Are There Ideological Differences in Intergroup Bias?
Examining Liberal-Conservative (A)symmetries in Minimal Group Cognition and Behavior

Abstract:

The liberal-conservative divide is one of the most contentious divisions in modern society. Several influential theoretical perspectives contend that this divide hinges primarily on orientations towards social groups, such that conservatives (versus liberals) generally tend to be more oriented towards protecting and benefitting their social "ingroups" (i.e., social groups to which they themselves belong), and exhibiting greater discrimination and aggression towards social "outgroups." However, empirical support for this theoretical perspective has been mixed. We argue that the empirical stalemate that characterizes this area of research stems from inherent limitations of the research paradigm used by both sides of the debate: examining attitudes towards real-world social groups. Drawing on research and theory from the social identity literature, we propose a novel approach—using "minimal groups" (i.e., experimentally constructed groups)—to answer whether, when, and why ideological differences in intergroup bias may exist. In this Registered Report proposal, we describe pilot data that we have collected that provide new insights into this longstanding debate, documenting both ideological symmetries and asymmetries in intergroup cognition, and suggesting that ideological extremity may also independently play a role in driving intergroup bias. We then propose additional research to more decisively answer these questions. We believe that this research will help reconcile this longstanding debate and provide a deeper understanding of the psychological underpinnings of political ideology.

Introduction

Tensions between the political right and left have grown in recent years, with greater polarization, increased animosity, and less willingness to engage with those of the opposing ideology (McCoy, Rahman, & Somer, 2018; Pew Research Center, 2014, 2016, 2017a; Reiljan, 2019). Indeed, the political divide is now one of the most contentious divisions in modern society (Iyengar & Westwood, 2015; Pew Research Center, 2016, 2017a, b). But what underlies these conflicting worldviews, and what factors influence whether a person adopts a more liberal versus conservative ideology?

Several leading theories suggest that the left-right divide hinges on orientations towards social groups (e.g., Graham, Haidt, & Nosek, 2009; Terrizzi, Shook, & McDaniel, 2013; Thornhill & Fincher, 2007). More politically conservative people are argued to possess a suite of basic psychological traits and motivations that lead them to exhibit a relatively stronger preference for their social "ingroups" (i.e., the groups to which they belong) and relatively stronger prejudice/animosity towards social "outgroups" (i.e., groups to which they do not belong). However, the empirical evidence for this highly influential theoretical perspective has been mixed. While some research has found that conservatives generally exhibit greater intergroup bias (e.g., Altemeyer, 1981, 1988; Duckitt, 2001; Hodson & Busseri, 2012), other research has suggested there are no ideological differences in bias (e.g., Brandt, Reyna, Chambers, Crawford, & Wetherell, 2014; Chambers, Schlenker, & Collisson, 2013; Crawford, Brandt, Inbar, Chambers, & Motyl, 2017). Despite decades of research, this debate appears little closer to being resolved.

We argue that the conflicting findings of past research are due to methodological limitations, and therefore a new methodological approach is needed to resolve this debate. Specifically, past research on both sides of the debate has focused almost exclusively on attitudes towards real-world social groups. Critically, such groups are confounded with complex histories and social information that makes it difficult—if not impossible—to measure a person's "general" degree of intergroup bias. Further, both sides of this debate examine attitudes toward only a small subset of existing social groups—an approach especially vulnerable to biased stimuli selection, and one which captures only a fraction of the intergroup domain.

In the present work, we draw on theory and methodology from social cognition to propose a novel test of whether conservatives are more predisposed than liberals to favor their

own social groups over others. This approach is centered on the "minimal groups" paradigm (Brewer, 1979; Tajfel, 1970), which was designed to strip away the complex social information associated with real-world social groups in order to examine the most basic forms of intergroup bias (Spears & Otten, 2012; Tajfel, Billig, Bundy, & Flament, 1971).

We present preliminary pilot data illustrating the insights this approach has yielded, then propose a programmatic series of studies that will provide a more decisive test of ideological differences in intergroup bias. In this work, we utilize several distinct indices of intergroup favoritism and a range of participant samples, and we systematically manipulate features of the intergroup context in order to understand the conditions under which ideological differences in intergroup bias are most likely to emerge. We believe that this research will help to adjudicate conflicting theoretical perspectives on the nature of the left-right political divide and, in doing so, may help us better understand how to resolve some of the real-world animosity between those of opposing ideologies.

Conflicting Perspectives on Ideological Differences in Ingroup Favoritism

Support for the ideological asymmetry hypothesis: The "ideological asymmetry hypothesis"—that more conservative belief systems are associated with greater intergroup bias—was first proposed in the early 1950s (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). Adorno and colleagues argued that individuals with a more "authoritarian" (i.e., conservative; Altemeyer, 1981) worldview were predisposed to hold greater prejudice against all types of social outgroups. Support for this argument rested on two central observations: 1) prejudices are positively correlated, such that individuals who are more prejudiced against one minority group tend to be more prejudiced against other minority groups, and 2) an authoritarian belief system strongly predicts this form of "generalized intergroup bias."

This perspective has proven remarkably influential in political psychology in the intervening decades, and the idea that conservatives are fundamentally more prejudiced against social outgroups is central to many theories of political ideology and related belief systems (e.g., Altemeyer, 1981, 1988; Pratto, Sidanius, Stallworth, & Malle, 1994; Sidanius & Pratto, 1993; Wilson, 1973). Additional empirical support for this perspective comes from decades of research documenting that conservative belief systems tend to correlate with prejudice towards a wide

range of minority groups (for a review, see Duckitt, 2001)—in line with Adorno and colleagues' original findings.

Other independent programs of research have converged on the conclusion that intergroup attitudes are central to the liberal-conservative ideological divide. For example, research from the moral foundations literature provides evidence of ideological differences in the relative weight assigned to ingroup-protective moral values (Graham, Haidt, & Nosek, 2009), reliably showing that political conservatives more strongly endorse moral values theorized to maintain ingroup cohesion and cooperation (e.g., ingroup loyalty and respect for authority; Haidt, 2007, 2012). In contrast, liberals tend to hold a more individualistic view of morality that does not privilege ingroups over outgroups (*ibid*.).

Other recent theoretical perspectives have gone beyond positing a simple association between conservatism and ingroup favoritism in order to explicitly reconceptualize *conservatism itself* as a set of ideological beliefs or psychological motivations that are oriented towards protecting the ingroup—often at the expense of outgroups. From this perspective, conservative beliefs (particularly socially conservative beliefs) are defined as "ideological systems that promote ingroup homogeneity and outgroup avoidance" (Terrizi et al., 2013, p. 99).

Similarly, evolutionary psychologists have argued that conservatism is a constellation of evolved psychological mechanisms designed to facilitate coalition building, to maintain ingroup cohesion, and ward off threats posed by outgroups. According to these accounts, conservatives are "in-group specialists" (Thornhill & Fincher, 2007, p. 215) who have a set of psychological traits that predispose them to form tighter-knit social groups, to exhibit greater favoritism toward their own social ingroups, and to be more likely to derogate and aggress against outgroups (e.g., Brown, Fincher, & Walasek, 2016; Haidt, 2012; Kessler & Cohrs, 2008; Sinn & Hayes, 2017; Tuschman, 2013). Conversely, liberals are argued to be "outgroup specialists" (Thornhill & Fincher, 2007, p. 215) who tend to make less of a psychological distinction between "us" and "them" and display relatively less favoritism towards their own groups.

Together, these theoretical perspectives and lines of research appear to provide strong support for the hypothesis that political conservatives may tend to express greater intergroup bias than liberals. Although empirical support for the ideological asymmetry hypothesis has come exclusively from studies examining attitudes towards real-world social groups (particularly racial/ethnic, religious, and cultural groups), these theoretical perspectives further predict that

conservatives' greater ingroup favoritism should extend beyond particular social groups. That is, they contend that conservatives have particular psychological traits and motivations that lead them to exhibit greater intergroup bias *in general*, showing a greater preference for their own (vs. other) social groups – regardless of the origin or nature of that group.

Support for the ideological symmetry hypothesis*:* In recent years, a rapidly growing body of research has challenged the ideological asymmetry hypothesis and has raised doubt about whether conservatives truly exhibit greater intergroup bias in general. This work instead suggests that the relationship between ideology and intergroup bias may be limited to *specific* kinds of social outgroups.

Early evidence supporting this perspective came from the finding that social dominance orientation and right-wing authoritarianism (SDO and RWA), two broad belief systems closely associated with political conservatism (Duckitt & Sibley, 2009; Jost et al., 2003; Wilson & Sibley, 2013), do not predict greater negativity toward all minority groups (Duckitt, 2006; Duckitt & Sibley, 2007, 2010; Sibley & Duckitt, 2008). Rather, these belief systems only predict greater prejudice towards minority groups that are perceived to be threatening or low in status. This argument has received robust support from several meta-analyses and correlational and experimental research (e.g., Duckitt & Sibley, 2007, 2010; Sibley & Duckitt, 2008; for a recent review, see Duckitt & Sibley, 2017).

