**Disentangling the Echo Chamber:
How Exposure to Congruent and Incongruent Opinion Climates on Social Networking
Sites Impacts Users' Processing and Selection of Information**

Manuel Cargnino & German Neubaum
University of Duisburg-Essen
Dep. of Computer Science and Cognitive Sciences

The growing significance of social networking sites (SNS) for political communication has been stimulating research on the psychological consequences of virtually conveyed opinion climates. The present research suggests that the exposure to both overly congruent and incongruent opinion climates on SNS can increase opinion strength and selective exposure while decreasing political tolerance. It is proposed that a balance of congruent and incongruent views can mitigate these effects provided that users do not identify with an ideological camp. In a representative pre-registered online experiment ($N = 704$), the levels of political congruence with an opinion climate on SNS and political social identity were manipulated. Different from what was hypothesized, results revealed very limited effects of political congruence. A salient political social identity decreases tolerance and opinion strength, but only for certain political issues. These results put earlier findings on the impact of opinion climates conveyed by social media into perspective.

Keywords: Political congruence, echo chamber, political social identity, opinion strength, political tolerance, selective exposure

Disentangling the Echo Chamber: How Exposure to Congruent and Incongruent Opinion Climates on Social Networking Sites Impacts Users' Processing and Selection of Information

Understanding the ways in which users of communication technologies like social networking sites (SNS) form their opinions is key facing the growing importance that online networks play for the political discourse (Taylor et al., 2018). In this regard, one pivotal concern related to the use of SNS has been that these technologies could lead users to selectively expose themselves to politically congruent information (i.e., information that is in line with their own views) thereby increasing the share of political congruence in their networks (O'Hara & Stevens, 2015; Sunstein, 2017). In a world where political communication more and more takes place in the sphere of SNS, such overtly congruent opinion climates may decrease the likelihood of interactions between political camps and therefore undermine democratic ideals (Habermas, 2007). However, research on the effects of political congruence on SNS (and beyond) so far did not fully disentangle, in which ways it affects users' cognitions and behaviors. While overtly congruent social networks are commonly associated with attitudinal polarization and increased intergroup bias (Wojcieszak & Garrett, 2018), the exposure to incongruent views is commonly linked to desirable outcomes as, for example, openness to diverging views and increases in political tolerance (Mutz, 2002a). Different from that, rather than improving the relationship between political groups, some research pointed out that the exposure to incongruent views can likewise foster polarization and selective exposure to information (Bail et al., 2018; Weeks et al., 2017). It hence appears that effects of exposure to congruent and incongruent views are contingent to further contextual variables. The present study suggests that the *degree* of political congruence in a given communication environment (i.e., the relative share of congruent and incongruent views represented within it) is a pivotal contextual factor.

In face of inconclusive findings by prior research, we argue that overtly congruent and overtly incongruent opinion climates may increase the preference for congruent information (i.e., selective exposure) and that this effect is facilitated by the way opinions are represented within SNS. In contrast, balanced opinion climates (i.e., equal shares of congruent and incongruent views) may increase tolerance toward political opponents and decrease opinion strength and selective exposure. Consequently, we propose that the degree of political congruence in opinion climates is not linked to these outcomes in a linear form (e.g.: higher political congruence leads to higher opinion strength), but in a curvilinear manner (low and high congruence lead to higher opinion strength compared to moderate congruence). Some

related studies provide initial hints on such non-linear relationships (Hopmann et al., 2019; Kaczinski et al., 2019). Furthermore, we pose that individuals' political social identities (PI) can exert an independent influence on opinion strength, tolerance, and selective exposure besides being a potential outcome of them. In the present experimental study, we manipulated the degree of political congruence of opinion climates within ostensible Twitter threads and the salience of SNS users' PI. We then asked participants on their attitude certainty and tolerance and assessed selective exposure via a news selection task. This study contributes to extant research by offering a new and more nuanced perspective on the circumstances under which politically congruent versus incongruent digital environments can affect both, individuals' cognitive system (in terms of opinion strength and political tolerance) and behavioral responses (in the form of information selection). It furthermore highlights the role of political social identity as an independent determinant which moderates effects of political congruence. This study's hypotheses were pre-registered in the Open Science Framework (OSF) before data collection.¹

Cognitive Effects of Congruence and Incongruence: Opinion Strength and Tolerance

In many instances, SNS expose users to the opinions of others (e.g., in comment threads) which, on an aggregate level, form opinion climates (Neubaum & Krämer, 2017). Opinions and opinion climates vary in the degree of congruence and a congruent opinion climate can thus be conceived of as one that is in line with or similar to the opinion of an individual. Besides addressing antecedents of individuals' exposure to congruent (e.g., Wojcieszak & Garrett, 2018) and incongruent opinion climates (e.g., Lu & Lee, 2018), a number of studies dealt with the cognitive consequences of being exposed to congruent and incongruent views and in particular with the question of how the exposure to congruent and incongruent information affects political attitudes (e.g., Huckfeldt et al., 2004; Stroud, 2010). For example, in a web-tracking study Knobloch-Westerwick and colleagues (2015) assessed selective exposure to online news over a period of three days and found that exposure to attitude consistent information increases attitude strength toward controversial issues while exposure to incongruent information has mitigating effects on attitudes. In line with this, a number of other studies has underscored the polarizing effects of the exposure to congruent political information, while stressing the mitigating potential of exposure to incongruent information (Kim, 2015; Parsons, 2010; Price, Cappella, & Nir, 2002; Yardi & boyd, 2010). They point out that a confirming environment increases the certainty and faith in one's own views and the attachment to the political in-group (Yardi & boyd, 2010) while fostering negative feelings toward political opponents and their opinions (Heatherly et al., 2017). At the

same time, they link the exposure to incongruent views to political learning and more positive evaluations of the other side and their arguments (Parsons, 2010; Price et al., 2002).

