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Abstract

Social group identity plays a central role in political polarization and inter-party conflict. Here, we use ambiguously valenced faces to measure bias in the processing of political ingroup and outgroup faces, while also accounting for interparty differences in judgments of emotion at baseline. Participants identifying as Democrats and Republicans judged happy, angry, and surprised faces as positive or negative. Whereas happy and angry faces convey positive and negative valence respectively, surprised faces are ambiguous in that they readily convey positive *and* negative valence. Thus, surprise is a useful tool for characterizing valence bias (i.e., the tendency to judge ambiguous stimuli as negative). Face stimuli were assigned to the participants' political ingroup or outgroup, or a third group with an unspecified affiliation (baseline). We found a significant interaction of facial expression and group membership, such that outgroup faces were judged more negatively than ingroup and baseline, but only for surprise. There was also an interaction of facial expression and political affiliation, with Republicans judging surprise more negatively than Democrats across all group conditions. However, we did not find evidence for party differences in outgroup negativity. Our findings demonstrate the utility of judgments of surprised faces as a measure of intergroup bias, and reinforce the importance of outgroup negativity (relative to ingroup positivity) for explaining inter-party biases.

Keywords: polarization, emotion, social perception, intergroup bias, political party, ambiguity

Before casually revealing your political views in an unfamiliar setting, it may be wise to consider the risks. If your listeners agree with you, this exchange may have a positive impact, signaling to them that you belong. However, if your listeners happen to hold dissimilar views, a small but revealing remark may be enough to hurt your rapport. Research on political groups in the United States shows that discourse across party lines and ideological camps is likely to elicit strong negative feelings (Iyengar & Westwood, 2015; Mason, 2015; Brandt et al., 2014). Even when political views are not central to an interaction, negative attitudes towards members of a political outgroup (based on party membership or ideology) may influence perceptions more broadly. For example, political outgroup members are less desirable both as romantic partners and employees (Iyengar et al., 2019; Iyengar & Westwood, 2015), and looking at pictures of outgroup politicians is enough to evoke a negative emotional response (Kaplan, Freedman, & Iacoboni, 2007). The impact of political partisanship in the United States may, in certain avenues, even rival or exceed that of race (Brandt et al., 2014), engendering more divisiveness (Iyengar et al., 2012) and discrimination (Iyengar & Westwood, 2015). This suggests that a full understanding of American political partisanship requires us to consider the psychological impact of membership in a political group and the ways in which this membership shapes individuals' social identity (Iyengar et al., 2012; Mason, 2015, 2018; Tajfel & Turner, 1986).

Like other kinds of social groups (Tajfel & Turner, 1986), the mere application of membership labels in political groups may be sufficient to give rise to bias. Research among non-political groups has shown that even when group membership is assigned at random (i.e., in a minimal group paradigm), individuals exhibit bias based on their arbitrary membership (Otten, 2016; Tajfel & Turner, 1986). While some have suggested that intergroup bias is primarily driven by preferential attitudes towards one's ingroup (i.e., ingroup enhancement/favoritism;

Brewer, 2017), political intergroup bias in the United States may be driven by negative behaviors/attitudes directed at outgroup members (Iyengar et al., 2019; i.e., outgroup derogation/discrimination). Indeed, partisans in the United States commonly cite negative impacts of "the other party's policies" as a major reason for their chosen partisan identity/leaning (Pew Research Center, 2016). In other words, party allegiance may have more to do with negative feelings towards the opposing party rather than positive feelings towards one's own party (Abramowitz & Webster, 2016). Moreover, the Republican and Democratic parties are becoming increasingly dissimilar in their ideology (Mason, 2015), policy (Grossmann & Hopkins, 2015), and demography (Finkel et al., 2020). The impact of this widening rift can be felt in the current atmosphere of intense partisan animosity and distrust, with more people viewing the other party's policies as a "threat to the nation's well-being" (Pew Research Center, 2016). Thus, rather than being motivated by loyalty to their group, the aversive prospect of being subject to the will of an antithetical opponent may be a strong driver of political intergroup bias in the United States.

In addition to impacting interpersonal attitudes (e.g., engendering disliking of outgroup members), intergroup bias can be detected in individuals' judgments of others' emotions. For example, recent work using a minimal group paradigm has shown that facial expressions are judged more positively when belonging to an ingroup member compared to an outgroup member (Lazerus et al., 2016). In fact, individuals were more likely to make positive judgments of ingroup faces (relative to outgroup faces) even when viewing a negative facial expression. Importantly, this bias toward judging ingroup affect as positive is conceptually distinct from other intergroup biases in interpersonal perception (e.g., a bias towards ascribing more positive *traits* to ingroup members relative to outgroup members). Nonetheless, given that trait

judgments, like trustworthiness, are highly related to valence judgments (Todorov, 2008), we may expect that the extent to which intergroup attitudes and perceptions are more strongly driven by ingroup versus outgroup bias should be mirrored in judgments of emotion for ingroup and outgroup facial expressions. Specifically, aforementioned findings showing a more dominant role for outgroup derogation/discrimination (rather than ingroup enhancement/favoritism) in driving political intergroup bias in the United States may suggest that partisans' tendency to interpret outgroup emotion as negative will be stronger than their tendency to interpret ingroup emotion as positive. Such an effect would suggest that the tendency for outgroup bias to take primacy in partisan attitudes extends to the domain of emotion perception.

The impact of political intergroup bias on affective processing may be exacerbated when a facial expression is inherently ambiguous (i.e., the expression is associated with more than one emotional meaning). For example, while some expressions convey a relatively clear positive (e.g., happy) or negative (e.g., angry) meaning, a surprised face is ambiguous in that it can be elicited in response to a positive (e.g., an unexpected visit from an old friend) or a negative event (e.g., witnessing a robbery). While the effect of emotional ambiguity in the context of intergroup bias is unclear, some have suggested that interpretations of ambiguous facial expressions may skew in the direction that confirms or justifies pre-existing beliefs and attitudes (Harp et al., 2021; Pauker et al., 2010). If so, responses to such expressions could offer unique leverage to detecting intergroup bias; we would expect interpretations of an ambiguous facial expression (e.g., a face expressing surprise) to lean more positive when conveyed by an ingroup member, and perhaps to a greater degree, to lean more negative when conveyed by an outgroup member.

