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Is negativity bias intuitive for liberals and conservatives?

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Abstract
Previous research suggests that conservatives (right-wingers) tend to show more negativity bias than liberals (left-wingers) in several tasks. However, the majority of these studies are based on correlational findings and do not provide information on the cognitive underpinnings of this tendency. The current research investigated whether intuition promotes negativity bias and mitigates the ideological asymmetry in this domain in three underrepresented, non-western samples (Turkey). In line with the previous literature, we defined negativity bias as the tendency to interpret ambiguous faces as threatening. The results of the lab experiment revealed that negativity bias increases under high-cognitive load overall. In addition, this effect was moderated by the participants' political orientation (Experiment 1). In other words, when their cognitive resources were depleted, liberals became more like conservatives in terms of negativity bias. However, we failed to conceptually replicate this effect using time-limit manipulations in two online preregistered experiments during the COVID-19 pandemic, where the baseline negativity bias is thought to be already at peak. Thus, the findings provide no strong evidence for the idea that intuition promotes negativity bias and that liberals use cognitive effort to avoid this perceptual bias.

Keywords Negativity bias · Cognitive load · Intuitive thinking · Liberal · Conservative · Threat

The question about the source of political differences has been one of the perennial topics over the last fifty years. Although there are various macro-level answers to this question in the field of political science, it is generally agreed, on the basis of psychological studies done in recent years, that most of these differences are caused by some psychological and biological traits (Hibbing et al., 2014). For example, liberals are known to have less cognitive closure and more need for cognition than conservatives. Conservatives also prefer to maintain the existing status quo as well as to preserve the hierarchical system of society (Jost et al., 2003; see also Jost et al., 2017).

Jost et al. (2003) meta-analysed these findings and showed that the above-mentioned trends correspond roughly to "resistance to change" and "opposition to equality." In other words, conservatives try to protect the existing state of affairs more than the liberals and defend the continuation of the hierarchically organized system in order to satisfy these two basic motives. This approach is described as "conservatism as motivated social cognition". More specifically, according to this approach, being a conservative is a sophisticated defence mechanism to avoid threats and anxieties in our everyday lives and having such an ideology serves to simplify and reduce uncertainty and make it more manageable in a relatively complex system out there. On the contrary, Brandt et al. (2014) suggest that some motivations that are attributed to conservatives by Jost et al. (2003) are not peculiar to political conservatives, which are in fact identical across the political spectrum. Crawford et al. (2017) also support this approach by arguing that just like conservatives, liberals have also an intolerance towards people, groups or ideas that are inconsistent with their own. They also specify this approach with two hypotheses (i.e., dimension-specific symmetry hypothesis and social primacy hypothesis) revolving around social and economic political dimensions and social dimension being more dominant compared to economic dimensions regarding ideological conflict. Dimension-specific symmetry hypothesis posits that two dimensions of conservatism (social and economic) separately predict negative attitudes toward out-groups that vary on these two dimensions. Specifically, if one encounters to a group that is perceived as deviating from one's

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social political attitudes, that group is going to be judged socially. Likewise, if this deviation is perceived to be on economic dimension, then the group is going to be judged on this domain. Moving from that, social primacy hypothesis suggests that compared to economic dimension, conflicts in ideological worldview are experienced stronger on social dimension.

Apart from this complexity, genetic and physiological studies carried out in recent years support the predictions of negativity bias approach (see Hibbing et al., 2014). For example, in a longitudinal survey of pre-school children, it is noted that 20 years later, relatively liberal participants were defined as "developing close relationships, "self-reliant" and "energetic", whereas relatively conservative participants were defined as "feeling easily victimized", "easily offended", and "indecisive" by their preschool teachers (Block & Block, 2006). In general, a number of genetic predispositions are thought to account for a variance of between 30% and 60% on political differences (Bouchard & McGue, 2003; Hatemi et al., 2010; Hatemi et al., 2014). There are also some findings to suggest that identical twins have more similar political attitudes than fraternal twins (Alford et al., 2005; Bouchard et al., 2003; but see Charney & English, 2012 for a counter-criticism arguing that looking at correlations between genes and political behaviour alone can be misleading).

Some neurophysiological differences among political groups have been also reported in the literature. Kanai et al. (2011), for example, showed that conservatives have more grey matter in the right amygdala than liberals, while Schreiber et al. (2013) showed that conservatives have more activation in the insula and amygdala regions of the brain. Oxley et al. (2008) also demonstrated that conservatives show more skin conduction reactions when they see a negative facial expression (but see Bakker et al., 2020). Likewise, in many studies, experimentally inducing threat leads liberals to become more like conservatives (e.g., Bonanno & Jost, 2006; Landau et al., 2004; Nail et al., 2009; see also Burke et al., 2013). Like predisposed differences, perceptual tendencies also differ. Dodd et al. (2012) demonstrated that conservatives spend more time looking at negative images than liberals (see also Pedersen et al., 2017). Also, in the emotional Stroop test, conservatives responded more slowly to negative stimuli (Carraro et al., 2011). Similarly, Vigil (2010) found that conservatives interpret ambiguous faces as more threatening compared to liberals (see also McLean et al., 2014). Therefore, all these findings show that conservatives are behaving in a way indicating ambiguity, intolerance, and having higher levels of cognitive closure, desire for order and sensitivity to threat to manage uncertainty and threat perception.

