Yikes! Are we disgusted by politicians?

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Abstract

In the political domain disgust is primarily portrayed as an emotion that explains individual differences in pathogen avoidance.[1] We hypothesized that political rhetoric that accuses opponents of moral transgressions also elicits disgust responses. In this registered report, we present results from a laboratory experiment. We find that participants self-report higher disgust and have stronger physiological responses to pictures of outparty leaders compared to inparty leaders. Participants reported higher disgust in response to moral violations of inparty leaders. There is more suggestive evidence that inparty leaders evoke more labii activity when they commit moral violations than when outparty leaders do. The impact of individual differences in moral disgust and partisanship strength is very limited to absent. Intriguingly, on average the physiological and self-reported disgust responses to the treatment are similar, but individuals differ in whether their response is physiological or cognitive. This motivates further theorizing regarding the concordance of emotional responses.

Keywords: Moral violation; disgust; physiology; self-report, registered report

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[1] Bert N. Bakker and Gijs Schumacher contributed equally to this study and are listed in alphabetical order. Registered Report Stage 1 (B.N.B. & G.S.), Data collection (B.N.B., G.S.& M.D.H.), Data preprocessing (G.S. M.D.H.), data analyses (B.N.B. G.S.) and writing up Stage 2 (B.N.B., GS & M.D.H.). We thank Cybele Atmeh, Charlotte Brands, Neil Fasching, Zilin Lin, Ilse Slabbekoorn and Mehdi Zamani for their help during the data collection. Our thinking about the associations between physiological and self-reported disgust been heavily influenced by our conversations and work with Vin Arceneaux. We also thank Alex Nai, Valentina Parma, Patrick Stewart, Michael Bang Petersen, Josh Tybur, members of the Hot Politics Lab and the Amsterdam Interdisciplinary Center for Emotion (AICE) seminar at the University of Amsterdam for their comments. **Funding:** This research was funded by the association for Politics and the Life Sciences (B.N.B & G.S.), the European UnionâĂŹs Horizon 2020 research and innovation programme under grant agreement No 750443 (B.N.B), the Amsterdam School of Communication Research (B.N.B) and the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 759079 (G.S).

Yikes! Are we disgusted by politicians?

In September 2016 a Pew poll found that 55% of American voters were disgusted by the campaign for the US Presidential elections (Kludt, 2016). A year into the Trump presidency, a NBC/WSJ poll found that "disgust" was the top answer to the question how respondents felt about the Trump presidency (Murray, 2018). Disgust is a basic, discrete emotion associated with the Behavioral Immune System (BIS). It can be elicited by various stimuli, for example pornography, feces or vomit, but also acts of lying and stealing (Haidt, Rozin, Mccauley, & Imada, 1997; Rozin, Lowery, Imada, & Haidt, 1999; Tybur, Lieberman, & Griskevicius, 2009). Disgust evolved to perform three different functions: the avoidance of interaction with disease-causing organisms (pathogen avoidance); the avoidance of mates that jeopardize fitness and the coordination of condemnation of people who violate moral standards (Tybur, Lieberman, Kurzban, & DeScioli, 2013). We can understand disgust both as state and trait: particular situations cause disgust responses, while at the same time some individuals are more sensitive to disgusting environmental cues than others. In the political domain disgust has mostly been associated with the first function, the avoidance of pathogens. That is, pathogen avoidance is reported to correlate with negative attitudes towards immigrants (Aarøe, Petersen, & Arceneaux, 2017), gay people (Balzer & Jacobs, 2011; Smith, Oxley, Hibbing, Alford, & Hibbing, 2011), pre-marital sex (Smith et al., 2011) and political conservatism in general (Inbar, Pizarro, Iyer, & Haidt, 2011; Smith et al., 2011) – but see (Bakker, Schumacher, Gothreau, & Arceneaux, 2020). In our view it is hard to see how pathogen avoidance motivates disgust against politicians in general or politicians like Donald Trump and Hillary Clinton in particular. After all, there is no reason to assume politicians are

infected with some virus (although some people surely believe this). Instead we propose that the third function of disgust, which signals moral violation, is a more likely explanation of disgust responses to politicians. As such, we suggest an additional, alternative role of disgust in the political domain through the route of moral violation.

We explore in this paper whether people experience disgust when confronted with politicians who perpetrate moral violations. In particular, we expect that the moral dimension of disgust sensitivity is relevant here, and not, or to a lesser extent, the pathogen dimension and sexual dimension. Indeed, people are found to have similar disgust responses to moral violations, and content with pathogenic or sexual content (Cannon, Schnall, & White, 2010; Chapman, Kim, Susskind, & Anderson, 2009). Disgust responses to moral violations serve the purpose of coordinating actions in a conflict between two people. When observers of the conflict successfully coordinate in identifying the person that is violating moral standards, the conflict can be solved and tension will dissipate (Tybur et al., 2013). If, however, observers cannot or do not coordinate, they may choose different sides and in effect produce a conflict between two groups, which further aggravates the situation. Clearly, such outcomes are not beneficial for the survival of individuals and groups (Tybur et al., 2013). Using facial displays (i.e., through the activation of the levator labii muscle), individuals can coordinate their disgust and quickly identify the person who violated moral standards (Vrana, 1993; Whitton, Henry, Rendell, & Grisham, 2014). Acts of indirect aggression, in the form of social exclusion and reputational attacks, are subsequently used to restore order (Molho, Tybur, Güler, Balliet, & Hofmann, 2017).

Modern political campaigns are rife with accusations of lying, cheating and bribery (Dolezal, Ennser-Jedenastik, & Müller, 2016; Elmelund-Præstekær, 2010; Hopmann,

Vliegenthart, & Maier, 2018; Nai, 2018; Soroka, 2014; Walter, 2014). In the 2016 US presidential campaign Donald Trump rarely referred to Hillary Clinton without calling her a liar or labelling her as crooked – for instance Associated Press (2016) or CNN (2016). The US 2016 presidential elections was not a case on its own. Especially when negative campaigns become uncivil, accusations of moral violation by the other become common (Brooks & Geer, 2007; Fridkin, Kenney, & Woodall, 2009; Mutz, 2006; Mutz & Reeves, 2005). Politicians from the other party are identified as cheaters and liars, as individuals who violate moral standards (Kenski, Filer, & Conway-Silva, 2018; Sobieraj & Berry, 2011). This frame of moral transgressions should then elicit disgust responses. There is some indirect evidence for this expectation. People self-report that they are disgusted by actions they find morally wrong: such as stealing the purse of a blind person (Hutcherson & Gross, 2011; Nabi, 2002). When people receive an unfair offer in an ultimatum game, they experience more activity of the levator labii (Chapman et al., 2009) – a muscle associated with physiological disgust. When people were listening to messages that described dishonest behavior, they also experienced more labii activity (Cannon et al., 2010). These examples of moral violations produced moral disgust responses. We expect this to extend to moral violations in the political domain too.

We do, however, believe that individuals do not respond even-handedly to accusations of moral violations targeted at politicians. In a time of increasing affective polarization (Iyengar, Sood, & Lelkes, 2012; Westwood et al., 2018) a large part of the population strongly identifies with a political inparty (e.g. Democrat), and therefore also has a specific other political outparty (e.g. Republican) (Huddy, Mason, & Aarøe, 2015). Despite our examples, strong positive feelings for the political inparty, and strong negative feelings for the political outparty are not uniquely American and are

pervasive in Europe too (Bakker, Lelkes, & Malka, 2020; Bankert, Huddy, & Rosema, 2017; Huddy, Bankert, & Davies, 2018; Westwood et al., 2018). Because of these strong identities disgust responses to outparty politicians are perhaps almost baked-in because they – and their party – are so often criticized for moral transgressions by the inparty. In this situation mere exposure to an outparty politician may already trigger associations with moral transgressions and elicit a disgust response.

This expectation may be too bold. People may have lots of different associations with outparty leaders and inparty leaders. Exposing people simultaneously to a leader and an accusation of moral transgressions should make this link more salient, and elicit disgust responses. Still, we expect that partisans do not respond the same to a message critiquing their leader, as they would to a message critiquing the âĂIJotherâĂİ leader. How different is, however, open for debate.

