

EXAMINING THE LEFT-RIGHT DIVIDE:
CAUSES, CORRELATES, AND CONSEQUENCES OF POLITICAL IDEOLOGY

A Dissertation
Presented to the Faculty of the Graduate School
of Cornell University
In Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

by
Benjamin Coe Ruisch
May 2020

© 2020 Benjamin Coe Ruisch

EXAMINING THE LEFT-RIGHT DIVIDE:
CAUSES, CORRELATES, AND CONSEQUENCES OF POLITICAL IDEOLOGY

Benjamin Coe Ruisch

Cornell University 2020

The left-right political divide is among the most contentious in modern society, often eliciting more explicit acrimony than divisions based on race, religion, or social class. In this dissertation, I present three lines of research examining the ideological divide. This work illustrates the three main lenses through which I have approached the study of ideology, examining its **causes**, **correlates** and **consequences**.

In the first series of studies I focus on the upstream **causes** of ideology, examining how individual differences in low-level physiological traits can influence a person's political attitudes. In four studies (total $N = 1,639$) I provide evidence that genetically determined differences in gustatory (taste) sensitivity shape a person's political ideology, with more taste-sensitive individuals tending to become more politically conservative.

In the second line of research, I turn to the **correlates** of ideology, investigating how the same upstream factors that influence ideology can also shape other aspects of cognition for those on the left and right. In a series of 14 studies (total $N = 4,595$), I find that there are wide-ranging ideological differences in judgment and decision-making confidence, with political conservatives exhibiting greater metacognitive confidence across a broad range of judgment domains. I also find evidence that these differences in confidence are driven by the same upstream epistemic needs that shape political ideology.

Finally, I consider the downstream **consequences** of ideology, examining how belonging to an ideological group, in turn, can influence a person's cognition and behavior. In a series of 12 studies (total $N = 9,917$), I examine how shifting social norms among ideological ingroups reshaped Americans' intergroup attitudes in the wake of the 2016 U.S. Presidential Election. I find evidence that Donald Trump's political ascent substantially reshaped expressions of explicit prejudice among Americans—but that the direction of this change diverged sharply along ideological lines: conservatives (especially Trump supporters) showed significant increases in prejudice towards a wide range of minority groups. Liberals, conversely, showed significant *decreases* in prejudice over this same period.

In conclusion, I consider some possible future research directions at the intersections of these three lines of work.

BIOGRAPHICAL SKETCH

Benjamin Ruisch was born in a small town in the rural Midwest. After high school, he spent a few years traveling around the U.S., waiting tables, doing odd jobs, and getting to know the country and its people. He finally settled in New York City, where he pursued a bachelor's degree in psychology at Hunter College. During this time, he conducted research on the psychological underpinnings of political ideology in the laboratory of Dr. John Jost at New York University. Following graduation, he moved to Ithaca, New York to begin a Ph.D. program at Cornell University, where he has worked primarily under the guidance of Dr. Melissa Ferguson. After receiving his Ph.D., Benjamin will begin a postdoctoral research position at Ohio State University working primarily with Dr. Russell Fazio.

ACKNOWLEDGMENTS

I owe every page of this dissertation to an incredible network of mentors, friends, and family:

- To my advisor, Melissa Ferguson, indescribably brilliant and somehow simultaneously one of the most caring people that I have ever known. To convey my gratitude would require many more pages than I am allotted here, but suffice it to say that I would never have made it this far were it not for her.

- To an extraordinary department of supportive and incessantly curious faculty who have pushed (and occasionally dragged) me in many new intellectual directions. I am particularly grateful to my committee: to David Pizarro, whose conversations—deftly weaving together comic books, rap music, and classic psychological theory—have taught me to think broadly and to find diverse sources of inspiration. To Tom Gilovich, whose lab meetings taught me how to look at the big picture (or at least how to try). To Amy Krosch, whose openness and creativity have taught me to search for new approaches to solving old problems. And to Mike Goldstein, able to provide surprising new insights into virtually any question, and to somehow always find a way to make babies and/or birds relevant to the conversation at hand.

- To the wonderful group of graduate students with whom I have had the good fortune to overlap—my collaborators, companions, and commiserators over the last few years. I'm particularly fortunate to have met Steve Strycharz, the other half of my cohort and now a lifelong friend, and Raj Anderson, my trusty collaborator and endless well of positivity during difficult times.

- Finally, to my wife, Francesca Manzi, amor de mi vida y mejor amiga. I don't know where I would be without you. And to my son Marco, joyous, beautiful baby boy who has completely upended our lives, and who in the span of only five short months has already managed to wrap us tightly around his tiny finger.

TABLE OF CONTENTS

Biographical Sketch	v
Acknowledgments	vi
Table of Contents	vii
List of Figures	viii
General Introduction <i>The Psychological Study of Political Ideology</i>	9
Chapter I. Causes <i>A Matter of Taste: Gustatory Sensitivity Shapes Political Ideology</i>	21
Chapter II. Correlates <i>The Confident Conservative: Ideological Differences in Judgment and Decision-Making Confidence</i>	43
Chapter III. Consequences <i>Changes in American Societal Prejudices Following the 2016 U.S. Presidential Election Cycle</i>	93
General Discussion	118

LIST OF FIGURES

Figure 1.1 Forest plot illustrating the relationship between taste sensitivity and both general and social conservatism	40
Figure 1.2 Scatterplot illustrating the relationship between taste sensitivity and political orientation	42
Figure 2.1 Sample pattern (Study 1F)	62
Figure 2.2 Response scales for the low and high difficulty conditions (Study 2B)	67
Figure 2.3 Model illustrating conservatism predicting greater confidence through the motivation for rapid judgments (Study 5A)	79
Figure 2.4 Model illustrating conservatism predicting greater confidence through the consideration of alternative responses (Study 5B)	81
Figure 2.5 Forest plot of effect sizes of conservatism-confidence relationship	83
Figure 2.6 Forest plot of effect sizes of extremity-confidence relationship	85
Figure 3.1 Density plots illustrating changes in prejudice against Muslims among those who support versus oppose Donald Trump	100
Figure 3.2 Plot depicting the relationship between Trump support and prejudice against Muslims at Time 2	101
Figure 3.3 Spaghetti plots illustrating heterogeneity in changes in prejudice between participants and between studies	104
Figure 3.4 Forest plot of effect sizes for longitudinal study prejudice measures	106
Figure 3.5 Forest plot illustrating the relationship between Time 2 prejudice and various anti-minority policy attitudes	108

General Introduction: The Psychological Study of Political Ideology

Tensions between the political left and right have been growing in recent years, with greater polarization, increased animosity, and less willingness to “reach across the aisle” to engage with individuals of the opposing ideology (McCoy, Rahman, & Somer, 2018; Pew Research Center, 2014, 2016, 2017a; Reiljan, 2019). Indeed, recent polls suggest that the liberal-conservative divide is now one of the most contentious divisions in modern American society, often eliciting more explicit antipathy than divisions based on race, religion, or social class (Iyengar & Westwood, 2015; Pew Research Center, 2016, 2017a, c). However, although the ideological gap has been particularly acrimonious in recent years, the divide between the political right and left is nothing new. This core ideological dimension has exhibited remarkable stability across both time and cultures (Bobbio, 1996; Burke, 1790/1987; Huber & Inglehart, 1995; Jost, 2006; Jost, Glaser, Kruglanski, & Sulloway, 2003a; Lukes, 2003; McCarty, Poole, & Rosenthal, 2006; Rosas & Ferreira, 2014), with social and political systems often being characterized by a push-and-pull between these two opposing mindsets.

Adherents of these two “political ideologies” – here, defined as “set[s] of beliefs about the proper order of society and how it can be achieved” (Erikson & Tedin, 2003, p. 64) – hold opposing positions across a wide range of domains. Research suggests that those on the political right—often called “conservatives” in the U.S. and many Western nations—tend to be relatively more concerned with maintaining societal order, structure, and stability, and are more resistant to social change and more tolerant of inequality between social groups (Jost et al., 2003a, b; Erikson & Tedin, 2003; McClosky & Zaller, 1984; Rathbun, 2007). Those on the political left—often called “progressives” or, in the U.S., “liberals”—tend to be more open to societal change and to prefer less hierarchical relations between groups (*ibid.*).

Although ideological belief systems are complex (e.g., consisting of partially independent facets of economic and social/cultural beliefs; Duckitt, Wagner, Du Plessis, & Birum, 2002; Evans, Heath, & Lalljee, 1996; Layman & Carsey, 2002, Saucier 2000, Stenner 2005), and the exact political policies endorsed by each of these ideological groups can to some degree vary as a function of the specific political system in which they are embedded (Benoit & Laver, 2006; Fuchs & Klingemann, 1990), these broad left-right “political orientations” play a central role in structuring political thought and behavior, and do so in reliable ways (Benoit & Laver, 2006; Bobbio, 1996; Fuchs & Klingemann, 1990; Jacoby, 1991, Jost, 2006; Lukes, 2003; Tomkins, 1963). For example, those on the right tend to support political policies that impose harsher punishments for criminals and social “deviants” or norm-violators (e.g., the death penalty, mandatory minimum sentences); to support more aggressive foreign policy (e.g., militaristic responses to conflict); and to be less supportive of redistributive economic policies (e.g., social welfare¹; Fuchs & Klingemann, 1990; Jacobs & Carmichael, 2002; Jost et al., 2003a; Marcus, Sullivan, Theiss-Morse, & Wood, 1995; Skitka, 1999; Skitka & Tetlock, 1993a, b; Tetlock et al., 2007; Tyler & Weber, 1982). Those on the left tend to endorse the inverse set of policy preferences, supporting less punitive responses to crime and violations of social norms, less “hawkish” foreign policy (e.g., favoring diplomacy over military action), and greater support for economic redistribution (*ibid.*).

However, the differences between those on the right and left are not limited to political attitudes and behavior. Indeed, decades of research has revealed that liberals and conservatives differ in numerous aspects of everyday behavior (e.g., pastimes, jobs/careers, social groups;

¹ Although research suggests that welfare attitudes—as well as economic conservatism more broadly—may be more closely related to social conservatism in the U.S. and other developed Western nations (e.g., Benoit & Laver, 2006; Malka et al., 2017), as will be discussed in more detail below.

DellaPosta, Shi, & Macy, 2015; Pew Research Center, 2014; Verdant Labs, 2016; Wilson, Ausman, & Mathews, 1973), values (e.g., conformity, self-expression; Caprara et al., 2017; Schwartz, Caprara, & Vecchione, 2010; Schwarz et al., 2014), preferences (e.g., in art, humor, poetry, cuisines; Epstein, 2014; Gillies & Campbell, 1985; Mikol, 1960; Ruch & Hehl, 1986; Schneider, 1985; Wilson et al., 1973; Yakovlev & Guessford, 2013), and beyond. Generally speaking, those on the political right tend to show more appreciation for tradition, to place greater value on social conformity or “fitting in,” and to be less likely to seek out novel and unfamiliar experiences. Conversely, those on the left tend to value self-expression and uniqueness, and to be more open to new and unfamiliar experiences. In sum, the divide between the right and left is not simply a political one; those of opposing ideologies have remarkably different values, lifestyles, and cultures.

The breadth, depth, and stability of the differences between liberals and conservatives led early researchers and theorists to speculate that political ideology might be driven by deeper psychological traits and motivations that are not specific to the political realm (Adorno, 1950; Altemeyer, 1988; Frenkel-Brunswick, 1949; Tomkins, 1963; Wilson, 1973). More than 70 years of research has borne out this prediction, revealing robust ideological differences in many aspects of basic psychology, including cognition/cognitive style (e.g., attention to negative situations and stimuli; Hibbing, Smith, & Alford, 2014), personality (e.g., openness to experience, conscientiousness; Gerber, Huber, Doherty, Dowling, & Ha, 2010), emotional experience (e.g., sensitivity to disgust; Inbar, Pizarro, & Bloom, 2009), and psychological motivations (e.g., needs for structure, certainty, and cognition; Chirumbolo, 2002; Cichocka & Dhont, 2018; Jost et al., 2003a; Kemmelmeier, 1997; for a recent meta-analysis, see Jost, Stern, & Sterling, 2017).

Jost and colleagues (Jost et al., 2003a), summarizing decades of research on the psychological underpinnings of political ideology, suggested that ideological differences in cognition and motivation tend to fall along two primary dimensions: (1) epistemic needs (motivations for certainty and stability, aversion to ambiguity) and (2) existential needs (motivations for safety and security, sensitivity or aversion to threat). They found that, generally speaking, individuals who are relatively higher in epistemic needs for certainty or existential needs for safety/security tend to be more politically conservative, while those relatively lower in these needs tend to be more politically liberal. Because these psychological motivations are not specific to the political domain, this also explains why ideological differences extend beyond the realm of politics, manifesting in a large number of “comorbid” preferences, traits, and beliefs.

Building on the predictions of early theorists (e.g., Adorno, 1950; Rokeach, 1960; Tomkins, 1963; Wilson, 1973), Jost and colleagues (2003a, b) hypothesized that different political ideologies may serve to assuage different types of psychological motivations. They suggested that conservatism may be particularly adept at satisfying psychological needs for certainty and safety because it offers a relatively stable and protected worldview through the preservation of the status quo, as well as harsh treatment of norm violators and social outgroups. Liberalism, conversely, because of its orientation towards societal change and more lenient treatment of outgroups, is argued to be less effective in assuaging these same needs.²

According to this theoretical perspective, although needs for certainty and security are universal (i.e., common to all humans), there is natural variation in these motivations. These individual differences in psychological needs, in effect, serve as “ideological predispositions” that lead an individual to be more likely to gravitate toward one ideology over another (Jost et

² Liberalism, presumably, also fulfills certain psychological needs, although these have received little attention in research (Duarte, Crawford, Stern, Haidt, Jussim, & Tetlock, 2015; Lilienfeld, 2015).

al., 2003a, b). Those higher in epistemic and existential needs are more likely to be drawn to political conservatism as a way of satisfying these needs.

Support for this hypothesized causal direction comes from both longitudinal and experimental research. In the domain of existential motivation, experimental manipulations of threat (e.g., reminders of one's own mortality; Burke, Kosloff, & Landau, 2013; Nail, McGregor, Drinkwater, Steele, & Thompson, 2009) as well as real-world threatening events (e.g., 9/11 and other terrorist attacks; Bonnano & Jost, 2006; Davis & Silver, 2004; Doty, Peterson, & Winter, 1991; McCann, 2008; Nail & McGregor, 2009; Willer, 2004; for a recent meta-analysis, see Jost, Stern, Rule, & Sterling, 2017) have been shown to cause a "conservative shift" in ideology, leading people to adopt more right-wing attitudes and policy preferences.

Analogous effects have been documented in the domain of epistemic needs, with experimental manipulations that heighten an individual's motivation for cognitive closure or certainty (e.g., time pressure, cognitive load, alcohol intoxication) also leading people to adopt more conservative views (Eidelman, Crandall, Goodman, & Blanchard, 2012; Hansson, Keating, & Terry, 1974; Rock & Janoff-Bulman, 2010; Skitka, Mullen, Griffin, Hutchinson, & Chamberlin, 2002; Thorisdottir & Jost, 2011; Van Berkel, Crandall, Eidelman, & Blanchard, 2015). Finally, providing further support for this theoretical perspective are longitudinal studies which have found that differences in temperament among young children predict ideology in adulthood, with children who are relatively more fearful/threat sensitive and/or averse to uncertainty tending to adopt more politically conservative views as they age (Block & Block, 2006; Fraley, Griffin, Belsky, & Roisman, 2012).

The Present Research

In the pages that follow, I will present three lines of research in which I have built on past work on the psychology of political ideology. These three lines of work illustrate the three primary lenses through which I have approached the study of ideology, examining its **causes**, **correlates**, and **consequences**.

First, I will discuss research that I have conducted on the upstream “**causes**” of political ideology, examining whether and how individual differences in low-level physiological traits may shape a person’s political orientation. In this work, I conducted a series of four studies (total $N = 1,639$) in which I tested the prediction that genetically determined individual differences in taste sensitivity may influence the political ideology that a person adopts. This work extends past research on the underpinnings of ideology beyond the domain of abstract psychological traits and motivations, bridging the psychological, evolutionary, and chemical senses literatures to examine a novel physiological factor that may shape a person’s political attitudes.

In the second part of this dissertation I focus on the psychological **correlates** of ideology, examining how the same upstream motivations (e.g., for certainty and safety) that shape ideology can also influence other aspects of cognition, leading to systematic cognitive differences between liberals and conservatives. I present a series of 14 studies (total $N = 4,595$) in which I tested the hypothesis that there are domain-general ideological differences in subjective judgment and decision-making confidence, and that these differences stem from the same epistemic needs that shape a person’s political ideology. In addition to identifying a novel domain of ideological differences – metacognitive confidence – this work extends past research and theory by focusing on a less-studied aspect of the relationship between psychological needs and ideology, revealing that needs for safety and certainty do not only shape the ideology that an individual adopts, but

can also give rise to other psychological differences between those on the left and right that have implications for both political and non-political cognition.

In the final section of this dissertation, I turn to the **consequences** of political ideology. In contrast to the first two lines of research, in which I examined how upstream physiological and psychological factors shape ideology and related aspects of cognition, in this work I reverse this lens to understand how belonging to an ideological group, in turn, can influence a person's cognition and behavior. In this research, I leveraged the unique sociopolitical event of Donald Trump's campaign and election to examine how ideology binds people into valued social groups that then serve as normative reference points that influence their personal attitudes. I conducted a series of 12 studies (total $N = 9,917$) in which I investigated how (pro-Trump) conservatives' and (anti-Trump) liberals' intergroup attitudes shifted in the wake of Donald Trump's political ascent. This work serves as an important counterweight to much past research on the psychological underpinnings of ideology by demonstrating that a person's political ideology is not simply a downstream product of individual differences in psychological traits, but that belonging to an ideological group can also catalyze identity- and norm-related psychological processes that shape a person's attitudes, beliefs, and behavior.

Finally, in conclusion, I consider the limitations of this work and discuss some unresolved questions. I also propose some potential avenues of future research at the intersections of these different lines of work that may help provide insight into whether and how these disparate processes may shape and inform one another.

Methodological Approach

Incorporating Recent Critiques and Best-Practice Recommendations

Although the hypothesis that needs for safety and certainty shape a person's political ideology has received a great deal of empirical support (for recent meta-analyses, see Jost, Stern, Rule, & Sterling, 2017 and Jost, Stern, & Sterling, 2017), this theoretical perspective has faced important challenges in recent years. Several lines of criticism have emerged arguing that the relationship between psychological needs and political ideology may be overstated and mischaracterized – or perhaps even completely illusory.

One line of criticism is based on the fact that much – if not most – of the research on ideological differences in epistemic and existential needs has relied on self-report measures of psychological motivations (e.g., scale measures of intolerance of ambiguity and needs for structure, closure, and cognition; for reviews, see Jost et al., 2003; Jost, Stern, & Sterling, 2017). Several commentators have argued that these self-report measures often include explicitly or tacitly ideological content, which effectively conflates the independent and dependent measures, and is therefore likely to artificially inflate effect sizes of the associations between these psychological needs and political ideology (Taber & Young, 2013; Van Hiel, Onraet, Crowson, & Roets, 2016; Van Hiel, Onraet, & De Pauw, 2010).

Furthermore, these commentators argue that because these self-report measures are susceptible to social desirability and self-presentational biases, they are likely to capture not only differences in how liberals and conservatives actually are, but also differences in how they *would like to be* and/or *would like to be perceived by others*. This, too, may exaggerate the degree of psychological differences between those on the left and right. Consistent with these critiques, meta-analyses have revealed that behavioral (vs. self-report) measures of these same psychological constructs (e.g., intolerance of ambiguity, cognitive rigidity) often show substantially attenuated associations with ideology (e.g., Van Hiel et al., 2010, 2016).

Accordingly, commentators have called for increased use of non-political, behavioral and “process-based” measures to circumvent the conceptual overlap and self-report bias that has threatened the validity of some past research.

A second line of criticism is that past research has tended to use relatively narrow operationalizations of epistemic and existential needs (Choma, Hanoch, Gummerum, & Hodson, 2013; Choma & Hodson, 2017; Crawford, 2017). For example, research suggesting that conservatives are more threat sensitive, or have stronger motivations for safety/security, has almost exclusively defined “threat” in terms of concrete, external, physical threats of severe injury or death (e.g., dangerous animals like snakes and spiders; Oxley et al., 2008; reflecting on one’s own death; Burke, Kosloff, & Landau, 2013). Other types of threat – such as more abstract, delayed, or collective threats (e.g., failure, pollution, income inequality) – have been largely overlooked (Choma, Hanoch, Gummerum, & Hodson, 2013; cf. Lilienfeld & Latzman, 2014; Olivola & Sussman, 2014).

Further, past research has often used clearly “politicized” issues as indices of basic psychological traits or motivations. For example, conservatives’ greater concern about terrorism is often interpreted as indicating a general threat sensitivity, despite the fact that such ideological differences might also be expected to result from factors such as the documented differences in frequency and style of depictions of terrorism between liberal and conservative news media (Stroud, 2011; Woods & Arthur, 2014). Similarly, the increased support for conservative leaders and parties that has been observed in the wake of terrorist attacks such as 9/11 (e.g., Bonnano & Jost, 2006; Nail & McGregor, 2009) has also been interpreted as indicating that threat *per se* leads to greater conservatism. This research has tended not to assess whether this “conservative shift” might be specific to terrorism (or threats emanating from foreign aggressors more

generally), given that conservative political policies tend to be seen as more effective in minimizing terrorist threats (Pew Research Center, 2018a). Particularly given the paucity of research assessing the effects of other forms of threat – including those that liberals tend to prioritize (e.g., climate change; Jones, 2010) – such generalizations may be premature.

Critics contend that these circumscribed definitions of threat and uncertainty may further inflate the apparent associations between ideology and needs for safety and certainty. In support of this argument, research that has utilized broader operationalizations of these constructs has often found that these relationships are moderated by the specific domain in question. For example, research assessing attitudes towards more diverse arrays of threat has found that while (social) conservatives exhibit greater concern about (certain forms of) concrete, external, physical threats, they express less concern about other kinds of threat (e.g., abstract, internal, and/or collective threats; Choma et al., 2013; Choma & Hodson, 2017; Crawford, 2017; Onraet, Van Hiel, Dhont, & Pattyn, 2013). Accordingly, there is a need to move beyond politicized issues and limited operationalizations of threat and uncertainty to develop more balanced and complete measures.

A related line of critique concerns the appropriateness of the use of single-item, left-right measures of political orientation, rather than examining distinct dimensions of ideology. That is, although the left-right dimension is ubiquitous in politics and can parsimoniously predict a wide range of policy attitudes (Bobbio, 1996; Burke, 1790/1987; Huber & Inglehart, 1995; Jost, 2006; Jost et al., 2003; Lukes, 2003; McCarty et al., 2006; Rosas & Ferreira, 2014), research increasingly suggests that citizens' political attitudes are better characterized by multiple distinct facets or dimensions (e.g., social/cultural vs. economic ideology; Duckitt et al., 2002; Evans et al., 1996; Layman & Carsey, 2002; Saucier, 2000; Stenner, 2005). Further, research suggests that

these dimensions may to some degree be driven by different types of psychological needs (Altemeyer, 1998; Duriez & Van Hiel, 2002; Feldman, 2013; Malka & Soto, 2015; Sibley & Duckitt, 2008). For example, recent perspectives on the psychological underpinnings of ideology go beyond positing simple associations between threat sensitivity and conservatism to suggest that *distinct forms of threat sensitivity* may relate to *distinct facets of political beliefs* (e.g., research suggests that pathogen threat/disgust sensitivity may specifically and uniquely predict people's positions on political issues concerning sexual traditionalism and adherence to social norms; Tybur, Inbar, Güler, & Molho, 2015). More nuanced measures of both psychological motivations and ideology appear to hold promise of deepening our understanding of the underpinnings of political ideology.

A final challenge to the theoretical framework outlined above concerns the replicability and transparency of past research. Most troublingly, recent research has failed to replicate some of the foundational findings of the field (e.g., Bakker and colleagues' (Bakker, Schumacher, Gothreau, & Arceneaux, 2019) and Knoll and colleagues' (Knoll, O'Daniel, & Cusato, 2015) failures to replicate the relationship between physiological threat sensitivity and conservatism documented by Oxley et al., 2008). These failed replications suggest that the field of political psychology is not exempt from the broader "replication crisis" facing the discipline of psychology and raise questions about the reliability of some past work. This further highlights the need for greater transparency and methodological rigor, and suggests that the field may benefit from a reevaluation of some of the fundamental tenets of the theoretical framework outlined above.

In sum, then, despite the large body of research on the psychological underpinnings of political ideology, many questions remain. Although there is ample evidence connecting political

ideology with fundamental psychological motivations for certainty and safety, recent critiques have provided reasons to question the scope and nature of these associations. Accordingly, there is a need for careful, methodologically rigorous, and transparent research to reexamine some of the basic tenets of this theory.

In the three lines of research that I present below, I have sought to overcome some of the limitations of past work by incorporating the recommendations of the various critiques outlined above: (1) In this research, I avoid the use of politically charged explanatory variables in favor of apolitical measures that assess more basic differences in physiological and psychological traits (e.g., measures of taste sensitivity borrowed from the field of sensation/perception; measures of metacognitive confidence from the judgment and decision-making literature). (2) When self-report measures are used, I have sought to complement these with conceptually analogous behavioral, physiological, and/or process-based measures to offer convergent support for my hypotheses. (3) I use nuanced measures of both threat (e.g., pathogen threat/disgust sensitivity) and epistemic motivation (e.g., need for cognitive closure). (4) Although left-right political orientation is a key focus of much of this work, I go beyond these global measures of ideology to examine individual facets of these ideological belief systems as well. (5) Finally, throughout this work I have sought to adopt a transparent and methodologically rigorous approach that incorporates the recent best-practice recommendations from the field. Each of the three lines of research that I present employ preregistration, a-priori power analyses, and internal meta-analyses. In addition, all materials, syntax, and preregistration documentation are made publicly available (all data will be made available immediately following publication). Through this approach, I seek not only to build on past work, but also to critically reexamine, refine, and reinforce some of the tenets of the theoretical framework on which this research is based.

Chapter I: Causes

A Matter of Taste: Gustatory Sensitivity Shapes Political Ideology

*with Rajen Anderson, Yoel Inbar, and David Pizarro

Early perspectives on the genesis of political attitudes considered them to be derived via a largely rational process whereby an individual dispassionately weighs the arguments for and against a given position to arrive at the appropriate conclusion (Nardin, 2015; Riker, 1995; Uhlaner, 1986). However, psychological and political scientific research in the intervening decades has identified a number of factors beyond impartial reasoning that shape a person's political attitudes and ideology. These include early socialization through family and peer groups (Tedin, 1980), personal self-interest (Erikson and Tedin, 2010; Lipset, 1966), and psychological motivations such as needs for safety and certainty (Jost et al., 2003, 2007).

However, a burgeoning body of research in the field of "biopolitics" has recently demonstrated that the foundations of political ideology may go even deeper than previously believed, and that differences in political ideology may also stem from more basic biological differences between individuals. This work has suggested that a person's genetic makeup plays a significant role in determining their political orientation – by some estimates explaining 30-60% of the variance in political liberalism/conservatism (Hatemi et al., 2014). However, the proximal mechanisms by which these observed genetic differences are translated into political attitudes and behavior remain largely unknown.

One intriguing possibility is that at least some of the observed variability in ideology is due to genetic influences on low-level physiological mechanisms, such as those that govern sensory perception. This possibility was suggested by Hatemi et al. (2011), who conducted a

genome-wide analysis of 13,000 people to identify the specific genomic regions that accounted for the heritability of political attitudes. Their analysis identified several regions that accounted for variance in respondents' liberalism/conservatism. Interestingly, one of these regions (on chromosome 9) contained a large number of genes related to taste and olfaction (Lacazette, Pitiot, Jobert, Mallet, & Gachon, 1997; Rajab et al., 2008), suggesting that individual differences in sensory processing may relate to political ideology.

Two additional lines of research converge to suggest possible associations between sensation, particularly gustation, and political ideology. They also suggest a possible psychological mechanism for this association. First, many researchers have posited a deep and evolutionarily ancient connection between taste and disgust. Specifically, some elements of taste (particularly bitterness perception) are believed to have evolved to detect potentially poisonous and pathogen-laden features of our environment, such as poisonous plants and rotten food (Curtis, 2013; Curtis & Biran, 2001). These stimuli elicit an unpleasant (usually bitter or sour) taste sensation, which triggers a set of physiological and behavioral responses (e.g., opening of the mouth, projection of the tongue) that serve to prevent the ingestion of the offending substance. The emotion of disgust is believed by many to have its origins in this initial oral rejection response (Kelly, 2011; Rozin, Haidt, & McCauley, 2008; Tybur, Lieberman, Kurzban, & DeScioli, 2013). It is argued that this system was repurposed (or "preadapted," in evolutionary parlance; Mayr, 1960) to respond to other environmental cues and other classes of sensory stimuli (e.g., sights and smells that signal the presence of pathogens) in order to avoid contamination and disease.

Consistent with this theorizing, neuroimaging studies have revealed that the area of the brain that is most often implicated in the disgust response, the anterior insula (Vytal & Hamann,

2010), is also intimately involved both in the processing of taste stimuli and the visceral experience of nausea (Rolls & Scott, 2003; Stern, Koch, & Andrews, 2011). Further, research from the sensation and perception literature has recently identified a connection between greater taste sensitivity and heightened sensitivity to disgust. This work has shown that individuals who are more sensitive to the chemical compound PROP, the most widely used measure of taste sensitivity (Bartoshuk, Duffy, & Miller, 1994), are more prone to experiencing certain forms of disgust (Herz, 2011). Given that taste sensitivity (e.g., sensitivity to PROP, taste receptor density) is largely genetically determined (Barbarossa et al., 2015), this work suggests that having a more sensitive sense of taste may predispose a person towards developing a heightened sense of disgust.

Additionally, recent social psychological research has demonstrated that disgust sensitivity, in turn, may have implications for political attitudes. This work has reliably found that greater dispositional sensitivity to disgust is associated with greater political conservatism (e.g., Inbar, Pizarro, & Bloom, 2009). This association is primarily due to a relationship between higher dispositional disgust sensitivity and greater cultural traditionalism and sexual restrictiveness (vs. permissiveness; Tybur, Inbar, Guler, & Molho, 2015; Tyber et al., 2016). Specifically, this work suggests that individuals with higher disgust sensitivity tend to place greater value on adherence to social norms (which often evolve culturally to limit pathogen transmission; Billing & Sherman, 1998; Schaller & Murray, 2008) as well as to adopt more monogamous (vs. promiscuous) mating strategies (which serve to limit pathogen transmission; Schaller, 2011; Schaller & Murray, 2008). Because political conservatism tends to align with these concerns/positions (e.g., through harsher punishment of norm violators and favoring

traditional vs. non-traditional sexuality), this leads more disgust-sensitive individuals to tend to adopt more politically conservative ideologies.

Integrating these various lines of research led us to hypothesize that physiological differences in taste sensitivity would be associated with political ideology, such that individuals with more sensitive senses of taste would tend to be more politically conservative. Further, we predicted that this association would be mediated by sensitivity to disgust. We tested these hypotheses in four studies (total $N = 1,639$), in which we assessed taste sensitivity using commercially available chemical test strips (Studies 1-3) as well as tongue fungiform papilla density (Study 4).

Analytic Plan

We preregistered two of the four studies we conducted. All deviations from our planned analyses and predicted results are explicitly described in the main text. Following our preregistered analysis plans, we tested our primary predictions using linear regression. In these analyses, all predictors are grand-mean centered, and we report standardized beta weights. We list all predictors and control variables that were included in the models. (If no covariates are stated, none are included.) We exclude no participants: all participants who provided complete, analyzable data are included in our analyses. Following recent best practices recommendations (e.g., McShane & Böckenholt, 2017), we also conducted an internal meta-analysis of our studies in order to further increase statistical power and better estimate the true size of any observed effects (Braver, Thoemmes, & Rosenthal, 2014). All materials, data, syntax, and preregistration documentation are available on the Open Science Framework at <https://osf.io/fv436/>.

Study 1

In Study 1, we provided an initial test of the association between taste sensitivity and political conservatism. To do so, we assessed participants' levels of taste sensitivity using a widely used measure of taste sensitivity: taste strips containing the chemical compound 6-n-propylthiouracil (PROP). PROP is a chemical that, depending on a person's genetically determined level of taste sensitivity, can be extremely bitter, completely tasteless, or anywhere in between (Barbarossa et al., 2015; Bartoshuk et al., 1994). Because sensitivity to PROP is associated with general taste sensitivity, it is an efficient method of assessing a person's overall level of taste sensitivity (Bartoshuk et al., 1994).

Method

Participants

For this initial test of our hypothesis, we recruited a convenience sample of students from an introductory psychology course. We included all students who elected to participate in the study, resulting in a total sample of $N = 343$.

Procedure

Participants were provided with a PROP taste strip and a paper survey packet. They were instructed to place the PROP strip on their tongues for 30 seconds and to rate the bitterness of the strip on two 100-point scales. They then indicated their general political orientation and their social and cultural liberalism/conservatism.

Materials

Taste strips contained 3-5 micrograms of PROP per strip and were purchased from Sensonics International (sensonics.com).

Participants rated the bitterness of the taste strip on two 100-point quasi-logarithmic scales developed by Bartoshuk and colleagues (Bartoshuk et al., 2003). These scales asked participants to compare the taste sensation from the taste strips to other sensory experiences. The first scale asked participants to compare the intensity of the bitterness to auditory sensations of differing intensities, ranging from “Absolute silence” to “An airhorn next to your ear.” The second scale asked participants to compare the bitterness of the strip to “the full range of sensations that [they] have ever experienced,” ranging from “no sensation” to “strongest imaginable sensation of any kind.” These scales were developed in order to overcome the difficulties inherent to comparing subjective sensory experiences between individuals and have been shown to accurately identify between-subjects differences in taste sensitivity (Bartoshuk et al., 2003).

General political orientation was assessed with the question “Where on the following scale of political orientation would you place yourself?” and social and cultural liberalism/conservatism was assessed with the question “In terms of social and cultural issues, how liberal or conservative are you?”. Participants provided their response to each question on a 7-point Likert-type scale ranging from “Extremely Liberal” to “Extremely Conservative” (general political orientation $M = 3.23$, $SD = 1.41$; Social/Cultural political orientation, $M = 2.68$, $SD = 1.31$).

Results

Twenty-two participants did not provide information about their political ideology, and one additional participant did not rate the bitterness of the taste strip. This left us with a sample of 320 participants with analyzable data. The correlation between our two taste sensitivity scales was high ($r = .83$), so we averaged them into a single index of taste sensitivity ($M = 38.74$, $SD =$

24.93).

As predicted, participants who reported greater bitterness from the taste strip (i.e., those with higher taste sensitivity) identified as more politically conservative, both on the measure of general political orientation ($\beta = .14$, $t(318) = 2.46$, $p = .01$; $M_{\text{liberals}} = 36.93$; $M_{\text{Conservatives}} = 44.20$), as well as on the measure of social and cultural conservatism ($\beta = .15$, $t(318) = 2.73$, $p = .007$; $M_{\text{liberals}} = 37.13$ $M_{\text{conservatives}} = 47.56$).

Discussion

The results of this study provided initial support for the hypothesized connection between taste sensitivity and political conservatism, using a well-established measure of taste sensitivity. Although these results are correlational and cannot speak to the causal direction of this relationship, past research has established that the ability to taste PROP is largely genetically determined (Barbarossa et al., 2015). These findings therefore provide an initial indication that taste sensitivity may play a role in shaping political ideology.

Study 2

In Study 2, we conducted a preregistered conceptual replication of Study 1 using a different measure of taste sensitivity and a more diverse sample of participants collected from a student and community center on Cornell University's campus. In this study, participants rated the bitterness of taste strips containing the compound phenylthiocarbamide (PTC), another widely used index of general taste sensitivity (Bartoshuk et al., 1994).

We also made two other changes to our experimental design in order to rule out potential confounds. First, because both age and sex have previously been shown to relate to taste sensitivity (Bartoshuk et al., 1994; Mojet, Christ-Hazelhof, & Heidema, 2001), we asked

participants to provide this information in order to test whether these factors explained the observed association between taste sensitivity and political conservatism. Second, we also asked participants to rate the specific flavor that they tasted from the test strip (e.g., bitter, sour, salty). This question allowed us to ensure that we were specifically analyzing participants' ratings of the target chemical PTC (rather than their ratings of the paper strip in which it was embedded). Because past work has shown that people experience the taste of PTC to be bitter or sour (Bartoshuk et al., 1994), all other responses (salty, sweet, or “no flavor”) were interpreted as indicating a lack of ability to taste PTC.

Method

Participants

We conducted a power analysis for 80% power to detect an effect size of $r/\beta = .145$, the effect size we observed in Study 1. This analysis recommended a sample size of 368 participants, which we increased to 400 in order to increase statistical power (59.3% female, 39.3% male; $M_{\text{age}} = 21.1$, $SD = 7.16$). We preregistered this target sample size for Studies 2 and 3.