Further evidence against a general association between conservatism and intergroup bias comes from recent research and theory that has raised doubts about the existence of ideological differences in moral foundation endorsement. In particular, Schein and colleagues argue that the apparent association between conservatism and ingroup-centric morality is simply an artifact of the specific social groups that have been examined in past research (Schein, Goranson, & Gray, 2015; Schein & Gray, 2015; Schein & Gray, 2017). That is, they contend that research has selectively sampled social groups that conservatives tend to value more, and in doing so has "conflated conservativism and [ingroup-centric] morality from the very beginning" (Schein & Gray, 2017, p. 24). Further, they argue that there are social groups for which liberals, too, value loyalty and respect for authority, and that expanding the field of investigation to include these groups would attenuate or even eliminate ideological differences in ingroup-protective moral beliefs (Schein & Gray, 2017; see also Voelkel & Brandt, 2018). In support of this argument, they provide evidence suggesting that the apparent tendency for conservatives (versus liberals) to

privilege ingroup-favoring moral values is more superficial than is often believed, and that individuals of both ideologies tend to think of morality in fundamentally similar ways (Schein & Gray, 2015).

Finally, perhaps the strongest evidence against a general association between conservatism and intergroup bias comes from a rapidly growing body of research on the "ideological conflict hypothesis" (Brandt, 2017; Brandt et al., 2014; Chambers et al., 2013; Crawford & Brandt, 2018; Crawford et al., 2017; Wetherell, Brandt, & Reyna, 2013). According to this hypothesis, all individuals—conservative or liberal—tend to dislike others who hold beliefs and values that are dissimilar from their own. This research suggests that the apparent association between conservatism and outgroup prejudice is driven by the fact that past research has focused almost exclusively on attitudes towards low-status minority groups—groups that tend to themselves be (perceived as) liberal or to be emblematic of liberal ideals and political causes (e.g., African-Americans, gay men, Muslims). Because conservatives' beliefs and values conflict with the (real or perceived) beliefs and values of these groups, conservatives tend to express greater prejudice towards these groups. This "worldview conflict," the authors argue, explains why conservatives have appeared to be more prejudiced in past research. Supporting this argument, they show that when the range of target groups includes non-liberal social groups (i.e., groups perceived to be politically conservative in their beliefs and/or emblematic of right-wing ideals and causes, like the elderly or fundamentalist Christians), the prejudice gap between liberals and conservatives disappears, and "liberals' and conservatives' prejudices manifest to roughly equal degrees" (Crawford et al., 2017, p. 384). This research provides compelling evidence that the previously documented prejudice gap between liberals and conservatives may be overstated, if not entirely illusory.

Taken together, this body of research provides strong reasons to question the existence of a general association between conservatism and intergroup bias. These lines of research come from very different theoretical backgrounds yet nonetheless converge on the same conclusion: previously documented ideological differences in ingroup favoritism may simply be an artifact of the limited range of target groups that has been examined in past work. This work casts doubt on theories of ideology that posit that the liberal-conservative divide stems from fundamentally different orientations towards social ingroups and outgroups.

Importantly however, this work, too, has relied exclusively on the methodological approach of examining attitudes toward *real-world* social groups—just as is true of research supporting the ideological asymmetry hypothesis. This work is therefore also vulnerable to biased stimuli selection and various confounding factors stemming from the complex nature of these target groups. As such, this work cannot directly speak to the presence or absence of more generalized tendencies toward ingroup favoritism.

Methodological Barriers to Advancing the Debate

In sum, the hypothesis that conservatives are more ingroup-centric is central to many leading theories of ideology. However, this hypothesis is hotly contested, with convincing evidence on both sides. Despite more than a decade of research aimed at settling this debate, little progress has been made. This impasse raises doubt regarding the suitability of the current methodological approaches for resolving it. Although both sides have employed a similar methodology—examining attitudes towards a range of real-world social groups—they nonetheless arrive at opposite conclusions.

Without question, recent research on worldview conflict has provided novel and important insight into the debate regarding the nature and extent of ideological differences in intergroup cognition. By using a comprehensive array of social groups, this research has convincingly demonstrated that the liberal-conservative prejudice gap is likely overstated, the psychological processes underlying intergroup discrimination are often symmetrical, and liberals and conservatives, under some circumstances, *can* show similar levels of prejudice. However, this approach is not well suited to answering the question that lies at the heart of this debate: Are there ideological differences in intergroup bias *in general*? As noted above, this weakness stems from the fact that research supporting the ideological symmetry hypothesis still examines attitudes only towards a very limited range of social groups, thus capturing only a small fraction of the relevant conceptual space and making this work vulnerable to the same issues (e.g., biased or nonrepresentative selection of social groups) that have plagued research documenting ideological *a*symmetries in bias. It is therefore difficult to use these findings to draw broad conclusions about generalized intergroup bias and the nature of the liberal-conservative divide.

One approach that has been suggested for overcoming this issue and decisively determining whether there are ideological differences in intergroup bias is to collect a random

sample of *all possible social groups* and then to examine whether liberals or conservatives differ, on average, in the bias that they show towards social outgroups vs. ingroups (e.g., Wetherell et al., 2013). At first blush, this would seem to be a potentially fruitful way of finally settling this debate. However, a closer examination raises doubts about the efficacy of this approach, given factors such as the tremendous range of social groups that could be constructed (e.g., nearsighted people, shi-tzu owners, Volvo drivers, people that live on your street, block, neighborhood, city, state, country, or continent) and the ambiguity surrounding what does and does not constitute a (relevant) "social group."

Moreover, even if a random selection of real groups *were* possible, this approach may still be unable to determine whether ideological differences exist in intergroup bias. One issue is that the kinds of social ingroups and outgroups to which liberals and conservatives belong differ in many ways (DellaPosta, Shi, & Macy, 2015). For example, political conservatives are more likely to belong to high-status, high-power, "majority" groups (e.g., racial/ethnic, religious, sexual orientation, and cultural groups; Pew Research Center, 2018), while liberals are more likely to belong to (a range of different) minority groups. Aside from their obvious numerical, status, and power differences, these groups also differ greatly in their history, culture, and salience (e.g., Whiteness, straightness, and maleness are often "invisible"; Bailey, LaFrance, & Dovidio, 2019; Bonilla-Silva, 2012), as well as the social norms surrounding expressing (dis)favoritism towards them (Crandall, Eshleman, & O'Brien, 2002; Crandall & Eshleman, 2003). The numerous differences in the social groups to which liberals and conservatives do and don't belong further complicate the prospect of using real-world groups to measure ideological differences in intergroup bias.

Further, ideological differences in group membership do not stop here. The left-right ideological divide permeates many aspects of daily life and culture, and liberals and conservatives operate in largely independent social spheres (DellaPosta et al., 2015). This means that not only the specific social groups—but even the *domain* of intergroup relations—will also differ substantially between those on the left and right. For example, to draw on (largely empirically supported) stereotypes (DellaPosta et al., 2015; Wilson, 1973), how are we to compare conservatives' relative preference for their fellow bird hunters, football teams, and NASCAR enthusiasts to liberals' affinity for their fellow latte drinkers, eco-tourists, and contemporary art aficionados? These groups are incommensurate not only in their origins,

history, and purpose, but also in the deeper features that characterize the intergroup environments in which they are embedded, such as the nature of intergroup interaction (e.g., cooperative vs competitive), the criteria for membership (e.g., volitional vs. not), and numerous contextual/situational features of the interaction sphere (e.g., the presence vs. absence of intergroup threat). Thus, any examination of intergroup bias using real-world social groups will necessarily be further confounded by numerous factors stemming from ideological differences in group belonging. Any apparent (a)symmetries in liberals' and conservatives' attitudes or behavior towards their ingroups and outgroups seem equally—if not more—likely to stem from these confounding factors than from (a lack of) general ideological differences in intergroup bias.

In sum, although the methodological approach of examining attitudes towards real-world social groups has taught us much regarding the nature of ideology, it cannot answer the broader question of whether there are fundamental ideological differences in generalized intergroup bias—Do conservatives and liberals differ in their broad tendency to exhibit preference toward ingroups and prejudice against outgroups? That is, independent of the specific groups involved, do conservatives display a stronger bias towards their ingroup over the outgroup, or are conservatives and liberals relatively equal in this bias?

In the proposed research, we take a novel approach to answering this question by drawing on theory and research from the social cognition literature that has examined the most fundamental aspects of group-based cognition and intergroup discrimination. We will use a methodology largely centered on formulations of the "minimal groups paradigm" that strip away the complex information that is invariably associated with real-world social groups. This will allow us to systematically investigate the cognitive processes that underlie ingroup favoritism and intergroup bias, as well as the factors that may moderate this relationship. In doing so, we will be able to circumvent the issues that have plagued past research in order to offer a more decisive answer to the questions of whether, when, and why there may be ideological differences in intergroup bias and discrimination.