On the one hand, we know that people reject information if it does not support their world view, and easily accept information in line with their world view (Taber & Lodge, 2006). From that perspective, we expect that partisans are easily disgusted by rhetoric placating the "other" leader as a violator of moral standards, because it is in line with their world view. Reversely they might ignore any rhetoric against their own leader.

On the other hand, confirming negative information (i.e., a moral violation) about an outparty politician is not likely to elicit a strong emotional response. After all, we are just telling the inparty supporters something they already know. Instead, calling the inparty leader out as a violator of moral standards may elicit a much stronger emotional response. The evolutionary function of disgust in the moral domain is primarily aimed at resolving intragroup differences and maintaining intragroup peace

(Tybur et al., 2013). As such, moral violations by a group member, i.e, a betrayal, may elicit a much stronger response, and motivate stronger punitive actions.

In sum, we have identified three possible hypotheses:

- **H1**: outparty politicians should elicit stronger disgust responses than inparty politicians.
- **H2a**: outparty politicians accused of moral violations should elicit stronger disgust responses than inparty politicians accused of moral violations.
- **H2b**: inparty politicians accused of moral violations should elicit stronger disgust responses than outparty politicians accused of moral violations.

In addition to this, we expect that disgust responses to our treatments are also influenced by the strength of party identification and disgust sensitivity as an individual difference. Finally, we also explore how self-reported and physiological disgust responses may differ in terms of the hypothesized effects. We further explore these theoretical issues in the next sections.

Covariate 1: strength of party identification

It is unlikely that all people will respond to violations of inparty and outparty politicians to the same extent. Partisanship is most likely an important factor shaping the response to moral violations. Recent research show the expressive notions of partisanship (e.g., Huddy et al., 2015) whereby party identification should be seen as a social group attachment akin to a tribal affiliation. People who identify with a social group vary in their strength of social identification with this group (Bankert et al., 2017). The strength of social identification with a party better predicts political activity than substantive issue stances, ideological intensity, and simple partisan self-placement

(Bankert et al., 2017). Bakker, Lelkes, and Malka (2020) found that those with a stronger partisan social identification were more likely to follow party cues when they had higher cognitive resources. Arceneaux and Vander Wielen (2017) showed that people high in need for affect – i.e., individuals who are motivated to feel strong emotions – and low in need for cognition were more likely to follow party cues. In sum, strong partisans have strong positive affective tags with the inparty leader and negative affective tags with the outparty leader (Lodge & Taber, 2005). In highly polarized political contexts – like the Netherlands – we expect strong partisans to already associate the outparty leader with moral violations. Therefore, additionally priming them with moral violations by the outparty leader will not increase the already strong response. We hypothesize that *strong partisans have stronger disgust responses to outparty leaders compared to inparty leaders than weak partisans* (**H3**).

Covariate 2: disgust as individual difference

Our hypotheses concern a specific state that elicits disgust. Yet, the literature we discussed places equal, or perhaps more, importance on treating disgust as an individual difference (Rozin et al., 1999; Tybur et al., 2009). In particular, Tybur and co-authors (2009) identified three domains of individual differences in disgust sensitivity. These are similar to the three different functions of disgust we discussed before (disgust sensitivity to pathogens, sexual acts, and immoral behavior). We expect disgust sensitive people to have stronger responses to moral violations than people who score low on disgust sensitivity. We hypothesize that *individuals higher on moral disgust sensitivity, compared to those lower on moral disgust sensitivity, have a stronger disgust response to our moral violation treatments* (**H4**).

Two different disgust responses

What do we mean with disgust responses? An emotion like disgust most likely originates from a multi-level response system which consists of experiences of the feeling of disgust, physiological changes in the individual and particular behavioral action tendencies (Lang, 2014). We will analyze the physiological and experiential self-reported responses, and initially we have formulated similar expectations for each type of emotional response (see H1a and H1b in Table 1). However, there are reasons to believe that the physiological and experiential responses do not result in a singular multi-modal disgust response. Therefore, we propose *ex ante* explanations of what differences in physiological and experiential responses mean.

According to the seminal James-Lange theory of emotion discrete emotions should have discrete patterns of physiological reactivity (James, 1884). Therefore, physiological disgust response should match with experiential disgust responses. However, there is not a universally accepted list of discrete emotions that are one-on-one associated with specific physiological patterns (Kreibig, 2010; Lang, 2014; Lang, Greenwald, Bradley, & Hamm, 1993). Generally, physiological arousal and self-reported feelings to stimuli that should be negative (threatening, disgusting) do not correlate very highly with each other (Lang et al., 1993; Stark, Walter, Schienle, & Vaitl, 2005; Vrana, 1993). Nor do either of these measures align with behavioral responses (Lang et al., 1993). At best, physiological reactions to emotional stimuli and self-reports (experiential) of affective states are weakly correlated (Chapman et al., 2009; Schaefer, Larson, Davidson, & Coan, 2014).

Why are physiological and experiential responses weakly correlated? There are two perspectives relevant here. First, some emotion researchers question whether

physiological responses are reliable predictors of emotions (LeDoux & Pine, 2016). If physiological responses are not valid, then there is no reason to expect concordance with experiential responses. Yet, there is evidence that disgusting stimuli evoke physiological responses such as an increase in the activity of the levator labii muscle in the face (Cannon et al., 2010; Chapman et al., 2009; Vrana, 1993) and an increase in arousal (Aarøe et al., 2017; Smith et al., 2011). Our study contains a "manipulation check": we show people a series of disgusting images and test whether we observe increased labii activity in response to these images.

A second perspective puts forward that people process emotions on conscious and non-conscious levels (Evers et al., 2014). This perspective builds upon dual process theories which posit that "automatic responses are relatively unconscious, fast, and efficient, while reflective responses are relatively conscious, deliberate, and effortful" (Evers et al., 2014, p.44). The automatic system is fast and "requires little or no cognitive effort and has a low threshold for processing incoming information", while the reflective system operates slowly, requires effort (Evers et al., 2014, p.44). Evers and colleagues (2014) showed that convergence between responses within each of the two systems is larger compared to the coherence in responses between the two systems. As such, there is not much reason to expect strong associations between associations between physiological and experiential responses.

The latter perspective – based upon the broader theoretical model outlined by Arceneaux and Bakker (2019) – leads us to four possible observations regarding the observed concordance or disconcordance between physiological and experiential responses. We summarize these in the theoretical model in Figure 1.

The hypotheses we formulated, assume that people are in quadrant 2 or 4. Starting

with quadrant 2, these people report a strong experiential response and a strong physiological response. The responses of these people are concordant (quadrant 2). The concordance between the physiological and experiential responses may happen when the physiological responses pass a critical threshold that motivates alignment among cognitive and behavioral components (Evers et al., 2014; Schaefer et al., 2014). For instance, there is strong concordance between the physiological responses to stimuli containing spiders or snakes among people who are very fearful (phobic) of spider or snakes (Hofmann & Kim, 2006; Stark, Schienle, et al., 2005) but see (Stark, Walter, et al., 2005). Therefore, one possibility – also reflected in hypothesis 4 – is that we only observe concordance between physiological measures and experiential measures of disgust when people score higher on moral disgust.

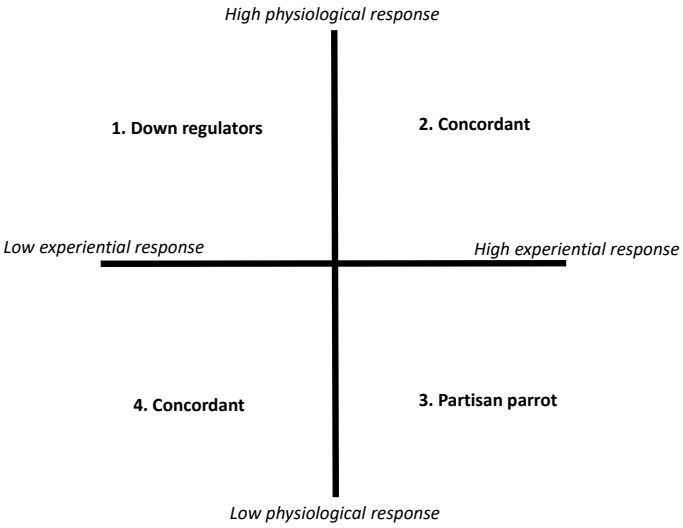
Another form of concordance is observed for people who are experiencing a weak experiential response and a weak physiological response (quadrant 4). They are simply not responding to the moral violations of politicians.