Furthermore, the exposure to incongruent views can evoke attitudinal ambivalence, i.e., the formation of simultaneously positive and negative views on one and the same issue (Huckfeldt et al., 2004; Jonas et al., 1997; Mutz, 2002b), and therefore mitigate own convictions (Schneider & Schwarz, 2017). However, exposure to incongruent views does not mitigate opinions under all circumstances (Bail et al., 2018; Kim, 2015; Weeks et al., 2017; Yardi & boyd, 2010).

For instance, a study which analyzed offline discussion networks (Huckfeldt et al., 2004) found that both overtly congruent and overtly incongruent online networks increase political polarization. At the same time, they underscored that more balanced networks exert a mitigating effect by fostering attitudinal ambivalence. Within a pre-registered multi-wave field experiment, Bail and colleagues (2018) made subjects in the treatment group follow a bot (i.e., a programmed entity resembling another user) on Twitter which regularly exposed them to information from an opposing political party. They found that, over time, these subjects became more polarized compared to subjects from the control group who followed a bot exposing them to congruent content. The results of this methodologically strong study particularly point out that intense exposure to incongruent information can lead to a strengthening of pre-existing opinions. Corroborating this notion, an experimental study by Hopmann, Bjarnøe and Wonneberger (2019) which investigated reactions to political disagreement showed that individuals are most likely to seek compromise at low and moderate levels of disagreement, while they tend to dominate or give in when disagreement is large. They argue that the kind of reaction further depends on the degree with which individuals are concerned with the needs of others, i.e., individuals are likely more willing to seek compromise within close relationships. SNS users are commonly exposed to political information from and discuss politics with strangers and weak ties. Considering this, large levels of disagreement, be it in the sense of diverging strongly from the views of a particular person or finding one's opinion underrepresented within the social environment, may drive users toward stronger opinions in a similar way as the overrepresentation of the own opinion. Recently, Kaczinski and colleagues (2019) accordingly revealed that users who perceive their online networks as very congruent or very incongruent have more extreme opinions than users who are surrounded by a more balanced mix of different opinions.

Effects of Political Congruence: A Question of Dosage?

Facing the inconsistencies of extant research, with some studies pointing to polarizing effects of congruent opinion climates and mitigating effects of incongruent ones while again others find that exposure to incongruent opinions can likewise lead to polarization, we suggest that effects of political congruence depend on the degree of congruence represented within an individual's environment. That is, it should make a difference on a psychological level, whether a user encounters some others who oppose his or her opinions, or, whether almost everyone or almost no one holds opposing views. Any mix of congruent and incongruent opinions can be encountered on SNS and the way opinions are presented there (e.g., comment thread) makes it even more likely for users to perceive slight differences in the situationally prevailing opinion climate (Neubaum & Krämer, 2016). Extant findings suggest that in particular overtly congruent and incongruent opinion climates lead to politically biased cognition and behavior (Bail et al., 2018; Hopmann et al., 2019; Huckfeldt et al., 2004; Kaczinski et al., 2019). Accordingly, congruency of opinion climates should impact political cognition and behavior not in a linear but curvilinear manner (with relatively low and relatively high levels of congruency leading to largest bias). On a theoretical level, this curvilinear link can be explained by different types of information processing as suggested by affective intelligence theory (see Marcus et al., 2000). Accordingly, overtly congruent and overtly incongruent opinion climates may foster unsystematic processing and increased reliance on pre-existing beliefs as they elicit enthusiasm and anger, respectively. At the same time, being exposed to balanced opinion climates may facilitate systematic processing and weighing of different perspectives by inducing doubts regarding the accuracy of own views.

Based on this reasoning, we propose the following hypothesis regarding the link between political congruence and opinion strength:

H1.

The effect of the degree of political congruence with opinion climates on SNS on users' opinion strength manifests itself in a curvilinear U-shaped form: A relatively high and a relatively low level of political congruence increase opinion strength compared to moderate levels of political congruence.

Besides increasing opinion strength toward an issue, exposure to overtly congruent and overtly incongruent opinion climates may affect the evaluations of the opposing (politically incongruent) group, i.e., decrease political tolerance. More precisely, both the experience of strong confirmation and the experience of threat due to strong disconfirmation of own opinions may foster the conviction that the oppositional group is not entitled to equal rights. At the same time, exposure to a balanced opinion climate may foster curiosity and

perspective taking and thereby increase tolerance (Mutz, 2002a). Extant research on political tolerance underscores that exposure to and active engagement with incongruent views increases tolerance as individuals learn about opinions and arguments different from their own (Mutz, 2002a; Siegel et al., 2018), while exposure to congruent information decreases tolerance (Stroud & Muddiman, 2013). However, as the exposure to overtly incongruent opinion climates can lead to a more pronounced defense of pre-existing opinions, it may simultaneously decrease the perceived legitimacy of opposing opinions and therefore decrease political tolerance. Again, exposure to incongruent views may increase tolerance only when it is ‘well-dosed’ and when congruent and incongruent opinions are likewise represented within a given communication setting. Accordingly, we hypothesize:

H2.

The effect of the degree of political congruence with opinion climates on SNS on users’ political tolerance manifests itself in a curvilinear inverted U-shaped form: A relatively high and a relatively low level of political congruence decrease political tolerance relative to moderate levels of political congruence.