Comparing responses to ambiguous facial expressions across political groups can also reveal whether intergroup bias is exacerbated by individual differences in the baseline tendency

to interpret ambiguous facial expressions as negative (i.e., valence bias). Responses to emotional ambiguity exhibit trait-like individual differences – some individuals have a negative valence bias and are consistently drawn to negative interpretations, while others have a positive valence bias and are consistently drawn to positive interpretations (Neta et al., 2009; Harp et al., 2022). Notably, U.S.-based conservatives, compared to liberals, are more sensitive to negative stimuli (Hibbing et al., 2014), and show higher levels of several factors that can contribute to a more negative valence bias (e.g., need for closure, intolerance for ambiguity; Hibbing et al., 2014; also see Fournier, Soroka & Nir, 2020). Thus, measuring and controlling for these preexisting differences is essential to isolating the effect of perceived group affiliation on shifting one's baseline valence bias when judging ambiguous emotions of political ingroup and outgroup members.

The present work examines the effect of others' group affiliation (i.e., ingroup/outgroup members) and one's own political party identification (i.e., Republican/Democrat) on interpretations of emotional ambiguity. To this end, participants viewed uncategorized (i.e., baseline), ingroup, and outgroup faces, and judged them as positive or negative. It was expected that participants' perceptions of the emotional expressions would be influenced by the group affiliation of the faces, displaying patterns of both ingroup positivity and outgroup negativity. More specifically, it was hypothesized that:

H1. Participants will judge ingroup surprised faces as more positive than uncategorized faces (ingroup positivity).

H2. Participants will judge outgroup surprised faces as more negative than uncategorized faces (outgroup negativity).

We also expected to replicate previously documented findings showing that Republicans are more likely than Democrats to arrive at negative interpretations of ambiguously valenced stimuli (Hibbing et al., 2014). Thus, we hypothesized that:

H3. Republicans will judge surprised faces more negatively than Democrats.

Finally, we planned to follow up on any observed differences in judgments of surprise by examining the extent to which participants were attracted to the unselected response option – i.e., the extent to which participants experienced "response competition" when making their judgments. To that end, we planned to look at the Maximum Deviation (MD) of mouse trajectories, which index attraction towards the competing response option when making these judgments. Specifically, we explored post-hoc hypotheses probing the extent to which MD differences across positive and negative judgmnts of surprise (which have been observed in past studies; Brown et al., 2017; Neta, Berkebile, & Freeman, 2021) might interact with group affiliation and participants' party identification.

Method

Participants

Target sample size was initially set at 100 (50 Republicans and 50 Democrats), then raised to 120 to correct for unbalanced group sizes and neutrally affiliated participants (see below). This sample size and adjustment were determined before any data analysis. We recruited 119 student participants through the Psychology Department's undergraduate student subject pool using online postings and text/email invitations. Seven participants were excluded because they did not believe the experimental manipulation, and 17 additional participants were excluded for expressing a neutral political affiliation (see details under Questionnaires). There were no other exclusions to report in this study. The final sample comprised 95 participants, ages 17-50

years (Republicans: M(SD) = 19.68(1.81); Democrats: M(SD) = 19.93(4.88); $t(59) = 0.31$, $p = 0.75$, $d = 0.07$)[1]. Participants included 42 Democrats (27 females; 35 strong, 7 leaning) and 53 Republicans (33 females; 36 strong, 17 leaning; see more details about party identification under Questionnaires). A sensitivity power analysis of difference between two means computed using G*Power ($\alpha = .05$, two-tailed) showed that, when collapsing across parties, this sample size provided adequate power (80%) to detect a small effect ($d = 0.29$).

Protocols were approved by the University of ------ Committee for the Protection of Human Subjects. The entirety of the study was conducted in the same private room at the University of ------, and each participant only saw/interacted with the researcher. Participants provided their written consent at the start of the session and were compensated for their time through course credit. All measures and manipulations are reported below and in sections 1-2 of the Supplementary Materials.

Stimuli

Face stimuli were obtained from the Umeå (72 faces, Samuelsson et al., 2012), NimStim (28 faces, Tottenham et al., 2009), and Karolinska Directed Emotional Faces (20 faces, Goeleven et al., 2008) databases, and were selected based on hit rate to maximize accuracy of expression. All images depicted faces of Caucasian individuals in full front-view presented in the upright position. A total of 120 faces were used to create three equivalent sets of 40 faces, with each set comprising 10 angry faces (5 female), 10 happy faces (5 female), and 20 surprised faces (10 female). Stimulus hit rate ranged from 62 to 100 (M(SD) = 94.12(6.85)), and was equated within

[1] Aside from one Democratic participant who was 50 years old, all participants were between the ages of 17 and 22. The subject in question was not excluded from the analysis, as age was not an exclusion criterion in this study. Notably, removing this subject from the analysis does not change the observed pattern of results reported here.

each expression condition across the three sets (e.g., the average hit rate of happy faces was closely matched across sets).

Each set of 40 faces was presented in a separate block (see below) and randomly assigned to represent one of three groups: a group of Democrats, a group of Republicans, and a group for whom affiliation was not specified (uncategorized). This face set assignment was counterbalanced, such that each set was assigned to each of the three groups (Democrats, Republicans, and uncategorized) an equal number of times across participants. This methodological choice allowed us to control for any inherent facial differences in perceived ideological leaning (Olivola, Tingley, & Todorov, 2018; Rule & Ambady, 2010) or any other trait impressions, as well as any differences in the apparent valence of faces within the same emotional expression (e.g., some faces looking happier than others in the case of happy faces). Faces assigned to the uncategorized condition were always presented first, and were used to measure a baseline response prior to any mention of political party membership.