Yet, as our discussion of the two systems of emotions (see, Evers et al., 2014)) suggested, in reaction to moral violations by politicians there might be disconcordance between the experiential and physiological responses. These possibilities are reflected in the two remaining quadrants in Figure 1. In quadrant 3 of Figure 1, there are people who report strong experiential responses but weak physiological responses. These people are partisan parrots. That is, people follow cues from the party (leadership) they support (Bakker, Lelkes, & Malka, 2020; Kam, 2005; Petersen, Skov, Serritzlew, & Ramsøy, 2013). As such, they simply echo the sentiments they hear, but they do not actually have any affective (unconscious) response to the moral transgressions stimuli. This means that people report disgust experience but this is simply a case of sticking to

your group rather than being physiologically disgusted.

Finally, in quadrant 1 of Figure 1, there are people that respond physiologically to moral violations but do not report any experiential emotions. These people have consciously or unconsciously down-regulated their physiological experiences (Butler, Gross, & Barnard, 2014).

Figure 1. Theoretical Predictions for Concordance between Experiential and Physiological Responses



This Figure is inspired by a theoretical model outlined by Arceneaux and Bakker (2019)

Research design

We conducted an experiment in our physiology lab at a large university in the Netherlands and tested our hypotheses using a within-subjects design. This paper was a registered report and our peer-reviewed In Principle Acceptance Stage 1 submission can be found here: https://osf.io/7h3ju. Deviations from the Stage 1, can be found Table 1 and discussed in the main text.

Table 1
Deviations from Stage 1 Registered Report

#	What	Explanation	Action
1	Data collection	Extra data collection in Nijmegen (lab-in-the-field)	Control for location in statistical models
2	Cleaning of face	Alcohol instead of non-oily soap	none
3	Randomization of experiments	Failed to randomize moral violation and disgusting images experiments	none
4	Politicians images	Images contained party logo	none
5	Response options in Qualtrics	forced response used	none
6	Inparty/outparty measurement	Measured in Presentation before treatment	none
7	Outparty measurement	All 13 parties in parliament instead of 12 parties were shown	none
8	Partisan Identity measurement	Measured in Presentation before treatment	none
9	Rating scale self-reported emotions	0-100 scale used instead of 1-4	none

Sample

To decide the number of participants we evaluated our model following the DeclareDesign model (Blair, Cooper, Coppock, & Humphreys, 2019). We are estimating the difference between the disgust response in the in-group treatment and out-group treatment, in the presence of covariates that potentially influence the levels of the outcome variable. We expect a small effect size, a Cohen's d of .2. This is based upon earlier studies (Arceneaux, Dunaway, & Soroka, 2018; Dodd et al., 2012; Oxley et al., 2008; Smith et al., 2011). We expect a high correlation between individual responses (r=.8). Based on this we calculated that 80 respondents gives acceptable power (0.95), conventional alpha-level (.05) and sampling bias (0.00). Based upon our earlier experiences using physiological data (Bakker, Schumacher, et al., 2020), we aimed to collect the responses from at least 100 respondents to allow for some drop-out and failed physiological readings (electrodes that fall off, etc.). Code to replicate our power analysis is provided on our OSF page (`https://osf.io/tp7yn`).

Using an online portal, we recruited participants from a diverse pool of students and locals for a 45-minute experiment. Participants received €7,50 or 1 research credit for their participation. We collected data between November 12, 2019 and December 13, 2019 and 65 participants completed the study. Aside from this preregistered mode of data collection, we also collected data during a public festival, the InScience Festival

(see here:https://www.insciencefestival.nl/en/festival/) in Nijmegen (the Netherlands) between November 7 and November 10, 2019 (deviation 1 from Stage 1, see Table 1). Here 43 participants completed the study. For details of the two data collection modes and the differences, see Appendix A.1. Our sample thereby consists of 108 respondents and is sufficiently powered.

Procedure

Upon signing the informed consent form, the trained lab assistant first cleaned parts of participant's face with water and an alcohol swap with 70% Isopropyl Alcohol (Brand: Romed) to clean the skin – this is contrary to the non-oily soap we preregistered to use (see Table 1, row 2). Next, participant started with a survey battery that contains measures of our moderators as well as a set of covariates (see measures). In the lab this was done on a computer, while in the lab-in-the-field this was done using an Ipad.

Upon completion of the pre-test, a trained lab assistant connected people to the physiological equipment. This was followed by the moral violations experiment and the visual disgust images. We preregistered to randomize the order of the two experiments to account for any spillover effects but a human error in our script caused that the moral violations experiment was always shown first.

Moral violations experiment. In the moral violations experiment all participants are exposed to four treatments: the inparty politician image, the inparty politician image plus moral violation text, the outparty politician image and the outparty politician image plus moral violation text. In all four conditions, we used images from the party leader. For the inparty and outparty politicians, we take the images from the party leaders with a white background and of the same size. Note that

Sybrand Buma of the CDA resigned but the CDA did not yet appoint a new party leader when we started data collection. Buma is arguably the most prominent politician of his party. Therefore, we included his image in the experiment. Contrary to our preregistration, the images also contained the party logo (see Table 1, row 4).

In the moral violation conditions, we use the following two moral violations: (1) "*Shared an email with classified documents with a befriended lobbyist in return for a political favor*" and (2) "*Joined a company on a luxury vacation in exchange for support of a law which would benefit that company*". These moral violations were selected based upon the results of a pre-test conducted in January 2019 (see Appendix A.2). Respondents saw both moral violations, once for the inparty, once for the outparty. The order was randomized. Figure 3 provides a schematic overview of the moral violations experiment.

Figure 2. Schematic outline of treatments

Treatment	Text	Time
Image only (in-party & out-party)	[Image of politician] This is [NAME POLITICIAN] of the [NAME PARTY].	8 seconds
Moral Violation (in-group & out-group)	[Image politician] This is [NAME POLITICIAN] of the [NAME PARTY]. He/she has [*"Shared an email with classified documents with a befriended lobbyist in return for a political favor."* Or *"Joined a company on a luxury vacation in exchange for support of a law which would benefit that company."*]	*Time of message + 6 seconds*

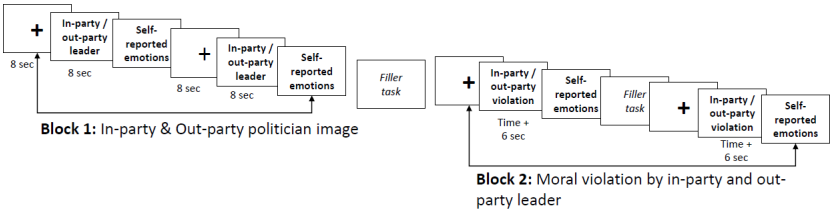
The experiment started with a blank screen with a black + in the middle – the interstimulus interval (ISI), which always lasts for 8 seconds (see also, Codispoti, Bradley, & Lang, 2001). Respondents first saw the images of the inparty and outparty leaders with their name and party affiliation – in randomized order (see Block 1 of Figure 3) – followed by a filler task – a video of birds (here:

(https://www.youtube.com/watch?v=rX40mBb8bkU) – after which they were randomly assigned to the inparty or outparty politician with the moral violation text (see Figure 3). This was followed by another filler task – a video of whales (here: https://www.youtube.com/watch?v=glxULceEEjA) – after which they were again assigned to a politician with the moral violation text. Participants were exposed to the message on the screen while they listened to the message via noise cancelling headphones (a speech actor recorded all messages) and saw the message on the screen at the same time (see also, Cannon et al., 2010). Note that the treatments in block 2 (moral violations) are a little longer: the time it takes to pronounce the moral violation (see Fig. 2 plus six seconds). We took the longest treatment plus six seconds as the time of exposure. We add six seconds because physiological responses to stimuli are often seen within that time period (Brown, Bradley, & Lang, 2006). In all conditions we measured participants' physiological responses and we asked participants to self-report their emotions (see measures).