Behavioral Effects of Congruence and Incongruence: Selective Exposure

On the level of behavioral consequences, findings by prior research show that being exposed to politically congruent, but also to incongruent information can increase selective exposure (i.e., the preference for information that is in line with one’s pre-existing beliefs, (Zillmann & Bryant, 1985). For instance, in a two-wave panel survey Weeks et al. (2017) show that exposure to both pro- and counter-attitudinal content on SNS can lead to higher levels of selective exposure. Similarly, Zhu et al. (2017) suggested that when the perceived opinion climate is perceived as overtly incongruent, defense motivation is triggered and subsequent avoidance of incongruent opinions results (but see Yang et al., 2017). Furthermore, being exposed to incongruent opinion climates can lead to selective disconfirming or ‘debunking’ of political opponents’ views and arguments rather than acknowledging and cognitively integrating them (Bail et al., 2018; Knobloch-Westerwick, 2015b; Lord et al., 1979; Taber & Lodge, 2006). At the same time, the exposure to politically balanced opinion climates may rather evoke doubts in one’s opinions and increase the proneness to form accurate impressions (see Parsons, 2010). Exposure to very congruent and very incongruent opinion climates and selective exposure may hence be linked in a mutually reinforcing process (Slater, 2007) in which both politically congruent and incongruent environments push individuals toward searching out for more congruence. We propose that also on the behavioral level (i.e., information selection), it is the degree of political

congruence that determines the strength of the effect. Again, related work suggests that this effect is curvilinear, with high and low levels of political congruence leading to strongest selective exposure effects:

H3.

The effect of the degree of political congruence with opinion climates on SNS on selective exposure manifests itself in a curvilinear U-shaped form: A relatively high and a relatively low level of political congruence increase selective exposure relative to moderate levels of political congruence.

Besides direct links between the exposure to politically (in-)congruent opinion climates and selective exposure, we argue that congruent and incongruent environments can impact information selection via more durable changes in the strength of individuals' political opinions and political tolerance, thereby fostering selective exposure indirectly (see Stroud, 2010). Hence, reinforcing processes between the exposure to very congruent or incongruent opinion climates and the selection of congruent information may be driven by according changes in opinion strength and tolerance (Slater, 2007). Individuals with a strong opinion toward an issue are more likely to selectively expose themselves to information that corroborates own views (Stroud, 2010). This can be explained by higher levels of certainty with regard to the accuracy of the own opinion and limited knowledge about diverging rationales which results in biased information evaluation and selection (Fischer et al., 2005). Furthermore, when an individual is certain about an opinion, reliance on peripheral cues (e.g., political congruence) is more likely than the mobilization of cognitive resources for more systematic information processing (see Kruglanski & Thompson, 1999). This is also reflected in how users create their information environments on social networking sites: First, studies found that also on SNS users with stronger opinions are more likely to select attitude-consistent information (Weeks et al., 2017; Wojcieszak & Garrett, 2018). Second, this selectivity also applies to whom users are connected since a line of research found that especially those users with strong political views tend to dissolve digital connections when they detect political disagreements with other people (John & Dvir-Gvirsman, 2015) but also seek connections to whom they agree with (Authors). Given that these findings may be indicative of opinion strength explaining the effect of political congruence on selective exposure:

RQ1.

Is the effect of the degree of political congruence on selective exposure mediated by opinion strength?

Furthermore, perceiving an opposing political group or ‘opinion camp’ as inferior to the own is in turn likely to foster the selection of congruent information. Research into the credibility of information sources highlights that information which stems from a distrusted source is more likely to be disregarded and information search hence guided toward more trustworthy ones (Flanagin & Metzger, 2014). Consequently, when exposed to an overtly congruent or incongruent opinion climate, tolerance toward politically incongruent individuals may decrease, which consequently increases selective exposure to congruent information. We therefore ask:

RQ2.

Is the effect of the degree of political congruence on selective exposure mediated by political tolerance?

The interwovenness of information exposure and political tolerance points to the inter-group context of political communication. To fully understand the inter-group dimension in the context of opinion climates on SNS, we need to address it on a more general level, i.e., in terms of users’ political social identity.

The Inter-Group Dimension of Opinion Climates: Political Social Identity

Individuals commonly identify with a range of social groups which prompts them to follow shared group norms and differentiate between *us* and *them* (Turner, 1988). When a political social identity (e.g., being member of an ideological group) is salient, individuals can be affected by intergroup bias that is related to political categories, i.e., they can be more likely to favor those who they perceive as members of their in-group (e.g., to whom they attribute the same ideological leaning, Greene, 1999). Perceiving oneself as member of a politically defined group can affect perceptions and behaviors not only offline, but also in online communication (Dvir-Gvirsman, 2018; Postmes & Spears, 2013). Cues that point to a user’s political leaning can serve as heuristic for other attributes (e.g., trustworthiness) which carries the risk of poor decisional outcomes, for instance, when it comes to the selection of political content (Iyengar & Westwood, 2015; Knobloch-Westerwick, 2015b; Lau & Redlawsk, 2001). A study by Iyengar and Westwood (2015) underscored individuals’ tendency toward affective polarization. They showed that their participants had unfavorable implicit and explicit attitudes toward supporters of opposite political parties (while holding favorable views on supporters of their preferred party). In a subsequent selection task, participants favored in-group over out-group members even when the latter outperformed the former in objective terms (e.g., with regard to qualification). In a different study, Dvir-Gvirsman (2018) found that social identification with an ideological group fosters selective

exposure to congruent news posts. Further experimental evidence underscores that PI can increase selective exposure to political online content (Wojcieszak & Garrett, 2018). Taken together, when a users' PI is salient, selective exposure will likely increase. We therefore hypothesize:

H4.

A salient political social identity leads to higher levels of selective exposure compared to a non-salient political social identity.