Materials and Procedure

Research assistants set up a table and invited passersby to participate in the study in exchange for a piece of chocolate. Participants were provided with a PTC taste strip (purchased from Nasco Precision Laboratories) and a paper survey packet. They were instructed to place the taste strip on their tongue for 30 seconds. After tasting the test strip – but before rating its intensity – participants were asked to indicate the flavor of the strip, with the following response options: no flavor, bitter, salty, sour, or sweet. Participants then rated the intensity of the flavor they experienced using the same general intensity scale from Study 1 ($M = 34.29$, $SD = 27.18$).

They then indicated their political orientation ($M = 2.90$, $SD = 1.26$). and social and cultural liberalism/conservatism ($M = 2.42$, $SD = 1.26$) using the same scales from Study 1 and provided information about their age and sex. Additionally, participants also answered nine questions regarding their food preferences. As specified in our preregistration documentation, however, the results of these questions were not analyzed in relation to the current research question.

Results

Two participants did not indicate their political ideology and therefore could not be included in analyses, leaving us with an analyzable sample of 398 participants.³ Seventy-one participants (17.75%) reported tasting no flavor from the taste strip, and were therefore coded as “0” for the intensity measure. Additionally, six participants (1.5%) rated the strip as salty and four (1%) rated it as sweet, indicating a lack of ability to taste PTC. Following our preregistered analysis plan, we coded intensity as “0” for these participants. The remainder of the participants indicated that the strip tasted bitter or sour, indicating an ability to detect PTC.

Replicating the results of Study 1, we found that greater taste sensitivity – indicated by the intensity of bitterness experienced from the PTC strip – was associated with greater general political conservatism ($\beta = .19$, $t(396) = 3.80$, $p < .001$; $M_{\text{liberals}} = 32.00$, $M_{\text{conservatives}} = 44.54$) and greater social and cultural conservatism ($\beta = .19$, $t(396) = 3.80$, $p < .001$; $M_{\text{liberals}} = 32.45$, $M_{\text{conservatives}} = 46.09$). This association remained significant (and in fact became slightly stronger) when controlling for participants’ age and sex (general conservatism: $\beta = .21$, $t(390) = 4.16$, $p <$

³Although we sought only to recruit participants aged 18 or older, a number of participants under 18 also participated in our studies (3% of the total sample, $N = 53$). Because we had permission from the Cornell Institutional Review Board to recruit participants under 18, we include the data from these participants in our analyses. However, our results do not meaningfully change if these participants are excluded from analyses.

.001; social/cultural conservatism: $\beta = .21$, $t(390) = 4.18$, $p < .001$), providing further evidence for the hypothesized association between taste sensitivity and political conservatism.

Study 3

In Study 3, we sought to extend these findings by moving to an issue-based measure of political conservatism, in which we asked participants to indicate their attitudes on 12 political issues. We included this scale in order to determine whether taste sensitivity would predict individuals' positions on specific political issues, or whether this association held only for overall ideological self-identification. Based on previous research on disgust sensitivity and political ideology (6, 7), we predicted that taste sensitivity would be most closely correlated with political issues related to traditional sexuality (e.g., LGBT rights, pornography, abortion). Additionally, in this study we also collected a more demographically and ideologically diverse sample recruited from two shopping malls in the northeastern United States.

Method

Participants

Based on the power analysis outlined in Study 2, we set a target sample size of 400 participants. We received 406 responses (39.8% male, 59.4% female, .3% other; $M_{\text{age}} = 38.21$, $SD = 18.14$).

Procedure

Research assistants set up a table and invited passersby to participate in the study in exchange for a piece of chocolate. Participants were provided with a PROP taste strip and a paper survey packet. As in Study 2, participants were first asked to rate the flavor of the strip (sweet, salty, sour, bitter, or no flavor). They then rated the intensity of the strip using the same general intensity scale from Studies 1 and 2 ($M = 36.73$, $SD = 30.87$). They then completed the issue-

based measure of conservatism ($M = 0.17$, $SD = 1.64$), indicated their age and sex, and indicated their general political ideology ($M = 3.46$, $SD = 1.50$) and social and cultural liberalism/conservatism ($M = 3.31$, $SD = 1.59$) using the same scales from Studies 1 and 2.

Measures

The taste strips used in this study were the same as those used in Study 1 (purchased from Sensonics International). Our issue-based ideology measure was adapted from Everett (2013). Participants were asked to rate their positivity/negativity towards 12 political issues/values on 11-point scales ranging from “-5 Extremely Negative” to “+5 Extremely Positive,” with the midpoint labeled “0 Neutral.” 10 of these items were borrowed or adapted from Everett’s scale. Additionally, we added two items (LGBT rights and pornography) in order to include a wider range of issues relating to (non)traditional sexuality.

In our preregistration, we designated five items as relating to traditional sexuality: the family unit, traditional marriage, LGBT rights (reverse-scored), abortion rights (reverse-scored), and pornography (reverse-scored). We designated the remaining seven items as non-sexuality relevant: lowering corporate taxes, reducing immigration, gun ownership, limited government, religion, traditional values, and welfare benefits (reverse-scored).

Results

Four participants did not indicate their political ideology, eight did not indicate their social/cultural conservatism, and 14 participants did not complete our issue based-ideology measure. These participants could therefore not be included in analyses using these measures (although they were included in all other analyses). All other participants provided complete, analyzable data.

As in Study 2, we coded responses of “no flavor” ($n = 88, 21.57\%$) “salty” ($n = 5, 1.23\%$) and “sweet” ($n = 2, 0.49\%$) as “0” for the intensity measure. Reliability for our issue-based measure of conservatism was acceptably high (full 12-item scale $\alpha = .81$; 5-item sexuality-relevant subscale $\alpha = .70$; 7-item non-sexuality relevant subscale $\alpha = .73$), so we averaged across the individual items to create separate indices of overall issue-based conservatism, conservatism on issues related to traditional sexuality, and conservatism on issues unrelated to traditional sexuality.

In this study, the association between taste sensitivity and self-reported political conservatism failed to reach traditional statistical significance, although it was directionally consistent with our previous studies, with greater taste sensitivity being associated with greater political conservatism ($\beta = .07, t(399) = 1.45, p = .15; M_{\text{liberals}} = 33.99, M_{\text{conservatives}} = 38.30$; social conservatism: $\beta = .06, t(395) = 1.19, p = .23; M_{\text{liberals}} = 33.92, M_{\text{conservatives}} = 35.94$). When controlling for age and sex, these relationships emerged more clearly: the relationship between taste sensitivity and general political conservatism became significant ($\beta = .11, t(390) = 2.23, p = .03$), and the association between taste sensitivity and social/cultural conservatism became marginally significant ($\beta = .1, t(386) = 1.91, p = .057$).

Additionally, we found that taste sensitivity significantly predicted greater conservatism on the issue-based ideology scale ($\beta = .11, t(390) = 2.27, p = .02$). This relationship remained significant when controlling for age and sex ($\beta = .16, t(379) = 3.15, p = .002$). Interestingly – and contrary to our predictions – this relationship was weaker for issues related to traditional sexuality ($\beta = .04, t(390) = .70, p = .48$) and was stronger for other political issues (e.g., those related to immigration, gun ownership, and welfare benefits; $\beta = .15, t(390) = 3.05, p = .002$; Table 1).

To better understand the reason for the smaller effect size that we observed with self-identified political orientation in this study, we conducted a meta-analysis (described in detail below) to examine how this effect compared to our other studies. We found that the size of this effect did not significantly differ from those we observed in our other studies (test of heterogeneity of effect sizes: $Q(7) = 8.0, p = 0.33$; test of moderation: $Q(1) = 3.31, p = 0.07$). This suggests that the relatively smaller effect size documented in this study was likely due to random variation between samples, rather than to any meaningful difference between the studies (Lakens & Etz, 2017). (Although it is common in the scientific literature to report only significant results (Fanelli, 2010), we nonetheless report this study here in order to increase transparency in our research (Lakens & Etz, 2017) and to provide a more accurate estimate of the true size of this effect (Braver, Thoemmes, & Rosenthal, 2014)).

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Taste Sensitivity	–											
2. Traditional Marriage	.07	–										
3. Pornography	-.06	– .25** *	–									
4. LGBT Rights	.03	– .41** *	.26** *	–								
5. Abortion Rights	.001	– .40** *	.26** *	.59** *	–							
6. The Family Unit	.03	.51** *	-.2***	-.18**	– .19** *	–						

7. Corporate Taxes	-.005	.18***	-.08	.25** *	-.31***	.12*	-					
8. Limited Government	.08	.25***	-.05	.19** *	-.18***	.18**	.30***	-				
9. Welfare	-.14**	.20** *	.06	.35***	.30** *	-.09	-.20***	-.26***	-			
10. Traditional Values	.06	.55** *	.23** *	.32** *	.37** *	.49***	.24***	.31***	-.32***	-		
11. Reducing Immigration	.09	.33** *	-.07	-.46***	-.33***	.17***	.17**	.36***	-.49***	.37***	-	
12. Religion	.13*	.33** *	-.29** *	-.27***	-.36***	.33***	.10*	.15**	-.11	.42***	.17**	-
13. Gun Control	.18**	.34** *	.07	-.30***	-.32***	.21***	.23***	.35***	-.43***	.39***	.51***	.23***

Table 1. Zero-order correlation table showing the relationships between taste sensitivity and degree of positivity towards each of the 12 political issues/values included in our issue-based conservatism measure (adapted from Everett, 2013). Bolded items are those that we designated as relating to traditional sexuality.

Discussion

Although the relationship between taste sensitivity and self-reported conservatism did not reach statistical significance in this study, the effect was directionally consistent with our previous studies, and did not significantly differ from our other studies. Further, the significant association that we observed between taste sensitivity and the issue-based measure of political

ideology constitutes a conceptual replication of our previous studies using a different measure of conservatism, providing convergent evidence in support of our hypothesis that higher taste sensitivity is associated with greater political conservatism.

The pattern of results with the individual political issues (Table 1), although contrary to our predictions, also offers potential insight into the nature of this effect. Taste sensitivity significantly predicted more conservative positions on three of the 12 political issues/values: gun ownership, welfare benefits, and religion. One additional item, reducing immigration, was marginally significantly related to greater taste sensitivity ($\beta = .09, p = .08$). Although these analyses are post-hoc and should therefore be interpreted with caution, it is notable that these issues are all closely related to intergroup attitudes and orientations (Brown-Iannuzzi, Dotsch, Cooley, & Payne, 2017; Johnson, Rowatt, & LaBouff, 2012; O'Brien, Forrest, Lynott, & Daly, 2013). This pattern of results seems to be consistent with recent theory and research on the nature of the relationship between disgust sensitivity and conservatism, which suggests that disgust sensitivity may lead to greater conservatism specifically on issues that relate to outgroup aggression and promotion of ingroup norms (e.g., Aarøe, Petersen, & Arceneaux, 2017). Also consistent with this perspective, the issue that related most directly to economic conservatism – and least directly related to social conservatism – reducing corporate taxes, showed no relationship whatsoever with taste sensitivity ($\beta = -.005, p = .92$). Although this pattern of results appears to be consistent our hypothesized disgust-based explanation for the relationship between taste and conservatism, in Study 4 we directly measured disgust sensitivity in order to provide a more decisive test of this prediction.

Study 4

We next sought to assess taste sensitivity with a more objective measure that did not rely on participants' self-reported taste experiences. To do so, in this study we used a direct physiological measure of taste sensitivity: the density of fungiform papillae on participants' tongues. Fungiform papillae are small mushroom-shaped structures on the surface of the tongue that are the primary location of taste receptors (Miller, 1986). Greater fungiform papilla density indicates greater taste receptor density and thus higher taste sensitivity (Miller, 1986; Zuniga, Davis, Englehardt, Miller, Schiffman, & Phillips, 1993). Importantly, because fungiform papillae can be directly observed, they provide a more objective means of assessing taste sensitivity (Shahbake, Hutchinson, Laing, & Jinks, 2005; Zuniga et al., 1993).

Additionally, in this study we included a measure of disgust sensitivity in order to assess whether disgust sensitivity mediated the relationship between taste sensitivity and political orientation. Finally, we included a wider range of demographic questions (e.g., race/ethnicity, income) to more conclusively rule out the possibility that demographic factors might account for our observed effects.

Method

Participants

In this study, we increased our target sample size from 400 to 500, given the additional uncertainty associated with using a different measure of taste sensitivity. We recruited a mix of students, staff, faculty, and community members of diverse demographic backgrounds from a student and community center on Cornell University's campus. Ten participants did not complete their survey packet, leaving us with a final sample of 490 participants (38.5% men, 60.5% women, .8% other; $M_{\text{age}} = 22.24$, $SD = 1.30$).

Materials and Procedure

Research assistants set up a table and invited passersby to participate in the study in exchange for a piece of chocolate. Individuals who chose to participate were provided a paper survey packet and were guided through the papilla-counting procedure. In order to assess fungiform papilla density, we used a well-established staining procedure (Shahbake et al., 2005). Participants were first provided a vial of blue food coloring and a cotton swab with which they dyed the anterior (i.e., front) portion of their tongues. They were then given a small plastic ring (1/4" diameter) and were instructed to place the ring near the tip of their tongue, just to the left of center (see Shahbake et al., 2005 for detail). A research assistant then photographed each participant's tongue using a high-resolution camera.

Participants then completed the 5-item contamination subscale of the revised Disgust Scale (DS-R; Haidt, McCauley, & Rozin, 1994; Olatunji et al., 2007), which served as our measure of disgust sensitivity ($M = 2.63$, $SD = 0.79$). They then indicated their general political orientation ($M = 2.83$, $SD = 1.21$) and social and cultural liberalism/conservatism ($M = 2.27$, $SD = 1.30$) using the same scales from Studies 1-3. Participants then provided demographic information (age, sex, race/ethnicity, and income). They also completed several exploratory measures. (These measures did not moderate any of our observed effects and are therefore not discussed further; see SM for all measures.) Fungiform papilla density (defined as the number of papillae within the area demarcated by the plastic ring) was assessed by a trained research assistant at the study site. Two additional trained research assistants later independently assessed papilla density off-site.

Results

The assessments of fungiform papilla density were highly reliable ($ICC(2,3) = .87$), and were therefore averaged into a single index of papilla density ($M = 10.07$, $SD = 4.46$). The

photographs for 15 participants could not be matched to their survey packets due to poor quality photographs and were coded only by a single research assistant at the study site. We therefore do not include these participants in analyses (however, the results are nearly identical if only this single coder's score is used and these participants are included in analyses). An additional three participants did not complete the disgust sensitivity scale, and therefore could not be included in analyses that examined this measure.

As predicted, we again found that greater taste sensitivity – as measured by higher fungiform papilla density – predicted greater social/cultural conservatism ($\beta = .15$, $t(473) = 3.35$, $p < .001$; $M_{\text{liberals}} = 9.89$, $M_{\text{conservatives}} = 10.96$), and marginally predicted greater general political conservatism ($\beta = .08$, $t(473) = 1.8$, $p = .07$; $M_{\text{liberals}} = 9.80$, $M_{\text{conservatives}} = 10.03$). We also verified that demographic factors could not explain this effect. Given that race/ethnicity has been shown to relate both to political orientation and to taste sensitivity, we were particularly stringent in controlling for this variable. We “dummy-coded” all eight levels of race/ethnicity (“1” if selected, “0” if not): White, Black, Latino/Hispanic, East Asian/Pacific Islander, Native American, Southeast Asian, Middle Eastern, and Other Ethnicity. We then entered all eight of these variables as covariates in the regression model, along with age, gender, and income. The results of this analysis revealed that the relationship between taste sensitivity and conservatism was nearly identical when controlling for these variables (social/cultural conservatism: $\beta = .16$, $t(426) = 3.25$, $p = .001$; general conservatism: $\beta = .08$, $t(426) = 1.72$, $p = .09$).

We then examined whether disgust sensitivity mediated this effect. To test for mediation, we used the PROCESS macro for SPSS (Hayes, 2012) to estimate the indirect effect using 10,000 bootstrapped samples. As predicted, we found that disgust sensitivity significantly mediated the relationship between papilla density and social conservatism (indirect effect 95%

CI[.02,.07]), suggesting that the relationship between taste sensitivity is at least partially mediated by sensitivity to disgust.

Internal Meta-Analysis

Following recent best-practices recommendations (e.g., McShane & Böckenholt, 2017), we conducted an internal, “within-paper” meta-analysis to determine the average effect size of the taste sensitivity-conservatism relationship. We used a random-effects model to better extrapolate these effects beyond the current studies to the general population (Hedges & Vevea, 1998). Because we had a nested structure, with measures of both general and social conservatism collected from the same participants, we fit a multi-level meta-analysis model (see Konstantopoulos, 2011), specifying nested random effects for study and measure type (general vs. social conservatism). The average effect size across these studies was $\beta = .13$ ($se = .026$, $z = 4.87$, $p = .000001$, Figure 1.1), and the 95% confidence interval for the true effect size was $\beta = .08-.18$. We also computed separate average effect sizes for general conservatism and social conservatism. Both analyses yielded similar estimates (general conservatism: $\beta = .12$, $se = .029$, $z = 4.12$, $p < .0001$, 95% CI[.06, .18]; social conservatism: $\beta = .14$, $se = .028$, $z = 5.01$, $p < .0001$, 95% CI[.08, .19]). Cochran’s Q-test was not significant ($p = .33$), suggesting that our effect sizes were relatively homogenous.

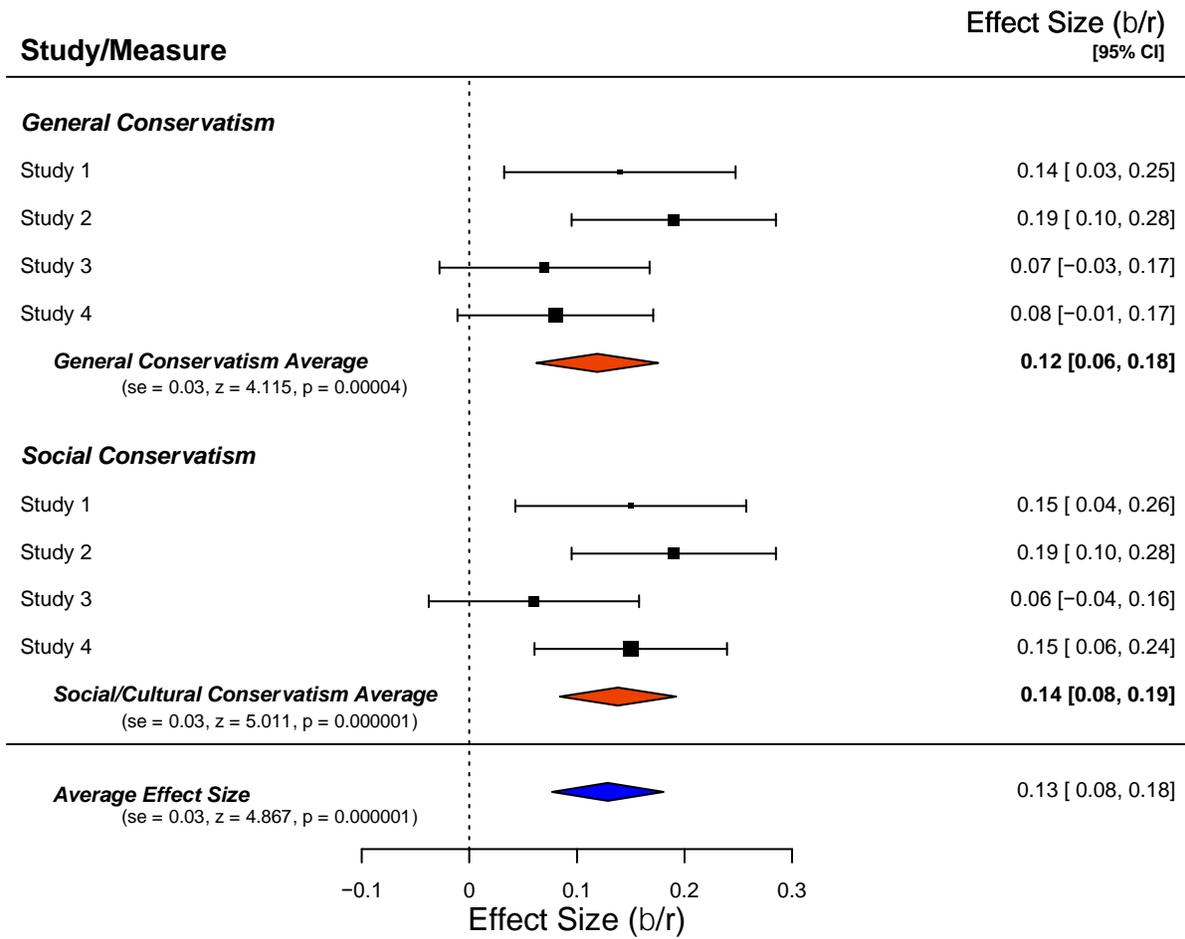


Figure 1.1. Forest plot illustrating the relationship between taste sensitivity and both general and social conservatism, Studies 1-4.

General Discussion

Across four studies using diverse methods, we found consistent evidence that individuals higher in taste sensitivity were more politically conservative than those lower in taste sensitivity

(Figs. 1 & 2). We also found evidence (Study 4) that this association is at least partially explained by the link between higher taste sensitivity and heightened sensitivity to disgust.

Although the participants in these studies were all recruited from the Cornell University campus or surrounding communities, they were nonetheless demographically diverse. Participants spanned an age range of 73 years, and in Study 4, 49% of the sample identified as non-White and 27% were born outside of the United States. Further, the observed relationship between taste sensitivity and political conservatism was not moderated by age, gender, race/ethnicity, income, or whether or not the participant was born in the U.S. (all $ps > .15$), suggesting that the taste-ideology link emerges to an equal degree across these major demographic dimensions. These findings, as well as the fact that both the taste-disgust and disgust-conservatism links have been documented by other research groups (e.g., Herz, 2011; Terrizi, Shook, & McDaniel, 2013), have strong theoretical support (Rozin et al., 2008; Tybur et al., 2013, 2015), and, in the case of the disgust-conservatism association, have been observed across different cultures (Aarøe et al., 2017; Terrizi et al., 2013), lead us to conclude that the observed association between taste sensitivity and ideology is likely to generalize beyond the samples examined here.

Although the correlational nature of these data does not allow us to speak to the causal direction of this relationship, given that both PTC/PROP sensitivity and fungiform papilla density are largely genetically determined (Barbarossa et al., 2015), this research suggests that individual differences in taste sensitivity may serve as a biological predisposition that can lead an individual towards adopting one political ideology over another. More broadly, this work constitutes, to our knowledge, the first evidence of an association between low-level physiological differences in sensory sensitivity and complex attitudinal and belief systems, and

suggests a possible biological mechanism that may underlie the high heritability of ideological beliefs documented in previous research.

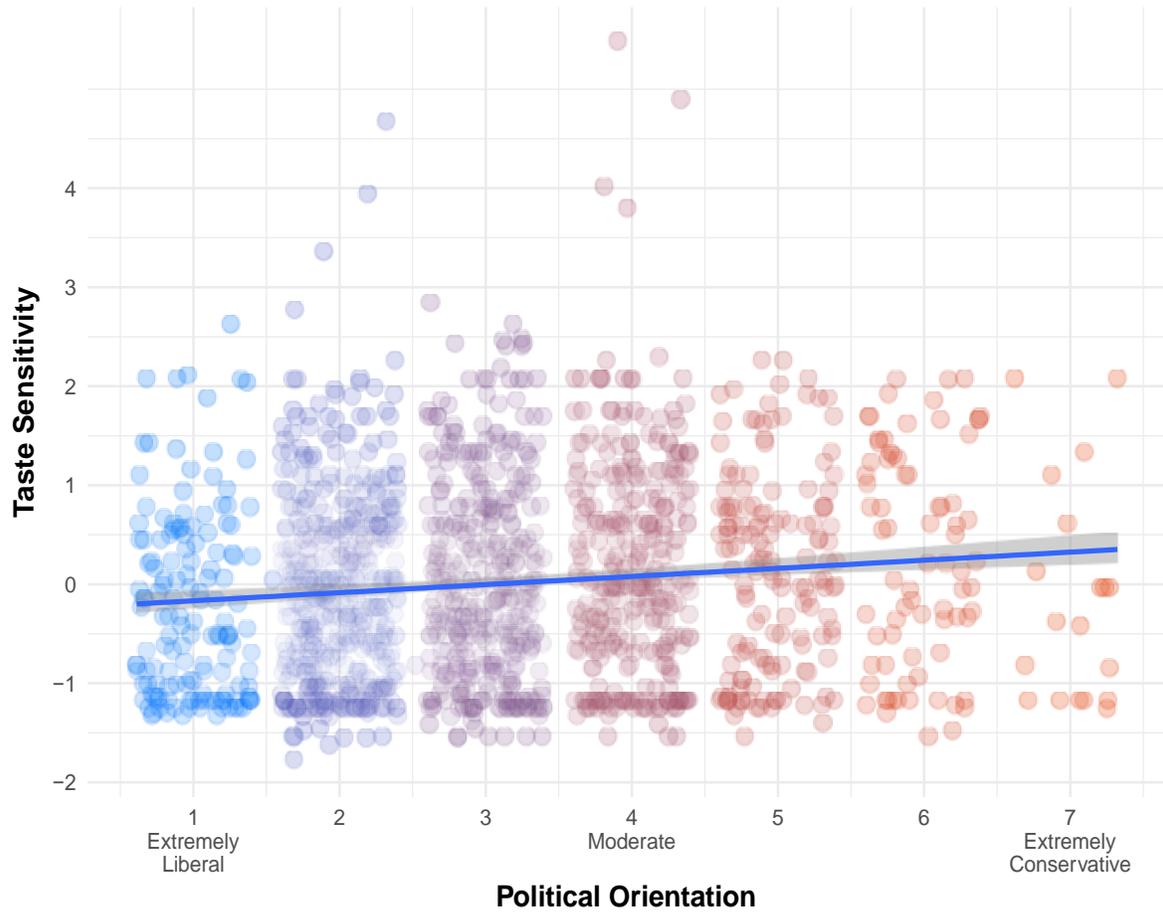


Figure 1.2. Scatterplot illustrating the relationship between taste sensitivity (standardized) and political orientation, Studies 1-4.

Chapter II: Correlates

In the first section of this dissertation, I presented research identifying a novel physiological factor that appears to shape political ideology: individual differences in gustatory sensitivity. However, as discussed above, the broader theoretical contention that a person's political ideology is shaped by upstream individual differences – particularly in psychological motivations – has been the subject of much research. This work has suggested that individual differences in epistemic needs for certainty and existential needs for safety may lead an individual to adopt a more politically conservative ideology (for reviews, see Jost et al., 2003, Jost, Sterling, & Stern, 2017, and Jost, Stern, Rule, & Sterling, 2017).

In this chapter, I move down the causal chain to examine a less-studied aspect of the relationship between psychological motivations and political ideology: whether and how the same upstream motivational differences that shape ideology may influence other aspects of cognition, giving rise to concomitant psychological differences between those on the political right and left. I focus specifically on how ideological differences in epistemic motivation shape subjective judgment confidence, a fundamental dimension of metacognition (Wagner, Briñol, & Petty, 2012) with broad-ranging implications for both political and non-political cognition and behavior.

The Confident Conservative: Ideological Differences in Judgment and Decision-Making

Confidence

*with Chadly Stern

“The essence of the liberal outlook lies not in what opinions are held, but in how they are held: instead of being held dogmatically, they are held tentatively, and with a consciousness that new evidence may at any moment lead to their abandonment.”

Bertrand Russell

“True conservatism is cautious and prudent.”

John W. Dean

Confidence—the meta-cognitive belief that one’s judgments, decisions, or attitudes are objectively correct (Dunning, 2012; Peterson & Pitz, 1988)—is a fundamental dimension of meta-cognition with wide-ranging implications for attitudes and behavior (Wagner, Briñol, & Petty, 2012). In the political realm, for example, more confident individuals are more likely to turn out to vote (Ortoleva & Snowberg, 2015). More generally, highly confident individuals tend to be more persuasive (Sah, Moore, & MacCoun, 2013), more resistant to persuasion (e.g., Babad, Ariav, Rosen, & Salomon, 1987), and to engage in less information seeking before making a decision (Locander & Hermann, 1979).

The two quotations in the epigram above suggest the intriguing possibility that confidence may be related to political ideology, and yet they appear to offer conflicting predictions regarding the nature and direction of this relationship. Is uncertainty and caution characteristic of liberals? Or conservatives? Moreover, even the names of these two ideological groups themselves carry connotations of (un)certainty: Merriam Webster defines “conservative” as “marked by moderation or caution,” while “liberal” suggests a lack of caution and restraint (e.g., a “liberal interpretation”; a “liberal helping of food”). From this perspective, excessive confidence would appear to run counter to the conservative ethos. But are these simply semantic coincidences, or does this, too, reflect something deeper about the ideological divide?

Beyond these quotations and definitions, research on the psychological underpinnings of political ideology provides reasons to predict that liberals and conservatives might differ in their degree of confidence. This work suggests that liberals and conservatives may differ in “epistemic motivations” to maintain a stable and secure worldview (e.g., Jost et al., 2003a). But whether and how differences in the *motivation* to achieve a stable worldview might translate into *actual differences in confidence* has not yet been examined, and the question of whether there are ideological differences in judgment and decision-making confidence remains unanswered.

Further, in recent years a growing body of research has challenged the conclusion that liberals and conservatives differ in basic psychological motivations, instead suggesting that these differences are the result of biased stimuli selection, overreliance on self-report measures of epistemic motivation, and other methodological issues (e.g., Crawford, 2017; Choma et al., 2017; Elad-Strenger, Proch, & Kessler, 2019; Fiagbenu, Proch, & Kessler, 2019; Proulx & Brandt, 2017; Young & Taber, 2013). Additionally, several lines of research have suggested that it is ideological *extremists*—both conservative and liberal alike—that show greater cognitive

rigidity (e.g., Skitka, 2010; Skitka, Bauman, & Sargis, 2005; Toner, Leary, Asher, & Jongman-Sereno, 2013; Zmigrod, Rentfrow, & Robbins, 2019). By this account, it should be ideological extremism, rather than ideological direction (i.e., liberalism vs. conservatism) that will relate to greater confidence.

In sum, then, despite the central role of metacognitive confidence in judgment and decision-making, attitude formation, and behavior (Wagner et al., 2012), the question of whether liberals and conservatives may generally differ in their degree of judgment confidence has not yet been the subject of systematic empirical investigation, and several competing hypotheses can be derived from past work. In this research, we seek to fill this theoretical and empirical gap.

We examined three questions in the present research. First, we investigated whether conservatives exhibit greater confidence in basic (i.e., nonpolitical) judgments, perceptions, and beliefs than do liberals. Second, we examined the degree to which this ideological difference would emerge across different types of judgment domains. Third, we examined a potential psychological mechanism underlying this effect, testing whether motivations to make rapid judgments and avoid deliberation would account for any confidence differences between liberals and conservatives.

Ideological Differences in Epistemic Motivation

Although political divisions appear to have been particularly tense in recent years (Pew Research Center, 2017), the psychological divide between the political right and left has long been a subject of research. Indeed, several large-scale meta-analyses, reviewing several decades of work, have found that people who are more politically conservative (versus liberal) tend to possess chronically stronger epistemic motivations to achieve a sense of certainty, stability, and

structure in everyday life (Jost et al., 2003a; Jost, Sterling, & Stern, 2018). Further, these motivations are described as being “domain general,” meaning that they do not simply impact political behavior but instead are also expected to guide the ways in which liberals and conservatives engage with non-political aspects of the world.

Research on epistemic differences between liberals and conservatives has generally centered around the broad construct of “intolerance of ambiguity” (Van Hiel, Onraet, & De Pauw, 2010; Van Hiel, Onraet, Crowson, & Roets, 2016). “Ambiguous” situations are defined as those in which the appropriate or correct judgment is not easily identifiable (Budner, 1962; Frenkel-Brunswik, 1949; Furnham & Marks, 2013). Ambiguity can arise from a number of sources, such as the novelty of a situation (i.e., the appropriate action in a new situation is often unclear), the complexity of a situation (i.e., too many available cues/inputs make the appropriate response difficult to identify), or the (in)solubility of a situation (i.e., more difficult problems require more difficult behavioral responses; Budner, 1962).

Research suggests that political conservatives (versus liberals) tend to be more averse to ambiguity, experiencing greater discomfort and anxiety when faced with ambiguous situations or stimuli (for reviews, see Van Hiel et al., 2010, 2016; Okimoto & Gromet, 2016). Conservatives’ greater dislike of ambiguity leads them to tend to prioritize quick and efficient judgments versus engaging in extensive deliberation (Jost et al., 2003; Jost et al., 2018). In other words, conservatives tend to be more likely to “seize” on their initial judgments as a means of addressing ambiguity in the task at hand, whereas liberals may be more inclined to consider a broader range of possible response options (Jost & Amodio, 2012; Kruglanski, Pierro, Mannetti, & De Grada, 2006). Thus, ideology is linked to basic epistemic motivations, such that conservatives place greater emphasis on making rapid judgments to resolve ambiguity.

Ease of Processing and Subjective Confidence

The extent to which people make rapid and efficient judgments may, in turn, impact how confident they feel about those judgments. Past work shows that while people's feelings of confidence sometimes closely correspond to the objective accuracy of their judgments (Dunning, 2012; Lichtenstein, Fischhoff, & Phillips, 1982; Moore & Healy, 2008), the strength of this association is often surprisingly modest or even nonexistent (Koriat, 2008, 2012). Thus, factors other than the veridicality of judgments shape people's meta-cognitive appraisals concerning the accuracy of their judgments.

One factor that has been shown to impact subjective confidence is ease of processing. Responses and judgments that are generated more quickly tend to be experienced as more "cognitively fluent" (Alter & Oppenheimer, 2009). The relative feeling of ease that accompanies faster judgments leads people to feel more certain that their response is correct. Indeed, people seem to hold the lay belief that a response that takes less mental effort to generate is more accurate than one that is more effortful (Alter & Oppenheimer, 2009; Finn & Tauber, 2015; Koriat & Ackerman, 2010; Schwarz, 2004; Tormala, Petty, & Briñol, 2002). Importantly, the rapidity with which a judgment is made exerts a strong effect on confidence *even when it is not a valid cue to accuracy*. For example, task instructions that are difficult to read (e.g., in an unfamiliar font; Alter et al., 2007), information that is cognitively taxing to process (e.g., lower- versus higher-volume auditory stimuli; Rhodes & Castel, 2009), and information from a less engaging source (e.g., a hesitant and awkward instructor; Carpenter, Wilford, Kornell, & Mullaney, 2013; Toftness et al., 2018) all lead people to feel less subjectively confident without impacting judgment accuracy. Thus, judgments that are made in a quick and efficient manner tend to lead to greater feelings of confidence that one's judgment is correct.

Conservatism and Confidence

Integrating research on liberal-conservative motivational differences and the relationship between cognitive processing and subjective confidence, we predicted that conservatives would possess greater confidence in their judgments and decisions than liberals. Specifically, to the extent that conservatives possess a stronger motivation to resolve ambiguity, we anticipated that they would make more rapid and efficient judgments and, in turn, feel greater certainty that the judgments they made were accurate.

Some previous research tentatively hints at this possibility. In one unpublished study, Krochik, Jost, and Nosek (2007) assessed participants' preferences for various pairs of objects or concepts (e.g., cats vs. dogs, love vs. money) and found that conservative participants expressed greater certainty regarding which of the two they preferred. Similarly, in research examining the effects of confidence on political behavior (e.g., voter turnout and partisan identity), Ortoleva and Snowberg (2015) found that conservatives expressed greater confidence in two types of political knowledge (unemployment and inflation rates in the U.S.), as well as four non-political trivia questions (the year of Shakespeare's birth, the year the telephone was invented, and the populations of Spain and California). These studies provide some tentative support for our hypothesized association between conservatism and confidence. However, because these studies were limited to a few specific judgment domains (personal preferences and trivia-style knowledge), they cannot answer the question of whether there may be broader, domain-general ideological differences in judgment and decision-making confidence. Further, previous research has not examined the psychological mechanism(s) that may underlie this association, should it exist. We directly addressed these questions in the present research.

Political Conservatism Versus Ideological Extremity

As noted above, some past research has suggested that ideological *extremity* (rather than liberalism-conservatism) might be more important for understanding certain judgment and decision-making processes (e.g., Greenberg & Jonas, 2003). For example, past research has shown that more ideologically extreme individuals tend to hold their political attitudes with greater moral conviction (Skitka, 2010; Skitka et al., 2005) and feel that their political beliefs are superior to those of others (Toner et al., 2013). Importantly, however, these studies have generally been limited to the political domain (and typically only to a subset of “hot-button” political issues; e.g., Toner et al., 2013), and so cannot answer the question of whether more ideologically extreme individuals tend to feel that their judgments are superior *in general*. Further, these studies did not directly assess confidence, and so cannot speak to our present hypothesis. Nevertheless, this past research raises the question of whether it may be ideological extremity, rather than conservatism, that is associated with greater judgment and decision-making confidence. To directly test this question, in our studies we measured both conservatism and ideological extremity and examined their associations with confidence across a wide range of basic, nonpolitical judgment and decision-making tasks. This allowed us to determine whether conservatism or extremity (or both) was associated with greater confidence.

