parasite load so this is further evidence that the causal order is likely one in which beliefs are shaped by psychology and physiology rather than the other way around. On the basis of

these longitudinal and experimental results, as well as common sense, we agree with Inbar et al. that "it seems unlikely political attitudes would shift a person's general emotional dispositions" (2009a).

6.2. Political orientations are too messy

Many scholars and in particular many political scientists assert that political issues and stances are so culturally elaborated that it is "incoherent" to expect a universal left-right or liberal-conservative dimension to appear (Charney 2008). Yet as noted in the introduction, although names, labels, and issues may change disputes surrounding tradition and innovation, as well as progressivism and stability, in-groups and out-groups have always surfaced wherever politics are discussed openly. If the level of analysis shifts from issues-of-the-day, such as whether or not to invade Iraq and whether or not to build a wall along the border with Mexico, to bedrock principles of politics, such as the appropriate orientation of a given group with other groups, commonalities across cultures and centuries immediately become visible.

This is not to say any single explanatory factor, such as difference in negativity bias, is capable of accounting for variation in all political issues. In fact, one of the most exciting aspects of research in this area is its potential to identify those political predispositions that are closer to the core and those that are peripheral. The dimensionality of political beliefs is a matter of some debate with the evidence showing that being liberal or conservative on certain issues does not automatically translate into being liberal or conservative on others. More specifically, conservative positions on economic issues can be held without holding conservative positions on social issues, and separate dimensions of political orientation also have been observed for racial issues and even for "toughness" issues (examples of work on political dimensionality include Carmines & Stimson 1990; Carsay & Layman 2002; Feldman 2003; Jacoby 2009; Lewis-Beck et al. 2008; Weisberg 1974). Sometimes even ideological subdimensions are not enough in that a person's views on a given economic issue might be inconsistent with that same person's views on other economic issues.

One claim is that deeper psychological and biological characteristics are less relevant to economic issues such as free market principles, tax codes, and the size of government than they are to social issues such as matters of reproduction, relations with out-groups, suitable punishment for in-group miscreants, and traditional/innovative lifestyles (Weaver 1992, p. 5; though see Gerber et al. 2010; Petersen 2009; Young 2009). As long as researchers assess political orientation by asking respondents about their bedrock principles and core issue positions rather than simply asking them to self-report their ideology (are you a liberal or a conservative) it is possible to push forward on these matters by correlating, for example, degree of negativity bias with first social and then economic issues. For example, Iyer et al. (2012) assert that libertarian beliefs, a label indicating liberal positions on social issues (limited government interference) and conservative positions on economic issues (limited government interference), exist because of an additional moral foundation based on liberty and it may not be likely that such a dimension springs directly from variations in negativity bias. Regardless, those predisposed toward both liberty and security might find it necessary to make difficult decisions on issues, such as the USA Patriot Act, that deal with trade-offs between civil liberties and national defense.

A related set of issues surrounds the many individuals who are near the middle of the ideological spectrum (Fiorina 2005). Are they also in the middle in terms of degree of negativity bias, neither as high as conservatives nor as low as liberals? Because most of the analyses reported rely on correlations of reasonably continuous variables (location on the ideological spectrum and degree of negativity bias) rather than analysis of variance techniques (ANOVAs) of discrete groups, this is likely the case but future research should pay more attention to possible nonlinearity in these relationships. In a similar vein, much more needs to be known about those individuals who tend to avoid politics. It is likely they have a physiological and psychological profile distinct from liberals, conservatives, and moderates. The larger point is that modern polities deal with an amazing array of issues and categories and it is foolhardy to expect a single trait such as negativity bias to account for all political variations.

One complicating aspect of current research arises from the fact that response to negative stimuli (like political dispositions) can be operationalized narrowly or broadly. Negative situations could be divided into disgust, threat, disorder, or the unexpected and even further parsing is possible. Disgust, for example, has not only been subdivided into core, contamination, and animal reminder (Haidt et al. 1994), but also into disgust relating specifically to microbes, to mating, or to morality (Tybur et al. 2009). Thus, sometimes response to a relatively narrow stimulus type (e.g., a particular category of disgust) is tested for a correlation with broad political orientations (e.g., global liberalism or conservatism) and sometimes with positions on an individual issue (e.g., opposition to redistributive taxes); likewise, response to a broad stimulus type (e.g., all negative stimuli) is sometimes correlated with broad political orientations and sometimes with a highly specific issue stance. Is sensitivity to disgust pertinent only to attitudes regarding homosexuality, to attitudes on all sexually related issues (e.g., support for abstinence-only sex education, opposition to pornography, and opposition to abortion rights), or to conservatism more generally? Empirical evidence can be found for all of these conclusions. Different subcategories of negative stimuli appear to connect to certain political issues more than others.

Another approach to learning more about the nature of the relationship between elevated negativity bias and political conservatism is to note the instances in which it may not apply. Several examples come to mind. Conservatives are eager for protection from out-groups, criminals, and pathogens but less concerned with accidental shootings, environmental degradation, and poverty. Liberals' positions are just the opposite. If conservatives are universally more averse to negativity, it would seem that heightened response and attention to the negative should lead to equal amounts of concern over a leveled rainforest and a hostile out-group. We see this apparent incongruity as a valuable opportunity to refine understanding of the overall pattern. For example, it may be the case that conservatives are particularly attuned to threats by an identifiable, malevolent, volitional force such as a bad guy with a gun. Or, perhaps attitudes toward longer term and arguably

more amorphous threats such as climate change, pollution, and income inequality are not as connected to negativity biases. This explanation would be consistent with conservatives' more concrete approach to life but is as yet empirically unverified.

6.3. Ultimate causes?

Of course, when we move the explanatory locus back a step from survey self-reports to deeper physiological and psychological forces, the issue immediately becomes the source of variations in these physiological and psychological traits. In other words, if negativity bias leads to the adoption of certain personality traits, basic values, moral foundations, and bedrock political principles, what causes variation in negativity bias in the first place? Obviously, answers to this question are even more speculative. Evolutionary psychologists actively debate the reasons for variation in personality traits (and presumably the same arguments would apply to political dispositions). Some (Figueredo et al. 2009; Nettle 2006) say variations are adaptive in a niche or group selection sense; some (Tooby & Cosmides 1992) say that behavioral morphs that shape complex variables such as personality traits and political orientations are impossible in sexually reproducing species; and some (Cochran & Harpending 2009; Thornhill et al. 2009) say that variations are the result of long-term differences in the relevant environment (Buss & Greiling 1999).

One possibility is that a strong negativity bias was extremely useful in the Pleistocene. Compared with the modern era, existence then was much more likely to be terminated prematurely at the hands of other human beings or by accidents involving wild animals or natural disasters (Pinker 2011). Threats were palpable and medical treatment for pathogens and injuries was ineffective. In such an environment, a heightened negativity bias would be advantageous. In modern life, on the other hand, threats are less immediate and the selection pressures for elevated negativity biases have likely been reduced, opening the door for substantial genetic variation at relevant loci.

If strong negativity biases were once selected for but now are not, it could explain why results often indicate that conservatism is in some senses better defined than liberalism. Conservatives have a negativity bias, whereas liberals do not have a positivity bias and may or may not have a negativity bias. Conservatives sometimes take umbrage at this situation, arguing that it is the result of liberal academics viewing conservatism as an aberration that needs to be explained (Will 2003). In truth, its status as a tighter, more discussed phenotype may be a result of the fact that, in contrast to proto-liberalism, proto-conservatism was once selected for.

Jencks (1980) points out that relatively modest initial genetic differences across people in reading ability can easily be magnified by environmental experiences. Children proficient in reading are more likely to receive encouragement and additional opportunities to read and further hone their skills. It is likely that similar, relatively modest differences in negativity bias and associated social proclivities could be exacerbated by the environment. Individuals with slight tendencies toward caution and tradition might gravitate to those with similar tendencies, and therefore receive reinforcement for their predispositions.

A somewhat different theory that relies on group selection has been floated on occasion. It holds that societies benefit from having a mixture of those with high negativity biases and those with more modest negativity biases, of those open to out-groups and of those who are more guarded (Alford et al. 2005; Nettle 2006). Weaver (1992, p. 12) notes the dangers of a society composed entirely of what he calls "ethnocentric hawks" and "empathic doves." Given that, except for the occasional brief (and partial) experiences such as fifth century B.C. Athens, mass-scale democracies are limited to the last couple of hundred years and even at that are still unknown in many parts of the world today (including highly populous countries such as China), the advantages of phenotypic mixtures would have to occur among the small-scale hunter-gatherer type societies that typified human existence for so long. Just as groups of spiders benefit from having a mix of social and asocial members (Pruitt & Riechert 2011) and virtually all species benefit from having individuals with different immune systems, the argument is that human groups benefit from having members who are differentially responsive and attentive to negative stimuli. If this were true, the polarization that afflicts many modern democracies may be a vestige of the mixes of the behaviorally relevant, biological predispositions that worked well in small-scale societies.

7. Conclusion: Politics and controversy

The extent to which politics evokes controversy is puzzling. Jost and Amodio ask the pertinent question: "How is it that individuals and groups can be so strongly inspired by an abstract configuration of ideas that they are willing to sacrifice even their own lives?" (2012). Along with religion (another abstract configuration of ideas capable of affecting the lives of others), politics is the topic most able to produce conflict at family reunions and on the battlefield. People do not typically come to blows over whether it is better to be an introvert or an extravert, presumably because introverts do not have to worry that they will need to change their behavior as a result of the existence of extraverts. Politics, however, is unavoidably intrusive. The mere presence of liberals [conservatives] creates a very real possibility that conservatives [liberals] in the same polity will not be able to structure society in the fashion they most desire. This potential imposition of values is likely one reason politics is so emotional and explosive (Brader 2006; Marcus et al. 2000; Redlawsk 2006; Sullivan & Masters 1988; Valentino et al. 2008).

The controversial nature of politics makes research on the differences between liberals and conservatives particularly sensitive. People are quick to be defensive and to suspect that their particular ideological beliefs are being defamed. As a result, it is appropriate to note in closing that citing differences in the psychological and physiological traits of liberals and conservatives is not equivalent to declaring one ideology superior to the other. Mounting empirical evidence suggests that, compared to liberals, conservatives are more responsive and attuned to negative stimuli, patterns consistent with their tendency to advocate political solutions designed to protect against threats and disorder – real or perceived. Liberals appear not to notice, respond to, or attend to negative stimuli to the

same degree, a pattern consistent with their willingness to advocate political solutions that could lead society to experience new approaches to life and governing but that could also leave society more vulnerable to threats and disorder. The relative advantages of one ideology compared to the other depend upon the circumstances. If a foreign policy threat turns out to be real, the conservative response will be extremely valuable; if it is not real, the liberal approach will be better positioned to cash in on opportunities the conservative response would miss.

Moreover, being more attuned to the dangers of the world does not make for pessimistic, fearful individuals and being less attuned to dangers does not make for carefree, hedonistic individuals. In fact, conservatives are consistently found to score higher than liberals on subjective well-being, even after controlling for socioeconomic status (Vigil 2010). Apparently, being responsive and attentive to negative aspects of the environment does not lead to depressive personalities. In fact, it may be that limiting the consequences of threats is a more manageable and defined goal than is pursuing novel experiences. Along these lines, it is well to remember that responding and attending to negative events is not the same thing as living in fear of them (see Aron 1996). Turning to liberals, the desire for stimulation, self-expression and new experiences does not necessarily make for self-absorbed individuals. Liberals consistently score higher than conservatives on empathy scales (Hirsh et al. 2010). From an evolutionary perspective, insufficient attention and response to negative situations is clearly a problem but it is also the case that unrelenting vigilance and heightened physiological response also become problems at some point.

Finally, just as the tendency to read value judgments into the findings summarized here should be resisted, so should the tendency to conclude the results are stronger than they are. The connection of conservative political orientations and heightened orientation to negative stimuli is surprisingly consistent across designs, studies, and countries but it is also consistently modest in effect size. Many political conservatives are not particularly responsive to negative stimuli and many political liberals are. The reported effects, however, persist even when more traditional explanatory variables, such as standard sociodemographics, are included in the models. Moreover, to provide perspective, the effects of variation in negativity bias and related concepts, though modest, typically are at least as large as many of these standard variables.

A recurring feature of human history seems to be, as Atran puts it, people going "to war without understanding the transcendent drives and dreams of adversaries who see a very different world" (2012). Empirical evidence is increasingly documenting the psychological and physiological differences across people that can lead them to perceive the world so differently. One person focuses on threats but when facing that same situation another person focuses on opportunities. It is not surprising that these different visions of reality lead to fundamentally different sets of political preferences. By documenting that political differences are not necessarily traceable to misinformation or ignorance on the part of one side or the other, scientific understanding of the broader and deeper bases of political diversity may make it possible for Emerson's forces of tradition and innovation to live together, if not more profitably, at least less violently.

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Open Peer Commentary

Liberals and conservatives can show similarities in negativity bias

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Abstract: Negativity bias may underlie the development of political ideologies, but liberals and conservatives are likely to respond to threats similarly. We review evidence from research on intolerance, motivated reasoning, and basic psychological threats that suggest liberals and conservatives are more similar than different when confronting threatening groups, situations, and information.

A negativity bias among conservatives offers a parsimonious account of the many social, political, and psychological differences between liberals and conservatives that Hibbing et al. discuss in the target article; but parsimony can oversimplify nuanced phenomena. There is evidence that a negativity bias may underlie the *development* of a liberal or conservative worldview (sect. 6, para. 10–12; see, e.g., Duckitt & Fisher 2003; Fraley et al. 2012; but see Verhulst et al. 2012); however, we suggest that both liberals and conservatives react to psychological threats in similar ways.

People need strategies to deal with negative and threatening situations, and both conservatives and liberals likely use similar, evolved strategies (Mercier & Sperber 2011; Proulx et al. 2012; Tetlock 2003). Although a negativity bias may, in part, orient people toward a conservative or liberal worldview and determine whether or not certain stimuli are considered threatening, we suggest that reactions to threats follow a comparable trajectory regardless of ideological orientation. Both liberals and conservatives will dig in their heels to defend their ideological values and beliefs. We will review research from three domains supporting the thesis that, when it comes to responding to negative and ideologically threatening information, liberals and conservatives are more alike than different.

Until recently, researchers and theorists have suggested that conservatives are more likely to be intolerant and prejudiced toward deviant and threatening groups (e.g., Cunningham et al. 2004). This association, however, is largely the product of the groups that researchers typically use as targets – namely, groups that threaten conservative values. When the type of target group includes groups that oppose, violate, or threaten the beliefs and values of liberals, liberals will likewise display prejudice and intolerance toward those groups (Chambers et al. 2013; Crawford & Pilanski, in press; Wetherell et al. 2013; see also Morgan et al. 2010).

For example, liberals were equally willing to discriminate against groups that threaten their values (e.g., anti-abortion

advocates, religious fundamentalists) as conservatives were to discriminate against groups who threaten their values (e.g., pro-choice advocates, atheists; Wetherel et al. 2013). That result has been replicated across different research labs, participant samples, target groups, and measures of intolerance. Once cherished beliefs are threatened, people across the ideological spectrum fight back.

Partisans also similarly defend their ideologies from information that conflicts with their political point of view. The *negativity bias* hypothesis suggests that conservatives react to threats with greater negativity and motivated information processing than their liberal counterparts. However, for several decades research has shown that liberals and conservatives both show evidence of motivated information processing when confronted with information that contradicts their point of view. For example, both supporters and opponents of the death penalty disparaged research that purportedly contradicted their opinions about the death penalty (Lord et al. 1979). That effect has recently been expanded to show biased processing of objectionable political information related to a variety of issues and multiple measures of political ideology (e.g., Crawford 2012; Taber & Lodge 2006). Some studies even show greater motivated reasoning among liberals and people who are relatively left-wing politically (Crawford et al. 2013). In sum, research on motivated reasoning suggests that when confronted with information contrary to their perspective, liberals and conservatives are both adept at avoiding ideologically threatening conclusions, and maintaining the integrity of their beliefs.

Finally, other work has tested how people at both ends of the political spectrum react to more basic threats (e.g., death, lack of control). The *negativity bias* hypothesis suggests general threats in the environment will make people adopt conservative political positions (see sect. 2, para. 2 and sect. 6, para. 12 of the target article); however, threat-compensation perspectives (e.g., Proulx et al. 2012) suggest that people will react to threats by affirming their ideological in-group and core ideological values (i.e., liberals affirming liberal values and vice versa). Studies with complete tests of those two competing hypotheses find that both liberals and conservative respond to threats and violated expectations by clinging to their cherished values (e.g., Castano et al. 2011; Greenberg et al. 1992; Kosloff et al. 2010). Proulx and Major (2013), for example, find that people low on a measure of the Protestant Work Ethic exposed to stimuli that violated their expectations more vigorously, endorse affirmative action policies, whereas people high on the same measure revealed the opposite pattern. Similar results have been obtained with other types of threats. For example, people primed with a lack of control expressed support for their political party (Fritsche et al. 2008) and threats to freedom and self-sufficiency increased support for meritocracy when meritocratic values were salient and increased support for equality when egalitarian values were salient (Zhu et al. 2013). Together, these results suggest that liberals and conservatives both respond to basic psychological threats with the affirmation of important and salient values.

The above findings offer an important theoretical layer to the *negativity bias* hypothesis. We agree that liberals and conservatives do differ on a number of dimensions that can be parsimoniously described as a negativity bias (e.g., Brandt & Reyna 2010; Jost et al. 2003); however, a careful review of the extant research leads to the conclusion that, although a negativity bias may be an underlying cause in the development of political ideologies, it is not manifest in reactions to threatening groups, threatening information, or fundamental psychological and epistemic threats. Instead, when it comes to dealing with negativity and threats, people across the political divide react similarly by defending their attitudes, values, and worldviews with intolerance toward people with differing beliefs, biased processing of attitude-inconsistent information, and the affirmation of core values.

Recent years have seen the rapid accumulation of data on the psychology of political ideology. The field needs a broad, integrative theory to help us connect the multitude of data points related to the foundations of ideology into fundamental patterns. Looking forward, any complete theory of political ideology, its precursors and consequences, needs to account for both the similarities and differences of seemingly divergent political orientations.

Emotional attachment security as the origin of liberal-conservative differences in vigilance to negative features of the environment

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Abstract: This commentary advances the hypothesis that differences between liberal and conservative orientations noted in the target article are emotional in nature and caused by differences in attachment security: Conservatives are more vigilant to negative features of the environment because of a general sense of insecurity, whereas liberals are relatively more secure.

In the target article, Hibbing et al. suggest that the multifarious, varied, and diverse differences between liberal and conservative socio-political ideologies can be traced to one organizing element: that, relative to liberals, conservatives register greater physiological responses and devote more psychological resources to features of the environment that are negative. This conception allows them to integrate findings from an impressively wide range of research domains. Although agreeing that this hypothesis is correct and substantiated by a great deal of evidence summarized thoroughly and comprehensively in the target article, I suggest that this phenomenon is secondary to an even more fundamental organizing element that is emotional in nature: that *liberal socio-political ideology emerges from secure attachment*, whereas *conservative ideology reflects insecure attachment*. Secure and insecure attachment in this example can be either a trait, as in general attachment orientation; or a state, as in attachment security in a given situation or with a given individual. This hypothesis allows the already comprehensive and widely applicable viewpoint of the target article to be applied to an even broader range of research and theory.

Where political views are concerned, some of the most relevant negative features of the environment are other people, and there is evidence that the responses of liberals and conservatives to other persons is quite different. As noted in the target article, the liberal-conservative contrast has long been noted in political theory. Bertrand Russell (1945) suggested that the basic foundations of modern conservatism and liberalism relate to the conceptions of the social contract used in Europe to support theories of political legitimacy in the seventeenth and eighteenth centuries, as the theory of the divine right of kings was increasingly questioned. These conceptions were based largely on the nature of life in the "state of nature" prior to the social contract. In *Leviathan*, Thomas Hobbes (1588–1679) argued that all are motivated by instincts for self-preservation to dominate others while maintaining their own freedom (Hobbes 1651/1982). The resulting universal war of all against all made life in the state of nature "nasty, brutish, and short," and the social contract was established as a universal peace treaty to end this conflict. In contrast, John Locke (1632–1704) suggested that people in the state of nature lived together peacefully without leaders according to reason and natural law (Locke 1689/1980). Conservatives have historically taken the more pessimistic, Hobbesian view of

human nature as essentially selfish, requiring constraints by authority and tradition; whereas liberals tend to have an optimistic view of human perfectibility, preferring the greatest possible freedom of the individual.

This difference in the tendency to regard other persons as negative has implications for social emotions, particularly when the other is in a less powerful position relative to the responder. Among other things, the relatively greater security of liberals prompts them to regard the less fortunate with pity, whereas more anxiously attached conservatives tend to regard them with scorn. This is consistent with the analysis of Haidt (2003), who described "other condemning" social/moral emotions – anger, disgust, and contempt – and a conservative "disgust-based moral order," which condemns people for what they are more than what they do, and tends to ostracize and excludes members of out-groups (based upon ethnicity, religion, social class, sexual orientation, etc.). The attachment-security argument also suggests a developmental origin of the liberal-conservative difference, consistent with Lakoff's (2002) suggestion that liberal thought centers around the Nurturing Parent model of the family as opposed to Strict Father model of morality underlying conservative thought.

The attachment-security argument also has specific implications regarding the likely effects of social threat and consequent widespread insecurity on liberal versus conservative tendencies in society. Specifically, there is evidence that social threats such as economic insecurity are associated with increases in conservative tendencies in society, whereas times of security tend to encourage liberal orientations. It is noteworthy that in the Adorno et al. (1950) *Authoritarian Personality* work that produced the F (Fascism) scale, political–economic conservatism (PEC) was explicitly considered an ideology related to prejudice, along with ethnocentrism (E) and Anti-Semitism (AS). This work held that prejudice is based upon parents' status anxiety leading to harsh child discipline, consequent repression of aggressive and sexual feelings on the part of the child, and displacement of aggression toward weaker groups that was rationalized by projecting one's unacceptable sexual and aggressive impulses on those groups. That psychoanalytically based view of prejudice was questioned by those who noted that prejudice varied regionally according to local norms, rather than by personality (e.g., Pettigrew 1961); and that experimentally-induced failure increases both F scale scores and tendencies to reject out-groups (e.g., Sales & Friend 1973). Sales (1972; 1973) presented evidence that instances of social threat (e.g., economic upheavals) have historically been associated with increases in attendance at authoritarian churches and other evidence of authoritarianism (e.g., power-oriented comic book characters, loyalty oaths, suppression of erotica).

More recent studies have supported and extended this evidence. For example, Doty et al. (1991) distinguished "dispositional authoritarians," intrinsically inclined to accept and encourage authoritarian organizations and activities; and "situational authoritarians," who adopt or reject authoritarian behaviors according to the "climate of threat" (p. 639). That view is also consistent with classic analyses of social movements made by sociologists and political scientists, including Brinton (1938), Hoffer (1951), Kornhauser (1959), and Lipset (1960), who claimed that revolutionary social movements are based upon complex problems that threaten security and that a group cannot deal with. The complex problems go unrecognized, and the group in question instead focuses on pseudoproblems that are concrete, simple, and easy to deal with. The discontented group may feel that their irritation is caused by minority groups, particularly when a history of conflict is present (Allport 1954).

The view that liberalism and conservatism differ in attachment security is consistent both with the classic literature and the new research summarized in the target article. It can allow theory and research on political orientation to be connected with the burgeoning research literature on attachment, with potentially beneficial implications for both areas of study.

The negativity bias: Conceptualization, quantification, and individual differences

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Abstract: There is an extensive literature on the negativity bias, including its conceptualization, measurement, temporal stability (individual differences), and neural and genetic associations. Hibbing et al. posit that the difference across individuals in the negativity bias is a key factor in determining political predisposition. The measures and paradigms developed in this literature provide a means of testing this hypothesis.

Differentiating hostile from hospitable stimuli is ubiquitous in animals. The evaluative space model (ESM; Cacioppo & Berntson 1994; Cacioppo et al. 1999; 2012) is a theory of the functional structure and operating characteristics of these evaluative processes across levels of the neuraxis, ranging from spinal cord reflexes to the executive functions of the frontal lobes (e.g., impulse control). According to the ESM, physical constraints limit behavioral expressions and incline behavioral predispositions toward a bipolar organization, but this bipolar organization is posited to be the consequence of multiple operations, including motivational activation function for positivity (appetition) and the activation function for negativity (aversion). The partial segregation of positive and negative evaluative processes permits greater flexibility in the mode of these evaluative processes (e.g., reciprocal activation, coactivation/coinhibition). The result is a much more flexible and adaptable affect system of evaluative processes than would be provided were evaluative processes characterized simply as a bipolar (positive–negative) activation function.

The ESM further posits that the partial segregation of the positive and negative evaluative channels in the affect system afforded evolution the opportunity to sculpt distinctive activation functions for positivity and negativity, such that the intercept for the positive activation function (i.e., the approach motivation at zero input) is higher than the intercept for the negative activation function (producing the *positivity offset*), and the gain for the negative activation function is higher than for the positivity activation function (producing the *negativity bias*). The consequence of the positivity offset is that the motivation to approach is stronger than the motivation to withdraw at very low levels of evaluative activation (thereby motivating exploratory behavior), whereas the consequence of the negativity bias is that the motivation to withdraw is stronger than the motivation to approach at high levels of evaluative activation. We focus primarily on the negativity bias.