Furthermore, a salient PI is likely to indirectly affect the impact of political congruence on selective exposure, particularly via the reinforcement of opinions on a particular stance and the decrease of political tolerance. More precisely, according to the notion of group polarization, those who identify with a political group (e.g., *leftists*) will move more closely toward shared group norms and therefore become more extreme in their opinions (e.g., Iyengar & Westwood, 2015). Likewise, intergroup bias caused by a salient PI likely decreases the tolerance toward political outgroups (Greene, 1999; Postmes et al., 2014). Within an environment that is dominated by incongruent opinions, those who identify with a political group may feel higher levels of threat and therefore display stronger favorability toward their in-group and its norms (Weeks et al., 2017). Accordingly, we hypothesize:

H5.

A salient political social identity leads to higher levels of opinion strength compared to a non-salient political social identity.

H6.

A salient political social identity leads to lower levels of political tolerance compared to a non-salient political social identity.

On an exploratory level, we furthermore ask:

RQ3.

Is the effect of political social identity on selective exposure mediated by opinion strength?

RQ4.

Is the effect of political social identity on selective exposure mediated by political tolerance?

Additionally, as a PI can be central to an individual's self-concept, it may generally boost the favorability toward congruent information and thereby undermine the mitigating potential of balanced opinion climates. We therefore pose the following research question:

RQ5.

Is there an interaction effect of the degree of political congruence and political social identity on selective exposure?

Method

To address these hypotheses and research questions, a pre-registered online experiment was conducted (see Footnote 1). All data was collected anonymously and under the common ethical guidelines of experimental research (APA, 2017). The study was approved by the local IRB on 11 November 2019 (protocol no. 1910SPCM1532).

Sample

Participants were recruited online by a large access panel (respondi.com). To take part in the study, participants were required to regularly use at least one social media platform. We performed an a-priori calculation of sample size based on the planned analyses of variance with an alpha-level of .05 and a small effect ($f = .15$) which we derived from prior research on links between exposure to political congruence, political extremity and tolerance (Heatherly et al., 2017; Knobloch-Westerwick et al., 2015; Mutz, 2002a). This suggested an ideal sample size of $N = 690$. After excluding participants who did not use any SNS ($n = 208$) or who did not answer the quality check item correctly ($n = 83$) the final sample was $N = 704$. This sample is representative with regard to age and gender of German SNS users between 18 and 69 years (GIK, 2018). Participants were on average 43.42 years old ($SD = 12.90$), 47.3 % of participants were female ($n = 333$). 37.8 % ($n = 266$) had a middle school degree, 28 % ($n = 197$) a university degree, 24.9 % ($n = 175$) a high school degree, 7.5 % ($n = 53$) a lower secondary degree, 1.10 % a Ph.D. and 0.7 % ($n = 5$) no degree. 59.8 % ($n = 421$) of participants reported employee as their current occupation, 6.4 % ($n = 45$) student, with each 5.7 % ($n = 40$) official, self-employed and unemployed. 16.8 % ($n = 118$) reported other types of occupation.

Design and Procedure

A pre-registered experiment with a between-subjects design and 5 (congruence: completely congruent to completely incongruent) x 2 (political social identity: salient / non-salient) x 2 (issue: deportation of criminal refugees / adoption rights for homosexual couples) experimental factors was conducted. Each participant was randomly assigned to one of the 20 resulting conditions. Participants were invited to take part in a study on “perceptions of opinions on social media.” They provided informed consent and were then asked on sociodemographic characteristics, social media use, political orientation, and their opinions toward *deportation* and *adoption* (see above). These issues and the experimental stimulus were addressed within and selected on the ground of a pilot study (for a full report, see [online material](#)).

Manipulation of Political Social Identity Salience

First, PI salience was manipulated by an essay priming procedure (adapted from Wojcieszak & Garrett, 2018). According to the active self-account (Wheeler et al., 2007), social identities can be situationally activated and thereby take influence on subsequent cognitions and behaviors. Accordingly, participants in the *salient identity* condition were instructed to “think about what it means to be part of” their “political group,” i.e., “people of the political left, right or the political center,” and write a short essay about it (for the complete instructions, see the [full questionnaire](#)). In the *non-salient identity* condition, participants were instructed to write about their past day (see Galinsky et al., 2003). Participants of both groups were asked to spend a maximum of five minutes on the task and essays were allowed to be between 100 and 1500 characters in length. In order to check the experimental manipulation of PI, a scale adapted from Greene (1999) measuring the degree of political social identification was used (e.g., “when someone criticizes people who belong to my political group it feels like a personal insult to me”) and mean scores were compared between the social identity conditions. A t-test for independent samples revealed that political social identification was significantly higher for individuals in the salient identity condition ($M = 3.70$, $SD = 1.10$) compared to individuals in the non-salient identity condition ($M = 3.32$, $SD = 1.28$), $t(690.18) = 4.21$, $p < .001$, $d = 0.31$, indicating a successful manipulation.