Inparty and outparty assignment. The Netherlands is a multi-party system with thirteen parties in parliament. Manipulating inparty - i.e., the party you support - and outparty - i.e., a party you do not support - is a daunting task compared to studies conducted in political contexts where there are only two political parties (Bakker, Lelkes, & Malka, 2020; Bullock, 2011; Kam, 2005). One approach, is to only use the major center-left and major center-right party (Bisgaard & Slothuus, 2018; Petersen et al., 2013). We opt for a different approach because (a) the Netherlands does not have an indisputable "major" party on the left nor an indisputable "major" party on the right and because (b) in a system where the positions of parties differ on both the left-right and the progressive-conservatism dimension, it is not automatically clear what

the logical "outparty" is. For instance, a supporter of the liberal VVD (a major party on the right) might see the progressive Greens (GroenLinks) or the left-wing Socialist Party (SP) as their outparty. We therefore, refrained from a rather arbitrary selection of two out of the thirteen parties. Instead, in we asked participants what party they were most likely to vote for if elections were held, this is their "inparty". We also asked them which party they would be most unlikely to vote for if elections were held, this party is the respondents' "outparty" (see measures).

Figure 3. Schematic outline of Moral Violations Experiment



Visual Disgust Images

Here we exposed participants to a series of images. First, we always show participants a neutral image of a Basket (7010) taken from the International Affective Picture System (Lang, Bradley, & Cuthbert, 1997). Next they were randomly exposed to six images. Three images images – used by Smith et al. (2011) and Bakker, Schumacher, et al. (2020) – are used to measure disgust sensitivity ("man eating worms", "human excrement in toilet", "vomit") and three neutral images (IAPS images of a spoon (7004), mug (7035) and lamp (7175). We show a blank screen with a plus for 8 seconds followed by one of the randomly drawn 6 images shown for 8 seconds (Codispoti et al., 2001). After each image respondents were asked how "disgusted" respondents were (see measures).

Measures

In the pre-test survey we measured socio-economic background variables (age, gender, level of education, student status, and political knowledge) as well as disgust sensitivity. At the start of the survey we also measure the temperature in the room in Celsius. The measures of the socio-economic background variables is discussed in detail in Appendix B.1. This Appendix B.1 also contains the descriptive statistics.

Disgust sensitivity was measured using the Dutch version of the "Three domain disgust scale" (Tybur & de Vries, 2013) which taps into pathogen (7 items), animal (7 items) and moral disgust (7 items) using items, such as: "Forging someone's signature on a legal document" that people answer on a scale from 0 "not at all disgusting" to 6 "extremely disgusting". The items load highly on the designated latent dimension, each scale is internally consistent and the three sub-dimensions are correlated with each other (see Appendix B.2). We created for each dimension a summated scale that we standardized (z-transformation).

inparty and outparty. Contrary to our Stage 1 submission, we measured the inparty and outparty assignment not in the pre-test (using Qualtrics) but at the start of the physiological experiment. We do this because it turned out to be impossible to use Qualtrics responses as input for the randomization in the physiological experiment that runs on Presentation. At the start of the physiological experiment, we measured which party participants support – i.e., their inparty – we asked respondents "which of the following parties has the highest probability of receiving your vote during the next national elections?" and they could choose from a list of the 13 parties currently in the Dutch parliament. To measure the *outparty*, we ask participants next "which party will certainly NOT receive your vote during the next national elections?" Participants could

choose out of the 13 parties that were currently in the Dutch parliament. This is different from what we preregistered where we stated that participants could choose out of the 12 other parties that were currently in the Dutch parliament (see Table 1).

Partisan social identity strength. Contrary to our Stage 1 submission, we did not measure this in Qualtrics but in physiological experiment immediately after the inparty and outparty support. We measured partisan social identification strength using the validated Dutch version introduced by (Bankert et al., 2017). The party which the participant was likely to vote for (see inparty) was used as the party for which we asked the eight items tapping into partisan social identity strength. A sample item is, "When I speak about the [NAME PARTY], I usually say "we" instead of "they" scored on a Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (4). We checked the internal consistency of the scale (see Appendix B) and averaged the eight items and standardized the partisan social identity strength scale.

Physiological measures

We measured activity of the levator labii superioris using facial electromyography at 1000 Hz. The levator labii is a facial muscle activated when people experience disgust (Whitton et al., 2014). We also measured the activity of the corrugator supercilii - the muscle above the eye-brow - which has shown to be a sensitivity marker of negative affect (Bolls, Lang, & Potter, 2001; Tassinary, Cacioppo, & Vanman, 2007). As a robustness check we also measured skin conductance levels as a measure of arousal (Arceneaux et al., 2018; Smith et al., 2011; Soroka & McAdams, 2015).

We created an index of labii activity in response to the treatments following the procedures outlined by Brown et al. (2006). We subtracted labii activity per 500ms (j) during the treatment (T) from the labii response in the last second (k) of the

interstimulus interval (Labii(ISI)). The index of labii sensitivity per individual in each treatment ($Labii_{i_T}$)) is the mean change in labii activity over the specified time in the treatment following equation 1 below. Note that for images in block 1 (see Figure 2, row 1, column 3), we look at the first six seconds after stimulus onset. For the images plus moral violation conditions, we calculate the labii activity over the time of the treatment plus six seconds (see Figure 2, row 2, column 3).

The index of corrugator activity was created in the same way as the labii.

$$Labii_{iT} = \frac{\sum_{j=1,2,3...N}(Labii(T)_{ij} - Labii(ISI)_{ik})}{N} \tag{1}$$

The index for skin conductance responses follows a slightly different procedure. In the treatments where we only show the image of the politician, we take the average of the natural log of Skin Conductance Levels (SCL), which were measured in microsiemens, from the second to the sixth second after the onset of a target image (T) and the subtracts the average of the natural log of the last 500 milliseconds of the SCL in the ISI (i.e., a baseline SCL) using equation 2. In the treatments where we show the image of the politician with the moral violation, we calculate the index of threat sensitivity using a modified version of equation 2 so that we take the average of the natural log of SCL from the 2^{nd} second after stimulus onset till 6 seconds after the treatment ends.

$$EDR[1]_i = \frac{\sum_{j=2,000}^{6,000} ln[SCL(T)_{ij}]}{4,000} - \frac{\sum_{j=7,500}^{8,000} ln[SCL(ISI_T)_{ij}]}{500} \tag{2}$$

Self-reported measures of emotions

In response to all four treatments, we measure self-reported disgust, anger, anxiety and enthusiasm using three items per emotion (Marcus, Neuman, & MacKuen, 2015; Nabi, 2002). Disgust is measured using the words "disgusted", "grossed out" and "repulsed"; anger using the words "angry", "hateful" and "bitter"; anxiety using the words "afraid", "scared" and "worried"; enthusiasm with the words "hopeful", "proud" and "enthusiastic" (Marcus et al., 2015; Nabi, 2002). For each target emotion participants answer whether they feel this emotion "not at all" (0) to "extremely" (100). We created for each emotion a summated scale. We preregistered to standardize the scales but we don't do this because standardized scales cannot be compared to each other (see Table 1). In Appendix B.3 we provide descriptive statistics (Mean, standard deviation, Cronbach's α) and a correlation matrix of the inter-correlations between the four emotions in response to each treatment.

Estimation Strategy

Data & code availability

The raw data, the codebook, scripts belonging to the experiment and R-script to produce the results belonging to this paper are available on our OSF page `https://osf.io/tp7yn/`. The OSF page also contains the documents belonging to the Stage 1 submission, which can also be found here: `https://osf.io/7h3ju`.

Missing data

Throughout the study, participants were forced to provide an answer, this contrary to our Stage 1 submission where we indicated people would be encouraged to provide

their answers (see Table 1) as such we have no missing values on the survey data.