The Present Research

Across 14 studies (total $N = 4,595$), we tested the prediction that conservatives would exhibit greater confidence across a range of basic judgment and decision-making domains, and that the motivation to make rapid and efficient judgments would, at least in part, explain the conservatism-confidence relationship. In Studies 1A-1F, we tested the existence and breadth of ideological differences in judgment confidence using a wide range of tasks (e.g., memory of

everyday environments, quantity estimates, pattern memory). In Studies 2A and 2B, we tested a possible boundary condition of this relationship, examining whether task complexity impacted the relationship between conservatism and confidence. In Studies 3A and 3B, we examined whether the conservatism-confidence relationship was limited to subjective feelings of confidence, or whether the relationship also emerged in other related judgments (e.g., probability estimates). In Study 4, we tested whether the conservatism-confidence relationship emerged even when participants were provided with an objective benchmark by which to evaluate their responses. In Study 5, we examined a behavioral consequence of ideological differences in confidence. Finally, in Studies 6A and 6B we examined a mechanism behind the conservatism-confidence relationship by testing whether the motivation to make quick and efficient judgments helped explain this association. All study materials, data, syntax, and preregistration information are available at https://osf.io/qea96/?view_only=9594503ed6394c39bf4cf3cb6080db91.

Analytic Strategy and Statistical Power

We preregistered nine of our 14 studies (Studies 1C, 1D, 2A, 3A, 3B, 4, 5, 6A, and 6B). In keeping with our preregistered analysis plans, we tested our primary predictions using both linear regression and mixed-effect models. For brevity and ease of interpretation, we report results of regression analyses in the main text and include results of mixed models in the Supplemental Materials (SM). Both sets of results are nearly identical, and overall conclusions are the same. For regression analyses, all predictors are grand mean centered, and we report standardized beta coefficients. We list all predictors and control variables included in the models (if no covariates are stated, none were included). We do not exclude any participants; all participants who provided complete, analyzable data are included in analyses.

We took four approaches to maximizing statistical power. First, we conducted power analyses to determine sample sizes for all studies after Study 1A. Additionally, we utilized observed effect sizes in power analyses to ensure that studies programmatically progressed in a highly powered manner. All power analyses were conducted using G Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007). Second, we collected large sample sizes to obtain stable effect size observations, based on simulation studies indicating that correlational effect sizes tend to achieve stability around 250 participants (Schönbrodt & Perugini, 2013). Thirteen of our fourteen studies involved samples comparable to or larger than 250. Third, we conducted a random-effects meta-analysis of the present studies to calculate an average effect size. Fourth, we conducted additional multilevel models for each study (see SI) that include both participant and stimulus as random factors (Judd, Westfall, & Kenny, 2017).

Overview of Studies 1A-1F: Testing the Conservatism-Confidence Relationship

In Studies 1A-1F, we tested the existence and scope of the hypothesized association between political conservatism and judgment/decision-making confidence. We included a wide range of paradigms that were designed to assess people's confidence in their most basic perceptions, judgments, and decisions. These tasks differed on a number of dimensions (e.g., quantitative vs. non-quantitative; memory recall vs. in-the-moment judgments) and included both naturalistic (e.g., memories from everyday life) and controlled judgments (e.g., a dot estimation task). Using this broad range of paradigms allowed us to more decisively conclude that any observed ideological differences in confidence were not specific to any particular decision domain or judgment type. To further ensure the generalizability of observed effects, we also collected data from a range of different participant samples.

Study 1A

In Study 1A, we conducted an initial test of our hypothesis that political conservatives would exhibit greater judgment confidence. We used a simple recollection task in which participants recalled pieces of information from their everyday environments and reported confidence in their memories.

Participants

We recruited 160 participants (38% women; $M_{\text{age}} = 33.07$, $SD = 8.08$) from Amazon's Mechanical Turk (Mturk; Buhrmester, Kwang, & Gosling, 2011). This sample size provided 80% power to detect an effect as small as $r = .22$.

Procedure

Recall task. After completing a short questionnaire on an unrelated hypothesis (the mindful attention questionnaire; Brown & Ryan, 2003), participants completed a short "Everyday Attention Quiz" in which they were asked to recall subtle elements of their everyday environments. There were 12 questions in total, which asked participants to recall objects and features from six different domains: their neighborhood, the house of a friend, their neighbor's house, their closest friend, their usual barbershop or salon, and their favorite restaurant. For each question, participants were asked to type their response into an empty text box, or to check a box indicating that they did not know the answer.

Confidence ratings. After answering each recall question, participants were asked "How confident are you that your answer is correct?" and rated their confidence on a scale from 1 (*not at all confident*) to 9 (*very confident*), with the midpoint, 5, labeled "somewhat confident." This measure is adapted from previous research (Briñol, Petty, Valle, Rucker, & Becerra, 2007).

Political ideology. Participants provided their political orientation using a 1 (*extremely liberal*) to 7 (*extremely conservative*) scale. They reported their ideology in general, for

social/cultural issues, and for economic issues. We created an average of these responses ($\alpha = .95$) to calculate a single ideology score for each participant ($M = 3.40$, $SD = 1.68$).

Ideological extremity. Following past research (e.g., Brandt, Evans & Crawford, 2015), in all studies we measured ideological extremity by “folding over” the ideology scale to measure the distance from participants’ reported ideology to the midpoint of the scale, resulting in a 4-point extremity scale ranging from 0 (*moderate*) to 4 (*extremely [liberal/conservative]*). Further, in this study we included two other questions assessing ideological extremity and/or importance, to further ensure that we would not fail to capture any potential relationship between ideological extremity and confidence: First, participants answered the question “How important is politics to you personally?” on a scale from 1 (*extremely unimportant*) to 7 (*extremely important*). Second, participants were asked to indicate the strength of their support for the candidate for whom they voted in the 2016 U.S. Presidential Election, on a scale from 1 (*not strong at all*) to 7 (*extremely strong*). Participants who reported not voting were coded as a “1” for this measure.

Additional measures. Participants also rated their current mood and provided demographic information.

Results

We first recoded “I don’t know” responses to the memory questions (13.8% of total responses) as missing values for confidence and excluded them from analyses (nearly identical results are obtained if these responses are instead recoded as a “1” for confidence). The confidence judgments were reliable ($\alpha = .81$), and so we averaged them into a single score.

Consistent with our hypothesis, political ideology was significantly associated with confidence ($\beta = .20$, $t(158) = 2.56$, $p = .01$), such that more conservative participants felt more certain of the accuracy of their recollections ($M_{\text{liberals}} = 7.37$, $M_{\text{conservatives}} = 7.85$). This relationship

remained significant when statistically adjusting for the demographic factors of age, gender, education, income, race (White vs. non-White), and country of birth (U.S.-born vs. non-U.S.-born; $\beta = .18$, $t(152) = 2.29$, $p = .02$), indicating that none of these factors accounted for the conservatism-confidence relationship. Demographic factors do not explain our effects in this or any subsequent study and are therefore not discussed further in the main text. Further analyses of these demographic variables are provided in the SM for interested readers.

We then examined the relationship between ideological extremity and confidence. We found that none of the three measures of ideological extremity were significantly associated with confidence, either with ($ps > .25$) or without ($ps > .24$) conservatism as a covariate. We also averaged these three extremity measures into a single index of ideological extremity. This measure also was not associated with confidence, either with ($p = .25$) or without ($p = .30$) conservatism as a covariate. Further, we found that the relationship between conservatism and confidence remained significant when adjusting for ideological extremity (adjusting for the mean of the three extremity measures: $\beta = .19$, $t(157) = 2.47$, $p = .01$; adjusting for all three measures of extremity: $\beta = .18$, $t(155) = 2.11$, $p = .04$).

Study 1B

Study 1A provided preliminary support for the hypothesis that conservatives are more confident in their judgments. In Study 1B, we provided a more controlled test to examine the generalizability of this effect and to rule out potential confounds (e.g., that there may be ideological differences in *actual* knowledge of everyday environments). Further, in this study we used a task assessing “in-the-moment” judgments to ensure that conservatives’ greater confidence was not limited to recollection-based tasks.

Participants

We conducted a power analysis based on an expected correlation of $r = .19$, the effect size from Study 1A. This resulted in a recommended sample size of 212 to achieve 80% power, which we increased to 250 to further increase power. This target sample size was used for this and all remaining studies in which we examined the basic conservatism-confidence association (i.e., did not examine moderating factors; Studies 1B, 1D, 1E, 1F, 3A, 3B, 4, and 5).⁴ Based on this power analysis, for this study we requested 250 participants from Mturk. We received 249 complete responses (50% women; $M_{\text{age}} = 37.57$, $SD = 13.09$).

Materials

We collected 20 photographs from an online image search. Images were chosen that contained simple depictions of landscapes with unambiguous, clearly identifiable features (a tree, a person, a car, an animal, or a building/structure). Photographs contained no political content.

Procedure

Each participant viewed three randomly selected photographs. For each photograph, they were asked to estimate the distance, in feet, from the camera to a specified point in the image (e.g., a tree, a house, a dog) and to type their estimate into a blank text box that appeared below the image. To prevent participants from trying to measure or otherwise calculate the distances, we included a timer on the page that allowed participants 20 seconds to make each estimate. If they did not complete their estimate within the allotted time, the survey page advanced and they were shown a message reminding them of the 20-second limit and encouraging them to make their responses more quickly (0.8% of all responses were not made within the allotted time).

⁴ The exact number of participants fluctuates slightly across studies because of some incomplete survey responses and a few participants who completed the study without recording their participation through Mechanical Turk.

After providing each estimate, participants reported their confidence in their response using the same measure as Study 1A. Confidence judgments were reliable ($\alpha = .89$), so we averaged them into a single score. Lastly, participants reported their political orientation ($M = 4.73$, $SD = 2.42$) using the general item from Study 1A: “Where on the following scale of political orientation would you place yourself?”, measured on 1 (*extremely conservative*) to 9 (*extremely liberal*) scale. Similar single-item measures of ideology have been widely used in past research (e.g., Graham, Haidt, & Nosek, 2009; Jost, 2006). We use this measure in all subsequent studies.

Results

Political ideology was associated with confidence ($\beta = .15$, $t(247) = 2.33$, $p = .02$), with more conservative participants expressing greater certainty in their judgments ($M_{\text{liberals}} = 4.35$, $M_{\text{conservatives}} = 4.95$). Ideological extremity was not significantly associated with confidence ($\beta = .08$, $t(247) = 1.20$, $p = .23$), and the relationship between conservatism and confidence remained significant when adjusting for extremity ($\beta = .16$, $t(246) = 2.54$, $p = .01$). These results demonstrated that the conservatism-confidence relationship was not specific to recollection-based judgments.

Study 1C

Study 1B provided additional support for the conservatism-confidence link. However, a post-hoc power analysis revealed that observed power in this study was relatively low (64%). To address this issue, in Study 1C we conducted a preregistered replication of Study 1B using a larger sample. To further assess the generalizability of the conservatism-confidence association, for this study we recruited a sample from a different source to ensure that the observed relationships were not specific to Mturk participants.

Participants

We collected 916 participants from a research participant panel managed by Qualtrics (83% women, $M_{\text{age}} = 35.79$, $SD = 13.19$).⁵ This sample size provided 99.5% power to detect the effect size observed in Study 1B ($r = .15$).

Procedure

Participants first completed a short task that was preregistered for use in an unrelated research project (see full study materials at OSF site). They then completed the distance estimation task, following the procedure outlined in Study 1B above. On 59 trials (2.1% of all trials), the time limit expired before a judgment was made. Confidence judgments were reliable ($\alpha = .87$), and so we averaged them into a single score. Lastly, participants indicated their political orientation ($M = 5.05$, $SD = 2.05$) and provided demographic information.

Results

Replicating Study 1B, political ideology was associated with confidence ($\beta = .13$, $t(910) = 4.03$, $p < .001$). More conservative individuals expressed greater certainty in their distance judgments ($M_{\text{conservatives}} = 4.88$, $M_{\text{liberals}} = 4.26$). Observed power was 98.2%. Ideological extremity was not associated with confidence ($\beta = .05$, $t(910) = 1.36$, $p = .17$), and the conservatism-confidence relationship remained significant when adjusting for ideological extremity ($\beta = .13$, $t(909) = 4.01$, $p < .001$).

Study 1D

In Study 1D, we made two advances. First, because we did not create the stimuli for studies 1A-1C, we could not rule out the possibility that the observed ideological differences in

⁵ As specified in the preregistration plan, we requested 800 participants from Qualtrics. We received 916 responses.

confidence might stem from differences in accuracy. To address this possibility, we used a task in which we could also assess objective accuracy. Second, we collected a different participant sample (college students, university staff, and community members) to ensure that the conservatism-confidence association generalized beyond online samples.

Participants

We recruited 250 (38% women, $M_{\text{age}} = 23.16$, $SD = 8.31$) students, teachers, staff, and community members from a popular pedestrian thoroughfare on a university campus in the northeastern United States.

Procedure

Research assistants set up a table and asked passersby to participate in the study in exchange for a piece of chocolate. Individuals who chose to participate were guided to a specific fixed point on the sidewalk, given a paper survey packet, and instructed to estimate the distance from themselves to each of three visible points in the distance: a large building (177.58 feet/54.13 meters away), a blue light post (218.08 feet/66.47 meters away), and a clocktower (346.17 feet/105.51 meters away). After making each estimate, participants rated their confidence in their response on the same 9-point scale as in the previous studies. Confidence judgments were highly reliable ($\alpha = .97$), so we averaged them into a single score. Participants then indicated their political orientation ($M = 4.16$, $SD = 2.02$), age, gender, and whether they were born in the United States.

Results

We again found that ideology was associated with confidence ($\beta = .47$, $t(248) = 8.46$, $p < .001$). More conservative participants expressed greater certainty in their judgments ($M_{\text{conservatives}} = 6.59$, $M_{\text{liberals}} = 4.25$). To assess task accuracy, we calculated the absolute difference between

participants' estimates and the correct distance value, such that higher scores indicated lower accuracy (i.e., greater deviation from the correct answer). We then z-scored these three accuracy values ($\alpha = .72$) and averaged them into a single accuracy score. Importantly, conservatives were not more accurate in their estimates ($\beta = .03$, $t(248) = .53$, $p = .60$), and adjusting for accuracy did not attenuate the strength of the relationship between conservatism and confidence ($\beta = .48$, $t(247) = 8.47$, $p < .001$). As in our previous studies, ideological extremity was not associated with greater confidence (and, in fact, was significantly associated with *lower* confidence, $\beta = -.22$, $t(248) = 3.56$, $p < .001$, although this relationship was not significant when adjusting for ideology, $p = .31$). Adjusting for ideological extremity also did not attenuate the relationship between conservatism and confidence ($\beta = .51$, $t(247) = 7.56$, $p < .001$).

Study 1E

In Study 1E, we tested this relationship in yet another judgment domain to further examine the breadth of this effect. For this study, we chose a simpler, more “minimalistic” judgment task in which participants estimated various quantities of dots presented on a computer screen. This task allowed us to remove some of the complexity present in the previous paradigms to examine whether the effect would emerge in even more basic judgments.

Participants

We set a target sample size of 250 participants, whom we recruited from Mturk. We received 251 responses (57% women, $M_{\text{age}} = 37.40$, $SD = 11.58$).

Procedure

We used a simple dot estimation task adapted from the social identity literature (e.g., Tajfel, Billig, Bundy, & Flament, 1971). In this task, participants viewed three images depicting random constellations of small black dots on a white background (the number of dots on each

page ranged from 169 to 229). For each image, participants estimated the number of dots by typing their estimate into a text box that appeared at the bottom of the screen. We included a timer on the task (15 seconds) to ensure that participants provided their *estimates* of the number of dots, rather than trying to count them. On 24 trials (3.2% of all trials), the time limit expired before a judgment was made. After each estimate, participants indicated their degree of confidence in their judgment using the same measure as in the previous studies. Confidence judgments were highly reliable ($\alpha = .90$), and so we averaged them into a single score. They then provided information about their political ideology ($M = 4.54$, $SD = 2.31$) and demographics.

Results

Political ideology was associated with confidence ($\beta = .24$, $t(248) = 3.85$, $p < .001$), with more conservative individuals expressing greater certainty in their estimates ($M_{\text{conservatives}} = 4.55$, $M_{\text{liberals}} = 3.82$). To assess task accuracy, we calculated the absolute difference between participants' estimates and the correct number of dots, such that higher scores indicated lower accuracy. We then z-scored these three accuracy values ($\alpha = .69$) and averaged them into a single index of objective accuracy. Conservatism was significantly associated with *lower* accuracy ($\beta = -.16$, $t(248) = 2.55$, $p = .01$), and the relationship between conservatism and confidence remained significant when adjusting for accuracy ($\beta = .23$, $t(247) = 3.72$, $p < .001$). As in our previous studies, we found that ideological extremity was not associated with greater confidence (and, in fact, was once again significantly associated with lower confidence, $\beta = -.18$, $t(248) = 2.96$, $p = .003$, an effect that remained significant when adjusting for ideology, $\beta = -.14$, $t(247) = 2.25$, $p = .03$). The relationship between conservatism and confidence remained significant when adjusting for ideological extremity ($\beta = .21$, $t(247) = 3.31$, $p = .001$).

Study 1F

Most of our previous studies (with the exception of Study 1) used tasks involving numerical judgments (i.e., estimates of quantities and distance). As such, in Study 1F we examined confidence in a non-numerical type of judgment to further verify that ideological differences in confidence would extend to other forms of judgment and decision-making.

Participants

We recruited 250 participants from Mechanical Turk.

Procedure

Participants completed a task in which they recalled portions of patterns of colored squares. Each pattern consisted of nine small squares of different colors displayed in a 3×3 matrix on a white background (Figure 1). For each trial, participants were first given five seconds to study the pattern. After five seconds, the pattern disappeared, and a blank white screen was presented for two seconds. The same pattern of colored squares then appeared again, but this time with one square missing. Participants were asked to recall the color of the missing square, and to indicate the color of that square by clicking on a point on a graded color wheel. After each judgment, participants indicated their level of confidence in their response using the same measure as in the previous studies. They then provided their political orientation ($M = 4.32$, $SD = 2.27$). No demographic information was collected in this study.



Figure 1. Sample pattern used in Study 1F.

Results

The reliability of participants' confidence judgments was somewhat lower in this study ($\alpha = .56$). However, there were no differences in the strength of the relationship between conservatism and confidence as a function of the specific pattern/trial ($p = .26$), and so we collapsed across the three confidence judgments to create a single confidence score.

We once again found that ideology was associated with confidence ($\beta = .20$, $t(248) = 3.17$, $p = .002$). More conservative individuals expressed greater certainty in their memories ($M_{\text{conservatives}} = 4.62$, $M_{\text{liberals}} = 3.87$). To assess accuracy in the task, we calculated the distance from the participant's response to the correct response (i.e., the distance from the point that the participant clicked on the color wheel to the point where the correct color was located, measured in pixels). We collapsed across these three values to create a single index of accuracy. Importantly, conservatives were *not* more accurate in their responses ($\beta = .04$, $t(248) = 0.62$, $p = .54$), and adjusting for accuracy did not attenuate the relationship between conservatism and confidence ($\beta = .21$, $t(247) = 3.48$, $p < .001$). Ideological extremity was not associated with greater confidence, with ($\beta = -.04$, $t(248) = 0.66$, $p = .51$) or without ($\beta = .03$, $t(247) = 0.41$, $p = .68$) conservatism as a covariate. Ideology also remained significantly associated with confidence when adjusting for ideological extremity ($\beta = .21$, $t(247) = 3.12$, $p = .002$).

Discussion: Studies 1A-1F

Studies 1A through 1F provided robust support for the hypothesized association between conservatism and confidence across a range of different judgment domains. Conversely, we observed no support for the ideological extremity hypothesis: in none of these studies was ideological extremity associated with greater confidence (and in two studies, extremity was

associated with *lower* confidence). These results provide consistent support for the idea that conservatives might generally feel and express greater confidence in their judgments and decisions than do liberals.

Studies 2A and 2B

In Studies 2A and 2B, we tested whether a high degree of task difficulty is necessary for this effect to emerge. That is, in our previous studies, the tasks that participants were asked to perform were likely perceived as difficult (e.g., guessing the exact number of dots; selecting a precise color from a graded color wheel). This raises the possibility that the conservatism-confidence link might emerge only for tasks that are very difficult, which would limit the generalizability of this effect. Indeed, previous research has argued that motivated judgment processes are most likely to emerge when tasks are ambiguous and difficult (versus clear and simple; Kruglanski, 1980; Kunda, 1990). We therefore examined whether the conservatism-confidence relationship is constrained to highly difficult tasks.

Study 2A

In Study 2A, we revisited the dot estimation task from Study 1E. In our original study, each dot set consisted of a relatively large number of dots (ranging from 169 to 229 dots in total), likely making this a difficult task for participants. In this study we systematically varied the degree of task difficulty by having participants judge a range of dot sets of varying complexity. We anticipated that the conservatism-confidence association would be stronger for more difficult (i.e., ambiguous) trials—but that it might emerge on less complex trials as well.

Participants

We preregistered a target sample size of 300 participants (80% power to detect an effect of $r = .16$), whom we recruited from Mturk (44% women, $M_{\text{age}} = 37.54$, $SD = 11.53$).

Procedure

We created 10 new images consisting of varying numbers of dots, ranging from 30 to 165 dots in total and increasing in increments of 15. As in Study 1E, one randomly selected image was presented in each trial. For each of these ten images, participants first estimated the number of dots on the screen, and then indicated their degree of confidence in their estimate using the same measure from the previous studies. We gave participants 15 seconds to make each judgment. On 25 trials (0.8% of all trials), the time limit expired before a judgment was made. Confidence judgments were highly reliable ($\alpha = .95$), and so we averaged them into a single score. After the estimation task, participants provided information about their political ideology ($M = 4.25$, $SD = 2.34$) and demographics.

Results

Ideology was associated with confidence ($\beta = .14$, $t(298) = 2.44$, $p = .02$), with more conservative individuals expressing greater certainty in their estimates ($M_{\text{conservatives}} = 4.78$, $M_{\text{liberals}} = 4.33$). To assess task accuracy, we calculated the absolute difference between participants' estimates and the correct number of dots, such that higher scores indicated lower accuracy. We then z-scored these three values and averaged them into a single accuracy score. Conservatives were not more accurate in the task ($\beta = .03$, $t(298) = .50$, $p = .62$), and adjusting for accuracy did not attenuate the size of the conservatism-confidence relationship ($\beta = .14$, $t(297) = 2.40$, $p = .02$). As before, ideological extremity was not associated with greater confidence in the task (and once again was associated with *lower* confidence, $\beta = -.12$, $t(298) = 2.07$, $p = .04$, although this association was not significant when adjusting for ideology, $\beta = -.09$, $t(297) = 1.48$, $p = .14$).

To examine whether task difficulty moderated the conservatism-confidence relationship, we conducted a linear regression analysis with ideology, number of dots in each trial, and their interaction term specified as predictors, and confidence specified as the dependent variable. This interaction was not significant ($p = .26$), indicating that task complexity (i.e., the number of dots in the trial) did *not* impact the size of this relationship. Rather, the relationship between conservatism and confidence emerged to a similar degree across easier and more difficult trials.

Study 2B

The results of Study 2A demonstrated that the conservatism-confidence association emerged not only under conditions of high task difficulty, but also on easier tasks as well. However, although we varied the complexity of individual trials, we used a within-subjects design whereby all participants completed all trials—both easy and hard. As a result, the task itself may still have been perceived as quite difficult. In Study 2B, we conducted a conceptual replication to more conclusively determine whether a high degree of task difficulty is necessary for the conservatism-confidence link to emerge. We used a between-subjects design in which participants were randomly assigned to *either* a low or high difficulty task.

Participants

We conducted a power analysis based on 80% power to detect an effect of $r = .14$, the effect size observed in Study 2A. This recommended a sample of 395, which we increased to 400. We recruited participants from Mturk.

Procedure

As in Study 1F, participants first viewed a pattern consisting of nine colored squares. They were given five seconds to study the pattern, after which it disappeared for two seconds. The pattern then reappeared with one square missing, and participants indicated the color of the

missing square. Those who were assigned to the high difficulty condition ($n = 191$) provided their response on the same measure used in Study 1F, in which they were asked to select the missing color from a graded color wheel. Those who were assigned to the low difficulty condition ($n = 209$) selected the missing color from one of six discrete color options (Figure 2). Participants completed three trials of this task and then indicated their political orientation ($M = 4.41$, $SD = 2.36$). No demographic information was collected in this study.

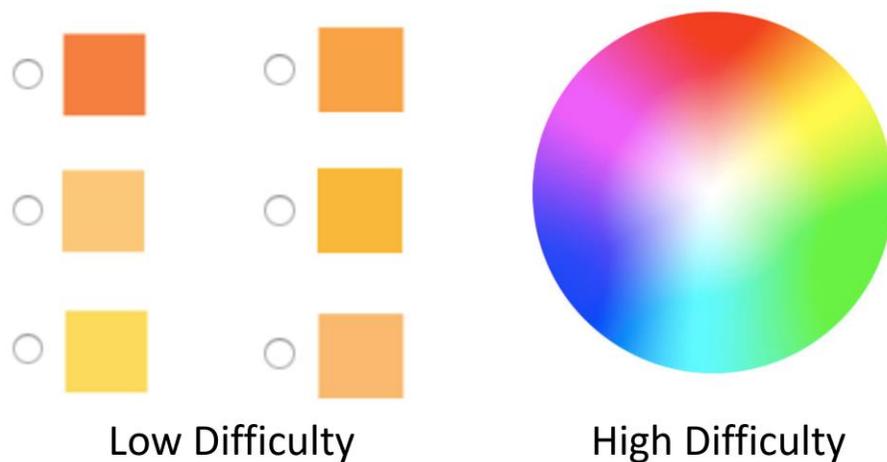


Figure 2. Response scales for the low and high difficulty conditions, Study 2B.

Results

As in our previous color pattern study (Study 1F), the reliability of confidence judgments was somewhat low ($\alpha = .65$). However, there were no differences in the strength of the relationship between conservatism and confidence as a function of the specific pattern/trial ($p = .72$), and so we collapsed across the three judgments to create a single confidence score.

Ideology was associated with confidence ($\beta = .18$, $t(398) = 3.57$, $p < .001$), with more conservative individuals reporting greater confidence in their memories of the missing color ($M_{\text{conservatives}} = 4.76$, $M_{\text{liberals}} = 4.14$). To assess accuracy in the high difficulty (color wheel) condition, we calculated the distance from the participant's response to the correct response in the same manner as in Study 2a. To assess accuracy in the low difficulty (discrete options)

condition, we coded correct choices as “1” and incorrect choices as “0.” The relationship between ideology and accuracy did not differ as a function of the specific pattern/trial (high difficulty condition: $p = .49$; low difficulty condition: $p = .99$), and so we z-scored and collapsed across these values to create a single accuracy score. There was no relationship between ideology and accuracy ($\beta = .01$, $t(398) = 0.09$, $p = .93$), and adjusting for accuracy did not attenuate the strength of the relationship between conservatism and confidence ($\beta = .18$, $t(397) = 3.59$, $p < .001$). Ideological extremity once again was not associated with greater confidence (without conservatism as a covariate, extremity was associated with *lower* confidence $\beta = -.10$, $t(398) = 2.06$, $p = .04$; with conservatism as a covariate, this relationship was not significant, $\beta = -.06$, $t(397) = 1.18$, $p = .24$).

To examine whether task difficulty moderated the conservatism-confidence relationship, we conducted a linear regression analysis with ideology, condition (high vs. low difficulty), and their interaction term specified as predictors, and with confidence specified as the dependent variable. As in Study 2A, this interaction was not significant ($p = .86$), indicating that the difficulty of the task did not moderate the size of this effect. Rather, the relationship between conservatism and confidence emerged to a similar degree for both the low-difficulty ($\beta = .17$, $t(396) = 2.44$, $p = .02$) and high-difficulty ($\beta = .19$, $t(396) = 2.60$, $p = .01$) versions of the task.

Discussion: Studies 2A and 2B

The results of these two studies further demonstrate the robustness of the association between conservatism and confidence. And while the null effects of our task-difficulty manipulations in these studies do not entirely rule out the possibility that degree of difficulty might moderate the relationship between conservatism and confidence, the fact that the size of this effect was similar for all judgments (in Study 2A, whether involving 30 dots or 165 dots; and

in Study 2B, whether responding on a graded color wheel or selecting from among six discrete response options) indicates that the threshold of difficulty required for the association between conservatism and confidence to emerge is relatively low.

Studies 3A and 3B

In Studies 3A and 3B, we investigated whether the conservatism-confidence relationship is limited to self-expressions of subjective confidence, or whether it would also emerge on other conceptually similar measures of certainty. Specifically, we examined people's estimates of the objective probability that their judgment is correct. Using a different assessment of confidence also allowed us to rule out the alternative explanation that there may be ideological differences in how the confidence scale itself was interpreted. That is, even though the scale that we employed in our previous studies is both widely used (Wegener, Downing, Krosnick, & Petty, 1995) and anchored by clear descriptive phrases that indicate different levels of subjective confidence, liberals and conservatives may differ in their interpretations of what these terms mean (e.g., conservatives may have a lower threshold for what it means to be "somewhat confident"). Asking participants to instead provide estimates of the likelihood that their response is correct using a simple numerical probability judgment allowed us to rule out this possible alternative explanation by avoiding subjective and valenced terms.

Study 3A

In Study 3A, we tested whether conservatives' greater confidence would also emerge in their estimates of the objective probability that their judgment was correct.

Participants

We set a target sample size of 250 participants from Mturk. We received 249 complete responses.

Procedure

Participants completed a single trial of the color pattern memory task from Study 2B, in which they briefly studied a pattern of nine colored squares, which then disappeared and reappeared with one color missing. Participants were then asked to choose the missing color from a set of six discrete color options. After making their choice, they were asked “If you had to guess, what do you think is the probability that you answered this question correctly?” Participants estimated the likelihood that their answer was correct on a scale ranging from 0 to 100%. Two participants did not provide a probability judgment. Participants then indicated their political orientation ($M = 4.25$, $SD = 2.07$). No demographic information was collected.

Results

Political ideology was significantly associated with likelihood estimates ($\beta = .15$, $t(245) = 2.30$, $p = .02$). More conservative participants estimated a higher likelihood that their response was objectively correct ($M_{\text{conservatives}} = 45.10$, $M_{\text{liberals}} = 38.90$). There was no relationship between conservatism and accuracy in the task (logistic regression: $B = -.02$, $\chi^2(1) = .07$, $p = .79$), and adjusting for task accuracy did not attenuate the relationship between conservatism and confidence ($\beta = .15$, $t(244) = 2.30$, $p = .02$). Ideological extremity was not associated with probability judgments, either with ($\beta = -.02$, $t(244) = 0.35$, $p = .72$) or without ($\beta = -.07$, $t(245) = 1.18$, $p = .24$) conservatism as a covariate.

Study 3B

The results of Study 3A provided support for our prediction that conservatives’ greater confidence would also emerge in estimates of the probability that their answer was correct. In Study 3B, we sought to conceptually replicate Study 3A using a different paradigm.

Participants

We set a target sample size of 250 participants from Mturk. We received 252 responses (38% women, $M_{\text{age}} = 34.25$, $SD = 9.30$).

Procedure

Participants completed the dot estimation task from Study 1D, in which they made estimates for three sets of dots. On 28 trials (3.7% of all trials), the time limit expired before a judgment was made. After making each estimate, participants rated the probability that their estimate was correct, using the same measure from Study 3A. Participants' probability judgments were highly reliable ($\alpha = .95$), so we averaged them into a single score. Lastly, participants indicated their political ideology ($M = 4.04$, $SD = 2.15$) and provided demographic information.

Results

Ideology was marginally associated with probability judgments ($\beta = .12$, $t(250) = 1.87$, $p = .06$), with conservatives estimating a greater probability that their responses were correct ($M_{\text{conservatives}} = 37.20$, $M_{\text{liberals}} = 31.77$). To assess task accuracy, we calculated the absolute difference between participants' estimates and the correct number of dots, such that higher scores indicated lower accuracy. We then z-scored these values ($\alpha = .72$) and averaged them into a single accuracy score. Conservatives were not more accurate in the task ($\beta = .10$, $t(250) = 1.54$, $p = .13$), and adjusting for accuracy did not attenuate the size of the conservatism-confidence relationship ($\beta = .12$, $t(249) = 1.85$, $p = .07$).

Ideological extremity was again not associated with greater confidence (and was marginally associated with *lower* confidence; without conservatism as a covariate: $\beta = -.12$, $t(250) = 1.91$, $p = .057$; with conservatism as a covariate: $\beta = -.08$, $t(249) = 1.21$, $p = .23$).

Discussion: Studies 3A and 3B

The results of Studies 3A and 3B demonstrated that the association between conservatism and confidence is not limited to a specific measure of subjective confidence. These findings indicate that our previous results do not simply reflect ideological differences in interpretation of our dependent measure. Rather, as hypothesized, they indicate that more conservative individuals tend to be more certain in the accuracy of their judgments, decisions, and beliefs.

Study 4

In Study 4, we sought to test whether differing interpretations of what it means to be “correct” may contribute to the conservatism-confidence relationship. Specifically, if liberals and conservatives differ in the stringency of the criteria that they adopt for what it means to be correct (e.g., if conservatives have a less strict definition), then this could explain our observed effects. To rule out this possibility, we gave participants an exact benchmark by which to judge their response. If our previously observed effects were due, in whole or in part, to ideological differences in interpretations of what it means to be correct, then giving participants a precise benchmark by which to evaluate their judgments should attenuate or eliminate the association between conservatism and confidence. Conversely, if more conservative individuals are truly more certain of the objective accuracy of their judgments, then the conservatism-confidence association should be robust to this change.

Participants

We set a target sample size of 250 participants from Mturk. We received 253 responses (50% women, $M_{\text{age}} = 34.75$, $SD = 9.54$).

Procedure

Participants completed the dot estimation task from Study 3A, in which they made estimates for three sets of dots. On 24 trials (3.2% of all trials), the time limit expired before a

judgment was made. After making each estimate, participants provided their judgment of the probability that their answer was *within ten dots* of the correct answer. They provided their response on the same 0-100% scale as in Studies 3A and 3B. Probability judgments were highly reliable ($\alpha = .91$), and so we averaged them into a single score. Lastly, participants reported their political orientation ($M = 4.26, SD = 2.19$).

Results and Discussion

Ideology was significantly associated with probability judgments ($\beta = .28, t(251) = 4.55, p < .001$), with conservatives estimating a greater probability that their responses were within ten dots of the correct answer ($M_{\text{conservatives}} = 46.54, M_{\text{liberals}} = 34.08$). To assess task accuracy, we calculated the absolute difference between participants' estimates and the correct number of dots, such that higher scores indicated lower accuracy. We collapsed across these three values to create a single accuracy score. Conservatives were not more accurate in the task ($\beta = -.10, t(251) = 1.53, p = .13$), and adjusting for accuracy did not attenuate the size of the conservatism-confidence relationship ($\beta = .29, t(250) = 4.75, p < .001$). Ideological extremity was again not associated with greater confidence (and was associated with lower confidence, $\beta = -.14, t(251) = 2.18, p = .03$; with conservatism as a covariate: $\beta = -.07, t(250) = 1.07, p = .29$). The relationship between conservatism and confidence also remained significant when adjusting for ideological extremity ($\beta = .26, t(250) = 4.10, p < .001$). Thus, conservatism was associated with greater confidence even when participants were given an exact benchmark by which to judge the correctness of their response, ruling out an alternative explanation for the conservatism-confidence relationship.

Study 5

In Study 5, we turned to the downstream consequences of these ideological differences in confidence, examining whether they would have implications for liberals' and conservatives' behavior. To test this question, we gave participants the opportunity to place a bet on their judgments. We predicted that conservatives' greater confidence would lead them to be more likely to bet money on the accuracy of their own response. In addition to testing a behavioral implication of these ideological differences in confidence, this study also allowed us to more conclusively rule out alternative interpretations of the conservatism-confidence association, such as that the relationship stems from ideological differences in self-presentational strategies (e.g., conservatives wanting to appear more confident to others), in order to determine whether these effects reflect genuine ideological differences in metacognitive confidence.

Participants

We set a target sample size of 250 participants from Mturk. We received 248 complete responses (50% women, 0.8% nonbinary, $M_{age} = 39.23$, $SD = 12.12$).

Procedure

Participants completed a single trial of the color pattern memory task from our previous studies, in which they briefly studied a pattern of nine colored squares, which then disappeared and reappeared with one color missing. Participants were then given the opportunity to place a bet on their judgment, for a chance to win a \$.20 bonus payment (giving them a chance to double their base compensation of \$.20). They had the option of either (1) betting *for* their answer (in which case they would receive the bonus payment if they got the answer correct) or (2) betting *against* their answer (in which case they would receive the bonus payment if they got the answer *incorrect*). This feature of our experimental design allowed us to ensure that any ideological differences in betting behavior were not due to ideological differences in financial risk-taking

(e.g., willingness to bet *in general*; Choma et al., 2014). Importantly, because there were four possible response options, the optimal choice for individuals who were not certain of the accuracy of their response would be to bet against their own answer. Thus, only individuals with a high degree of confidence should bet for their own answer. Participants then indicated their gender, age, and political orientation ($M = 4.21$, $SD = 2.38$).