Minimal Groups and Intergroup Cognition

The minimal groups paradigm was designed to test the minimum necessary conditions to elicit intergroup bias (Tajfel, 1970; Spears & Otten, 2012). In this paradigm, participants are assigned to novel social groups based on arbitrary criteria (e.g., painting preferences) or even

completely at random (e.g., a coin toss). Participants have no interaction with the members of either group, all individuals remain anonymous, and there is no possibility of instrumental gain for participants themselves. Following group assignment, people complete tasks in which they distribute resources or evaluate members of their ingroup and the outgroup. A large body of research has shown that even for these arbitrary groups and even under these minimal conditions, people nonetheless show a preference for their social ingroup: they exhibit greater psychological identification with their own group, make more positive evaluations of their ingroup (vs. outgroup), and show intergroup bias in allocations of money and other resources (Bourhis, Turner, & Gagnon, 1997; Brewer, 1979; Diehl, 1990; Otten, 2016; Tajfel, 1970; Tajfel et al., 1971; Spears & Otten, 2012).

Research examining the psychological mechanisms underlying minimal intergroup bias suggests that simply being categorized as part of a social group creates an important psychological distinction between "us" and "them," which in turn provides a motivation to maximize the relative standing of one's own (vs. another) social group (Brewer, 1979; Lemyre & Smith, 1985; Turner, 1975). This maximization of the relative status, position, or power of one's social ingroup can be achieved through ingroup-favoring cognition or behavior, such as evaluating ingroup (vs. outgroup) members more positively (e.g., as being superior in intelligence, personality, or other traits), or allocating greater rewards or resources to ingroup (vs. outgroup) members (Brewer, 1979; Jetten, Spears, & Manstead, 1999; Lemyre & Smith, 1985; Oakes & Turner, 1980).

Importantly, however, there is also substantial variability in the degree to which different individuals exhibit this bias (Brown, 2000; Branscombe & Wann, 1994; Branscombe,Wann, Noel, & Coleman, 1993; Gagnon & Bourhis, 1996; Rubin & Hewstone, 1998). Thus, this "us versus them" distinction seems to be more salient, central, or otherwise important for some individuals than others, with some people exhibiting pronounced favoritism for their own (vs. other) social groups, and others showing a more egalitarian intergroup orientation. The existence of individual differences in basic intergroup bias—even for these perfectly equivalent social groups—suggests that some individuals may simply exhibit greater intergroup bias in general.

Conceptually, the "minimal" intergroup bias that is captured in this paradigm—reflecting the most basic form of ingroup favoritism—neatly parallels the kind of basic, generalized intergroup bias that has been argued to characterize the liberal/conservative divide. This

paradigm therefore provides an ideal environment in which to test for ideological differences in intergroup bias, stripping away the complex social information associated with real-world social groups in order to isolate and examine basic intergroup social-cognitive processes. Additionally, unlike research using real social groups, this paradigm allows for methodologically "clean" and systematic manipulations of the intergroup environment that will allow us to precisely test the conditions under which ideological differences in intergroup bias may be most likely to emerge (e.g., in cooperative vs. competitive environments), as well as the psychological mechanisms underlying these effects. In the proposed research, we use this methodological framework to test both the overarching question of whether there are general ideological differences in intergroup bias, as well more fine-grained predictions that will adjudicate between competing theoretical accounts regarding the nature of the liberal-conservative divide.

Past Research on Ideology-Relevant Predictors of Minimal Group Bias

Despite the tremendous amount of minimal groups research (at the time of this writing, a PsycINFO search for "minimal groups" returns over 1,400 results), to our knowledge no study has examined the relationship between political ideology and minimal group cognition or behavior. However, a close examination of the literature reveals a few scattered studies that have included related individual difference measures—social dominance orientation and right-wing authoritarianism—that provide possible insight into our research question.

Our literature search identified four published studies have reported the statistical associations between SDO or RWA and minimal intergroup bias in resource allocation or evaluations. One study examined the relationship between SDO and intergroup bias in evaluative trait ratings (Sidanius, Pratto, & Mitchell, 1994, $N = 198$), one study examined the relationship between both SDO and RWA and minimal intergroup discrimination in resource allocation (Reynolds, Turner, Haslam, Ryan, Bizumic, & Subasic, 2007, Study 2: Conditions 1-3, $N \sim 167$), and two studies examined the relationship between RWA and minimal intergroup discrimination in resource allocation (Reynolds et al., 2007, Study 1, $N = 160$; Perreault & Bourhis, 1999, $N = 121$).[1] None of these studies found significant relationships between either SDO or RWA and minimal intergroup bias.

[1] A few other studies have included measures of SDO or RWA in other *non*-minimal ingroup favoritism tasks (e.g., a mergers and acquisitions game, Amiot & Bourhis, 2005; team-based ski lessons, Downing & Monaco; or groups

Given the strong bias toward the publication of statistically significant results (Ioannidis, 2005), the existence of four null effects in the literature—*and zero significant effects*—is particularly notable. Further, despite widespread use of the minimal groups paradigm and its powerful influence on research and theory on prejudice and social cognition (Otten, 2016), as well as the large literature examining the psychological underpinnings of ideology (for reviews, see Hibbing, Smith, & Alford, 2014; Jost et al., 2003; Jost, Sterling, & Stern, 2017), the complete absence of published studies examining the relationship between ideology and minimal groups cognition and behavior is notable as well. Taken together, this lack of results seems to speak against the existence of ideological differences in minimal intergroup bias and lend further support to the ideological symmetry hypothesis.

Pilot Studies

Despite this tentative evidence, we nevertheless believed that the question of whether ideological differences exist in minimal intergroup bias was deserving of a more comprehensive and systematic examination, and we conducted a series of three pilot studies (total $N = 1{,}001$) to that end. We anticipated that several factors could have contributed to the null results described above, such as the lack of a direct measure of political ideology, exclusive use of college student samples, and relatively small samples sizes that provided low statistical power for detecting small effects. Further, we predicted that an additional, previously unexamined factor could have obscured potential relationships between ideology and intergroup bias: ideological extremity.

Past research has found that more (versus less) ideologically extreme individuals exhibit greater prejudice towards ideologically dissimilar others (McClosky & Chong, 1985; van Prooijen & Krouwel, 2017; van Prooijen, Krouwel, Boiten, & Eendebak, 2015). We predicted that this association between extremity and prejudice might not be limited to the political or ideological domain but could extend to attitudes towards dissimilar others *in general*—such as those belonging to different social groups (even arbitrary, minimal ones).

This possibility is particularly relevant to the current investigation because of the likely confounding of ideology and ideological extremity in past research. That is, because past work used participant samples that tend to be liberally skewed (e.g., college students, people from

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that differ in status, perceived stability, or related factors, Federico, 1998; Reynolds et al., 2007). However, because these are not true minimal groups paradigms (Brewer, 1979; Tajfel & Turner, 1979), they are not discussed here.

college towns and major cities) liberal participants would be, on average, relatively more ideologically extreme than political conservatives (e.g., with many individuals who identify as "extremely liberal" but only very few who identify as "extremely conservative"). Thus, ideology (whether a person is liberal or conservative) and ideological extremity (the extremity of that person's political beliefs) are likely confounded in these samples. If our prediction is correct and ideological extremity also predicts greater intergroup bias, then associations between extremity and intergroup bias could have "cancelled out" any general associations between conservatism and intergroup bias, thereby explaining the null effects of past research—both in work examining minimal intergroup bias, as well as much of the research supporting the ideological symmetry hypothesis in general.

To test this prediction, we assessed ideological extremity in addition to liberal-conservative ideology in our studies and examined its relationship with ingroup favoritism. Further, rather than using undergraduate student participants, we recruited participants from Amazon's Mechanical Turk, who are more ideologically and demographically diverse than undergraduate student samples (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Keith, Tay, & Harms, 2017; Krupnikov & Levine, 2014; Paolacci & Chandler, 2014), although still slightly more politically liberal on average. Finally, in assessing the relationship between conservatism and intergroup bias, we conduct analyses both with and without extremity as a covariate, in order to isolate and understand the relative effects of each factor.

Overview

In our pilot studies, we wished to provide a preliminary test of the relationship between ideology and intergroup bias under the most minimal of conditions. As such, we based group assignment on either (1) random (Pilots 1 and 2, random-number generator) or completely arbitrary (Pilot 3, overestimator/underestimator of dot quantities) characteristics, (2) kept the studies short (2-3 minutes), and (3) included no tasks other than the group assignment, an allocation task, and a measure of ingroup identification. Our three pilot studies were nearly identical, save for the method used to assigned participants to their groups (random vs. arbitrary). Analyses revealed that neither the pattern of results nor effect sizes differed between these three studies, so in order to increase statistical power (Goh, Hall, & Rosenthal, 2016; Lakens & Etz, 2017) and provide a more accurate estimate of effect sizes (Braver, Thoemmes, & Rosenthal,

2014), we collapsed across these studies and present the combined results below. We preregistered our predictions for Studies 2 and 3. All data, materials, syntax, and preregistration documentation are available at https://osf.io/jxsgw/?view_only=1b1994774989419eac3be214fce974f7.