Face Judgment Task

In a within-subjects design, each participant viewed each of the three sets of faces (displayed one face at a time) in separate blocks. Within each block, the order of face displays was pseudorandomized, such that surprised faces occurred after happy and angry faces an equal number of times. This was done in order to mitigate potential priming effects that may have influenced the perceived valence of surprise. Faces were presented on a computer screen (image size 256×397 pixels, screen resolution 1280 x 1024 pixels) on a white background using MouseTracker (Freeman & Ambady, 2010). All participants were seated in an upright position, approximately 63.5 cm from the computer screen (horizontal viewing angle = 6.07°, vertical viewing angle = 9.31°). Before the second and third blocks, an instruction screen indicated the

party affiliation of the group of faces in the upcoming block. The researcher read the block label ("You are now going to see faces that belong to individuals that identify as ---") and informed the participant that the task was otherwise the same.

The first block of trials assessed baseline valence bias (see Figure 1). Participants viewed faces assigned to the uncategorized group (for which party affiliation was not mentioned). At the beginning of each trial, participants saw a black fixation cross for 500 ms. After, participants used the mouse to click a start button at the bottom center of the screen to initiate the judgment phase of the trial. The use of the start button to initiate trials in this manner ensured that participants returned the mouse cursor to the same position before making a response. Clicking the start button triggered the presentation of a face for 500 ms, followed by a response screen. To respond, participants made their face "ratings" (which they were instructed to do as quickly and accurately as possible) by clicking on one of the two response options ("POSITIVE" and "NEGATIVE") visible in the top left and right corners of the display (counterbalanced across participants). Although these response options were visible during the face presentation, participants could not see or move the cursor to make a response until the face display was over. The trial ended once the participant clicked on a response.

In the second and third blocks, participants viewed the faces assigned to the Democrat and Republican conditions. The order of these last two blocks was counterbalanced such that about half of the participants viewed faces belonging to the same political party to which they identified (ingroup) followed by faces belonging to the opposing party (outgroup), while the other half viewed outgroup faces followed by ingroup faces. Before starting each block, participants were told that the faces in those blocks belong to individuals who self-identify as Democrats/Republicans, and were reminded to respond as quickly and accurately as possible.

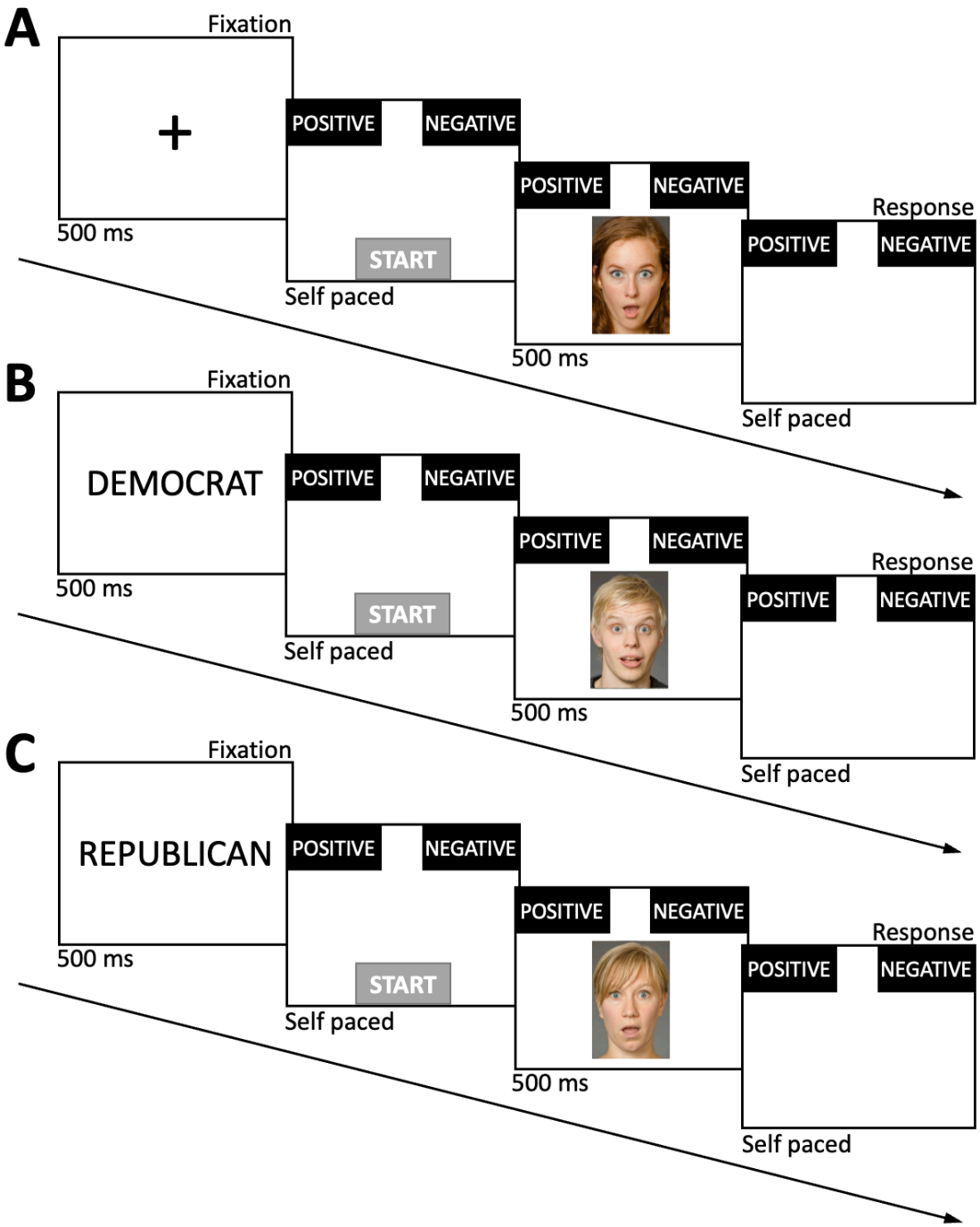

Figure 1. Face judgment task. *In a within-subjects design, participants viewed three sets of faces in three blocks: Uncategorized faces* ***(A)****, followed by Democrat* ***(B)*** *or Republican faces* ***(C)****, where the fixation cross was replaced by the label "DEMOCRAT" or "REPUBLICAN" for each trial. The order of the second and third blocks was counterbalanced such that half of the participants saw faces associated with their ingroup first and half saw outgroup first. Participant clicked a start button at the bottom center of the screen, then saw a face for 500 ms, which they were instructed to "rate" as positive or negative with the computer mouse.*

These blocks proceeded identically to the first block, except that the fixation cross in between trials was replaced by a label in black font and all caps indicating the assigned party affiliation (i.e., “DEMOCRAT” or “REPUBLICAN”) displayed for 500 ms.