A number of the above-mentioned differences also point to systematic cognitive style differences (analytic vs. intuitive thinking) among ideologies (e.g., Kemmelmeier, 2008). For example, there are a number of findings showing that threat perception leads people to think automatically and suppresses sophisticated analytical thinking (e.g., Gailliot et al., 2006; Trémolière et al., 2012, 2014; Yilmaz & Bahçekapili, 2018). At the same time, when we think of other features that distinguish liberals from conservatives, it is known that conservatives have lower levels of integrative complexity (Brundidge et al., 2014), and higher levels of need for cognitive closure (NFCC; Kruglanski, 2004), support for a hierarchical system, and preference for continuity of the status quo (Jost et al., 2003). All these features go hand in hand with intuitive and low effort thinking. For example, participants with high integrative complexity can interpret an issue and evaluate it from multiple perspectives (Brundidge et al., 2014). NFCC is defined as the tendency to give simpler responses to reduce the potential for uncertainty independently of the content of the question (Kruglanski, 2004). Likewise, preferring the status quo and familiar objects is a choice consistent with automatic and intuitive thinking processes (Eidelman & Crandall, 2009). There are also a number of correlational and experimental findings indicating that conservatives think more intuitively than liberals in general (Deppe et al., 2015; Pennycook et al., 2012; Talhelm et al., 2015; Yilmaz & Alper, 2019; Yilmaz & Saribay, 2016, 2017a, 2018). For example, it is known that directing people to think intuitively leads them to adopt more conservative attitudes (Eidelman et al., 2012; but see Isler et al., 2021) whereas directing people to think analytically leads them to adopt more liberal attitudes (Yilmaz & Saribay, 2017b, 2017c).

Negativity Bias Account

Hibbing et al. (2014) argue that the differences described above can be integrated around the concept of "negativity bias" and claim that what creates the fundamental difference between conservatives and liberals is being biased toward negative stimuli (but see Tritt et al., 2013). Negativity bias is defined as the situation in which the negative cases are more dominant, distinct, and stronger than the positive cases (Rozin & Royzman, 2001; see also Ashare et al., 2013). The evolutionary explanation for this bias is that negative situations such as injury, infection, and death are more costly than positive situations. Prioritizing negative events and making decisions accordingly will increase the chances of survival. This shows why negativity bias can be an evolved mechanism. Research generally shows that conservatives are more vulnerable to negative stimuli than liberals (see Hibbing et al., 2014). However, even though negativity bias is defined as an automatic and fast perceptual process (Carraro

et al., 2011), there is no study to investigate the cognitive mechanisms of this tendency.

In addition, there are some conceptual criticisms levelled against the negativity bias account. More specifically, the hypothesis that negativity bias differs in terms of political groups has received a number of criticisms. For example, Brandt et al. (2014) stated that both liberals and conservatives use similar strategies to overcome threatening situations. Crawford (2017) also argues that there are indeed no political differences in negativity bias in the domain of meaning threats (i.e., a threat to values and worldviews), but claimed that there may be political differences in negativity bias in the domain of physical threat that may cause fear. Therefore, in line with this criticism, we defined negativity bias in terms of physical threat in this study.

The Present Research

Negativity bias has been studied in many different tasks to this day. One of them is the facial expression task, in which the participants specify which emotions the ambiguous face expressions display. Vigil (2010) showed that conservatives are more likely to interpret the ambiguous faces as more threatening than liberals. However, as stated above, the cognitive mechanisms that lead to this perceptual bias are unknown. We predict that negativity bias is driven by an intuitive thinking style and liberals use cognitive effort to suppress this automatic tendency. If liberals indeed consume cognitive resources to suppress negativity bias, they should show a bias similar to conservatives when their cognitive resources are depleted (i.e., when thinking in an intuitive mindset). Therefore, we aimed to investigate whether directing people to think in a low-effort mode would lead to a shift in negativity bias in three predominantly Muslim samples. In addition, we expected a significant interaction between the manipulation and political orientation.

In Experiment 1, we used a cognitive load manipulation in isolated cubicles in the laboratory. In Experiment 2 and 3, we attempted to conceptually replicate the findings of Experiment 1 by using a time-limit manipulation in online and preregistered experiments.

We preregistered Experiment 2 and 3 as preregistration of studies increases the credibility of the research via multiple ways (Nosek et al., 2018): a) it separates analyses which were planned a priori, and which were conducted post hoc. This distinction has benefits in more than one way as well. First, it improves statistical inference of planned analyses (Nosek et al., 2019). Second, it prevents various misconducts, such as HARKing (Kerr, 1998), p-hacking (Head et al., 2015) or reporting bias (John et al., 2012); b) by enforcing a transparent approach (submitting hypotheses and methods of the study a priori and making data and analysis code freely available). This allows other researchers to attempt to reproduce and identify boundary conditions of the effect. These aspects of preregistration support the notion that studies which do not yield significant results can still be scientifically important as they present valuable information about the robustness of the effect in question and the potential boundary conditions of the effect.

Experiment 1

Method

Data, code, materials, and preregistration forms are available at this link: osf.io/7s5by.