The theoretical rationale for the negativity bias is that it is more difficult to overcome a fatal (or a near-fatal) assault than to return to an opportunity unpursued, so it is more adaptive to err on the side of caution as threats get nearer. Human taste buds respond to sweet, salty, sour, and bitter stimuli. Most can detect sweetness in approximately one part in 200, saltiness in one part in 400, sourness in one in 130,000, and bitterness in one in 2,000,000. From the perspective of the affect system, a given amount of a negative or threat-related gustatory stimulus (e.g., most poisons taste bitter) activates a stronger affective response than the same amount of a positive (e.g., sweet) gustatory stimulus. This may be more than an epicurean curiosity; it may represent differences in the activation functions for positive and negative affective

processing (see reviews by Baumeister et al. 2001; Cacioppo & Gardner 1999; Cacioppo et al. 1997; Larsen & McGraw 2011). Moreover, the combination of spatial and affective information is essential for many approach and avoidance behaviors, and thus for survival. As predicted by the ESM, Crawford and Cacioppo (2002) found that the incidental learning of the likely spatial location of affective stimuli is greater for negative than positive stimuli.

Given individual variation is the engine of natural selection, the ESM predicts that there are measurable individual differences in the positivity offset and negativity bias. The underlying structure and operation of the affect system is generally outside people's awareness, and these dispositional tendencies are similarly conceived as generally lying outside awareness, but like the affect system itself these dispositional tendencies should be measurable through people's judgments of and responses to affective stimuli. Indeed, temporally stable and predictive individual differences in the positivity offset and the negativity bias have been identified (Ito & Cacioppo 2005; Norris et al. 2011).

Participants in Norris et al. were exposed to three different sets of stimuli (pictures, sounds, and words), and during each set they were exposed to 66 stimuli, 6 of which were neutral and low in arousal, and 30 each of which vary in their extremity of pleasant or unpleasant and arousal but which were matched on these two dimensions. Ratings of each are made using the affect matrix – a 5 (positivity: zero to maximum) by 5 (negativity: zero to maximum) matrix on which participants rate each stimulus (Larsen et al. 2009). The positivity offset was indexed by the difference between the positivity and negativity ratings of the six neutral stimuli, and the negativity bias was gauged as the difference in the rating of the six most extreme unpleasant stimuli minus the rating of the six most extreme (and initially matched on extremity and arousal) pleasant stimuli. Results revealed that individual differences in the positivity offset and negativity bias were uncorrelated, temporally stable, and generalizable across ratings of pictures, sounds, and words. Furthermore, individual differences in the positivity offset predicted the spatial learning for positive stimuli, whereas individual differences in the negativity bias predicted the spatial learning for negative stimuli (Norris et al. 2011). Early electrical neuroimaging research indicated that the negativity bias is associated with a larger late positive potential (Ito & Cacioppo 2000; Ito et al. 1998; Smith et al. 2006), and recent work suggests that the positivity offset and negativity bias are associated differently to two serotonin receptor genes (Ashare et al. 2013). In sum, although most individuals exhibit both a positivity offset and a negativity bias, this is not true for all individuals, and stable individual differences in the positivity offset and negativity bias exist and predict what is learned about the world.

Hibbing et al. posit that individual differences in the negativity bias underlie the difference between liberals and conservatives. However, they treated any evidence that negative stimuli elicit more attention, consideration, or weight than positive stimuli as bearing on evidence for a negativity bias. This conceptualization of the negativity bias conflates the various underlying mechanisms that can produce such a result and provides little guidance for quantifying this bias. The definition and psychometrics of the negativity bias provided by the ESM may provide a means of testing the Hibbing et al. hypothesis.

Conservatives, liberals, and "the negative"

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Abstract: The authors connect conservatism with aversion to negativity via the tendentious use of the language of threats to characterize conservatism, but not liberalism. Their reliance upon an objective conception of the negative ignores the fact that much of the disagreement between liberals and conservatives is over whether or not one and the same state of affairs is negative or positive.

One would anticipate that an attempt to identify the cause of the *political* differences between liberals and conservatives would carefully elaborate what those political differences are. The authors' characterization, however, is devoid of specific political content: Conservatives are "supporters of tradition and stability"; liberals are "supporters of innovation and reform," a distinction that represents the two "ubiquitous" (abstract), "primal mindsets" that "pervade human history" (sect. 1, para. 1). Perhaps, but what do these two mindsets have to do with liberalism and conservatism?

According to the authors' characterization, the following are conservatives: Andre Siegfried (1939), who defended the French Democratic Tradition by arguing that "for a hundred and fifty years the Revolution has served a basic line of demarcation in the domestic politics of France," and that its principles had to be "defended from a new enemy [i.e., Fascism] along a new battle front"; members of the Chinese Communist Party who in the name of the Communist tradition and stability opposed market reforms as dangerous innovations (Deng 2012); those who criticized the use of "enhanced interrogation" (referred to by critics as torture) during the Bush administration's "War on Terror" as based upon a "truly innovative and quite radical view" (Lederman 2007) that "undermin[ed] the moral values and legal traditions on which America was founded" (McTigue & Merman 2006); and the following are liberals: defenders of Vichy France; Chinese communists who advocated market reforms (but not basic rights); advocates of the use of enhanced interrogation.

Inasmuch as there are liberal traditions (e.g., Hartz 1955), the stability of which liberals are concerned to defend, a concern with tradition and stability cannot be the defining attribute of political conservatives. Precisely how liberalism and conservatism should be defined is a vexed question, but the content of the article leaves no doubt as to what the authors intend by these terms: the political attitudes of 21st century American liberals and conservatives. As such, although we can look for historical antecedents of contemporary American liberalism and conservatism, they can no longer be mischaracterized as two ubiquitous, primal mindsets associated with an ancient and universal *political* division. The authors might object that I define political ideology too narrowly, but it is hard to see how a characterization that cannot differentiate political liberals and conservatives could tell us anything useful about the causes of their differing political views. In fact, what the authors characterize are not two political ideologies, but two personality types that could appropriately be termed "stability seekers" v. "innovators."

A fundamental – perhaps *the* fundamental – assumption underlying the authors' theory is that the relationship between negativity bias (NB) and political conservatism is *causal* because conservative policies "seem naturally to mesh with heightened response to threatening stimuli" (sect. 6, para. 7). What is the basis of such a claim? Surely, someone who experienced acute aversion to a particular threat could believe that *liberal* policies were a better guarantor of public safety (or order and stability). For example, liberals do not perceive the threat posed by what the authors describe as a "bad guy with a gun" (sect. 6.2, para. 6) as any less of a threat than conservatives (as the intensity of both sides in recent debates over gun control in the US should make apparent). Rather, (many) liberals think the best way to deal with such a threat is stricter gun control whereas (many) conservatives think it is "a good guy with a gun" (Lapierre 2012). If both liberals and conservatives are equally averse to the threat, then greater or lesser aversion to negativity cannot be the source of their differences. Furthermore, is it the authors' contention that the conservative, but not liberal political response to gun violence seems "naturally to mesh" with an acute aversion to the

nature of the threat? And what does it mean for a political response "naturally to mesh" with the nature of a threat?

Nor can greater or lesser aversion to negativity account for the fact that some threats are perceived *as threats* by liberals but not conservatives, something the authors mention in passing as instances where their theory may not apply:

> If conservatives are universally more averse to negativity, it would seem that heightened response and attention to the negative should lead to equal amounts of concern over a leveled rainforest and a hostile outgroup (sect. 6.2, para. 6)

Some conservatives deny that global warming is a threat not because, as the authors speculate, it is a "longer term and arguably more amorphous" threat (sect. 6.2, para. 6) but because they deny that it exists; others argue that although it exists it is not manmade, or its dangers are overstated or are outweighed by the costs of reducing greenhouse gases.

This points to an omnipresent form of political disagreement: Depending upon their ideology, liberals and conservatives may view one and the same state of affairs as negative *or positive*. Hence (to generalize), the overturning of Roe v. Wade is a negative (threat) for liberals and a positive for conservatives; teaching creationism in the public schools is a negative (threat) for liberals and a positive for conservatives; denial of the right to same-sex marriage is a negative (threat) for liberals and a positive for conservatives. In fact, most conservative policies can be characterized as threats to liberals, just as most liberal policies can be characterized as threats to conservatives, a fact concealed by the authors' tendentious use of the language of threats to characterize conservative, but not liberal positions.

What distinguishes political liberals and conservatives is not that conservative but not liberal political views reflect (or mesh with) a heightened aversion to negativity. Rather, conservatives and liberals disagree both over the best way to deal with an agreed upon negative (e.g., a bad guy with a gun) and over whether *one and the same state of affairs* (e.g., prayer in public schools) is itself negative or positive.

Significantly, the omnipresence of such disputes appears incompatible with the authors' understanding throughout that the negative refers to what *really is* (i.e., objectively) negative: Greater reactivity to the negative means greater reactivity to negative *events*, negative *stimuli*, negative *environments*, and negative *states of affairs*. Hence, their use of the language of *perception*: Perceiving the negative is akin to perceiving the color blue. Although the authors acknowledge that persons can be factually mistaken about the *existence* of an objectively negative state of affairs (just as poor lighting might lead one mistakenly to conclude that a blue object is black), they fail to realize that some of the most contentious debates in political life are over whether the very same things are negative or positive.

Context, engagement, and the (multiple) functions of negativity bias

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Abstract: Hibbing and colleagues argue that political attitudes may be rooted in individual differences in negativity bias. Here, we highlight the complex, *conditional* nature of the relationship between negativity bias and ideology by arguing that the political impact of negativity bias should vary as a function of (1) *issue domain* and (2) *political engagement*.

Hibbing and his colleagues provide an enlightening overview of current research on the psychological foundations of ideology, with a specific focus on how ideology may be rooted in individual differences in negativity bias. Here, we focus on two points underplayed in the target article. First, we highlight the *conditional* nature of the relationship between negativity bias and ideology. Second, we contend that the mechanism by which negativity bias structures preferences is more complex. Although we agree that negativity bias has important consequences for political attitudes, we also suggest that its impact should vary as a function of (1) *issue domain* and (2) *political engagement*, or the degree to which citizens are interested in and informed about politics.

In the domain of social issues (e.g., gay marriage), variables associated with negativity bias should translate into conservatism among both the engaged and unengaged (though the relationship may be stronger among the engaged; Zaller 1992). Such "easy" issues elicit symbolic associations relevant to negativity bias (e.g., threats to traditional values) regardless of political knowledge. However, economic policy is "hard" – technical and unlikely to automatically elicit emotionally laden symbolic associations (Carmines & Stimson 1980). We argue that in the domain of economic issues, engagement should play a key moderating role. Among the engaged, economic preferences should serve a *symbolic function*, expressing partisan and cultural affiliation. Two mechanisms are responsible. First, cues from political-party leaders assign symbolic meaning to party membership and party-endorsed issue positions. For example, in an effort to reshape electoral competition long dominated by the Democratic Party, Republicans embraced a number of affect-laden concerns related to race and ethnicity, crime, and religion, all issues *directly* related to negativity bias (Hetherington & Weiler 2009). Second, elites strategically *frame* economic issues in symbolic terms ("Obamacare is socialism"). These frames convey the abstract meaning of issues in ways relevant to negativity bias (e.g., rapid institutional change). However, since symbol-laden elite signals like cues and frames are more likely to be picked up by the highly engaged (Zaller 1992), it is only among these individuals that negativity bias should influence partisan sorting (Federico & Goren 2009; Federico et al. 2011) and lead to the assimilation of party-approved issue frames.

By contrast, if less attentive citizens are unlikely to notice (and therefore be influenced by) elite cues and frames, their economic preferences are more likely to serve an *instrumental function*. That is, the economic preferences of inattentive citizens should reflect a more personal view of the stakes – that is, the extent to which one desires government protection from the risks associated with free markets. Given this largely instrumental outlook,

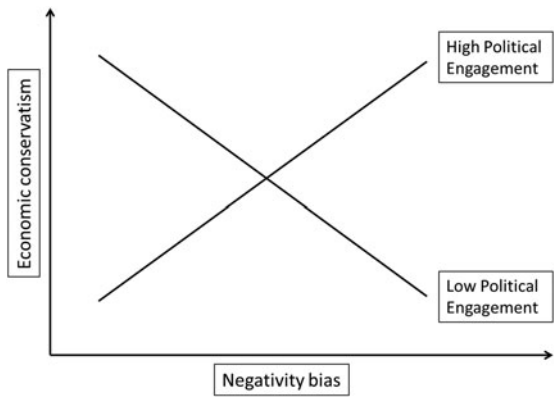


Figure 1 (Federico et al.). Schematic representation of predictions regarding the impact of negativity bias as a function of issue domain and political engagement.

negativity bias should function as dispositional *risk-aversion*, and thus promote *liberal* economic preferences (e.g., Iversen 2005). A schematic representing our predictions is shown in Figure 1.

Consistent with this account, our recent work – based on multiple national surveys – indicates that the impact of variables related to negativity bias is strongly heterogeneous with respect to economic issues, with negativity bias leading to economic *conservatism* among those high in engagement and economic *liberalism* among those low in engagement (Johnston 2011; Johnston et al. 2014). In turn, our model and results allow us to speak to several issues left open by Hibbing and colleagues. In particular, they allow us to address two complications in the literature on the relationship between individual differences and ideology that Hibbing and colleagues highlight. First, the model outlined above speaks to the claim that "deeper psychological and biological characteristics are less relevant to economic issues" (sect. 6.2, para. 3), which Hibbing and colleagues discuss as a current ambiguity in the literature. Our model provides concrete predictions about *when* and *how* variables related to negativity bias will predict economic attitudes: Negativity bias will be associated with economic conservatism among those high in engagement and economic liberalism among those low in engagement, because of the different functions served by these preferences for each group. This asymmetry can explain researchers' failure to find consistent relationships between negativity bias and economic judgments. If negativity bias has *opposite* effects on economic preferences as a function of engagement, the two effects will cancel in analyses that collapse across engagement levels.

Second, our model speaks to the question of when the relationship between negativity bias and conservatism may not arise (sect. 6.2 para. 6). In this context, Hibbing and colleagues note that conservatives appear less concerned than liberals about a number of negative outcomes, such as "leveled rainforest," despite greater negativity bias. In passing, Hibbing and colleagues note that conservatives may be attuned primarily to threats involving an "identifiable, malevolent, volitional force" rather than ones involving diffuse social problems (sect. 6.2, para. 6). However, it seems unlikely that a general negativity bias would operate in such a narrow fashion. We argue that some conservatives – highly engaged ones – may not react against these threats because preferences on these issues serve a symbolic function rather than the instrumental function of avoiding a direct source of danger. So, for example, given the negative symbolic meaning attached by conservatives to government interventions aimed at reducing poverty, rejection of these policies may simply reflect the assimilation of elite issue positions among engaged conservatives – even if they would seem to leave one open to economic risks. Thus, any consideration of why individuals differing in ideology react to some threats but not others requires an analysis of *which citizens* invest issues with additional symbolic meaning that draws out the relationship of negativity bias with conservatism (and vice versa). In this sense, a complete understanding of the role of negativity biases in political preference formation requires greater attention to politics itself, and a push to unify psychological models with standard models in political behavior.

Not so simple: The multidimensional nature and diverse origins of political ideology

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Abstract: At odds with Hibbing et al., we argue that political ideology is best explained by at least two dimensions linked to economic and social ideology. In addition, Hibbing et al's claim that conservatism is grounded in a heightened sensitivity to negative outcomes, something closely tied to the personality trait of neuroticism, does not fit with the established personality correlates of political ideology. Conscientiousness and a lack of openness to experience are linked to conservatism but there is no established connection to neuroticism.

There has been resurgent interest in the psychological underpinnings of political ideology in recent years, with a welcome growth in research on its biological correlates as is made clear by Hibbing et al.'s comprehensive and concise review. They and their collaborators have contributed significantly to this literature by deepening our understanding of the genetic, biological, and physiological bases of political attitudes. In addition to providing a succinct account of extant research on the correlates of liberal-conservative ideology, Hibbing et al. advance a parsimonious account of political ideology. Parsimony is a laudable goal in scientific research, but not if it fails to account well for existing patterns of empirical evidence. We take issue with two core aspects of their argument: (1) that political ideology is best presented as a single dimension of political beliefs and attitudes, and (2) that it can be explained by differential reactions to negative stimuli.

Hibbing et al.'s target article is based on the underlying assumption that political ideology can be represented by a single dimension labeled left-right or liberal-conservative. This is a common starting point for much recent research on the psychological bases of ideology but there is abundant evidence that a unidimensional conceptualization of political ideology is incomplete (Feldman 2013). Research in psychology and political science demonstrates the existence of at least two dimensions of ideology: an economic dimension linked to views on the distribution of societal resources, influencing attitudes on social welfare, taxation, and other economic policies, and a social/moral dimension conveying a preference for tradition and order, affecting positions on gay marriage, race relations, and legal abortion. Hibbing et al. acknowledge the existence but downplay the importance of these two dimensions, whereas we regard the multidimensional nature of political ideology as a more fundamental issue. Although some researchers believe the two dimensions correlate strongly enough to be subsumed by a single left-right continuum, the empirical evidence clearly suggests the opposite. Correlations between economic and social dimensions of ideology are low to non-existent in samples from numerous countries (Cochrane 2010). More important, the two ideological dimensions have very different psychological correlates, suggesting that they arise from different underlying processes (Feldman 2013).

To underscore the psychological bases of a two-dimensional approach to ideology consider two central constructs in contemporary social psychology: right-wing authoritarianism (RWA) and social dominance orientation (SDO) (Duckitt 2001). There are clear parallels between RWA and SDO and social and economic dimensions of ideology: RWA correlates highly with social conservatism and SDO with economic conservatism (Duckitt & Sibley 2010). In addition, RWA is associated with a view of the world as a dangerous place, akin to Hibbing et al.'s concept of sensitivity to negative stimuli, and SDO is related to a competitive world view with clear implications for inequality and the societal distribution of economic resources. RWA is strongly correlated with a lack of openness to experience and need for cognitive closure, consistent with extant literature on the personality basis of conservatism cited by Hibbing et al., whereas SDO is correlated with a lack of empathy (Duckitt & Sibley 2010; Feldman 2013). RWA is also linked to valuing conservation more than openness to change, whereas SDO is related to the value of self-enhancement as opposed to self-transcendence, and a limited pro-social orientation. In some ways it is ironic that the current emphasis on social conservatism as the key psychological facet of political ideology, including in Hibbing et al.'s essay, fails to account for the

historically more powerful and politically consequential ideological divide over the distribution of economic resources.

Substantively large differences in the nature of economic and social ideology make it difficult to attach clear meaning to the labels liberal and conservative in the manner that Hibbing et al. and others use them. Research also shows that self-identified liberals and conservatives are internally heterogeneous (Feldman & Johnston 2014). In the U.S., Ellis and Stimson (2012) demonstrate that many people who label themselves conservative actually have liberal preferences on specific policy issues. Other research identifies a significant number of people who are best described as libertarian – conservative on economic issues but liberal on social issues – within the conservative label (Swedlow & Wyckoff 2009).We have comparable concerns with Hibbing et al.'s grounding of liberal-conservative ideology in habitual reactions to negative stimuli. To make their case, Hibbing et al. summarize a great deal of research on a diverse array of attitudinal and physiological correlates of liberal-conservative ideology, ranging from self-reported values to the size of the amygdala. They view the pattern of findings across this diverse research as consistent with a model of ideology based on individual differences in sensitivity to negative stimuli. But there is little or no research to connect those disparate findings. Can we reliably equate a larger amygdala, reduced activity in the anterior cingular cortex, heightened electrodermal activity, or difficulty in suppressing a learned Go response in the Go/No-Go task with habitual sensitivity to negative stimuli? There might be a single basis for these diverse states but the connections remain elusive.

Moreover, the documented personality correlates of political ideology argue against Hibbing et al.'s position. In the personality literature, neuroticism typically captures individual differences in sensitivity to negative outcomes (DeYoung & Gray 2009). Yet there is no evidence that neuroticism is associated with conservatism. Indeed, Gerber et al. (2010) report that conservatives score lower than liberals on neuroticism. Hibbing et al. argue that a heightened sensitivity to threat leads to lower openness to experience and greater conscientiousness, the strongest personality correlates of ideology. But this claim is contradicted by correlations among personality dimensions in the Big 5 Framework. Conscientiousness is associated with lower, not higher, levels of neuroticism, and openness and neuroticism are simply unrelated (DeYoung 2006).

In conclusion, we urge for greater research attention to at least two distinct dimensions of political ideology as captured by social and economic ideology. In addition, we see as fruitful more granular research devoted to the psychological and biological origins of ideology in lower-level, proximate psychological factors such as empathy, egalitarianism, and cooperation in the economic realm and anxiety, need for security, cognitive closure, religiosity, and other factors in the social arena.

Is it impolite to discuss cognitive differences between liberals and conservatives?

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Abstract: Hibbing and colleagues argue convincingly that liberals and conservatives differ in reactivity to (negative) stimuli. Yet their analysis sidesteps evidence that cognitive ability differs as a function of ideology. Cognitive abilities, like cognitive preferences (e.g., structure needs), shape whether stimuli are psychologically threatening (prompting avoidance) or offer opportunity (prompting approach). Incorporation of these findings is critical despite any socially "delicate" implications.

Hibbing et al. contribute greatly to our understanding of the fundamental differences between liberals and conservatives, covering an impressive array of research. However, their analysis focuses almost exclusively on *emotional* reactivity to negative environments. Absent from their synthesis is a consideration of cognitive factors, most notably cognitive or mental *abilities,* a factor associated with both ideology and orientations toward social environments.

Admittedly, Hibbing et al. acknowledge that liberals and conservatives differ in cognitive *styles*, most notably (a) need for closure, with conservatives exhibiting stronger need for simpler, more predictable, more clear, and more structured lives; and (b) need for cognition, with conservatives demonstrating less favorable attitudes or orientations toward cognitive exertion and complexity. These constructs involve *preferences* for dealing with information, including toleration of ambiguity, need for structure and routine, and pleasure derived from approaching (or avoiding) intellectual puzzles, factors long associated with conservatism. These theoretical constructs are interesting and informative but are clearly distinct from cognitive (or mental) abilities relevant to solving problems and mastering challenging tasks.

Yet empirical evidence reveals negative associations between cognitive ability and conservatism (e.g., Kanazawa 2010, Studies 1–2; Kemmelmeier 2008; Sidanius 1985; Stankov 2009) or right-wing authoritarianism (Keiller 2010; McCourt et al. 1999). Particularly compelling are discoveries that poorer cognitive abilities in childhood predict stronger endorsement of social conservative values or conservative self-identification in adulthood (e.g., Block & Block 2006; Deary et al. 2008; Fraley et al. 2012). When complex relationships are uncovered, such as curvilinear trends (e.g., Sidanius 1985), linear relations persist (Kemmelmeier 2008), with liberals (vs. conservatives) scoring higher in mental abilities.

My colleagues and I have found this relation of particular value in explaining why lower cognitive ability predicts greater outgroup prejudice (even after controlling for socioeconomic status and education). Specifically, lower cognitive ability predicts prejudice through heightened social conservatism, often fully explaining the relation (Hodson & Busseri 2012). The first mediation path (i.e., between lower cognitive ability and right-wing ideologies) drew considerable media attention and public ire, yet was hypothesized given the reliable negative meta-analytic relation previously established between cognitive ability and political or authoritarian conservatism (Van Hiel et al. 2010). Strong public backlash against such findings presumably explains its near-absence from theoretical and empirical discussions of ideology in psychology (e.g., Hibbing and colleagues). Instead such findings lie largely "off the radar," with authors carefully crafting their language or de-emphasizing their importance or relevance (see Block & Block 2006; Fraley et al. 2012).

Yet these patterns converge on related findings, including: low-effort thinking promoting political conservatism (Eidelman et al. 2012), analytical thinking generating religious disbelief (Gervais & Norenzayan 2012), abstract thinking (measured or manipulated) reducing conservative prejudices (Luguri et al. 2012), lower creativity among conservatives (Dollinger 2007), and stronger illusory correlations among conservatives (exaggerating the perceived association between minorities and negative outcomes; Castelli & Carraro 2011). Using distinct methodologies, these studies converge on a central point: ideology and cognitive functioning/processing are meaningfully related.