Results

Political ideology was significantly associated with betting behavior (logistic regression: $B = .16$, $\chi^2(1) = 5.93$, $p = .02$), such that more conservative participants were more likely to bet for (vs. against) their own response (79% of conservatives vs. 68% of liberals bet for their response). As in our previous studies, we also verified that this relationship was not explained by ideological differences in task accuracy: there was no relationship between conservatism and accuracy in the task ($B = -.03$, $\chi^2(1) = .33$, $p = .57$), and adjusting for task accuracy did not attenuate the relationship between conservatism and betting for (vs. against) one's own response ($B = .19$, $\chi^2(1) = 7.54$, $p = .006$). Ideological extremity was not associated with betting decisions, either with ($B = -.07$, $\chi^2(1) = .355$, $p = .55$) or without ($B = -.15$, $\chi^2(1) = 2.15$, $p = .14$) conservatism as a covariate. This finding indicates that ideological differences in confidence have implications for behavior, and that the observed differences are likely to reflect genuine differences in confidence (versus, for example, self-presentational strategies).

Studies 6A and 6B

In Studies 6A and 6B, we turned our attention to testing a potential mechanism underlying the association between conservatism and confidence. We hypothesized that conservatives' greater confidence might be explained in part by ideological differences in closure-directed cognition. Specifically, we predicted that when making a judgment or decision

about a difficult or ambiguous task, conservatives would be more motivated to “seize and freeze” on an initial response, while liberals would consider a broader range of possible response options. We predicted that these ideological differences in deliberation would in part explain the conservatism-confidence relationship. We examined this prediction using both a self-report measure of need for closure and a behavioral measure of closure-directed cognition.

Study 6A

In Study 6A, we provided an initial test of our proposed mechanism that ideological differences in closure-directed cognition would in part explain the conservatism-confidence relationship. We predicted that conservatives would express greater motivation to make quick and efficient decisions, and that this would help explain their greater confidence.

Participants

We recruited participants through Qualtrics’ panel service, requesting an equal number of political liberals and conservatives. We preregistered our requested sample size of 341 “qualifying participants” (participants who passed an included attention check). This yielded a total sample (including those who failed the attention check) of 462 participants. Three participants did not complete our dot estimation task, and therefore could not be included in analyses, leaving an analyzable sample of 459 participants (52% women, $M_{\text{age}} = 38.55$, $SD = 13.69$; 80% power to detect an effect of $r = .13$).

Procedure

Political ideology. Participants first provided demographic information and indicated their political ideology ($M = 5.00$, $SD = 2.55$).

Motivation for quick judgments. To assess motivation to make quick and efficient judgments, participants completed the 7-item decisiveness subscale of the need for closure scale

(Roets & Van Hiel, 2007) using a 1 (*completely disagree*) to 7 (*completely agree*) response scale. Sample items include “When I am confronted with a problem, I’m dying to reach a solution very quickly,” and “I would rather make a decision quickly than sleep on it.” We created a composite by averaging across these items ($\alpha = .85$).

Confidence task. Participants then completed a modified version of the dot task from our previous studies. They first made estimates for 10 randomly generated sets of dots and then rated their confidence in each estimate on the 9-point confidence measure used in our previous studies. On 226 trials (4.9% of all trials) the time limit expired before a judgment was made. Confidence judgments were highly reliable ($\alpha = .95$), and so we averaged them into a single score.

Other measures. Finally, participants answered an attention check question and were asked to provide their opinion about what they believed was the purpose of the study.

Results and Discussion

In our preregistered analyses, we originally planned to exclude participants who failed the attention check. However, for consistency with our other studies (in which no attention check was included), we included all participants in our primary analyses. We nevertheless also report all statistics excluding participants who failed the attention check. All findings are the same when excluding these participants.

We again found that ideology was associated with confidence ($\beta = .20$, $t(457) = 4.36$, $p < .001$), with more conservative participants expressing greater certainty in their estimates ($M_{\text{conservatives}} = 5.36$, $M_{\text{liberals}} = 4.61$). To assess task accuracy, we calculated the absolute difference between participants’ estimates and the correct number of dots, such that higher values indicated lower accuracy. Reliability for these scores was high ($\alpha = .90$), so we averaged them into a single accuracy score. There was no association between ideology and accuracy ($\beta =$

.06, $t(457) = 1.32, p = .19$), and adjusting for accuracy did not meaningfully attenuate the relationship between conservatism and confidence. ($\beta = .19, t(456) = 4.23, p < .001$). Unlike our previous 12 studies, ideological extremity was significantly associated with greater confidence, both with ($\beta = .12, t(456) = 2.61, p = .009$) and without ($\beta = .12, t(457) = 2.65, p = .008$) conservatism as a covariate. Importantly, however, political orientation remained a significant predictor of confidence when adjusting for ideological extremity ($\beta = .20, t(456) = 4.34, p < .001$).

We also found that conservatism was associated with greater decisiveness ($\beta = .19, t(457) = 4.17, p < .001$). To examine whether decisiveness accounted, in part, for the relationship between conservatism and confidence, we conducted a mediation analysis using Model 4 of the PROCESS macro with 10,000 bias-corrected bootstrap samples (Hayes, 2015). We specified ideology as the exogenous variable, motivation for quick judgments as the mediator variable, and confidence as the outcome variable. The indirect effect was significant: $ab = .03, SE = .01, 95\% CI [.01, .06]$, suggesting that conservatives' greater confidence was, at least in part, explained by their greater desire to reach a rapid and final judgment (Figure 3).

Excluding participants who failed the attention check, the conservatism-confidence association ($\beta = .16, t(340) = 2.89, p = .004$), the conservatism-decisiveness association ($\beta = .13, t(340) = 2.34, p = .02$) and the indirect effect ($ab = .02, SE = .01, 95\% CI [.002, .04]$) were also all significant.

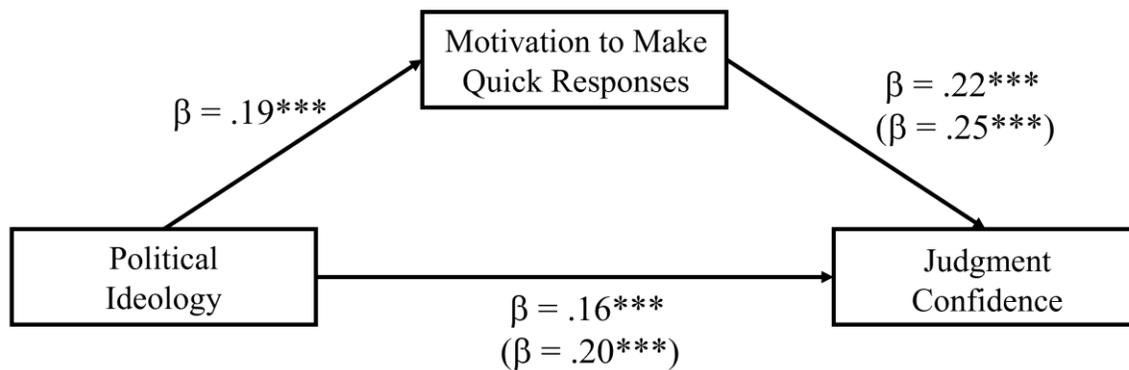


Figure 3. Model illustrating conservatism predicting greater confidence through the motivation for rapid judgments (Study 6A). Coefficients are standardized regression coefficients. Values in parentheses represent direct relationships; values without parentheses represent relationships after including all variables in the model.

Note: *** $p < .001$.

Study 6B

The results of Study 6A suggested that conservatives' greater need to reach a rapid and final decision in part explained their greater levels of confidence. In Study 6B, we provided a conceptual replication and extension using a behavioral measure of rapid and efficient cognition. Using this measure, we directly tested the prediction that conservatives would be more likely to seize and freeze on an initial response, rather than considering a broader range of possible response options. Past work has suggested that comparing a wider range of response options increases the probability that no single response option will be clearly superior to the others, which in turn increases the difficulty of making a judgment (Alter & Oppenheimer, 2009; Mills, Meltzer, & Clark, 1977; Schwarz, 2004). Thus, we predicted that consideration of fewer alternative judgment options would explain, in part, conservatives' greater confidence.

Participants

We preregistered a target sample size of $N = 350$ from Mturk (80% power to detect an effect of $r = .15$). We received 354 responses. Nine participants either did not complete the dot estimation task ($N = 8$) or did not provide a confidence judgment ($N = 1$), leaving 345 participants for analyses (50% women, $M_{\text{age}} = 36.70$, $SD = 11.58$).

Procedure

Judgment confidence. Participants completed a single trial of the dot estimation task, in which they viewed a set of dots (randomly selected from one of five randomly generated patterns) and estimated the number of dots that appeared on the page. After making their estimate, they rated their level of confidence in their response using the 9-point confidence measure from the previous studies.

Consideration of alternative responses. Next, participants completed a measure adapted from Gilovich, Medvec, and Savitsky (2000) in which they were asked to list all of the possible responses (i.e., other possible dot quantities) that they considered before providing their final estimate. They entered these responses into a blank text box, or clicked a box indicating that they did not consider any alternative responses.

Political ideology. Participants reported their political ideology ($M = 4.23$, $SD = 2.33$) in the same manner as in the previous studies.

Results and Discussion

Ideology was associated with confidence ($\beta = .18$, $t(343) = 3.43$, $p = .001$), with more conservative participants expressing greater confidence in their dot estimates ($M_{\text{conservatives}} = 4.76$, $M_{\text{liberals}} = 3.92$). To assess task accuracy, we calculated the absolute difference between participants' estimates and the correct number of dots, such that higher scores indicated lower accuracy. Conservatives were not more accurate in the task ($\beta = .04$, $t(343) = 0.84$, $p = .40$), and

adjusting for accuracy did not attenuate the relationship between conservatism and confidence ($\beta = .18, t(342) = 3.35, p = .001$). We once again found that ideological extremity was not associated with greater confidence, either with ($\beta = .10, t(342) = 1.75, p = .08$) or without ($\beta = .04, t(343) = 0.66, p = .51$) conservatism as a covariate.

As predicted, we also found that more conservative participants listed fewer alternative responses ($\beta = -.14, t(343) = 2.71, p = .007$), indicating that they considered fewer possible response options before making their judgment. To examine whether consideration of alternative options accounted, in part, for the relationship between conservatism and confidence, we conducted a mediation analysis using Model 4 of the PROCESS macro with 10,000 bias-corrected bootstrap samples (Hayes, 2015). We specified ideology as the exogenous variable, number of alternatives considered as the mediator variable, and confidence as the outcome variable. The indirect effect was significant: $ab = .01, SE = .007, 95\% CI [.001, .03]$. Thus, conservatives' greater tendency to make rapid and final decisions explained, in part, their higher levels of judgment confidence (Figure 4).

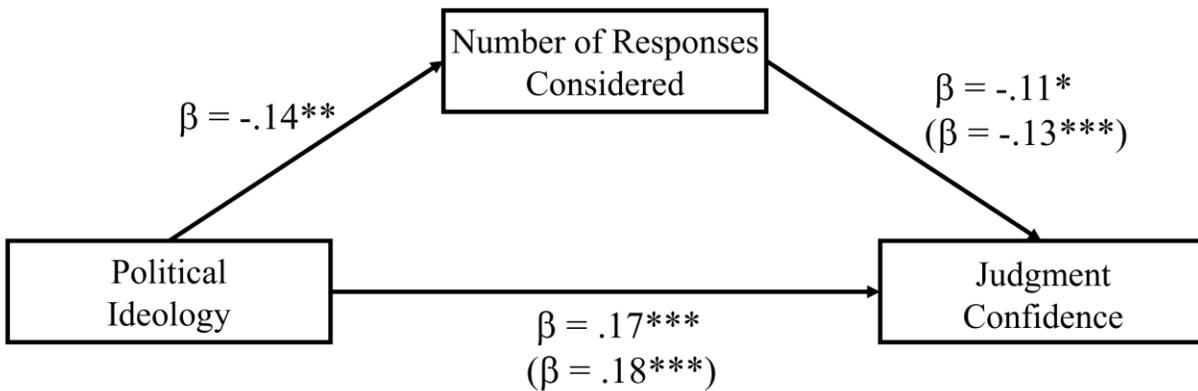


Figure 4. Model illustrating conservatism predicting greater confidence through the consideration of alternative responses (Study 6B). Coefficients are standardized regression

coefficients. Values in parentheses represent direct relationships; values without parentheses represent relationships after including all variables in the model.

Note: * $p < .05$. ** $p < .01$ *** $p < .001$.

Discussion of Studies 6A and 6B

These studies suggest that ideological differences in epistemic motivation partially explain the conservatism-confidence relationship. We found that both a self-report scale and an actual measure of “seizing and freezing” significantly mediated the relationship between conservatism and confidence. The results of these two studies therefore provide convergent support for our hypothesized mechanism.

Internal Meta-Analysis of Conservatism-Confidence Relationship

Following the recent best-practices recommendations of a number of researchers and statisticians (e.g., Goh, Hall, & Rosenthal, 2016; Lakens & Etz, 2017; McShane & Böckenholt, 2017), we conducted an internal, “within-paper” meta-analysis to optimize statistical power in determining the mean effect size of our studies (Braver, Thoemmes, & Rosenthal, 2017; Cohn & Becker, 2003), as well as to examine potential moderators of the conservatism-confidence relationship. We used a random-effects model to better extrapolate these effects beyond the current studies to the general population (Hedges & Vevea, 1998). The average effect size across these studies was $\beta = .20$, $SE = .03$, $z = 7.89$, $p < .001$, and the 95% confidence interval for the true effect size was $\beta = .15-.25$ (Figure 5).

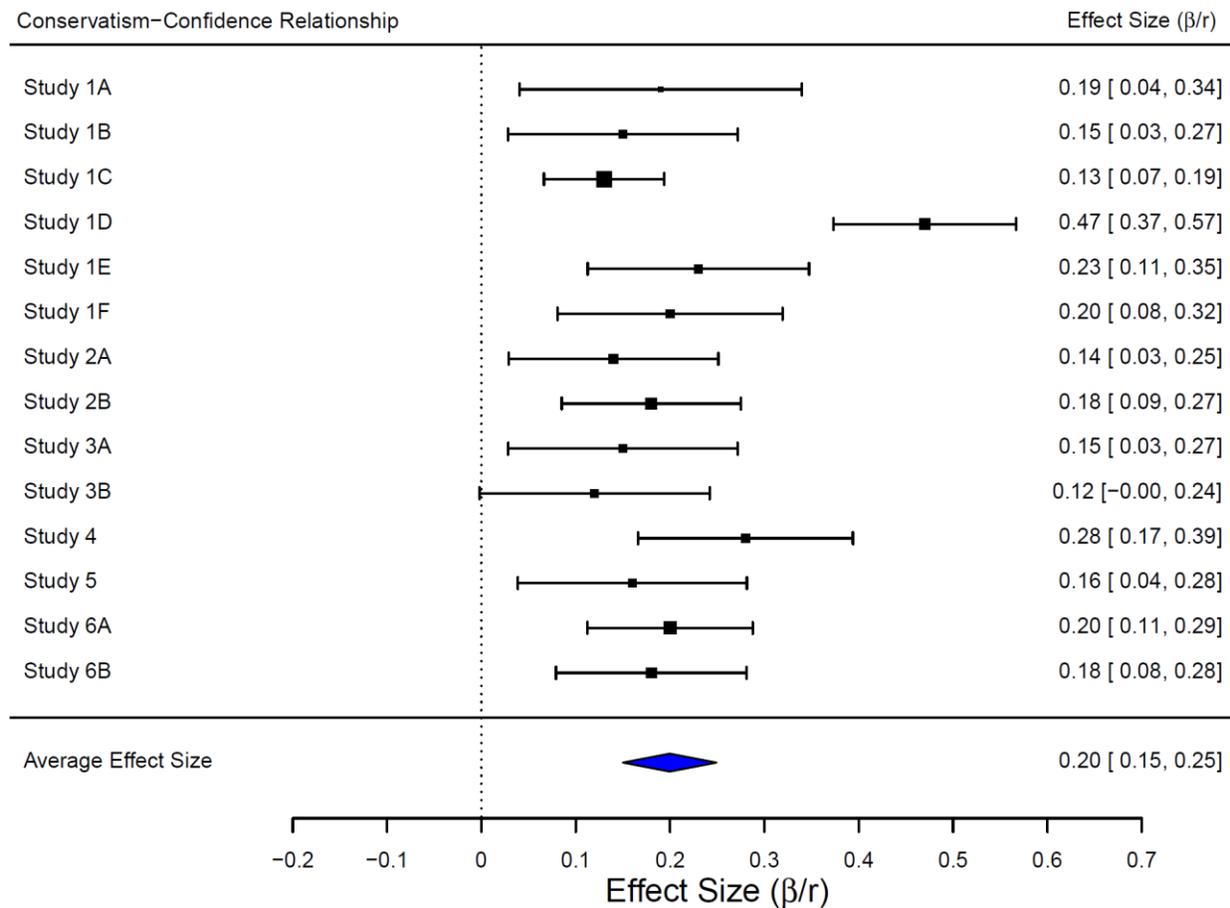


Figure 5. Forest plot of effect sizes of conservatism-confidence relationship, Studies 1A-6B. Average effect size (β/r) based on a random-effects meta-analysis model.

Cochran’s Q-test suggested that there was heterogeneity in our observed effect sizes ($Q(13) = 41.46, p < .001$), and so we examined potential moderators. We found no differences in effect sizes as a function of task type ($p = .79$), whether the task required a numerical or non-numerical judgment ($p = .51$), or whether the sample was from Mturk or other sources ($p = .18$). However, we did find that the effect size observed in Study 1D (the real-world distance estimation task) was significantly larger than effect sizes observed in the other studies (estimated difference: $\beta = .30, SE = .05, z = 5.77, p < .001$). When this difference is accounted for, the residual variance among the effect sizes becomes non-significant ($Q(12) = 8.08, p = .78$). This

suggests that Study 1D accounts for most of the variance among the observed effect sizes. Importantly, however, the estimated average effect size does not change substantially when this study is excluded from the meta-analysis: $\beta = .17$, $SE = .01$, $z = 11.70$, $p < .001$.

Although these judgment tasks were non-political in nature, the highly polarized political landscape in the U.S. raises the possibility that liberals' and conservatives' confidence could be shaped by which political party is currently in power. To test this question, we took advantage of a naturally occurring political power manipulation—the end of Barack Obama's (liberal) administration and the beginning of Donald Trump's (conservative) administration. There was no significant difference in effect sizes between studies conducted during the Obama (Studies 1A, 1B, 1E) vs. Trump (all other studies) presidencies ($p = .86$), suggesting that the association between conservatism and confidence is similarly strong regardless of the political party currently in power.

We also examined the overall size of the relationship between ideological extremity and confidence. We first tested the relationship between extremity and confidence without political orientation as a control variable. This analysis revealed a statistically significant *negative* relationship between ideological extremity and confidence, such that more ideologically extreme individuals tended to be less confident in their judgments. The average effect size was $\beta = -.06$, $SE = .03$, $z = 1.97$, $p = .049$, and the 95% confidence interval for the true effect size was $\beta = -.11$, $-.0003$ (Figure 6). We also examined the relationship between ideological extremity and confidence after adjusting for political orientation. This effect size was non-significant and was very close to zero: The estimated average effect size was $\beta = .001$, $SE = .02$, $z = 0.08$, $p = .94$, and the 95% confidence interval for the true effect size was $\beta = -.04$, $.05$.

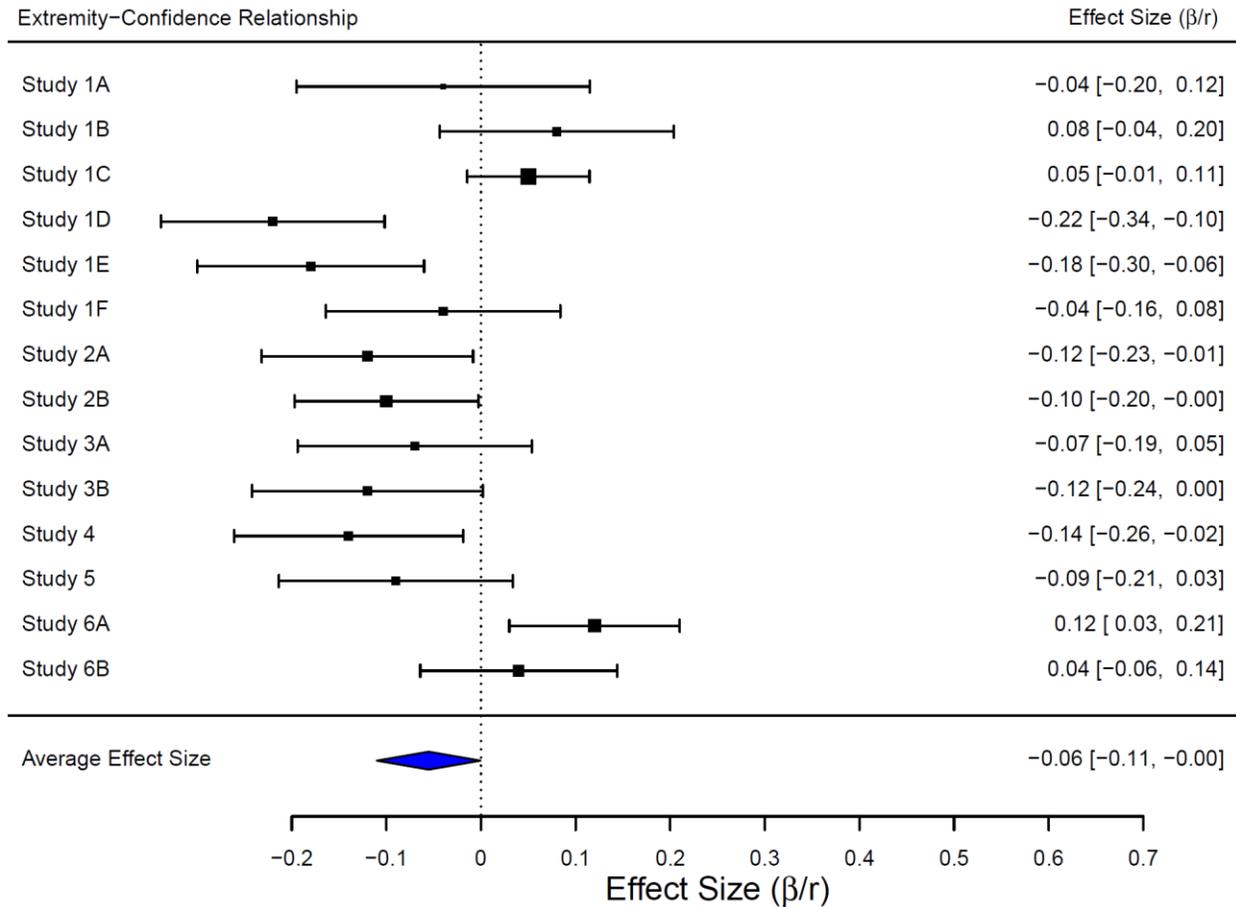


Figure 6. Forest plot of effect sizes of ideological extremism-confidence relationship, without conservatism as a covariate, Studies 1A-6B. Average effect size (β/r) based on a random-effects meta-analysis model.

General Discussion

Across 14 studies (total $N = 4,595$), we found that political conservatism was associated with greater judgment and decision-making confidence. This conservatism-confidence relationship emerged across a range of judgment and decision-making domains, including distance estimates, memory judgments, and quantity estimates (Studies 1A-1F). We found that

this association was of a similar strength under conditions of both low and high task difficulty (Studies 2A and 2B). Importantly, we also found that this relationship was robust across different operationalizations of confidence, such as when participants reported the probability that their responses were objectively correct (Studies 3A and 3B) and when they indicated confidence in their judgment against an objective benchmark (Study 4). Further, these ideological differences in confidence appear to have behavioral consequences, with conservatives being more likely to place bets *for* (versus against) the accuracy of their own response (Study 5). In examining the factors that underlie this relationship, we found that conservatives reported a greater motivation to reach a rapid and final decision (Study 6A) and considered fewer alternative options before making a final judgment (Study 6B). This desire to quickly reach closure in judgments in part explained conservatives' greater confidence. Overall, the present research broadly contributes to understanding the role of ideology and motivation in basic social-cognitive judgments.

Linking Ideological Differences in Motivation to Judgment Confidence

In this research we have sought to answer calls emphasizing the need for greater integration and organization of the large body of research on ideological differences in cognition, motivation, and behavior (e.g., Taber & Young, 2013). Rather than simply adding another entry to the list of psychological differences between liberals and conservatives, in this research—and the theoretical framework that we have constructed to support it—we have sought to situate the present findings within several branches of research on ideological differences.

Of greatest importance to the present research, past theory has argued that closure-directed cognition stems from a psychological motivation or “need” for a clear and rapid answer to a problem or decision. This more closed thinking style (i.e., “seizing and freezing”) is theorized to reduce ambiguity and heighten certainty (Kruglanski & Webster, 1996). Therefore,

to the extent that conservatives are more chronically oriented toward making quick decisions, theory predicts that they should be inclined to experience greater certainty in their perceptions and judgments of the world. However, no past research, to our knowledge, has empirically examined whether or how closure-directed cognition actually heightens certainty in one's own judgments and decisions. As a result, there has been a theoretical gap in the literature regarding whether and how a greater *desire for certainty* among conservatives may translate into actually *experiencing greater certainty*. Our work answers this question by bridging the divide between research and theory on ideological differences in epistemic motivations to attain certainty (e.g., intolerance of ambiguity and need for closure) with work from the judgment and decision-making literature on deliberation and fluency. Specifically, we demonstrated that “seizing and freezing” on judgments minimizes the degree to which an individual considers possible alternative response options, and that this reduced consideration of alternatives, in turn, heightens confidence in one's own response.

Moving forward, the development of a more comprehensive theoretical understanding will also require further investigation of the impact and implications of these ideological differences in confidence. Research suggests that confidence is a fundamental dimension of human metacognition (Wagner et al., 2012) with widespread implications. For example, more confident individuals are more resistant to persuasion (Babad et al., 1987) and tend to seek less information before making a decision (Locander & Hermann, 1979). The observed ideological differences in confidence may therefore lead to liberal-conservative asymmetries in these domains. Additionally, confidence may shape other politically relevant aspects of cognition and behavior. For example, individuals who are more confident in a given topic or position may be less likely to “vet” or verify information that agrees with their views. If true, this may shed light

on the recent epidemic of “fake news” and help explain why these fictitious news stories seem to have found greater purchase among more conservative individuals (Guess, Nyhan & Reifler, 2018; Pennycook & Rand, 2018). Future research could examine whether conservatives’ greater confidence impacts these types of downstream consequences.

Ideological Direction, Ideological Extremity, and Political Confidence

This work also takes a step towards resolving an ongoing ambiguity in the literature regarding the relative influence of ideology versus ideological extremity on judgment and decision making. In this work, we found consistent evidence that ideological direction (i.e., a person’s degree of liberalism vs. conservatism) was associated with greater judgment confidence. As noted in the introduction, however, some previous research has suggested that ideological extremity – rather than direction – may play a more impactful role in guiding some metacognitive appraisals (e.g., perceived belief superiority; Toner et al., 2013), at least for certain “hot button” political beliefs and judgments. However, we did not find that ideological extremity predicted greater judgment confidence. In fact, across the present studies the meta-analytic effect size of the relationship between extremity and confidence was not different from zero (see SI). Importantly, however, we do not view our findings as being at odds with those of past research. Rather, we believe it is possible to develop an integrated perspective concerning when ideological direction will play a more or less important role than ideological extremity in guiding judgment confidence.

At any given time, people possess multiple motivations and goals. Contextual factors can modulate which of these motivations take prominence and guide a person’s judgment and decision-making processes (Fishbach & Zhang, 2008; Kruglanski et al., 2002). Although several meta-analytic reviews have highlighted that liberals and conservatives differ in the epistemic

motivations that they most readily prioritize (Jost et al., 2003; Jost et al., 2018), other salient motivations could play a stronger role in guiding liberals' and conservatives' judgment and decision-making cognition under some circumstances.

Over the past several decades, countries throughout the world have become increasingly polarized, and political identity is now a central aspect of the self for many people (Bennett, 2012; Huddy, 2015). Largely as a consequence of this, both liberals and conservatives alike are often strongly motivated to defend their political identities and the beliefs that correspond to those identities (Huddy, 2001). Judgments that explicitly invoke political content are likely to activate these valued political identities (Unsworth & Fielding, 2014). Because strongly ideologically identified individuals—whether liberal or conservative—should be motivated to prioritize the defense of their ideological identity, extremity may be a stronger predictor of metacognitive judgments like confidence for political judgment tasks. However, when tasks do not invoke political content (e.g., those used in the present research), we would anticipate that the epistemic motivations in which liberals and conservatives systematically differ would take prominence and produce ideological differences in confidence. In sum, then, we would expect that directional ideology will most strongly predict judgment confidence for tasks viewed as non-political, but extremity may be a stronger predictor for tasks viewed as political in nature—particularly when the tasks relate to issues that are central to ideological identity (e.g., “hot-button issues”).

Sample Diversity

One limitation of this research is that our participant samples were all collected in the United States, and were predominately comprised of individuals born in the U.S. This prevents our work from decisively speaking to the degree to which the conservatism-confidence

relationship will hold across different nations and cultures. However, the research on which our work builds—documenting a relationship between political conservatism and epistemic needs for certainty—spans over 50 years and has been replicated across several nations and cultures (Jost et al., 2003, 2018; Van Hiel et al., 2011, 2016). This suggests that the conservatism-confidence relationship is likely to extend beyond the samples examined here. In line with this expectation, in Study 1D, in which over one-third of the sample was born outside the United States, we found that the relationship between conservatism and confidence emerged to a similar degree among both those born within and outside of the U.S. Nevertheless, future work should examine the degree to which the conservatism-confidence relationship replicates in other nations to assess its generalizability.

Boundary Conditions of the Conservatism-Confidence Association

In the present research, we examined the relationship between ideology and judgment confidence using tasks that differed on several dimensions, including both naturalistic judgments and more controlled tasks; memory recall and in-the-moment judgments; and quantitative and non-quantitative judgments. Our meta-analysis showed that the size of the conservatism-confidence relationship did not differ based on task type, suggesting that conservatives' greater confidence is relatively robust to the specific features of the decision task and is therefore likely to generalize to other judgments. Additionally, these tasks were designed to assess simple forms of judgment that seem likely to represent domain-general differences.

Importantly, however, there are a variety of factors that can affect subjective confidence. In particular, previous experience with the task at hand may modulate the strength and direction of the relationship between ideology and confidence. When experience with a given domain is relatively equal between liberals and conservatives, we would anticipate that the conservatism-

confidence relationship should emerge. However, in domains where liberals have considerably greater experience, exposure, or vested interest, this relationship may be attenuated, or liberals may even express greater confidence. For example, given that liberals have been shown to express a greater preference for abstract art (Wilson, Ausman, & Matthews, 1973), they may be more confident in their ability to distinguish between a Rothko and a Mondrian. Similarly, lifestyle differences between liberals and conservatives (DellaPosta et al., 2015) might lead liberals to be more certain in their knowledge of what separates a latte from a macchiato. However, it is unlikely that these differences derived from exposure and expertise would reflect meaningful cognitive differences between liberals and conservatives. Similarly, we would be hesitant to conclude general psychological differences if we observed that conservatives were more confident in their knowledge of NASCAR, hunting, or country music (DellaPosta et al., 2015). In this work, we intentionally chose simple judgment domains that were free of explicitly or tacitly political content, and we avoided tasks that might be (even tangentially) related to ideological differences. Nevertheless, future research should seek to identify the domains in which the conservatism-confidence relationship might be attenuated or even reversed. Doing so would surely deepen our understanding of the nature and extent of this effect.

Concluding Remarks

In this work, we documented the existence of broad ideological differences in judgment and decision-making confidence, finding that political conservatives exhibit greater confidence across a wide range of judgment domains. Additionally, we found that these confidence differences are explained by differences in judgment and decision-making *style*: conservatives exhibit a greater tendency to make quick and efficient decisions, which leads them to experience greater confidence. Liberals, conversely, tend to consider a wider range of possible responses,

which in turn undercuts their confidence. We hope that these findings will prove generative for future research and theory. Further, given the broad influence of metacognitive confidence, we anticipate that these ideological differences in confidence may have the potential to help explain other ideological differences in both political and non-political cognition and behavior.

Chapter III: Consequences

In the first two chapters of this dissertation, I discussed research on how upstream physiological and psychological factors shape ideology (Chapter I) and lead to differences in metacognition between those on the left and right (Chapter II). In the third and final chapter of this dissertation, I discuss work that I have conducted that has approached the study of ideology from a fundamentally different perspective, examining how belonging to an ideological group, in turn, can influence an individual's attitudes and behavior.

In this research, I leveraged a unique sociopolitical moment in American history, the campaign and election of Donald Trump. Against this historical backdrop, I examined how the intergroup attitudes of conservatives (especially those who supported Trump) and liberals (especially those who opposed Trump) were rapidly reshaped by Trump's political rise and counter-normative behavior.

Changes in Societal Prejudices Following the 2016 U.S. Presidential Election Cycle

*with Melissa J. Ferguson

Over the past several decades, people in the United States have exhibited substantial declines in explicit prejudice against racial and religious minority groups (Bobo & Charles, 2009; Bobo, Charles, Krysan, Simmons, & Fredrickson, 2012; Dovidio & Gaertner, 2004, 2010; Schuman, Steeh, Bobo, & Kysan, 1997). This decline in prejudice is clearly reflected in both survey data (Bobo & Charles, 2009; Bobo et al., 2012; Schuman et al., 1997) and broader cultural norms (Bobo et al., 2012; Dovidio & Gaertner, 2004; 2010), and has been interpreted as a pivotal cultural shift with myriad implications for people's daily life experiences, public policy,

and beyond (Bobo & Charles, 2009; Bobo et al., 2012). However, recent events have raised the question of whether this trend towards decreasing prejudice continues, or whether it may have abated or even reversed course. Social scientific analyses of the 2016 U.S. Presidential Election suggest that racial and religious prejudice played a key role in Donald Trump's victory (Mutz, 2018; Tesler, 2016; Schaffner, MacWilliams, & Nteta, 2018), which raises the possibility that prejudice may be exerting an increasingly powerful influence in American politics. Furthermore, since the election, reports of hate crimes have increased (Federal Bureau of Investigation, 2016; O'Reilly, 2017), supporters of White supremacist movements have become more vocal (O'Reilly, 2017; Thrush & Haberman, 2017), and racial and religious minorities have reported experiencing greater discrimination (Pew Research Center, 2017b; Ritter & Tsabutashvili, 2017). These trends have led some commentators to suggest that Trump's political ascent may have amplified or emboldened racial and religious prejudice among the American people (BBC, 2017; Crandall, Miller, & White, 2018; Thrush & Haberman, 2017).

However, there is no direct empirical evidence to support the claim of general societal increases in prejudice. Further, other commentators have questioned the source of these apparent increases in hate crime and other forms of discrimination, suggesting that they may simply be the result of increased national attention to issues of prejudice (Green, 2017; Nash, 2017; Wendling, 2016). That is, they argue that as Americans have become increasingly conscious of racial and religious prejudice, there has been greater reporting of acts of discrimination against members of minority groups, and police have become more likely to officially categorize crimes as hate crimes – trends that together have artificially created the appearance of increasing discrimination. Similarly, other commentators – from both the political right and left – have argued that even if instances of discrimination have increased, this only represents the acts of an

emboldened extremist fringe, rather than changes in prejudice among broad swaths of Americans (Chait, 2017; Hunt, 2018; Kuttner, 2017). Providing some support for this argument, the only study to examine changes in Americans' prejudice since Donald Trump's election found no increases in prejudice – and actually found that prejudice against some minority groups had *decreased* in the week following (vs. the week before) the election (Crandall et al., 2018). However, the small sample size ($N = 169$) and limited timespan of this study may limit its generalizability.

Thus, although these questions have received considerable attention in the media and in public discourse, there is no decisive social scientific evidence regarding whether or how prejudice in the U.S. may have changed since the 2016 election cycle. In the current research, we examine these questions. Building on social psychological research on social norms (e.g., Sherif & Sherif, 1964; Terry & Hogg, 1996; Tankard & Paluck, 2017), we derived a set of predictions regarding whether, how, and why Donald Trump's political ascent would have affected the intergroup attitudes of the American people.

During his campaign and presidency, Donald Trump has made many remarks that have been widely interpreted as derogatory towards minority groups (Desjardins, 2017; Leonhardt & Philbrick, 2018). Regardless of his motivations for making these comments (e.g., whether they reflect his personal attitudes or a political strategy), these remarks nonetheless constitute a highly salient violation of the social norms (i.e., standards) of tolerance and egalitarianism that have come to characterize American public and political discourse in recent decades (Mendelberg, 2001). Because social norms have powerful effects on human behavior (Cialdini & Goldstein, 2004) – including the expression of prejudicial attitudes (Sechrist & Stangor, 2005) – these changes in norms should have implications for Americans' personal expressions of prejudice.

However, research has also shown that social norms do not exert a uniform effect on people's attitudes. Rather, adherence to social norms occurs largely along group boundaries: people primarily assimilate to norms that are held by "social reference groups" – that is, individuals and groups that they personally respect and admire (Terry & Hogg, 1996; Sherif & Sherif, 1964). In the highly polarized political landscape of the United States (Pew Research Center, 2016), this translates into the prediction that Trump's counter-normative behavior should not have uniformly affected the attitudes of all Americans; rather, it should have increased expressions of prejudice primarily among those who view him positively: his supporters.