Method

Participants. We collected 1,001 participants from Mechanical Turk (49.7% women, 50.3% men; mean age = 37.23; Pilot 1 N = 201, Pilot 2 N = 400, Pilot 3 N = 400).

Procedure. After providing informed consent, participants were assigned to their minimal groups. In Pilots 1 and 2, participants were randomly assigned to either the Green Team or the Blue Team (Rabbie & Horwitz, 1969). Because explicitly random team assignment has been less commonly used in past research (Brewer, 1979; Diehl, 1990), in Study 3, we used a modified version of a more established paradigm (Tajfel, Billig, Bundy, & Flament, 1971; Spears & Otten, 2012) in which participants completed a short dot estimation task and then were assigned to teams based, ostensibly, on whether they underestimated or overestimated the correct number of dots in the task (in fact, group assignment was random).

After the group assignment, participants completed an attention check asking them to indicate the team to which they had been assigned (see OSF page for a full list of all materials and measures). Following this, they completed a novel allocation task created for the purposes of this study, in which they were asked to distribute $.50 between one randomly selected member of their ingroup and one randomly selected member of the outgroup.[2] Following the allocation task, participants indicated their level of identification with their ingroup using a single-item measure of group identification: "I identify with [group name]", measured on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale (Postmes, Haslam, & Jans, 2013; see also Gagnon & Bourhis, 1996). They next reported their age and gender and then indicated their political orientation on a 1 (*extremely liberal*) to 9 (*extremely conservative*) scale.

[2] The typical minimal groups allocation measure is the "Tajfel matrices" (Diehl, 1990; Spears & Otten, 2012). However, this measure is both time-consuming and relatively complex (Brewer, 1979). Because we wished to keep this study as short and as "minimally" involved as possible, we therefore used this novel measure instead. However, we note that this measure has not been widely used or validated in past research

In Pilot 3, participants also rated their degree of *social and cultural* conservatism, in addition to their global liberal-conservative orientation. Additionally, because our other studies only asked participants to report their identification with ingroup members, in one study (Pilot 2), we also asked them to indicate their identification with the outgroup, so that we could ensure that any observed ideological differences in identification were indeed indicative of greater ingroup favoritism, rather than a tendency to report greater identification on this measure in general.

Results

Following our preregistered analysis plan, we excluded 46 participants (4.6%) who failed the attention check by inaccurately identifying the group to which they belonged. In keeping with past research (e.g., Brandt, Evans, & Crawford, 2015), we calculated ideological extremity by "folding over" the political orientation scale in order to measure distance from the midpoint (such that 1 and 9 were coded as 4; 2 and 8 as 3; 3 and 7 as 2; 4 and 6 as 1; and 5 as 0), resulting in a 5-point scale of extremity.

Descriptive statistics. The distribution of political orientation (M = 4.25, SD = 2.26) exhibited a liberal skew, but measures of normality indicated that it was acceptably normally distributed (*skewness* = .28, *excess kurtosis* = -.88; West et al.). However, in line with our expectations, even among this (relatively less skewed) sample, there were nonetheless significant ideological differences in ideological extremity, with political liberals (those below the midpoint of the ideology scale; N = 493), on average, being relatively more extreme than political conservatives (those above the midpoint of the ideology scale; N = 259; independent samples t-test: $t(750) = 5.02$, $p < 0.001$, 95% CI of mean difference [.25,.56])

Minimal intergroup bias. Consistent with past work (Brewer, 1979; Diehl, 1990; Spears & Otten, 2012), despite the minimal nature of the task, participants nonetheless exhibited significant levels of ingroup favoritism overall. They showed relatively high levels of identification with their minimal ingroup (M = 5.23; significantly higher than 4, the neutral midpoint of the scale; one sample t-test: $t(950) = 98$, $p < .001$; Figure 1). They also allocated significantly more of the $.50 to their ingroup ($M$ = $.31; one-sample t-test, compared to a $.25 even split: $t(950) = 18$, $p < .001$). Further, although an even split was the modal response (62.3% of all responses), when participants chose to allocate an uneven amount, they overwhelmingly did so in favor of their ingroup (94.7% of unequal allocations; Figure 2). Ingroup identification

was significantly correlated with allocations to the ingroup at $r = .33$ ($p < .0001$), demonstrating that individuals who felt more identified with their minimal ingroups tended to favor their ingroup (vs. the outgroup) in their allocations of the financial resources.

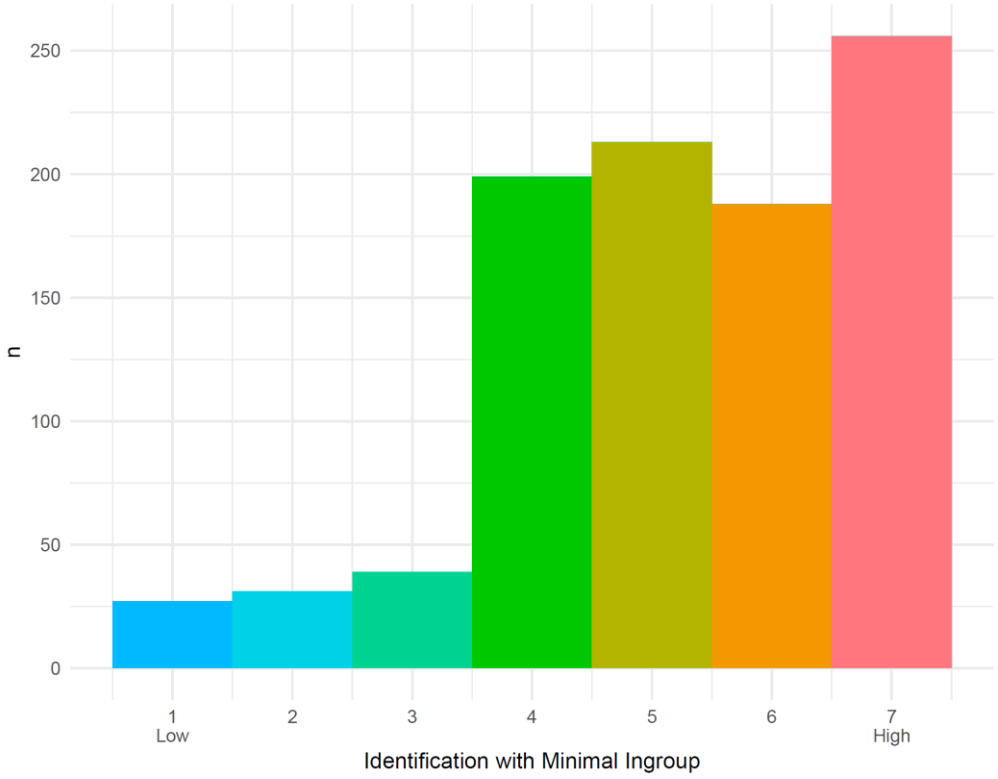

Fig. 1 | Histogram of identification with minimal ingroup. Higher numbers indicate greater ingroup identification.