Manipulation of Political Congruence

To manipulate the degree of political congruence of opinion climate, participants were exposed to fictitious user comments resembling a Twitter comment thread (Figure 1). They were instructed “to take a moment and look at the following comment thread” allegedly taken from Twitter. Each thread consisted of a short teaser text (presenting a neutral statement on one of the two issues) by an alleged news platform and a mixture of comments in favor and against *one of the two issues* below it (1: four comments in favor of [issue], none against; 2: three comments in favor of [issue], one against; 3: two comments in favor of [issue], two against; 4: one comment in favor of [issue], three against; 5: none comment in favor [issue], four against). These conditions were later recoded in accord with each participant’s personal opinion toward *deportation* or *adoption* in order to represent the level of political congruence (i.e., 1: completely congruent, 2: rather congruent, 3: balanced, 4: rather incongruent, 5: completely incongruent). The thread was displayed on one single page and contained four comments expressing an opinion, some with a pertinent hashtag attached (e.g., *deportation*: “Please don’t draw wrong conclusions here! You cannot send people back to war zones. #WirSindMehr” / “Enough is Enough! I’m in favor to send such refugees back to their home countries immediately. #EsReicht”; *adoption*: “Germany has enough problems so solve and

instead of solving them, new problems are created with that! #EheBleibtEhe” / in favor: “Great, because with that society becomes more tolerant and open-minded. #LoveisLove”) and additionally two neutral comments (e.g., “I don’t know what to say about that.”). Median time spent on the comment page was 30 seconds. To check the manipulation of political congruence, one item asked participants on their perception of the opinion climate within in the ostensible Twitter comment thread they were exposed to beforehand (“the comments just shown were...”; 1: mostly in favor of [issue], 5: mostly against [issue]). An analysis of variance (ANOVA) with political congruence as independent variable and perceived opinion climate within comment thread as dependent variable was performed and revealed a significant effect, $F(4, 699) = 78.87, p < .001, \eta^2 = .31$. Subsequent Bonferroni-corrected comparisons of means indicated that opinion climate perceptions differed between experimental conditions in the intended ways. Merely the difference between the first (*completely in favor/against*) and second (*rather in favor/against*) group was not significant but differed in the intended way on a descriptive level (see [online material](#)). Altogether, the manipulation proved largely successful.

Figure 1. Two examples of comment threads to which participants were exposed in the manipulation of political congruence (left: *deportation*, right: *adoption*). The second and fifth comment did not entail a clear stance and were equal for each issue.

After the manipulation of political congruence, the dependent variables (i.e., opinion strength, political tolerance and selective exposure) were assessed. Then, we obtained descriptive measures and debriefed participants.

Measures

Opinions

Participants' opinion toward *deportation* and *adoption* was assessed by the items "How is your opinion toward the deportation of criminal refugees (i.e., the deportation of refugees who committed a crime in Germany)? / adoption rights for homosexual couples (i.e., the legal provision that homosexual couples are allowed to jointly adopt children)?" (1: I'm strongly against it, 7: I'm strongly in favor of it), $M_{deportation} = 6.27$, $SD = 1.12$; $M_{adoption} = 5.01$, $SD = 1.81$. Additionally, dichotomous forced-choice items were assessed to clearly determine (non-)political congruence within our experimental design ("If you had to decide for or against [issue], what would you choose?", 1: I would decide against it ($n_{deportation} = 37$, $n_{adoption} = 168$), 2 = I would decide in favor of it ($n_{deportation} = 667$, $n_{adoption} = 536$)).

Selective Exposure

Participants were exposed to 16 short summaries (*teasers*) of fictitious news articles (Figure 2) presented in random order on a single page. Each teaser expressed an opinion either against or in favor of one of both issues used (four in favor and four against *deportation* / *adoption*). Participants were instructed to select any desired number of teasers of which they would like to receive the full article afterwards. Median time spent on this task was 1.8 minutes and participants selected, on average, 2.8 teasers ($SD = 3.00$). A selective exposure variable was created by subtracting the number of incongruent news teasers from the number of congruent news teasers chosen by participants. Positive values thus indicate biasedness in terms of a preference for congruent news articles ($M = 1.19$, $SD = 2.08$).

a)

b)

Figure 2. Examples of news article teasers that were used in the selective exposure task (a: *deportation*, b: *adoption*).

Opinion Strength

Opinion strength was operationalized by a measure assessing the certainty with which a specific attitude is held (Petrocelli et al., 2007; Petty & Krosnick, 1995). The attitude certainty measure used in this study is composed of the sub-dimensions attitude clarity (four items, e.g., “how certain are you that you really know your opinion toward [issue]?”) and attitude correctness (three items, e.g., “how certain are you that your opinion towards [issue] is the right opinion toward this topic”; 1: not certain at all, 9: completely certain) which were collapsed into one score of attitude certainty for each issue (*deportation*: $M = 6.95$, $SD = 1.48$, Cronbach’s $\alpha = .93$; *adoption*: $M = 6.85$, $SD = 1.59$, Cronbach’s $\alpha = .91$, overall: $M = 6.90$, $SD = 1.54$, Cronbach’s $\alpha = .92$). This measure enabled us to obtain a reliable score that is sensitive to potential, nuanced changes in participants’ opinion strength (see Petrocelli et al., 2007). Attitude certainty was measured with regard to the issue to which a participant was experimentally assigned beforehand.

Political Tolerance

To assess political tolerance, an adapted version of the *least-liked paradigm* was used (Mutz, 2002a). Participants were asked “to think about the people that have an opinion towards [issue] contrary to their own” and rate their agreement with six statements (e.g., “People that have an opinion toward [issue] contrary to my own should not be allowed to give a speech in my city”; 1: completely disagree, 7: completely agree). For each of the both issues, answers were collapsed into a score of political tolerance (*deportation*: $M = 4.76$, $SD = 1.27$, Cronbach’s $\alpha = .82$; *adoption*: $M = 4.98$, $SD = 1.24$, Cronbach’s $\alpha = .80$; overall: $M = 4.87$, $SD = 1.26$, Cronbach’s $\alpha = .81$). Political tolerance was measured with regard to the issue to which a participant was experimentally assigned beforehand. For exploratory purpose, tolerance toward an opposing ideological group (i.e., left-wing / right-wing) was additionally assessed for all participants ($M = 4.66$, $SD = 1.27$, Cronbach’s $\alpha = .84$).