And yet, although there are theoretical reasons to predict that Trump's political ascent may have increased prejudice among his followers, the findings on which these theories are based come almost exclusively from small laboratory-based studies that examined attitudes over very short spans of time, usually during a single study session (Sechrist & Stangor, 2005). Research suggests that real-world intergroup attitudes are complex and shaped by many different factors (Dovidio & Gaertner, 2010), raising the question of whether an event like Trump's political rise would lead to lasting changes in societal prejudice. Indeed, past research casts doubt on the prediction that Trump's political ascent has affected Americans' intergroup attitudes. For example, recent work has shown that even when a real-world sociopolitical event (a Supreme Court decision legalizing same-sex marriage) successfully changed perceived social norms, people's personal prejudices did not follow suit (Tankard & Paluck, 2017). Moreover, other research has shown that even watershed events in race relations – such as the election of the first Black president in the U.S. – have not led to changes in societal prejudice (Schmidt & Axt, 2016; Schmidt & Nosek, 2010). To our knowledge, in the more than 60 years of research on intergroup

attitudes, there is no evidence that a single salient political event has created widespread changes in societal prejudices.

The election of Donald Trump therefore provides a unique opportunity for examining whether a single counter-normative public figure – and, more importantly, his widespread acceptance by the American people – can lead to large-scale changes in social norms and societal prejudices. In a series of 12 studies with a combined sample of approximately 10,000 Americans, we tested these predictions: 1) that racial and religious prejudice has significantly increased among supporters of Donald Trump, but *not* among other Americans, and 2) that these increases in prejudice are a consequence of changing social norms regarding the perceived acceptability of expressing prejudice. First, we assessed our central prediction that supporters of Donald Trump have increased in prejudice since Trump’s political ascent. To do so, we conducted eight in-depth, multi-year longitudinal studies involving over 1,000 participants, examining the breadth and depth of changes in prejudice across various target groups and measure types. In a ninth study, we then confirmed and extended these findings using an open dataset with a longitudinal, nationally representative sample of over 7,500 Americans. Finally, in Studies 10 through 12, we tested our proposed mechanism: that Trump’s political rise has changed social norms, such that his supporters feel that the expression of prejudice has become more acceptable. All materials, data, syntax, and preregistration documentation are available at <https://osf.io/9syz8/>.

Has Prejudice Changed During the Trump Era?

We first tested whether Trump’s political ascent has been accompanied by large-scale increases in racial and religious prejudice among his supporters. To do so, we conducted eight

multi-year longitudinal studies. In these studies, we tested whether Trump supporters have exhibited changes in prejudice over time. We also assessed the nature and scope of changes in attitudes across a range of different target groups and measures.

We first examined changes in prejudice against Muslims (Studies 1-3).⁶ To do so, we re-contacted participants who had participated in studies that we conducted several years ago (between December 2014 and February 2015), before the political ascent of Donald Trump. In these initial studies, we assessed participants' explicit prejudice against Muslims using an established measure (Imhoff & Recker, 2012) that includes items such as "Compared to other religious and philosophical approaches, Islam is quite primitive." Approximately two years later, between February and June of 2017, we followed up with a subset of these same participants ($N = 384$) and re-assessed their explicit prejudice. We also collected detailed information about political views, voting habits, geographic location, and demographics (full measures available in the online Supplementary Information; SI).

We first tested for overall changes in prejudice among our sample – collapsing across support for Donald Trump – in order to determine whether participants as a whole may have increased or decreased in their prejudice during this time period. This is the pattern of results that would be expected if prejudice has been on the rise among Americans in general, as some commentators have argued. However, our studies revealed no aggregate-level changes in prejudice from Time 1 to Time 2 ($p = .89$).

⁶ Several of our longitudinal studies contained identical measures of prejudice. A meta-analysis (detailed below) showed no systematic differences between these studies that could explain our effects. Therefore, for brevity, and to present a more accurate estimate of effect sizes⁵⁶, in the main text we have chosen to present the data by measure, collapsing across individual studies/samples (however, the effect sizes for each individual study can be found in Fig. 3).

We next examined our central prediction that supporters of Donald Trump specifically would have increased in their prejudice during this time period. Consistent with previous work (Mutz, 2018; Tesler, 2016; Schaffner et al., 2018), we found that greater support for Donald Trump (measured by four items assessing support, opposition, positivity, and negativity towards Trump; $\alpha = .96$) was associated with greater prejudice against Muslims at Time 1 ($\beta = .51, t(382) = 11.47, p < .001$). Furthermore, in line with our predictions, we also found that support for Trump significantly predicted *increases* in prejudice over this time period ($\beta = .33, t(382) = 6.74, p < .001$).

Closer inspection of this effect revealed that individuals who were opposed to Trump (those below the midpoint of the scale) showed significant decreases in negativity towards Muslims over this time period ($F(1,253) = 18.41, p < .001$), demonstrating a continuation of the decades-long trend of declining prejudice that has been widely observed in other research (Bobo & Charles, 2009; Bobo et al., 2012; Dovidio & Gaertner, 2004; 2010; Schuman et al., 1997)¹⁻⁵. Conversely, as predicted, Trump supporters (those above the midpoint of the scale) exhibited a clear reversal of this pattern, not only deviating from the historical trend towards decreasing prejudice, but showing a significant *increase* in prejudice over this time period ($F(1,112) = 20.96, p < .001$, Figure 3.1).

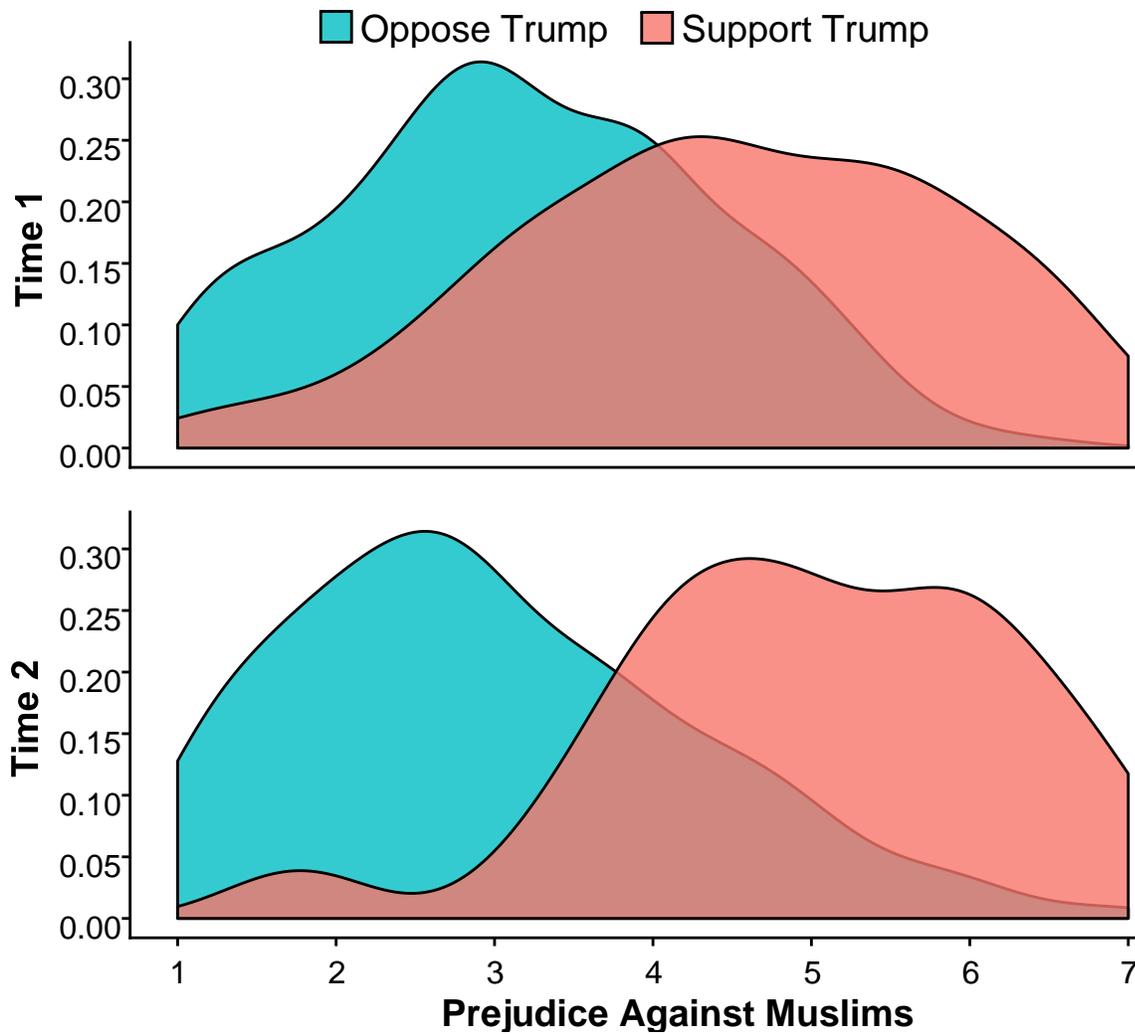


Figure 3.1. Density plots illustrating changes in prejudice against Muslims among those who support versus oppose Donald Trump.

Further, we found that this increase in prejudice was specifically associated with support for Donald Trump, rather than with political conservatism more generally: When both Trump support and conservatism were included as predictors in the regression model, Trump support remained a significant predictor of increases in prejudice ($\beta = .35, t(381) = 4.96, p < .001$), while conservatism did not ($\beta = -.04, t(381) = 0.54, p = .59$).

Because these are correlational data, we examined whether the relationship between Trump support and increases in prejudice was explained by other factors, focusing on variables that have been identified as predictors of support for Trump, such as economic hardship (Tesler, 2016). We examined 39 different factors in total (Supplementary Table 1), including demographic factors (e.g., income, education, age, gender), geographic factors (e.g., county-level measures of income inequality, median income, and unemployment rate), and ideological factors (e.g., political party identification, pride/identification as an American), but none of these variables explained the observed relationship: regardless of what we controlled for, Trump support remained a robust predictor of increases in prejudice.

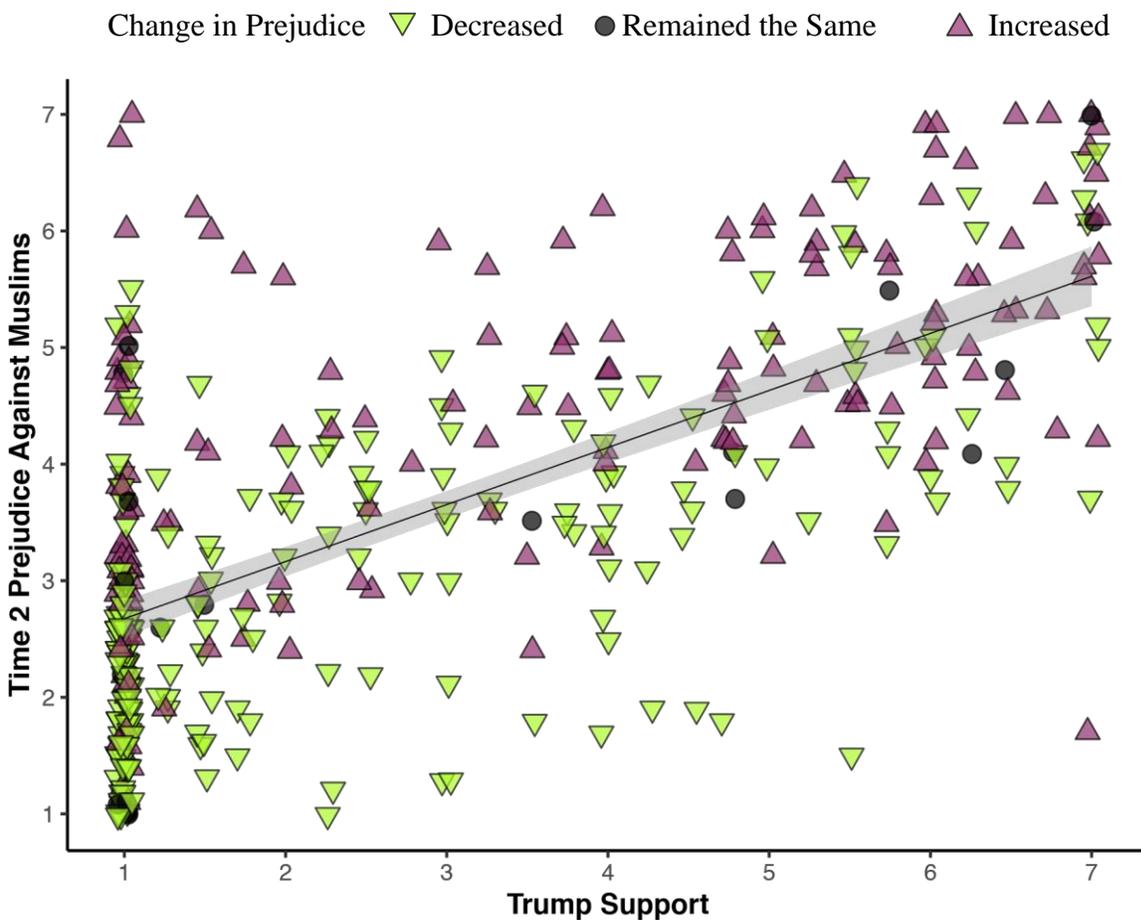


Figure 3.2. Plot depicting the relationship between Trump support and prejudice against Muslims at Time 2 ($\beta = .66$). Shape and color indicate whether each participant's prejudice score increased, decreased, or remained the same from Time 1.

Next, we tested whether this increase in prejudice among Trump's supporters would be limited to Muslims as an abstract group, or whether it would also extend to their attitudes and feelings towards an individual Muslim person (Study 3). In February of 2015, participants read a short story describing a Muslim man who is arrested by U.S. forces while on vacation with his family, harshly interrogated, and held in a military prison for five years without being charged with a crime, before being released without compensation or apology (from Kteily, Bruneau, Waytz, & Cotterill, 2015). Participants rated the degree of shame, anger, guilt, and compassion that they felt on behalf of the man. More than two years later, in June of 2017, a subset of these same participants ($N = 136$) again provided their feelings about this scenario. As predicted, we found that Trump support predicted a significant decrease in reported concern for the wrongly punished Muslim man ($\beta = -.22$, $t(134) = 2.63$, $p = .01$). Once again, we found that the effects of Trump support held when controlling for political conservatism ($\beta = -.38$, $t(131) = 3.56$, $p = .001$), further demonstrating that these increases in prejudice were uniquely associated with support for Trump. (To test the boundary conditions of this effect, we also included a scale assessing blatant dehumanization of Muslims (Kteily et al., 2015). However, we did not find significant changes in prejudice on this measure, $p = .43$.)

In our next study (Study 4), we examined whether this increase in prejudice was limited to attitudes towards Muslims – a group that has been explicitly targeted in controversial remarks

by Trump (Desjardins, 2017; Leonhardt & Philbrick, 2018) – or whether it would also extend to other minority groups. To test this question, we examined prejudice against African Americans. We first used a more subtle measure of prejudice (The Symbolic Racism Scale; Henry & Sears, 2002), in which negative attitudes towards Black people are expressed in the terms of principled conservatism (e.g., “It’s really a matter of some people not trying hard enough; if Blacks would only try harder they could be just as well off as Whites.”). We first assessed participants’ attitudes in September 2015, and then followed up with these same participants over a year and a half later in June 2017. We found that Trump support predicted an increase in prejudice towards African-Americans over the observed time period ($N = 89$; $\beta = .36$, $t(87) = 3.59$, $p = .001$; controlling for conservatism: $\beta = .56$, $t(86) = 4.75$, $p < .001$).

We next examined whether Trump support also predicted changes in more blatant forms of prejudice (Studies 4-8). To do so, we used a measure assessing explicit racial animus toward Black people (The Attitudes Towards Blacks Scale; Brigham, 1993; e.g., “Generally, Blacks are not as smart as Whites are.”). Notably, we found that Trump support predicted increases even in this more blatant form of racism ($N = 478$; $\beta = .23$, $t(480) = 5.19$, $p < .001$; controlling for conservatism: $\beta = .2$, $t(479) = 3.16$, $p = .002$).

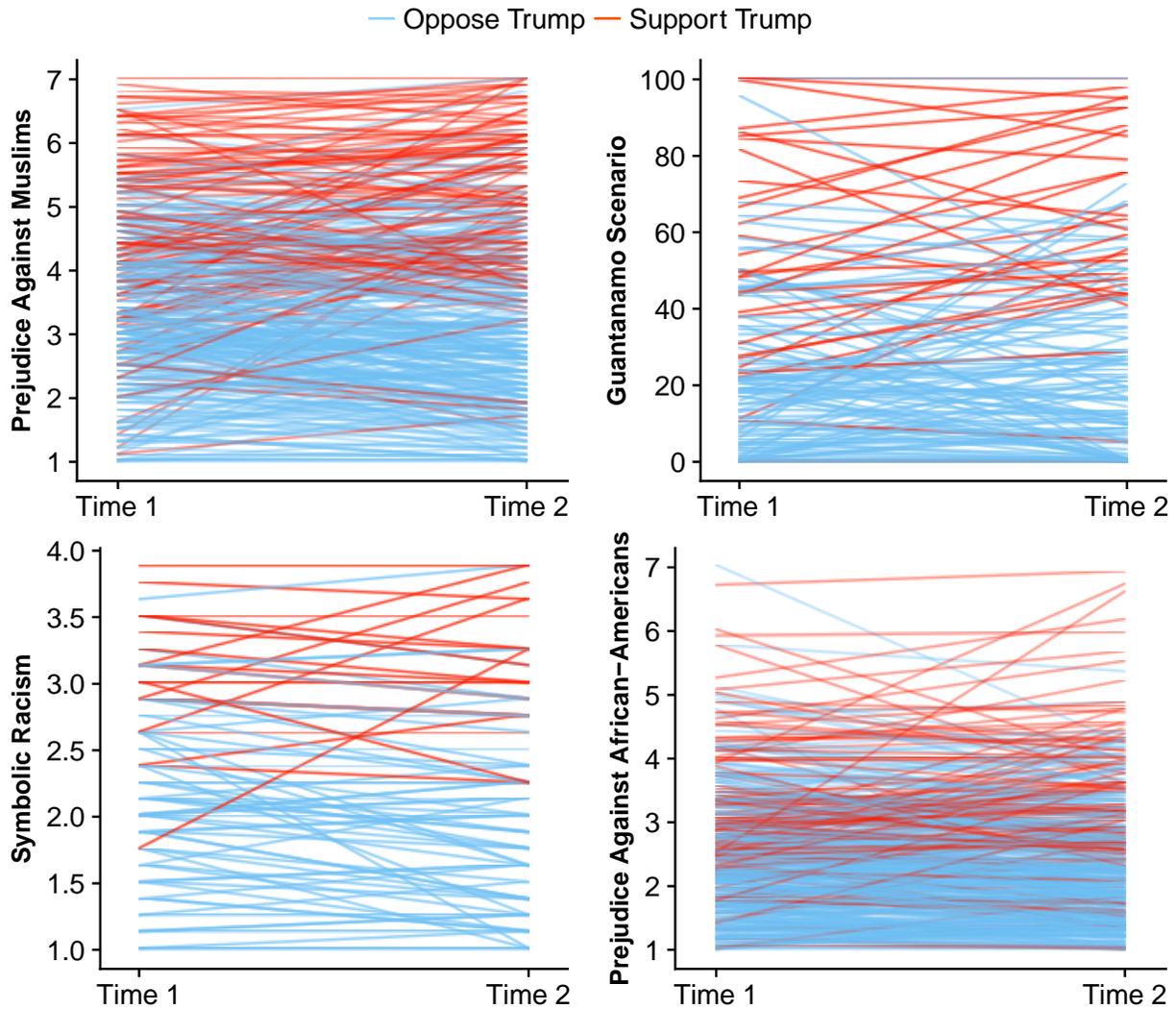


Figure 3.3. Spaghetti plots illustrating heterogeneity in changes in prejudice between participants and between studies. Each line represents one participant. Higher scores indicate greater prejudice.

In Study 9, we examined an open dataset from the *Views Of The Electorate Research* survey (VOTER; Democracy Fund Voter Study Group), a longitudinal, nationally representative sample of 7,666 Americans, in order to replicate and extend our findings from Studies 1-8. These data were collected at two time points, one in 2011 and one following Trump’s election in 2016.

The study contained measures of prejudice towards several minority groups and assessed a wide range of other political, non-political, and demographic factors.

On the measures of prejudice against Muslims and African Americans, we again found that Trump support (measured by a 4-point scale assessing general positivity towards Trump) significantly predicted increases in prejudice over time (β s: .15-.29, $ps < .001$; Fig. 3).

Additionally, the size of these effects did not differ from those obtained in our previous studies ($p = .21$; see meta-analysis in “Methods” in the appendix below), demonstrating that this rising prejudice effect was not limited to our own studies, but generalized to a nationally representative sample of Trump supporters as well.

To further examine the generality of this effect, we also examined attitudes towards other minority groups. We found that Trump support also predicted changes in prejudice towards Latino/Hispanic people, Jewish people, Gay people, Asian people, and immigrants (β s: .14-.41, $ps < .001$, Figure 3.4 and Supplementary Table 2). These results demonstrate that the previously observed changes in prejudice toward Muslims and Black people extend to a range of minority groups. Again, we examined whether other variables (82 different factors in total) explained this relationship. No other variable – or combination of variables – accounted for this effect. In all cases, Trump support remained a significant predictor of increases in prejudice (all $ps < .001$, Supplementary Table 3).

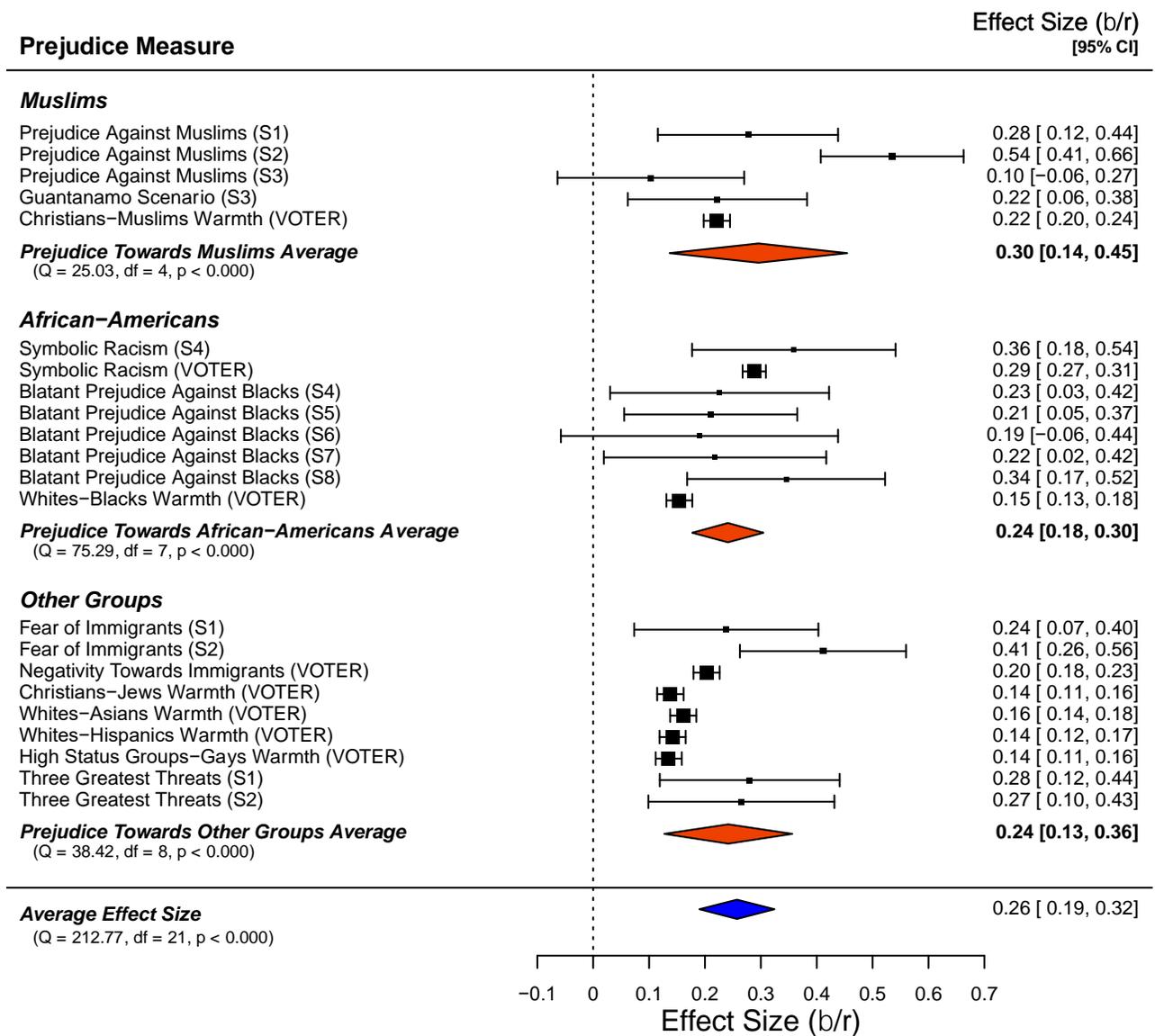


Figure 3.4. Forest plot of effect sizes for longitudinal study prejudice measures. Standardized beta weight (β) indicates the strength of the relationship between Trump support and increases in prejudice. Average effect size based on a meta-analysis with nested effects for group, observation, and sample (see Methods).

Next, we wanted to assess the relevance of these racial and religious attitudes for participants' judgments about social and political issues. To do so, we returned to a study we had conducted between September and December of 2014, in which we asked participants to identify what they considered to be "the three greatest threats to the continued safety and prosperity of the U.S." We then asked a subset of these same participants ($N = 242$) this same question again approximately 2.5 years later, between February and May of 2017. We found that Trump support predicted increases over this time period in perceived threat from minority groups (e.g., Muslims, immigrants, Black people; $\beta = .27$, $t(246) = 4.46$, $p < .001$; controlling for conservatism: $\beta = .244$, $t(245) = 2.58$, $p = .01$). These results indicate that Trump supporters have increased in their propensity to express negativity towards minority groups even when they have not been explicitly asked to evaluate these groups. Further, these results suggest that these prejudices are becoming increasingly important to Trump supporters' judgments about the social and political world.

Building on these findings, we next wished to more directly test the degree to which the increases in prejudice that we observed on these measures would have implications for real-world policy support. Using the VOTER dataset, we assessed participants' support for 13 policies relating to the restriction of minority group rights (e.g., banning Muslims from entering the U.S., opposition to affirmative action and gay marriage). We found that participants' scores on these prejudice measures predicted their endorsement of all 13 of these policies (average $r = .61$, 95% CI [.60,.61], Figure 3.5). Furthermore, this was true *even when controlling for Time 1 prejudice* (Supplementary Table 4), suggesting that the observed changes in prejudice over this time period may have implications for participants' endorsement of real-world policies concerning minority group rights.

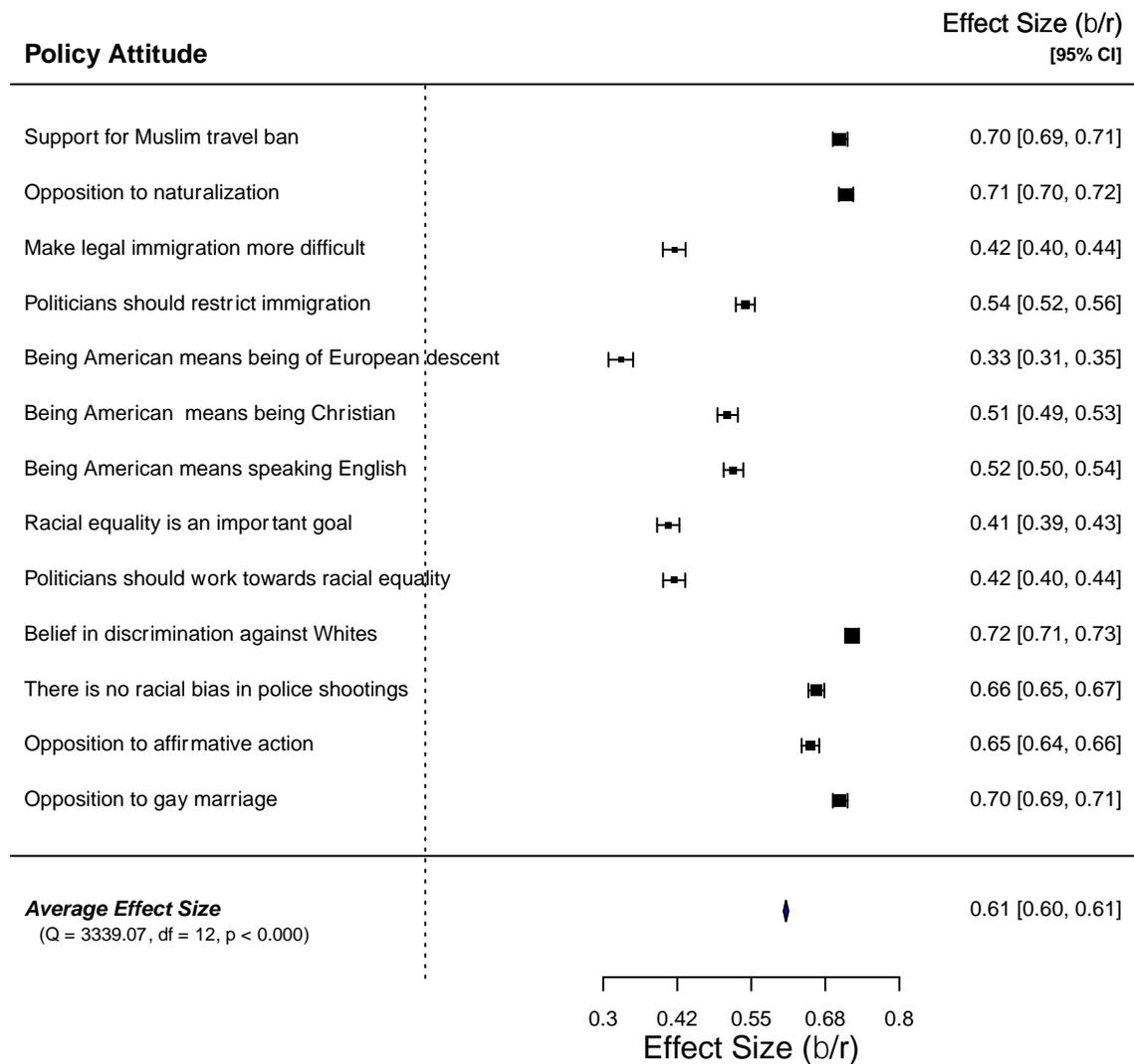


Figure 3.5. Forest plot illustrating the relationship between Time 2 prejudice and various anti-minority policy attitudes (Study 9).

Why Has Prejudice Increased Among Trump’s Supporters?

These nine studies demonstrate that prejudice in the U.S. has changed since the political ascent of Donald Trump. However, not all Americans have increased in prejudice. Rather, these increases in prejudice were specifically and uniquely predicted by support for Trump. Indeed, we

find that Trump supporters have not only deviated from the widely documented societal trend towards decreasing prejudice (Bobo & Charles, 2009; Bobo et al., 2012; Dovidio & Gaertner, 2004, 2010; Schuman et al., 1997), they exhibited significant increases in prejudice towards a range of minority groups.

We next turned to examining the mechanism behind these effects. We predicted that Trump's political ascent had changed the social norms (i.e., standards) for expressing prejudice, leading his supporters to feel that prejudice against minority groups had become more acceptable. Although our previous studies included no Time 1 measures of perceived norms (preventing longitudinal analysis), we conducted three additional studies to examine whether changing social norms may explain the rising prejudice observed among Trump's supporters.

Because people are motivated to seek praise and avoid censure from others, social norms exert a powerful effect on human behavior (Cialdini & Goldstein, 2004). The domain of prejudice is no exception. In fact, perceived norms regarding the acceptability of expressing prejudice are argued to be one of the strongest influences on an individual's own prejudiced behavior (Sechrist & Stangor, 2005). Importantly, however, the influence of social norms is not uniform; rather, people typically assimilate only to norms held by valued "social reference groups" (i.e., people they respect and admire; Sherif & Sherif, 1964; Terry & Hogg, 1996). As a leader and salient exemplar, Trump's behavior should have an outsized effect on the perceived social norms among his supporters (Hogg & Reid, 2006). Therefore, his controversial remarks regarding minority groups should have made these attitudes seem more acceptable among his supporters.

One previous study showed that Donald Trump's election created at least a temporary change in perceived norms, with people reporting that expressing prejudice towards certain

minority groups was more acceptable in the week following (vs. the week before) the election (Crandall et al., 2015). In our next study (Study 10) – conducted over a year into Trump’s presidency – we tested whether Trump’s election created a lasting perception that expressing prejudice had become more normative.

Although our previous studies specifically identified Trump support as the most important predictor of increases in prejudice, for this initial test of our proposed mechanism we nonetheless avoided any mention of Trump or the election until after the dependent variables had been collected. Instead, we simply asked people how they felt things had changed “in recent months and years.” This allowed us to collect a more naturalistic assessment of whether a change in social norms had occurred, while preventing people’s responses from being colored by their beliefs about what Trump’s election may have represented for American race relations (cf. Pew Research Center, 2017d).

In this study ($N = 300$ from Mechanical Turk), we again examined attitudes towards Muslims. We had two primary aims. First, we tested whether people perceived that there had been a change in Americans’ attitudes towards Muslims, such that expressing negativity towards Muslims had become more “descriptively normative” (i.e., more common) among the U.S. population. We predicted that all participants – both those who support Donald Trump and those who do not – would perceive that Americans had recently become more negative in their attitudes towards Muslims. To assess this question, we asked participants to rate the degree to which they felt that other Americans had recently changed in their negativity towards Islam/Muslims (on a 9-point scale ranging from “Have become much less critical” to “Have become much more critical,” with the midpoint labeled “Are the same as the past”).

Our second aim was to examine whether people felt that the norms of expressing prejudice had changed among their social reference groups (i.e., other people whom they personally respect and admire). To test this question, we asked participants to indicate the degree to which they felt that people that they respect and admire had recently become more critical towards Muslims/Islam, on the same scale described above. Because we anticipated that Trump's political rhetoric would be most influential in changing the norms among individuals who viewed him positively, we predicted that Trump's supporters, specifically, would believe that the attitudes of their social reference groups had changed. Given that research has shown that people primarily assimilate to norms held by valued others (Sherif & Sherif, 1964; Terry & Hogg, 1996), finding this effect among Trump supporters would suggest a possible mechanism for why prejudice has increased only among supporters of Donald Trump.

The results of this study supported both of our predictions. First, we found that participants believed that Americans had recently become more critical of Muslims/Islam (scores were significantly higher than the midpoint of the scale; Cohen's $d = .62$, $t(299) = 10.80$, $p < .001$). This belief was held by both Trump supporters and non-Trump supporters, with no significant difference between the two groups ($p = .53$). Thus, even over a year into Trump's presidency, people believe that there has been a lasting shift in Americans' negativity towards Muslims.

People's beliefs about changes in norms among their personal social reference groups also supported our predictions. Participants who more strongly supported Donald Trump were more likely to report that the norms among their social reference groups had changed ($\beta = .2$, $t(298) = 3.54$, $p < .001$). Specifically, whereas Trump supporters reported that people they respect and admire had recently become more critical of Muslims (Cohen's $d = .50$, $t(72) = 4.24$,

$p < .001$), this same belief was not held by people who did not support Trump ($t(205) = .56, p = .57$).

In sum, in Study 10 we found that both Trump supporters and non-supporters believed that Americans in general had recently become more negative toward Muslims. But only Trump supporters felt that people that they personally admire and respect had become more negative toward Muslims. This finding supports our prediction that Trump may have changed the norms of expressing prejudice specifically among his supporters, and suggests a possible social reference group-based mechanism for why Trump supporters – and only Trump supporters – have increased in prejudice.

In Study 11, we built on these findings in two ways. First, we assessed whether people felt that norms had changed *specifically among Trump's supporters*. We predicted that all participants – both Trump supporters and non-Trump supporters – would believe that prejudice had become more normative (i.e., more common and more acceptable) among Trump's supporters. This effect would be in line with our previous findings showing that Trump supporters have indeed increased in prejudice, and would demonstrate that people (regardless of their personal support for Trump) have recognized this increase.

Second, we provided an initial test of the implications of these beliefs about changing norms for people's own personal prejudice (using the same scale of prejudice against Muslims from Studies 1-3 (Imhoff & Recker, 2012)). We predicted that Trump supporters who perceived that prejudice had become more normative among their fellow Trump supporters (a social reference group) would express greater personal prejudice. However, we expected that the same relationship would not emerge among non-Trump supporters. That is, because non-Trump

supporters should not view Trump supporters as a social reference group, beliefs regarding the norms among this group should not lead them to express greater personal prejudice.

The results of this study confirmed our predictions. First, people believed that prejudice has become more normative among Trump's supporters ($t(298) = 12.3, p < .001$). This belief was held by both Trump supporters ($N = 120, t(119) = 4.19, p < .001$) and non-Trump supporters ($N = 165, t(164) = 12.94, p < .001$), and was true for both descriptive and prescriptive norms, with people believing that Trump supporters had both become more negative towards Muslims ($t(298) = 11.36, p < .001$) and more accepting of other people expressing negativity towards Muslims ($t(298) = 11.17, p < .001$). These findings suggest that people have indeed perceived the increase in prejudice among Trump supporters that we documented in our first 9 studies.