Participants To our knowledge, there was no previous study experimentally investigating the effect of intuitive thinking style on negativity bias. Thus, we took the closest experiment as a reference to determine the estimated effect size. Eidelman et al. (2012) previously used a similar cognitive load manipulation and found an increase in conservative opinions with an effect size of (*d*) .67. However, in contrast to most social psychological findings (Richard et al., 2003), this is a moderate-to-large effect size. Thus, to have a more conservative test of our main hypothesis, we determined a low-to-moderate effect size (*d*) of .40, instead of (*d*) .67, which required a total sample of at least 156 participants to attain 80% power of detecting an effect (Faul et al., 2009). We considered potential attritions and collected data from a total of 176 undergraduate participants (114 females, 62 males; mean age = 21.95, *SD* = 2.53) from Dogus University (Istanbul). The sample size was determined before any data collection. We also conducted a sensitivity power analysis with G*power (Faul et al., 2009), and showed that this sample size is large enough to detect effects more than $d = 0.42$, with 80% power and .05 alpha level (two-tailed). The participants were randomly assigned to either high-cognitive load ($n = 86$), or low-cognitive load ($n = 90$) condition. All participants were Turkish native speakers (see Table 1 for descriptive statistics of each experiment).

Materials and Procedure To direct participants to low effort thinking through high cognitive load, a Dot Memory Task (Fig. 1) was used as in Trémolière et al.'s (2012) study. Low cognitive load item is a 3×3 matrix with 3 dots, which is easier to remember. High cognitive load item is a 4×4 matrix with 5 dots in it to make it harder than the low version. Participants were instructed to memorize the locations of the dots in the matrix before the task was shown. It was shown for 2 s to the participants of both groups. After completing other tasks (see below), the experimenter gave the

Table 1 Descriptive statistics

			N	Mean	SD	Skewness	Kurtosis	Min	Max
Experiment 1	Low Load	Gender	86	0.33	0.47	0.76	−1.46	0.00	1.00
		Age	86	22.1	2.77	1.95	6.92	18.00	36.00
		Political Orientation	86	3.62	1.18	−0.44	0.05	1.00	6.00
		SES	86	2.33	0.71	−0.16	−0.43	1.00	4.00
		Negativity Bias	86	2.66	1.46	0.26	−0.17	0.00	7.00
		Gender	90	0.38	0.49	0.51	−1.78	0.00	1.00
	High Load	Age	90	21.8	2.28	1.45	4.09	18.00	32.00
		Political Orientation	90	3.76	1.28	0.21	0.9	1.00	7.00
		SES	90	2.14	0.77	0.79	1.55	1.00	5.00
		Negativity Bias	90	3.31	1.35	0.13	−0.39	1.00	6.00
		Gender	176	0.35	0.48	0.62	−1.63	0.00	1.00
	Total	Age	176	21.9	2.53	1.8	6.27	18.00	36.00
		Political Orientation	176	3.69	1.23	−0.05	0.6	1.00	7.00
		SES	176	2.23	0.75	0.34	0.45	1.00	5.00
		Negativity Bias	176	2.99	1.44	0.14	−0.32	0.00	7.00
		Gender	192	1.15	0.39	2.5	5.72	1.00	3.00
Experiment 2	Time Delay	Age	191	22.3	3.9	4.16	20.4	17.00	46.00
		Political Orientation	188	3.26	1.19	0.31	−0.17	1.00	7.00
		SES	192	2.41	0.79	0.28	−0.32	1.00	4.00
		Negativity Bias	192	4.14	0.59	−0.56	1.98	1.30	5.67
		Gender	201	1.18	0.41	2.06	3.4	1.00	3.00
	Time Pressure	Age	201	22.7	5.08	4.24	20.2	17.00	53.00
		Political Orientation	190	3.44	1.18	0.2	−0.6	1.00	6.00
		SES	201	2.51	0.84	0.47	0.38	1.00	5.00
		Negativity Bias	201	4.11	0.62	0.74	2.4	2.80	7.00
		Gender	393	1.17	0.4	2.25	4.33	1.00	3.00
	Total	Age	392	22.5	4.54	4.32	21.7	17.00	53.00
		Political Orientation	378	3.35	1.19	0.25	−0.41	1.00	7.00
		SES	393	2.46	0.82	0.39	0.11	1.00	5.00
		Negativity Bias	393	4.12	0.6	0.15	2.11	1.30	7.00
		Gender	234	1.24	0.45	1.52	1.06	1.00	3.00
Experiment 3	Time Delay	Age	234	28.97	10.06	1.79	2.88	18.00	67.00
		Political Orientation	234	2.91	1.01	0.83	0.83	1.00	7.00
		SES	234	3.03	0.85	−0.18	−0.27	1.00	5.00
		Negativity Bias	234	0.29	0.14	0.2	−0.01	0.00	0.70
	Time Pressure	Gender	235	1.27	0.47	1.42	0.87	1.00	3.00
		Age	235	28.97	9.64	1.75	2.75	17.00	63.00
		Political Orientation	235	3	1.21	0.86	0.41	1.00	7.00
		SES	235	3.03	0.88	−0.17	−0.02	1.00	5.00
		Negativity Bias	235	0.29	0.14	0.3	0.23	0.00	0.80
	Total	Gender	469	1.25	0.46	1.46	0.95	1.00	3.00
		Age	469	28.97	9.84	1.77	2.79	17.00	67.00
		Political Orientation	469	2.96	1.11	0.87	0.67	1.00	7.00
		SES	469	3.03	0.86	−0.17	−0.14	1.00	5.00
		Negativity Bias	470	0.29	0.14	0.25	0.11	0.00	0.80

appropriate empty matrix to the participants to fill the dots in the correct form as in the matrix shown before. Participants showed adequate performance on the Dot Memory Task (1 = compliant, 0 = non-compliant): Mean correct response in the low-cognitive load condition was 2.98 out of 3, whereas mean correct response in the high cognitive