Exclusion criteria

Using our physiological measures, we exclude people for which the electrodes have fallen off their face. We also instruct our trained lab assistants to pay attention – via a camera that allows them to unobtrusively observe the participant (we don't record participants) – to the fact whether respondents are sitting still and are not touching their face. This would distort the measures. If this occurred, the lab assistant will record this in the logbook and the physiological measures of this participant will not be included in the analyses. Following our preregistration, we do not find any indication that missing values on the key physiological indicator of interest (the Labii) is systematically associated with any of the covariates – results can be derived from the replication files.

Control variables in our models

We control for the fact whether respondents choose the compensation (Financial, research credit or volunteers), temperature in the room (in Celsius), gender (Male set as reference category), age (in years), education (completed level with primary school and preparatory secondary vocational [VMBO] jointly set as the reference category), political knowledge and any events that happened during the study (third person enters lab, loud noises, participant is distracted) or not (dummy variable).

We also control for one characteristics of the experiment, namely the order within the moral violations experiment, namely whether respondents were first exposed to the outparty violation (0) or to the inparty violation (1). Importantly, the two moral violations that we used were rated as equally moral unacceptable and negative in the

pre-test (see design section). Therefore, we do not control for the pairing of the specific moral violation to the inparty or outparty. As discussed earlier, we cannot control for the order in which the moral violations experiment and the visual disgust images were shown because contrary to Stage 1, we failed to randomize the order (see Table 1). Finally, we added a control variable whether the data was collected in our lab in Amsterdam or during the lab-in-the-field setting – note that control variable was not preregisted but added because the unexpected possibility to collect data at another location.

Results

Preregistered manipulation check

Figure 4 summarizes our manipulation checks. We stacked the responses of the participants to the neutral (4 in total) and disgusting (3 in total) pictures. We performed an OLS regression with robust standard errors to predict differences in labii activity per picture, using the neutral picture of the basket as reference category. This procedure was preregistered. The black dots and bars in the first column represent the differences in labii activity of the six neutral and disgusting pictures compared to the reference category. None of the reported differences in labii activity are statistically significant at conventional levels.

The very large confidence intervals imply that there is still considerable noise in the data, despite the fact that we omitted cases of mechanical or protocol failure following our preregistered exclusion criteria. To address this we winsorized the labii response variable. In particular, the bottom and top 5% of the values in the distribution of the labii response variable were reset to respectively the 5% and 95% values. These grey

dots and bars represent these result. Here the manipulation check is clearly passed: there is no significant labii response to the neutral pictures, while for the vomit (b=2.025, ci=[0.799 - 3.251], p=.001) and worms (b=1.885,ci=[0.575 - 3.194], p=005) pictures we find a statistically significant difference with the neutral basket picture. For poop (b=1.043, ci=[-0.224 - 2.309], p=0.107) the sign is the expected direction. This validates our procedure designed to pick up physiological disgust responses. However, we do recognize that this only applies to the exploratory procedure using post-hoc winsorizing.

The preregistered procedure was in fact insufficient to obtain normally distributed data. This is problematic for the statistical tests we preregistered. For reasons of transparency, the remainder of the paper will report both winsorized results and non-winsorized results for labii activity.

In the second column of Figure 4 we display the effects of self-reported disgust to these pictures. Here we clearly find increased disgust in response to the disgusting images compared to the reference category (poop: b=54.85, ci=[48.98 - 60.71], p<.001; vomit: b=57.47, ci=[51.30 - 63.64], p<.001; and worms: b=54.36,ci=[48.10 - 60.62], p<.001).

In columns 3 and 4 we analyze corrugator and SCL responses to the disgusting images. Here we find few significant differences between the disgusting images and the reference category: only the picture of the worms (b=2.168, ci=[0.645 - 3.691], p=0.005) provoked significantly higher corrugator activity compared to the reference condition. These results indicate the divergent validity of our measure: disgusting images, if anything, evoke labii activity.

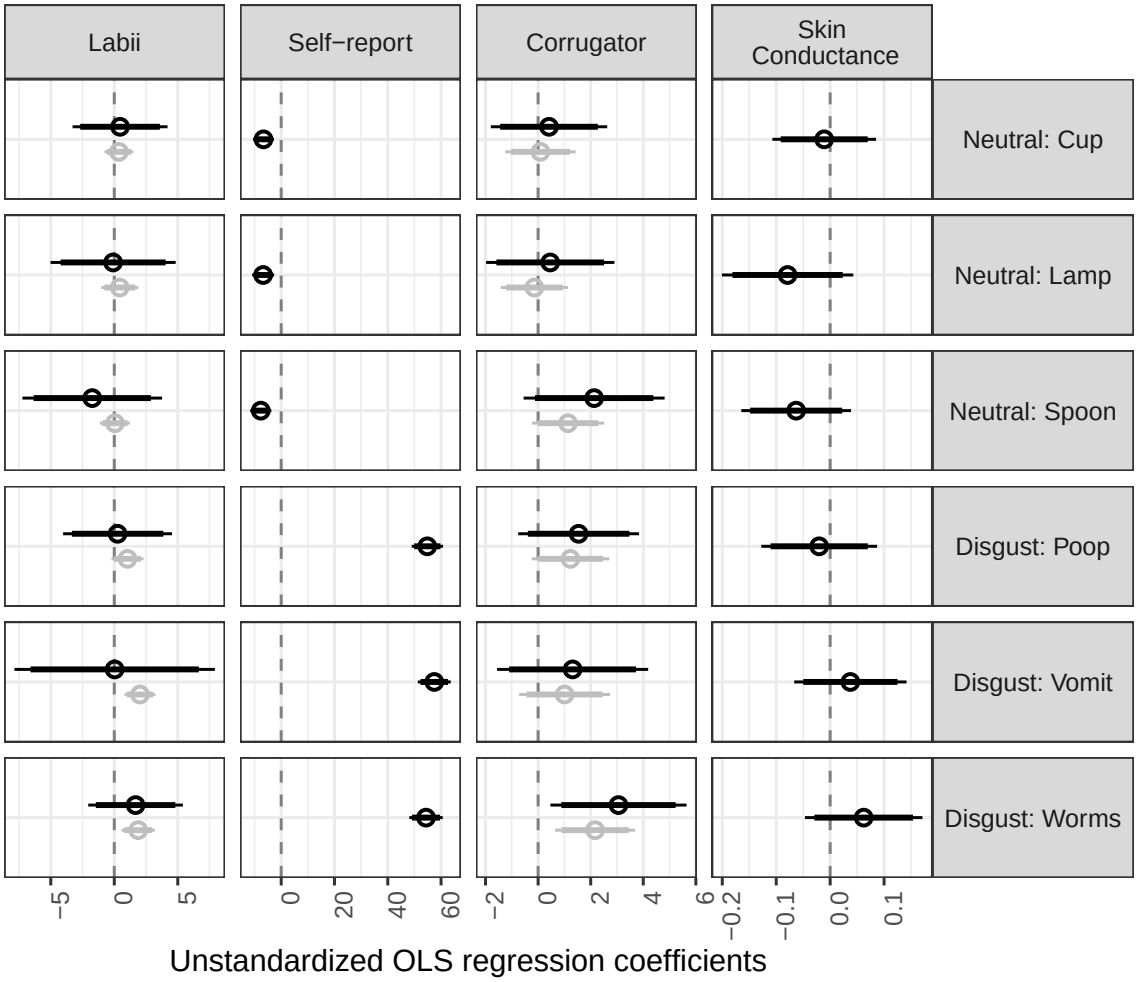


Figure 4. Results of preregistered and exploratory manipulation checks. We conducted OLS regression analyses: the dependent variables are in the columns of the figure, the independent variables are the rows. The picture of the basket is the reference category. The dots are point estimates of the difference with the reference category. Black dots represent preregistered manipulation checks, grey ones represent exploratory checks in which we winsorized the dependent variable. The point estimates with 95 (thin-line) and 90 (thick line) percent confidence intervals are plotted. Full regression output can be found in Appendix B.4.

Preregistered t-tests

Table 2 presents the results of t-tests comparing two experimental conditions. In line with our manipulation check we do not find any statistically significant difference between the conditions following the preregistered operationalization of labii activity (p-value >.06 in all tests) – see test statistics in the first four rows of Table 2. Note that we also preregistered t-tests against zero. These are discussed in Appendix B.5. The labii responses and self-reports differed significantly from zero in all treatments.