Further Measures

For descriptive purposes and further explorations, intensity of social media use, political social media use (e.g., “How important are social media to you personally to keep at track politically?”), political interest (e.g., “In general, I find politics very interesting”), political extremity, perceived authenticity of ostensible Twitter comment threads and of news teasers was assessed.²

Results

To investigate the hypotheses and research questions, three analyses of variance (ANOVA), each with *political congruence*, *political social identity* and *issue* as independent variables and either (1) *opinion strength*, or, (2) *political tolerance*, or, (3) *selective exposure* as dependent variable were run. Means and standard deviations of dependent variables as well as the distribution of participants over experimental conditions are shown in Tables 1 and 2.³ Participants were evenly distributed across conditions, $\chi^2(19) = 20.77, p = .349$.

Table 1

Cell means (standard deviations) of the dependent variables and distribution of participants across political congruence conditions.

	(1)	(2)	(3)	(4)	(5)
	Completely congruent	Rather congruent	Balanced	Rather incongruent	Completely incongruent
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Opinion strength	6.98(1.48)	7.19(1.44)	6.74(1.51)	6.73(1.65)	6.83(1.58)
Political tolerance	4.93(1.19)	4.75(1.23)	4.87(1.26)	4.98(1.32)	4.86(1.37)
Selective exposure	1.14(2.15)	1.21(1.87)	1.23(2.09)	1.30(2.12)	1.07(2.17)
	<i>n</i> = 155	<i>n</i> = 146	<i>n</i> = 142	<i>n</i> = 135	<i>n</i> = 126

H1 and H2 posited a curvilinear effect of political congruence on opinion strength and political tolerance, respectively. Neither opinion strength, $F(4, 684) = 2.15, p = .073, \eta^2 = .01$, nor political tolerance, $F(4, 684) = 0.68, p = .609, \eta^2 = 0$, differed between any of the conditions of political congruence. Importantly, the quadratic polynomial contrasts of political congruence also were not significant (opinion strength: $p = .653$, political tolerance: $p = .713$). There was a significant main effect of issue on political tolerance, $F(1, 684) = 6.66, p = .010, \eta^2 = .01$, indicating that political tolerance toward incongruent individuals was somewhat higher for the issue *adoption* ($M = 4.98, SD = 1.24$) compared to *deportation* ($M = 4.76, SD = 1.27$). However, there was no significant interaction of congruence and issue on political tolerance indicating that there was no issue-dependent effect of congruence on political tolerance. Taken together, H1 and H2 were not supported.

Similarly, H3 supposed a curvilinear effect of political congruence on selective exposure. Selective exposure did not differ between the congruence conditions, $F(4, 684) = 0.21, p = .932, \eta^2 = 0$. As a consequence, the quadratic contrast of political congruence did not reach statistical significance ($p = .466$). Altogether, this indicated that there was neither a curvilinear nor a linear effect of political congruence on selective exposure. Furthermore, we checked for issue-specific effects on an exploratory level.

Table 2

Cell means (standard deviations) of the dependent variables and distribution of participants across all experimental conditions.

			Dependent variable:			
			Opinion	Political	Selective	
			strength	tolerance	exposure	
Politcal congruence	PI	Issue	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>N</i>
1 completely congruent	EG	adoption	6.75(1.46)	5.03(1.22)	1.41(2.57)	29
		deportation	6.76(1.56)	4.79(1.12)	0.93(1.88)	42
	CG	adoption	7.08(1.48)	4.95(1.14)	0.91(2.07)	46
		deportation	7.29(1.40)	4.99(1.33)	1.45(2.21)	38
2 rather congruent	EG	adoption	7.20(1.48)	4.88(1.30)	1.33(1.96)	43
		deportation	6.97(1.70)	4.57(1.31)	1.41(1.77)	37
	CG	adoption	7.44(1.07)	5.18(1.03)	0.86(2.02)	36
		deportation	7.13(1.44)	4.29(1.10)	1.23(1.72)	30
3 balanced	EG	adoption	7.06(1.52)	4.53(0.97)	0.81(2.04)	31
		deportation	6.17(1.48)	4.92(1.28)	1.39(2.19)	33
	CG	adoption	6.83(1.44)	5.32(1.23)	1.62(2.18)	29
		deportation	6.86(1.51)	4.79(1.35)	1.16(2.01)	49
4 rather incongruent	EG	adoption	6.62(1.70)	4.78(1.36)	1.19(1.99)	42
		deportation	6.67(1.58)	5.06(1.12)	1.56(2.58)	32
	CG	adoption	6.64(1.52)	5.22(1.18)	0.81(1.64)	32
		deportation	7.05(1.81)	4.71(1.44)	1.69(2.22)	29
5 completely incongruent	EG	adoption	7(1.14)	5.07(1.44)	1.32(2.48)	28
		deportation	6.37(1.86)	4.62(1.30)	0.78(2.17)	32
	CG	adoption	6.75(1.71)	5.01(1.42)	0.56(1.65)	34
		deportation	7.21(1.39)	4.74(1.31)	1.69(2.28)	32
overall			6.90(1.54)	4.87(1.26)	1.19(2.08)	704

Note. EG = experimental group (salient political identity), CG = control group.

Selective exposure did not differ between the issues that participants had previously been exposed to within comment threads, $F(1, 684) = 2.41, p = .121, \eta^2 = 0$, and there was no interaction effect of issue and congruence on selective exposure, $F(4, 684) = 0.45, p = .773, \eta^2 = 0$. This indicated that effects of political congruence were not contingent on the issue. H3 cannot be supported.

RQ1 and RQ2 posited that effects of political congruence on selective exposure are mediated by opinion strength and political tolerance, respectively. As no total effects were observed, no mediated effects were in place either. We only observed a correlation between opinion strength and selective exposure ($r = .19, p < .001$). Political tolerance was unrelated to selective exposure ($r = .03, p = .485$).