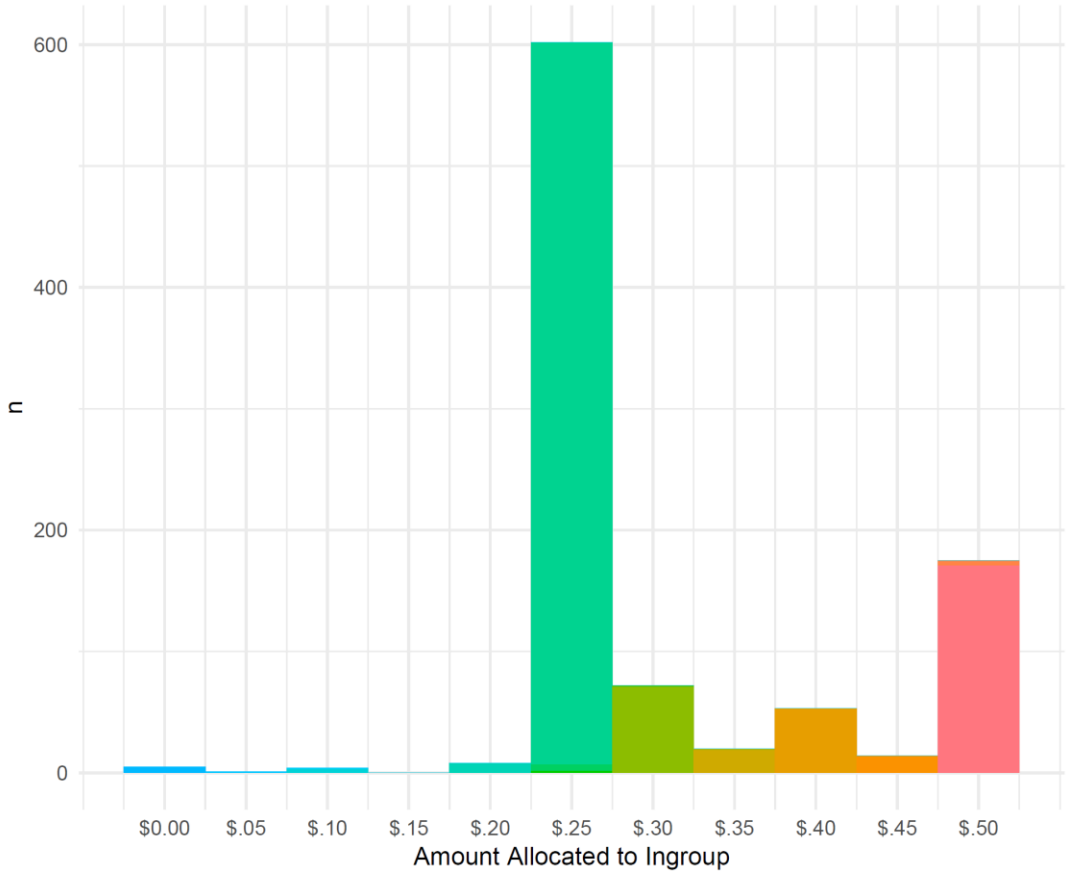

Fig. 2 | Histogram of amount of money allocated to ingroup. Ranging from $0.00 (allocating the full $.50 to the outgroup) to $.50 (allocating $0.00 to the outgroup), with $.25 representing an even split between ingroup and outgroup.

Political ideology and minimal intergroup bias.

Identification: As predicted, conservative participants exhibited greater identification with their minimal ingroups: Dividing the sample into liberals (n = 493) and conservatives (n = 259) revealed that political conservatives exhibited significantly greater mean levels of ingroup identification (M = 5.46, SD = 1.33) than did political liberals (M = 5.10, SD = 1.64; independent samples t-test: $t(624.12) = 3.23$, $p = .001$, unequal variances). Regressing identification onto the continuous measure of ideology, we found that greater political conservatism was associated with greater ingroup identification ($\beta = .09$, $t(950) = 2.63$, $p = .009$). Additionally, in Pilot 2, we verified that these results did not differ if an ingroup minus outgroup identification difference score was used (ideology x measure type interaction: $p = .36$), demonstrating that these results

truly reflect a *preference for ingroups over outgroups* rather than a general tendency for conservatives to rate identification with all groups higher.

Allocation. Interestingly—and contrary to our predictions—the same pattern of results was not observed using our allocation measure. There was no significant relationship between the continuous measure of conservatism and allocations to the ingroup (β = 0.03, $t(949) = 0.79$, p = .43) and no significant mean differences in allocations to the ingroup between liberals (M = \$.307, SD = .099) and conservatives (M = \$.313, SD = .109; $t(481.61) = 0.78$, p = .44, unequal variances).

However, given that a clear majority of participants (62%) simply chose to give an even split (\$.25 to the ingroup and \$.25 to the outgroup; Figure 1), this may have minimized our ability to detect an effect. In exploratory analyses, we recoded allocation responses to indicate whether the participant gave an even split (coded as "0") versus allocated an unequal amount to the ingroup and outgroup (coded as "1"). These analyses provided tentative support for our predictions, with conservatives (n = 259) showing a non-significant, but directional trend towards more unequal (vs. equal) allocations compared with liberals (n = 493) (Pearson Chi-Square X(1,752) = 2.78, p = .095).

Exploratory analyses: The effect of ideological extremity. We also tested our prediction that ideological extremity might independently contribute to minimal ingroup favoritism. To test this question, we conducted regression analyses in which both ideology (liberal vs. conservative) and ideological extremity (weak to extreme) were included as predictors. We examined the associations between these two predictors and both ingroup identification and ingroup allocations.

On the measure of ingroup identification, we found tentative support for our predictions, with greater ideological extremity marginally predicting greater ingroup identification (β = .08, $t(749) = 1.73$, p = .08. As predicted, with extremity in the model, ideology remained a significant predictor of identification (β = .11, $t(750) = 3.04$, p = .003). Further, there was no significant interaction between political orientation and ideological extremity (p = .87), revealing that the effect of ideological extremity exerted a similar influence on minimal ingroup identification among both liberals and conservatives. On our allocation measure, we found null effects of extremity and ideology, and no significant interaction of the two (ps > .21).

Thus, as predicted, it appears that ideological extremity, too, may be associated with greater ingroup favoritism, at least on some measures. Because liberals and conservatives differed in their mean levels of ideological extremity, this extremity effect exerted a countervailing force on minimal group identification, partially obscuring the effect of conservatism. Indeed, when controlling for ideological extremity, conservatism not only remained a significant predictor of identification, but this relationship actually became slightly stronger (without extremity covariate: $\beta = .11$, $t(750) = 3.04$, $p = .003$; with extremity covariate: $\beta = .12$, $t(749) = 3.3$, $p = .001$; Figure 3).

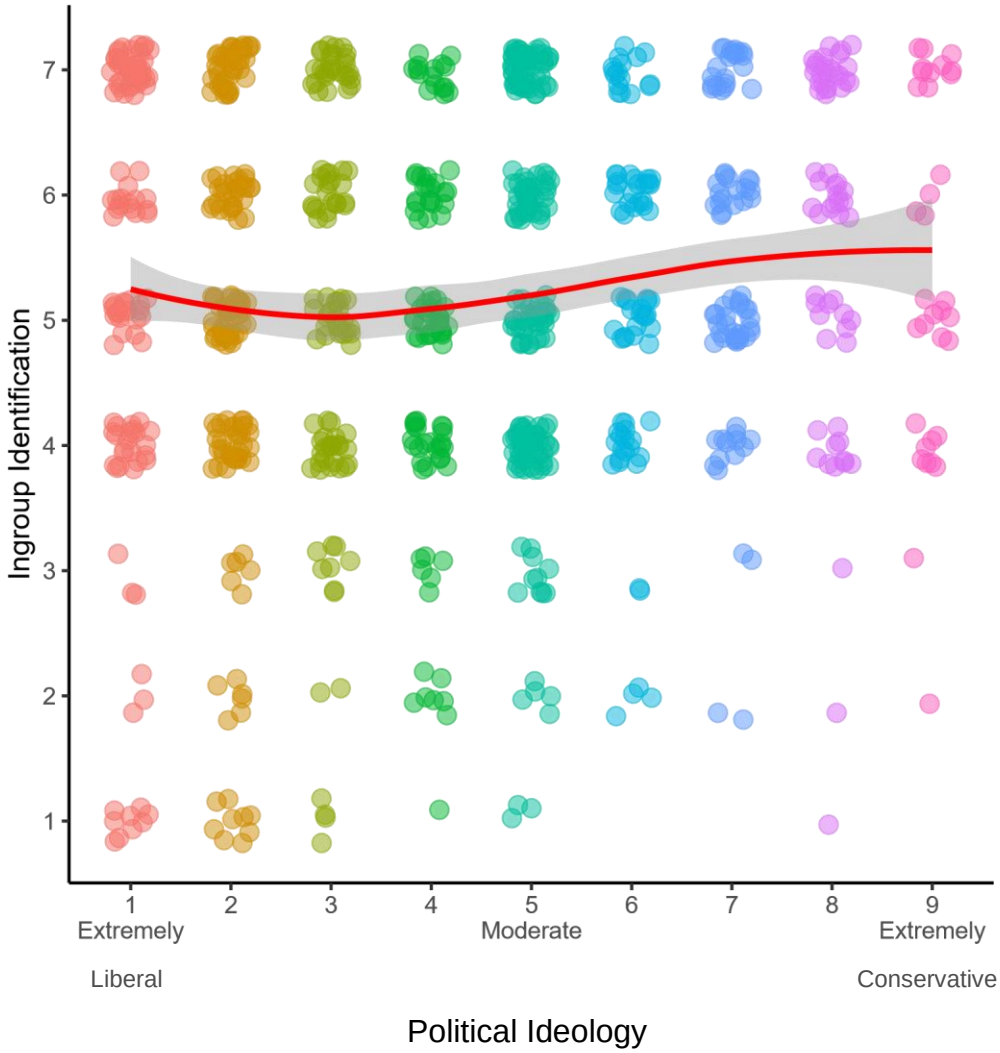

Fig. 3 | Relationship between political ideology and ingroup identification. Loess smoothing line (with 95% confidence interval) reveals the sinusoidal pattern arising from the independent effects of both political conservatism (versus liberalism) and ideological extremity.