Speaking to the present discussion, cognitive abilities can influence why particular events, groups, or contexts are perceived *as* threatening. That is, "when considering social, moral, and political situations, those with greater cognitive skill are *able* to form more individualistic and open-minded (i.e., antiauthoritarian) attitudes than those of lesser cognitive ability." (McCourt et al. 1999, p. 987, emphasis added). With greater cognitive resources at hand, life is more manageable and navigable, lowering threat perceptions and social-motivational needs for change-resistant ideologies. In discussing Janoff-Bulman's (2009) work on prevention

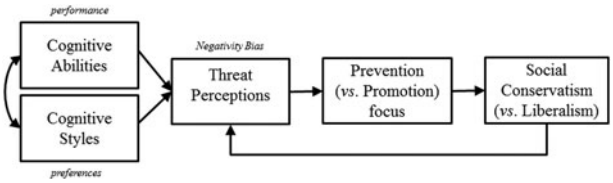


Figure 1 (Hodson). A conceptual model of cognition, threat, and ideology.

versus promotion focus, the target article informs this basic point, emphasizing that prevention focus leads to protective strategies that are conservative in nature, whereas a promotion focus encourages openness to alternative (including out-group) lifestyles. As Hibbing et al. note, with greater "psychological and physiological" resources available, individuals gravitate toward promotion-based, liberal orientations. Cognitive abilities undoubtedly play a central role in managing available psychological resources. Consistent with this interpretation, lower cognitive ability predicts decreased trust in others (Sturgis et al. 2010), with distrust in the social world (seeing others as "bad") a reliable predictor of right-wing ideologies (Altemeyer 1996; Duckitt 2006).

The field arguably needs greater integration between the cognitive, emotional, and motivational factors underpinning the fundamental ways that people differ ideologically. Although Hibbing et al. describe associations between threat negativity bias and conservatism, the authors do not articulate a vision for structural relations between the constructs. At this early stage this is understandable given the complexity of the variables involved and difficulties isolating causal directions. To this discussion I offer a model specifying that cognitive factors impact threat perceptions (i.e., reactivity bias) that cue avoidance (*vs*. approach), which enhance conservative ideology (see Figure 1).

Conceptually, both cognitive abilities (e.g., reasoning; thinking skills) and preferences (e.g., for structure and order) impact whether the social or physical world is psychologically considered threatening and in need of prevention-based strategies. Once threatened, people generally shift to the ideological right (Hetherington & Suhay 2011; Nail et al. 2009). In this manner, conservatism (characterized by resistance to change and acceptance of inequality) is the product of social-cognitive motives enlisted to navigate threating aspects of social life (Jost et al. 2003). This model conceptually emphasizes that threat reactivity induces the prevention focus that drives conservatism, while explicitly recognizing a feedback loop. That is, change-resistant ideologies valuing tradition and convention heighten threat salience given that social systems are perpetually in flux or "risk" becoming so.

At this exciting juncture the field is embracing the notion of meaningful, psychological differences correlating with ideology. In doing so we must recognize the proverbial elephant in the room: cognitive differences between liberals and conservatives. It is unclear whether its omission by Hibbing et al. reflects their belief that cognitive abilities do not inform this discussion, or whether it is simply impolite (or too controversial) to contemplate these findings. The psychological community needs to debate the scientific evidence, regardless of its palatability, if it speaks to a deeper understanding of political ideology and human nature.

Negativity bias, emotion targets, and emotion systems

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Abstract: Hibbing et al.'s article isolates a plausible psychological factor contributing to differences in political orientation. However, there are two potential difficulties. Both the nature of negativity and the liberal–conservative opposition are ambiguous. A possible way of treating these problems enhances the theoretical framework through fuller reference to emotion systems and categories of triggers for those systems.

This illuminating analysis suffers from two ambiguities. First, the liberal–conservative opposition may refer to attitudes regarding change or it may refer to left-wing and right-wing policies. There is presumably some correlation between the two, but they are not equivalent. For instance, the All-India Progressive Writers Association advocated socialist and egalitarian policies along with the retention of many Indian cultural traditions (Coppola 1974, p. 40). Similarly, conservatives work not to conserve, but to dismantle the welfare state. There is a question, then, as to how negativity bears on conservatism in these different senses. Second, there is an ambiguity in negativity. As the authors indicate, liberals are more likely to envision disastrous consequences from environmental decline, whereas conservatives are more likely to see disastrous consequences in mass immigration. In some cases, then, it seems that liberals have greater negativity bias. These issues may be addressed in part by considering the nature and eliciting conditions of the motivational systems involved.

The problem of negativity ambiguity is perhaps more straightforward. The authors note that liberals score higher on empathy than conservatives (Hirsh et al. 2010). Empathy is a form of emotion system activation – specifically, the activation of a system in parallel with that of some other person, predominantly for an aversive emotion (i.e., we empathize with a target's pain more readily than his or her joy [see Royzman & Rozin 2006].) This may suggest that the negativity bias is greater in conservatives for prudential considerations (such as possible employment competition), but greater in liberals for (non-prudential) empathic targets (e.g., future generations suffering depleted resources). The tendencies are related in that intensified prudential negativity is likely to reduce empathic sensitivity (Preston & de Waal 2002, p. 8). In this sense, prudential negativity bias would be prior and determinative, as the target article suggests.

On the other hand, even this is likely to be overly simple. Proneness to empathy varies with a number of factors, including in-group versus out-group divisions (Ambady et al. 2006, p. 213) as defined by identity categories (such as nationality or race; for a fuller discussion of emotion and identity categories, see Hogan 2009). The presence and nature of such divisions may modulate the proneness of individuals toward empathy, and may even explain some of the difference in empathy itself. For example, it may appear obvious that some people are inclined to experience strong motivational responses to identity divisions, whereas others are not. But a priori it seems equally possible that people vary primarily in which (not whether) identity divisions have strong motivational consequences for them. In this case, part of the conservative–liberal difference may be less a matter of psychological properties per se than of social context. For example, someone whose most important identity division is Hindu versus non-Hindu may be liberal in the U.S. but conservative in India, where that identity division is more socially functional. The difference would not be in broad psychological propensities as such, but in the social significance of some particular manifestation of those propensities – here, a specific identity category.

Another important variable concerns precisely which emotion systems are involved (on the nature of emotion systems, see Ch. 2 of Hogan 2011). Specifically, the key emotion systems for negativity bias would seem to be disgust, fear, and anger. Here, too, eliciting conditions for the emotion are important. We may distinguish broad, situational activations from activations for a defined target – for example, diffuse social anxiety versus fear of some person. Among other things, this may be valuable in clarifying the relation between different senses of *conservative* or *liberal*. Conservatism in the root sense may be associated with situational versions of the three systems, because an inclination

to situational negativity should be assuaged by what is familiar. In contrast, we would expect specific policy responses to bear on defined target activations. For example, we would expect disgust arousal at homosexuality to be connected with opposition to gay marriage (see Nussbaum 2001, p. 205, 347); fear of crime to promote advocacy of strict policing (see, for example, Gardner 2008, pp. 209–213); and anger system activation for crimes already committed to encourage victim seeking and thus advocacy of harsh punishment (on victim seeking, see Berkowitz 1993).

This division would help to explain the partial correlation between the two senses of *conservatism*, because a propensity toward situational versions of these emotions would foster particular arousals as well (fearful persons being more likely to be afraid). The two sorts of conservatism should diverge at points where policies are based on well-established empathic responses (good for anti-change conservatives) or on novel, non-empathic considerations (good for right-wing conservatives). On the other hand, the differentiation of emotion systems may lead us to wonder why various forms of aversive response tend to cluster together, forming liberal and conservative platforms, rather than remaining separated in insular policies (regarding gay marriage, policing, etc.), in keeping with the diversity of views on specific topics, noted by Hibbing et al.

With two small additions, we may begin to answer this final question. First, a strong negative response in any of these systems would tend to become motivationally dominant. Severe disgust at gay sexuality is likely to become a strong motivational force relative to, say, a weak emotional response to the possibility of crime. Second, social dynamics will tend to cluster policies into a limited number of complexes, often tending toward two (see the research on alliances summarized in chapter twelve of Ball 2004). In this case, the clustering seems likely to bear on motivational factors, such as prudence versus empathy. In consequence, someone who feels strongly disgusted at gay marriage is unlikely to find a political outlet that opposes gay marriage and also opposes the death penalty. The result may be the partial revision of the person's more peripheral political attitudes. For example, an anti-gay marriage voter might revise more weakly held opposition toward the death penalty, in line with a socially available political platform. Thus it seems plausible that the political consequences of psychological traits will develop in relation to social systems here as well.

Disgust, politics, and responses to threat

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Abstract: We address two questions regarding the relationship between political ideology and responses to threatening or aversive stimuli. The first concerns the reason for the connection between disgust and specific political and moral attitudes; the second concerns the observation that some responses to threat (i.e., neuroticism/anxiety) are associated with a more *left-wing* political orientation.

There is something clearly right about the analysis offered by Hibbing et al. It appears that no matter how you slice (or measure) it, liberals and conservatives differ in psychologically basic ways in their responses to threatening or aversive stimuli. Hibbing et al. present compelling evidence that these low-level psychological differences account for some of the observed variation in social, moral, and political attitudes.

One strength of this analysis is the elegance with which it unifies findings from seemingly disparate literatures under one conceptual umbrella. On this approach, the separate relationships between political attitudes and individual differences in attention to risk and threat, sensitivity to disgust, and valuing of order and consistency can all be described as reflecting a deeper underlying relationship between responsiveness to negative stimuli and political ideology.

However, this level of abstraction, while providing a useful framework for disseminating the work of psychologists to political scientists and others, also leaves many questions to be answered – as the authors themselves acknowledge.

One important question is the nature and scope of disgust's influence on political attitudes and ideology. Hibbing et al. ask: "Is sensitivity to disgust pertinent only to attitudes regarding homosexuality, to attitudes on all sexually related issues (e.g., support for abstinence-only sex education, opposition to pornography, and opposition to abortion rights), or to conservatism more generally? Empirical evidence can be found for all of these conclusions" (sect. 6.2, para. 5).

In our work, we have focused on the relationship between disgust and moral and political attitudes. As we have recently argued elsewhere (Inbar & Pizarro 2014), we believe that disgust's connection to specific social/political issues – as well as to broader ideological commitments – can be parsimoniously explained by its role as part of the behavioral immune system, an evolved motivational system that responds to physical contamination threats (Schaller & Park 2011). Our primary claim is that disgust evolved in part to keep individuals safe from disease by motivating them to avoid disease-bearing foods, substances, individuals, and groups. As such, in addition to causing rejection and avoidance of basic contamination threats (such as rotten meat, blood, and feces; Rozin et al. 2008) disgust also motivates a range of social judgments. These include negative evaluations of acts that are associated with a threat of contamination (e.g, moral norm violations pertaining to food and sex; Haidt et al. 1993); negative attitudes towards unfamiliar groups who might pose the threat of contamination through physical contact (e.g, outgroups characterized by these moral norm violations, or who are unfamiliar; Inbar et al. 2009b; Navarrete et al. 2007); and greater endorsement of certain social and political attitudes that minimize contamination risk (such as increased sexual conservatism, reduced contact between different social groups, and hostility towards foreigners; Inbar et al. 2009a; Terrizzi et al. 2013). We see this argument as consistent with, and complementary to, the argument advanced by Hibbing et al., but it explains why the same emotion should be related to many superficially different attitudes (because they all involve disease and contamination threats), and why disgust is related to politics both at the specific-issue and broad-ideology levels (because more conservative attitudes at both levels minimize these threats).

The disease avoidance approach to understanding disgust also sheds light on another question posed by Hibbing et al. – that of the relationship between oxytocin and political ideology. They point to two theoretically plausible but conflicting possibilities. On the one hand, oxytocin might give rise to a "liberalizing" effect in due to its association with trust and "warmth;" on the other, oxytocin's promotion of in-group favoritism (de Dreu et al. 2011) might mean that it would instead boost politically conservative attitudes. We can offer a preliminary suggestion based on work in the animal literature. Kavaliers et al. (2004) demonstrated a critical role for oxytocin in motivating parasite avoidance in mice. Mice respond to olfactory cues indicating parasitic infection by avoiding the infected individual, protecting the non-infected mouse from potential contagion. The authors found that mice missing a gene critical for the production of oxytocin lose this ability to identify infected conspecifics. Given this link between oxytocin and disease avoidance, and given the relationship between disease avoidance, disgust, and political conservatism in humans, we believe that oxytocin administration will move individuals toward the more conservative end of the political spectrum – consistent with its promotion of in-group favoritism.

One final important question is how the findings reviewed by Hibbing et al. can be reconciled with the fact that higher

neuroticism (lower emotional stability) is typically correlated with *liberalism*, not conservatism (e.g., Gerber et al. 2010). Similarly, in data collected by our collaborator, Ravi Iyer at www.yourmorals.org, liberals score higher than conservatives on a self-report measure of Behavioral Inhibition System strength, which taps sensitivity to negative outcomes (the BIS/BAS scale; Carver & White 1994). This is, on the face of it, inconsistent with the view of conservatives as anxious, fearful, and threatened. One possibility is that conservatives are more likely to respond to threats with externalizing emotions, such as anger or disgust, whereas liberals are more likely to respond with internalizing emotions, such as anxiety and distress (Tomkins 1963; 1965; 1995). Again, more research is needed to shed light on the complex relationship between these variables.

The idea that basic individual differences in responses to threatening or aversive stimuli can account for high-level differences in social, moral, and political opinions is, we believe, an important insight. What remains is to work out the details.

Motivation and morality: Insights into political ideology

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Abstract: Our past work linking motivation and morality provides a basis for understanding differences in political ideology and positions across the political spectrum. Conservatism is rooted in avoidance-based proscriptive morality, whereas liberalism is rooted in approach-based prescriptive morality. Two distinct, binding, group moralities reflect these different regulatory systems and emphasize social coordination through Social Order versus social cooperation through Social Justice.

Hibbing et al. have done a masterful job reviewing research in support of their compelling claim that conservatives have a negativity bias. Although they give us excellent insights into political conservatism, they leave us questioning the comparable underpinnings of political liberalism. They note that liberals do not have a positivity bias; is liberalism, then, simply the absence of a negativity bias? Our work suggests otherwise and relies on a fundamental motivational distinction to understand political ideology. In linking this motivational distinction to morality and moral regulation in particular, we provide a perspective that helps account for political positions across the political spectrum.

Psychologists distinguish between two fundamental motivations – approach and avoidance. The approach system has a positive end-state and is based in behavioral activation, whereas the avoidance system has a negative end-state and is based in behavioral inhibition. When applied to the moral domain, approach and avoidance motivation are reflected in two distinct systems of moral regulation (Janoff-Bulman et al. 2009): a *prescriptive* system focused on positive outcomes and behavioral activation ("shoulds"), and a *proscriptive* system focused on negative outcomes and behavioral inhibition ("should nots"). Most broadly, proscriptive morality involves not harming, or protecting others from threat or danger; in contrast, prescriptive morality involves helping, or providing for others' well-being. Research has shown that proscriptive morality is strict, mandatory, and condemnatory, whereas prescriptive morality is less strict, more discretionary, and commendatory (Janoff-Bulman et al. 2009).

In past work we have linked these two moral regulatory systems and their underlying approach-avoidance motivations to political ideology. More specifically, political conservatism is rooted in avoidance-based proscriptive moral regulation, and political liberalism is rooted in approach-based prescriptive moral regulation (Janoff-Bulman 2009; Janoff-Bulman et al. 2008). Hibbing et al.'s conclusion that conservatives have a negativity bias is entirely consistent with our perspective. Based on their analysis, liberals nevertheless remain theoretically untethered, other than being associated with an absence of any negativity bias. It is tempting to conclude that political liberalism results from this absence, yet work on motivation and morality would suggest otherwise. More specifically, a failure to avoid a negative stimulus is not the same as approaching a positive one – these are distinct motivations. Similarly, and perhaps less obviously, not harming another (proscriptive morality) is not the same as helping another (prescriptive morality). Motivationally, proscriptive morality requires restraint of an existing temptation, whereas prescriptive morality requires overcoming inertia and establishing a positive motivation. Political liberalism and conservatism are not simply opposite sides of the same coin, but likely reflect distinct motivational and moral regulatory systems.

Morality can be directed at the self, another person, or the group writ large; group-based morality is most pertinent to politics. We maintain that there are two group-based moralities, one prescriptive and liberal and the other proscriptive and conservative (Janoff-Bulman & Carnes 2013; also see Janoff-Bulman 2009). More specifically, the conservative group-based morality focuses on *Social Order* in the interest of *protecting* the group from harm; included here are Haidt's binding foundations of loyalty, authority, and purity that are endorsed by conservatives (Graham et al. 2009). The liberal group-based morality emphasizes *Social Justice* in the interest of *providing* for the well-being of the group; this group-based morality focuses on equality-oriented macrojustice concerns (see Brickman et al. 1981).

These group-based moralities bind societies in very different ways for very different purposes, reflecting the different underlying motivations of each perspective. By emphasizing conformity, strict norm adherence and obedience to authority, conservatives' Social Order morality maximizes the possibility for *social coordination* in response to both internal and external group threats. Cross-cultural work demonstrates that tight societies encounter more ecological and historical threats which "increase the need for strong norms and punishment of deviant behavior in the service of social coordination for survival" (Gelfand et al. 2011, p. 1101). In contrast, by emphasizing equality, interdependence and communal responsibility, liberals' Social Justice morality strives to maximize *social cooperation* to achieve common goals for mutual well-being. Indeed, nations with greater economic equality possess a higher quality of life for all citizens, not just the poorest, on nearly every index of well-being (e.g., Wilkinson & Pickett 2009).

These different motivations influence preferred domains of regulation and autonomy concerning social and economic issues. A morality based in Social Justice focuses on economic issues and social resources as the appropriate domains of regulation, for here lie the means to provide for the group's welfare. Universal health care and anti-poverty programs are clearly liberal causes. The environment is embraced as a public good on the left and is therefore regarded as a domain for regulation by liberals. A morality based in Social Order emphasizes protection and vigilance, and focuses on restrictiveness in the domain of social issues, where norm adherence and deviance can be observed. Not surprisingly, abortion and gay marriage are primary targets of regulation from the right.

Capital punishment is lauded by conservatives for its posited deterrence (i.e., protective) value, and demonized on the left for its inequitable distribution. Despite their focus on threat, conservatives sometimes ignore a relatively abstract danger such as climate change – particularly one that would require a response involving economic regulation. Here we need to recognize that in addition to domains of regulation, conservatives and liberals have distinct domains of individual autonomy, where the government should not tread; in each case it is the other side's domain of

regulation. There are a few economic arenas in which conservatives call for more government involvement (e.g., greater spending), but not surprisingly they clearly concern protection and do not directly interfere with the free market, as in budgets for police and national defense.

Conservatives endorse Social Order and not Social Justice, whereas liberals display the opposite pattern. Interestingly, libertarians are critical of both group-based moralities and espouse individual autonomy in social and economic domains; and communitarians champion both Social Order and Social Justice and prefer regulation in both domains. Differences in moral regulation can help us understand ideology and positions across the political spectrum.

The "chicken-and-egg" problem in political neuroscience

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Abstract: A comprehensive review by Hibbing et al. establishes close links between physiological and psychological responses and ideological preferences. However, existing research cannot resolve the "chicken-and-egg problem" in political neuroscience: Which is cause and which is effect? We consider the possibility, which they reject, that general ideological postures, if consistently adopted, could shape psychological and physiological functioning.

Political discourse in the U.S. and elsewhere is characterized by vast differences in cognitive, perceptual, rhetorical, and motivational styles as well as ideological substance or content as a function of left–right (or liberal–conservative) political ideology. These differences are manifested in budgetary stalemates, protracted conflicts about tax policy and social security, debates about military spending and intervention, and disputes about cultural issues. Ideological differences have long been assumed to arise from exposure to mass media, family socialization, economic interests, and beliefs about human nature.

Ten years ago it was controversial to suggest, as Jost et al. (2003) did, that ideological differences result, even in part, from situational and dispositional variability in psychological needs, motives, or tendencies that are not explicitly political – such as basic needs to manage or reduce uncertainty and threat. There is by now evidence from a variety of laboratories around the world using a variety of methodological techniques leading to the virtually inescapable conclusion that the cognitive-motivational styles of leftists and rightists are quite different (e.g., Jost & Amodio 2012; Kandler et al. 2012). This research consistently finds that conservatism is positively associated with heightened epistemic concerns for order, structure, closure, certainty, consistency, simplicity, and familiarity, as well as existential concerns such as perceptions of danger, sensitivity to threat, and death anxiety.

Masterfully, Hibbing et al. have reviewed dozens of studies revealing, among other things, that conservatives exhibit stronger physiological and psychological responses to negative stimuli (including stimuli that are threatening or disgusting), in comparison with liberals. We now know that there are also ideological differences in neurological structure and function, especially when it comes to the anterior cingulate, amygdala, and insula (Amodio et al. 2007; Kanai et al. 2011).

The first objection that Hibbing et al. consider is the one that we feel is most in need of conclusive scientific research. They ask in section 6.1, paragraph 1: "Do physiological and broad psychological traits shape political dispositions or might political dispositions actually shape physiological and broad psychological traits?" The authors argue that the former direction of causality is far more plausible than the latter, but they acknowledge that existing empirical research is almost entirely cross-sectional and correlational in nature. As a result, their important question remains unanswered; we refer to this as the "chicken-and-egg problem" in political neuroscience (see also Jost et al. 2014).

Hibbing et al. assume that psychological and physiological responses are relatively stable over time, and so they must give rise to political ideology. That is certainly one possibility, but it seems more likely to us that ideological differences in neurocognitive structure and functioning reflect a constellation of social and psychological processes that unfold over time and give rise to the expression of beliefs, opinions, and values. Ideology, in other words, results from an "elective affinity" between the socially constructed, discursive elements of a belief system and the underlying needs, motives, and interests of individuals and groups who seek out and embrace those elements (e.g., see Jost et al. 2009).

Therefore, we are not as dismissive as Hibbing et al. are of the possibility that "political attitudes [could] shift a person's general emotional dispositions" (sect 6.1, para. 3; see also Inbar et al. 2009a). We believe that general ideological postures, if they are consistently adopted, could shape psychological and physiological characteristics as well. In any case, existing research – including that reviewed by Hibbing et al. – simply does not allow us to determine whether (a) individual differences in brain structure and function bring about divergent ideological preferences, as the authors contend, and/or (b) the adoption of specific ideologies leads individuals to think in certain ways, causing our brains to process information differently.

Although it is common to assume that chicken-and-egg problems such as this one possess a single (unidirectional) solution, for the time being we favor a dynamic, recursive theoretical framework in which the connection between physiological (and psychological) functioning and ideological preferences is conceived of as bidirectional. Recent work suggests, for example, that compassion training may alter neural responses in the anterior insula and anterior cingulate – brain regions that are associated with empathy in response to the pain of others (Klimecki et al. 2013). Research of this kind may be more relevant to political psychology than it seems at first blush, given that differences between liberals and conservatives have been observed with respect to empathy (McCue & Gopoian 2001) as well as gray matter volume in those specific regions.

Furthermore, there is growing neuroscientific evidence that experience can alter gray matter volume – that is, basic anatomical structure. Woollett and Maguire (2011), for example, demonstrated that men who complete a four-year training program to become London taxi drivers exhibit increased gray matter volume in the posterior hippocampus along with significant changes in memory. Although some reservations about this study and others have been expressed (Thomas & Baker 2012), animal studies show that the brain can change drastically in response to experience and training (Fu & Zuo 2011).

Tackling the chicken-and-egg problem should be a top priority for the fledgling field of political neuroscience (see also Jost et al. 2014). It will require a judicious admixture of prospective, longitudinal methods (Block & Block 2006; Fraley et al. 2012) and experimental investigations of specific causal mechanisms. We envision a multi-methods approach that may involve not only magnetic resonance imaging (MRI) and electroencephalography (EEG) but also transcranial magnetic stimulation (TMS), direct administration of neuromodulators, and research involving patients with brain lesions. Methods such as these are necessary to test dynamic theories of causation and, ultimately, to resolve the chicken-and-egg problem. This work has the potential to elucidate not only the

specific neural pathways that underlie political attitudes and behavior; it may also challenge longstanding assumptions about the stability of both biological and ideological processes.

Political infants? Developmental origins of the negativity bias

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Abstract: The negativity bias in human cognition emerges in infancy and continues throughout childhood. To fully understand the relationship between differences in attention to negative stimuli and variance in political ideologies, it is critical to consider human development and the process by which early individual differences in negativity unfold and are shaped by both genes and environment.

Hibbing et al. propose a fascinating account of how individual variation in the negativity bias explains variations in political ideology. This account raises a critical question: What explains individual variation in the negativity bias? The authors present an evolutionary hypothesis to explain this individual variation, but this need not mean that the variation is innate and present from birth (Gottlieb 2007; McClintock 1979). To fully understand the foundations of individual variation in the negativity bias, it is equally important to consider the emergence of the bias in human ontogeny. The authors review two important studies that tie early psychological attributes to later political attitudes (Block & Block 2006; Fraley et al. 2012); we propose that research exploring how biological and environmental factors contribute to the early development of, and variability in, the negativity bias could be profitably integrated with this approach.

Research in developmental psychology reveals that the negativity bias guides human cognition as early as infancy and continues throughout childhood. For example, infants look longer at fearful than at happy faces and modify their own behavior more strongly in response to others' negative than others' positive expressions (see Vaish et al. 2008 for a review), and preschool-aged children selectively remember the faces of threatening individuals (Kinzler & Shutts 2008). Yet, very little is known about the nature of early individual differences in the negativity bias. Understanding how and whether early individual differences in attention to negative stimuli guide later attitudes – and the process by which early individual differences unfold and are shaped by both genes and environment – is critical for gaining traction on the nature of psychological and political attitudes across the lifespan.