To allow for a closer examination of the impact of ambiguity (Brown et al., 2017) and group membership (Lazerus et al., 2016) on the participants’ decision-making process, MouseTracker (Freeman & Ambady, 2010) was used to record participants’ judgments, as well as their mouse trajectories and reaction times during the response portion of the task (i.e., immediately after face presentation and until the participant clicked on a response button). Mouse trajectories always began at the start button, where the cursor remained locked throughout face presentation. Maximum Deviation (MD) of mouse trajectories was calculated for each trial as an index of response competition throughout the participants’ decision-making process (Calcagnì et al., 2017; Freeman et al., 2011; Hehman et al., 2015). MD is the maximal extent to which the cursor deviated from a straight-line mouse trajectory from the start button (at the bottom center of the screen) to the selected response option (on the top right or left corner of the screen) on a given trial. This deviation indexes the extent to which participants were attracted to the alternative (competing) response option; the more difficulty experienced suppressing the alternative response, the greater the MD for that trial. As such, examining participants’ MD provided unique insight into the effect of group conditions on these judgments of facial expressions.

Questionnaires

After the face judgment task, participants completed a series of questionnaires administered using Qualtrics (Qualtrics, Provo, UT). First, we measured political affiliation in all participants in order to prevent any impact of the other scales on an individual’s party

identification. Political affiliation was assessed using the 7-point party identification scale developed by the University of Michigan Survey Research Center (i.e., the Michigan Measure; American National Election studies; www.electionstudies.org). Participants were asked "Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?". Participants who did not explicitly identify as Democrats or Republicans received a follow-up question to assess leaning: "Do you think of yourself as closer to the Republican or Democratic party?". Participants indicated their leaning on a 7-point scale, where 1 represented strong Republican leaning and 7 represented strong Democratic leaning. Of the 119 participants recruited for this study, 17 participants expressed a neutral affiliation (a score of 4 on the leaning scale), and were therefore excluded from the study and did not complete the remaining questionnaires. Of the 95 participants that did complete the experiment, 7 were leaning toward the Democratic Party (leaning scores ranging from 5 to 7) and 17 were leaning toward the Republican Party (leaning scores ranging from 1 to 3). These participants were treated as Democrats/Republicans, as previous work suggests that leaners tend to behave more like partisans than independents (Petrocik, 2009). We also note that post-hoc analyses indicated that excluding the 24 leaners did not change the observed pattern of results (see section 1.2 of the Supplementary Materials).

Next, participants completed free response questions that attempted to probe the extent to which they believed the experimental manipulation. Specifically, participants typed short responses to this series of questions (note that the order of the words Democratic/Republican was randomized across participants):

1. "What was the difference between the three groups of faces you viewed?"

2. “Overall, did you feel differently about the Democratic faces versus the Republican faces?”
3. “Did you find the Democratic faces and the Republican faces to be different in how negative/positive they were?”

One participant was excluded for explicitly stating that they did not believe the manipulation: “I assumed that the labels ‘Democrat’ and ‘Republican’ were arbitrarily assigned to faces and were not actual descriptions of the real people.” Additionally, 6 more participants were excluded for erroneously believing that one or more faces belonging to the same individuals were repeating across blocks (e.g., believing that the same faces appeared as both a Democrat and a Republican). For example, one participant believed they “saw some of the same faces pop up in both parties”. Participants completed additional questionnaires that were outside the scope of this report; a full description of which can be found in the Supplementary Materials.

Analyses

Data analyses were conducted in R version 3.6.2 (R Core Team, 2017). We calculated the percentage of surprise trials judged as negative as our measure of valence bias in each block. We fit a linear mixed effects model to condition mean data to explore these percent negative judgments, using random intercepts for each subject and subject x within-subjects factor to account for the within-subject variance. The lmerTest package (Kusteznova et al., 2016) was used to calculate F tests and p-values and the effsize package (Torchiano, 2020) was used to calculate Cohen’s d. All post hoc contrasts were completed with the emmeans package (Lenth et al., 2020) and any contrasts reported as significant passed Bonferroni correction for significance threshold. Finally, we fit linear mixed effects models for Maximum Deviation (MD) of mouse trajectories on condition mean values, as we did with percent negative judgment. Analyzing MD

as a function of subjective judgments (positive vs. negative) resulted in an unbalanced dataset with some missing values (e.g., if a participant only judged surprise as negative, then there would be a missing value for MD for surprise judged as positive). This resulted in 28 out of 570 missing values (5.17%). Full information maximum likelihood estimation was used in all linear mixed effects models to account for any missing data.