After winsorizing the labii response – *which was not preregistered* – we find that there is a statistically significant stronger labii response to the picture of the outparty leader than to the picture of the inparty leader (μ_{diff} = 1.688, p=0.001). There is no significant difference between the inparty leader picture treatment and the inparty leader with a moral violation treatment (μ_{diff} = -0.093, p=0.865). Surprisingly we find that the labii response is stronger to the treatment with the picture of the outparty leader than to the treatment with the moral violation of the outparty leader (μ_{diff} = 1.711, p=0.002). Finally, the labii response to the inparty leader who committed a moral violation does not differ significantly from the labii response to the outparty leader who committed a moral violation (μ_{diff} = -0.071, p=0.886).

Regarding the self-reports we find that participants were more disgusted by the outparty leader picture than by the inparty leader picture (μ_{diff} = 40.194, p<.001). Adding moral violations to the inparty leader (μ_{diff} = 33.623, p<.001) or outparty leader picture (μ_{diff} = 5.491, p=.006) significantly increases self-reported disgust. The self-reported disgust to the inparty leader who committed a moral violation is lower than the self-reported disgust to the outparty leader who committed a moral violation (μ_{diff} = -12.062, p<.001).

Table 2
T-test of differences in disgust (Labii and self-report) between conditions (pre-registered and exploratory)

Preregistered	Measure	Condition 1	Condition 2	M diff	t	df	p	2.5 CI	97.5 CI
Pre-registered	Labii	Outgroup	Ingroup	4.021	1.925	99	0.057	-0.124	8.166
Pre-registered	Labii	Ingroup + MV	Ingroup	1.321	0.653	99	0.515	-2.690	5.331
Pre-registered	Labii	Outgroup	Outgroup + MV	1.737	1.550	99	0.124	-0.487	3.960
Pre-registered	Labii	Ingroup + MV	Outgroup + MV	-0.964	-0.763	99	0.447	-3.470	1.542
Exploratory	Labii	Outgroup	Ingroup	1.688	3.557	99	0.001	0.747	2.630
Exploratory	Labii	Ingroup + MV	Ingroup	-0.093	-0.170	99	0.865	-1.178	0.992
Exploratory	Labii	Outgroup	Outgroup + MV	1.711	3.178	99	0.002	0.642	2.779
Exploratory	Labii	Ingroup + MV	Outgroup + MV	-0.071	-0.144	99	0.886	-1.047	0.906
Pre-registered	Self-report	Outgroup	Ingroup	40.194	16.155	107	0.000	35.262	45.127
Pre-registered	Self-report	Ingroup + MV	Ingroup	33.623	14.216	107	0.000	28.935	38.312
Pre-registered	Self-report	Outgroup	Outgroup + MV	-5.491	-2.796	107	0.006	-9.383	-1.598
Pre-registered	Self-report	Ingroup + MV	Outgroup + MV	-12.062	-5.514	107	0.000	-16.398	-7.726

Preregistered multivariate test of hypotheses H1-H4

Figure 5 presents the results for the multivariate regression analyses that test hypotheses 1-4. An important difference with the t-tests that we presented earlier is that we now control for a number of preregistered covariates. In our analyses some covariates have statistically significant effects, but there is not an overall pattern. That is, none of the covariates is significantly positive or negative across the analyses. For the labii responses there are some differences associated with the fact that we collected data in two locations: in particular this is expressed in a dummy variable identifying the location, the temperature and the reward system. But these effects are not systematic (see Appendix B.6 for full regression output). Political knowledge is associated with a stronger winsorized labii response to the picture of the outparty leaders than to the picture of the inparty leaders but this could as well be a fluke.

Now let's move to hypothesis 1. The results suggest that people respond with more labii activity in response to an outparty politician compared to the inparty politician but the result is not statistically significant at preregistered $p<.05$ (b=4.033, ci=[-0.297 - 8.365], p=0.068). The exploratory analysis does suggest a significantly stronger labii response (b=1.678, ci=[0.003 - 3.351], p=0.050). Turning to the self-reports

participants report significantly more disgust to the outparty leader compared to the inparty leader (b=40.109, ci=[34.758 - 45.460], p<.001). In sum, hypothesis 1 is supported by self-reports and more suggestively by the physiological reports.

Do people who say that they are disgusted also have increased labii activity? The correlation between the labii response and the self-reported responses to the inparty pictures is very low (preregistered labii variable (r=0.074, ci=[-0.124 - 0.266, p=.465) or winsorized labii variable (r=-0.002, ci=[-0.219 - 0.174], p=.815). We find similar disconnects in the disgust responses to outparty leaders. This means that the physiological and cognitive-emotions (self-report) are not aligned.

For hypotheses 2a and 2b we compare the difference in disgust between the picture and the picture with the moral violations. In other words, here we test the effect of moral violations of inparty and outparty leaders. For the preregistered labii acitivity, we do not find a statistically significant difference in labii responses to inparty leaders compared to outparty leader (b=-3.031, ci=[-7.131 - 1.07], p=0.147). For the exploratory, winsorized labii response variable we find a similarly negative but statistically significant difference in labii responses to inparty leaders compared to outparty leaders (b=-1.576, ci=[-3.077 - -0.076], p=0.040). The effect size is comparable to the effect sizes we found with the disgusting images in the manipulation check (see Figure 4). This means that labii responses to poop, vomit and worms are as strong as labii responses to the picture of the inparty leader as compared to the outparty leader.

The preregistered self-report evidence is in line with preregistered expectations: respondents express stronger disgust responses for inparty leaders who commit moral violations compared to outparty leaders who commit moral violations (b=-28.016, ci=[-34.021 - -22.010], p<.001). In sum, the self-reports and the explorative

physiological results point in favor of hypothesis 2b.

Following Hypothesis 3 we expected that strong partisans have stronger responses to outparty leaders than to inparty leaders. However, our findings indicate that there is no statistically significant association between partisan strength and the difference in labii responses to the outparty leader and inparty leader (preregistered result: b=1.381, ci=[-1.678 - 4.439], p=0.372; exploratory result: b=-0.411, ci=[-0.536 - 1.358], p=0.391). We do find that stronger partisans report more disgust in response to the picture of the outparty leader than to the picture of the inparty leader than weaker partisans (b=6.060, ci=[1.097 - 11.024], p=0.017).

Following Hypothesis 4 we expected that people who score high on the moral disgust scale have stronger responses to moral violations. We do not find evidence for this. There is no statistically significant association between the moral disgust scale and the difference between labii responses to the moral violation and the picture treatment (preregistered result: b=-0.13,ci=[-2.412 - 2.152], p=0.911; exploratory result: b=0.581,ci=[-0.249 - 1.412], p=0.169). Also there is no statistically significant association between the moral disgust scale and self-reported disgust (b=-1.364, ci=[-4.676 - 1.949], p=0.418).

In sum, our analyses justify the following conclusions (for an overview, see Table 3). Our participants self-report higher disgust against outparty leaders, and find moral violations more problematic if inparty leaders commit them. Strong partisans report more disgust against the outparty leader. Moral disgust is not associated with the expressions of disgust to inparty and outparty leaders that committed moral violations. We also find evidence that people have stronger labii responses to outparty politicians than inparty politicians. There is more suggestive evidence that inparty leaders evoke

more labii activity when they commit moral violations than when outparty leaders do. Individual differences in moral disgust and partisanship strength on average cannot explain these physiological responses.