One area of investigation that promises to be extremely fruitful in this regard is that of genetic variation. Indeed, one recent study shows that genetic variation accounts for differences in infants' negativity bias in processing fearful faces (Grossmann et al. 2011). Equally, one can ask about the role of early experience in establishing the negativity bias. The authors note that parents' political beliefs have only meager effects on their children's eventual political orientations. Yet parenting may have very important effects on the emergence of the negativity bias in early development. As illustration, infants who have had more frequent exposure to happy expressions (because they have happy, positive mothers) show a greater negativity bias than infants whose mothers are not as happy and positive (de Haan et al. 2004). Thus, the influence of parenting on the factors that contribute to political attitudes may be more robust than is currently known. Further research is needed to understand how such biological and environmental factors, as well as their interaction, impact individuals' attention to negative events throughout development.

The target article provides evidence that individual differences in the negativity bias are stable over time, yet when do such stable differences emerge? Although diverse studies suggest that the negativity bias emerges as early as infancy, no research to date has explored whether infants' reactions are predictive of later attitudes. The authors briefly make reference to Jerome Kagan's work on early temperament, but this relation needs to be empirically explored. Moreover, it is unknown whether individual differences in early attention to negative social stimuli relate to individual differences in other aspects of temperament (though see Grossmann et al. 2011). It is plausible that early attention to negative information could be meaningfully related to infants' novelty seeking behaviors. If so, this might suggest an early coherence across psychological profiles that relate to later political attitudes. If not, this would suggest a potential complexity in the developmental trajectory of early social behaviors and attitudes, and raise new questions regarding how such individual variation serves as a precursor to later attitudes.

In their discussion, the authors put forth the possibility that different subcategories of negative emotion may differentially impact attitudes toward diverse issue sets. Is attention to *some kinds* of negative information early in development most predictive of later political attitudes? For example, there is evidence that threatening information (as opposed to information that is negative but non-threatening, such as sadness) may be most attention grabbing early in development (Kinzler & Shutts 2008; Lobue 2009). It is conceivable that individual differences in early attention to threat, but not all subcategories of negative information, may predict the emergence of diverse political profiles. It also remains to be seen whether the category *threat* may be even further meaningfully subdivided – for instance, is early attention to social threats different from attention to non-social threats? A more nuanced understanding of the parameters of early negativity bias that predict later political profiles may help uncover new insight regarding the nature of political attitudes among adults, and could help resolve apparent incongruities in the kinds of negative information (e.g., threats from people versus threats from the environment) that elicit different reactions among conservatives and liberals.

To conclude, the authors argue that their approach can be useful in identifying which political attitudes are "peripheral" and which are "core." We agree. Furthermore, if core attitudes are identified, might the hallmarks of those attitudes be present early in development? And if so, which candidate aspects of children's early lives, choices, and social experiences might reflect those attitudes? We submit that inquiries at the intersection of developmental and political psychology will generate new productive research programs that inform our understanding of the factors contributing to political attitudes across the lifespan and will reveal many fascinating insights into the human mind in social and political context.

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Threat bias, not negativity bias, underpins differences in political ideology

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Abstract: Although disparities in political ideology are rooted partly in dispositional differences, Hibbing et al.'s analysis paints with an overly broad brush. Research on the personality correlates of liberal–conservative differences points not to global differences in negativity bias, but to differences in threat bias, probably emanating from differences in fearfulness. This distinction bears implications for etiological research and persuasion efforts.

Hibbing et al. provide a helpful review of the psychological underpinnings of individual differences in political ideology, especially between social liberals and social conservatives (whom for brevity we refer to as "liberals" and "conservatives," respectively). They conclude that the principal variable underlying the difference between liberal and conservative attitudes is negativity bias.

Although we share Hibbing et al.'s view that disparities in political ideology are rooted partly in dispositional differences, we contend that they paint with too broad a brush. The data point not to global differences in negativity bias, but to differences in threat bias, most likely emanating from differences in fearfulness. In fairness, Hibbing et al. at times describe the difference between liberals and conservatives as stemming from differential sensitivity to threat, quoting Schaller and Neuberg (2008): "Some people [conservatives] seem to go through life more cognizant of threats" (p. 405). Yet elsewhere, they portray this difference as originating from an overarching temperamental difference in negativity: "Compared with liberals, conservatives tend to be more psychologically and physiologically sensitive to environmental stimuli generally but in particular to stimuli that are negatively valenced, whether threatening or merely unexpected and unstructured" (sect. 6, para. 6).

The difference between negativity bias and threat bias is hardly semantic. The personality literature points consistently to the existence of largely orthogonal higher-order dimensions of negative emotionality (NE) and Constraint, the latter of which falls on the opposite pole of Disinhibition (Tellegen & Waller 2008). NE is a pervasive dimension, similar to but broader than neuroticism, which reflects the propensity to experience unpleasant affects of many kinds, including anxiety, irritability, and mistrust. As Watson and Clark (1984) noted, individuals with elevated NE tend to dwell on the negative aspects of life and attend selectively to unpleasant stimuli. In contrast, Constraint is a disposition toward fearfulness and response inhibition that, according to some theorists (e.g., Fowles 2002; Lykken 1995), reflects the activity of the Behavioral Inhibition System, a brain-based circuit that mediates sensitivity to signals of punishment and uncertainty (Gray & McNaughton 1996).

Most evidence suggests that Constraint, more than NE, is the principal nexus of individual differences in threat sensitivity, especially when perceived dangers are relatively clear-cut (Depue & Spoont 1986). For example, individuals with elevated Constraint and its constituent traits, particularly harm-avoidance/fear, exhibit pronounced fear-potentiated startle (Kramer et al. 2012; Vaidyanathan et al. 2009) and habituate slowly to startle-provoking stimuli (LaRowe et al. 2006). In contrast, NE is not consistently related to avoidance reactions to threatening stimuli, including gruesome imagery (Watson & Clark 1984). The independence of NE and Constraint parallels the distinction between trait anxiety and trait fear, respectively (Sylvers et al. 2011). Trait anxiety appears to reflect a disposition to react to uncertain threats, whereas trait fear appears to reflect a disposition to react to certain threats. In factor analytic studies, trait anxiety loads primarily on NE, whereas trait fear loads primarily on Constraint (Church & Burke 1994; Tellegen & Waller 2008).

These two higher-order dimensions are conflated in much of Hibbing et al.'s analysis. This confusion is problematic, because the literature suggests that liberals and conservatives differ in threat sensitivity, presumably reflecting individual differences in Constraint (see also Jost et al. 2003), but *not* in their attunement to the negative. For example, studies in both the U.S. and Europe reveal that conservatives are either essentially identical to liberals in NE (Butler 2000; Caprara et al. 1999; 2006; Carney et al. 2008; Chirumbolo & Leone 2010; Kossowska & van Hiel 1999) or significantly *lower* than liberals in NE (Gerber et al. 2010). Vigil (2010) similarly found that compared with liberals, conservatives reported modestly but significantly lower levels of emotional distress and frequencies of crying.

In contrast to the absence of clear-cut differences in NE, Carney et al. (2008) found that the principal correlates of political ideology within the Five Factor Model of personality (FFM) are in the dimensions of Conscientiousness and Openness to Experience, with liberals tending to be somewhat lower in most facets of the former and somewhat higher in most facets of the latter (see also Caprara et al. 2006; Gerber et al. 2010). Notably, Constraint is best accounted for by Conscientiousness and Openness within the FFM (Church 1994; cf. Digman 1997). In sum, the principal difference between liberals and conservatives appears to lie not within with the domain of NE, but rather within Constraint and probably fearfulness in particular, manifesting itself in differential sensitivity to reasonably clear-cut threats.

This alternative conceptualization is important for at least three reasons. First, it clarifies the primary dispositional differences between liberals and conservatives, and directs efforts to understand the etiology of political ideologies away from basic affective dimensions and toward threat sensitivity. It also raises a plethora of questions, such as why the links between threat sensitivity and political affiliation are only modest, suggesting the presence of unidentified modifying variables. Second, this conceptualization may help to avert the pejorative connotations often associated with research on personality differences in political ideology (e.g., York 2003). The assertion that conservatives are globally negatively biased bears few implications for adaptive functioning. In contrast, the proposition that conservatives are especially attuned to threat is not inherently disparaging, as certain hazards are genuine and necessitate attention (Barlow 2004). Hence, a threat bias interpretation reminds us that neither political view is inherently healthier than the other. Third, this perspective may be helpful in crafting messages designed to bridge the partisan divide (Abramowitz 2010). For example, a threat bias interpretation may imply that conservatives will be most readily persuaded by communications reassuring them that dangers arising from policy changes (e.g., immigration reform) are less dire than initially envisioned. Conversely, liberals may respond best to communications that leverage psychological attributes other than threat, such as perceived fairness (Haidt 2012). In this way, a more precise characterization of the wellspring of liberal-conservative differences may promote a more constructive dialogue between individuals of competing political ideologies.

Differences in negativity bias probably underlie variation in attitudes toward change generally, not political ideology specifically

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Abstract: Many of the characteristics cited in Hibbing et al.'s account are ineffective predictors of economic conservatism. However, these same characteristics are often associated with differences not only in social conservatism but also in religiousness and authoritarianism. Hibbing et al. may have offered a useful explanation of traditionalism and attitudes toward change across domains rather than of general political attitudes.

Hibbing et al. argue that the association between political attitudes and a wide range of psychological and physiological characteristics reflects elevated levels of negativity bias among political

conservatives. We suggest that their account is both too general and too specific. Too general because many of the variables invoked by Hibbing et al. show clearer associations with social than with economic conservatism, sometimes showing no association at all with the latter. And too specific because attitudes outside of the political domain show clear connections to many of the variables cited by Hibbing et al.: Attitudes concerning religion and the structure of family and society show highly comparable results to those observed for social conservatism. Accordingly, negativity bias may be best construed as a predictor not of political opinions specifically but of general attitudes toward change across a range of domains. This conclusion is buttressed by a recent behavioral genetic study which found that, in a sample of twins reared apart, attitudes in the political, social, and religious spheres (the Traditional Moral Values Triad; TMVT; Bouchard 2009) were best construed as superficially different representations of a single underlying trait, reflecting traditionalism (Ludeke et al. 2013). The TMVT hypothesis is supported to the extent that the development of attitudes in all three domains can be accounted for by the same mechanisms.

The importance of distinguishing between attitudes toward change (reflected in social conservatism) and attitudes toward equality (reflected in economic conservatism) has been demonstrated elsewhere (e.g., Jost et al. 2009). Here we highlight how the predictors cited by Hibbing et al. show importantly different connections to these two dimensions, and how findings for the social dimension typically apply to all traits in the TMVT.

The Big Five personality model provides some of the most frequently used predictors of attitude constructs. Although general political conservatism is associated with both low Openness/Intellect and high Conscientiousness (Sibley et al. 2012), studies that distinguish between social and economic dimensions report that Openness/Intellect and Conscientiousness are primarily associated with social conservatism, whereas economic conservatism is primarily associated with low Agreeableness (Carney et al. 2008; Hirsh et al. 2010; Van Hiel & Mervielde 2004). This pattern is particularly clear in studies that used social attitude measures related to social and economic conservatism: meta-analysis indicated that Openness/Intellect and Conscientiousness are more strongly associated with Altemeyer's (1996) Right-Wing Authoritarianism (assessing attitudes toward change) than with Pratto et al.s' (1994) Social Dominance Orientation (SDO, assessing attitudes toward equality); SDO was primarily correlated with Agreeableness and more modestly with Openness/Intellect (Sibley & Duckitt 2008). Consistent with the TMVT model, meta-analysis demonstrated correlations of religious fundamentalism with Conscientiousness and Openness/Intellect similar to those associated with social conservatism (Saroglou 2010).

In their values, social conservatives diverge from economic conservatives but converge with authoritarians and religious individuals. Duriez et al. (2002) reported that, although both social and economic conservatism were associated with a tendency to favor the self-enhancing cluster of Schwartz's Values Scale (1992), only social conservatism was associated with a preference for conservation values; this preference for conservation values is, however, common to both authoritarians and religious individuals (Feather 2005; Saroglou et al. 2004).

Similarly, disgust sensitivity appears to be more correlated with social conservatism than economic conservatism and is also correlated with religiousness and authoritarianism (e.g., Haidt et al. 1994; Hodson & Costello 2007; Inbar et al. 2012b; Terrizzi et al. 2010). Because evolutionary accounts of disgust have posited that the emotion evolved to prevent infection, countries with elevated infection risk (higher parasite loads) might be expected to exhibit corresponding attitude differences; Hibbing et al. note precisely this effect for conservative religious and social beliefs (Fincher & Thornhill 2012), and a recent study (Murray et al. 2013) observed a comparable association between parasite load and cross-national differences in authoritarian attitudes. Even humor preferences are informative: both conservatism and religiousness appear to be negatively correlated with enjoyment of "sick" humor (which includes jokes with morbid, gruesome, or sadistic content; Saroglou & Anciaux 2004, Wilson & Patterson 1969). In Hibbing et al.'s framework, this might indicate that elevated sensitivity among conservatives and religious individuals to the aversive imagery in such jokes interferes with their ability to find humor in them.

Variables related to cognitive function follow the same pattern. Cognitive style measures such as Need for Closure and Need for Cognition correlate moderately with measures of social conservatism, authoritarianism, and religiousness, though they appear to be only modestly or even not at all associated with economic conservatism and SDO (Crowson 2009; Hunsberger et al. 1996; Saroglou 2002; Van Hiel et al. 2004). Intelligence and education are negatively correlated with political conservatism, authoritarianism, and conventional religiousness (Lewis et al. 2011; Van Hiel et al. 2010), whereas the relation of education and intelligence to economic conservatism and SDO appears to be smaller than that observed for the TMVT traits, and possibly even inverted (Heaven et al. 2011; Johnson & Tamney 2001; Kemmelmeier 2008).

Studies of the physiological and neurological correlates of attitude differences represent a recent but expanding addition to this literature. Consistent with the TMVT account, Hibbing et al. note that the same pattern of neural activity exhibited by conservatives during a task requiring response inhibition was observed among highly religious individuals (Amodio et al. 2007; Inzlicht et al. 2009). (Significantly, the results of these studies seem to be in conflict with the "negativity bias" hypothesis, as the pattern of neural activity exhibited by conservatives and the highly religious is typically interpreted as an indication of reduced sensitivity to negative information; Shackman et al. 2011.)

Although Hibbing et al. have provided a novel and compelling integration of a broad literature, we suggest their proposed mechanism is better suited to account for differences in the trait identified by the TMVT than for political conservatism broadly construed. Future empirical work exploring the origins of political attitude differences could employ a broader range of outcome measures (differentiating between social and economic conservatism, and assessing religiousness, authoritarianism, and traditionalism) to assess this possibility.

How encompassing is the effect of negativity bias on political conservatism?

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Abstract: We argue that the political effects of negativity bias are narrower than Hibbing et al. suggest. Negativity bias reliably predicts social, but not economic, conservatism, and its political effects often vary across levels of political engagement. Thus the role of negativity bias in broad ideological conflict depends on the strategic packaging of economic and social attitudes by political elites.

Hibbing et al. provide a masterful review of the literatures documenting psychological, behavioral, and physiological differences between liberals and conservatives. Moreover, they propose an elegant thesis to account for these literatures' main findings: that conservatives are more attuned and responsive to aversive stimuli than are liberals, and individual differences in dispositional negativity bias account for differences in

conservative versus liberal political attitudes. We comment here on three key aspects of this thesis: the structure of political attitudes, the relations of negativity bias (as broadly conceptualized by Hibbing et al.) with social and economic political attitudes, and contextual moderators of the links between negativity bias and political attitudes. These considerations, we argue, suggest that dispositional influences on political attitudes, and therefore political conflicts, are narrower than the authors describe.

The authors define political conservatism versus liberalism as a single broad dimension, reflecting an "ancient and universal" political division pitting preferences for "stability and order" against those for "progress and innovation" (sect. 1, para. 1). The former side of this division is said to correspond with a "great many of the typical tenets of political conservatism," including not only sociocultural preferences (such as support for restrictive immigration policies, harsh treatment of criminals, and social and moral traditionalism) but also economic preferences (such as opposition to government economic intervention and welfare programs) (sect. 6, para. 7).

However, individuals do not consistently organize their political attitudes along a broad conservative–liberal dimension (e.g., Treier & Hillygus 2009). Rather, individuals with a high degree of political engagement – those who are most interested in and informed about political discourse – typically structure their political attitudes along a single dimension, but individuals who are less engaged typically do not (e.g., Zaller 1992). These findings present a challenge to any claim that a psychological disposition directly or organically leads individuals to adopt broad coherent packages of liberal or conservative attitudes. Such claims must contend with the fact that political attitudes do not organically cohere into particular packages; instead, the emergence of an overarching liberal-conservative dimension appears contingent upon exposure to political discourse, which itself emerges from the strategic actions of political elites.

The messy structure of political attitudes raises a second issue: whether negativity bias relates differently with different kinds of political attitudes. Hibbing et al. mention the claim that negativity bias influences economic attitudes less strongly than it does social attitudes (sect. 6.2, para. 3). They are right to do so, as a great deal of evidence is consistent with this view. For example, Smith et al. (2011) found that physiologically assessed disgust sensitivity predicted conservative positions on certain sexuality-related issues but not on a single economic issue: welfare spending, tax cuts, free trade, or small government (p. 4, see also Inbar et al. 2009a, pp. 720–21 and footnote 2). Oxley et al. (2008) found that physiologically assessed threat sensitivity predicted conservative position on a composite of sociocultural attitudes (e.g., the death penalty, gay marriage, abortion rights), but not a composite of economic attitudes, concluding that "physiological responses to threat are connected to socially protective policy positions but not to economic policy positions" (Supporting Online Material, p. 7). Self-report measures pertaining to negativity bias reliably predict conservative social attitudes but do not reliably predict conservative economic attitudes (Carney et al. 2008; Crowson 2009; Duckitt & Sibley 2009; Feldman & Johnston 2014; Johnston 2013; Johnson & Tamney 2001; Stenner 2005; Van Hiel & Mervielde 2004). To be sure, there are well-conducted studies showing some common dispositional correlates of economic and social attitudes (e.g., Gerber et al. 2010). However, the overall pattern of findings indicates that dispositional negativity bias reliably predicts social conservatism but does not reliably predict economic conservatism. Both social and economic positions are central aspects of right vs. left ideology, as well as frequent sources of political conflict. The available evidence indicates that conflicts about sociocultural issues – but not those about economic issues – may be organically rooted in individual differences in negativity bias.

This brings us to a third and final issue: the moderating effects of contextual variables. Hibbing et al. acknowledge that cultural and historical factors can influence links between negativity bias and political attitudes (sect. 3, para. 9). Another key contextual variable is exposure to political discourse. For example, one study found that high need for cognitive closure predicted more liberal (i.e., pro-government intervention) economic attitudes in both community and student samples, but predicted more conservative (i.e., anti-government intervention) economic attitudes in a sample of political activists; meanwhile, high need for closure predicted more-conservative sociocultural attitudes in all three samples (Golec 2002). What might explain this pattern of results? We propose that individuals high in negativity bias are organically drawn toward conservative sociocultural attitudes. If such individuals become politically engaged (as in the case of activists), then they are frequently exposed to political discourse indicating that conservative sociocultural attitudes should be packaged with conservative economic attitudes, which they ultimately come to adopt. This study and others like it (e.g., Malka & Soto 2011) suggest that some dispositional effects on political attitudes are not organic, but rather are contingent upon exposure to discursive messages about the packaging of political attitudes.

Taken together, the findings reviewed in this commentary support several conclusions about the relations between dispositional negativity bias and political attitudes. As proposed by Hibbing et al., individuals high in negativity bias do appear to be organically drawn toward conservative social attitudes such as restrictive immigration policies, harsh treatment of criminals, and social and moral traditionalism. However, such individuals do not appear to be organically drawn toward conservative economic attitudes. Instead, the effects of negativity bias on economic attitudes are contingent upon contextual factors such as culture and exposure to political discourse. More generally, the bottom-up structuring of sociocultural and economic attitudes compelled by dispositional influences might differ from, and even compete with, the top-down attitude structuring promoted by political discourse (e.g., Hatemi et al. 2012). Conservative economic and sociocultural preferences do not seem to be bound together through the bottom-up influence of negativity bias.

Political ideology is contextually variable and flexible rather than fixed

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Abstract: Hibbing et al. argue that the liberal–conservative continuum is (a) universal and (b) grounded in psychological differences in sensitivity to negative stimuli. Our commentary argues that both claims overlook the importance of context. We review evidence that the liberal–conservative continuum is far from universal and that ideological differences are contextually flexible rather than fixed.

Hibbing et al. make two overarching claims: (a) the liberal–conservative continuum is an "ancient and universal" lens that people use to make sense of their social world (sect. 1, para. 1), and (b) the psychological explanation for the liberal–conservative continuum is that liberals are less sensitive and responsive to negative stimuli than conservatives. These claims are consistent with a scientific commitment to parsimony and alluring in their simplicity. Both of these claims, however, ignore a foundational psychological principle: Context matters. This commentary will address a

number of ways that these claims fail to consider the importance of context.

Hibbing et al. reify the liberal–conservative continuum – they claim that it is an organizational framework that is "universal" and "in our DNA" (sect. 1, para. 3). Evidence suggests that this claim is overstated. Although some studies suggest that people organize their beliefs along a single, liberal–conservative dimension (Judd et al. 1981; Judd & Milburn 1980; Moskowitz & Jenkins 2004; Peffley & Hurwitz 1985), other evidence indicates that people use more than one dimension (Duckitt 2001; Kerlinger 1972; 1984; Krauss 2006; Saucier 2000), and that individuals vary in the number of dimensions that they use to organize their attitudes and beliefs (Stimson 1975). We contend that the tendency for scholars to focus on a single ideological dimension may be an artifact of widespread reliance on samples drawn from Western industrialized democracies and from a narrow band of time (the mid-twentieth through the early twenty-first centuries; see Gunther & Diamond 2003). Cross-cultural studies of political ideology, for example, reveal substantial variability in whether people from East Asia, Southeast Asia, and Oceania use the left–right continuum as an organizational framework (Jou 2010). Similarly, a glimpse at the United States' contemporary political landscape suggests the growing prevalence of ideologies that cannot be easily accounted for by a simple liberal–conservative continuum, including libertarianism (strong needs for autonomy fused with support for "liberalism" on social issues and "conservatism" on economic issues) and coercive egalitarianism (resentment of the wealthy fused with support for the redistribution of wealth, e.g., the Occupy Movement).

Hibbing et al.'s claims about the universality of the liberal–conservative continuum echo claims about the Big Five personality traits. Scholars have claimed that open-mindedness, conscientiousness, agreeableness, extroversion, and neuroticism are universal individual difference variables (McCrae & Costa 1997) that are heritable (Loehlin et al. 1998) and based in physiology (DeYoung et al. 2010). Recent research and theory, however, cast doubt on the universality of the Big Five (e.g., Cervone 2005; Molenaar et al. 2003; Orom & Cervone 2009). These critiques provide evidence that the Big Five describe aggregate-level, between-person differences that say little about within-person psychology and, moreover, do not consistently apply to specific individuals; a given person may see a trait as describing her personality in some contexts but not others. Darla, for example, may describe herself as extroverted in professional settings, introverted at parties, but may not think of herself as either extroverted or introverted with her family. The same critiques apply to claims that the liberal–conservative continuum is universal. Darla may see liberalism and conservatism as relevant to her attitudes about some issues or in some contexts (e.g., when discussing taxes) but irrelevant to other issues or in other contexts (e.g., when discussing same-sex marriage). In short, not all people consistently see their social world through the lens of the liberal–conservative continuum. Whether and when people see politics as relevant is idiographically and contextually variable (e.g., Skitka et al. 2002).

Hibbing et al. also assert that conservatives are intrinsically more sensitive and responsive to negative stimuli than their liberal counterparts. This conclusion, however, is at odds with extant research. For example, conservatives are higher in subjective well-being, nearly twice as likely to report they are happy, less likely to be maladjusted in their adult lives, and are less pessimistic about their future prospects than liberals (e.g., Brooks 2008; Napier & Jost 2008; Schlenker et al. 2012; Taylor et al. 2006). A selective review of this body of research might suggest the existence of a conservative positivity bias! In short, although there may be evidence of conservative negativity in some contexts, there is ample evidence of conservative positivity in others.

The conclusion that context matters is further supported by numerous studies that demonstrate that liberals' and conservatives' reasoning styles can be affected by contextual cues. Conservatives, for example, generally prefer to explain social problems (e.g., poverty) by referencing the characteristics of persons (e.g., laziness) rather than situations (e.g., a lack of jobs), whereas liberals tend to do the converse. Although this pattern has been documented across numerous contexts (e.g., Cozzarelli et al. 2001; Crandall 1994; Kluegel 1990; Skitka 1999; Skitka & Tetlock 1992), it nonetheless reverses in other contexts (Morgan et al. 2010) and does not emerge at all in others (Skitka et al. 2002). Likewise, although liberals reason in ways that are more characteristic of conservatives when resources are scarce, they are distracted, or are under the influence of alcohol (Eidelman et al. 2012; Skitka et al. 2002), other studies similarly reveal circumstances that lead conservatives to reason more like liberals (Skitka & Tetlock 1992; Skitka et al. 2002). Finally, small variations in context cues can influence liberals to be moral deontologists and conservatives to be moral consequentialists, or the converse (Uhlmann et al. 2009). In sum, theory and research reveal that context affects ideological reasoning, findings that contradict the notion that ideological differences are fixed, hardwired, or inevitably emanate from differences in negativity bias.