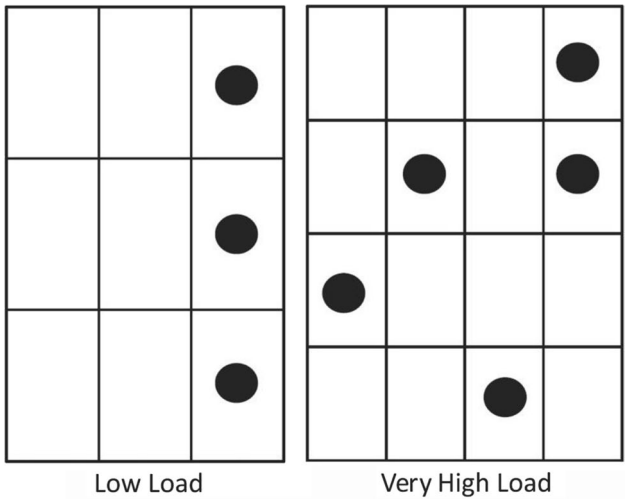

Fig. 1 Dot matrices used in the two load conditions (Retrieved from Trémolière et al., 2012)

load condition was 3.52 out of 5. All data were individually collected in isolated cubicles at Dogus University Psychology Lab.

To measure negativity bias, the Facial Expression Discrimination Task (Fig. 2), developed by Vigil (2010), was used. It is comprised of 10 photographs taken with one male and one female actor, each portraying five ambiguous facial expressions. These photographs were enhanced with digital exposure and blur effects to make them difficult to distinguish. Participants were asked to rate each photograph with 6 choices (happiness, sadness, surprise, anger, fear, and disgust). In line with Vigil's (2010) analysis, choosing anger, fear or disgust was coded as indicating a threat whereas choosing happiness, sadness, or surprise was coded as indicating a non-threat condition (non-threat = 0, threat = 1) for each photograph. The choices and the facial expressions were counterbalanced across participants. A one-item political orientation question from 1 (left) to 7 (right) was used in addition to a demographic form.

Results

Following Gelman and Hill's (2006) suggestions, we ran a generalized linear mixed model with categorical outcomes (i.e., the logistic mixed-effects regression modelling) using Jamovi 1.1.5.0 (The Jamovi Project, 2019). This analysis is a kind of general linear model used for binomially distributed dependent variables, and it takes into account random and fixed effects in the same model. Specifically, the model estimates the outcome of a dichotomous dependent variable (i.e., assigning 10 ambiguous facial expressions as either threatening or non-threatening[1]) in terms of log odds (i.e., *logits*) as a linear combination of a set of independent variables (i.e., fixed effects; manipulation groups [high vs. low cognitive load]) and random variable (i.e., random effects; political orientation).

Model estimations revealed that a linear combination of a set of fixed and random effects explained 1% of the variance ($R^2 = .013$), and the fixed effect omnibus test revealed that manipulation groups differed from each other in terms of responses on the 10 ambiguous facial expressions ($\chi 2(1) = 8.66$, $p = .003$). Manipulation effect (i.e., high [1] vs. low cognitive load [0]) on threat interpretation about ambiguous facial expressions was significant, $\beta = .31$, $z = 2.94$, 95% *CIs* [.10–.51], meaning that participants in the high cognitive load group were more likely to rate the faces as threatening ($M = 3.32$, $SD = 1.33$; *95% CIs* [3.03, 3.59]) compared to the low cognitive load group ($M = 2.64$, $SD = 1.46$; *95% CIs* [2.35, 2.98]). More specifically, participants in the high cognitive load condition were 35% more likely to interpret the ambiguous facial expressions as threatening, compared to those in the low cognitive load condition (*Exp (B)* = 1.36, [1.10–1.67] see Table 1).

In addition to the significant manipulation effect on threat interpretation, there was also a significant effect of political orientation ($\beta = .16$, $z = 2.35$, 95% *CIs* [.03–.29]) and interaction effect of manipulation and political orientation ($\beta = -.19$, $z = -2.35$, 95% *CIs* [−.36 – -.02]) on threat interpretation. Specifically, one unit increase in political orientation (refers to approaching right-wing) resulted in 17% increase in threat perception on 10 ambiguous facial expressions (*Exp (B)* = 1.17, 95% *CIs* [1.02–1.57]). For the interaction effect, an omnibus test of simple effects yielded significant results, suggesting that different levels of political orientation had a divergent effect on threat interpretation as a function of high ($\chi 2(1) = 12.45$, $p = .001$) and low cognitive load conditions ($\chi 2(1) = 8.66$, $p = .003$). Specifically, participants who defined themselves as left-leaning showed higher threat interpretation in high cognitive load condition, compared to low cognitive load condition, $\beta = .24$, $z = 2.18$, 95% *CIs* [.03–.45]. Conversely, participants who rated themselves as right-leaning reported fewer threat interpretations about ambiguous facial expressions under high cognitive load, compared to low cognitive load condition, $\beta = .42$, $z = 3.54$, 95% *CIs* [.20–.67] (see Fig. 3).

In addition to this model, we also tested if SES and sex (as random effects) predict threat interpretation.

[1] Because participants were asked to respond to 10 ambiguous facial expressions in a counterbalanced order and responses were not independent from each other, and we decided not to run an independent samples t-test by aggregating 10 responses from the participants. Instead, we took into account intercepts, fixed, and random effects in the analysis using GLMM with categorical outcomes.