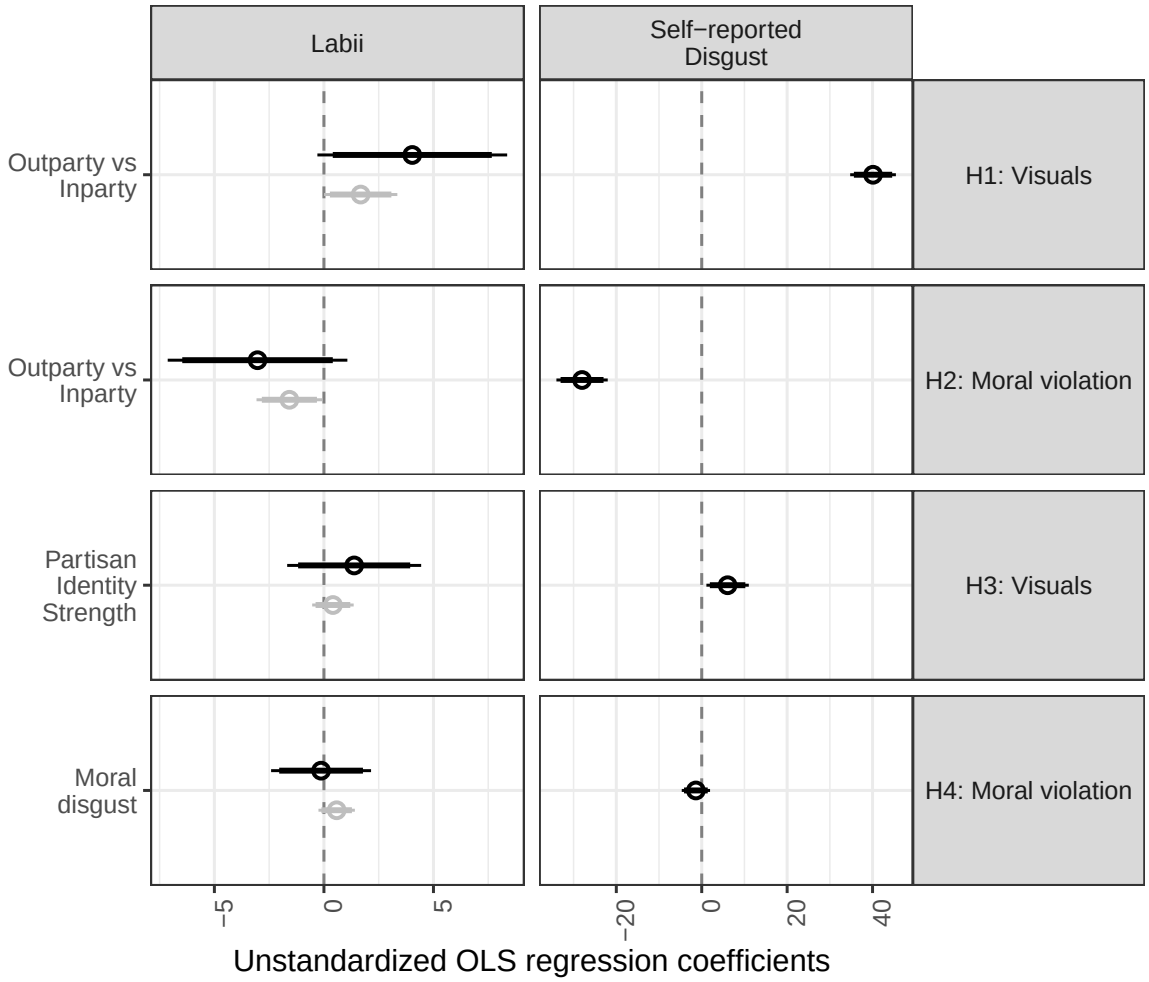


Figure 5. Results of preregistered hypothesis tests. Plot of the unstandardized OLS regression coefficients of the preregistered hypothesis tests (in black) – and one exploratory model for the Labii (in grey-scale) – for the Labii (left-hand column) and the self-reported disgust (right-hand column). The point estimates with 95 (thin-line) and 90 (thick line) percent confidence intervals are plotted. Full regression output can be found in Appendix B.6.

Table 3
Overview of the preregistered hypothesis tests

H#	Hypothesis	Physiology	Self-report
H1	Outparty politicians should elicit stronger disgust responses than in-party politicians	**Mixed**. People have more labii activity (Preregisterd: p=.068; Exploratory: p=.050) in response to an outparty politician compared to the inparty politician.	**Confirmed** People report more disgust to the outparty politician compared to the inparty politician.
H2a	Outparty politicians accused of moral violations should elicit stronger disgust responses than inparty politicians accused of moral violations.	**Reject**	**Reject**
H2b	Inparty politicians accused of moral violations should elicit stronger disgust responses than outparty politicians accused of moral violations.	**Mixed**. We find a stronger labii response to inparty leaders who commit a moral violation (Preregistered: p=0.147; Winsorized: p=0.04) compared to an outparty leader.	**Confirmed**. Stronger disgust response to the in-party leader who commit a moral violation compared to the outparty leader.
H3	Strong partisans have stronger disgust responses to outparty leaders compared to inparty leaders than weak partisan	**Reject**	**Confirmed**. Stronger partisans report more disgust in response to the outparty leader compared to the inparty leader.
H4	Individuals higher on moral disgust sensitivity, compared to those lower on moral disgust sensitivity, have a stronger disgust response to our moral violation treatments	**Reject**	**Reject**

Preregistered robustness checks

Following preregistered procedures we reran all our analyses of physiological responses using skin conductance and corrugator activity as dependent variables. In addition, we also created a winsorized version of the corrugator response, as we did with the labii response. Figure 6 plots the results of the robustness checks. We find no evidence for H1-H4 using either corrugator responses (column 1 of Figure 6) or skin conductance as dependent variable (column 1 of Figure 6). These results give support to the notion that the labii response to the moral violation of inparty leaders we reported is indeed a distinctive response and not the product of cross-talk.

Turning to the self-reported emotions, the results for self-reported anger, anxiety and enthusiasm (although reversed signed) are very similar to the results of self-reported disgust. Starting with H1, in response to the outparty leader people report more anger, (b=31.349, ci=[26.329 - 36.369], p<.001) anxiety (b=21.935, ci=[7.274 - 26.595], p<.001) and less enthusiasm (b=-30.875, ci=[-35.781 - -25.969], p<.001). The self-reports also show that people report more anger (b=-23.184, ci=[-28.554 - -17.814], p<.001) and anxiety (b=-18.638, ci=[-23.699 - -13.576 ,], p<.001) but less enthusiasm for inparty leaders (b=23.944, ci=[19.171 - 28.717], p<.001) who commit moral violations than for outparty leaders (see, H2). Finally, we find that stronger partisans report more anger (b=6.286, ci=[1.527 - 11.044], p=.001) and anxiety (b=4.617, ci=[0.612 - 8.623], p=.002) but less enthusiasm (b=-9.715, ci=[-14.047 - -5.384], p<.001) in response to the picture of the outparty leader than to the picture of the inparty leader than weaker partisans (see H3). Also there is no statistically significant association between moral disgust sensitivity and self-reported anger, anxiety and enthusiasm (see H4).

What is striking is that the results for self-reported anger and anxiety are very similar to the results for self-reported disgust. This might not be so surprising as the correlation between self-reported disgust and self-reported anger is very high across all four treatment conditions ($r>.72$, see Appendix B.3). But also anxiety and disgust were highly correlated with each other: $r>.57$ across conditions (see Appendix B.3). This raises doubts whether the self-reported disgust is indeed capturing the emotion disgust rather than a more general negative affect in response to our treatments.

Finally, we find no evidence that the other two traits (sexual and pathogen disgust) of the disgust sensitivity scale have an effect on physiological disgust responses or the self-reported disgust to the moral violations. We do find a positive association between self-reported anxiety and pathogen disgust as well as sexual disgust sensitivity but not any statistically significant association with the self-reported anger or enthusiasm (see Appendix B.7). As such, the results for anxiety are most likely a fluke.

Discussion

Many people are deeply concerned about polarization, particularly because recent works hints at the affective nature of this polarization (Iyengar et al., 2012). This paper supports this view as our participants reported high levels of disgust towards just the picture of the outparty leader. Our paper also goes beyond the status quo of the literature by demonstrating - primarily through exploratory analyses - that people are also physiologically disgusted by the picture of the outparty leader. In addition to this our paper contains three intriguing findings that we discuss in more detail below.