In summary, we argue that to fully understand political ideology, researchers must adopt a position that appreciates the importance of context and the role of cognitive flexibility. The liberal–conservative continuum is far from universal, and ideological differences – including differences in sensitivity to negative stimuli – are flexible and contextualized rather than fixed.

Will the real fundamental difference underlying ideology please stand up?

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Abstract: Negativity bias explains many ideological differences, yet does not explain research such as conservatives' greater life satisfaction. Conservatives live in safer communities, perhaps to escape negative emotions, yet display numerous other community preferences unrelated to negativity. This tendency toward cognitive consistency can explain both these phenomena *and* many of the phenomena described in the target article.

Social scientists have long studied ideology and proposed myriad theories trying to explain differences along ideological lines. These differences have tended to paint one side in a positive light (usually the left side of the spectrum) and the other side in a negative light (usually the right side of the spectrum). The target article does not do this (thankfully). Rather, the target article remains value-neutral and summarizes a wide swath of literature showing that conservatives are more attuned to threats in their environments than liberals are. The authors state that the basic logic of their proposal is that: "Life is about encounters: sights, sounds, smells, imaginings, objects, and people. These encounters are indisputably physiological and psychological because the systems employed to sense, process, formulate, and execute a response to stimuli are psychological and physiological" (sect. 1, para. 6). Thus, if there are differences in the perception of these stimuli or in people's responses to specific environmental stimuli that map onto politics, then we can infer that there is something in this physiological–psychological system driving ideological preferences. These points are not to be disputed here.

Rather, we focus our comments on pushing this theory to its extremes and inferring that negativity bias is "a key factor in accounting for people's political predispositions" (sect. 6, para. 3). We would like to suggest a similarly extreme, yet related, theory; that the desire for cognitive coherence provides a broader explanation for much of the research discussed. For example, one line of research that the target article does not discuss is the liberal-conservative life satisfaction gap. Specifically, conservatives tend to be more satisfied with their lives (Napier & Jost 2008; but also see Onraet et al. 2013). If negativity bias is the psychological variable that best distinguishes across ideological lines, it ought to be able to integrate the growing body of work on the liberal–conservative "happiness gap." This life satisfaction difference has actually been explained by traits such as a positive outlook (Schlenker et al. 2012), which directly contradicts the negativity bias hypothesis. In fact, the basis of the prevailing cognitive-behavioral therapeutic model helps people to recover by getting them to stop focusing on the negative, and generating new cognitions and behaviors that steer them away from the negative. People who wish to be happier go to therapy to reduce their fixation on negative stimuli. Why would people showing a strong tendency to fixate on negative stimuli also report greater satisfaction with life? Why would they be happier?

Models of cognitive coherence (Monroe & Read 2008; Simon et al. 2004), which posit that our attitudes are a product of the simultaneous constraints of existing beliefs, dispositions, and identities can explain both the cited research and a variety of other phenomena related to liberal-conservative differences. The conservative predisposition toward negative emotions such as disgust (Graham et al. 2013; in preparation; Inbar et al. 2012b) and threat sensitivity (Oxley et al. 2008) is clear, and a coherent response to these emotions is to distance ourselves from the sources of disgust (e.g., sexually explicit material) or potential threat (e.g., outgroups). In contrast, liberals may be more willing to suppress their initial emotional reactions and rationalize a dissonant state (Skitka et al. 2002; Wisneski et al. 2009). However, this willingness to live in more dissonant states certainly has hedonic consequences. The liberal mindset could be regarded as contrary to what our natural psychological immune system (Gilbert et al. 1998) does to keep us happy. Indeed, in some of our preliminary data, we find that conservatives who are primed with a threat report that they are better drivers than average, happier, and view themselves more positively, a finding which could either be interpreted as self-deception or as indicative of a functioning psychological immune system (Wojcik et al. 2013).

Coherence explains a variety of other findings that are unaccounted for by negativity bias as well (Iyer 2012). Conservatives are more likely to create coherence between their factual and moral beliefs, showing more consistency between their beliefs about the morality and effectiveness of capital punishment (Kesebir et al., under review; Liu & Ditto 2013). This desire for coherence may underlie observed differences in cognitive complexity (Tetlock 1983; Tetlock & Mitchell 1993), a line of research that is orthogonal to negativity bias. Coherence also explains more of our current research where we seek to understand *where* liberals and conservatives are coming from. The communities where liberals and conservatives live differ in important ways, and these differences lead to widely different life experiences (Bishop 2008; Craik 2000; Motyl et al. 2014; Rentfrow et al. 2008). These diverse experiences contribute to the conflicting narratives that people craft as they try to craft a coherent understanding of their social realities. Conservatives do tend to reside in communities that prioritize safety and security, and in communities with relatively lower crime rates, perhaps in order to encounter fewer negatively valenced environmental stimuli than liberals do. In laboratory studies where they are presented with negative stimuli that is uncommon in their daily lives, conservatives may fixate more on that negative, threatening stimuli than liberals do, because they do have a stronger reaction to negative stimuli. Yet we also find that conservatives seek out neighborhoods that have more sports fans, which coheres with having a competitive worldview (Lakoff 2002). If negativity bias were truly the defining feature of conservatism, conservatives should instead shy away from optional competitive situations, like sports, where losses occur half the time and all but one team fails to attain their goal of a championship in each season.

In conclusion, we think that negativity bias accounts for many ideological differences and is an encouraging step forward in thinking about what differentiates liberals from conservatives. At present, this account fits an impressive quantity of the data but a broader theory that considers models of cognitive coherence may be able to explain both negativity bias and seemingly contradictory findings, such as conservative life satisfaction.

Many behavioral tendencies associated with right-leaning (conservative) political ideologies are malleable and unrelated to negativity

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Abstract: Recent research has identified several judgment and decision making tendencies associated with right-leaning political ideologies that are difficult (if not impossible) to explain in terms of stable, negative affective appraisals because they (1) are uncorrelated with the negativity of the stimuli being considered, (2) do not reflect divergent affective evaluations, and (3) can be eliminated by superficial manipulations and interventions.

Hibbing et al. propose that variations in political ideology, along the left–right (liberal–conservative) dimension reflect deep-seated, stable, inter-individual differences in physiological and psychological affective responses to negative stimuli. Specifically, they argue that conservatives (those with a right-leaning political orientation) have a negativity bias (they react more strongly to negative stimuli). Hibbing et al. convincingly show that one can find evidence to support this proposal. At the same time, they overlook much of the counterevidence contained within the psychological research literature. Building on recent findings, we challenge their claim that patterns of behavior moderated by (or correlated with) political orientation are attributable to a stable, affect-based negativity bias among conservatives.

First, a number of behavioral tendencies associated with right-leaning (conservative) political views are uncorrelated with the negativity of the stimuli being considered. For example, right-leaning Americans (i.e., Republicans) are more likely to vote for political candidates who have stereotypically Republican-looking faces, whereas left-leaning U.S. voters (i.e., Democrats) are not influenced by these political facial stereotypes (Olivola et al. 2012). Yet the voting preferences of *both* Democrats *and* Republicans are strongly (and positively) predicted by another facial stereotype: how competent the candidates look (Olivola et al. 2012). This pattern of results – Republicans being more influenced by one set of facial features, but equally influenced by another – is difficult to explain within Hibbing et al.'s theoretical framework. It is unlikely that Republican voters react more strongly to "facial-conservatism" than "facial-competence" because the latter is actually a stronger predictor of voters' preferences (Olivola & Todorov 2010); even among Republican voters (Olivola et al. 2012). As another example, consider political

consumerism, whereby people deliberately abstain from purchasing products that conflict with their political views (boycotting) and/or deliberately purchase products that accord with their political views ("buycotting"). Hibbing et al.'s assertion that "[c]onservatives have a negativity bias, whereas liberals do not have a positivity bias" (sect. 6.3, para. 3) implies distinct predictions concerning the tendency for liberals and conservatives to engage in political boycotting (negative product avoidance) versus buycotting (positive product approach). If conservatives react more negatively (than liberals) to products that are incongruent with their political views then they should be more likely (than liberals) to engage in political boycotting. In contrast, if conservatives are distinguished solely by a negativity bias and liberals do not show a positivity bias then both groups should react just as positively to politically congruent products, and therefore be equally likely to engage in political buycotting. However, the data are inconsistent with these predictions: Conservatives are less or equally likely (than liberals) to engage in political boycotting, whereas liberals are more likely (than conservatives) to engage in political buycotting (Katz 2011; Newman & Bartels 2011). Taken together, these examples almost suggest a double-dissociation between politically differentiated behavioral patterns and stimulus negativity.

Second, behavioral tendencies associated with right-leaning (conservative) political views that are correlated with stimulus negativity do not necessarily reflect differences in affective appraisal. For example, we found that people who identify with right-leaning political parties are more likely (than their left-leaning counterparts) to exhibit an irrational aversion to taxes, in the specific sense that they will go to greater lengths to avoid tax-related costs than to avoid equivalent (or larger) financial costs that are unrelated to taxes (Sussman & Olivola 2011). However, this "tax aversion" is driven by differing beliefs about tax usage and not by differing emotional appraisals: left- and right-leaning respondents reported feeling equally angry when their tax dollars were used in ways that they disapproved of, but left-leaning respondents were more likely to believe that their tax dollars were being used in ways that they approved of (Sussman & Olivola 2011). Similarly, although Republicans are less willing to pay a surcharge for emitted carbon dioxide that is framed as a "carbon tax" (vs. "carbon offset"), this tendency is driven by memory retrieval processes and not by affective reactions (Hardisty et al. 2010).

Third, many behavioral tendencies associated with right-leaning (conservative) political views are too malleable to be the product of deep-seated physiological reflexes. For example, we found that we can decrease (increase) tax aversion among right-leaning participants, simply by asking them to list a few positive (negative) uses of their tax payments (these manipulations did not influence left-leaning participants; Sussman & Olivola 2011). In fact, asking right-leaning participants to consider positive uses of their tax payments eliminated the left-right difference in tax aversion altogether (Sussman & Olivola 2011). Similarly, merely priming political identity (by asking participants which political party and presidential candidate they supported) increased the likelihood that Republicans (but not Democrats) preferred lower-risk (vs. higher-risk) monetary gambles when these were labeled as "conservative" (vs. "risk-tolerant") choice options (Morris et al. 2008).

The above studies demonstrate failures of negativity bias to explain several important behavioral and attitudinal correlates of political ideology, and thus represent empirical challenges to the theory advanced in the target article. More generally, we are skeptical that any single variable or dimension can provide a unifying account of something so complex, malleable, and nebulous as political ideology. Hibbing et al. acknowledge that their theory faces many difficult questions (e.g., "If conservatives are universally more averse to negativity, it would seem that heightened response and attention to the negative should lead to equal amounts of concern over a leveled rainforest and a hostile out-group." [sect. 6.2, para. 6]). Unfortunately, their attempts to address these issues (e.g., "…it may be the case that conservatives are particularly attuned to threats by an identifiable, malevolent, volitional force such as a bad guy with a gun. Or, perhaps attitudes toward longer term and arguably more amorphous threats such as climate change, pollution, and income inequality are not as connected to negativity biases" [sect. 6.2, para. 6]) lead them to contradict their earlier claims (e.g., "Environmental stimuli that are unexpected, ambiguous, uncertain, or disorderly also appear to generate more response and attention from conservatives than liberals at a variety of levels" [sect. 6, para. 6]). It seems the only way to accommodate existing data is to adopt a definition of "negativity bias" that is so flexible it risks becoming unfalsifiable.

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Individual differences in political ideology are effects of adaptive error management

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http://pure.au.dk/portal/en/persons/michael-bang-petersen(7998cc16-75d5-4065-8b6e-395d73e22151).html

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Abstract: We apply error management theory to the analysis of individual differences in the negativity bias and political ideology. Using principles from evolutionary psychology, we propose a coherent theoretical framework for understanding (1) why individuals differ in their political ideology and (2) the conditions under which these individual differences influence and fail to influence the political choices people make.

Understanding how deep individual differences – such as political ideology – emerge from universal, evolved cognitive biases – such as the negativity bias – is one of the key questions facing the social sciences.

From the perspective of evolutionary psychology, cognitive biases – that is, asymmetries between the subjective weights attributed to outcomes in cognitive processes and the probability of the occurrence of the outcomes – are design features that evolved to maximize expected fitness when making decisions under uncertainty (Tooby & Cosmides 1990). Uncertainty implies that errors in identifying situations accurately are possible (Haselton & Nettle 2006; Johnson et al. 2013). By utilizing recurrent statistical relationships in the environment of evolutionary adaptedness, cognitive biases maximize fitness by weighting (1) the probability of the occurrence of errors by (2) the fitness consequences of errors if they occurred. Specifically, the negativity bias weights the probability and fitness consequences of erring by failing to identify a situation as involving potential for resource loss (a false negative) relative to the fitness consequences of erring by incorrectly identifying a potentially fitness-enhancing situation as involving potential for resource loss (a false positive). When erring by way of a false negative, the potential for fitness costs is magnified as the individual is off guard. When erring by way of a false positive, individuals shun situations that potentially involve fitness gains. Because false negatives in this case were plausibly associated with greater fitness loss over evolutionary history than false positives (Haselton & Nettle 2006; McDermott et al. 2008), this created a selection pressure for the negativity bias (even if probabilities of the errors were equal). In this perspective, cognitive biases reflect adaptive error management.

The framework of analyzing cognitive biases as adaptive error management adds to Hibbing et al.'s discussion about the relationship between individual differences in political ideology and the adaptive nature of the negativity bias in two important ways: First, the framework directly predicts the existence of the *individual* differences in the negativity bias and, subsequently, political ideology that Hibbing et al. struggle to reconcile with an adaptationist account. Second, the framework provides new testable predictions on the existence of *contextual* differences in when these differences are important and when they turn unimportant.

Only to the extent that the ratio of false negative and false positive errors in terms of expected fitness within a specific domain are constant across individuals and contexts, should biases in that domain be universally fixed (genetic noise aside). If, however, there have been systematic and evolutionarily recurrent variations across individuals and contexts, it is plausible that relevant cognitive biases evolved within a larger cognitive architecture that allows for systematic individual and contextual calibration of those biases to fit individual circumstances (see also Buss 2009; Lukaszewski & Roney 2011; Tooby & Cosmides 1990).

With regards to resource loss, it is highly plausible that the ratio of the fitness consequences of false negative and false positive errors, respectively, would have varied considerably and systematically from individual to individual over human evolutionary history. For example, previous research consistently shows that a range of basic individual differences influence people's abilities to guard against unexpected resource loss (e.g., Petersen 2013; Sell et al. 2009; Tooby & Cosmides 1996). Such differences would influence how different individuals trade off unexpected resource loss relative to the foregoing of resource gains. As consequence, such differences should be picked up by any calibrational mechanism designed to align the strength of the negativity bias with individual circumstances and, subsequently, have downstream effects on political ideology. If valid, evolutionarily recurrent correlates of loss exposure should, in part, predict modern political ideology. Some evidence suggests the existence of such a link. For example, lack of social support (Petersen 2013), high levels of pathogen exposure (Fincher et al. 2008) and chronically (versus temporarily) low levels of resources (Henningham 1996) are all factors that ancestrally would have been associated with decreased abilities to accommodate resource loss and have all been found to be associated with social conservative ideology and/or judgments.

Just as fitness consequences of different outcomes vary systematically across individuals, the probability of unexpectedly losing resources versus unknowingly foregoing gaining resources will vary across contexts. Contexts differ in their informational load either because of differences in available information or in assigned attention. In order to maximize expected fitness in specific situations, it is likely that natural selection geared the mind to not exclusively rely on base rate estimates but, rather, to dynamically update probability estimates depending on present information. Importantly, when probabilities that specific situation identifications constitute errors approach zero and one, respectively, other asymmetries related to making these errors will become increasingly unimportant. In other words: as certainty about outcomes increases, it will be adaptive to shift away from initial decision-making biases. In terms of cognitive architecture, this argument predicts the existence of mechanisms for not just calibrating individual differences in the strength of biases but also of mechanisms designed to temporarily deactivate a relevant bias in the face of informational certainty. Consistent with this argument, research suggests that – under specific circumstances – people's political views converge independently of strong general ideologically relevant individual differences. While individual differences in ideological outlook often fuel strong political disagreement, liberals and conservatives are surprisingly likely to agree when facing certain (rather than uncertain) information about the politically-relevant events, groups or individuals facing them (see Petersen et al. 2011, 2012; Petersen & Aarøe 2013; Tetlock et al. 2013).

This proposed notion of ideology as an individually calibrated error management system provides an important theoretical superstructure to the argument of Hibbing et al. It embeds the analysis of political ideology within an adaptationist framework that facilitates the formulation of clear predictions on the *ultimate* and *proximate* causes of ideological differences, and on the *conditions under which* the relationship between elevated negativity bias and political conservatism should not apply. The notion of ideology as an error management system is also normatively important. It suggests that political polarization is not inevitable: when the problems facing society are clear, conservatives and liberals are predicted to converge in the political solutions they promote.

The role of negativity bias in political judgment: A cultural neuroscience perspective

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Abstract: Hibbing et al. provide a comprehensive overview of how being susceptible to heightened sensitivity to threat may lead to conservative ideologies. Yet, an emerging literature in social and cultural neuroscience shows the importance of genetic and cultural factors on negativity biases. Promising avenues for future investigation may include examining the bidirectional relationship of conservatism across multiple levels of analysis.

Contrary to the notion that political decision making relies mainly on rational thoughts, Hibbing et al. provide substantive evidence indicating that negativity bias is a key dimension underlying political ideology across cultures. Conservatives demonstrate a stronger preference for processing negative information compared to liberals. Here, we agree that the rational view of the political mind is too narrow, and that an affective dimension, like negativity bias, should be taken into consideration to better understand mechanisms defining political judgment. Nonetheless, for negativity bias to be used as a predictive factor for political attitudes, we argue that the authors should also consider the heterogenetic nature of negativity bias. Finally, the authors limited their levels of analyses to physiological and psychological levels. Here, we argue that extending their scope to include genetic and cultural levels would offer a more comprehensive picture of the political mind.

Limitations of the rational view of the political mind. Research has shown contradicting evidence about the popular belief that political judgment mainly concerns high-level, deliberative cognitive processes. Hibbing et al. cite many priming studies showing political judgment being influenced by seemingly irrelevant environmental stimuli, such as a messy room, disgusting odor, uncomfortable chair, church, and happy faces. Consistent with this line of research, recent studies have shown that perceived attributes of political candidates based solely on candidates' facial appearance can predict voting behaviors in both simulated and actual elections (Chiao et al. 2008; Little et al. 2007; Todorov et al. 2005). In our study (Chiao et al. 2008), for example, participants were asked to judge facial pictures taken from actual congressional candidates in terms of several attributes. We found that both perceived competence and dominance

predicted actual House of Representative election outcomes. Altogether, evidence consistently shows affective heuristics in political decision-making.

The heterogenetic nature of negativity bias. Hibbing et al. summarize psychological and physiological evidence showing higher negativity bias among conservatives compared with liberals. When encountering negative stimuli, conservatives are more attentive, react with stronger activity in the amygdala, have an enhanced skin conductance response, frown more, and show a stronger startle blink. Yet, this bias among conservatives does not apply to every type of negativity. In fact, the authors acknowledge "the messiness" of politics – that there are some negative situations in which liberals demonstrate greater bias compared with conservatives, such as income inequality, gun accidents, pollution, and so forth. Moreover, liberals are found to be more empathetic than conservatives (Hirsh et al. 2010), which may contradict the notion that liberals are less sensitive to aversive situations, such as the pain and suffering of others. Consistent with this idea, we previously conducted an fMRI study (Chiao et al. 2009) to investigate empathy in relation to social dominance orientation (SDO; Pratto et al. 1994), a construct reflecting social hierarchy (as opposed to egalitarian) preference and associating closely with conservative ideology. Participants were asked to view pictures of others in pain and to report how empathetic they felt toward those people. We found that high-SDO participants showed less activity in the pain matrix, including anterior cingulate cortex and anterior insula, when empathizing with others' pain. Although consistent with the view that conservatives tend to be less empathic than liberals, our results somewhat contradict the negativity bias argument. Specifically, in our study, high SDO participants, who had hierarchical ideologies closer to conservative, showed less bias under a negative situation (i.e., viewing others' pain). Hence, we suggest that negative bias phenomena are not homogenous; rather negative bias seems to be domain-specific. Next steps for political scientists, then, are not only identifying the domains that may be more sensitive to liberals than conservatives (and vice versa), but also finding factors that determine such domains (e.g., tangibility of topics as mentioned by the authors).

Genes, culture, and their interaction. The authors did not narrow their levels of analyses to genetics, nor broaden them to culture. However, understanding both genetic and cultural contributions to the political mind may prove fruitful. As for genetics, although the influence of specific genes on political judgment may be small, the association between genes and negativity bias is well documented, particularly in the case of SLC6A4 gene in the serotonin-transporter-linked polymorphic region (5-HTTLPR) (Canli & Lesch 2007; Hariri et al. 2002).

Genetic studies show a relationship between 5-HTTLPR genotype and negativity bias, leading to heightened sensitivity to social cues, in which S-allele carriers of the short (S) allele variant of the polymorphism are found to be more sensitive to social cues than long (L) carriers. S-allele carriers, for example, show higher heart-rate and blood-pressure reactivity than L-allele carriers when giving a speech to negative audiences (Way & Taylor 2011). Additionally, rhesus macaques, Macaca mulatta, with one S-allele (SL) show larger pupil diameters when looking at photos of high, versus low, social dominant macaques than those without an S-allele (LL) (Watson et al. 2009). This association between 5-HTTLPR genotype and social sensitivity may then influence political ideology in terms of hierarchical preference. In rhesus monkeys, for instance, when female monkeys were reorganized into a group of five monkeys varying in terms of 5-HTTLPR genotype, forcing the group to form a new social status hierarchy, S-allele carriers expressed the highest levels of both submission and aggression toward other members (Jarrell et al. 2008). This pattern of behaviors is expected among high-SDO (hence, conservative) humans, as well as those living in countries high in power distance index (PDI) (Hofstede 2001), where the inhabitants prefer hierarchical systems. Hence, genetic influence on political ideology may interact with culture. Strikingly, in human society, countries that are high in PDI scores are more likely to have a greater prevalence of 5-HTTLPR S-allele carriers (Chiao 2010). Supporting this notion, species of rhesus monkey that have more tolerant societies with lenient hierarchy and relaxed dominance usually carry only the L-allele (Chiao 2010). However, species that are intolerant and have a strict hierarchy, including M. mulatta, carry at least one S-allele.

In sum, we argue that multilevel analysis approach covering from genetic to psychological, physiological and cultural levels would be more appropriate in analyzing the influence of negativity bias on political judgment.

Explaining ideology: Two factors are better than one

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Abstract: Hibbing et al. contend that individual differences in political ideology can be substantially accounted for in terms of differences in a single psychological factor, namely, strength of negativity bias. We argue that, given the multidimensional structure of ideology, a better explanation of ideological variation will take into account both individual differences in negativity bias and differences in empathic concern.

In their target article, Hibbing et al. suggest that individual differences in political ideology can be traced to differences in the way in which liberals and conservatives attend to and process negative stimuli. In detail, their hypothesis is this: Compared with liberals, conservatives are more attuned to, and devote more processing resources to, negative stimuli, and it is this difference in "negativity bias" – that is, the fact that conservatives are more strongly biased toward negative stimuli than liberals are – that accounts in large measure for the divergence in political perspective between the groups. The principal appeal of the negativity bias hypothesis (NBH) is twofold. First, NBH promises to account for more of the psychological and physiological data on ideological differences than competing accounts. Second, NBH promises to account for the data at a deeper level, by identifying a causal mechanism underlying those differences. But does it?

We have our doubts. The main source of our skepticism relates to the authors' use of a single, unidimensional measure of political ideology, anchored by liberalism on one end and conservatism on the other. A problem that arises with the use of this measure is that it glosses over the fact that, although some people self-identify as conservative on the basis of their views about both sociocultural issues (such as abortion and gay rights) and economic issues (such as taxation and social welfare programs), others self-identify as conservative on the basis of their views about issues in one of these domains but not the other. The distinction between domains here reflects the distinction made in the "ideology as motivated social cognition" literature between two factors underlying the liberal–conservative divide: (1) attitudes toward social change, indexed by right-wing authoritarianism (Altemeyer 1998) and (2) attitudes toward economic inequality, as measured by social dominance orientation (Sidanius & Pratto 1999). Attitudinally speaking, then, there seem to be two routes to conservatism, one social (rejecting change) and one economic (accepting inequality) (Jost et al. 2003). What's more, these attitudinal routes appear to have different motivational origins (Duckitt et al. 2002). Negative attitudes toward social change are thought to stem from a concern to reduce threats to the prevailing social

order, whereas positive attitudes toward inequality are thought to derive from a concern to maximize economic self-interest.