Discussion

The results of these pilot studies provide some preliminary support for the existence of ideological differences in ingroup favoritism. Conservatives exhibited significantly greater identification with their minimal ingroup. Further, although there were no ideological differences in the mean amount allocated to the ingroup (versus outgroup), there was a directional trend towards more conservative participants being more likely to choose unequal (versus equal) allocations. Additionally, these studies also provided some tentative support for the possibility that ideological extremity may also predict greater minimal intergroup bias. This countervailing effect of extremity may help to explain why past research has failed to reliably find differences in ingroup favoritism between liberals and conservatives.

However, many outstanding questions remain, such as whether and to what degree these ideological differences might manifest on other measures of intergroup bias—including more established measures of resource allocation. Given that ingroup identification has been shown to be a powerful predictor of many forms of minimal ingroup favoritism (Branscombe et al., 1993; Branscombe & Wann, 1994; Gagnon & Bourhis, 1996; Sidanius et al., 1994), including intergroup bias on evaluative measures (e.g., warmth/liking and trait ratings), as well as established allocation measures (e.g., the Tajfel matrices), conservatives' greater identification with their ingroup suggests that they may exhibit other forms of ingroup favoritism as well. In the proposed research, below, we provide a more systematic examination of this question using a range of validated outcome measures.

Additionally, it is noteworthy that the association between conservatism and ingroup identification, although statistically significant, is a rather small effect. This may indicate that true ideological differences in ingroup favoritism are indeed quite small, or it may reflect other features of our study, such as the particularly minimal nature of our research design, or factors related to our participant sample (e.g., the use of participants who have completed hundreds if not thousands of psychological studies; Chandler, Mueller, & Paolacci, 2014) and who may be

generally less susceptible to a minimal groups manipulation). In our proposed research, we include a range of different paradigms and target groups in order to better understand the true nature and size of this effect, as well as to examine whether it may be amplified or attenuated under different conditions.

Proposed Research

In this proposed research, we will conduct a series of five studies that systematically build on the preliminary findings of our pilot studies in order to more conclusively determine whether there are ideological differences in minimal intergroup bias. We examine these effects using three different types of outcome measures: ingroup identification, evaluative ratings (liking/warmth and trait ratings on dimensions such as intelligence and competence), and allocations. Further, we systematically manipulate other relevant features of the intergroup environment (e.g., intergroup competition and group relevance), in order to understand the factors that may moderate the degree to which these effects emerge. Finally, we examine multiple possible mediators of this effect in order to understand the psychological mechanism(s) that may underlie any ideological differences in ingroup favoritism, as well as to adjudicate between competing theories regarding the nature of the liberal-conservative divide.

Studies 1A-1C

In Studies 1A through 1C, we will build on our pilot studies in three central ways. First, we will conceptually replicate these results using three distinct samples (Mechanical Turk participants, university students, and a community sample) in order to examine the generalizability of these effects. Second, we will use a more engaging and better-validated minimal groups paradigm (a longer form of the overestimator/underestimator task from Pilot 3, which yielded the strongest effects in our pilot studies). Because research and theory suggest that ideological differences in ingroup favoritism may emerge more strongly for social groups that are perceived to be more meaningful (e.g., Haidt, 2012), we anticipate that this paradigm will amplify ideological differences in minimal group favoritism. Third, we will include three distinct outcome measures: ingroup identification, trait evaluations, and an empirically validated allocation task. This will give us a more complete understanding of how ideological differences in ingroup favoritism may manifest.

Our allocation measure in these studies will be the Tajfel matrices (Tajfel et al., 1971), a measure that has been widely used and well-validated in past research (e.g., Bourhis & Gagnon,

2001; Bourhis, Gagnon, & Sachdev, 1997; Bourhis, Sachdev, & Gagnon, 1994; Brewer, 1979; Brown, Tajfel, & Turner, 1980; Diehl, 1990; Otten, 2016; Spears & Otten, 2012; Turner, 1983). This measure asks participants to choose between payoff matrices that award differing amounts of points (which correspond to different sums of money) to members of their ingroup and the outgroup. These matrices capture both individual differences in general ingroup favoritism in allocation, as well as more fine-grained distinctions among four types of intergroup reward strategies: Maximum Ingroup Profit (MIP; giving the maximum amount to the ingroup, regardless of the amount awarded to the outgroup); Parity (P; distributing equal amounts to both groups); Maximum Differentiation (MD; maximizing the positive difference in points between ingroup and outgroup members); and Maximum Joint Profit (MJP; maximizing the total amount distributed, independent of the target group; Bourhis et al., 1994; Tajfel et al., 1971).

The design of Studies 1A-1C will be identical save for the specific participant sample used. This will allow us to more conclusively determine whether these three samples meaningfully differ, as well as to analyze the combined dataset to gain additional statistical power to detect small effects.

Participants. Based on past research and theory suggesting that ideological differences should emerge more strongly for more meaningful groups, as well as our pilot studies, which yielded somewhat stronger effects when non-random group assignment (i.e., the overestimator/underestimator paradigm) was used, we base our target sample sizes on 95% power to detect an effect of $r = .15$. In line with this analysis, we will set a target sample size of 472 participants for each study. The combined sample from these three studies ($N = 1{,}416$) will give us 99.99% power to detect an effect of $r = .15$, and 96% power to detect an effect of $r = .11$ (the effect size observed in our overestimator/underestimator pilot study).

For Study 1A, we will recruit participants from Mechanical Turk. For Study 1B, we will recruit students from the psychology department research participant pools at Cornell University and Ohio State University. For Study 1C, we will recruit participants from four shopping malls (two in upstate New York and two in central Ohio).

Design. After providing informed consent, participants will be assigned to their minimal groups based on the dot estimation paradigm used in the original minimal groups studies (Tajfel, 1970; Tajfel et al., 1971) and much subsequent research (Brewer, 1979; Otten, 2016). Participants will first complete a task in which they will view images consisting of random

constellations of small black dots and will be asked to estimate the number of dots in each image. Each image will be presented for 500 milliseconds, after which participants will make their estimate. There will be 20 images in total. After the estimation task, participants will be informed about the (ostensible) nature of the groups. They will be told that past research has found that when estimating quantities, some people tend to consistently underestimate, while others tend to consistently overestimate. They will be informed that although these two groups do not differ in their degree of accuracy in these tasks, these individual differences appear to be relatively stable, and researchers suspect that they may correlate with other aspects of personality as well.

After receiving this information, participants will be informed of the group to which they belong, either Underestimators or Overestimators (group assignment will in fact be random). Participants will then complete a short "personality test," ostensibly with the purpose of identifying personality differences between Underestimators and Overestimators. The test will consist of 10 questions that are designed to appear meaningful (but to nonetheless lack any easily discernible significance; Budner, 1962). Participants will then complete our three dependent measures, which will be presented in random order:

Evaluative Trait Ratings: Participants will be asked to provide their trait ratings of Underestimators and Overestimators, ostensibly for the purpose of assessing lay perceptions of how the two groups might differ (Brewer, Manzi, & Shaw, 1993). To this end, participants will be asked to rate both groups on a number of traits. There will be 10 traits in total, five negative (e.g., lazy, selfish) and five positive (e.g., intelligent, kind). Participants will be asked to rate how they think that both Underestimators and Overestimators would score on each trait, using 7-point semantic differential scales.

Ingroup Identification: Participants will report their identification with both the ingroup and the outgroup, using a single-item measure of group identification (Postmes et al., 2013).

Tajfel Matrices Allocation Task: Participants will complete a task in which they will (ostensibly) assign points to other randomly selected participants from the study, one ingroup member and one outgroup member. The other individuals will be identified only by an anonymous identification number. Each point in the task will be said to correspond to $.10, to be distributed at the end of the study. Participants will be presented with the 6 Tajfel matrices that have been most commonly used in past research, consisting of different relative ingroup/outgroup allocations (Bourhis et al., 1994). For each matrix, they will be asked to choose

the distribution of points that they prefer (the first pair of matrices compares Ingroup Favoritism (FAV = Maximum Ingroup Profit + Maximum Differentiation) versus Parity (P; equal amounts to ingroup and outgroup); the second pair compares FAV versus Maximum Joint Profit (MJP), and the third pair compares Maximum Differentiation (MD) against Maximum Ingroup Profit (MIP) + Maximum Joint Profit (MJP). See Table 1.

Finally, participants will complete an attention check question in which they will be asked to identify the group to which they belong. They will then indicate their political orientation using the same item from our pilot studies, complete measures of RWA (The Authoritarianism-Conservatism-Traditionalism Scale; Duckitt & Bizumic, 2013) and SDO (the SDO-7 scale; Ho et al., 2015), and then provide demographic information.

Matrix Type A.1: FAV (MIP + MD) vs. MJP strategies opposed (O).