Results

Negativity Judgments

Using judgments from the uncategorized condition as a baseline, we fit a Group Affiliation (within-participants: uncategorized, ingroup, outgroup) x Expression (within-participants: surprised, angry, happy) x Party Identification (between-participants: Democrat, Republican) linear mixed effects model on percent negative judgments (see Figure 2 and Table 1 for a summary of descriptive statistics). There was a main effect of Expression ($F(2, 281) = 1980.92$, $p < .001$), such that angry faces (M(SD) = 0.99(0.03)) were judged as more negative than surprised faces (M(SD) = 0.71(0.18), $t(194) = 18.13$, $d = 1.94$), which were judged as more negative than happy faces ((M(SD) = 0.02(0.05), $t(194) = 42.54$, $d = 5.22$); ps < .001; Bonferroni-corrected threshold = .016). There was also a main effect of Group Affiliation ($F(2,194) = 11.44$, $p < .001$) showing that, while judgments of baseline (M(SD) = 0.59(0.11)) and ingroup faces (M(SD) = 0.59(0.11)) were not significantly different from one another ($t(194) = 0.54$, $p = .589$, $d = 0.03$), outgroup faces (M(SD) = 0.63(0.11)) were judged more negatively than both the baseline ($t(194) = 4.34$, $d = 0.36$) and ingroup faces ($t(194) = 3.80$, $d = 0.33$;ps < .001; Bonferroni-corrected threshold = .016). Notably, there was a significant Expression x Group Affiliation interaction ($F(4, 380) = 6.67$, $p < .001$), such that this pattern of results was unique to judgments of surprised faces (baseline (M(SD) = 0.68(0.21)) versus ingroup (M(SD) =

0.68(0.21)): $t(582) = 0.03$, $p = .975$, $d = 0.00$; outgroup (M(SD) = 0.75(0.21)) versus baseline: $t(582) = 5.75$, $p < .001$, $d = 0.32$; outgroup versus ingroup: $t(582) = 5.78$, $p < .001$, $d = 0.32$; Bonferroni-corrected threshold = .005). All other comparisons did not survive the corrected threshold (ps > .190, but note that there was a trending effect that did not survive correction where outgroup happy faces were judged as more negative than baseline $p = .036$). In sum, while these findings did not provide support for our first hypothesis (i.e., evidence of ingroup positivity in judgments of surprise), they were in line with our second hypothesis (i.e., evidence for outgroup negativity).

Table 1: Percent Negative Judgments Across Conditions

	Angry M (SD)	Happy M (SD)	Surprise M (SD)
Group Affiliation			
Uncategorized	.99 (.03)	.01 (.03)	.68 (.21)
Ingroup	.99 (.04)	.02 (.07)	.68 (.21)
Outgroup	.99 (.05)	.03 (.09)	.75 (.21)
Party Identification			
Democratic	.99 (.02)	.03 (.06)	.66 (.20)
Republican	.99 (.03)	.02 (.05)	.74 (.16)

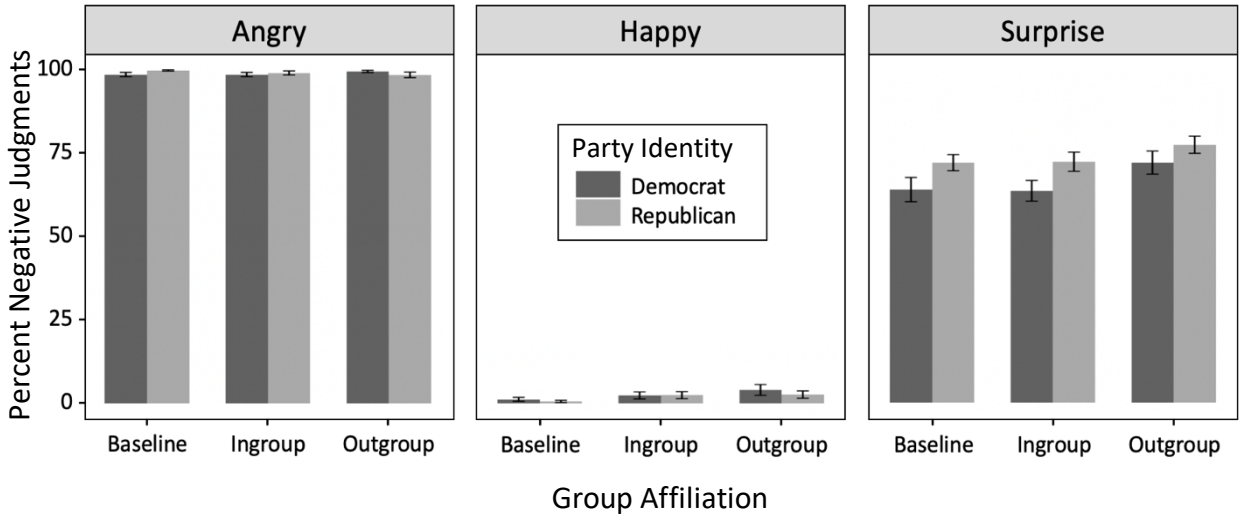

Figure 2. Negativity judgments. *Outgroup faces were judged more negatively than Ingroup and Uncategorized, but only for surprise ($p < .001$). Republicans judged surprise more negatively than Democrats ($p = .001$). Error bars represent standard error.*

As for our third hypothesis, although the main effect of Party Identification only approached the traditional significance threshold ($F(1, 280) = 3.20$, $p = .075$), where Republicans (M(SD) = 0.62(0.08)) appeared to be more negative than Democrats (M(SD) = 0.59(0.01) , d = 0.40), there was a significant interaction of Expression x Party Identification ($F(2, 281) = 3.90$, $p = .021$), suggesting that Republicans judged surprised faces (M(SD) = 0.74(0.16)) more negatively than Democrats (M(SD) = 0.66(0.20); $t(291) = 3.27$, $p = .001$, $d = 0.41$; Bonferroni-corrected threshold = .016). There was no Party Identification difference in judgments of angry ($t(291) = 0.10$, $p = .919$, $d = 0.08$) and happy ($t(291) = 0.29$, $p = .773$, $d = 0.12$) faces.

Response Competition When Judging Surprised Faces

Next, we examined Maximum Deviation (MD) as a measure of response competition when judging the ambiguously valenced surprised faces, with greater MD in mouse trajectories indicating greater response competition (see Tables S1 and S2 for a summary of descriptive statistics).