Fig. 2 Facial Expression Discrimination Task used by Vigil (2010)

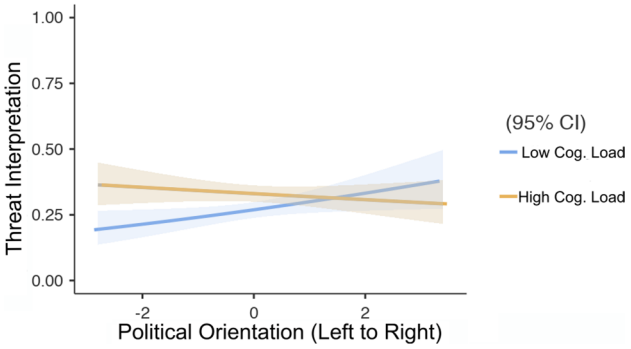

Fig. 3 Interaction Effects of Political Orientation and Manipulation on Threat Interpretation

Results revealed that SES and sex did not predict threat interpretation.

Overall, generalized linear mixed model with categorical outcomes yielded several significant results. First, high cognitive load (compared to low load) led participants to interpret 10 different ambiguous facial expressions more negatively. Second, political orientation was positively associated with threat perception. Participants who defined themselves as more conservative (right-wing) also reported a higher rate of threat interpretations on ambiguous facial expressions. Third, this link was moderated by the level of cognitive load. Specifically, high cognitive load (vs. low cognitive load) led liberals (who defined themselves as left-leaning) to interpret ambiguous facial expressions more negatively. Conversely, high cognitive load led conservatives (who rated themselves as right-leaning) to interpret ambiguous facial expressions as less threatening.

Experiment 2

The results of Experiment 1 were consistent with the current literature on cognitive and perceptual differences between conservatives and liberals with respect to negativity bias (Hibbing et al., 2014) and were also consistent with the reactive liberal hypothesis (Nail et al., 2009). But Experiment 1 was based on a single lab experiment where external factors were mostly eliminated because the participants took part in the experiment in isolated cubicles. In addition, it was not preregistered, and intuition was activated using a cognitive load manipulation. Hence, to test the robustness of this effect, we attempted to conceptually replicate the findings of Experiment 1 by using a different method to induce intuition (i.e., time-limit) and conducted the experiment online.

We expected an increase in negativity bias as a function of the time pressure manipulation. Specifically, we hypothesized that participants who are under time pressure would show more negativity bias on facial expression discrimination tasks compared to participants in the time-delay condition. We also expected political orientation to predict negativity bias. In other words, we hypothesized that as conservatism increases, reliance on negativity bias also increases. Finally, we expected political orientation to interact with time-pressure manipulation. We hypothesized that time-pressure (vs. time-delay) would have a stronger effect on negativity bias for those who define themselves as less conservative (i.e., more liberal).

Method

The preregistration form is available online at osf.io/854kn.

Participants In accordance with the first study's sample size, we planned for a powerful test ($1\text{-}\beta = 0.95$) to identify the effect size found in Study 1 ($f^2 = .05$) in a multiple linear regression model with 3 predictors and standard Type I error rate ($\alpha = 0.05$). Using G*Power 3.1.9.2 (Faul et al., 2009), we estimated our target sample size to include at least 348 complete submissions. We considered potential attrition and collected data from 392 participants (330 females, 58 males, 4 others; mean age = 22.47, $SD = 4.54$). The sample size was determined before any data collection. All data were collected by the Qualtrics survey software. Participants had a choice to fill the survey with their smartphones, tablets, or computers. Participants who took an unrealistically short or long time to complete the survey were excluded from the analysis (Z scores of response time spent on survey were used to determine participants who deviated from ±3). Participants were randomly assigned to either the time-pressure group ($n = 201$) or the time-delay group ($n = 192$). All participants were native Turkish speakers and they participated in the experiment in exchange for a gift draw.

Materials and Procedure The same materials as in Experiment 1 were used in this study except for the manipulation (cognitive load) and the response scale of the threat interpretation (see below). Instead of using Dot Memory Task (Trémolière et al., 2012), to manipulate participants' cognitive thinking style, we used time-limit manipulation commonly used in the literature. In the time-pressure condition, the participants were instructed to answer each of Facial Expression Discrimination Task in less than 5 s to induce intuition while in the time-delay condition, the participants were instructed to reflect on each question for at least 5 s to allow for reflection. To incentivize this condition, participants were offered a bonus lottery gift if they followed the instructions. The order of the ambiguous faces was randomized.

One other difference from the first study was, in Experiment 1, participants rated ambiguous faces based on 6 categorical universal emotions (happiness, sadness, surprise, disgust, fear, and anger; Ekman & Friesen, 1971). Different from Experiment 1, participants rated the ambiguous faces using a 7-Likert scale ranging from (1) very positive to (7) very negative in this study. The ends of the single continuum from positivity to negativity were counterbalanced for each group.

After completing the Facial Expression Discrimination Task, participants filled a demographic from which included the same one-item political orientation question from 1 (left) to 7 (right) that was used in Experiment 1.

Results

We conducted one-way ANOVA to test the first hypothesis in which we expected time pressure to increase reliance on negativity bias. ANOVA results revealed that there was no significant difference between time-pressure and time-delay groups in terms of negativity bias, $F(1, 389) = .145$, $p = .703$, $\eta^2 < .001$. However, there was a significant main effect of measurement direction (i.e., 1 = positive vs. 7 = negative), $F(1, 389) = 30.409$, $p = .001$, $\eta^2 = .072$. Participants who responded to the negativity questions in reversed order (1 = very negative, 7 = very positive) rated pictures more negatively ($M = 4.304$, $SD = .660$), compared to the participants responded to the question in non-reversed order ($M = 3.917$, $SD = .513$). Overall, there was no time pressure effect on negativity bias. We also used the reaction time of each participant spent on ambiguous facial expressions as covariate. ANCOVA results yielded no significant covariate effect, $F(1,388) = .018$, $p = .650$, $\eta^2 < .001$.