Points to Underestimator Group Member	19	18	17	16	15	14	13	12	11	10	9	8	7
Points to Overestimator Group Member	1	3	5	7	9	11	13	15	17	19	21	23	25

Matrix Type A.2: FAV (MIP + MD) vs. MJP strategies together (T).

Points to Underestimator Group Member	25	23	21	19	17	15	13	11	9	7	5	3	1
Points to Overestimator Group Member	7	8	9	10	11	12	13	14	15	16	17	18	19

Table 1 | Sample Tajfel Matrix. From the perspective of an Underestimator, such that numbers in the top row represent the allocation to an ingroup member, and numbers in the bottom row represent the allocation to an outgroup member. This matrix pair assesses the relative "pull" of "FAV" (Maximum Ingroup Profit + Maximum Differentiation) versus Maximum Joint Profit (Bourhis et al., 1994; Turner, 1978).

Analysis Plan.

***Calculation of Intergroup bias*:** Ingroup identification will be calculated by subtracting the difference between participants' rated identification with their outgroup from their rated identification with their ingroup. Evaluative intergroup bias will be defined as the difference between mean positivity towards the ingroup and mean positivity towards the outgroup on the

trait ratings (with negative trait ratings reversed scored). Finally, a simple difference score between the number of points allocated to the ingroup minus the number allocated to the outgroup (Brewer, 1979) will serve as our primary measure of intergroup bias. Additionally, we will calculate "pull scores" to quantify the relative preferences for each of the intergroup strategies described above (MIP, P, MJD, and MD), following the procedure outlined by Brown and Bourhis (1978; see also Bourhis et al., 1994; Turner, 1978).

Main hypothesis testing.

Hypothesis 1: We predict that political ideology will be associated with greater ingroup favoritism on each of the three dependent measures. We will use linear regression to test these hypotheses. In each analysis, political ideology will be entered as the independent variable, and one of our three outcome measures will be entered as the dependent variable: 1) ingroup identification, 2) evaluative intergroup bias, and 3) ingroup favoritism in allocation. We will consider our hypotheses supported if this relationship is positive (such that greater conservatism is associated with greater ingroup favoritism) and statistically significant at $p = .05$ or below.

***Hypothesis 2*:** We predict that ideological extremity, when adjusting for conservatism, will be associated with greater ingroup favoritism on each of the three dependent measures. We will use linear regression to test these hypotheses. In each analysis, 1) ideological extremity and 2) ideology (dummy-coded "0" for liberals and "1" for conservatives) will be entered as predictors, and one of our three outcome measures will be entered as the dependent variable: 1) ingroup identification, 2) evaluative intergroup bias, and 3) ingroup favoritism in allocation. We will consider our hypotheses to have been supported if this relationship is positive (such that greater ideological extremity is associated with greater ingroup favoritism) and statistically significant at $p = .05$ or below.

Moderation analyses. We will also examine whether the size or nature of these effects differ meaningfully as a function of the specific sample (i.e., university student, Mturk worker, community). We will combine the three datasets, adding sample type as a categorical moderator variable. We will then examine the interaction between sample type and ideology on each of our three ingroup favoritism measures. If these interactions are not significant, we will conclude that the size and nature of the relationship between ideology and minimal intergroup bias does not differ meaningfully as a function of the specific sample chosen. If there is a significant

interaction, we will conduct simple slopes analyses to examine the nature of these differences (e.g., to determine whether one sample differs from the other two, or whether the effects in all three samples are meaningfully different).

Equivalence testing. Because non-significant results are not necessarily sufficient to conclude that an effect truly does not exist (i.e., "absence of evidence is not evidence of absence," e.g., Altman & Bland, 1995), we will conduct an inferiority test on any measures that show no ideological differences in ingroup favoritism, following the recommendations of Lakens, Scheel, and Isager (2018). This form of equivalence test examines the probability that—given an observed effect size—there exists a true effect in the population that is at least as large as the *smallest effect size of interest* (SESOI; Lakens et al., 2018). We will define the smallest effect size of interest as a correlation of $r = .1$, following past research that has argued that smaller effects are unlikely to have meaningful real-world impacts (Maxwell, Lau, & Howard, 2015). In line with these arguments, we expect that this is the smallest effect that could realistically be expected to lead to practically significant ideological differences in intergroup attitudes or behavior in the real world.

To test this question, we will calculate the 90% confidence interval around the observed correlation between conservatism and ingroup favoritism on each of our three primary dependent measures. If this interval does not include (or exceed) .1, we will conclude that the effect of ideology on that measure of ingroup favoritism either does not exist or is too small to be of any practical importance (Lakens et al., 2018).

Exploratory analyses: Ingroup favoritism versus outgroup bias. If significant associations are observed between ingroup identification and ideology and/or ideological extremity, we will conduct exploratory analyses separately examining identification with the ingroup vs. (de-)identification with the outgroup, in order to understand whether ingroup favoritism or outgroup derogation (see Brewer, 2007) is primarily driving this effect.

Study 2

In Study 2, we will build on the previous results by examining potential moderators and mediators of this effect to make two central contributions: First, we will manipulate the nature of the minimal groups—whether they are formed randomly, by volition, or based on (ostensible) attitudinal similarity—in order to determine whether group type moderates the size of the effect

between conservatism and ingroup favoritism. Because past research and theory suggests that ingroup-favoring cognition and behavior should emerge more strongly for more meaningful groups, we predict that ideological differences in intergroup bias should be larger when the groups are personally chosen or based on similarity.

Second, we will examine the potential mechanism(s) underlying these effects, drawing from several influential theories of conservatism. We will focus on three possible mechanisms:

(1) Ingroup-protective moral values. Work on moral foundations theory has argued that conservatives more strongly endorse ingroup-protective moral values, such as loyalty towards one's own social groups (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007). To the degree that this is true (cf. Schein & Gray, 2015; Voelkel & Brandt, 2018), these moral values may lead conservatives to show greater favoritism to their minimal ingroups as well.

(2) Intolerance of uncertainty. One leading theory regarding the nature of the left-right divide is that political conservatism is related to fundamental psychological needs, such as epistemic needs to avoid uncertainty (Jost et al., 2003, 2017). Given that uncertainty avoidance has been shown to lead individuals to more strongly identify with their social groups—including minimal groups (Grieve & Hogg, 1999; Mullin & Hogg, 1998)—ideological differences in motivations to resolve or avoid uncertainty could explain conservatives' greater identification with their minimal groups.

(3) Social norms. Perceived social norms regarding the acceptability of ingroup favoritism play a strong role in shaping discrimination, both in minimal groups (e.g., Hertel & Kerr, 2001) and in the real world (Crandall & Eschleman, 2003). Past research has shown that many conservatives tend to view modern society as a competitive, "dog-eat-dog" world, expecting others to be more aggressive and to primarily look out for their own interests (Duckitt, Wagner, Du Plessis, & Birum, 2002). These findings suggest that conservatives may see outgroup derogation and ingroup favoritism as more normatively common and/or acceptable intergroup interaction strategies, which may shape their own responses in these tasks (cf. Wetherell et al., 2013).

Participants. To determine the sample size for this study, we will conduct a power analysis based on 95% power to detect either (a) an effect of the size observed in Studies 1A-1C or (b) $r = .1$, our smallest effect size of interest, whichever is larger. Participants will be recruited from Mechanical Turk.

Design. After providing informed consent, participants will complete the 10 personality test questions from Studies 1A-1C, as well as report their political ideology and complete the three measures assessing the three possible psychological mechanisms discussed above: (1) the three "binding foundation" subscales (loyalty, respect for authority, and purity) of the 30-item moral foundations questionnaire (Graham, et al., 2011); (2) the 15-item need for closure scale (a measure of intolerance of uncertainty; Roets & Van Hiel, 2011), and five questions assessing perceptions of the descriptive and prescriptive norms surrounding ingroup favoritism and intergroup bias (adapted from Paluck & Shepherd, 2012).

Participants will then be randomly assigned to one of three conditions, which will determine the method by which their minimal groups will be assigned. Participants in the Attitude-Similarity Group Condition will be assigned to either "The Blue Group" or "The Green Group," ostensibly based on the results of the personality test (group assignment will in fact be random; adapted from Gagnon & Bourhis, 1996). Participants in the Volitional Group Condition will be asked to choose the group to which they wish to belong, either Blue or Green. Participants in the Random Group Condition will be asked to click a button on their computer screen in order to generate a random number. Based on the number they receive, they will be assigned to either The Blue Group or The Green Group. Participants will then complete the three dependent measures from Studies 1A-1C: Ingroup identification, intergroup evaluations, and intergroup allocations, presented in random order. Finally, they will complete the attention check question from Studies 1A-1C and provide demographic information.

Analysis Plan. To test our primary hypotheses, we will follow the procedure outlined in Studies 1A-1C. In addition to these analyses, we will also examine whether minimal group type moderates the size of the relationship between ideology and ingroup favoritism.