We started by examining MD during the baseline (uncategorized faces) block. This allowed us to avoid potential confounding effects of task habituation (i.e., a training effect), as the baseline block always occurred first, whereas the ingroup and outgroup conditions were counterbalanced.[2] For our primary analysis, we fit a linear mixed effects model with effects of Surprise Judgment (within-participants: positive, negative) x Party Identification (between-participants: Republican, Democrat) on MD (see Figure 3A). There was a main effect of Surprise Judgment, such that there was greater MD for positive (M(SD) = 0.53(0.37)) than negative judgments (M(SD) = 0.27(0.27); $t(95) = 5.07$, $p < .001$, $d = 0.75$), consistent with prior work

[2] Results of an analysis including all three group conditions is reported in section 3 of the Supplementary Materials.

(Brown et al., 2017; Neta, Berkebile, & Freeman, 2021). This suggests that positive judgments are associated with greater attraction to the competing (negative) response option. There was also a significant interaction of Surprise Judgment x Party Identification ($F(1,184) = 8.52$, $p = .004$); Republicans had greater MD than Democrats when surprise was judged as positive (Republicans M(SD) = 0.62(0.35); Democrats M(SD) = 0.41(0.38); $t(188) = 3.00$, $p = .003$, $d = 0.56$), but not when it was judged as negative (Republicans M(SD) = 0.24(0.26); Democrats M(SD) = 0.31(0.28); $t(188) = 1.05$, $p = .296$, $d = 0.26$; Bonferroni-corrected threshold = .0125). We also compared MD across positive and negative judgments of surprise within each party: Republicans had significantly greater MD when judging surprise as positive (M(SD) = 0.62(0.35)) than negative (M(SD) = 0.24(0.26); $t(95) = 6.00$, $p < .001$, $d = 1.20$), but this difference was not significant among Democrats (positive M(SD) = 0.41(0.38); negative M(SD) = 0.31(0.28); $t(96) = 1.46$, $p = .147$, $d = 0.25$; Bonferroni-corrected threshold = .0125). Overall, the findings suggested positive judgments are associated with more competition, more so for Republicans than Democrats.

Next, we examined MD during ingroup and outgroup blocks as a function of participant political party identification. We fit a linear mixed effects model with effects of Surprise Judgment (within-participants: positive, negative) x Group Affiliation (between-participants: ingroup, outgroup) x Party Identification (between-participants: Republican, Democrat; see Figure 3B). There was no main effect of Group Affiliation on MD ($F(1, 181) = 0.24$, $p = .625$), and no significant interactions involving Group Affiliation (ps $\geq .660$). Thus, we did not find evidence to support our (exploratory) hypothesis that MD for positive versus negative judgments varied as a function of Group Affiliation.

All other effects replicated findings in the uncategorized condition, with one exception. Within the Surprise Judgment x Party Identification interaction, which approached traditional levels of significance ($F(1, 96) = 3.66$, $p = .059$), the difference in MD of positive judgments across Party Identification was no longer significant (Republican M(SD) = 0.46(0.31), Democrat M(SD) = 0.37(0.21); $t(194) = 1.52$, $p = .130$, $d = 0.33$; Bonferroni-corrected threshold = .0125). Interestingly, in addition to Republicans showing the same effect as above, with greater MD when judging surprise as positive than negative (positive M(SD) = 0.46(0.31), negative M(SD) = 0.21(0.18), $t(96) = 5.64$, $p < .001$, $d = 0.97$), Democrats now also showed a similar trend, although the effect did not survive Bonferroni correction for multiple comparisons (positive M(SD) = 0.37(0.21), negative M(SD) = 0.26(0.19); $t(95) = 2.53$, $p = .0129$, $d = 0.56$; Bonferroni-

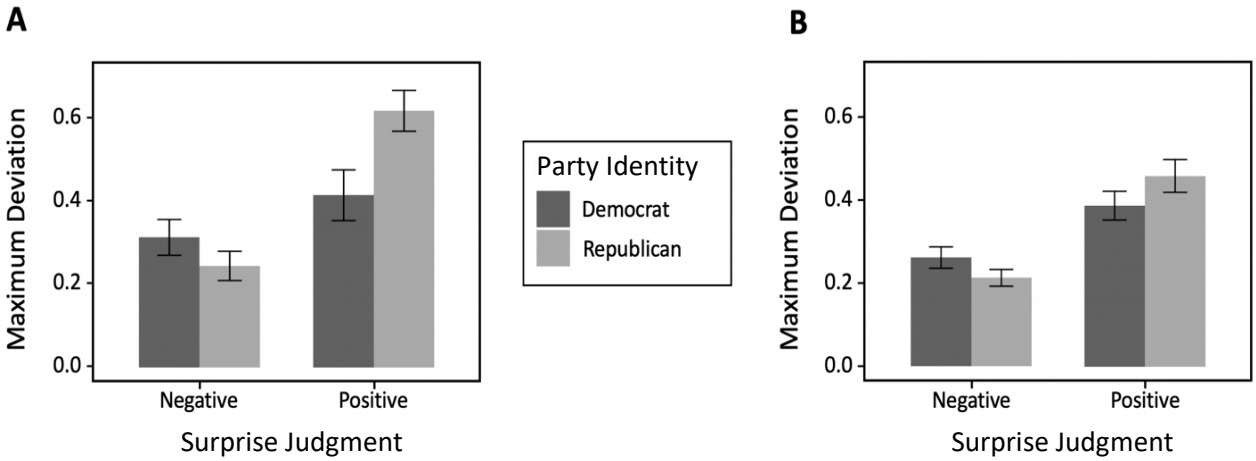

Figure 3. Party differences in response competition when judging surprise. (A) *Surprise trials with uncategorized faces. When surprise was judged as positive, Republicans showed greater attraction to the competing (negative) response options than Democrats (p = .003). This difference was not significant when surprise was judged as negative (p = .30). Republicans also showed greater attraction to the competing response when judging surprise as positive compared to negative (p < .001), but this difference was not significant among Democrats (p = .15).* ***(B)*** *Surprise trials with party labeled faces, collapsed across ingroup and outgroup. Similar to uncategorized faces, Republicans showed greater attraction to the competing response when judging surprise as positive compared to negative. However, for group judgments, Democrats did show a similar trend, although the effect did not survive Bonferroni correction for multiple comparisons (p = .0129, Bonferroni-corrected threshold = .0125). Error bars represent standard error.*

corrected threshold = .0125). In other words, while Republicans consistently showed attraction to the competing response when judging surprise as positive, both in this analysis of ingroup and outgroup blocks *and* in the previous baseline analysis, Democrats only showed – albeit weak – evidence of response competition in the presence of information regarding others' party membership.