To test our second hypothesis, where we expected political orientation to predict negativity bias, we ran a regression analysis. Results showed that the single-item political orientation score (1 = left; 7 = right) did not predict negativity bias ($\beta = -.006$, $p = .900$). In short, negativity bias was not associated with political orientation in this sample.

A moderated regression was run to see if there is a significant interaction between political orientation and time-pressure on negativity bias. Hierarchical regression analysis was estimated with the first step the centered political orientation and manipulation conditions (time-pressure vs. time-delay), and with the second step interaction term between political orientation and conditions. The results revealed that interaction between political orientation and manipulation did not significantly predict negativity bias ($R^2 = .002$, $p = .715$), suggesting that negativity bias did not change as a function of political orientation and time-limit manipulations.

Experiment 3

The results of Experiment 1 were consistent with the current literature (Hibbing et al., 2014; Nail et al., 2009), but the results of Experiment 2 contradicted these findings. There were some major methodological differences between Experiment 1 and 2. In this preregistered study, we attempted to conceptually replicate the findings of Experiment 1 by using the same design with Experiment 2 but addressing some issues in the second experiment. In Experiment 3, we made two major differences: (1) to measure political orientation more reliably, we added Conservatism Scale (Saribay et al., 2017), and (2) instead of asking how negative or positive facial expressions seemed to the participants in the ambiguous faces (Experiment 2), we used the original version of the Facial Expression Discrimination Task and asked which of the six universal emotions participants saw in the ambiguous faces (as in Experiment 1). All other design procedures were identical to Experiment 2.

Similar to previous experiments, we hypothesized that on Facial Expression Discrimination Task, participants who were under time pressure would show more negativity bias compared to participants in the time-delay condition. Also, we expected participants who reported higher levels of conservative attitudes to show more negativity bias. Finally, we hypothesized that political orientation would have a moderating role between the time-limit manipulation and negativity bias. In other words, time-pressure would have a stronger effect on negativity bias for those who report lower levels of conservative attitudes.

Method

The preregistration form is available online at osf.io/4mgdc.

Participants Since Simonsohn et al. (2014) suggest that the size of the replication sample should ideally exceed the original sample size, we planned to recruit a sample that was at least 1.5 times as large as Experiment 1 (N = 176 * 1.5 = 264). Considering potential attrition, we aimed the sample size to be at least 300. We also planned to collect data for 5 days and stop if the sample size exceeds 300, and we collected data from 515 participants based on this preregistered criterion. But after initial examination, we excluded 31 participants who had missing data (13 in time-pressure, 18 in time-delay) on the dependent variable (i.e., negativity bias) and moderator (i.e., political orientation) and filtered the data down to 476 participants (360 females, 110 males, 5 others, 1 no answer; mean age = 28.91, $SD = 9.80$). As preregistered, we also excluded those (n = 6) who took very short or very long time to complete the experiment (i.e., z score for the duration

of completion in seconds is lower than −3 or higher than 3), resulting in 470 participants (355 females, 109 males 5 others, 1 no answer; mean age = 28.97, *SD* = 9.84). The sample size was determined before any data collection and all data were obtained by the Qualtrics. Participants were allowed to fill the survey with their smartphones, tablets, or computers. They were randomly assigned to either the time-pressure group ($n = 236$) or the time-delay group ($n = 234$). All participants were native Turkish speakers and they participated in the experiment in exchange for a gift draw.

Materials and Procedure The same materials and procedures in Experiment 2 were used in this study except: (1) we asked the participants to rate the ambiguous faces from 6 categorical universal emotions in the Facial Expression Discrimination Task (as we did in Experiment 1), and (2) to measure conservatism more reliably, we used the Conservatism Scale (Saribay et al., 2017) in addition to single-item political orientation question.

The societal resistance to change subscale of the Conservatism Scale was used to measure participants' conservative attitudes. It is a 7-point Likert scale ranging from 1 (don't agree at all) to 7 (completely agree). It consists of nine items. We did not include item 3 ("Protection of our country's land is more important than personal profit") in computing this variable due to a technical error when collecting data in Qualtrics. Higher scores on this scale refers to higher conservatism levels (original $\alpha = .80$; the current study $\alpha = .85$).

After the informed consent form, participants were randomly assigned to two groups: the time-pressure and the time-delay. Participants in the time-pressure group were instructed to rate the ambiguous faces in less than 5 s to induce intuitive thinking, while participants in the time-delay group were instructed to think on each question for at least 5 s to allow for reflection. To incentivize these conditions, participants were offered bonus lottery gifts if they followed the instructions. In both groups, the order of the ambiguous faces was randomized.

After participants completed the Facial Expression Discrimination Task, they moved on to fill the Conservatism Scale and then, lastly, they completed the demographic form, including a single-item political orientation question.