Our prediction regarding the relationship between perceived changes in norms and participants' personal expressions of prejudice was also confirmed. We found a significant interaction between perceptions of Trump-supporter norms and participants' personal support for Trump in predicting prejudice ($\beta = .7, t(295) = 4.08, p < .001$). Among Trump supporters, the belief that prejudice had become more acceptable among other Trump supporters (a social reference group) predicted greater personal explicit prejudice against Muslims ($\beta = .24, t(119) = 2.72, p = .007$). However, as predicted, this effect did not emerge among non-Trump supporters (and in fact, this belief predicted *less* personal prejudice for non-Trump supporters; $\beta = -.24, t(163) = 3.2, p = .002$).

The results of Study 11 revealed that both Trump supporters and non-Trump supporters believe that prejudice has become more normative among supporters of Donald Trump. However, these perceived changes in norms only predicted personal prejudice among individuals who themselves supported Trump. In line with social psychological theory on social norms

(Terry & Hogg, 1996; Sherif & Sherif, 1964), these results support our prediction that perceived changes in norms will only affect prejudice among individuals who have positive views of the people and groups that hold those norms. These findings further support the possibility that changing social norms may be responsible for the increases in prejudice observed among Trump supporters in Studies 1-9.

Finally, in Study 12, we wished to more decisively test our proposed mechanism using an experimental manipulation. Specifically, in this study we manipulated perceived social norms in order to test their causal influence in shaping Trump supporters' personal expressions of prejudice. We predicted that by undercutting (vs. amplifying) the degree to which expressing prejudice was seen to be normative among their social reference groups, we could reduce Trump supporters' own expressions of prejudice.

Participants ($N = 601$ from Mechanical Turk) completed a task (ostensibly) to assess their comprehension of everyday news headlines. They rated their understanding of a series of five headlines. Four of these five headlines were apolitical (e.g., technology, weather, pop culture). However, the penultimate headline differed between participants by random assignment. Participants in the "Normative Prejudice" condition viewed a headline, ostensibly from Fox News, which read "New Poll: Trump Supporters Increasingly Supportive of Trump's Anti-Immigrant Message." The headline for participants in the "Counter-Normative Prejudice" condition differed by a single word: rather than reading that Trump supporters were increasingly *supportive* of Trump's anti-immigrant message, participants read that they were increasingly *disapproving* of this message (control condition participants read an additional apolitical headline about the weather).

This paradigm provides a direct test of our proposed social norms mechanism, while ruling out alternative explanations such as participants assimilating to the views of Trump himself. That is, Trump’s reported message is always held constant (in both cases being described as “anti-immigrant”); the difference lies only in whether Trump’s supporters are said to oppose vs. support this message. If Trump’s personal views are driving these effects, then being reminded of his anti-immigrant stance should lead all Trump supporters to express greater prejudice (compared to the neutral control condition). Conversely, if perceived social-reference-group norms are the mechanism, as we predict, then being told that Trump’s supporters oppose his rhetoric should reduce Trump supporters’ personal willingness to express prejudice, despite having been reminded of Trump’s personal anti-immigrant stance.

Following the manipulation, participants completed a short filler questionnaire to reduce suspicion. They then completed a measure of prejudice. To further reduce suspicion – and to provide a more stringent test of our hypothesis – we did not directly assess participants’ attitudes towards immigrants. Rather, we assessed their attitudes towards another minority group, Muslims, using a shortened version of the scale from Study 11.

Following our preregistered analysis plan, we tested our focal prediction that Trump support would interact with condition (counternormative versus normative) to predict prejudice. This interaction was significant ($\beta = .3$, $t(397) = 2.01$, $p = .045$; excluding those who failed attention/suspicion checks: $\beta = .35$, $t(386) = 2.31$, $p = .02$). Among Trump supporters, those who were led to believe that other Trump supporters opposed (vs. supported) Trump’s anti-immigrant rhetoric expressed less prejudice (Cohen’s $d = .28$, $t(157) = 1.74$, $p = .08$). Conversely, as predicted, the social norms manipulation had no effect on individuals who do not support Donald

Trump (Cohen's $d = .07$, $t(204) = .5$, $p = .62$).⁷ These findings provide further support for a social reference group-specific norms account, and demonstrate that even extremely minimal information (one headline during a 5-minute study) about what Trump supporters view as acceptable is enough to shift expressions of prejudice among Trump's supporters. This evidence suggests that the months of exposure to Trump's political rhetoric – in combination with the support that a significant proportion of the population has expressed for him – may in fact have implications for his supporters' own expressions of prejudice.

The results of these three studies support our hypothesis that since Trump's campaign and election, the social norms about the acceptability of expressing prejudice have shifted among Trump's supporters. These findings also suggest that these changing social norms have implications for the degree of prejudice that Trump supporters themselves express. Taken together, these studies strongly suggest that changes in social norms may explain the increases in prejudice that we observed in Studies 1-9.

Conclusion

In a series of 12 studies, using a variety of methods and with a combined sample of nearly 10,000 Americans, we found that prejudice in the United States has changed since Donald Trump's political ascent. Indeed, among Trump's supporters we documented not just a tempering of the decline in prejudice that has been observed in historical trends, but a significant increase in prejudice towards a range of social, racial, and religious minority groups (Studies 1-9). Our results also suggest that these changes in prejudice may stem from shifting social norms: Trump supporters perceive that it has become more acceptable to express prejudice since

⁷Comparing to the control condition suggests that the counter-normative condition decreased prejudice (Cohen's $d = .25$, $t(144) = 1.56$, $p = .12$) more than normative condition increased it (Cohen's $d = .03$, $t(155) = .179$, $p = .86$), suggesting that baseline perceptions may be that Trump's supporters endorse his views.

Trump's election (Study 10), and the perception that prejudice has become more acceptable predicts greater personal prejudice among Trump supporters (Study 11). Finally, we also demonstrated that experimentally manipulating these perceived social-reference-group norms influenced expressions of prejudice among Trump supporters, providing convergent evidence in support of our proposed social norms mechanism. Together, this research suggests that the campaign and election of Donald Trump has substantially reshaped the topography of prejudice in the United States, disrupting the trend towards decreasing prejudice that has characterized the American social and political landscape for the last 50 years.

General Discussion

Summary

In the above pages, I have discussed three lines of research that I have conducted on political ideology, examining its psychological causes, correlates, and consequences. In the first chapter, I discussed work on the upstream causes of ideology. Building on previous research on the psychological underpinnings of political ideology, I identified a novel biological factor – individual differences in gustatory (taste) sensitivity – that appears to predispose a person towards adopting more conservative political attitudes. In this research, I conducted a series of four studies using different indices of taste sensitivity, such as sensitivity to the chemical compound 6-n-propylthiouracil (PROP) and a physiological measure of tongue taste receptor density. I consistently found that individuals with more sensitive senses of taste tend to develop more socially and culturally conservative attitudes. Further, I found that this relationship is mediated by sensitivity to disgust, suggesting that more taste-sensitive individuals may develop a heightened response to disgusting stimuli, which in turn shapes their political beliefs.

This research provides evidence that genetically determined physiological differences influence a person's political ideology. It also identifies a pathway of biological (sensory processing physiology) and psychological (sensitivity to disgust) mechanisms by which previously observed ideological differences in genetic makeup may be translated into political attitudes. More generally, this is, to my knowledge, the first research to suggest that low-level differences in sensory processing may shape higher-level attitudes and beliefs.

In the second chapter, I presented research on the correlates of ideology, examining how the same upstream factors that shape ideology can also shape other aspects of cognition. In this research, I found that there are broad differences between conservatives and liberals in subjective

judgment and decision-making confidence. In a series of 14 studies, I found that conservatives exhibit greater confidence across a wide range of domains (e.g., dot estimation, memories of daily life, distance estimation, pattern memory). Further, I found that these differences in subjective confidence stem from ideological differences in judgment and decision-making *style*: Conservatives' greater preference for stability and certainty leads them to make more rapid and efficient judgments – tending to “trust their gut” when faced with a decision. Liberals, conversely, are better described as “chronic second guessers” who spend more time in deliberation and consider a broader range of counterfactuals and alternative response possibilities – which in turn undercuts their subjective confidence in their own response.

This work identifies a novel domain of ideological differences, metacognitive confidence, and suggests that these asymmetries stem from the same individual differences in epistemic motivation that influence a person's position on the ideological spectrum. More generally, this work bridges research on fundamental psychological motivations and judgment and decision making to show how differences in epistemic needs can shape decision-making style in ways that can have wide-ranging influences on metacognition.

While the previous two lines of research examined how differences in physiological and psychological traits can shape ideology and other aspects of cognition, in the final line of work that I presented, I reversed this lens to understand how belonging to an ideological group can impact attitudes and behavior. In this research, I examined how ideological group membership and shifting social norms reshaped intergroup attitudes in the wake of the 2016 U.S. Presidential Election. I found evidence that Donald Trump's political ascent substantially reshaped expressions of explicit prejudice among Americans – but that the direction of this change diverged sharply along ideological group lines. In a series of 12 studies, I found that political

conservatives – particularly Trump supporters – showed substantial increases in explicit prejudice towards a range of racial and religious minority groups following Trump’s election. Conversely, liberals – particularly those opposed to Trump – showed significant *decreases* in prejudice towards these groups over this same period. I also find evidence suggesting that shifting social norms explained these changes in expressions of prejudice: Americans generally believe that Trump’s supporters became more openly prejudiced following Trump’s election, but while conservatives assimilated to these new prejudice norms, liberals contrasted away from them.

This research provides the first evidence, to my knowledge, that a single salient sociopolitical event can lead to rapid, societal-level shifts in intergroup attitudes. It also provides insight into how salient political figures can drive changes in norms and attitudes among both ingroup and outgroup members. More generally, this work further highlights that ideological group membership is not simply a consequence of an individual’s psychological makeup, but rather that belonging to an ideological group can shape (and reshape) a person’s traits, attitudes, and beliefs.

(Additional) Limitations of the Present Research

In addition to the limitations discussed in the sections above, there are other potential limitations that may apply to this research as a whole – in particular, those related to the idiosyncrasies of the American political context. That is, although these lines of research incorporated diverse participant samples (e.g., community members and a nationally representative sample, in addition to online panels and undergraduate students), the participants in these studies were nonetheless all from the United States, which may limit the generalizability of some of these results. One important question is the degree to which the relationships

documented in these studies (e.g., between taste sensitivity and ideology; between ideology and confidence) are truly indicative of relationships with political ideology in general, versus unique subfacets of ideology.

As discussed above, while the left-right dimension is ubiquitous in politics (Bobbio, 1996; Burke, 1790/1987; Huber & Inglehart, 1995; Jost 2006; Jost et al., 2003a; Lukes, 2003; McCarty et al. 2006; Rosas & Ferreira, 2014), research has increasingly suggested that there exist independent facets or dimensions of ideology (Duckitt et al. 2002; Evans et al., 1996; Layman & Carsey, 2002; Saucier, 2000; Stenner, 2005) and that these may be driven by distinct psychological motivations (Altemeyer, 1998; Duckitt et al., 2002; Duriez & Van Hiel, 2002; Malka & Soto, 2015; Sibley & Duckitt, 2008). The most important and well-studied among these dimensional distinctions is that between social/cultural conservatism – conservatism on issues such as immigration and sexual morality (e.g., gay marriage, abortion) – and economic conservatism – conservatism on issues related to economic redistribution and the appropriate scope of government involvement in economic affairs. In recent years, research has suggested that the psychological motivations that are typically posited as underlying political conservatism—namely, motivations for certainty and security—might be better characterized as driving social/cultural conservatism specifically (Federico, Fisher, & Deason, 2011; Federico & Goren, 2009; Federico, Johnston, & Lavine, 2014; Feldman, 2013; Feldman & Johnston, 2014; Hibbing, Smith, & Alford, 2014; Malka et al., 2017).

Although empirical research has documented relationships between these psychological motivations and economic conservatism (e.g., Sterling, Jost, & Pennycook, 2016), some researchers have argued that these associations stem from the fact that social and economic conservatism are positively correlated in the nations where most past research has been

conducted (specifically, developed Western nations, and in particular, the United States; Malka et al., 2017). Supporting this contention, research suggests that the relationships between epistemic/existential needs and economic conservatism are typically weaker than those with social conservatism (Duckitt & Sibley, 2009; Federico et al., 2014; Malka & Soto, 2015), and that the associations with economic conservatism tend to be further attenuated in non-Western nations where social and economic conservatism are less closely related (Duriez et al., 2005; Golec, 2002; Kossowska & Van Hiel, 2003; Malka et al., 2017; Roccato and Ricolfi, 2005).

This argument is particularly relevant in light of recent empirical work suggesting that positive correlations between social and economic conservatism may actually be the exception, rather than the rule. For example, Malka and colleagues (2017) examined the association between social and economic conservatism across 99 nations and found a net negative correlation between these two dimensions of ideology (though see also Benoit and Laver, 2006, who found a positive correlation across 41 out of 44 nations). They argue that although there tends to be a strong correspondence between social and economic conservatism among political elites (Benoit & Laver, 2006; De Vries & Marks, 2012; Gabel & Hix, 2002; Huber & Inglehart, 1995; Wiesehomeier & Benoit, 2009), the same is not always true of the general public. Rather, the correspondence between social and economic conservatism among a citizenry depends on factors such as political sophistication and exposure to elite rhetoric (Bullock, 2011; Federico & Goren, 2009; Federico et al., 2011; Levendusky, 2009; Malka & Lelkes, 2010).

In the three lines of research presented above, I included measures examining both of these facets of conservatism—social/cultural and economic—as well as general or “global” political orientation. I reliably found that the traits of interest (e.g., taste sensitivity, confidence) were associated not only with individual dimensions of ideology, but also with global political

orientations. However, it is possible that the nature and strength of these relationships may differ as a function of the national context in which they are examined – a possibility that future researchers may wish to examine.

The theoretical frameworks that I have outlined above offer some more specific predictions regarding the possible nature of these relationships. For example, as discussed above, past research and theory suggests that taste sensitivity should be most closely related to social/cultural conservatism, given that disgust sensitivity – the psychological mechanism underlying this association – tends to be specifically associated with conservatism on issues related to adherence to social norms and traditional sexuality (Tybur et al., 2015), both of which are more characteristic of social conservatism. Although our studies also documented a relationship between taste sensitivity and global political orientation, the strength of this relationship may be attenuated in nations in which there is a lower correspondence between social and economic conservatism. International replications will be required to assess these predictions and to determine the degree to which the findings presented here can be generalized to other nations and cultures.

Future Directions

Although the three lines of research discussed above are in many ways distinct – touching on disparate processes, outcomes, and points in the causal chain – there are several potential points of interconnection between them that future research might explore. One possible connection between these lines of research relates to how sensory sensitivity may shape confidence in one’s judgments and beliefs.

Individuals who are more sensitive in a given sensory domain, by definition, experience sensations with greater intensity. In the realm of taste, for example, “supertasters” (i.e.,

individuals at the upper end of the taste sensitivity spectrum) experience flavors with a greater degree of intensity than their less taste-sensitive counterparts (Bartoshuk, Duffy, & Miller, 1994; Hayes & Keast, 2011). Although less well researched, there appear to be individual differences in other forms of sensory sensitivity as well, such as olfactory (smell) sensitivity or interoceptive sensitivity (sensations arising from internal bodily states and processes; Barrett, Quigley, Bliss-Moreau, & Aronson, 2004; Critchley & Garfinkel, 2017; Dunn, 2001; Ludwick-Rosenthal & Neufeld, 1985; Sorokowski et al., 2019), which should operate similarly. Thus, when faced with an identical sensory stimulus (e.g., gustatory, olfactory, interoceptive), individuals higher in sensory sensitivity will tend to experience a relatively stronger sensation than those lower in sensitivity. These differences in experienced intensity may then have implications for a person's confidence in their sensory and perceptual judgments.

Signal detection theory suggests that sensations that are experienced with greater intensity are subjectively easier to detect (i.e., to accurately distinguish from background noise; Green & Swets, 1966; Hautus, 2015). This greater subjective ease—or, in other words, cognitive fluency (Alter & Oppenheimer, 2009)—in detecting sensory stimuli should, in turn, influence people's confidence (Alter & Oppenheimer, 2009; Finn & Tauber, 2015; Koriat & Ackerman, 2010; Schwarz, 2004; Tormala et al., 2002), with more sensorily sensitive individuals feeling more confident in the accuracy of their perceptions.

One intriguing possibility is that this greater confidence may extend beyond the specific sensory domain in question to influence confidence more generally. Such an effect might be expected to occur for several reasons – for example, because these same sensory signals play a role in the judgment at hand (Morrison, 2016; Peirce & Jastrow, 1884), or through processes of social calibration (Brickman & Bulman, 1977; Mettee & Smith, 1976; Thornton & Arrowood,

1966) whereby more sensorily sensitive individuals learn that their sensory perceptions (within a given sensory domain) are typically more accurate than those of their peers – a judgment which may then be generalized to other domains. Future research may wish to examine these possibilities.

A second possible point of connection between these lines of research relates to how subjective confidence may influence prejudice against social outgroups. Although our studies on ideological differences in confidence focused on relatively innocuous, nonpolitical domains such as distance judgments and dot estimates, the same psychological processes should be at play in other, more politically charged domains. For example, political conservatives should also be more confident in the objective accuracy of their moral, political, and religious beliefs. This confidence, in turn, may lead them to be less accepting of those who (are perceived to) hold different or conflicting beliefs, such as racial, religious, and cultural outgroups. Conversely, liberals' lower confidence in the objective accuracy of their own judgments and beliefs might lead them to express greater tolerance towards those with divergent viewpoints. If these predictions are correct, then the ideological differences in confidence that we documented may help to explain why conservatives often hold greater prejudice towards many kinds of minority groups (Adorno et al., 1950; Allport, 1954; Altemeyer, 1988; Hodson & Dhont, 2015; Sibley & Duckitt, 2008; Sidanius, Pratto, & Bobo, 1996; though see also Crawford, Brandt, Inbar, Chambers, & Motyl, 2017), particularly those that are perceived to hold politically liberal beliefs (Brandt, Reyna, Chambers, Crawford, & Wetherell, 2014).

More generally, there may be other ways in which these upstream psychological and physiological causes of ideology interrelate. One possibility is that low-level individual differences in sensory sensitivity may shape traits like openness to experience, threat sensitivity,

and epistemic motivations for closure. Research suggests that more intense sensory experiences may lead to a relative dominance of negative (vs. positive) sensations. For example, for people higher in taste sensitivity, bitter, sour, and spicy flavors are often unpleasantly intense and tend to take greater prominence in taste experiences (Bartoshuk, 2000; Kauer, Pelchat, Rozin, & Zickgraf, 2015). Other lines of research converge to suggest similar processes may hold true in other sensory domains. Pregnant women often undergo a lowering of their sensory thresholds and experience an increase in sensory sensitivity (Bhatia and Puri, 1991; Hansen & Glass, 1936; Henssge, 1930; Luvara & Murizi, 1961; Nordin, Broman, Olofsson, & Wulff, 2004), particularly in the domains of gustation and olfaction (which is theorized to provide them with greater ability to detect and avoid poisonous or pathogen-laden foods during sensitive gestational periods; Hook, 1978; Profet, 1992). This period of heightened sensitivity is often associated with a greater frequency of negative sensations in these sensory domains (e.g., bad smells, bad tastes, etc.; Cantoni, Hudson, Distel, & Laska, 1999; Duffy, Bartoshuk, Striegel-Moore, & Rodin, 1998; Gilbert & Wysocki, 1991; Nordin et al., 2014). Similarly, more global forms of heightened sensory sensitivity, such as that which characterizes certain types of sensory processing disorder (Dunn, 1997, 2001), are associated with a high frequency of negative sensory experiences, whereby sensations that are innocuous for most individuals (e.g., indoor lighting, other people's cologne/perfume, a t-shirt tag touching the back of the neck) are experienced as intensely unpleasant (Dunn, 1997, 2001; Miller, Anzalone, Lane, Cermak, & Osten, 2007; Tomchek & Dunn, 2007).

Research from outside the realm of sensory sensitivity has shown that the frequency and intensity of negative experiences, in turn, influence the way that a person engages with and explores the world around them, with a relatively greater frequency or intensity of negative (vs.

positive) experiences inhibiting exploration and openness to novel stimuli (Fazio, Eiser, & Shook, 2004; Fazio, Pietri, Rocklage, & Shook, 2015). Consistent with these findings, there is some evidence suggesting that more taste-sensitive individuals' greater frequency of negative (vs. positive) taste experiences may lead them to avoid novel or unfamiliar flavors, foods, and cuisines (Bajec, & Pickering, 2010; Kauer et al., 2015; Tepper, 2008).

To the degree that the same processes hold true in other sensory domains, we may predict that, for example, more olfactorily sensitive individuals may avoid situations or experiences that have the potential to expose them to unfamiliar odors, or that more interoceptively sensitive individuals may avoid situations with the potential to induce unfamiliar bodily sensations. Future research may wish to explore these possibilities, as well as whether these differences in exploratory behavior and openness to new experiences may even extend beyond these individual sensory domains to shape broader personality traits like openness, risk aversion, and sensitivity to threat.

Concluding Remarks

In this work, I have built on past research on the psychological underpinnings of ideology by exploring novel causes, correlates, and consequences of a person's political ideology. In Chapter 1, I identified a physiological trait, taste sensitivity, that appears to predispose a person towards developing a more conservative ideology, and I provided evidence that the psychological mechanism behind this effect is sensitivity to disgust. In Chapter 2, I identified a novel domain of ideological differences, subjective judgment and decision-making confidence, and provided evidence that conservatives' greater confidence stems at least in part from their greater epistemic need for cognitive closure. Finally, in Chapter 3, I examined how shifting

ingroup norms following the 2016 U.S. Presidential Election reshaped Americans' attitudes, leading to increases in explicit prejudice among individuals who supported Donald Trump.

In addition to these theoretical and empirical contributions, I have also sought to reexamine some of the basic tenets of the theoretical framework on which this work builds by incorporating the recommendations of recent commentators and critics, as well as more general best-practice recommendations from the field. My aim in adopting this methodological approach is to further refine our knowledge of the scope and nature of the relationship between political ideology and fundamental psychological motivations for certainty and safety. My hope is that this work, taken together, has helped to deepen our scientific understanding of political ideology – these complex systems of belief that guide us, drive us, and divide us.

References

- Aarøe, L., Petersen, M. B., & Arceneaux, K. (2017). The behavioral immune system shapes political intuitions: Why and how individual differences in disgust sensitivity underlie opposition to immigration. *American Political Science Review*, *111*(2), 277-294. <https://doi.org/10.1017/s0003055416000770>
- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The authoritarian personality*. New York, NY: Harper.
- Allport GW. 1954. *The Nature of Prejudice*. Reading, MA: Addison-Wesley.
- Altemeyer, B. (1998). The other ‘authoritarian personality’. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (pp. 47–92). New York, NY: Academic Press. [https://doi.org/10.1016/s0065-2601\(08\)60382-2](https://doi.org/10.1016/s0065-2601(08)60382-2)
- Alter, A. L., & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. *Personality and Social Psychology Review*, *13*(3), 219-235.
- Alter, A. L., Oppenheimer, D. M., Epley, N., & Eyre, R. N. (2007). Overcoming intuition: Metacognitive difficulty activates analytic reasoning. *Journal of Experimental Psychology: General*, *136*, 569-576.
- Babad, E. Y., Ariav, A., Rosen, I., & Salomon, G. (1987). Perseverance of bias as a function of debriefing conditions and subjects' confidence. *Social Behaviour*.
- Bajec, M. R., & Pickering, G. J. (2010). Association of thermal taste and PROP responsiveness with food liking, neophobia, body mass index, and waist circumference. *Food Quality and Preference*, *21*(6), 589-601. <https://doi.org/10.1016/j.foodqual.2010.03.007>

Bakker, B., Schumacher, G., Gothreau, C., & Arceneaux, K. (2019). Conservatives and Liberals have Similar Physiological Responses to Threats: Evidence from Three Replications.

<https://doi.org/10.31234/osf.io/vdpyt>

Barbarossa, I. T., Melis, M., Mattes, M. Z., Calò, C., Muroi, P., Crnjar, R., & Tepper, B. J.

(2015). The gustin (CA6) gene polymorphism, rs2274333 (A/G), is associated with fungiform papilla density, whereas PROP bitterness is mostly due to TAS2R38 in an ethnically-mixed population. *Physiology & Behavior*, *138*, 6-12.

<https://doi.org/10.1016/j.physbeh.2014.09.011>

Barrett, L. F., Quigley, K. S., Bliss-Moreau, E., & Aronson, K. R. (2004). Interoceptive sensitivity and self-reports of emotional experience. *Journal of Personality and Social Psychology*, *87*(5), 684.

<https://doi.org/10.1037/0022-3514.87.5.684>

Barth, M., Masson, T., Fritsche, I., & Ziemer, C. T. (2018). Closing ranks: Ingroup norm conformity as a subtle response to threatening climate change. *Group Processes & Intergroup Relations*, *21*(3), 497-512.

<https://doi.org/10.1177/1368430217733119>

Bartoshuk, L. M. (2000). Comparing sensory experiences across individuals: recent

psychophysical advances illuminate genetic variation in taste perception. *Chemical Senses*, *25*(4), 447-460.

<https://doi.org/10.1093/chemse/25.4.447>

Bartoshuk, L. M., Duffy, V. B., Fast, K., Green, B. G., Prutkin, J., & Snyder, D. J. (2003).

Labeled scales (eg, category, Likert, VAS) and invalid across-group comparisons: what

we have learned from genetic variation in taste. *Food Quality and Preference*, *14*(2), 125-

138. [https://doi.org/10.1016/s0950-3293\(02\)00077-0](https://doi.org/10.1016/s0950-3293(02)00077-0)

- Bartoshuk, L. M., Duffy, V. B., & Miller, I. J. (1994). PTC/PROP tasting: anatomy, psychophysics, and sex effects. *Physiology & Behavior*, 56(6), 1165-1171.
[https://doi.org/10.1016/0031-9384\(94\)90361-1](https://doi.org/10.1016/0031-9384(94)90361-1)
- BBC. (2016, November 29). "Trump Effect" led to hate crime surge, report finds. *BBC News*.
Retrieved from <https://www.bbc.com>.
- Bennett, W. L. (2012). The personalization of politics: Political identity, social media, and changing patterns of participation. *The ANNALS of the American Academy of Political and Social Science*, 644(1), 20-39.
- Benoit, K., & Laver, M. (2006). *Party Policy in Modern Democracies*. London: Routledge.
- Bhatia, S., & Puri, R. (1991). Taste sensitivity in pregnancy. *Indian Journal of Physiology and Pharmacology*, 35(2), 121-124.
- Billing, J., & Sherman, P. W. (1998). Antimicrobial functions of spices: why some like it hot. *The Quarterly Review of Biology*, 73(1), 3-49. <https://doi.org/10.1086/420058>
- Block, J., & Block, J. (1951). An investigation of the relationship between intolerance of ambiguity and ethnocentrism. *Journal of Personality*.
- Block, J., & Block, J. H. (2006). Nursery school personality and political orientation two decades later. *Journal of Research in Personality*, 40, 734-749.
<https://doi.org/10.1016/j.jrp.2005.09.005>
- Bobbio, N. (1996). *Left and right: The significance of a political distinction*. Chicago, IL. University of Chicago Press.

- Bobo, L. D., & Charles, C. Z. (2009). Race in the American mind: From the Moynihan report to the Obama candidacy. *The Annals of the American Academy of Political and Social Science*, 621(1), 243-259. <https://doi.org/10.1177/0002716208324759>
- Bobo, L., Charles, C., Krysan, M., & Simmons, A. D. (2012). The Real Record on Racial Attitudes. In P. V. Marsden (Ed.), *Social Trends in the United States: Evidence from the General Social Survey since 1972* (pp. 38-83). Princeton: Princeton University Press. <https://doi.org/10.1515/9781400845569-005>
- Bonanno, G. A., & Jost, J. T. (2006). Conservative shift among high-exposure survivors of the September 11th terrorist attacks. *Basic and Applied Social Psychology*, 28(4), 311-323. https://doi.org/10.1207/s15324834basp2804_4
- Brandt, M. J., Evans, A. M., & Crawford, J. T. (2015). The unthinking or confident extremist? Political extremists are more likely than moderates to reject experimenter-generated anchors. *Psychological Science*, 26(2), 189-202.
- Brandt, M. J., Reyna, C., Chambers, J. R., Crawford, J. T., & Wetherell, G. (2014). The ideological-conflict hypothesis: Intolerance among both liberals and conservatives. *Current Directions in Psychological Science*, 23(1), 27-34. <https://doi.org/10.1177/0963721413510932>
- Braver, S. L., Thoemmes, F. J. & Rosenthal, R. (2014). Continuously cumulating meta-analysis and replicability. *Perspectives on Psychological Science*, 9, 333. <https://doi.org/10.1177/1745691614529796>

- Brickman, P., & Bulman, R. J. (1977). Pleasure and pain in social comparison. In J. M. Suls & R. L. Miller (Eds.), *Social comparison processes: Theoretical and empirical perspectives* (pp. 149-186). Washington DC: Hemisphere.
- Brigham, J. C. (1993). College students' racial attitudes. *Journal of Applied Social Psychology*, 23, 1933-1967. <https://doi.org/10.1111/j.1559-1816.1993.tb01074.x>
- Briñol, P., Petty, R. E., Valle, C., Rucker, D. D., & Becerra, A. (2007). The effects of message recipients' power before and after persuasion: a self-validation analysis. *Journal of Personality and Social Psychology*, 93(6), 1040.
- Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.
- Brown-Iannuzzi, J. L., Dotsch, R., Cooley, E., & Payne, B. K. (2017). The relationship between mental representations of welfare recipients and attitudes toward welfare. *Psychological Science*, 28(1), 92-103. <https://doi.org/10.1177/0956797616674999>
- Brun, W., & Teigen, K. H. (1988). Verbal probabilities: Ambiguous, context-dependent, or both?. *Organizational Behavior and Human Decision Processes*, 41(3), 390-404.
- Budner, S. (1962). Intolerance of ambiguity as a personality variable. *Journal of Personality*, 30(1), 29-50.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?. *Perspectives on Psychological Science*, 6(1), 3-5.
- Bullock, J. G. (2011). Elite influence on public opinion in an informed electorate. *American Political Science Review*, 105, 496–515. <https://doi.org/10.1017/s0003055411000165>

- Burke, E. (1790). *Reflections on the Revolution in France and on the Proceedings in Certain Societies in London*, London: Printed for J. Dodsley.
- Burke, B. L., Kosloff, S., & Landau, M. J. (2013). Death goes to the polls: A meta-analysis of mortality salience effects on political attitudes. *Political Psychology*, *34*(2), 183-200.
<https://doi.org/10.1111/pops.12005>
- Cantoni, P., Hudson, R., Distel, H., & Laska, M. (1999). Changes in olfactory perception and dietary habits in the course of pregnancy: a questionnaire study. *Chemical Senses*, *24*(58), 111.
- Campbell, A., Converse, P. E., Miller, W. E., & Stokes, D. E. (1960). *The American Voter*. New York, NY: Wiley, 1960
- Caprara, G. V., Vecchione, M., Schwartz, S. H., Schoen, H., Bain, P. G., Silvester, J., ... & Baslevent, C. (2017). Basic values, ideological self-placement, and voting: A cross-cultural study. *Cross-Cultural Research*, *51*(4), 388-411.
- Carney, D. R., Jost, J. T., Gosling, S. D., Potter, J. (2008). The secret lives of liberals and conservatives: personality profiles, interaction styles, and the things they leave behind. *Political Psychology*, *29*, 807-840. <https://doi.org/10.1111/j.1467-9221.2008.00668.x>
- Carpenter, S. K., & Olson, K. M. (2012). Are pictures good for learning new vocabulary in a foreign language? Only if you think they are not. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *38*, 92–101.

- Carpenter, S. K., Wilford, M. M., Kornell, N., & Mullaney, K. M. (2013). Appearances can be deceiving: Instructor fluency increases perceptions of learning without increasing actual learning. *Psychonomic Bulletin & Review*, 20(6), 1350–1356.
- Ceaser, J. W., Busch, A. E., & Pitney Jr, J. J. (2017). *Defying the Odds: The 2016 Elections and American Politics*. Rowman & Littlefield.
- Chait, J. (2017, September 24). Donald Trump, White supremacy, and the discourse of panic. *New York Magazine*. Retrieved from <http://nymag.com>.
- Chirumbolo, A. (2002). The relationship between need for cognitive closure and political orientation: The mediating role of authoritarianism. *Personality and Individual Differences*, 32(4), 603-610. [https://doi.org/10.1016/s0191-8869\(01\)00062-9](https://doi.org/10.1016/s0191-8869(01)00062-9)
- Choma, B. L., Hanoch, Y., Gummerum, M., & Hodson, G. (2013). Relations between risk perceptions and socio-political ideology are domain-and ideology-dependent. *Personality and Individual Differences*, 54(1), 29-34.
- Choma, B. L., & Hodson, G. (2017). Right-wing ideology: Positive (and negative) relations to threat. *Social Cognition*, 35(4), 415-432. <https://doi.org/10.1521/soco.2017.35.4.415>
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591-621.
<https://doi.org/10.1146/annurev.psych.55.090902.142015>
- Cichočka, A., & Dhont, K. (2018). The personality bases of political ideology and behavior. In V. Zeigler-Hill, & T. K. Shackelford (Eds.), *SAGE handbook of personality and*

individual differences (pp. 323-351). London: SAGE.

<https://doi.org/10.4135/9781526451248.n14>

Clark, D. A. (1990). Verbal uncertainty expressions: A critical review of two decades of research. *Current Psychology*, 9(3), 203-235.

Cohn, L. D., & Becker, B. J. (2003). How meta-analysis increases statistical power. *Psychological Methods*, 8(3), 243.

Confessore, N. & Haberman, M. (2015). Hillary Clinton Lags in Engaging Grass-Roots Donors.

The New York Times. Retrieved from

<https://www.nytimes.com/2015/07/16/us/politics/hillary-clinton-lags-in-engaging-grass-roots-donors.html>

Converse, P. E. (2000). Assessing the capacity of mass electorates. *Annual Review of Political Science*, 3, 331–53.

Converse, P. E. (2006). Democratic theory and reality. *Critical Review*, 18, 297–329.

Cornelis, I., & Van Hiel, A. (2006). The impact of cognitive styles on authoritarianism based conservatism and racism. *Basic and Applied Social Psychology*, 28, 37–50.

https://doi.org/10.1207/s15324834basp2801_4

Crandall, C. S., Eshleman, A. & O'Brien, L. (2002). Social norms and the expression and suppression of prejudice: the struggle for internalization. *Journal of Personality and Social Psychology*, 82, 359. <https://doi.org/10.1037//0022-3514.82.3.359>

- Crandall, C. S., Miller, J. M., & White, M. H. (2018). Changing norms following the 2016 US presidential election: The Trump effect on prejudice. *Social Psychological and Personality Science*, 9(2), 186-192. <https://doi.org/10.1177/1948550617750735>
- Crawford, J. T. (2017). Are conservatives more sensitive to threat than liberals? It depends on how we define threat and conservatism. *Social Cognition*, 35(4), 354-373. <https://doi.org/10.1521/soco.2017.35.4.354>
- Crawford, J. T., Brandt, M. J., Inbar, Y., Chambers, J. R., & Motyl, M. (2017). Social and economic ideologies differentially predict prejudice across the political spectrum, but social issues are most divisive. *Journal of Personality and Social Psychology*, 112(3), 383. <https://doi.org/10.31234/osf.io/3g5pz>
- Critchley, H. D., & Garfinkel, S. N. (2017). Interoception and emotion. *Current Opinion in Psychology*, 17, 7-14. <https://doi.org/10.1016/j.copsyc.2017.04.020>
- Curtis, V., & Biran, A. (2001). Dirt, disgust, and disease: Is hygiene in our genes?. *Perspectives in Biology and Medicine*, 44(1), 17-17. <https://doi.org/10.1353/pbm.2001.0001>
- Davis, D. W., & Silver, B. D. (2004). Civil liberties vs. security: Public opinion in the context of the terrorist attacks on America. *American Journal of Political Science*, 48(1), 28-46. <https://doi.org/10.1111/j.0092-5853.2004.00054.x>
- De Vries, C. E. & Marks, G. (2012). The Struggle Over Dimensionality: A Note on Theory and Empirics. *European Union Politics*, 13(2), 185-93. <https://doi.org/10.1177/1465116511435712>

DellaPosta, D., Shi, Y., & Macy, M. (2015). Why do liberals drink lattes?. *American Journal of Sociology*, 120(5), 1473-1511. <https://doi.org/10.1086/681254>

Desjardins, L. (2017, August 22) How Trump talks about race. *PBS News Hour*. Retrieved from <https://www.pbs.org>.