Assuming this general picture is right, individual differences in ideology exhibit an underlying complexity that unitary explanations like NBH are unlikely to capture. The reason for this is simple: Although differences in negativity bias plausibly have a direct effect on *security* motivation (i.e., the motivation to reduce or deflect social threats), it is less plausible that such differences have an analogous influence on *power* motivation (i.e., the motivation to maintain or improve one's economic status). In other words, even if heightened negativity bias does a reasonable job of explaining and predicting the tendency to adopt socially conservative attitudes, it does not do nearly so well where economic conservatism is concerned. (Indeed, as Hibbing et al. observe, insofar as extremes of economic inequality may be seen to pose a social threat, a heightened negativity bias might just as well predict a traditionally liberal response to poverty, as opposed to a traditionally conservative one.) And that explanatory and predictive shortfall, we think, is something that advocates of NBH ought to worry about.

How might the shortfall be made up? One possibility is that ideological differences based on contrasting attitudes toward economic inequality are driven by differences in empathic concern or compassion, understood as an other-oriented affective response to the plight of a person in need (Batson 2009). Individuals relatively high in empathic concern, on this view, would be strongly motivated to oppose inequality and endorse a more egalitarian perspective, whereas individuals lower in this trait would be less pulled in this direction. Indeed, validating the stereotypical contrast between "bleeding-heart" liberals and "tough-minded" conservatives, recent evidence from Five Factor–based studies of personality suggests that liberals are more compassionate (but less polite) than conservatives (Hirsh et al. 2010).

The alternative picture that emerges from these considerations looks something like our Figure 1.

In this dual-factor model, the two strands of conservative ideology have distinct motivational and attitudinal profiles. This proposal, which effectively embeds NBH as a component, has greater explanatory and predictive power than Hibbing et al.'s single-factor model. In particular, it helps to explain why economic conservatives, being relatively low on empathic concern, respond to poverty as they typically do – namely, by downplaying the suffering of the poor and emphasizing personal responsibility for life outcomes (i.e., depicting the poor as agents, rather than victims, of misfortune). Hence, poverty may be processed by economic conservatives less as a social threat and more as a spur to the pursuit of self-interest. Similar remarks apply, *mutatis mutandis*, to the underlying psychology of liberalism (see Figure 2).

The dual-factor approach is not without limitations, however. One advantage of the single-factor approach that it gives up, for example, is the prediction that social conservatism and economic conservatism (and the corresponding variants of liberalism) will be strongly correlated. That such a correlation exists seems clear (Jost et al. 2009). What is less clear is how to explain it. One possibility, of course, is that differences in negativity bias lie at the root of both tendencies. Proponents of NBH would presumably favor this option. An intriguing alternative, and one more attractive to the dual-factor theorist, is that negativity bias and empathic concern (trait compassion) are inversely correlated. This may seem counterintuitive, given that compassion involves sensitivity to the distress of others, and distress is a paradigmatically negative stimulus. But empathic concern has less to do with emotional responsivity than with capacities for emotion regulation, particularly the capacity to downregulate one's own (self-oriented) emotional response to an aversive situation. This is reflected in studies that show a negative correlation between

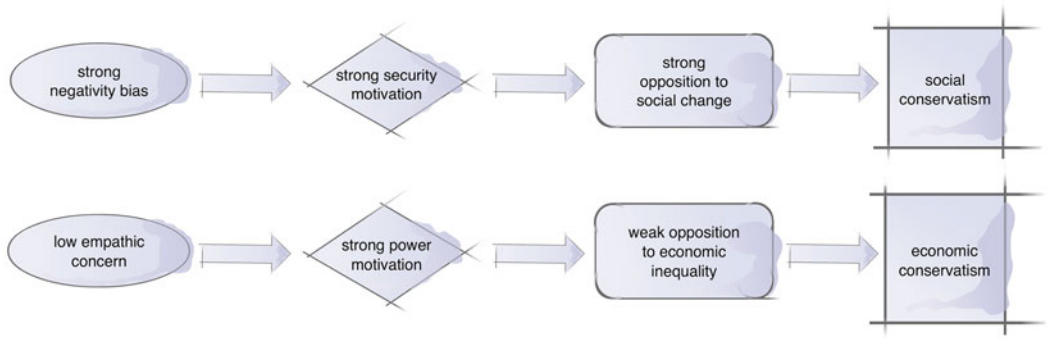


Figure 1 (Robbins & Shields). Two psychological routes to conservativsm.

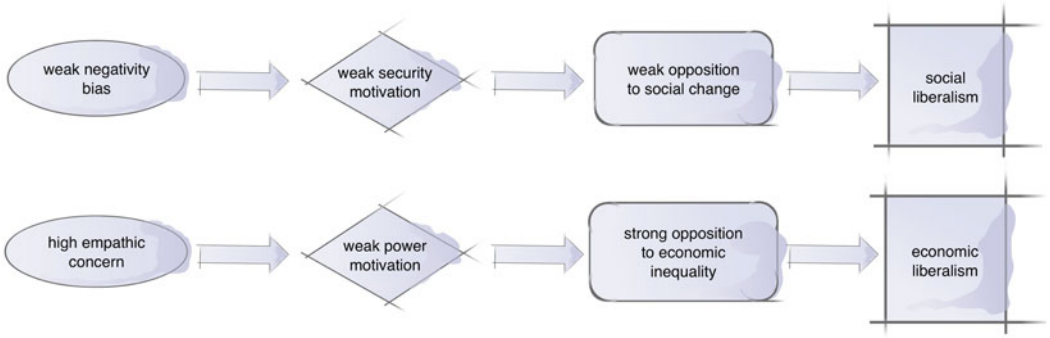


Figure 2 (Robbins & Shields). Two psychological routes to liberalism.

ratings on the empathic concern and personal distress subscales of the Interpersonal Reactivity Index (Thakkar et al. 2009), as well as by evidence from functional neuroimaging (Decety & Moriguchi 2007).

Negativity bias and basic values

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Abstract: Basic values explain more variance in political attitudes and preferences than other personality and sociodemographic variables. The values most relevant to the political domain are those likely to reflect the degree of negativity bias. Value conflicts that represent negativity bias clarify differences between what worries conservatives and liberals and suggest that relations between ideology and negativity bias are linear.

My theory of basic human values strongly supports the fundamental claim of this article. It also helps to address some questions that Hibbing et al. raise.

Substantial cross-national evidence demonstrates that specific basic values underlie conservative versus liberal political preferences (Schwartz et al., in press). The values likely to reflect the strength of a person's negativity bias are the ones most relevant to the political domain. Figure 1 below presents a circular motivational continuum on which ten basic values are organized. The three outer circles specify principles that underlie and account for the organization of the values in the center. Any two values may express compatible or opposing motivations. The closer two values are in the circle (e.g., tradition and conformity), the more compatible their motivations; the more distant (e.g., tradition and hedonism), the more their motivations conflict.

Consistently, universalism and self-direction values relate to liberal preferences whereas security, conformity and tradition values relate to conservative preferences. I briefly define the core motivational goals of these values.



Figure 1 (Schwartz). Circular motivational continuum of basic values.

Universalism: understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

Self-Direction: independent thought and action – choosing, creating, exploring.

Security: safety, harmony, and stability of society, of relationships, and of self.

Conformity: restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.

Tradition: respect, commitment and acceptance of the customs and ideas that traditional culture or religion provide.

The outer circle in the figure specifies the organizing principle that underlies value relations and is most relevant to political preferences. Values in the bottom part of the circle are based in the need to avoid or control anxiety and threat and to protect the self. Conservation values (bottom left) emphasize avoiding conflict, unpredictability, and change by submission and passive acceptance of the status quo. Self-enhancement values (bottom right) emphasize overcoming possible sources of anxiety by controlling, dominating, or gaining admiration. In contrast, values in the top part of the circle are relatively anxiety free; they express growth and self-expansion. Self-transcendence values (top left) emphasize promoting the welfare of others. Openness to change values (top right) emphasize autonomous, self-expressive experience.

Conservation values, which consistently correlate with conservatism, are aimed at coping with negative features of the environment, with protecting the self. Power values, which also frequently correlate with conservatism, are aimed at coping with negative features too, but through dominance and control over people and resources. It is highly plausible that greater physiological and psychological sensitivity to negative stimuli would lead people to endorse these values. It is equally plausible that those who endorse the values associated with liberalism, universalism and self-direction, are free to do so because they are less sensitive to negative stimuli.

Relations of basic values to worries further support the idea that a negativity bias undergirds conservatism. Hibbing et al. note a seeming incongruity in conservatives' greater concern than liberals' with protection from criminals, pathogens, and out-groups but their lesser concern with poverty, accidental shootings, and environmental degradation. The distinction between what Boehnke et al. (1998) called micro and macro worries can resolve this incongruity. Micro worries concern threats to the self or in-group – personal or in-group health, safety, economic and social success. Macro worries concern threats to entities external to the self – problems in the society or world of poverty, disease and harm to the environment. Micro worries, which correlate most positively with power values and most negatively with universalism values, cause conservatives more distress. Macro worries, which correlate most positively with universalism values and most negatively with power values, cause liberals more distress. Thus, what troubles people more depends on values that are grounded in self-protection versus growth, values that relate consistently to conservatism versus liberalism.

Are relations between negativity bias and ideology linear, or might the observed associations be a result of people who are located at the extremes on either or both of these dimensions? An individual's preference for security versus universalism values can serve as a proxy for the degree of the negativity bias. Using these values, I addressed the question of linearity with data from five rounds of the European Social Survey. Respondents from representative samples in 33 countries reported their values and located themselves on a 0–10 left–right scale.

In 18 of 20 Western democracies, an ANOVA revealed a linear pattern. The importance of security minus universalism was greater to the extent that respondents located themselves on the right rather than the left. In 14 of these countries, however, the extreme left (0) attributed slightly more importance to security

than the less-extreme left (1). This supports the view that those at the extremes do not account for the relations of ideology to negativity bias. In contrast, in 13 post-communist countries, the pattern of greater importance for security minus universalism values on the right emerged in only four countries. Most likely, this reflects context specific meanings of ideologies and/or values (Piurko et al. 2011; Thorisdottir et al. 2007); but one might wonder whether the experience of substantial threat and little autonomy might neutralize differences in sensitivity to negative stimuli.

Hibbing et al. avoid speculating about the amount of variance that negatively bias can explain in conservative versus liberal political stances. They locate negativity bias at an intermediate level of analysis and, as I understand them, argue successfully that it accounts for the coherence among an immense array of variables at higher levels of analysis. Yet, the question of how much influence negativity bias has on variables at higher levels is worth pursuing. This requires developing persuasive measures of this bias and studying its direct and mediated effects on personality variables known to predict political attitudes, ideology and voting. Basic values have emerged as perhaps the strongest personality variable to predict political thought and action (Caprara et al. 2006; Schwartz et al., in press). Hence, assessing the link from negativity bias to values, assumed in this comment, would be a productive next step.

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The importance of adult life-span perspective in explaining variations in political ideology

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Abstract: As a comment on Hibbing et al.'s paper, we discuss the evolution of political and social views from more liberal to more conservative over the span of adulthood. We show that Hibbing et al.'s theoretical model creates a false prediction from this developmental perspective, as increased conservatism in the adult life-span trajectory is accompanied by the avoidance of negative bias.

Hibbing et al. refer to our findings (Kossowska & van Hiel 2003) that indicate a substantial dissociation between social-cultural conservatism and economic-hierarchical conservatism in western and post-socialist European countries, regardless of whether these constructs are classified as ideologically right-wing or left-wing. However, there is an even more important and universal dimension that is only incidentally mentioned in the target article: age differences in social-cultural conservatism (for a recent review and empirical evidence, see Cornelis et al. 2009). Cross-sectional data have suggested a monotonic effect of age on social-cultural conservatism and the need for closure (Cornelis et al. 2009). The consistent finding that older people tend to be more conservative than younger people has emerged in so many studies that the adult life-span perspective should be incorporated into Hibbing et al.'s proposed theoretical framework on sources of variation in political views.

The integration of political view variations with adult life-span perspective demands deeper consideration, as our recent work shows (Verhaeghen et al. 2012) that older adults' everyday life is governed by a multitude of compensatory mechanisms, most of which are social, emotional, and motivational in nature (see also Sedek & von Hecker 2004). Compensatory models of emotion regulation, such as the socioemotional selectivity theory (SST) and its further refinement in the form of the theory of strength and vulnerability integration (Carstensen 2006; Charles & Carstensen 2008; Reed & Carstensen 2012), are highly relevant to the theoretical argument of the target paper. In our opinion, the implications of these models should evoke considerable doubt about the validity of the target article's central claim as it concerns the exact direction of the relationship between conservatism and negative bias. An increase in conservatism and a reduction in negative emotional experiences with age are consistent with each other, and both derive from compensatory models of emotion regulation. According to the SST, as the perceived time left in life changes, we should see a shift in priority between the two categories of goals (acquisition of knowledge and emotion regulation). From this perspective, it follows that conservatism increases with age; as compared with young adults, older adults are more focused on the short-term goal of optimizing psychological well-being rather than the long-term goal of preparing for the challenges ahead.

The positivity effect, which is grounded in the theoretical framework of SST, is an age-related preference for positive over negative stimuli in cognitive processing that is driven by chronically activated goals. From studies on this topic, we can conclude that older people are more attentive to and have a better memory for positive information than negative information (Reed & Carstensen 2012; see also Carstensen 2006). The special strengths related to present-oriented goals are found among older adults in the use of the emotion regulation strategies of deemphasizing negative emotions and emphasizing positive emotions. Reed and Carstensen (2012) show in their review that the research evidence is robust, as it is supported by a substantial body of data stemming from various experimental paradigms and stimuli types; the positivity effect among older adults has been found in studies on visual attention, working memory, short-term memory, autobiographical memory, false memories, and decision making. We notice a clear incompatibility between predictions from the adult life-span perspective on the relationship between negative bias and conservatism and the predictions formulated in the target article. More precisely, Hibbing et al.'s theoretical model creates a false prediction from this developmental perspective because increased conservatism in the adult life-span trajectory is accompanied by avoidance of negative bias, which suggests that the relationship is opposite to that presented in the target article.

Interestingly, some other aspects of the target paper on the relationship between conservatism and an increased need for closure are supported from this developmental perspective. Aging not only increases conservative views but also strongly increases scores on the need for closure (Kossowska et al. 2014). This is especially true for two of the need-for-closure subscales: intolerance of ambiguity and closed-mindedness. Older people may want closure out of concern for ambiguity-avoidance or from a desire to stick to their own knowledge, belief, or opinion. Older adults may conserve resources by simplifying their interactions with the environment and limiting both the quantity and complexity of information to which they attend. This may be manifested as a reliance on highly routinized and schematic cognitive and behavioral patterns rather than the construction of new and perhaps more adaptive approaches on the spot. It is therefore possible that for older adults, the need for closure, especially intolerance of ambiguity and closed-mindedness, may be related to a variety of strategies that facilitate the effort to maintain closure. One such strategy is adherence to certain ideologies, as they have a potent knowledge structure that contains established ways of viewing the world and reduces

feelings of uncertainty. In this specific context, the model proposed by Hibbing et al. may be true: Ideological beliefs may be related to negative emotions as the source of the need for closure, whereas feelings of uncertainty and ambiguity are related to ideological beliefs. However, as older adults are mainly motivated to seek closure, they may also search more for positive rather than negative information because being in a positive mood allows them to successfully achieve closure (Kossowska et al. 2012). Thus, although the need for closure (and ideological beliefs) may be related to negative emotions, positive emotional states allow older adults to achieve closure and reduce uncertainty.

To summarize, we suggest the necessity for a deeper integration of the adult life-span perspective with roots of variations in the political views theoretical model, as the current version of Hibbing et al.'s model presented in the target article is inconsistent with the existing data on emotion regulation (i.e., deemphasizing orientation to negative stimuli) and increase of conservatism over the span of adulthood.

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Confounding valence and arousal: What really underlies political orientation?

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Abstract: The negative valence model of political orientation proposed by Hibbing et al. is comprehensive and thought-provoking. We agree that there is compelling research linking threat to conservative political beliefs. However, we propose that further research is needed before it can be concluded that negative valence, rather than arousal more generally, underlies the psychological motivations to endorse conservative political belief.

Hibbing et al. present persuasive research linking threat sensitivity to conservative political beliefs. Yet further study into the possible confound between negative valence and arousal is needed before it can be affirmed that negative valence, rather than arousal more generally, underlies the psychological motivations to endorse conservative political belief.

Arousal and valence have often been confounded. For decades, psychologists have assumed that humans have a negativity bias, responding more intensely to negative than to positive and/or neutral information (e.g., Baumeister et al. 2001; Cacioppo et al. 1999; Öhman 1992; Smith et al. 2003). However, some of the support for such a bias may have come from the use of positive stimuli that are low in arousal (e.g., scenes of leisure activities) instead of stimuli that are high in arousal (e.g., erotica). Indeed, recent psychophysiological studies that have used positive and negative stimuli with the same mean arousal ratings, have found equally enhanced attention to positive as well as negative compared to neutral images (e.g., see Weinberg & Hajcak 2010).

Political psychology research may have similarly confounded valence and arousal, leading to the false conclusion that negative valence per se is associated with conservative political beliefs. The confounded nature of arousal and valence is reflected in Hibbing et al.'s interpretation of experimental, psychophysiological, neurobiological, and personality research.

For example, Hibbing et al. cited experimental studies that supported the idea that threat leads to conservative shifts in political beliefs. However, most of the studies referenced neglected to assess the impact of non-negative forms of arousal. Could positively-arousing stimuli lead to similar conservative shifts? It is premature to conclude that negative valence causes conservative shifts when the impact of positively valenced arousing stimuli has not been assessed. Hibbing et al. reviewed only one experimental study that included positively valenced stimuli, happy faces (Lodge & Taber, 2013). Yet because happy faces have elsewhere been found to be less motivationally salient/arousing than unhappy/angry faces (e.g., Hansen & Hansen 1988), it remains unclear whether valence or arousal underlie such findings.

Citing the relevant psychophysiological research, Hibbing et al. similarly concluded that conservatives preferentially process negative information, even though the studies they considered did not include an arousing, non-negatively valenced condition. Instead, researchers either assessed how individuals process negative compared to neutral information (Dodd et al. 2012; Fodor et al. 2008; Oxley et al. 2008; Smith et al. 2011) or how participants processed highly arousing negative compared to less arousing positively valenced information, thus confounding the effect of arousal and valence (Carraro et al. 2011; Dodd et al. 2012; McLean et al., in press). Dodd et al., for example, used three photographic stimuli of each valence type; positive stimuli included depictions of a happy child, a bowl of fruit, and a cute rabbit, whereas negative stimuli included depictions of a spider walking across a man's face, an open wound infested with maggots, and a violent altercation between a man and a group of people. Without the engagement of equally arousing positive and negative stimuli, findings in these studies remain questionable.

Hibbing et al. also cited studies that documented enhanced volume and activity of the amygdala among conservatives as support for their greater sensitivity to threat and uncertainty (Kanai et al. 2011; Schreiber et al. 2013. Yet, recent evidence suggests that the amygdala is implicated in detecting a broad range of motivationally relevant stimuli, including positive rewards (Cunningham 2012; Murray 2007). Thus, enhanced amygdala activity/volume may reflect heightened motivational arousal, in general, rather than specific sensitivity to threat and uncertainty.

Additionally, if political conservatism is fundamentally associated with sensitivity to negative valence specifically, then it should be at least somewhat positively correlated with neuroticism, a personality trait that clearly subsumes fear, anxiety, and aversion to uncertainty (e.g., Hirsh & Inzlicht 2008). Neuroticism, however, has not been linked in any consist manner to political belief (e.g., Hirsh et al. 2010).

In fact, the personality research cited by Hibbing et al., which indicates that conservatism is linked with intolerance of uncertainty, may arguably be interpreted to indicate intolerance of arousal rather than threat. Uncertainty or novelty is not always experienced as aversive, and is just as likely to activate the dopaminergic exploratory systems as the threat/anxiety system (Gray 1982). Moreover, uncertainty or novelty can intensify the impact of positive as well as negative emotional events (see Bar-Anan et al. 2009).

Not only is it conceivable that the effects of arousal and valance have been confounded in past studies but there are compelling reasons independent of these studies to believe that conservatism is motivated by arousal rather than by valance. Lines of research have recently indicated a link between conservative political belief and positive emotional states such as happiness (e.g., Taylor et al. 2006). Moreover, although a negative valence model would suggest that conservative political parties are most likely to be voted into power during times of instability, recession and threat, historically, this has not always been the case. Extreme right-wing political parties such as Denmark's Folk party and

Norway's Progress Party, for example, rose to power during the boom years of the mid-2000s, when unemployment hovered around only 5% in both countries. A review of studies examining economic influences on voting behavior provides similar evidence: Societies become more conservative in times of economic boom, rather than recession (Monroe 1979). In addition, premarital and unconventional sex, sexually explicit literature and representation, and recreational drug use, although typically decried by conservatives (Dombrink 2006), are not obviously fear- inducing but rather appear to be more accurately construed as arousing. Finally, we have recently demonstrated that positive, like negative mood induction, can lead to conservative shifts in belief preference (Tritt et al. 2013).

In short, it is reasonable to conclude that arousal, regardless of valence, may underlie conservative shifts in political beliefs, and to posit that conservatives are more sensitive to arousing stimuli than to threat, per se. At the very least, further research is needed to distinguish the effects of arousal and valence before it can be definitively concluded that differences in negativity bias underlie variations in political ideology.

Facial expression judgments support a socio-relational model, rather than a negativity bias model of political psychology

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Abstract: Self-reported opinions and judgments may be more rooted in expressive biases than in cognitive processing biases, and ultimately operate within a broader behavioral style for advertising the capacity – versus the trustworthiness – dimension of human reciprocity potential. Our analyses of facial expression judgments of likely voters are consistent with this thesis, and directly contradict one major prediction from the authors' "negativity-bias" model.

Hibbing et al. describe a conventional interpretation of political psychology that rests on the assumption that people who advocate different political ideals possess relatively distinct, and somewhat hard-wired or trait-like, "organizational" (i.e., cognitive) tendencies. More nuanced models of political ideology suggest instead that self-reported political opinions and judgments reflect facultative and stylistic (i.e., expressive) biases in how people advertise their "reciprocity potential," or perceived value to other people, via basic social-signaling patterns (Vigil 2009). In this commentary we describe an alternative model to Hibbing et al.'s "negativity bias" model, and conduct a study to directly measure the predictive validity of the two competing models using a facial discrimination paradigm.

Our socio-relational perspective of political ideologies subsumes the following five premises: (1) social signaling (communicative) systems underlie social cognition; (2) expressive behaviors are composed of *capacity cues* and *trustworthiness cues* (see Vigil [2009] for detailed examples); (3) capacity cues (e.g., expressed confidence) are implicitly functional for attracting novel relationship partners and for maintaining larger social networks, whereas trustworthiness cues (e.g., expressed vulnerability) are better at regulating relationships within more consolidated and intimate social networks; (4) people implicitly advertise capacity cues when they experience social and/or material resource acquisition, and they instead advertise trustworthiness cues when they experience resource losses; and (5) individual and group differences in expressive styles are measurable through self-reported opinions and judgments about internal (e.g., self-esteem) and external (e.g., societal views) stimuli and/or events.

We previously showed that self-identified Democrats and Republicans report facial judgment biases that can support both the negativity bias and the socio-relational models of political ideology (Vigil 2010). People self-identified as Republicans were more likely to interpret ambiguous facial stimuli as expressing threatening emotions as compared to self-identified Democrats (e.g., anger and fear vs. joy and sadness). However, when participants' facial judgments were coded as either conveying capacity (e.g., dominant) or trustworthiness (e.g., submissive) attributes, we found that Republicans were more likely to report viewing capacity emotions (e.g., anger and joy), whereas Democrats were more likely to report viewing trustworthiness emotions (e.g., fear and sadness). Democrats also reported having smaller peer networks, and experiencing greater emotional distress including higher rates of crying behaviors, emotional pain, and lower life-satisfaction. We interpreted the findings as evidence that people who experience conditional hardships have adopted an expressive style that is characterized by demonstrations of vulnerabilities (e.g., low mood), as well as demonstrations of altruism (e.g., liberal platform ideals) for regulating smaller, more intimate social networks. The converse interpretation is that experiential prosperities motivate the expression of empowerment demonstrations (e.g., high confidence, conservative platform ideals) that operate to regulate larger peer networks. Thus, both models had components that appeared to be supported by our previous data.

Here we conduct a follow-up study using a more standardized facial stimuli-set to examine if self-identified liberals and conservatives show facial expression judgment biases that are more in line with either a negativity-bias model or with a socio-relational model. Eight hundred and sixty seven people from a college and community sample completed a survey designed to measure individual differences in "political attitudes" in the immediate months preceding and following the 2012 U.S., presidential election (mean age=25 yr, 39% males). Using a 1–5 scale for current voting decisions, 54% of participants described themselves as more likely to vote or having voted for the Democrat presidential candidate, 25% as more likely to vote or having voted for the Republican candidate, and 21% as completely undecided. Facial stimuli were created using FaceGen software (Modeler 2.0, Singular Inversion Inc.), which creates 3D faces programmed to display several basic facial expressions of emotion. Six ambiguous facial stimuli were created by simultaneously setting the facial expression parameters to the maximum levels for two discrete emotions, for every combination of emotions, from a total of four distinct emotions: sadness, joy, fear, and anger. Under each sketch, participants were instructed to identify the facial expression as displaying either: *anger* (A), *joy* (J), *fear* (F), or *sadness* (S). To test the negativity bias model, participants' responses were coded according to whether the reported emotion facilitates affiliation (joy or sadness coded 0) or avoidance/negativity/aversion (anger or fear coded 1). To test the socio-relational model, the responses were coded according to whether the reported emotion displays capacity (anger or joy coded 0) or trustworthiness (fear or sadness coded 1). For each set of contrasts, the facial judgment scores were summed across all six facial stimuli.