Results

Manipulation Check

To check out if participants spent much more time in the time-delay condition than the time-pressure condition, we ran an independent samples t-test using average reaction time spent on the ambiguous face evaluations as dependent variable and manipulation groups as independent level. The results showed that participants in the time-delay condition significantly spent more time on the ambiguous face evaluations ($M = 7.42$, $SD = 3.73$) than those in the time-pressure condition ($M = 5.17$, $SD = 1.47$; $t(468) = 8.63$, $p < 001$, Cohen's $d = 0.794$), indicating that our manipulation worked as intended.

Confirmatory Analyses

Following our preregistration, we ran a generalized linear mixed model with categorical outcomes (i.e., the logistic mixed-effects regression modeling) using Jamovi 1.1.5.0 (The Jamovi Project, 2019). We estimated negativity bias using a dichotomous outcome (i.e., assigning 10 ambiguous facial expressions as threatening or non-threatening). Negativity bias was estimated in terms of log odds (i.e., *logits*) as a linear combination of a set of predictors (i.e., fixed effects; manipulation groups [time pressure vs. time delay]) and random variables (i.e., random effects; single-item political orientation).

Model estimations yielded that a linear combination of a set of fixed and random effects explained 0.0001% of the variance ($R^2 = .0001$). The fixed effect omnibus test showed that participants in the time-pressure and the time-delay group did not differ in responses on the 10 ambiguous facial expressions ($\chi 2(1) = 0.018$, $p = .894$). Moreover, negativity bias was not predicted by political orientation ($\chi 2(1) = 0.007$, $p = .933$). An omnibus test of simple effects also revealed nonsignificant results for the interaction between political orientation and time pressure manipulation ($\chi 2(1) = 0.093$, $p = .676$).

Overall, the logistic mixed-effects regression modeling showed that neither time pressure manipulation nor political orientation predicted negativity bias. The interaction between political orientation and time pressure manipulation did not predict negativity bias as well.

Exploratory Analyses

To explore if conservatism (i.e., the resistance to change subscale of the Conservatism Scale) predicts negativity bias, we also estimated the logistic mixed-effects regression modeling in which negativity bias was a dichotomous outcome variable. The conservatism score, manipulation (i.e., time pressure vs. time delay), and the interaction between manipulation and conservatism were entered as predictors into the model. Results revealed a similar pattern with the model, including the single item political orientation; manipulation, conservatism, and interaction between manipulation and conservation did not predict

negativity bias ($\chi 2(1) = 0.025$, $p = .874$; $\chi 2(1) = 0.014$, $p = .906$; and $\chi 2(1) = 0.517$, $p = .472$, *respectively*). In addition to this model, we also added SES and sex as random effects into the model predicting negativity bias but the results showed that SES and sex did not predict negativity bias as well.

Discussion

In this research, we investigated whether intuition promotes negativity bias and mitigates the ideological asymmetry in this domain in three underrepresented, non-WEIRD (Henrich et al., 2010) samples (Turkey). The findings were not consistent with each other across the three experiments. The first experiment, conducted in the lab before the COVID-19 pandemic, showed that not only did intuitive thinking increase negativity bias overall, but also political orientation moderated this effect: Liberals became more like conservatives in showing negativity bias when thinking intuitively. However, in two online experiments (Experiment 2 and 3) conducted during the COVID-19 pandemic, we failed to find a significant effect of either intuition or political orientation on negativity bias. Overall, these findings may be viewed as evidence for the negativity bias account (Hibbing et al., 2014) which argues that people intuitively show this tendency, and also the reactive liberal hypothesis (Nail et al., 2009) which argues that when thinking intuitively, liberals become more like conservatives.

Why Conflicting Findings?

Experiment 1 was conducted in a controlled, laboratory environment where each participant took part in an isolated cubicle with a computer screen. However, in Experiment 2 and 3, the survey was conducted on an online platform and the participants participated via smartphones, tablets, or computers. Hence, one possible reason why studies yielded different results might be the relatively uncontrolled environment in the last two, which made it difficult to make sure that the participants paid sufficient attention to the task. Cultural differences might also have an instrumental effect on participants' negativity bias. Fournier et al. (2020), however, suggest that this may not be the case. In their comparative cross-cultural study (across 17 countries), using skin conductance to operationalize negativity bias, they did not find a consistent relationship between political ideology and negativity bias. Although the significant positive association between negativity bias and conservatism has already been shown using Turkish participants before (Peker et al., 2017), neither this association nor the causal effect of intuition provided strong evidence in this research.

Another major difference was that Experiment 1 was conducted in 2017 which was way before the COVID-19 outbreak, while Experiment 2 and 3 were conducted in the midst of the global COVID-19 pandemic. This might be a problem because according to Terror Management Theory (Greenberg et al., 1986), when the feeling of mortality is reminded consciously or unconsciously, people tend to allocate some mental resource to deal with this issue either by suppressing it or by maintaining self-esteem and faith in a cultural world view. Whether consciously or unconsciously, people spend cognitive effort to reduce death anxiety which can work as a cognitive load (Trémolière et al., 2012, 2014; Yilmaz & Bahçekapili, 2018). Past literature also converges with the claim that scarcity or mortality primes such as the global pandemic can lead people to have a cognitive load (e.g., Mani et al., 2013; Trémolière et al., 2012), which in turn can lead them to be unaffected by the experimental manipulations due to a ceiling effect. Hence, one alternative explanation is that the cognitive load induced by the current COVID-19 threat might invalidate the experiment due to the ceiling effect.