Devos, T., & Banaji, M. R. (2005). American= white?. *Journal of Personality and Social Psychology*, 88(3), 447. <http://dx.doi.org/10.1037/0022-3514.88.3.447>

Deyoung, C. G., & Gray, J. R. (2009). Personality neuroscience: Explaining individual differences in affect, behaviour and cognition. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 323-346). New York, NY: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511596544.023>

Dhont, K., & Hodson, G. (2014). Does lower cognitive ability predict greater prejudice?. *Current Directions in Psychological Science*, 23, 454–459.
<https://doi.org/10.1177/0963721414549750>

Doty, R. M., Peterson, B. E., Winter, D. G. (1991). Threat and authoritarianism in the United States, 1978–1987. *Journal of Personality and Social Psychology*, 61(4), 629–640.
<https://doi.org/10.1037//0022-3514.61.4.629>

Dovidio, J. F., & Gaertner, S. L. (2004). Aversive racism. *Advances in Experimental Social Psychology*, 36, 4-56. [https://doi.org/10.1016/s0065-2601\(04\)36001-6](https://doi.org/10.1016/s0065-2601(04)36001-6)

Dovidio, J. F. and Gaertner, S. L. (2010). Intergroup Bias. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of Social Psychology* (pp. 1084-112). Hoboken, NJ: Wiley.
1.doi:10.1002/9780470561119.socpsy002029

- Duarte, J. L., Crawford, J. T., Stern, C., Haidt, J., Jussim, L., & Tetlock, P. E. (2015). Political diversity will improve social psychological science. *Behavioral and Brain Sciences*, *38*, e130. <https://doi.org/10.1017/s0140525x14000430>
- Duckitt, J. & Sibley, C. G. (2009). A dual-process motivational model of ideology, politics, and prejudice. *Psychological Inquiry*, *20*, 98–109.
<https://doi.org/10.1080/10478400903028540>
- Duckitt, J., Wagner, C., Du Plessis, I., & Birum, I. (2002). The psychological bases of ideology and prejudice: Testing a dual process model. *Journal of Personality and Social Psychology*, *83*(1), 75. <https://doi.org/10.1037//0022-3514.83.1.75>
- Duffy, V. B., Bartoshuk, L. M., Striegel-Moore, R., & Rodin, J. (1998). Taste Changes across Pregnancy. *Annals of the New York Academy of Sciences*, *855*(1), 805-809.
<https://doi.org/10.1111/j.1749-6632.1998.tb10663.x>
- Dunn, W. (1997). The impact of sensory processing abilities on the daily lives of young children and their families: A conceptual model. *Infants and Young Children*, *9*, 23-35.
<https://doi.org/10.1097/00001163-199704000-00005>
- Dunn, W. (2001). The sensations of everyday life: Empirical, theoretical, and pragmatic considerations. *American Journal of Occupational Therapy*, *55*(6), 608-620.
<https://doi.org/10.5014/ajot.55.6.608>
- Dunning, D. (2012). Confidence considered: Assessing the quality of decisions and performance. In *Social Metacognition*, 63-80.

- Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment: Implications for health, education, and the workplace. *Psychological Science in the Public Interest*, 5, 69–106.
- Duriez, B., Van Hiel, A., & Kossowska, M. (2005). Authoritarianism and social dominance in Western and Eastern Europe: The importance of the sociopolitical context and of political interest and involvement. *Political Psychology*, 26(2), 299-320.
[https://doi.org/10.1016/s0191-8869\(01\)00086-1](https://doi.org/10.1016/s0191-8869(01)00086-1)
- Eidelman, S., Crandall, C. S., Goodman, J. A., & Blanchard, J. C. (2012). Low-effort thought promotes political conservatism. *Personality and Social Psychology Bulletin*, 38, 808–820. <https://doi.org/10.1177/0146167212439213>
- Elad-Strenger, J., Proch, J., & Kessler, T. (2019). Is disgust a “conservative” emotion?. *Personality and Social Psychology Bulletin*, 0146167219880191.
- Epstein, R. J. (2014, May 2). Liberals eat here. Conservatives eat there. *The Wall Street Journal*. Retrieved from <https://blogs.wsj.com>.
- Erikson, R. S., & Tedin, K. L. (2003). *American Public Opinion*. New York, NY: Longman.
- Erikson, R. S., & Tedin, K. L. (2015). *American public opinion: Its origins, content and impact*. New York, NY: Routledge.
- Evans, G., Heath, A., & Lalljee, M. (1996). Measuring left-right and libertarian-conservative attitudes in the British electorate. *British Journal of Sociology*, 47(1), 93-112.
<https://doi.org/10.2307/591118>
- Everett, J. A. (2013). The 12 item social and economic conservatism scale (SECS). *PloS One*, 8(12), e82131. <https://doi.org/10.1371/journal.pone.0082131>

- Fanelli, D. (2010). "Positive" results increase down the hierarchy of the sciences. *PloS One*, 5(4), e10068. <https://doi.org/10.1371/journal.pone.0010068>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191.
- Fazio, R. H., Eiser, J. R., & Shook, N. J. (2004). Attitude formation through exploration: Valence asymmetries. *Journal of Personality and Social Psychology*, 87, 293–311. <https://doi.org/10.1037/0022-3514.87.3.293>
- Fazio, R. H. & Olson, M. A. (2003) Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, 54(1), 297-327. <https://doi.org/10.1146/annurev.psych.54.101601.145225>
- Fazio, R. H., Pietri, E. S., Rocklage, M. D., & Shook, N. J. (2015). Positive versus negative valence: Asymmetries in attitude formation and generalization as fundamental individual differences. In J. M. Olson & M. P. Zanna (Eds.), *Advances in experimental social psychology* (pp. 97-146). Academic Press. <https://doi.org/10.1016/bs.aesp.2014.09.002>
- Federal Bureau of Investigation. (2016). *Hate Crime Statistics 2016*. Retrieved from <https://ucr.fbi.gov/hate-crime/2016/topic-pages/incidentsandoffenses>.
- Federico, C. M. & Goren, P. (2009). Motivated social cognition and ideology: Is attention to elite discourse a prerequisite for epistemically motivated political affinities? In J. T. Jost, A. C. Kay, & H. Thorisdottir (Eds.), *Social and psychological bases of ideology and system justification* (pp. 267–91). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195320916.003.011>

- Federico, C. M., Fisher, E. L., & Deason, G. (2011). Political expertise and the link between the authoritarian predisposition and conservatism. *Public Opinion Quarterly* 75, 686–708.
<https://doi.org/10.1093/poq/nfr026>
- Federico, C. M., Johnston, C. D., & Lavine, H. G. (2014). Context, engagement, and the (multiple) functions of negativity bias. *Behavioral and Brain Sciences*, 37(3), 311-312.
<https://doi.org/10.1017/s0140525x13002550>
- Federico, C. M., & Schneider, M. C. (2007). Political expertise and the use of ideology: Moderating effects of evaluative motivation. *Public Opinion Quarterly*, 71(2), 221-252.
<https://doi.org/10.1093/poq/nfm010>
- Feldman, S. (2013) Political ideology. In L. Huddy, D. O. Sears, & J. S. Levy (Eds.), *Oxford Handbook of Political Psychology* (pp. 591–626). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199760107.001.0001>
- Feldman, S., & Johnston, C. (2014). Understanding the determinants of political ideology: Implications of structural complexity. *Political Psychology*, 35(3), 337-358.
<https://doi.org/10.1111/pops.12055>
- Fiagbenu, M. E., Proch, J., & Kessler, T. (2019). Of deadly beans and risky stocks: Political ideology and attitude formation via exploration depend on the nature of the attitude stimuli. *British Journal of Psychology*.
- Finn, B., & Tauber, S. K. (2015). When confidence is not a signal of knowing: How students' experiences and beliefs about processing fluency can lead to miscalibrated confidence. *Educational Psychology Review*, 27(4), 567-586.

- Fishbach, A., & Zhang, Y. (2008). Together or apart: When goals and temptations complement versus compete. *Journal of Personality and Social Psychology*, 94(4), 547.
- Fitzmaurice, G. M., Laird, N. M., & Ware, J. H. (2012). *Applied longitudinal analysis* (Vol. 998). John Wiley & Sons.
- Fraley, R. C., Griffin, B. N., Belsky, J., & Roisman, G. I. (2012). Developmental antecedents of political ideology: A longitudinal investigation from birth to age 18 years. *Psychological Science*, 23, 1425–1431. <https://doi.org/10.1177/0956797612440102>
- Frenkel-Brunswik, E. (1949). Intolerance of ambiguity as an emotional and perceptual personality variable. *Journal of personality*, 18(1), 108-143.
<https://doi.org/10.1111/j.1467-6494.1949.tb01236.x>
- Fuchs, D., & Klingemann, H. D. (1990). The left-right schema. In M. K. Jennings & J. W. Van Deth (Eds.), *Continuities in political action* (pp. 203–234). Berlin, Germany: deGruyter.
<https://doi.org/10.1515/9783110882193.203>
- Funk, C., Rainey, L., & Page, D. (2016). The politics of climate. *Pew Research Center*. Retrieved from: https://www.pewinternet.org/wp-content/uploads/sites/9/2016/10/PS_2016.10.04_Politics-of-Climate_FINAL.pdf
- Furnham, A., & Marks, J. (2013). Tolerance of ambiguity: A review of the recent literature. *Psychology*, 4(9), 717.
- Gabel, M. J. & Hix, S. (2002). Defining the EU political space: An empirical study of the European elections manifestos, 1979–1999. *Comparative Political Studies*, 35(8), 934–64. <https://doi.org/10.1177/001041402236309>

- Gambino, L. & Jacobs, B. (2015). 'Grassroots movement working': Bernie Sanders gains on the Clinton machine. *The Guardian*. Retrieved from <https://www.theguardian.com/us-news/2015/jul/03/bernie-sanders-grassroots-movement-gains-clinton-machine>
- Gerber, A. S., Huber, G. A., Doherty, D., Dowling, C. M., & Ha, S. E. (2010). Personality and political attitudes: Relationships across issue domains and political contexts. *American Political Science Review*, *104*(1), 111-133. <https://doi.org/10.1017/s0003055410000031>
- Gilbert, A. N., & Wysocki, C. J. (1991). Quantitative assessment of olfactory experience during pregnancy. *Psychosomatic medicine*, *53*(6), 693-700. <https://doi.org/10.1097/00006842-199111000-00009>
- Gillies, J., & Campbell, S. (1985). Conservatism and poetry preferences. *British Journal of Social Psychology*, *24*(3), 223-227
- Gilovich, T., Medvec, V. H., & Savitsky, K. (2000). The spotlight effect in social judgment: An egocentric bias in estimates of the salience of one's own actions and appearance. *Journal of Personality and Social Psychology*, *78*(2), 211.
- Goh, J. X., Hall, J. A., & Rosenthal, R. (2016). Mini meta-analysis of your own studies: Some arguments on why and a primer on how. *Social and Personality Psychology Compass*, *10*(10), 535-549.
- Golec, A. (2002). Need for cognitive closure and political conservatism: Studies on the nature of the relationship. *Polish Psychological Bulletin*, *33*(4), 5-12.
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, *96*(5), 1029.

Green, E. (2017, July 26). How much discrimination do Muslims face in America? The Atlantic.
Retrieved from <https://www.theatlantic.com>

Green, D.M., & Swets J.A. (1966). *Signal Detection Theory and Psychophysics*. New York, NY: Wiley.

Greenberg, J., & Jonas, E. (2003). Psychological motives and political orientation--the left, the right, and the rigid: comment on Jost et al. (2003). *Psychological Bulletin*, 129(3), 376-382.

Greenwald, A. G., McGhee, D. E. & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: the implicit association test. *Journal of Personality and Social Psychology*, 74, 1464-1480. <https://doi.org/10.1037//0022-3514.74.6.1464>

Guess, A., Nyhan, B., & Reifler, J. (2018). Selective exposure to misinformation: Evidence from the consumption of fake news during the 2016 US presidential campaign. *European Research Council*, 9.

Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences*, 16(5), 701-713. [https://doi.org/10.1016/0191-8869\(94\)90212-7](https://doi.org/10.1016/0191-8869(94)90212-7)

Hansen, R., & Glass, L. (1936). Über den Geruchssinn in der Schwangerschaft. *Journal of Molecular Medicine*, 15(25), 891-894. <https://doi.org/10.1007/bf01781122>

Hansson, R. O., Keating, J. P., & Terry, C. (1974). The effects of mandatory time limits in the voting booth on liberal conservative voting patterns. *Journal of Applied Social Psychology*, 4, 336-342. <https://doi.org/10.1111/j.1559-1816.1974.tb02813.x>

- Hatemi, P. K., Gillespie, N. A., Eaves, L. J., Maher, B. S., Webb, B. T., Heath, A. C., ... & Montgomery, G. W. (2011). A genome-wide analysis of liberal and conservative political attitudes. *The Journal of Politics*, *73*(1), 271-285.
<https://doi.org/10.1017/s0022381610001015>
- Hatemi, P. K., Medland, S. E., Klemmensen, R., Oskarsson, S., Littvay, L., Dawes, C. T., ... & Christensen, K. (2014). Genetic influences on political ideologies: Twin analyses of 19 measures of political ideologies from five democracies and genome-wide findings from three populations. *Behavior Genetics*, *44*(3), 282-294. <https://doi.org/10.1007/s10519-014-9648-8>
- Hautus, M. (2015). Signal detection theory. *International Encyclopedia of the Social and Behavioral Sciences*. 946-951. <https://doi.org/10.1016/b978-0-08-097086-8.43090-4>
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- Hayes, J. E., & Keast, R. S. (2011). Two decades of supertasting: where do we stand?. *Physiology & Behavior*, *104*(5), 1072-1074.
<https://doi.org/10.1016/j.physbeh.2011.08.003>
- Hedges, L. V., & Vevea, J. L. (1998). Fixed-and random-effects models in meta-analysis. *Psychological Methods*, *3*, 486-504. <https://doi.org/10.1037//1082-989x.3.4.486>
- Henry, P. J., & Sears, D. O. (2002). The symbolic racism 2000 scale. *Political Psychology*, *23*, 253-283. <https://doi.org/10.1111/0162-895x.00281>

- Henssge, E. (1930). Steigerung der Geruchsempfindlichkeit in der Schwangerschaft. *Psychol. Med*, 4, 206-207.
- Herz, R. S. (2011). PROP taste sensitivity is related to visceral but not moral disgust. *Chemosensory Perception*, 4(3), 72. <https://doi.org/10.1007/s12078-011-9089-1>
- Herz, R. S. (2014). Verbal priming and taste sensitivity make moral transgressions gross. *Behavioral Neuroscience*, 128(1), 20.
- Hertzog, C., Dunlosky, J., Robinson, A. E., & Kidder, D. P. (2003). Encoding fluency is a cue used for judgments about learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 29(1), 22.
- Hibbing, J., Smith, K., & Alford, J. (2014). Differences in negativity bias underlie variations in political ideology. *Behavioral and Brain Sciences*, 37(3), 297-307.
doi:10.1017/S0140525X13001192
- Hodson, G., & Dhont, K. (2015). The person-based nature of prejudice: Individual difference predictors of intergroup negativity. *European Review of Social Psychology*, 26(1), 1-42.
<https://doi.org/10.1080/10463283.2015.1070018>
- Hogg, M. A., & Reid, S. A. (2006). Social identity, self-categorization, and the communication of group norms. *Communication Theory*, 16, 7-30. <https://doi.org/10.1111/j.1468-2885.2006.00003.x>
- Hook, E. B. (1978). Dietary cravings and aversions during pregnancy. *The American Journal of Clinical Nutrition*, 31(8), 1355-1362. <https://doi.org/10.1093/ajcn/31.8.1355>

- Huber, J., & Inglehart, R. (1995). Expert Interpretations of Party Space and Party Locations in 42 Societies. *Party Politics*, 1(1), 73–111. <https://doi.org/10.1177/1354068895001001004>
- Huddy, L. (2001). From social to political identity: A critical examination of social identity theory. *Political Psychology*, 22(1), 127-156.
- Huddy, L. (2015). Group identity and political cohesion. *Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource*, 1-14.
- Hunt, A. R. (2018, October 29). No, Republicans, not everyone incites violence. *Bloomberg News*. Retrieved from <https://www.bnnbloomberg.ca>
- Imhoff, R., & Recker, J. (2012). Differentiating Islamophobia: Introducing a new scale to measure Islamoprejudice and secular Islam critique. *Political Psychology*, 33, 811-824. <https://doi.org/10.1111/j.1467-9221.2012.00911.x>
- Inbar, Y., Pizarro, D. A., & Bloom, P. (2009). Conservatives are more easily disgusted than liberals. *Cognition and Emotion*, 23(4), 714-725. <https://doi.org/10.1080/02699930802110007>
- Iyengar, S., & Westwood, S. J. (2015). Fear and loathing across party lines: New evidence on group polarization. *American Journal of Political Science*, 59(3), 690-707. <https://doi.org/10.1111/ajps.12152>
- Jacobs, D., & Carmichael, J. T. (2002). Subordination and violence against state control agents: Testing political explanations for lethal assaults against the police. *Social Forces*, 80(4), 1223-1251. <https://doi.org/10.1353/sof.2002.0027>

- Jacoby, W. G. (1991). Ideological identification and issue attitudes. *American Journal of Political Science*, 35(1), 178-205.
- Jennings, M. K. (1992). Ideological thinking among mass publics and political elites. *Public Opinion Quarterly*, 56(4), 419–441. <https://doi.org/10.1086/269335>
- Johnson, M. K., Rowatt, W. C., & LaBouff, J. P. (2012). Religiosity and prejudice revisited: In-group favoritism, out-group derogation, or both?. *Psychology of Religion and Spirituality*, 4(2), 154-168. <https://doi.org/10.1037/a0025107>
- Jost, J. T. (2006). The end of the end of ideology. *American psychologist*, 61(7), 651.
- Jost, J. T., & Amodio, D. M. (2012). Political ideology as motivated social cognition: Behavioral and neuroscientific evidence. *Motivation and Emotion*, 36(1), 55-64.
- Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, 60, 307-337. <https://doi.org/10.1146/annurev.psych.60.110707.163600>
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003a). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129(3), 339-375. <https://doi.org/10.1037/0033-2909.129.3.339>
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003b). Exceptions that prove the rule--Using a theory of motivated social cognition to account for ideological incongruities and political anomalies: Reply to Greenberg and Jonas (2003). *Psychological Bulletin*, 129(3), 383-393. <http://dx.doi.org/10.1037/0033-2909.129.3.383>

- Jost, J. T., & Krochik, M. (2014). Ideological differences in epistemic motivation: Implications for attitude structure, depth of information processing, susceptibility to persuasion, and stereotyping. In *Advances in Motivation Science* (Vol. 1, pp. 181-231). Elsevier.
- Jost, J. T., Stern, C., Rule, N. O., & Sterling, J. (2017). The politics of fear: Is there an ideological asymmetry in existential motivation?. *Social Cognition*, 35(4), 324-353.
<https://doi.org/10.1521/soco.2017.35.4.324>
- Jost, J. T., Sterling, J., & Stern, C. (2018). Getting closure on conservatism, or the politics of epistemic and existential motivation. In C. Kopetz & A. Fishbach (Eds.). *The Motivation-Cognition Interface, From the Lab to the Real World: A Festschrift in Honor of Arie W. Kruglanski*. (Volume I, pp. 56- 87). New York: Routledge.
<https://doi.org/10.4324/9781315171388-4>
- Judd, C. M., Westfall, J., & Kenny, D. A. (2017). Experiments with more than one random factor: Designs, analytic models, and statistical power. *Annual Review of Psychology*, 68, 601-625.
- Kauer, J., Pelchat, M. L., Rozin, P., & Zickgraf, H. F. (2015). Adult picky eating. Phenomenology, taste sensitivity, and psychological correlates. *Appetite*, 90, 219-228.
<https://doi.org/10.1016/j.appet.2015.03.001>
- Kemmelmeier, M. (1997). Need for closure and political orientation among German university students. *The Journal of Social Psychology*, 137(6), 787-789.
<https://doi.org/10.1080/00224549709595501>

- Knight, K. (1999). Liberalism and conservatism. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of social psychological attitudes, Vol. 2. Measures of political attitudes* (pp. 59-158). San Diego, CA, US: Academic Press.
- Knoll, B. R., O'Daniel, T. J., & Cusato, B. (2015). Physiological responses and political behavior: Three reproductions using a novel dataset. *Research & Politics*, 2(4), 1-6.
<https://doi.org/10.1177/2053168015621328>
- Konstantopoulos, S. (2011). Fixed effects and variance components estimation in three-level meta-analysis. *Research Synthesis Methods*, 2, 61-76. <https://doi.org/10.1002/jrsm.35>
- Koriat, A. (2008). Subjective confidence in one's answers: The consensuality principle. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 34, 945 – 59 .
- Koriat, A. (2012). The self-consistency model of subjective confidence. *Psychological Review*, 119 (1), 80 – 113 .
- Koriat, A., & Ackerman, R. (2010). Choice latency as a cue for children's subjective confidence in the correctness of their answers. *Developmental Science*, 13(3), 441-453.
- Kossowska, M., & Hiel, A. V. (2003). The relationship between need for closure and conservative beliefs in Western and Eastern Europe. *Political Psychology*, 24(3), 501-518.
- Krochik, M., Jost, J. T., & Nosek, B. A. (2007). Ideology informs structure: social and motivational influences on the attitudinal strength of liberals and conservatives. Paper presented at the annual meeting of the International Society of Political Psychology (June 2007). Portland: Oregon.

- Kruglanski, A. W. (1980). Lay epistemo-logic—process and contents: Another look at attribution theory. *Psychological Review*, *87*(1), 70.
- Kruglanski, A. W., Pierro, A., Mannetti, L., & De Grada, E. (2006). Groups as epistemic providers: need for closure and the unfolding of group-centrism. *Psychological Review*, *113*(1), 84.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in Experimental Social Psychology*, *34*, 331-378.
- Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: “Seizing” and “freezing”. *Psychological Review*, *103*(2), 263.
- Kteily, N., Bruneau, E., Waytz, A., & Cotterill, S. (2015). The ascent of man: Theoretical and empirical evidence for blatant dehumanization. *Journal of Personality and Social Psychology*, *109*, 901-931. <https://doi.org/10.1037/pspp0000048>
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological bulletin*, *108*(3), 480.
- Kuttner, R. (2017, August 16). Steve Bannon, unrepentant. *The American Prospect*. Retrieved from <https://prospect.org>
- Lacazette, E., Pitiot, G., Jobert, S., Mallet, J., & Gachon, A. M. F. (1997). Fine genetic mapping of LCN1/D9S1826 within 9q34. *Annals of Human Genetics*, *61*(5), 449-455.
<https://doi.org/10.1046/j.1469-1809.1997.6150449.x>

- Lakens, D., & Etz, A. J. (2017). Too true to be bad: When sets of studies with significant and nonsignificant findings are probably true. *Social Psychological and Personality Science*, 8(8), 875-881. <https://doi.org/10.1177/1948550617693058>
- Lauriola, M., Foschi, R., & Marchegiani, L. (2015). Integrating values and cognitive style in a model of right-wing radicalism. *Personality and Individual Differences*, 75, 147-153.
- Layman, G. C., & Carsey, T. M. (2002). Party polarization and "conflict extension" in the American electorate. *American Journal of Political Science*, 786-802.
- Leonhardt, D. (2018). Trump's Big, Beautiful List of Scandals. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/12/26/opinion/trump-russia-2018.html>
- Leonhardt, D., & Philbrick, I. P. (2018, January 15). Donald Trump's racism: The definitive list. *The New York Times*. Retrieved from <https://www.nytimes.com>
- Levendusky, M. (2009). *The Partisan Sort: How Liberals Became Democrats and Conservatives Became Republicans*. Chicago, IL: University of Chicago Press.
<https://doi.org/10.7208/chicago/9780226473673.001.0001>
- Lichtenstein, S., Fischhoff, B., & Phillips, L. D. (1982). Calibration of probabilities: The state of the art to 1980. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under Uncertainty: Heuristics and Biases*. Cambridge, UK: Cambridge University Press.
- Lilienfeld, S. (2015). Lack of political diversity and the framing of findings in personality and clinical psychology. *Behavioral and Brain Sciences*, 38, E149.
<https://doi.org/10.1017/s0140525x14001253>

- Lilienfeld, S. O., & Latzman, R. D. (2014). Threat bias, not negativity bias, underpins differences in political ideology. *Behavioral and Brain Sciences*, 37(3), 318-319.
<https://doi.org/10.1017/s0140525x1300263x>
- Litman, L., Robinson, J. & Abberbock, T. (2017). TurkPrime.com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavioral Research Methods*, 49(2), 433-442. <https://doi.org/10.3758/s13428-016-0727-z>
- Locander, W. B., & Hermann, P. W. (1979). The effect of self-confidence and anxiety on information seeking in consumer risk reduction. *Journal of Marketing Research*, 16(2), 268-274.
- Ludwick-Rosenthal, R., & Neufeld, R. W. (1985). Heart beat interoception: a study of individual differences. *International Journal of Psychophysiology*, 3(1), 57-65.
[https://doi.org/10.1016/0167-8760\(85\)90020-0](https://doi.org/10.1016/0167-8760(85)90020-0)
- Lukes, S. (2003). Epilogue: The grand dichotomy of the twentieth century. In T. Ball & R. Bellamy (Eds.), *The Cambridge History of Twentieth-Century Political Thought* (pp. 602-626), Cambridge: Cambridge University Press.
<https://doi.org/10.1017/chol9780521563543.030>
- Luvara, A., & Maurizi, M. (1961). Ricerche di olfattometria in gravidanza. *Bollettino delle Malattie dell'Orecchio, della Gola, del Naso*, 79, 367-375.
- Malka, A., & Lelkes Y. (2010). More than Ideology: Conservative-Liberal Identity and Receptivity to Political Cues. *Social Justice Research*, 23(2), 156-88.
<https://doi.org/10.1007/s11211-010-0114-3>

- Malka, A., Lelkes, Y., & Soto, C. J. (2019). Are cultural and economic conservatism positively correlated? A large-scale cross-national test. *British Journal of Political Science*, 49(3), 1045-1069.
- Malka, A., & Soto, C. J. (2015). Rigidity of the economic right? Menu-independent and menu-dependent influences of psychological dispositions on political attitudes. *Current Directions in Psychological Science*, 24, 137–142.
<https://doi.org/10.1177/0963721414556340>
- Marcus, G. E., Sullivan, J. L., Theiss-Morse, E., & Wood, S. L. (1995). *With malice toward some: How people make civil liberties judgments*. New York: Cambridge University Press. <https://doi.org/10.1017/cbo9781139174046>
- Mayr, E. (1960). The emergence of evolutionary novelties. *Evolution after Darwin*, 1, 349-380.
- McCann, S. J. (2008). Societal threat, authoritarianism, conservatism, and US state death penalty sentencing (1977-2004). *Journal of Personality and Social Psychology*, 94(5), 913.
- McCarty, N., Poole, K. T., & Rosenthal, H. (2006). *Polarized America*. Cambridge, MA: MIT Press.
- McClosky, H., & Zaller, J. (1984). *The American Ethos*. Cambridge, MA: Harvard University Press
- McCoy, J., Rahman, T., & Somer, M. (2018). Polarization and the global crisis of democracy: Common patterns, dynamics, and pernicious consequences for democratic politics. *American Behavioral Scientist*, 62(1), 16-42. <https://doi.org/10.1177/0002764218759576>

- McShane, B. B., & Böckenholt, U. (2017). Single-paper meta-analysis: Benefits for study summary, theory testing, and replicability. *Journal of Consumer Research*, 43, 1048-1063. <https://doi.org/10.1093/jcr/ucw085>
- Mendelberg, T. (2001). *The race card: Campaign strategy, implicit messages, and the norm of equality*. Princeton, NJ: Princeton University Press.
<https://doi.org/10.1515/9781400889181>
- Mettee, D. R., & Smith, G. (1977). Social comparison and interpersonal attraction: The case for dissimilarity. In J. M. Suls & R. L. Miller (Eds.), *Social comparison processes: Theoretical and empirical perspectives* (pp. 69-101). Washington, DC: Hemisphere.
- Mikol, B. (1960). The enjoyment of new musical systems. *The open and closed mind*. New York: Basic Books, 270-284. (in Rokeach editors)
- Miller Jr, I. J. (1986). Variation in human fungiform taste bud densities among regions and subjects. *The Anatomical Record*, 216(4), 474-482.
<https://doi.org/10.1002/ar.1092160404>
- Miller, L. J., Anzalone, M. E., Lane, S. J., Cermak, S. A., & Osten, E. T. (2007). Concept evolution in sensory integration: A proposed nosology for diagnosis. *American Journal of Occupational Therapy*, 61(2), 135-140.
- Millon, T. (1957). Authoritarianism, intolerance of ambiguity, and rigidity under ego-and task-involving conditions. *The Journal of Abnormal and Social Psychology*, 55(1), 29.

- Mills, J., Meltzer, R., & Clark, M. (1977). Effect of number of options on recall of information supporting different decision strategies. *Personality and Social Psychology Bulletin*, 3(2), 213-218.
- Mojet, J., Christ-Hazelhof, E., & Heidema, J. (2001). Taste perception with age: generic or specific losses in threshold sensitivity to the five basic tastes?. *Chemical Senses*, 26(7), 845-860. <https://doi.org/10.1093/chemse/26.7.845>
- Moore, D. A., & Healy, P. J. (2008). The trouble with overconfidence. *Psychological Review*, 115, 502–517.
- Mutz, D. C. (2018). Status threat, not economic hardship, explains the 2016 presidential vote. *Proceedings of the National Academy of Sciences*, 115(19), E4330-E4339.
<https://doi.org/10.1073/pnas.1718155115>
- Nail, P. R., & McGregor, I. (2009). Conservative shift among liberals and conservatives following 9/11/01. *Social Justice Research*, 22(2-3), 231-240.
<https://doi.org/10.1007/s11211-009-0098-z>
- Nail, P. R., McGregor, I., Drinkwater, A. E., Steele, G. M., & Thompson, A. W. (2009). Threat causes liberals to think like conservatives. *Journal of Experimental Social Psychology*, 45(4), 901-907. <https://doi.org/10.1016/j.jesp.2009.04.013>
- Nardin, T. (2015) Rationality in politics and its limits. *Global Discourse: An Interdisciplinary Journal of Current Affairs*, 5(2), 177-190.
<https://doi.org/10.1080/23269995.2015.1018693>

Nash, C. (2017, June 26). CAIR Releases App for Reporting ‘Hate Crimes’, ‘Bias Incidents’.

Breitbart. Retrieved from <https://www.breitbart.com>

Nordin, S., Broman, D. A., Olofsson, J. K., & Wulff, M. (2004). A longitudinal descriptive study of self-reported abnormal smell and taste perception in pregnant women. *Chemical Senses*, 29(5), 391-402. <https://doi.org/10.1093/chemse/bjh040>

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The Implicit Association Test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Social Psychology and the Unconscious: The Automaticity of Higher Mental Processes* (pp. 265-292). New York, NY: Psychology Press. <https://doi.org/10.4324/9780203783016>

Nosek, B. A., & Hansen, J. J. (2008). The associations in our heads belong to us: Searching for attitudes and knowledge in implicit evaluation. *Cognition and Emotion*, 22, 553-594. <https://doi.org/10.1080/02699930701438186>

O’Brien, K., Forrest, W., Lynott, D., & Daly, M. (2013). Racism, gun ownership and gun control: Biased attitudes in US whites may influence policy decisions. *PloS one*, 8(10), e77552. <https://doi.org/10.1371/journal.pone.0077552>

O’Reilly, A. (2017, August 15). Hate crimes in US on the rise. *Fox News*. Retrieved from <https://www.foxnews.com>

Okimoto, T. G., & Gromet, D. M. (2016). Differences in sensitivity to deviance partly explain ideological divides in social policy support. *Journal of Personality and Social Psychology*, 111(1), 98.

- Olatunji, B. O., Williams, N. L., Tolin, D. F., Abramowitz, J. S., Sawchuk, C. N., Lohr, J. M., & Elwood, L. S. (2007). The Disgust Scale: item analysis, factor structure, and suggestions for refinement. *Psychological Assessment, 19*(3), 281. <https://doi.org/10.1037/1040-3590.19.3.281>
- Olivola, C. Y., & Sussman, A. B. (2014). Many behavioral tendencies associated with right-leaning (conservative) political ideologies are malleable and unrelated to negativity. *Behavioral and Brain Sciences, 37*(3), 323-324. <https://doi.org/10.1017/s0140525x13002689>
- Onraet, E., Van Hiel, A., Dhont, K., & Pattyn, S. (2013). Internal and external threat in relationship with right-wing attitudes. *Journal of Personality, 81*(3), 233-248. <https://doi.org/10.1111/jopy.12011>
- Olson, M. A., & Fazio, R. H. (2004). Reducing the Influence of Extrapersonal Associations on the Implicit Association Test: Personalizing the IAT. *Journal of Personality and Social Psychology, 86*, 653-667. <https://doi.org/10.1037/0022-3514.86.5.653>
- Ortoleva, P., & Snowberg, E. (2015). Overconfidence in political behavior. *American Economic Review, 105*(2), 504-35.
- Oxley, D. R., Smith, K. B., Alford, J. R., Hibbing, M. V., Miller, J. L., Scalora, M., ... & Hibbing, J. R. (2008). Political attitudes vary with physiological traits. *Science, 321*(5896), 1667-1670. <https://doi.org/10.1126/science.1157627>
- Paolacci, G. & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science, 23*, 184. <https://doi.org/10.1177/0963721414531598>

- Payne, B. K., Vuletich, H. A. & Lundberg, K. B. (2017). The Bias of Crowds: How Implicit Bias Bridges Personal and Systemic Prejudice. *Psychological Inquiry*, 28, 233-248.
<https://doi.org/10.1080/1047840x.2017.1335568>
- Peirce, C. S., & Jastrow, J. (1884). On small differences in sensation. *Memoirs of the National Academy of Sciences*, 3, 73-83.
- Pennycook, G., & Rand, D. G. (2018). Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition*.
- Peterson, D. K., & Pitz, G. F. (1988) Confidence, uncertainty, and the use of information. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14, 85-92.
- Pew Research Center (2014). *Political Polarization in the American Public*. Retrieved from <https://www.people-press.org/2014/06/12/political-polarization-in-the-american-public/>
- Pew Research Center (2016). *Partisanship and political animosity in 2016*. Retrieved from <http://www.people-press.org/2016/06/22/1-feelings-about-partisans-and-the-parties/>
- Pew Research Center (2017a). *Political Typology Reveals Deep Fissures on the Right and Left*. Retrieved from <https://www.people-press.org/2017/10/24/political-typology-reveals-deep-fissures-on-the-right-and-left/>
- Pew Research Center (2017b). *U.S. Muslims concerned about their place in society, but continue to believe in the American dream*. Retrieved from <https://www.pewforum.org/2017/07/26/findings-from-pew-research-centers-2017-survey-of-us-muslims/>

- Pew Research Center (2017c). *The Partisan Divide on Political Values Grows Even Wider*. Retrieved from <http://www.people-press.org/2017/10/05/the-partisan-divide-on-political-values-grows-even-wider/>
- Pew Research Center (2017d), *Most Americans Say Trump's Election Has Led to Worse Race Relations in the U.S.* Retrieved from <https://www.people-press.org/2017/12/19/most-americans-say-trumps-election-has-led-to-worse-race-relations-in-the-u-s/>
- Pew Research Center (2018a). *Voters more focused on control of Congress – and the president – than in past midterms*. Retrieved from <https://www.people-press.org/2018/06/20/voters-more-focused-on-control-of-congress-and-the-president-than-in-past-midterms/>
- Pew Research Center (2018b). Trump's approval ratings so far are unusually stable – and deeply partisan. <https://www.pewresearch.org/fact-tank/2018/08/01/trumps-approval-ratings-so-far-are-unusually-stable-and-deeply-partisan/>
- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology*, 75, 811. <https://doi.org/10.1037//0022-3514.75.3.811>
- Pollard, M. & Mendolsohn, J. (2016). RAND kicks off 2016 presidential election panel. *RAND Corporation*. Retrieved from <https://www.rand.org/blog/2016/01/rand-kicks-off-2016-presidential-election-panel-survey.html>
- Poole, K. T., Rosenthal, H. (1997). *Congress: A Political-Economic History of Roll-Call Voting*. New York, NY: Oxford University Press

- Profet, M. (1992). Pregnancy sickness as adaptation: a deterrent to maternal ingestion of teratogens. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (pp. 327–365). New York, NY: Oxford University Press. <https://doi.org/10.1017/s0730938400018700>
- Proulx, T., & Brandt, M. J. (2017). Beyond threat and uncertainty: The underpinnings of conservatism. *Social Cognition, 35*(4), 313-323.
<https://doi.org/10.1521/soco.2017.35.4.313>
- Rajab, A., Kelberman, D., de Castro, S. C., Biebermann, H., Shaikh, H., Pearce, K., ... & Krude, H. (2008). Novel mutations in LHX3 are associated with hypopituitarism and sensorineural hearing loss. *Human Molecular Genetics, 17*(14), 2150-2159.
<https://doi.org/10.1093/hmg/ddn114>
- Rathbun, B. C. (2007). Hierarchy and community at home and abroad: evidence of a common structure of domestic and foreign policy beliefs in American elites. *Journal of Conflict Resolution, 51*(3), 379-407. <https://doi.org/10.1177/0022002707300842>
- Reiljan, A. (2019). ‘Fear and loathing across party lines’(also) in Europe: Affective polarisation in European party systems. *European Journal of Political Research*.
<https://doi.org/10.1111/1475-6765.12351>
- Rhodes, M. G., & Castel, A. D. (2008). Memory predictions are influenced by perceptual information: Evidence for metacognitive illusions. *Journal of Experimental Psychology: General, 137*(4), 615–625.
- Rhodes, M. G., & Castel, A. D. (2009). Metacognitive illusions for auditory information: Effects on monitoring and control. *Psychonomic Bulletin & Review, 16*(3), 550-554.