H4 posed that a salient PI leads to higher levels of selective exposure compared to a non-salient PI. There was no effect of PI on selective exposure, $F(1, 684) = 0.01, p = .929, \eta^2 = 0$. Hence, H4 was not supported.

H5 and H6 posited that a salient PI increases opinion strength and decreases political tolerance, respectively. Contrary to our hypothesis, a small effect of PI on opinion strength, $F(1, 684) = 5.29, p = .022, \eta^2 = .01$, indicated that a salient PI ($M = 6.77, SD = 1.58$) leads to less strong opinions than a non-salient PI ($M = 7.03, SD = 1.48$). This effect was qualified by a significant interaction between PI and issue, $F(1, 684) = 4.50, p = .034, \eta^2 = .01$, indicating that a salient compared to a non-salient PI only led to less strong opinions for the issue *adoption*, but not for *deportation*. Based on these findings, H5 was not supported. Furthermore, no main effect of PI on political tolerance was observed, $F(1, 684) = 0.95, p = .330, \eta^2 = 0$. Instead, there was a marginally significant interaction effect of PI and issue on tolerance, $F(1, 684) = 3.70, p = .055, \eta^2 = .01$, indicating that political tolerance toward incongruent individuals with regard to the issue *deportation* was somewhat lower for participants for whom PI was salient, but not with regard to the issue *adoption*. Taken together, we obtained weak support for H6.

RQ3 and RQ4 asked, whether effects of PI on selective exposure are mediated by opinion strength and political tolerance, respectively. However, the absence of an effect of PI on selective exposure ruled out the possibility of mediated effects. Finally, RQ5 asked, whether there is an interaction effect of political congruence and PI on selective exposure. Results indicated that there was no such effect, $F(4, 684) = 0.41, p = .799, \eta^2 = 0$.

Additional Exploratory Analyses

To rule out that results were biased by methodological artifacts, or, whether results differ for specific groups of users, we performed additional analyses on an exploratory level. For instance, the rather small effect of the manipulation of political congruence might have had an impact on results. We therefore recoded the congruence variable into three categories by collapsing the political congruence conditions and leaving the neutral condition unchanged (congruent vs. balanced vs. incongruent). We then performed the ANOVA (see above), but used the modified political congruence variable. This revealed a small linear (but not a

quadratic) effect of congruence on attitude certainty, $F(2, 692) = 3.81, p = .023, \eta^2 = .01$. Bonferroni-corrected comparisons of means indicated that participants who were exposed to rather congruent and very congruent opinion climates had marginally stronger opinions afterwards ($M = 7.08, SD = 1.46$) compared to participants who were exposed to rather incongruent and very incongruent ($M = 6.78, SD = 1.61, p = .059$) opinion climates. They did not differ from participants who were exposed to balanced opinion climates ($M = 6.73, SD = 1.51, p = .074$). Using the modified political congruence variable yielded no effects on political tolerance, $F(2, 692) = 0.147, p = .863, \eta^2 = 0$, or selective exposure, $F(2, 692) = 0.04, p = .963, \eta^2 = 0$.

Furthermore, to rule out that results were influenced by different completion times, particularly regarding the time participants were exposed comment threads, we additionally ran separate analyses for participants beyond and equal/above the median exposure time. This had no impact on results. Lastly, experimental effects can be more pronounced for participants who more thoroughly elaborated presented stimuli. Elaboration may be higher for participants who (1) are more interested in politics and have stronger political ideologies, or, (2) use SNS more frequently, or, (3) perceived the experimental setting as more authentic. Therefore, the main analyses were re-run, but this time with political interest, intensity of SNS use, political extremity, and perceived authenticity of stimuli as additional covariates. While the post-hoc inclusion of covariates has been criticized for type I error inflation, recent work qualified this concern and pointed to the potential of exploring on *hidden* experimental effects using covariates (Wang et al., 2017). However, the inclusion of covariates did not reveal differential results.⁴

Discussion

Drawing on a representative sample of social media users, this pre-registered experimental study addressed under which circumstances (a) opinion climates conveyed by SNS and (b) political social identity impact users' cognition, behavior and the relationship between opposing political groups (i.e., political tolerance). More precisely, in light of mixed findings by extant research we suggested that the *degree of congruence* of an opinion climate is a crucial determinant of the former and posed curvilinear relationships, i.e., that both very congruent and very incongruent opinion climates can increase opinion strength and selective exposure and decrease political tolerance. Surprisingly however, our results suggest that the degree of political congruence of an opinion climate on SNS has, if any, very little impact on users' political opinions, tolerance and information selection – even when the opinion climate is completely congruent or completely incongruent with users' pre-existing opinion.

We found no evidence that being exposed to incongruent opinion climates changes opinion strength, irrespective of the amount of political incongruence encountered. While earlier work has pointed out the depolarizing effects of the exposure to incongruent views (Knobloch-Westerwick, Johnson, et al., 2015; Parsons, 2010), such effects seem to be limited – at least when it comes to the exposure to user-generated comments on SNS. At the same time, the exposure to congruent opinion climates appears to weakly increase opinion strength. This finding is supported by related work on the polarizing effects of one-sided social and informational environments (Knobloch-Westerwick et al., 2015; Stroud, 2010; Sunstein, 2017). While the link between congruent opinion climates on SNS and opinion strength was made mostly on a hypothetical level so far, the present work provides experimental evidence for this causal claim. Moreover, our findings provide some support for the existence of a self-reinforcing mechanism (see Slater, 2007) between congruent SNS environments and opinion strength (indicated by the marginal correlation between opinion strength and selective exposure). However, given the possibility of incidental exposure to incongruent opinions via SNS (Lu & Lee, 2018), the degree of political congruence that users are exposed to in these environments may not be sufficient for such dynamics to unfold (O'Hara & Stevens, 2015).