In addition, although participants evaluated ambiguous faces in all experiments, they were asked to categorically choose between the six universal emotions in Experiment 1 (happiness, sadness, surprise, disgust, fear, and anger; Ekman & Friesen, 1971), while they rated the ambiguous faces as very positive or very negative on a 7-Likert type scale in Experiment 2. Although using a categorical outcome measure might be a boundary condition to observe such an effect, Experiment 3, where we used the categorical outcome measure as in Experiment 1, conclusively demonstrated that the differences in the operational definition of the outcome measure are not the main reason for conflicting findings.

Furthermore, one of the main differences across experiments was that different cognitive load methods were used. Dot Memory Task was used in the first experiment where we found a reliable effect, while in the second and the third, participants were under time pressure or time-delay. This difference might be the main reason why the last two experiments failed to replicate the first experiment's findings. In other words, Dot Memory Task is more of a direct cognitive load manipulation as the participant keeps the pattern of the image in mind throughout the experiment, whereas time-limit manipulations combined with the study being an online survey might not be strong enough to shift the participant to a more intuitive mindset. Therefore, future studies should use more powerful manipulation techniques to induce intuition, and they should also test the causal effect of not only intuitive but also reflective thinking on negativity bias (see Isler et al., 2020 for potential manipulation techniques).

One further possibility is that the effect found in Experiment 1 is spurious. In other words, considering the high statistical power of the last two experiments, failing to replicate the results of Experiment 1 in two attempts might indicate either that the effect in Experiment 1 was spurious or that the effect is very weak to be captured in an online setting, especially during the COVID-19 pandemic where the feelings of scarcity and mortality are more likely to induce an intuitive mindset. Therefore, future studies should investigate these alternative explanations considering that the effect size might be too small.

Potential Implications

The political psychology literature has been nourished from the meta-analysis of Jost and his colleagues (Jost et al., 2003), which concludes that there are motivational and relatively constant variables that separate political groups from each other. A number of longitudinal and physiological studies in recent years have supported the argument that these differences point to a relatively constant set of trending differences (Block & Block, 2006; Bouchard & McGue, 2003; Hatemi et al., 2014; Kanai et al., 2011; Schreiber et al., 2013). Hibbing et al. (2014) argue that physiological differences are due to conservatives being more prone to negative stimuli. The findings of the current research are partially consistent with the current literature on cognitive differences between conservatives and liberals and with the literature showing that liberals under threat are similar to conservatives (e.g., Nail et al., 2009).

The hypothesis that the negativity bias differs as a function of political groups has been criticized in the literature. For instance, Brandt et al. (2014) stated that both liberal and conservative people use similar strategies to overcome threatening situations. In other words, this critique argues that the negativity bias is not specific to conservatives but that liberals show more sensitivity and prejudice to the groups that threaten their values, just like conservatives. For example, while it is known that liberals have negative attitudes toward value-violating outgroups such as religious fundamentalists, conservatives have similar negative attitudes towards atheists (Crawford et al., 2017). In line with this criticism, Crawford (2017) argued that there are no differences between conservatives and liberals on meaning threats such as threats to one's values and beliefs. From this perspective, Hibbing et al.'s (2014) negativity bias account is valid only for physical threats. Crawford (2017) reviewed the extant literature and found support for this claim. Consistent with this perspective, we only looked at physical threat in this study to define negativity bias. The relationship should be further investigated in the domain of meaning threats in order to test Crawford's (2017) argument on negativity bias. In addition, we defined negativity bias as the tendency to interpret ambiguous faces as threatening. Since our limited effect is obtained only in this domain, future studies should further examine the moderating role of political orientation on the effect of intuition on other tasks, originally designed to measure negativity bias, such as flanker tasks, startle responses, galvanic skin responses, etc.

When we look at the literature in general, a great majority of the previous studies investigating the role of cognitive styles on negativity bias are based on correlational findings and Western samples, with certain exceptions (Fournier et al., 2020; Peker et al., 2017). In this research, all experiments were conducted with a sample where the majority of the participants were Muslim (cf. Henrich et al., 2010). Future experiments should increase sample diversity in political psychological research.

One limitation of the current research is the use of a one-item political orientation question. Although social and economic orientations have different meanings for American participants, this distinction is not clear in the Turkish context, and the utility of this one-item political orientation measure has also been previously shown in past studies in Turkey (e.g., Yılmaz et al., 2016). Using a more valid psychometric tool to measure political ideology in Experiment 3 also produced identical results with that of a single item measure. Thus, future studies should try to replicate the current findings in western samples using more valid measures (e.g., Henningham, 1996) and examine the potential moderating effects of social and economic orientations on this relationship.

Even though Experiment 2 and 3 failed to conceptually replicate the findings of the first experiment, we think that this research is still valuable for understanding how robust the effect is and which particular methods (e.g., cognitive load vs. time-limit) and boundary conditions (lab vs. online environment) the effect is specific to (cf. Nosek et al., 2018). Future research can investigate these potential boundary conditions to identify more robust effects.

Conclusion

Overall, our findings may be viewed as evidence for the argument that negativity bias originates from an intuitive cognitive style and that liberals use cognitive effort to avoid this intuitive perceptual bias of negativity in the domain of physical threat. As a result, these findings suggest that researchers should bring more attention to the replication studies in general and to the relationship of cognitive styles and political affiliations in particular, as the results suggest that the effect of cognitive style is highly sensitive to boundary conditions. We suggest that manipulation technique is one potential source of boundary condition and this is what future studies should focus on.

Data Availability All data generated or analysed during this study are included in this published article [and its supplementary information files].

Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Approval Ethical approval for the study was granted by the ethical board of Dogus University, Turkey. All participants were provided with an informed consent form before their participation.

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