- Riker, W. H. (1995). The political psychology of rational choice theory. *Political Psychology*, 16(1), 23-44. <https://doi.org/10.2307/3791448>
- Ritter, Z., & Tsabutashvili, D. (2017, August 10). Hispanics' emotional well-being during the Trump era. *Gallup*. Retrieved from <https://news.gallup.com>
- Robinson, M. D., Johnson, J. T., & Herndon, F. (1997). Reaction time and assessments of cognitive effort as predictors of eyewitness memory accuracy and confidence. *Journal of Applied Psychology*, 82(3), 416.
- Roccatò, M., & Ricolfi, L. (2005). On the correlation between right-wing authoritarianism and social dominance orientation. *Basic and Applied Social Psychology*, 27(3), 187-200. https://doi.org/10.1207/s15324834basp2703_1
- Rock, M. S., & Janoff-Bulman, R. (2010). Where do we draw our lines? Politics, rigidity, and the role of self-regulation. *Social Psychological and Personality Science*, 1, 26–33. <https://doi.org/10.1177/1948550609347386>
- Roets, A., & Van Hiel, A. (2007). Separating ability from need: Clarifying the dimensional structure of the need for closure scale. *Personality and Social Psychology Bulletin*, 33(2), 266-280.
- Rokeach, M. (1960). *The Open and Closed Mind*. Oxford, UK: Basic Books
- Rolls, E. T., & Scott, T. R. (2003). Central taste anatomy and neurophysiology. In R. L. Doty (Ed.), *Handbook of olfaction and gustation* (pp. 1189-1233). CRC Press. <https://doi.org/10.1201/9780203911457.ch33>

- Rosas, J. C., & Ferreira, A. R. (2014). Left and Right: Critical Junctures. In Rosas, J. C., & Ferreira, A. R. (Eds.), *Left and right: the great dichotomy revisited* (pp. 2-21). Newcastle upon Tyne, UK: Cambridge Scholars Publishing.
- Rozin, P., Haidt, J., & McCauley, C. R. (2008). Disgust. In M. Lewis, J. M. Haviland-Jones & L. F. Barrett (Eds.), *Handbook of emotions, 3rd ed.* (pp. 757-776). The Guilford Press.
- Ruch, W., & Hehl, F. J. (1986). Conservatism as a predictor of responses to humour: A comparison of four scales. *Personality and Individual Differences, 7*(1), 1–14.
[https://doi.org/10.1016/0191-8869\(86\)90102-9](https://doi.org/10.1016/0191-8869(86)90102-9)
- Sah, S., Moore, D. A., & MacCoun, R. J. (2013). Cheap talk and credibility: The consequences of confidence and accuracy on advisor credibility and persuasiveness. *Organizational Behavior and Human Decision Processes, 121*(2), 246-255.
- Saucier, G. (2000). Isms and the structure of social attitudes. *Journal of Personality and Social Psychology, 78*(2), 366. <http://dx.doi.org/10.1037/0022-3514.78.2.366>
- Sawyer, J. & Gampa, A. (2018). Implicit and Explicit Racial Attitudes Changed During Black Lives Matter. *Personality and Social Psychology Bulletin.*
<https://doi.org/10.31234/osf.io/29j7y>
- Schaffner, B. F., MacWilliams, M., & Nteta, T. (2016). Explaining white polarization in the 2016 vote for president: The sobering role of racism and sexism. In Conference on the US Elections of (pp. 8-9).

- Schaffner, B. F., Macwilliams, M. & Nteta, T. (2018). Understanding White polarization in the 2016 vote for president: The sobering role of racism and sexism. *Political Science Quarterly*, 133, 9-34. <https://doi.org/10.1002/polq.12737>
- Schaller, M. (2011). The behavioural immune system and the psychology of human sociality. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 366(1583), 3418-3426. <https://doi.org/10.1098/rstb.2011.0029>
- Schaller, M., & Murray, D. R. (2008). Pathogens, personality, and culture: Disease prevalence predicts worldwide variability in sociosexuality, extraversion, and openness to experience. *Journal of Personality and Social Psychology*, 95(1), 212. <https://doi.org/10.1037/0022-3514.95.1.212>
- Schmidt, K., & Axt, J. R. (2016). Implicit and explicit attitudes toward African Americans and Barack Obama did not substantively change during Obama's presidency. *Social Cognition*, 34, 559-588. <https://doi.org/10.1521/soco.2016.34.6.559>
- Schmidt, K., & Nosek, B. A. (2010). Implicit (and explicit) racial attitudes barely changed during Barack Obama's presidential campaign and early presidency. *Journal of Experimental Social Psychology*, 46, 308-314. <https://doi.org/10.1016/j.jesp.2009.12.003>
- Schneider, J. F. (1985). Authoritarian-Conservatism and Pleasantness of Visual Patterns: What Determines Aesthetic Preferences?. *The High School Journal*, 68(4), 389-395.
- Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality*, 47, 609–612.

- Schuman, H., Steeh, C., Bobo, L. D., & Kysan M. (1997). *Racial Attitudes in America: Trends and Interpretations*. Cambridge, MA: Harvard University Press.
- Schwarz, N. (2004). Metacognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology, 14*(4), 332-348.
- Schwartz, S. H., Caprara, G. V., & Vecchione, M. (2010). Basic personal values, core political values, and voting: A longitudinal analysis. *Political psychology, 31*(3), 421-452.
- Sechrist, G. B., Stangor, C., & Killen, M. (2005). Prejudice as social norms. In C. S. Crandall & M. Schaller (Eds.), *Social psychology of prejudice: Historical and contemporary issues* (pp. 163-183). Lawrence, KS: Lewinian.
- Serra, M. J., & Dunlosky, J. (2010). Metacomprehension judgements reflect the belief that diagrams improve learning from text. *Memory, 18*(7), 698–711.
- Shahbake, M., Hutchinson, I., Laing, D. G., & Jinks, A. L. (2005). Rapid quantitative assessment of fungiform papillae density in the human tongue. *Brain Research, 1052*(2), 196-201.
<https://doi.org/10.1016/j.brainres.2005.06.031>
- Shephard, A. (2019). Why Are Democrats Freaking Out About “Electability”? New Republic. Retrieved from: <https://newrepublic.com/article/152949/democrats-freaking-out-electability>
- Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*(3), 248-279.

- Sidanius, J., & Duffy, G. (1988). The duality of attitude structure: A test of Kerlinger's critical referents theory within samples of Swedish and American youth. *Political Psychology*, 9, 649–70. <https://doi.org/10.2307/3791532>
- Sidanius, J., Pratto, F., & Bobo, L. (1996). Racism, conservatism, affirmative action, and intellectual sophistication: A matter of principled conservatism or group dominance? *Journal of Personality and Social Psychology*, 70, 476–490.
<https://doi.org/10.1037//0022-3514.70.3.476>
- Sherif, M., & Sherif, C. W. (1964). *Reference groups*. New York, NY: Harper & Row.
- Skitka, L. J. (1999). Ideological and attributional boundaries on public compassion: Reactions to individuals and communities affected by a natural disaster. *Personality and Social Psychology Bulletin*, 25, 793-808. <https://doi.org/10.1177/0146167299025007003>
- Skitka, L. J. (2010). The psychology of moral conviction. *Social and Personality Psychology Compass*, 4(4), 267-281.
- Skitka, L. J., Bauman, C. W., & Sargis, E. G. (2005). Moral conviction: Another contributor to attitude strength or something more? *Journal of Personality and Social Psychology*, 88, 895–917.
- Skitka, L. J., Mullen, E., Griffin, T., Hutchinson, S., & Chamberlin, B. (2002). Dispositions, scripts, or motivated correction? Understanding ideological differences in explanations for social problems. *Journal of Personality and Social Psychology*, 83, 470–487.
<https://doi.org/10.1037//0022-3514.83.2.470>

- Skitka, L. J., & Tetlock, P. E. (1993a). Providing public assistance: Cognitive and motivational processes underlying liberal and conservative policy preferences. *Journal of Personality and Social Psychology*, 65(6), 1205. <https://doi.org/10.1037/0022-3514.65.6.1205>
- Skitka, L. J., & Tetlock, P. E. (1993b). Of ants and grasshoppers: The political psychology of allocating public assistance. In B. Mellers & J. Baron (Eds.), *Psychological perspectives in justice* (pp. 205–233). New York, NY: Cambridge University Press.
<https://doi.org/10.1017/cbo9780511552069.011>
- Sorokowski, P., Karwowski, M., Misiak, M., Marczak, M. K., Dziekan, M., Hummel, T., & Sorokowska, A. (2019). Sex differences in human olfaction: a meta-analysis. *Frontiers in Psychology*, 10, 242. <https://doi.org/10.3389/fpsyg.2019.00242>
- Sporer, S. L. (1993). Eyewitness identification accuracy, confidence, and decision times in simultaneous and sequential lineups. *Journal of Applied Psychology*, 78(1), 22.
- Sterling, J., Jost, J. T., & Pennycook, G. (2016). Are neoliberals more susceptible to bullshit?. *Judgment & Decision Making*, 11(4), 352-360.
- Stern, C., & Rule, N. O. (2018). Physical androgyny and categorization difficulty shape political conservatives' attitudes toward transgender people. *Social Psychological and Personality Science*, 9(1), 24-31.
- Stern, R. M., Stern, R. M., Koch, K. L., & Andrews, P. (2011). *Nausea: mechanisms and management*. USA: Oxford University Press.

- Stewart, N., Ungemach, C., Harris, A. J., Bartels, D. M., Newell, B. R., Paolacci, G., & Chandler, J. (2015). The average laboratory samples a population of 7,300 Amazon Mechanical Turk workers. *Judgment and Decision making*, *10*(5), 479-491.
- Stollberg, J., Fritsche, I., & Jonas, E. (2017). The groupy shift: Conformity to liberal in-group norms as a group-based response to threatened personal control. *Social Cognition*, *35*(4), 374-394. <https://doi.org/10.1521/soco.2017.35.4.374>
- Stenner, K. (2005). *The Authoritarian Dynamic*. London: Cambridge University Press
- Stroud, N. J. (2011). *Niche news: The politics of news choice*. Oxford University Press on Demand.
- Taber, C. S., & Young, E. (2013). Political information processing. In L. Huddy, D. O. Sears, & J. S. Levy (Eds.), *The Oxford Handbook of Political Psychology* (pp. 525–558). New York, NY: Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199760107.013.0017>
- Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, *1*(2), 149-178.
- Tankard, M. E., & Paluck, E. L. (2017). The effect of a Supreme Court decision regarding gay marriage on social norms and personal attitudes. *Psychological Science*, *28*(9), 1334-1344. <https://doi.org/10.1177/0956797617709594>
- Tedin, K. L. (1980). Assessing peer and parent influence on adolescent political attitudes. *American Journal of Political Science*, *24*(1) 136-154. <https://doi.org/10.2307/2110929>

- Tepper, B. J. (2008). Nutritional implications of genetic taste variation: the role of PROP sensitivity and other taste phenotypes. *Annual Review of Nutrition*, 28(1), 367-388
<https://doi.org/10.1146/annurev.nutr.28.061807.155458>
- Terrizzi Jr, J. A., Shook, N. J., & McDaniel, M. A. (2013). The behavioral immune system and social conservatism: A meta-analysis. *Evolution and Human Behavior*, 34(2), 99-108.
<https://doi.org/10.1016/j.evolhumbehav.2012.10.003>
- Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin*, 22(8), 776-793.
<https://doi.org/10.1177/0146167296228002>
- Tesler, M. (2016, August 22). Economic Anxiety Isn't Driving Racial Resentment. Racial Resentment Is Driving Economic Anxiety. The Washington Post. Retrieved from
<https://www.washingtonpost.com>.
- Tetlock, P. E., Visser, P. S., Singh, R., Polifroni, M., Scott, A., Elson, S. B., ... & Rescober, P. (2007). People as intuitive prosecutors: The impact of social-control goals on attributions of responsibility. *Journal of Experimental Social Psychology*, 43(2), 195-209.
<https://doi.org/10.1016/j.jesp.2006.02.009>
- Thorisdottir, H., & Jost, J. T. (2011). Motivated closed-mindedness mediates the effect of threat on political conservatism. *Political Psychology*, 32, 785–811.
<https://doi.org/10.1111/j.1467-9221.2011.00840.x>
- Thornton, D. A., & Arrowood, A. J. (1966). Self-evaluation, self-enhancement, and the locus of social comparison. *Journal of Experimental Social Psychology*, 40-48.
[https://doi.org/10.1016/0022-1031\(66\)90064-3](https://doi.org/10.1016/0022-1031(66)90064-3)

- Thrush, G., & Haberman, M. (2017, August 15). Trump gives White supremacists an unequivocal boost. *The New York Times*. Retrieved from <https://www.nytimes.com>
- Toftness, A. R., Carpenter, S. K., Geller, J., Lauber, S., Johnson, M., & Armstrong, P. I. (2018). Instructor fluency leads to higher confidence in learning, but not better learning. *Metacognition and Learning, 13*(1), 1-14.
- Tomchek, S. D., & Dunn, W. (2007). Sensory processing in children with and without autism: a comparative study using the short sensory profile. *American Journal of Occupational Therapy, 61*(2), 190-200. <https://doi.org/10.5014/ajot.61.2.190>
- Tomkins, S. (1963). Left and right: A basic dimension of ideology and personality. In R. W. White (Ed.) & K. F. Bruner (Collaborator), *The study of lives: Essays on personality in honor of Henry A. Murray* (pp. 388-411). New York, NY, US: Atherton Press.
<http://dx.doi.org/10.1037/12238-017>
- Toner, K., Leary, M.R., Asher, M.W., and Jongman-Sereno, K.P. (2013). Feeling superior is a bipartisan issue: extremity (not direction) of political views predicts perceived belief superiority. *Psychological Science, 24*, 2454–2462.
- Tormala, Z. L., Petty, R. E., & Briñol, P. (2002). Ease of retrieval effects in persuasion: A self-validation analysis. *Personality and Social Psychology Bulletin, 28*(12), 1700-1712.
- Tybur, J. M., Inbar, Y., Aarøe, L., Barclay, P., Barlow, F. K., De Barra, M., ... & Consedine, N. S. (2016). Parasite stress and pathogen avoidance relate to distinct dimensions of political ideology across 30 nations. *Proceedings of the National Academy of Sciences, 113*(44), 12408-12413. <https://doi.org/10.1073/pnas.1607398113>

- Tybur, J. M., Inbar, Y., Güler, E., & Molho, C. (2015). Is the relationship between pathogen avoidance and ideological conservatism explained by sexual strategies?. *Evolution and Human Behavior*, 36(6), 489-497. <https://doi.org/10.1016/j.evolhumbehav.2015.01.006>
- Tybur, J. M., Lieberman, D., Kurzban, R., & DeScioli, P. (2013). Disgust: Evolved function and structure. *Psychological Review*, 120(1), 65–84. <https://doi.org/10.1037/a0030778>
- Tyler, T. R., & Weber, R. (1982). Support for the death penalty; instrumental response to crime, or symbolic attitude?. *Law and Society Review*, 21-45. <https://doi.org/10.2307/3053531>
- Uhlener, C. J. (1986). Political participation, rational actors, and rationality: A new approach. *Political Psychology*, 551-573. <https://doi.org/10.2307/3791256>
- Unsworth, K. L., & Fielding, K. S. (2014). It's political: How the salience of one's political identity changes climate change beliefs and policy support. *Global Environmental Change*, 27, 131-137.
- Van Berkel, L., Crandall, C. S., Eidelman, S., & Blanchard, J. C. (2015). Hierarchy, dominance, and deliberation egalitarian values require mental effort. *Personality and Social Psychology Bulletin*, 41, 1207–1222. <https://doi.org/10.1177/0146167215591961>
- Van Hiel, A., & Kossowska, M. (2007). Contemporary attitudes and their ideological representation in Flanders (Belgium), Poland, and the Ukraine. *International Journal of Psychology*, 42, 16–26. <https://doi.org/10.1080/00207590500411443>
- Van Hiel, A., Onraet, E., Crowson, H. M., & Roets, A. (2016). The relationship between right-wing attitudes and cognitive style: A comparison of self-report and behavioural measures

- of rigidity and intolerance of ambiguity. *European Journal of Personality*, 30(6), 523-531. <https://doi.org/10.1002/per.2082>
- Van Hiel, A., Onraet, E., & De Pauw, S. (2010). The relationship between social-cultural attitudes and behavioral measures of cognitive style: A meta-analytic integration of studies. *Journal of Personality*, 68, 1765–1800. <https://doi.org/10.1111/j.1467-6494.2010.00669.x>
- Verdant Labs (2016). *Democratic Versus Republican Occupations*. Retrieved from http://verdantlabs.com/politics_of_professions/
- Vytal, K., & Hamann, S. (2010). Neuroimaging support for discrete neural correlates of basic emotions: A voxel based meta-analysis. *Journal of Cognitive Neuroscience*, 22, 2864–2885. <https://doi.org/10.1162/jocn.2009.21366>
- Wendling, M. (2016, November 11). US election 2016: Are hate crimes spiking after Trump's victory?. *BBC News*. Retrieved from <https://www.bbc.com>
- Wiesehomeier, N. & Benoit, K. (2009). Presidents, Parties, and Policy Competition. *The Journal of Politics*, 71(4), 1435–7. <https://doi.org/10.1017/s0022381609990193>
- Willer, R. (2004). The effects of government-issued terror warnings on presidential approval ratings. *Current research in social psychology*, 10(1), 1-12. <https://doi.org/10.1037/e633962013-083>
- Wilson, G. D. (1973). *The psychology of conservatism*. Oxford, England: Academic Press.

- Woods, J., & Arthur, C. D. (2014). The threat of terrorism and the changing public discourse on immigration after September 11. *Sociological Spectrum*, 34(5), 421-441.
<https://doi.org/10.1080/02732173.2014.937652>
- Xu, K., Nosek, B. A. & Greenwald, A. G. (2014). Psychology data from the race implicit association test on the project implicit demo website. *Journal of Open Psychology Data*, 2. <https://doi.org/10.5334/jopd.ac>
- Yakovlev, P. A., & Guessford, W. P. (2013). Alcohol consumption and political ideology: What's party got to do with it?. *Journal of Wine Economics*, 8(3), 335-354.
<https://doi.org/10.1017/jwe.2013.23>
- Young, E. (2011). *Why We're Liberal, Why We're Conservative A cognitive theory on the origins of ideological thinking* (Doctoral dissertation).
- Yourish, K., Buchanan, L., & Parlapiano, A. (2016). More than 160 Republican leaders don't support Donald Trump. Here's when they reached their breaking point. *The New York Times*.
- Wagner, B. C., Briñol, P., & Petty, R. E. (2012). Dimensions of metacognitive judgment: Implications for attitude change. In P. Briñol & K. DeMarree (Eds.), *Social Metacognition*. (pp. 43–61). New York, NY: Psychology Press.
- Wegener, D. T., Downing, J., Krosnick, J. A., & Petty, R. E. (1995). Measures and manipulations of strength-related properties of attitudes: Current practice and future directions. *Attitude strength: Antecedents and consequences*, 4, 455-487.

- Wesson, C. J., & Pulford, B. D. (2009). Verbal expressions of confidence and doubt. *Psychological Reports, 105*(1), 151-160.
- Wickens, C.D., 1992. *Engineering Psychology and Human Performance*, 2nd ed. Harper Collins, New York
- Wilson, G. D., Ausman, J., & Mathews, T. R. (1973). Conservatism and art preferences. *Journal of Personality and Social Psychology, 25*(2), 286.
- Zacker, J. (1973). Authoritarian avoidance of ambiguity. *Psychological Reports, 33*(3), 901-902.
- Zhou, H. & Fishbach, A. (2016). The pitfall of experimenting on the web: How unattended selective attrition leads to surprising (yet false) research conclusions. *Journal of Personality and Social Psychology, 111*, 493. <https://doi.org/10.1037/pspa0000056>
- Zuniga, J. R., Davis, S. H., Englehardt, R. A., Miller Jr, I. J., Schiffman, S. S., & Phillips, C. (1993). Taste performance on the anterior human tongue varies with fungiform taste bud density. *Chemical Senses, 18*(5), 449-460. <https://doi.org/10.1093/chemse/18.5.449>

Appendix A

Detailed Methods for Chapter III: Changes in Societal Prejudices Following the 2016 U.S. Presidential Election Cycle

All of our studies were approved by the university's institutional review board, and all subjects provided informed consent using an online consent form. VOTER survey data are publicly available at <https://www.voterstudygroup.org/publications/2016-elections/data>. We preregistered our primary predictions for all of our studies save for two preliminary studies (Studies 2 and 5), of which we later conducted preregistered replications (documentation can be viewed at <https://osf.io/9syz8/>). Data were analyzed with R 3.4.1 and SPSS 20.0. Given the large number of studies described in the manuscript, we provide only a brief overview of our methods below. Additional information regarding procedure and analyses, as well as a full list of the materials and measures for all studies, can be found in the online Supplementary Information.

Longitudinal Studies (Studies 1-9)

Procedure

Studies 1-8, General Procedure: Participants were recruited through Amazon's Mechanical Turk, an online platform where workers complete short tasks in exchange for payment (Buhrmester et al., 2011). At Time 1, participants completed one or more measures of prejudice and answered questions regarding their views on social and political issues, their political orientation, and demographics. At Time 2, they completed many of the same measures and rated their support for Donald Trump. Time 1 and Time 2 surveys were nearly identical in format and content, to help ensure that no extraneous factors could influence results. In addition to the measures described in the main text, we also collected eight other dependent measures. Although the results on these measures were consistent with those described above (see meta-analyses below), we nonetheless omit these measures from the main text for brevity (for a full description of all additional measures and results, see SI).

Though our primary predictions in these longitudinal studies were relatively straightforward, we also wished to explore a wide range of potential mediators and moderators, in order to determine whether the relationship between Trump support and increases in prejudice might be explained by other factors. To this end, we included an extensive array of other measures, assessing factors such as political ideology, political party identification, perceptions of the state of the U.S. economy, perceptions of conflict between the U.S. and other nations, perceived threat from terrorists, political knowledge/sophistication, and news following habits, as well as a number of questions about demographic characteristics such as age, gender, race, education, and income. We also examined a number of "regional factors" such as indices of income inequality, racial diversity, and voter turnout in participants' home counties. To do so, we first extracted information about the state and zip code in which participants were located using Qualtrics's built-in "GeoIP" functions. We then transformed these zip codes into U.S. counties and cross-referenced this information with various online databases (from, e.g., the U.S. Census Bureau's American Fact Finder website) in order to obtain the relevant indices for each participant's home county. Below is a brief description of the procedure for each study.

Studies 1 and 2: The Time 1 data for Studies 1 and 2 were taken from a single study with a large sample ($N = 600$). We divided this sample into two separate subsamples, with which we conducted an initial exploratory test of our hypothesis, and a subsequent preregistered direct replication. At Time 1, participants first completed the Islamophobia scale. They then answered several questions about their social and political attitudes and completed a scale assessing their perceptions of threat from illegal immigrants. They then completed a political knowledge questionnaire, answered questions about their news following habits, and provided demographic information (e.g., age, gender, income, education).

At Time 2, participants first completed the same Islamophobia scale and answered many of the same questions about their social and political attitudes and news watching habits. They then indicated their support for Donald Trump and provided demographic information. In Study 2, participants also completed some exploratory questions about how they felt about Donald Trump's election, and whether they felt that their own attitudes towards Muslims had changed (i.e., become more negative or more positive) over time.

Study 3: At Time 1, participants completed three prejudice measures, which were presented in random order: the Islamophobia scale, the Guantanamo scenario, and the measure of blatant dehumanization of Muslims. Afterwards, they answered some questions about their social and political attitudes, and then completed a novel IAT intended to assess their associations between the concepts of "America" (vs. "Foreign") and "Safety" (vs. "Danger"). They then provided demographic information.

At Time 2, participants completed the same three prejudice measures. These were presented to each participant in the same order that s/he had seen them at Time 1. Afterwards, participants provided demographic information and indicated their support for Donald Trump.

Study 4: At Time 1, participants first completed a task intended to measure racial bias in punishment, in which they read a short vignette about a (Black or White) criminal suspect and made a recommendation for how that individual should be punished (see SI). They then answered two questions about their perceptions of the police, and then were randomly assigned to complete one of three prejudice measures: the less blatant measure of prejudice against Blacks discussed above (the Symbolic Racism scale), the more blatant prejudice measure discussed above (the Attitudes Towards Blacks scale) or the Internal/External Motivation to Respond Without Prejudice scale (see SI). They then answered some demographic questions.

At Time 2, participants read the same vignette and completed the same punishment task. They then completed the same prejudice measure that they completed at Time 1, provided demographic information, and indicated their support for Donald Trump.

Studies 5 and 6: At Time 1, participants first completed the Attitudes Towards Blacks scale. They then answered questions about their social and political views and provided demographic information. Participants in Study 6 also completed a task in which they rated three applicants to Cornell University (this task was not included at Time 2).

At Time 2, participants completed the same prejudice measure, answered questions about their social and political views, provided demographic information, and rated their level of Trump support. In Study 6, participants also completed the Black/White IAT (Greenwald, McGhee, & Schwartz, 1998) at both time points.

Studies 7 and 8: At Time 1, participants first completed a short “Geography and Daylight” task in which they were asked to view photographs of six buildings and to guess the time of day when the photo was taken. They then completed the Attitudes Towards Blacks scale and answered some questions about their social and political attitudes. Afterwards, they completed the American=White IAT (Devos & Banaji, 2005).

At Time 2, participants first completed the Geography and Daylight task and then filled out the same measure of prejudice against Blacks. They then completed the same IAT, answered questions about their social and political attitudes, provided demographic information, and indicated their support for Donald Trump.

Studies 1-8 Procedure, Continued: The Time 1 survey for Studies 3 and 5-8 also contained a manipulation not of interest for the present project: half of participants were randomly assigned to a condition in which two small American flags were placed in the banner at the top of the survey (in Studies 7 and 8, participants in the flag condition also viewed “Geography and Daylight” photos containing small images of U.S. flags). There were no significant differences in prejudice scores between individuals in these two conditions (all $ps > .08$), so we collapsed across condition for all analyses (controlling for flag condition does not change our results). At Time 2, no flags were presented.

Response Rates, Studies 1-8: Many individuals on Mechanical Turk work only temporarily, or cycle on and off of the site (Paolacci & Chandler, 2014; Stewart et al., 2015). Accordingly, some of our longitudinal studies had high attrition rates (see Supplementary Table 5). However, because attrition rates in the nationally representative VOTER data were considerably lower, replicating our results with that dataset served to verify our findings and ensure that attrition rates did not create any systematic biases in our data. Additionally, we took several steps to ensure that there were no systematic differences between participants who returned (vs. did not return) for Session 2 of our studies, in order to ensure the generalizability of our findings: 1) In the study ad (or “HIT”), we provided no information about the content of the survey, so participants could not decide whether to participate based on survey content; 2) we offered very high pay rates (~10 times higher than standard rates on Mechanical Turk, see SI) to incentivize completion; 3) we examined the data for incomplete responses (i.e., drop-out) and verified that drop-out rates could not have biased our conclusions (for a discussion, see Zhou & Fishbach, 2016). We found that drop-out rates were very low, with only 9 participants out of 1,065 (.8%) dropping out after beginning the survey.

Further, we also analyzed the data to understand the causes of the observed attrition rates and to ensure that they were in keeping with those typically observed on Mechanical Turk. Our longitudinal Mechanical Turk studies varied substantially in their inter-session intervals (i.e., the length of time between the Time 1 and Time 2 surveys), ranging from 1.77 to 3.42 years (Supplementary Table 5). There was a strong negative correlation between the length of this inter-session interval and the response rate for each study ($N = 8$, $r = -.877$, $p = .004$), such that the more time that elapsed between Session 1 and Session 2, the fewer participants responded to the second survey. There was also a strong negative correlation between the expected duration of the study (which was provided to people before they decided whether to participate) and response rate ($N = 8$, $r = .882$, $p = .004$). Together, these factors explained 90% of the variance in participant response rates ($R^2 = .895$), suggesting that inter-study interval and study length were the primary determinants of how many participants returned for Session 2. These

associations suggest that general attrition rates in use of Mechanical Turk (Paolacci & Chandler, 2014; Stewart et al., 2015) explain the response rates that we observed, rather than features of our particular studies. Additionally – and most importantly – the effect size observed in each study was not associated with the response rate for that study ($r = -.146$, $p = .73$; based on the relationship between Trump support and prejudice against Muslims in Studies 1-3, and between Trump support and blatant prejudice against African-Americans in Studies 4-8). These results further suggest that attrition did not systematically bias our findings.

In addition to these analyses, we also carefully examined the data to ensure that there were no meaningful differences between individuals who did and did not return for Session 2. In general, Responders and Non-Responders looked very similar: in none of our eight studies were there Time 1 differences between these two groups in key demographic variables such as gender, education, income, proportion born in the U.S., percent who identified as White, political identification, or political party identification. Out of the 13 unique observations of scale measures of prejudice discussed in the main text, only two showed significant differences between individuals who did and did not return for Session 2. Excluding these studies does not change the pattern of results. (The full results of these analyses can be found in Supplementary Tables 6 and 7.)

VOTER Survey (Study 9): The 2016 VOTER survey (Study 9) is a multi-session longitudinal survey of 8,000 Americans conducted by the Democracy Fund Voter Study Group and YouGov. Participants in the 2016 survey (conducted between November 29th and December 29th of 2016) were selected from a stratified sample of 45,000 people who had completed another survey in December 2011. At both time points, extensive information was collected about participants' voting history, social and political attitudes, daily lives and habits, social group memberships, health history, and demographic characteristics. The dataset and additional information about the methodology can be found here: <https://www.voterstudygroup.org/publications/2016-elections/data>.

The sample was weighted by both demographic and non-demographic factors to approximate the U.S. population, following YouGov's proprietary algorithm. The reported margin of error is +/- 2.2%. All analyses with this dataset were conducted using the weighted data. However, the results obtained using the unweighted data are not substantially different. Supplementary Table 8 contains information about key demographic variables for this sample.

Statistical Information

Sample: In order to conduct a more conservative test of our hypotheses, we did not exclude any participants from our analyses. However, there were nine participants from our longitudinal studies who did not respond to our Trump support scale (our independent variable for all studies), and who therefore could not be included in analyses. Additionally, in Study 3, three participants who did not provide complete responses to our Time 1 dependent measures were inadvertently invited to participate in the Time 2 survey. Because of these incomplete data, we did not include these participants in analyses.

Hypothesis Testing: Several of our longitudinal studies contained identical measures of prejudice. A meta-analysis (detailed below) showed no systematic differences between these studies that could explain our effects. Therefore, for brevity, and to present a more accurate

estimate of effect sizes (Braver, Thoemmes, & Rosenthal, 2014), in the main text we have chosen to present the data by measure, collapsing across individual studies/samples (however, the effect sizes for each individual study can be found in Fig. 3).

Our primary hypothesis in these studies was that Trump support would be associated with changes in prejudice over time. We tested this hypothesis using linear regression. In each analysis, Trump support was entered as the independent variable, and participants' prejudice difference score (Time 2 minus Time 1) was entered as the dependent variable. We considered our hypothesis to be supported if the relationship between Trump support and change in prejudice was positive (such that greater Trump support was associated with greater increases in prejudice) and significant at $p < .05$.

For these studies, we also conducted alternative sets of analyses in which we (where possible): 1) excluded participants who belonged to the target racial or religious group under investigation (e.g., excluding Muslim participants from the studies on prejudice against Muslims; excluding African-American participants from the studies on prejudice against African-Americans) and 2) excluded all non-White participants. In neither case are the findings of our studies substantively altered.

Meta-Analyses: Following recent best-practice recommendations (e.g., McShane & Böckenholt, 2017), we conducted an internal, “within-paper” meta-analysis in order to determine the mean effect size of our longitudinal studies (Studies 1-9) and to identify potential moderators of these effects. We used a random-effects model to better extrapolate these effects beyond the current studies and to the general population (Hedges & Vevea, 1998). For our primary analyses, we had a total of 22 unique observations with 13 different prejudice measures across 9 studies (see Supplementary Table 2). Because we had a nested structure, with some individual studies having multiple distinct groups of participants (Study 4), and some studies collecting multiple observations (i.e., multiple measures of prejudice) from a single group of participants (Studies 1-4, VOTER data), we fit a multi-level meta-analysis model, specifying nested random effects for study, participant group, and observation (see Konstantopoulos, 2011). The average effect size across these studies was $\beta = .26$ ($se = .034$, $z = 7.50$, $p < .0001$), and the 95% confidence interval for the true effect size was $\beta = .19-.32$ (we also conducted a separate meta-analysis including the three preregistered scale measures of prejudice not discussed in the main text: the Ascent of Man dehumanization scale, and the Internal and External Motivation to Control Prejudice scales. This analysis yielded a nearly identical estimated effect size: $\beta = .25$, $p < .0001$, 95% CI[.18,.31]).

Cochran's Q-test suggested that there was substantial heterogeneity in our observed effect sizes ($Q(21) = 212.77$, $p < .0001$; see Fig. 3, Supplementary Fig. 5), so we examined potential moderators. We first tested whether target group type moderated these effects. We divided our observed effects into three categories: 1) prejudice against Muslims, 2) prejudice against African-Americans, and 3) prejudice against other minority groups (there were not enough distinct observations to subdivide the latter group any further). We then fit a second model with group type added as a moderator. The effect was directional but non-significant ($QM(2) = 4.90$, $p = .086$). Examining the effects for each of these target groups separately revealed significant estimates for all three subgroups (prejudice against Muslims: $\beta = .30$, $se = .08$, $z = 3.64$, $p = .0003$, 95% CI[.14,.45]; prejudice against African-Americans: $\beta = .24$, $se = .03$, $z = 7.43$, $p < .0001$, 95% CI[.18,.30]; prejudice against other minority groups: $\beta = .24$, $se = .06$, $z = 4.14$, $p < .0001$, 95% CI[.13,.36]). Descriptively, the relationship between Trump support and increases in prejudice against Muslims was the strongest, while the relationships with prejudice against

Blacks and prejudice against other groups were slightly weaker. However, none of these differences were significant ($ps > .069$).

We also examined whether sample type (Mechanical Turk studies vs. VOTER sample) moderated effects, but these differences were not significant ($p = .21$). Importantly, we also found that response rates did not moderate effect sizes ($p = .26$), further verifying that our results were not shaped by attrition rates. Given the relatively small number of studies, we lacked the statistical power for more fine-grained analyses, such as examining other potential moderators (e.g., individual prejudice measures).

Mechanism Studies (Studies 10-12)

Procedure

Participants were recruited through Mechanical Turk. The ad (or “HIT”) for the study did not provide any detailed information about the content of the study, and there was no mention of politics, prejudice, or minority groups in the study description. Because there are fewer political conservatives (and thus fewer Trump supporters) on Mechanical Turk, for Study 11 we used Turkprime.com (Littman, Robinson, & Abberbock, 2017) in order to recruit a larger sample of conservatives.

Study 10: Participants first answered two questions assessing their perceptions of changing norms, which were presented in random order: 1) general American norms: “To what degree have **Americans** become less or more critical of Islam/Muslims in recent months and years?” 2) social reference group-specific norms: “To what degree have **people that you respect and admire** become less or more critical of Islam/Muslims in recent months and years?” They then rated their support for Donald Trump on a single item (Item #1 from Studies 1-8) assessing positivity towards Trump.

Study 11: Participants first completed the full 20-item Differentiating Islamophobia scale (as preregistered, our predictions concerned only the explicit prejudice, or “Islamoprejudice,” subscale). Afterwards, participants answered two questions about their perceptions of how norms had changed among supporters of Donald Trump: 1) descriptive norms: “Since Trump’s election, have **Trump supporters** become more or less negative in their feelings towards Muslims/Islam?” 2) prescriptive norms: “Since Trump’s election, have **Trump supporters** seen it as more or less acceptable to express negativity towards Muslims/Islam?” Participants then answered some exploratory questions relating to how they believed their friends and family felt about Muslims, rated their degree of liberalism/conservatism, and rated their support for Donald Trump on the four-item scale from Studies 1 through 8.

Study 12: Information on the methodology is included in the main text above. News headlines and other materials can be found in the online Supplementary Materials.

Statistical Information

In all analyses, individuals who scored above the midpoint on our Trump support measure (indicating generally favorable views of Donald Trump) are categorized as Trump

supporters, and individuals who scored below the midpoint of our Trump support measure (indicating generally unfavorable views of Donald Trump) are categorized as non-Trump supporters. Our hypotheses relating to changing norms in Studies 10 and 11 were tested using one-sample t-tests, to determine whether mean scores were significantly above the “no change” midpoint of the scale. In Study 11, we used linear regression to test for an interaction between Trump support and perceived norms. Both predictor variables were entered into a linear regression model along with their interaction term. As preregistered, we considered our hypothesis to have been supported if the interaction term was significant at $p = .05$ or below, and if the pattern of results was in the predicted direction.