To test for mediation, we will use the PROCESS macro for SPSS (Hayes, 2012). We will conduct separate mediation analyses for each of our three ingroup favoritism measures (identification, evaluations, and allocations). In each mediation analysis, political orientation will be entered as the predictor (X) variable, intergroup bias will be entered as the dependent (Y) variable, and our three proposed mediator variables (ingroup-protective morality, intolerance of uncertainty, and perceived norms) will be entered as the mediator (M) variables.

In exploratory analyses, we will also conduct moderated mediation analyses in order to determine whether the psychological mechanism explaining ideological differences in intergroup

bias may differ as a function of minimal group type (for example, loyalty may be more influential in determining favoritism towards more meaningful groups, but factors such as perceived norms regarding ingroup favoritism may play a stronger role for arbitrary groups).

Study 3

In our final study, we will build on our previous findings by examining an additional potential moderator and testing a possible boundary condition of this effect. First, we will examine whether ideological differences in intergroup bias differ as a function of whether the intergroup interaction is characterized as cooperative versus competitive. Theories of conservatism and related belief systems have argued that ideological beliefs are largely situationally dependent, becoming more salient or "activated" under conditions of intergroup competition of threat, and that they exert a stronger influence on cognition and behavior under these circumstances (e.g., Amiot & Bourhis, 2005; Reynolds et al., 2007). We therefore predict that ideological differences in intergroup bias will emerge more strongly under competitive (versus cooperative) intergroup conditions.

Second, in this study we will add a measure of implicit minimal group identification to examine the degree to which ideological differences in intergroup bias are automatic and uncontrollable (versus deliberative and controlled) in nature. Finding ideological differences in *implicit* minimal group favoritism would lend support to the perspective that ideological differences in intergroup favoritism may stem from low-level (perhaps even evolved) cognitive mechanisms that shape the importance and/or salience of the psychological distinction between "us" and "them" (Brown et al., 2016; Haidt, 2012; Kessler & Cohrs, 2008; Sinn & Hayes, 2017; Tuschman, 2013). Conversely, little or no ideological differences on implicit measures of ingroup identification would support the argument that liberals and conservatives do not differ in their degree of implicit negative associations with social outgroups, and that ideological differences in discrimination (to the degree that they exist) likely arise from more deliberative processes relating to attitudes towards engaging in explicitly discriminatory behavior (cf. Wetherell et al., 2013). Further, from a practical perspective, understanding the degree to which ideological differences in intergroup bias are automatic versus deliberative in nature may provide insight for the development of new methods of reducing intergroup bias, given their differing effects on intergroup behavior (e.g., Dovidio, Kawakami, & Gaertner, 2002).

Participants. We will recruit participants from Cornell University's and The Ohio State University's psychology department research participant pools. To determine the sample size for this study, we will conduct a power analysis based on 95% power to detect either (a) an effect of the size observed in the Random-Groups condition of Studies 1A-1C or (b) $r = .1$, our smallest effect size of interest, whichever is larger.

Design. Upon arriving at the lab, each participant will be led to a computer cubicle by a research assistant. The research assistant will inform the participant that there will be a short wait while other participants arrive (a cover story intended to further create the appearance that other people are simultaneously participating in the study). After approximately 5 minutes, the research assistant will return to the cubicle and begin the study.

After providing informed consent, participants will be assigned to their minimal groups. They will click a button on the screen in order to generate a random number. Based on this number, they will then be assigned to either the "The Red Group" or "The Green Group." All participants will then be informed that they will be completing a problem-solving task, and they will be shown three sample problems (mental rotation problems; Wexler, Kosslyn, & Berthoz, 1998) to familiarize them with the task. Participants will then receive further information about the structure of the problem-solving task, which will differ between participants by random assignment. Participants in the *No Interaction Condition* will be told that each person in the study will complete the problem-solving task independently and will be judged solely on the basis of their own work. They will be informed that any participant that meets the threshold will receive $5.00 at the end of the study. Participants in the *Cooperative Interaction Condition* will be informed that they will work together with the other members of their team. They will be informed that the scores of each member of their group will be added together, and that all group members will receive $5.00 if their group's combined score meets the threshold. Participants in the *Competitive Interaction Condition* will be told that their group will compete against the opposing group in the problem-solving task. They will be informed that the scores of each group member will be added together in order to determine which group received the higher overall score, and that each member of the winning group will receive a $5.00 reward.

Participants will then be informed that they will complete a few other tasks before the problem-solving task begins. First, they will be asked to familiarize themselves with the names of the individuals from both groups. They will be shown two lists of five names, ostensibly the

names of other individuals who belong to the green and red groups. Each list will consist of common American first names (e.g., Lisa, Daniel, Erin, Ryan). Participants will be given a few moments to look over the list, and then will complete a computer-based task in which they will memorize the names of the members of each group, following the procedure outlined by Pinter and Greenwald (2011). The task will consist of two blocks of 30 trials in which a single name will appear on the screen, and participants will be asked to assign it to the appropriate group.

Following this task, participants will then complete an Implicit Association Test (IAT: Greenwald, Nosek, & Banaji, 2003), designed to measure their implicit identification with their minimal group (Pinter & Greenwald, 2011). The IAT categories will be represented by the group names "Red" and " Green," and the stimuli for the trials will be the team members' names. The attribute categories will be "self" (I, me, mine, my, self) and "other" (other, their, theirs, them, they). Response latencies will be calculated following the recommendations of Greenwald and colleagues (2003), such that higher values indicate greater implicit identification with the ingroup (versus outgroup). Participants will then complete the three dependent measures from our previous studies, measuring (explicit) ingroup identification, intergroup evaluations, and intergroup allocations. They will then indicate their political orientation and provide demographic information.

Analysis Plan. Consistent with our previous studies, we hypothesize that conservatism will be associated with greater ingroup identification and, possibly, greater intergroup bias in allocations and evaluations. To test these hypotheses, we will follow the procedures outlined in Studies 1A-1C. We also predict that conservatism will predict greater *implicit* ingroup identification. To test this prediction, we will conduct a linear regression analysis with political orientation as the predictor variable and IAT D-score as the dependent variable. In addition to these analyses, we will also examine whether interaction type (independent vs. competitive vs. cooperative) moderates the size of the relationship between ideology and ingroup favoritism on each of the dependent measures outlined above. To test this, we will conduct regression analyses in which (a) interaction type, (b) ideology, and (c) their interaction are entered as predictor variables, and one of our outcome measures are entered as the dependent measure. For all analyses in which statistically significant results are not obtained, we will conduct inferiority tests following the procedures outlined in Studies 1A-1C.

Concluding Remarks

The five studies outlined above will build on the findings from our pilot studies to provide a comprehensive and well-powered test of the question of whether liberals and conservatives may generally differ in their degree of intergroup bias. This work will circumvent many of the complexities and confounds that have plagued past research by adopting a different methodological approach, grounded in social identity theory, that strips away the complex social information associated with real-world groups in order to assess the most basic forms of intergroup bias. This paradigm will also allow us to systematically manipulate features of the intergroup environment (e.g., cooperative versus competitive contexts) to determine when these ideological differences may emerge most strongly, as well as allow us to identify the specific dimensions of intergroup bias (e.g., identification, evaluation, resource allocation) on which liberals and conservatives do—and do not—differ. Additionally, this research will also provide a possible means of reconciling the apparent inconsistencies of past work by testing whether ideological *extremity*, in addition to ideology, may independently predict intergroup bias. Taken together, we believe that this research has the potential to shed new light on the nature of the ideological divide, generate exciting new directions for future research, and help to advance this longstanding theoretical debate.

Project Timeline

We anticipate completing this project approximately 10 months after stage 1 acceptance:

Month	M1		M2		M3		M4		M5		M6		M7		M8		M9		M10	
Week	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
IRB Amendment	S1 S2 S3	S1 S2 S3																		
RA Training	S1B	S1C	S1C					S3	S3											
S1A-1C: Data Collection		S1A S1B	S1B S1C	S1B S1C	S1B S1C	S1B S1C	S1B S1C	S1B S1C	S1B S1C	S1C										
S1A-1C: Analyses			S1A	S1A				S1B	S1B S1C	S1B S1C	S1C									
S2: Data Collection										S2	S2									
S2: Analyses											S2	S2								
S3: Data Collection										S3	S3	S3	S3	S3	S3	S3	S3	S3		
S3: Analyses																S3	S3	S3	S3	
Prep Materials for OSF Site	S1 S2 S3			S1A	S1A				S1B	S1B S1C	S1C	S2	S2				S3	S3	S1 S2 S3	S1 S2 S3
Manuscript Preparation			S1A	S1A	S1A			S1B	S1B S1C	S1B S1C	S1B S1C	S2	S2	S2	S3	S3	S3	S1 S2 S3	S1 S2 S3	S1 S2 S3

*Red cells indicate the expected periods during which each task will be performed. Gray cells indicate additional time allotted to account for uncertainty

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