Finally, we note that, in addition to MD, we also analyzed Reaction Time (RT) as a secondary indicator of response competition. As expected, RT findings largely replicated those of MD (see section 4 of the Supplementary Materials).

Discussion

In this study, we investigated the effect of group affiliation on valence bias among Republicans and Democrats by leveraging interpretations of emotional ambiguity. We examined valence judgments for faces belonging to ingroup members, outgroup members, and individuals who were not assigned a group category (uncategorized) serving as a baseline. We predicted that participants' judgments of emotionally ambiguous (i.e., surprised) facial expressions would reveal underlying intergroup bias in affective processing, such that judgments of ingroup faces would be more positive than uncategorized (H1), and outgroup faces would be more negative (H2). We also predicted that Democrats and Republicans would differ in their responses to ambiguity, such that Republicans' judgments of surprise would be more negative compared to Democrats' (H3). Finally, we conducted follow-up analyses that explored the effect of group affiliation and party identification on attraction to response competition across judgments of surprise.

Our findings provided partial support for our predictions. Specifically, we found evidence for an outgroup negativity bias in judgments of surprised faces; surprised faces belonging to

outgroup members were more likely to be judged as negative compared to surprised faces of uncategorized or ingroup affiliation. Conversely, judgments of uncategorized and ingroup surprised faces did not differ from one another. Additionally, as predicted, judgments of surprised faces differed across Republicans and Democrats; Republicans in our sample demonstrated evidence of a negativity bias towards surprised faces – indexed by both negative judgments and a greater attraction to the negative response. Finally, despite this alignment across judgments and response competition for surprised faces that was evident for party identification, this pattern of results did not extend to group affiliation. Namely, while we observed an outgroup negativity bias in *judgments* of surprised faces, we did not find evidence for intergroup differences with respect to response competition (e.g., attraction to the negative response when judging surprise as positive).

Our findings highlight the importance of separately examining political intergroup bias in judgments of ingroup and outgroup emotion, as we found that participants' valence bias in response to partisan faces were driven by outgroup negativity and not ingroup positivity. These findings align with claims that political partisanship in the United States may be primarily driven by outgroup bias rather than ingroup bias (Iyengar et al., 2019), and extend these claims by demonstrating a parallel pattern for bias in the emotion perception domain. Why might outgroup bias take primacy in American cross-party interactions? In the greater context of intergroup emotion processing, a bias towards outgroup negativity sacrifices accuracy to reduce the likelihood of a more costly outcome: being caught off guard by an ill-intentioned outgroup member. Given the widening ideological and demographic rift between the two parties (Mason, 2015; Grossmann & Hopkins, 2015; Finkel et al., 2020), this cost may be particularly high, as the losing party is forced to contend with the victorious party enacting policies that are perceived

as “a threat to the nation’s wellbeing” (Pew Research Center, 2016). Future work can shed light on the extent to which this outgroup bias is exacerbated by specific features of the American political arena (e.g., two party systems) by exploring this pattern of findings in other countries with more political parties (e.g., Israel) or countries where ideological/political views are more homogeneous (e.g., Netherlands).

Despite relying on a highly controlled paradigm, we argue that participants’ experience in this study does have key real-world parallels that support generalizability beyond the experimental setting. In this study, faces in the ingroup and outgroup blocks were labeled as “Democrat” or “Republican”, providing participants with an explicit cue to the political identification and group affiliation of the targets in question. While observers do not typically have such direct access to others’ party membership in the real world, they may be sensitive to several visually available cues that can predict others’ political views with some level of accuracy. For example, individuals may be able to make first-glance predictions about the political affiliation of those around them based on common stereotypes about the parties’ average demographics (age, sex, race, etc.), or based on probabilistic detection of how demography uniquely relates to ideology in one’s own community. Relatedly, some work shows that observers form predictions about others’ political affiliation based solely on thin slice judgments (i.e., trait impressions from faces; Olivola, Tingley, & Todorov, 2018; Rule & Ambady, 2010). As such, while individuals do not normally see faces paired with a label indicating party membership, seeing such labels may approximate the experience of generating an instantaneous prediction about others’ political views based on their appearance.

Limitations

One potential limitation of this work is the reliance on a design where ingroup faces and outgroup faces are presented in separate blocks. This design may have allowed the participants to respond in a simplistic manner (e.g., simply responding "negative" to outgroup faces, without paying attention to the faces per se). However, our findings suggest that the group affiliation of the faces did not likely dictate participants' responses across the different expressions. Specifically, while we did find an effect of group affiliation on judgments of surprised faces, there were no such effect observed for angry faces and there was only a trending effect for happy faces that did not survive correction. Indeed, the vast majority of participants (more than 80%) judged angry faces as negative and happy faces as positive on every trial, regardless of group affiliation. This pattern of results shows that, even when information about political group membership was presented using explicit labels in a block design, participants were not responding in a simplistic manner. Rather, our findings seem to reflect legitimate differences in emotion processing driven by participants' underlying bias towards political outgroup members.