The stimuli and the results of the independent-samples *t*-tests examining the predictive validity of the two models among participants who indicated a voting preference (*somewhat* or *very likely* to vote either Democrat or Republican) are shown in Figure 1. No group differences in facial judgment biases were detected when the stimuli were coded as either conveying affiliative or negative/aversive emotions, $t(541) = 1.09$, $p = .38$ (Fig. 1a). In contrast, a significant group difference in facial judgments emerged when the responses were coded as either conveying capacity or trustworthiness emotions, $t(541) = 2.48$, $p = .01$ (Fig. 1b). The findings showed that conservatives were more likely to report viewing

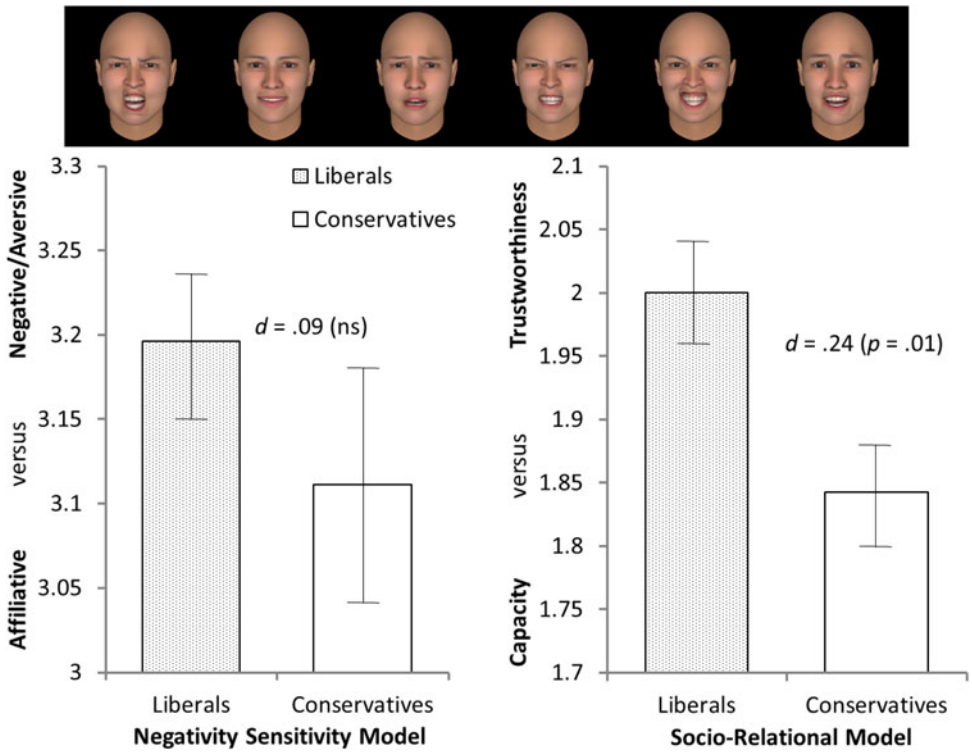


Figure 1 (Vigil & Strenth). Test of alternative models for predicting facial expression judgments based on political affiliation.

capacity emotions than were liberals, or conversely, liberals were more likely to report viewing trustworthiness emotions than were conservatives. The findings remained the same after controlling for age and sex, $F(1,529) = 6.68$, $p = .01$.

These findings contradict the main prediction from the negativity-bias model and provide more support for the socio-relational thesis that self-reported political affiliations (and ideals) are correlated with differential expressive styles for heuristically advertising the trustworthiness (Democrats) versus the capacity (Republicans) dimensions of reciprocity potential (Vigil 2009; 2010). From this perspective, self-reported political views are not based on distinct, traitlike dispositions or cognitive tendencies, but rather they are mere examples of content that people use as part of broader expressive styles for facultatively advertising capacity and trustworthiness cues to others. This thesis challenges many conventional explanations of political psychology.

Beyond the negative: Political attitudes and ideologies strategically manage opportunities, too

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Abstract: Hibbing et al. use evolutionarily derived logic to suggest that political attitudes are related to responses to negative features of the environment. We suggest that the authors focus too narrowly on the negative and contend, instead, that a more comprehensive evolutionary approach focusing on people's responses to threats and *opportunities* will better account for variation in political attitudes.

Hibbing et al. propose that variation in political attitudes can be attributed to physiological and psychological differences in responding to negative events. Specifically, they summarize an impressive set of findings that highlight a link between conservatism and enhanced physiological and psychological responsivity to negative stimuli. Drawing from an evolutionary framework, they suggest that responses to negative events, rather than positive events, should have a strong influence on political attitudes because "good evolutionary reasons exist for negativity bias given that negative events can be much more costly in fitness terms than positive events are beneficial."

We agree with Hibbing et al. that considering political attitudes from an evolutionary perspective is a useful means of integrating the largely disparate set of findings that exists in the current literature. However, we suggest that an evolutionary approach to understanding political attitudes and ideologies would view them not just as precautionary strategies employed to protect against potential threats but also as exploitative strategies designed to take advantage of potential *opportunities*.

Over the past decade, our lab has developed an evolutionary framework for understanding human behavior that focuses on fundamental motives – relatively independent, domain-specific psychological subsystems that act in response to recurring sets of threats, such as the need to protect oneself and avoid disease, as well as opportunities, such as finding a mate, taking care of kin, and affiliating with others. Using this framework, we have generated a network of novel and theoretically sensible findings linking fundamental motives to a broad range of psychological processes, including cognition (e.g., perception, attention, and memory; Ackerman et al. 2006; 2009; Maner et al. 2003; 2005), the expression of personality characteristics (Mortensen et al. 2010; White et al. 2012), economic decision-making (Griskevicius et al. 2012; Li et al. 2012; White et al. 2013a; 2013c), and complex social behaviors (e.g., aggression, consumption, conformity, creativity, and leadership preferences; Griskevicius et al. 2006a; 2006b; 2009; Sundie et al. 2011; White et al. 2013b). As evidenced throughout this work, we have found it beneficial to consider

human responding to both threats *and* opportunities. For example, in one series of studies we found that, whereas a threat-focused self-protection motive led men and women to become conforming (Griskevicius et al. 2006b), an opportunity-focused mate acquisition motive led men, but not women, to become counter-conforming (Griskevicius et al. 2006b). Given theoretical reasons for believing that the mind evolved to identify and manage both threat and opportunity affordances (Neuberg et al. 2010), and the usefulness of examining responses to both threats and opportunities in our own empirical work, we believe it is critical for an evolutionary approach to political attitudes to similarly consider responses to both negative and positive aspects of social life.

Supporting this thinking, a coherent set of findings is beginning to emerge linking variation in political attitudes to human mating opportunities. Research by Weeden and colleagues finds that mating strategies are often a better predictor of attitudes toward recreational drug use and abortion than is political affiliation: Those who are sexually unrestricted and relatively more interested in short-term sexual relationships hold more favorable views of both drug use and abortion – attitudes that ostensibly facilitate sexual relations (Kurzban et al. 2010; Weeden 2003). Political attitudes also vary across the course of a women's ovulatory cycle in functionally sensible ways (Durante et al. 2013): During peak fertility, when it is especially advantageous to prioritize opportunities to secure mates possessing cues of genetic fitness, women adopt more liberal political attitudes – a shift thought to facilitate short-term sexual relationships. Researchers have also begun to link political attitudes to male mating-relevant characteristics. For example, men with relatively greater upper body strength, muscularity, chest-to-waist ratio, and physical attractiveness tend to hold political attitudes favoring social hierarchy and inequality – attitudes that, if adopted by broader society, would strategically confer greater fitness opportunities for those possessing such dominance-relevant characteristics (Petersen et al. 2013; Price et al. 2011).

Finally, work from our own lab has demonstrated that ecological cues that intensify male intrasexual competition, such as resource scarcity or male-biased sex ratios, interact with mate-value to affect attitudes toward opportunity-providing government redistribution policies (Griskevicius et al. 2012; White et al. 2013a). In one series of studies, for example, cues of resource scarcity led high mate-value males (i.e., those already advantaged in mate competition) – to be less favorable toward economic redistribution, but led low mate-value men (i.e., those already disadvantaged in mate competition) to be more enthusiastic about economic redistribution (White et al. 2013a). Such relationships were observed in both real-world voting behavior and in controlled lab experiments.

As a whole, these studies suggest that political attitudes and preferences can be viewed as functionally strategic orientations directed toward increasing the likelihood that one successfully defends against potential threats and exploits available opportunities. Although the work reviewed has focused on mating strategies, future research might profitably consider the functional relationship between political attitudes and other positive aspects of social life, such as opportunities for seeking or enhancing affiliation, status, and kin care.

Overall, then, we agree with Hibbing et al. that an evolutionary approach to political attitudes has the potential to integrate a disparate set of empirical findings. Indeed, from our perspective it makes eminent sense to consider the functionality of political attitudes: To the extent that political attitudes can tangibly affect outcomes in responding to threats and opportunities (e.g., via social activism, voting behaviors, etc.), one would expect these attitudes to be functionally tuned to respond to the negative and positive aspects of social life. Using this thinking, we thus believe that Hibbing et al. have too narrowly focused on the relationship between political attitudes and responses to negative stimuli. Rather, we contend that a more comprehensive evolutionary framework, one that considers responses to both threats and opportunities, will better account for the empirical findings in the current literature and be better positioned to generate novel, testable hypotheses in future research.

Authors' Response

Negativity bias and political preferences: A response to commentators

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Abstract: A broad, multidisciplinary empirical literature reports that individual-level differences in psychology and biology map onto variation in political orientation. In our target article we argued that negativity bias can explain a surprisingly large share of these findings. The commentators generally support the negativity bias hypothesis but suggest theoretical and empirical revisions and refinements. In this response, we organize these proposals, suggestions, and criticisms into four thematic categories and assess their potential for furthering theories and empirical investigations of the bases for individual-variation in political ideology.

R1. Introduction

People with particular nonpolitical characteristics, including psychological tendencies, tastes, cognitive patterns, physiological traits, and perhaps even genetics and physical appearance, tend to have corresponding political preferences. The reasons for the correlations of these broader variables and political beliefs are a matter of considerable interest and dispute. In our target article, we asserted that an important organizing feature of the myriad correlations is an individual's degree of negativity bias. More specifically, we summarized extensive empirical evidence that individuals displaying heightened physiological response and concerted attention to negative stimuli also demonstrate a proclivity for political issue stances that can be classified as "conservative" in the sense that they are intended to foster order, stability, security, and tradition.

The 26 commentator teams favor us with unusually thoughtful insights. Perhaps three or four, depending on the reading, believe the negativity bias hypothesis is largely or entirely incorrect but the remaining 22 or 23 accept the general idea and set to work modifying it, expanding on it, specifying where it does and does not work, explaining why it does not work in some areas, trying to make it work where it does not initially seem to work, offering more robust theoretical foundation, suggesting measurement approaches, and generally refining and revising in a helpful and constructive fashion.

Though it is dangerous to pigeonhole wide-ranging essays, doing so affords organizational structure to the

Table R1. *Categorizing the commentaries.*

Defining conceptualizing and measuring negativity bias
Buck
Cacioppo, Cacioppo, and Gollan
Inbar and Pizarro
Janoff-Bulman and Carnes
Lilienfeld and Latzman
Motyl and Iyer
Olivola and Sussman
Sedek, Kossowska, and Rydzewska
Tritt, Inzlicht, and Peterson
Vigil and Strenth
White and Neuberg
The nature and origins of negativity bias
Brandt, Wetherell, and Reyna
Charney
Hodson
Jost, Noorbaloochi, and Van Bavel
Kinzler and Vaish
Petersen and Aarøe
Pornpattananangkul, Cheon, and Chiao
Schwartz
Neuroticism versus negativity bias
Cacioppo, Cacioppo, and Gollan
Feldman and Huddy
Inbar and Pizarro
Lilienfeld and Latzman
Morgan, Skitka, and Wisneski
Conceptualizing political preferences
Federico, Johnston, and Lavine
Feldman and Huddy
Hodson
Hogan
Janoff-Bulman and Carnes
Ludeke and DeYoung
Malka and Soto
Robbins and Shields

commentaries, as well as to our response. We see them falling into four broad categories as depicted in the accompanying table. Since some commentaries make more than one point, a few are placed in more than one category. Below we briefly address each of these four broad collections of commentaries, apologizing in advance for not having the space to go into the detail each deserves.

R2. Defining, conceptualizing, and measuring negativity bias

At the center of our target article is the claim that political orientations are, at least in part, driven by deeply embedded individual-level variations in orientations to negative stimuli – but what is negativity bias, and what specifically about it explains the link with political orientation? A large number of commentators posed this question in one form or another. The general definition of negativity bias we employ is a tendency to respond more strongly, to be more attentive, and to give more weight to negative elements of the environment. Several commentators accept the claim that individual-level responses – especially implicit responses – to negative stimuli systematically map onto political orientation but argue that we are painting negativity bias with too broad a brush. They suggest it is not generally negative elements of the environment that are relevant but rather more specific types of negative stimuli.

Lilienfeld & Latzman, for example, assert that the connection we seek to explain rests on threat bias rather than the more general concept of negativity bias. Specifically, they distinguish between negative emotionality ("the propensity to experience unpleasant affects of many kinds, including anxiety, irritability, and mistrust") and constraint ("differential sensitivity to reasonably clear-cut threats"). They also note that "individuals with elevated constraint and its constituent traits, particularly harm-avoidance/fear, exhibit pronounced fear-potentiated startle … and habituate slowly to startle-provoking stimuli." This notion of constraint is later relabeled "threat bias" and offered as an explicit substitute for our overly broad "negativity bias." As our own earlier work on startle reflex (Oxley et al. 2008) would suggest, we agree that threat sensitivity, and not negative emotionality, is key.

Like **Lilienfeld & Latzman**, **Inbar & Pizarro** assert that our approach is overly broad, but their focus is on disgust rather than threat. They support this focus with a cogent and well-defended argument for the role of disgust and the associated behavioral immune system as the central explanation for variations in political orientations. Disgust is, of course, one of the main negatives in our conception of negativity bias, and we have also addressed this topic in previous research (see Smith et al. 2011), so once again we find ourselves in agreement with the commentators.

Both sets of scholars are right in calling for a more complete and careful explication of the role of threat and disgust in the broader concept of negativity bias. For example, it would be useful to know the extent to which threat sensitivity and disgust sensitivity are correlated across people. To the extent they both contribute to conservatism, are the effects compensatory, additive, multiplicative, or something else? Also, do threat sensitivity and disgust sensitivity affect different categories of political issues, as some existing empirical work suggests?

Still, **Lilienfeld & Latzman**'s exclusive focus on threat ignores the powerful effects of disgust elucidated by **Inbar & Pizarro**, just as Inbar & Pizarro's exclusive focus on disgust ignores the powerful effects of threat so accurately described in Lilienfeld & Latzman's commentary. The empirical evidence indicates that both threat and disgust are relevant to political attitudes. Each set of commentators makes a strong case for their preferred subcategory of negativity but does not make a similarly strong case that the other subcategory is irrelevant. This is precisely the case that must be made if the charge that our approach is "overly broad" is to have merit.

Approaching the target essay from the opposite perspective, **Tritt, Inzlicht, & Peterson** (**Tritt et al.**) claim that rather than being too broad, we have too narrowly defined the key concept. They suggest that much of the literature we review repeats a flaw in the negativity bias literature by concentrating on valence at the expense of arousal. They point out that responses to positive features of the environment are either entirely ignored by scholars or are measured with low arousal cues that are not comparable

with the high arousal cues typically employed to measure negativity bias. As such, they raise the possibility that a key variable in explaining the differences between liberals and conservatives might be degree of arousal regardless of whether the valence of the stimulus is positive or negative. Perhaps once degree of arousal is controlled conservatives are more responsive to all stimuli and not just to negative stimuli. We take their point on the importance of isolating rather than conflating valence and arousal and in some respects it would be even more fascinating if conservatives were, as they suggest, more easily aroused regardless of the stimulus valence. In our own research we have seen occasional hints that conservatives are more responsive than liberals to positive stimuli, but that is not usually the case, and some previous research, contrary to the implications of Tritt et al.'s commentary, does control for degree of stimulus arousal and still finds a greater negativity bias for conservatives. Be that as it may, the arousal hypothesis definitely merits additional empirical scrutiny.

Several other commentaries offer plausible expansions of the negativity bias hypothesis. For **Buck**, the large research literature on infant attachment provides a broader and more suitable focus than negativity bias. Marshaling arguments that range from Hobbes and Locke to Haidt and Lakoff, Buck offers variation in the degree of secure attachment as an alternative explanation for later adult ideological variation. We certainly are willing to entertain the possibility that levels of infant attachment are associated with levels of negativity bias and join Buck in encouraging efforts to explore this connection.

Other commentators critique our focus on negativity for failing to give equal time to positivity and in the process relegating liberalism to the status of little more than the absence of conservatism. Both **Janoff-Bulman & Carnes** and **White & Neuberg** agree that our focus on the negative offers useful insight into avoidance, but both fault us for ignoring the positive. In the more psychological treatment of Janoff-Bulman & Carnes this positive side centers on the approach systems of the brain and the consequent prescriptive moral domain. White & Neuberg take a more evolutionary approach and associate positive motivation with seeking opportunity. There very well may be a parallel positive system but our reading of the literature is that a significant portion of the findings can be accounted for with a focus solely on negativity bias. In our own research, we typically find negativity bias more strongly correlated with conservatism than positivity bias is with liberals but the comments of Janoff-Bulman & Carnes, as well as those of White & Neuberg suggest productive new avenues for investigating the positive side of the ledger. It may be that, given the vulnerable and fragile existence of our ancestors (Pinker 2011), for evolutionarily sensible reasons, sticking with the tried and true (conservatism) is a tighter, more conserved phenotype than liberalism. Though speculative, this point might explain why the focus of research in this area tends to be on explaining conservatism rather than liberalism.

Motyl & Iyer also believe our target article focuses too narrowly on negativity bias and suggest an alternate explanation that includes many of the findings we review but places them within a more general explanation of ideological differences. They accept our central thesis that negativity bias explains many ideological differences but point out (as we do in the target article) that negativity bias does not seem to account for the finding that conservatives tend to have higher levels of life satisfaction. They suggest an important element of conservatives' negativity bias, as well as their greater life satisfaction and generally (compared to liberals) more positive view of life, is a greater desire for cognitive coherence. Motyl & Iyer suggest that conservatives are less willing than liberals to rationalize dissonant states. Faced with the negative or aversive, conservatives recognize and deal with it (as we describe in our previous work – see Dodd et al. 2012), a process that leads not just to a more ordered world but also to a hedonic payoff. We find the cognitive coherence hypothesis intriguing and consistent with our speculation that fending off the negative may be more tractable and in some ways more satisfying than constantly seeking unspecified new experiences as many liberals are wont to do.

Motyl & Iyer's commentary also suggests the basis of a response to the criticism of the negativity bias hypothesis raised by **Sedek, Kossowska, & Rydzewska** (**Sedek et al.**). The latter point out that conservatism increases with age but that older people also tend to display a more positive outlook, at least in a present-oriented sense. This, they argue, runs counter to the central argument laid out in the target article, yet they also suggest that older adults seem to seek more of a cognitively coherent world view, with a "reliance on highly routinized and schematic cognitive and behavioral patterns." If Motyl & Iyer's arguments have validity, perhaps Sedek et al.'s arguments are more compatible with our approach than they realize.

More clarity in the central explanatory variable is always desirable. **Tritt et al.** and **Inbar & Pizarro**, as well as **Lilienfeld & Latzman,** are quite right in pointing out that little of the research we reviewed was designed to precisely define negativity bias, let alone translate that definition into an instrument capable of validly measuring that concept. The need for conceptual and measurement clarification is apparent in the commentaries that attempt empirical tests of the negativity bias hypothesis. For example, **Vigil & Strenth** report the results of a study of theirs in which respondents were asked to mark emotionally ambiguous faces as joyful, angry, fearful, or sad. In a coding scheme that considers fear/anger as negative/aversive and joy/sadness as affiliative, they report no differences between liberals and conservatives (actually, between Democrats and Republicans) and conclude that this result fails to confirm the negativity bias hypothesis. Using an alternative coding scheme where fear/sadness are seen as signals of trustworthiness and anger/joy as capacity, they do find statistical support for a "socio-relational model." These findings are interesting but may muddy rather than clarify the empirical validity of the hypothesis they seek to test. Their test of the negativity bias hypothesis appears to rest on a continuous variable, with one end of the spectrum anchored by negativity bias and the other by affiliation. We are not convinced affiliation is the opposite of negativity bias and thus are not convinced their study, interesting as it is, constitutes a critical test of the negativity bias hypothesis. Moreover, they employ partisanship as a proxy for ideology and, though these concepts are related, the correlation (in the United States at least) typically is only around 0.5 to 0.6.

We have a somewhat similar reaction to the argument offered by **Olivola & Sussman**. They report that Republicans as well as Democrats (again, not liberals and

conservatives) react positively to facial signals of competence. That is an interesting finding, but it is not clear to us how it is indicative of flaws in the negativity bias hypothesis. Moreover, the differences (or non-differences) between liberals and conservatives in boycotting or "buycotting" strike us as empirically questionable. Some of the survey items measuring these practices (see Newman & Bartels 2011) refer to "buying American" or supporting local producers as opposed to corporate chains, items loaded with contaminating political content. Finally, it is widely known that people who identify with right-leaning parties tend to be more averse to taxes and less supportive of carbon emission surcharges, and we do not see this fact as contradicting the negativity bias hypothesis.

One of the topics consistently emerging from the commentaries is the need to think clearly about concept definition and operationalization. Fortunately, one set of commentators offers a path for doing exactly that. **Cacioppo, Cacioppo, & Gollan** (**Cacioppo et al.**) argue for employing measures and paradigms directly developed in the negativity bias literature as a better and more direct basis for testing the hypothesis that conservatives are higher in negativity bias. Drawing on their earlier work with the Evaluative Space Model (ESM), they describe a set of tightly focused concepts and measures of negativity bias (stronger responses to very negative compared with equally arousing positive stimuli) and positivity offset (stronger responses to mildly positive compared with equally arousing negative stimuli) that have been psychometrically validated. These measures may not be perfect. For example, it is not clear which negative and (especially) positive stimuli are the most appropriate, just as it is not clear whether sympathetic nervous system responses can be employed in addition to self-report response. Still, we view the general approach outlined by Cacioppo et al. as an extremely promising strategy for developing more standardized concepts and measures that will improve testing of the negativity bias hypothesis.

Cacioppo et al.'s ideas address many of the concerns of other commentators. For example, they describe measures of negativity bias that rely on differences between responses to oppositely valenced stimuli of equal arousal. This clearly addresses the potential valence/arousal confound that **Tritt et al.** raise. By varying the stimuli and producing directly comparable measures of general negativity bias versus more threat specific bias, it should also be possible to get leverage on the issues raised by **Inbar & Pizarro** and by **Lilienfeld & Latzman**. Finally, by providing more standardized approaches to concept definition and measurement, a better platform will be available for direct hypothesis tests such as those presented by **Vigil & Strenth** and clearer guides will exist for drawing inferences from secondary resources, as **Olivola & Sussman** do.

R3. The nature and origins of negativity bias

As we point out in our target article, one of the clear challenges in examining relationships between elevated negativity bias and political conservatism is the fact that there seem to be many exceptions. A number of commentators address this matter and they tend to fall into two main categories. The first are those commentators who accept the general nature of the negativity bias hypothesis and see these ambiguities as a puzzle that needs to be addressed in order to more fully understand this relationship. The second are those commentators who see the exceptions and incongruities as so numerous and frequent that they contradict and ultimately falsify the entire negativity bias hypothesis.

Schwartz falls into the first category by suggesting that a focus on universal human values is one possible approach to sorting out the instances in which liberals appear to be more responsive than conservatives to negativity. Following Boehnke et al. (1998), Schwartz makes the distinction between micro and macro worries. Micro worries are centered on threats to the self or in-group and macro worries are centered on external threats to broader entities such as the whole of society or the world. Schwartz speculates that this distinction between macro and micro worries may correlate systematically with values in a way that distinguishes between liberalism and conservatism (because liberals tend to resonate more with universal or macro values). This line of thought strikes us as utterly sensible and a potentially fruitful line of research.