First, even though the results for self-reported disgust and physiological disgust are in the same direction, the correlation between them is zero. This suggests that *some people have physiological disgust responses and others cognitive disgust responses to*

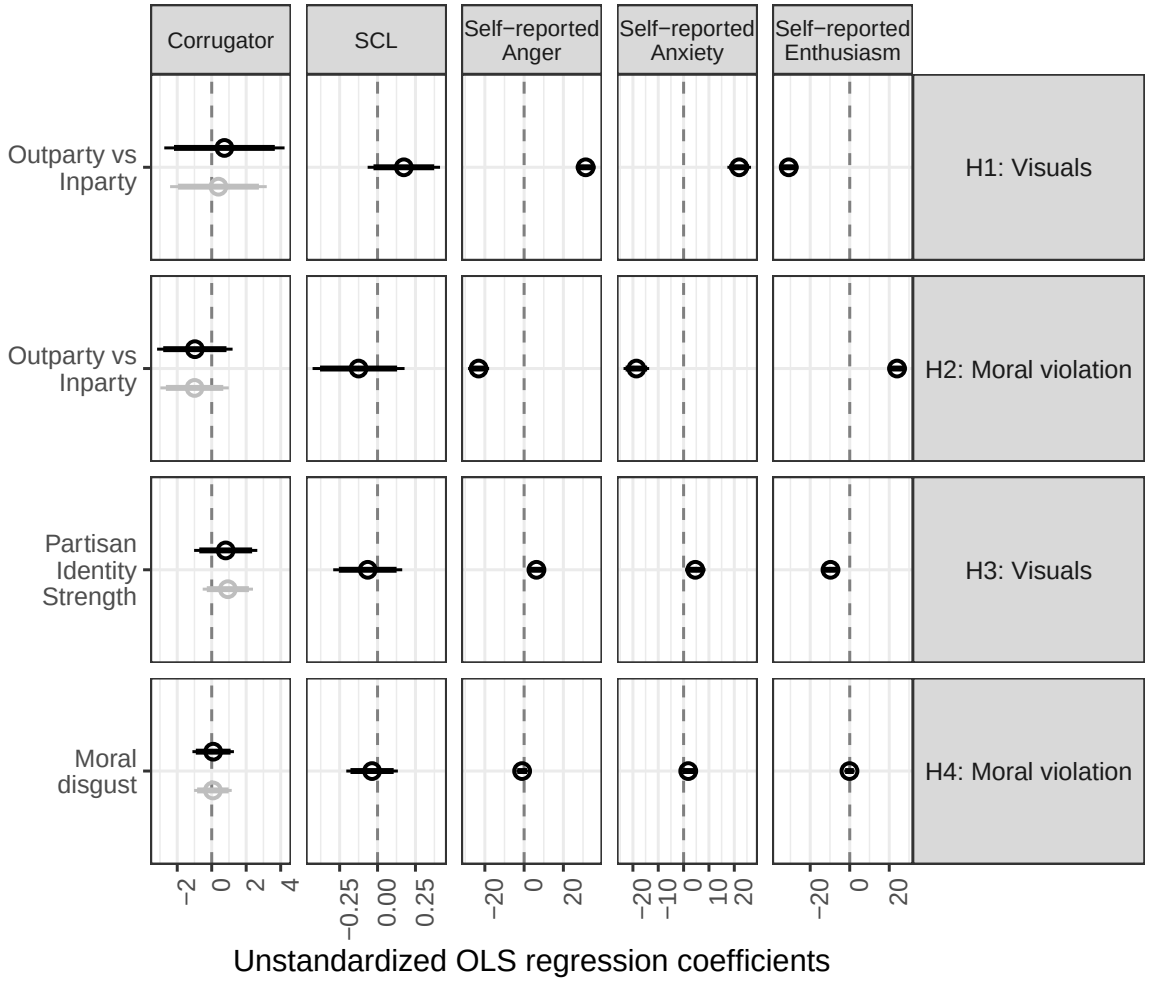


Figure 6. Results of preregistered robustness checks. Plot of the unstandardized OLS regression coefficients of the preregistered hypothesis tests (in black) – and one exploratory model for the corrugator (in grey-scale) – for the corrugator, skin conductance (SCL), self-reported anger, self-reported anxiety and self-reported enthusiasm. The point estimates with 95 (thin-line) and 90 (thick line) percent confidence intervals are plotted. Full regression output can be derived from the replication files.

outparty leaders. In our view this is not evidence for the lack of validity of either measure, rather it betrays the complex nature of emotions (LeDoux & Pine, 2016). Emotions have a quick, physiological side, but also more evaluative, cognitive aspects. Our work thereby comports with work in neuroscience that shows weak correlations between physiological, cognitive, and behavioral responses (Bradley & Lang, 2000; Lang, 1968).

We will now discuss a number of issues with measuring physiological and

self-reported measures of emotions. Physiological measures are costly, time consuming are harder to collect and analyze than self-reports. Our manipulation check suggests that we get a "valid" measure of disgust relying upon the physiological measures: in response to the disgusting images labii activity went up while corrugator and scl activity did not change. Regarding self-reports, they are cheap, fast, and easy to collect and analyze. Yet our results question the discriminant validity of these self-report. Our preregistered analyses show clear evidence for H1 and H2. If we switch self-reported disgust for anxiety, anger or enthusiasm, as preregistered, our results are identical. Multiple explanations are possible. We might have isolated a cognitive-emotional disgust response but that people also report anger, anxiety and enthusiasm to our treatments. Yet, the extremely high correlations between these self-reported emotions in responses to our treatments suggests that people respond with a more general negative affect towards our treatments. We would welcome future work that critically assesses to what extent disgust can be distinguished from other emotions in a valid and reliable manner. The lack of discriminant validity of the self-reported discrete emotions might explain why we find no correlation between self-reported disgust and labii activity. If our self-reported measure of disgust cannot be distinguished from other self-reported emotions, then it is not surprising that these self-report do not correlate with labii activity. So while some recent work has criticized the use of physiological measures (Osmundsen, Hendry, Laustsen, Smith, & Petersen, 2019), our findings point out that self-reported measures of discrete emotions are not the unbiased "gold standard" that we might think they are. Going forward, scholars that want to study concordance between experiential (self-reported) and physiological responses (see Figure 1) need to make sure that both the physiological *and* the experiential measures are

validly captured.

Second, when we associated inparty and outparty leaders with moral violations we found that increased disgust towards the inparty leader, both in terms of self-reports and through exploratory analyses physiological responses. For the outparty leader moral violations do not matter, but they do for inparty leaders. Obviously, we will only know if these results hold once well-powered and preregistered studies will take up the challenge to replicate and extent these findings.

Third, against our hypotheses we found little evidence that partisan social identity strength and moral disgust influence disgust responses. We only find that strong partisans self-report more disgust against the outparty leader, but even there the effect is limited. Our study was sufficiently powered to detect these effects. Apparently, these results do not show up in this study with this particular design and this particular sample. While both partisan identity strength and moral disgust have been widely studied and shown to matter for a variety of attitudes and behaviors, they might not matter that much for the disgust responses to politicians and their moral transgressions. To us, these and other null-findings reported in this paper show the importance of the registered report format. Null findings tend to be much less likely to be written and/or published (Franco, Malhotra, & Simonovits, 2014). But in this format they get published.

We deviated in a couple of cases from our preregistered Stage 1 submission (see Table 1. Sometimes this was due to human errors (i.e., the failure to randomize the order of the experiments), mistakes (the idea to standardize our self-reported emotions scales) and other times this was due to opportunities (i.e., the decision to collect data as a lab-in-the-field study). We do not think that any of these deviations are detrimental

for the conclusions we reach in this study. Going forward we realize that programming errors and mistakes in the planned analyses could be circumvented by even more extensive pilot testing of the protocol before submitting a Stage 1 Registered Report.

To conclude, in our view this paper motivates further investigation into emotions as cognitive products and emotions as physiological responses. Moreover, we find little evidence that cognitive-emotional and physiological responses are aligned. That means that in the theoretical framework about the concordance between physiological and cognitive-emotional responses, people can have their physiological and cognitive-emotional responses aligned but they might also experience only a physiological response or only a cognitive-emotional responses. We welcome well-powered, preregistered, studies to test the causes and consequences of concordance between physiological and cognitive emotional responses.

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