Another potential limitation is that, when making their judgments, participants were simply instructed to categorize each face as positive or negative. Instructions were kept brief in order to facilitate spontaneous responses, and to be consistent with prior work (Neta et al., 2009; Harp et al., 2021). However, this simplicity could have also introduced a limitation to this study, as it left the instructions open to interpretation. Participants may have been judging the expression itself, the underlying emotion, or their own emotional state. Moreover, participants may have relied on different interpretations of the task across the different group conditions. Future work involving judgments of facial expressions may benefit from providing more explicit instructions or even simply debriefing participants about their criteria for what makes a face positive or negative. Based on our limited data to this effect, participants' judgments may have

reflected various inferences about the individuals being viewed, as written responses showed that some participants made trait attributions, describing outgroup faces as “annoying”, “condescending”, “judgmental”, etc. Similarly, two participants wrote that the happy faces expressed by the opponent party seemed “smug”, and another described the “meaning” of a target’s smile being different depending on their party affiliation. These responses suggest that such trait attributions may have been closely linked to participants’ valence judgments -- a phenomena that has been documented in previous work (Todorov, 2008). Thus, the group-based shift in valence bias observed in this study could be interpreted as a biproduct of skewed face trait attributions and an underlying bias in interpersonal impressions and/or attitudes.

Lastly, methodological limitations may have hindered our ability to explore the patterns of response competition experienced during face judgments. Specifically, after determining that participants’ judgments of surprise showed an outgroup negativity bias, we followed up by examining Maximum Deviation (MD) as an indicator of response competition. Contrary to our expectations, we did not find an interaction in MD between group membership and surprise judgments (positive versus negative), which would have suggested that response competition is modulated by group membership. Although the uncategorized condition provided a useful baseline to compare judgments of ingroup and outgroup faces, we noted that the uncategorized condition had greater MD than both the ingroup and the outgroup conditions (see section 3 of the Supplementary Material). This may point to a training effect that dwarfed the MD difference between the ingroup and outgroup, making it more difficult to detect. However, excluding the uncategorized condition from the analysis did not change the pattern of results. Another likely explanation is that the effect of the group condition on response competition occurred at the earliest stages of the decision-making process (i.e., at the onset of the face presentation).

Unfortunately, our task design failed to capture this stage of the response, as participants were unable to move the mouse during face presentation. Future work should prioritize recording mouse trajectories beginning with the stimulus onset to more fully explore these processes.

Implications

The findings of this study highlight important social-affective phenomena with several implications for our understanding of political prejudice in the United States. First, our findings successfully demonstrate that political group membership can shift individuals' valence bias, skewing one's judgments of ambiguous emotions. Facial expressions are important non-verbal cues that convey a message to the perceiver, and the ability to accurately decipher the emotional content of a facial expression is an essential part of effective social interaction. Our findings suggest that bias towards outgroup members can impair this ability, possibly leading individuals to misconstrue the intentions of outgroup members and giving rise to conflict, disagreements, or polarization. Even altering the perceived valence of a social interaction with a single outgroup member can have ripple effects, as interactions with individual outgroup members can shape attitudes towards the outgroup as a whole (Stark, Flache & Veenstra, 2013; Yu et al., 2020). If so, our findings could indicate that social interactions involving ambiguous emotional states may carry the potential to exacerbate preexisting intergroup bias. Future work can examine whether these findings extend beyond judgments of faces – e.g., by using ambiguous words (Harp et al., 2021) that were reportedly taken from text written by individuals from different political parties. Future work can also elucidate the link between valence bias and other forms of prejudiced beliefs/behaviors by examining individual differences in endorsement of group-based stereotypes, or allocation of resources in economic games (e.g., the trust game; Charness & Dufwenberg, 2006).

Finally, our findings demonstrate that outgroup negativity bias is distinct from partisan differences in baseline negativity. On the one hand, both Republicans and Democrats exhibited a more negative valence bias when viewing surprised facial expressions belonging to the outgroup, consistent with the view that members of both parties hold prejudiced attitudes towards the rivaling political outgroup. In contrast, Republicans in our sample exhibited a stronger overall bias towards negativity, as well as a stronger attraction to the negative response at baseline. However, our findings did not suggest that Republicans' stronger bias towards negative judgments of surprise was specific to outgroup emotion, nor that there were partisan differences in judgments thereof. Notably, while the overall tendency for Republicans to be more negative than Democrats is in line with prior findings linking conservatism to negativity (Hibbing et al., 2014), we did not find a link between conservatism and judgments of surprise (see section 2 of Supplementary Materials). Rather, the baseline differences identified in this study were associated with participants' political party identification. Interestingly, more recent findings suggest that the aforementioned association between conservatism and physiological responses to negative emotional stimuli may not replicate in non-American samples (Fournier, Soroka & Nir, 2020). As such, future work is needed to further probe the unique effects of political ideology and party identification on valence bias to better understand the underlying differences in emotion processing – e.g., by examining the effect of individual differences in ideology *within* political parties. Future work can also test whether individual differences in valence bias can predict voting behavior or endorsement of policies that tend to evoke different moral values across parties (Graham et al., 2009).

While we focus here on intergroup effects related to political party identification, future work will also be critical in determining the implications for non-political intergroup relations, as

biased interpretations of emotional ambiguity may be particularly damaging to interactions across racial, ethnic, and socioeconomic groups. For instance, geographic and/or cultural differences among ethnic groups may contribute to different norms of social and emotional expression (Soto et al., 2005). As a result, a bias toward interpreting ambiguous emotional cues from the outgroup as negative suggests that subtle differences in cultural norms may be sufficient to create (or reinforce) negative stereotypes.

Conclusions

Overall, this work demonstrates that the social dimension of political identity plays an important role in shaping judgments of ambiguous social cues, putatively shaping inter-party attitudes and interactions. Indeed, in the absence of any other cues to evoke political or ideological disagreements, party labels alone were sufficient to elicit a shift in valence bias – driven by outgroup negativity rather than ingroup positivity – among both Democrats and Republicans. This aligns with the idea that, rather than being driven exclusively by ideological or policy differences, political prejudice in the United States is the product of social and affective processes that may persist even in contexts where political views might otherwise be irrelevant (Iyengar et al., 2012; Mason, 2015, 2018). Future work integrating social, affective, and political psychology will be critical to our understanding of how this bias emerges, why it differs across individuals, and how best to mitigate its harmful effects on political prejudice in the United States and other countries with similar patterns of partisanship.

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