We would offer the same encouragement to several other lines of research described by the commentators. For example, **Brandt, Wetherell, & Reyna** (**Brandt et al.**) suggest that negativity bias underpins the development of a political world view but not necessarily the way an individual reacts to specific events or threats in that world. In other words, negativity bias may shape political traits but is less predictive of the manner in which individuals react to particular environmental states – a possibility we think is worth testing. **Kinzler & Vaish** suggest a similar notion, arguing that development is crucial to understanding negativity bias. They believe that identifying the precise situations in which individual differences in negativity bias manifest themselves would help greatly in understanding differences across the political spectrum in responses to social versus non-social threats. They assert that variations in development likely shape individual responses to negative stimuli and that the nature of these responses affects political temperament. We have no argument whatsoever with this formulation.

Petersen & Aarøe push the exploration of the causes of negativity bias back in time to their evolutionary origins. Although it is typical to suppose that traits at equilibrium will have little or no meaningful variation, they suggest that at the individual level, variation in other individual traits related to the likelihood or severity of resource loss could lead to compensating variation in the levels of negativity bias. This hypothesis is intriguing, and the variety of studies linking genetic variation to negativity bias cited by **Pornpattananangkul, Cheon, & Chiao** (**Pornpattananangkul et al.**) would seem broadly compatible with this line of thinking. In addition to pushing the search for the causes of negativity bias into biology, Pornpattananangkul et al. also suggest considering the impact of culture. In making the argument, they propose a potential source of explanations for the lack of homogeneity in the relationship between negativity bias and political orientation. Though some types of negative stimuli may elicit stronger amygdala activity in conservatives, other types of negative stimuli may activate greater empathic reactions in other parts of the brain in liberals. (As it turns out, our research team has preliminary fMRI evidence that is consistent with this point.) Culture may help to condition these sorts of differential

reactions to particular types of stimuli. This seems an admirably comprehensive platform for thinking about political heterogeneity in negativity bias response. Not only is it likely to identify exceptions to the link between negativity bias and conservative political temperament but it may also provide a clear understanding of why these exceptions exist.

One final suggestion regarding the origins of negativity bias is that the information needed was right under our noses – specifically in our dependent variable. The argument here is that political orientation is a cause not a function of negativity bias. The possibility that we might have our "causal arrow" backwards is one we take seriously. Though we believe that variation in negativity bias is a temporally prior cause of variation in ideology, we are also in agreement with **Jost, Noorbaloochi, & Van Bavel** (**Jost et al.**) on their two main points: First, that there is a lack of clear empirical research (as opposed to strong theoretical arguments) with the proper dynamic design to definitively answer the causal order question, and second that the actual relationship may be bidirectional, though we would posit a much fatter arrow running from negativity bias to ideology. The important point is that the nature and degree of recursion is an empirical question that modern tools can answer and we agree that teasing out the true causal order should be a research priority.

Charney is one of the few commentators who reject the possibility of a connection between heightened negativity bias and political beliefs. He appears to do so largely because he employs an unusually narrow, U.S.-centric view of the political spectrum and fails to appreciate the depth of political ideology. At one point, however, he does seem to recognize that some people are "stability seekers" whereas others are "innovators" but he is skeptical that those behavioral tendencies are relevant to political orientations. The notion that the "types" Charney acknowledges would be relevant to so much of life but not to politics, flies in the face of common sense, as well as the reflections of Mill and Emerson that we included in the target article (sect. 1, para.1; see also paras. 3 and 4). There is no firewall around the political arena, isolating it from the baseline forces that influence people's orientations and behaviors in all other facets of life. When this basic fact is recognized, the ancient and universal nature of political divisions becomes easy to see. Charney also seems bothered that liberals and conservatives sometimes agree on the elements of the environment that are negative but disagree about how to respond to them, and at other times disagree about whether a given stimulus is in fact negative or positive. To illustrate this point, he claims that "liberals do not perceive a 'bad man with a gun' as any less of a threat than conservatives," and asserts that the only disagreement between liberals and conservatives is over the best way to ameliorate the threat. In truth, empirical research suggests that the level of threat perceived (and the physiological response apparent) in identical situations is quite different for "stability seekers" as opposed to those more comfortable with change. Moreover, the best way to measure these differences is to present stimuli that are as basic and not-overtly-political as possible. If stimuli are politicized, the relationship becomes circular and much less likely to reveal core rather than induced psychological and physiological differences.

R4. Neuroticism versus negativity bias

Several commentators argue that negativity bias is unlikely to be a discriminator of political orientation, because if it were, conservatives would be more fearful and more neurotic, and have a more generally negative outlook on life, an argument similar to that of **Sedek et al.** described above. These commentators typically go on to point out that, in reality, conservatives are not more neurotic and, indeed, by many measures are happier than liberals and have a more positive outlook.

We take issue with the assumption that being more attentive and aware of negative stimuli automatically translates into neuroticism, fearfulness, depression, or a negative outlook on life. In fact, in our target article, after acknowledging that conservatives score higher than liberals on several measures of subjective well-being, we state that, "being more attuned to the dangers of the world does not make for pessimistic, fearful individuals and being less attuned to dangers does not make for carefree, hedonistic individuals" (sect. 7, para. 1). Several respondents, however, persist in arguing that negativity bias must mean exactly that. For example, **Morgan, Skitka, & Wisneski** (**Morgan et al.**) note that an extensive literature finds compared with liberals, conservatives report being happier and better adjusted. They assert our claim that conservatives are more dispositionally sensitive to negative stimuli would be at odds with that literature. They go so far as to state that "a selective review of this body of research might suggest the existence of a conservative positivity bias!" Similar perspectives are expressed in a number of other commentaries, such as **Inbar & Pizarro**, and we think they all misperceive a central message of the target article.

Responding and attending to negative events is not synonymous with living in fear of them and does not necessarily lead to singular activation of behavioral inhibition as opposed to behavioral approach. The research we reviewed does not demonstrate that conservatives are more fearful, more pessimistic, and more convinced that life is a negative experience. The fact that conservatives display marginally but significantly greater detection, response, and attention to negative events should not lead to the conclusion that conservatives therefore are "fearful and threatened" people. Part of the problem here may be the tendency in previous research to dichotomize behavior into approach or avoid, and, when it is useful to add a third category, attend (see Aron & Aron 1997). As suggested by Dodd et al. (2012), conservatives are more likely than liberals to attend and even to confront the negative, hardly the actions of fearful, withdrawn individuals.

Sedek et al. raise a related issue from the perspective of changes over the life cycle. They begin with the documented fact that political conservatism increases with age. They go on to observe that older people are also more likely to report a reduction in negative emotional experiences and to have some difficulty remembering negative facts. They believe this combination of findings evokes "considerable doubt as to the validity of the target article's central claim." In truth, it does no such thing. The size of the shift toward political conservatism that comes with age, though statistically significant, is actually quite small. More important, just because age is related positively to conservatism and negatively to some aspects of negativity

bias in no way eliminates the possibility that conservatism and negativity bias are positively related (as Sedek et al. note, e.g., preference for closure, which also increases with age, could be an important confound). Several of the studies we cite have included controls for age and they still report a positive correlation between aspects of negativity bias and political conservatism.

We also take issue with the notion that the negativity bias hypothesis is falsified by personality research. Several respondents point out that the two personality traits most consistently associated with political orientation are openness (which correlates with liberal orientations) and conscientiousness (which correlates with conservative orientations). The general argument is (1) any impact of negativity bias must operate through the broader personality traits of the Big Five and (2) negativity bias is subsumed into the larger personality trait of neuroticism. With regard to the latter, **Feldman & Huddy** argue that "in the personality literature, neuroticism typically captures differences in sensitivity to negative outcomes … yet there is no evidence that neuroticism is associated with conservatism." We disagree.

First, it is clear that some Big 5 traits – primarily conscientiousness and openness – are indeed consistently correlated with political orientation but it is not evident why it follows that all other aspects of psychology must be rooted in these traits in order to be relevant to politics. Personality is important to politics but the bar for concluding that some particular dimension of psychology or biology is influencing political temperament should not be that it is mediated through one or more or the Big 5 traits. Second, the negativity bias hypothesis does not posit a connection between negativity bias and neuroticism so the absence of a relationship with that personality trait is no problem for the central argument of our target article. **Lilienfeld & Latzman** realize this and point out that the personality literature suggests two orthogonal dimensions of negative affect. They go on to note that one of these dimensions may correlate with neuroticism but the other definitely does not. The dimension that may correlate with neuroticism is defined by the propensity to experience unpleasant affects of many kinds, including anxiety, irritability, and mistrust and is precisely the sort of psychological dimension that we explicitly argue is *not* associated with conservatism. The second dimension is constraint and is best accounted for by conscientiousness and openness, not neuroticism. Indeed, one of Lilienfeld & Latzman's criticisms of our target article is that we confound negative emotionality and constraint and they note that a by-product of doing so is often an unnecessary and distracting debate on neuroticism. Several commentators appear to have proved their point.

Tellingly, in earlier work Cacioppo and other colleagues (Norris et al. 2011) empirically examine the relationships between positivity offset and negativity bias using the ESM framework. They found that individual-level differences in positivity offset and negativity bias were stable across time, that they were consistent across a wide range of stimuli (pictures, sounds, words, games of chance), and, more pertinently, that "positivity offset and negativity bias were generally unrelated to personality measures" (pg. 107). Interestingly, they also found that negativity bias was not related to "satisfaction with life" measures but that positivity offset was. In sum, for our hypothesis to be right, it is not necessary for negativity bias to correlate with neuroticism or for neuroticism to correlate with conservatism. In fact, **Motyl & Iyer** suggest that successfully monitoring and attending negative features of the environment, as conservatives tend to do, may be just the sort of tractable task – particularly for those who take special pleasure in successfully completed tasks – that is more likely to lead to a fulfilling and happy life than is a constant search for new experience after new experience. Some people who display large negativity biases seem to give evidence of less optimism but this does not tend to be the case for political conservatives. Maybe employing politics in an attempt to minimize the dangers posed by the negative elements of life is mentally healthier than concluding nothing can be done about those dangers. Investigating the reasons people respond so differently to elevated negativity bias and investigating the potential benefits of a viable political outlet for that bias could be valuable lines of research, both with regard to politics and mental health.

R5. Conceptualizing political ideology

A popular view of political ideologies (see especially Jost et al. 2003) is that they vary primarily on the basis of two undergirding factors: orientation to change and orientation to inequality. Conservatives, or individuals on the political right, are more likely to oppose social change but to be relatively accepting of inequality. Liberals (as the term is used in the United States), or those on the political left, are more likely to welcome social change but to be deeply bothered by inequality. As several of the commentators are quick to note, the conceptualization of ideology employed in our target article goes rather heavy on orientation to change and lightly on orientation to inequality. They quite appropriately wonder about the relevance of the negativity bias hypothesis to inequality and to the economically-oriented issues that revolve around attitudes toward inequality.

In doing so, the commentators raise questions that go well beyond our target article. How are socio-cultural political preferences (topics such as gun control, school prayer, gay marriage, and capital punishment) related to preferences on political issues related to economic matters? If the relationship is weak or nonexistent, what are the deeper forces that explain each of them and is the negativity bias hypothesis at all relevant to economic issues? If the relationship between economic and sociocultural preferences is solid, what explains the connection? Are those who favor traditional social arrangements naturally or organically inclined to favor free market economic approaches as well and, if so, why? Alternatively, is this connection merely the product of historical quirks and ephemeral, top-down elite framing rather than timeless and universal psychological and physiological tendencies?

Though we plead guilty to emphasizing preferences on sociocultural issues more than economic issues, we disagree with the assertion found in some of the commentaries that our account requires there to be a single ideological dimension**. Feldman & Huddy** claim that our ideas are "based on the underlying assumption that political ideology can be represented by a single dimension," and **Malka & Soto** suggest that individuals who do not consistently organize their political attitudes along a broad conservative–liberal continuum present "a challenge to any

claim that a psychological disposition directly or organically leads individuals to adopt broad coherent packages of liberal or conservative attitudes." **Robbins & Shields** make a similar point. In truth, we are happy to concede that political issues cover a broad range of topics, that individuals often hold distinct packages of beliefs, and that multiple dimensions therefore are often in evidence. This is why in our target article we acknowledged the diverse dimensions of political issues and speculated that characteristics such as the degree of negativity bias may be "less relevant to economic issues … than … to social issues" (sect 6.2, para. 3) and this is why in our own research we do not use single items that ask respondents to place themselves on an overarching left–right continuum but instead ask them about individual issues so that their positions on those issues can then be flexibly aggregated in a variety of meaningful ways. As such, Feldman & Huddy's point that many self-professed conservatives actually hold liberal issue positions, which although accurate, is quite irrelevant.

If a concept such as negativity bias could account for a significant portion of the variance merely in socio-cultural political preferences, it would be an important accomplishment. If it were able to account for economic or equality issues, as well, we would view this as icing on the cake. The implication that the success of our hypothesis rests on its ability to account for preferences on economic, as well as socio-cultural issues, is inaccurate. Virtually all of the commentators recognize that socio-cultural issues are "core" issues in political life and that economic issues are peripheral (the exception is **Feldman & Huddy**, who inexplicably assert that economic issues are "historically more powerful and politically consequential"). Sociocultural issues cover a wide range of topics and are the issues that people tend to feel in their gut (see the commentary by **Federico, Johnston, & Lavine** [**Federico et al.**]; also see Carmines & Stimson 1980). For example, **Ludeke & DeYoung** (see also Bouchard 2009) see sociocultural conservatism as blending with authoritarian attitudes and also religious fundamentalism to form a central "triad," leaving economic issues on the outside looking in. Economic issues are undeniably important (witness recent riots by the economically downtrodden in Brazil and elsewhere) but sociocultural-religious disputes are continuing flashpoints (witness the recent and massive public demonstrations in supposedly permissive France over gay marriage and the ongoing unrest in the Mideast, Africa, and South Asia over music, schooling for girls, and creeping Western values).

So what is the relationship between people's preferences on sociocultural issues and their preferences on economic issues? The commentators are quite helpful in making progress toward answering this question in spite of mixed signals in the existing literature. Certainly it is the case, as **Hogan** and other commentators point out, that some individuals adopt free market economic ideas but pro-change sociocultural ideas (permit abortions, legalize drugs, and sanction gay marriage). Such individuals are often called libertarians. The question, however, is whether pro-tradition sociocultural preferences and free-market economic preferences trend together statistically and here answers differ. **Feldman & Huddy**, citing an unpublished doctoral dissertation, claim that "correlations between economic and social dimensions of ideology are low to non-existent in samples from numerous countries." Conversely, **Robbins & Shields**, citing Jost et al. (2009) conclude that the correlation between social and economic conservatism "seems clear."

We believe the explanation for these contradictory messages in extant empirical research has to do with the way political preferences are operationalized. If stances on economic issues are measured in the abstract (e.g., survey items soliciting general attitudes toward taxes, social transfers, and big government), respondents' economic attitudes may appear to be unrelated to their attitudes on socio-cultural issues. However, bloodless survey items of this sort are not particularly meaningful because they do not tap the way people in the real world typically think about economic issues. People tend not to view economic issues as technical matters but rather, if given the opportunity, load them with all kinds of social content; thus, to get valid indicators of people's economic attitudes, the social component must be included.

For example, defense spending is an economic issue involving government spending and the size of the public sector but preferences on it clearly overlap with preferences on gun control, capital punishment, and law and order – "protection" issues, as **Janoff-Bulman & Carnes** call them. So here we see social issues bleeding over into an economic issue. The same can be seen regarding aspects of social welfare spending. It seems highly unlikely that public attitudes toward welfare spending are a purely economic matter and it is more likely that they are bound up with attitudes toward immigration, in-groups and out-groups, deservedness, and freeriding (a point confirmed by Petersen [2012]). When economic issues are embedded in real social context, as ordinary people tend to do, the distinction between the two dimensions becomes substantially less clear and this is why research utilizing richer survey items often uncovers a correlation between economic and social issue attitudes.

Even political/economic systems can become socially contextualized. In some parts of Eastern Europe preferences for closure and security sometimes correlate with desires for socialistic rather than free-market policies. This is not particularly surprising given that communist economic policies were an essential part of that region – and a security blanket for many people – for decades. To what extent is the blending of socially conservative and free market political beliefs that is prevalent in many Western political parties, a product of the fact that free market policies are part of the traditional sociocultural fabric of these countries? To what extent did opposition to communism during the Cold War spring from the fact that it was presented to generations of school children not just as a set of economic policies but as a challenge to everything traditional in the West, including Christianity? The social and the economic dimensions of ideology are simply not as clearly separable as some of the commentaries let on which is perhaps why analyses of voting patterns in legislatures, try as they might and regardless of the era, usually produce only one dimension (Poole & Rosenthal 1997).

More generally, the extent, nature, and source of the relationship between economic and social issues is much debated in the commentaries. Some believe both economic and social preferences to be organic, bubbling up from deeper psychological and physiological forces but not

necessarily related closely to negativity bias and sometimes arising from entirely separate domains. Several of the commentators wonder whether negativity bias might connect to sociocultural preferences while different psychological and physiological orientations connect to economic preferences. For example, the commentary by **Janoff-Bulman & Carnes,** as well as recent work by Iyer et al. (2012) suggests that orientations toward personal autonomy are central to people's economic attitudes. Although a story could be spun linking negativity bias to personal autonomy, it could also be the case that they are distinct.

Another possibility raised by the commentators is that, because sociocultural issues are core and economic issues are peripheral (see above), then sociocultural issues may very well be organic (connected to deep-seated psychological and physiological tendencies) whereas economic issues are more top-down than bottom-up. Along these lines, the commentators suggest two specific possibilities for the source of economic attitudes.

The first is that economic preferences are elite driven and are by-products of the party/ideological group with which individuals associate. **Hogan** suggests that identities are formed on the basis of core (usually sociocultural) issues and preferences on peripheral issues are merely the consequence of "socially available political platforms." **Malka & Soto**, as well as **Federico et al**., are clearly thinking along similar lines. In this vision, a social conservative in the U.S. might gravitate to the Republican Party because of its stated positions on core social issues like abortion and school prayer, and then adopt the positions on peripheral (often economic) issues that happen to be championed by that party. Malka & Soto nicely describe how this could work with regard to the core hypothesis of our target article: "Individuals high in negativity bias are organically drawn toward conservative sociocultural attitudes. If such individuals become politically engaged then they will be frequently exposed to political discourse indicating that conservative sociocultural attitudes should be packaged with conservative economic attitudes, which they ultimately come to adopt." The clear implication is that this transfer will be much less applicable to individuals who tune out political discourse and therefore do not have a well-developed sense of the issue packages involved. This distinction between those who are and those who are not politically well-informed plays an even bigger role in the commentary by Federico et al., who go so far as to assert that among the poorly informed heightened negativity bias will actually be associated with *liberal* economic stances.

If individuals are merely assimilating positions on peripheral issues that are promoted by those elites who share their sociocultural preferences, this could explain many of the inconsistencies surrounding the negativity bias hypothesis that we note in our target article (e.g., high negativity bias individuals not being particularly bothered by gun accidents, environmental degradation, and the ravages of poverty – sects. 6.1, 6.2, and 6.3). Though we are open to such a possibility, it does not explain what appears to be a modest tendency across time and across countries for elites to combine opposition to social change with a fondness for free market approaches (just as it does not explain why libertarian beliefs, though held by a subset of individuals, are rarely promoted by dominant parties regardless of the political system).

The second possibility is that economic preferences come less from what elites tell individuals to believe than from what the individuals have convinced themselves is in their own self-interest. Some of the commentators imply that conservative sociocultural positions derive from heightened negativity bias but that free market economic beliefs and "positive attitudes toward inequality" tend to derive from "a concern to maximize economic self-interest" (**Robbins & Shields**). **Hogan** also asserts that conservatives advocate free-market policies because they are "prudential," whereas **Federico et al.** use phrases such as "personal" and "instrumental" to get to much the same place. Such a view is consistent with Hirsh et al.'s finding (2010) that although conservatives are more polite than liberals, they also tend to be less empathetic. This situation leads Hogan to speculate that conservatives might have particular trouble with concepts that mix features that resonate with their deep psychological and physiological preferences with features that do not; for example, concepts that are firmly traditional but also deeply empathic or, conversely, positions that are socially novel but prudential. Perhaps this is why, in the view of some, certain empathic features of traditional Christianity have been modified by politically conservative adherents into tenets that are more consistent with cutthroat capitalism.

The larger point of this line of reasoning is that economic preferences are thought to spring not from any organic characteristics (such as negativity bias) but from the specific economic situation in which individuals find themselves, a suggestion Marx would certainly endorse. As **Robbins & Shields** put it, differences in negativity bias have "a direct effect on security motivation" but not on issues relating to a power motivation such as the desire to improve one's own economic status (see also **Feldman & Huddy's** connection of economic preferences to Social Dominance Orientation).

Is it really the case, however, that economic more than sociocultural positions are adopted out of prudential concerns? The redistributive policy preferences of multimillionaires such as Warren Buffett and Teddy Kennedy would seem to suggest otherwise and, as Thomas Frank (2004) points out, conservative farmers in Kansas are often strong supporters of economic policies, such as ending farm subsidies, that run directly counter to their personal economic interests. Self-interest does not always explain preferences on economic issues – and it is not necessarily the case that self-interest is irrelevant to stances on sociocultural issues. Some people believe that holding the proper sociocultural beliefs will help them in the afterlife – and what could be more self-interested than that?

The distinction between economic and social issues can even refine the provocative commentary by **Hodson**, in which he cites empirical research suggesting differences in the cognitive ability of liberals and conservatives. Our reading of the research referenced by Hodson is that it does not suggest that cognitive ability is correlated with overall political ideology, as Hodson implies, but rather that a possible inverse correlation between cognitive ability and conservative positions on sociocultural issues should not be ruled out. The same cannot be said, however, for economic conservatism. In fact, in line with previous research, data to which we have access (from a sample in Australia) seem to suggest that economic conservatives (often libertarians) on average tend to have slightly

greater cognitive abilities than liberals, whereas social conservatives tend to have significantly lower cognitive abilities than either liberals or economic conservatives (libertarians). Our belief is that we did not address these matters because they are tangential to negativity bias, though a study of the correlation between negativity bias and cognitive ability would be interesting. Of course, we are studying biases that sometime lurk outside of conscious awareness, so we can hardly authoritatively reject Hodson's suspicions that deep down we wanted to avoid engaging with a potentially inconvenient stream of literature.

In sum, we are quite open to the possibility that negativity bias has a greater influence on social issues than it does on economic issues and in fact suggested that very point in our target article. The commentaries we discuss in this section have helped us greatly in understanding why economic and sociocultural issues might diverge, and they also suggest a potentially profitable set of research agendas, especially pertaining to the causes of economic attitudes.

R6. Conclusion

It is worth noting that the commentaries are devoid of two features that frequently characterize exchanges on the topic of the deeper bases of political orientations. The first is fulminations directed at those with the temerity to suggest that higher-order matters such as morality, religion, and politics are likely grounded in biology and subthreshold forces. The desire to believe that political beliefs spring exclusively from rational, conscious considerations is as strong as it is erroneous, and it is a pleasure to be absolved of the need to fight that fight again here. The second is allegations that any and all research on the deeper bases of political differences is merely a façade for the promotion of a particular political agenda. We are delighted that the commentators joined us in an effort to sort through the nature of these differences without casting aspersions on specific belief sets, and we are especially pleased that a couple of commentators complimented our objectivity despite the emotionally charged nature of political beliefs.

Instead, nearly all of the commentators used their allotted space to offer constructive suggestions for modifying our model by adjusting the way we measure our variables, by including additional variables, or by incorporating the impact of variations in context on the functioning of our model. Several themes recur in multiple commentaries and suggest the need for both careful rethinking and further research. For example, variations in desire for constraint, coherence, or closure was cited by multiple commentators as either an adjunct to negativity bias or as an outright replacement for it. We dealt with parts of this theme in sections 2 and 4 of this response, but clearly this nest of issues needs to be more carefully and explicitly reconciled with our model. Our initial take is that the need for constraint/coherence, or what we refer to in our article as the desire for cognitive closure, may intervene between negativity bias and political orientations. In this view negativity bias is a driver of the need for cognitive closure, thus giving negativity bias both a direct impact on political beliefs and an additional indirect impact through cognitive closure.

An alternative conception more compatible with several of the commentaries would place negativity bias and cognitive closure bias on a more equal footing, with both seen as direct downstream results of the same prior causal mechanism, a view broadly consistent with the commentaries that focus on evolutionary origins (i.e., **White & Neuberg** and **Petersen & Aarøe**). Clarifying the details and structural mechanisms that underpin the inter-relation between negativity bias and cognitive closure (or coherence) is a high research priority. Many of the commentaries provide promising pathways to pursue that priority.

Perhaps our favorite criticism of the target article is the admonition from **Ludeke & DeYoung** that we have cast our net too narrowly by focusing on political orientations. They argue persuasively that the impact is much more inclusive and includes "religiousness, authoritarianism, and traditionalism" in a variety of settings. The suggestion that negativity bias, properly refined and delineated in light of the discussions above, could undergird virtually all of the broad variation in human orientations toward large-scale social organization is heady stuff indeed. Whether or not the contention is pushed that far, the general consensus in the commentaries certainly is consistent with the central argument in our target article that negativity bias may explain a portion of the variation in core political orientations. With appropriate theoretical refinement and more empirical research in the spirit discussed in the commentaries, that portion could turn out to be even more substantial than we have argued.

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[The letters "a" and "r" before author's initials stand for target article and response references, respectively]

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