Different from opinion strength, our findings imply that the degree of political congruence does not change users' relationship to opposing political groups (in terms of tolerance). Besides this, political tolerance appears to be unrelated to users' preference for congruent information. Consequently, even though the exposure to incongruent opinions may in some cases increase the awareness for diverging political views (see Mutz, 2002a), this does not necessarily lead to increases in political tolerance. Similarly, while the exposure to very congruent environments may increase the affective distance between political camps (Heatherly et al., 2017; Siegel et al., 2018), it does not necessarily lead to decreases in tolerance. In fact, changes in political tolerance may be dependent on further conditions (e.g., perspective taking ability, Mutz, 2002a). In sum, our results do not provide evidence for the claim that a one-time exposure to an (in-)congruent opinion climate has an impact on opinion strength, tolerance or information selection. In fact, we found that being exposed to a congruent opinion climate slightly increases opinion strength – in disregard of the *degree* of political congruence.

While our results corroborate the general tendency of preference toward congruent information (Knobloch-Westerwick, 2015a; Zillmann & Bryant, 1985), the degree of political congruence of opinion climates on SNS does not appear to affect that tendency. In line with this, others have found that the amount of disagreement encountered on SNS is unrelated to

the selective detachment from network contacts (Yang et al., 2017). Our findings are consistent with this and suggest that the amount of disagreement that users are exposed to is also unrelated to selecting opinion-congruent information (i.e., selectivity toward congruent news). Given the lack of support for our hypotheses, further explanations are necessary: First, it seems possible that inconclusive findings regarding the exposure to congruent vs. incongruent opinions cannot just be explained by varying levels of political congruence. Other factors such as the source or the way of expression (e.g., uncivil speech, Gervais, 2015) could play a more important role than the mere quantity of people supporting or opposing one's viewpoint. Second, another explanation could be that our manipulation was too weak or created not in an appropriate manner. It seems conceivable that five comments are not enough to represent an opinion climate to the individual which, in turn, has an effect on cognitions and behavior. Nevertheless, previous research showed that already four user-generated comments on Facebook are enough to slightly affect users' perceptions of opinions (Neubaum & Krämer, 2016). However, it might depend on the platform where an opinion climate is presented and Twitter is still not as popular as Facebook in the country this study was conducted (Kaczinski et al., 2019). Consequently, exposure to content from Twitter may be perceived as less relevant to the own life of participants recruited for the present study.

Furthermore, there is no indication that the salience of an ideological identity decreases political tolerance, but instead, that it decreases opinion strength. While social identity has commonly been linked to increased attitude strength and polarization (e.g., Dvir-Gvirsman, 2018; Slater, 2007; Turner & Reynolds, 2012), our findings imply that the effect of political identities may be determined on the level of specific issues. Interestingly, PI also does not appear to impact the preference for political congruence when users are exposed to overtly (in-)congruent opinion climates. Some earlier research has suggested that in particular extreme partisans who identify with a political camp may be most susceptible to overtly congruent online networks and their effects (e.g., Bright, 2016; Weeks et al., 2017; Wojcieszak & Garrett, 2018). Our findings show that mere social identification with an ideological camp may not be a sufficient condition for any polarizing or mitigating effects of the exposure to opinion climates on SNS. Contrary to other research (Dvir-Gvirsman, 2018; Wojcieszak & Garrett, 2018), we did not find that the salience of a political social identity increases selective exposure to congruent information. Former research indicated that PI may only increase selective exposure of specific sub-groups (e.g., politically more extreme individuals) and within highly polarized societies. In Germany, polarization and partisanship have been decreasing since decades (Munzert & Bauer, 2013) and therefore political identities

and their effects on cognition and behavior are likely to be weaker (Knobloch-Westernwick et al., 2015). Moreover, different from related research which used convenience samples, we drew on a representative sample which included participants with low overall levels of political interest and identification. Taken together, the mere salience of PI may not affect users in general, but instead only those who are strongly attached to a political group and are exposed to rather polarized political and media environments.

Limitations

This study has several limitations. First of all, there are few doubts that the limited time and variety of opinions to which participants were exposed makes the present study insensitive to potential long-time effects that may stem from exposure to (in-)congruent opinion climates on SNS. However, given the relatively large sample and the independence of results from the time participants were exposed to stimuli puts this limitation somewhat into perspective. Furthermore, the comment threads were to some degree artificial as they only resembled comments on social media. Even though participants' perceptions of stimulus authenticity did not impact results, a lack of actual authenticity might still have biased our findings. Moreover, the applied communication setting only represents a small snapshot out of the complex dynamics that communication via SNS involve and political congruence can manifest itself in ways other than opinion climates in comment threads (e.g., by the dominance of congruent online media a user follows). Taken together, our findings need to be evaluated through the lens of these shortcomings which particularly pose limits to the external validity. Future work should investigate on potential long-term effects that the exposure to congruent, incongruent and balanced opinion climates on SNS might have on selectivity, polarization of opinions and the relationship between political camps (e.g., by employing field experiments). Furthermore, the systematic inclusion of further contextual factors of the communication setting (e.g., civility of opinion expression, societal context) would be advisable in order to explain gaps between related research and the present work.

Conclusion

This study started from the notion that it might be the degree of political congruence of the opinion climate that determines whether it has desirable or undesirable effects on the individual. Our findings suggest that the opinion climates encountered in online networks may have, if any, very limited effects on selective exposure, opinion strength and political tolerance. Moreover, findings point to the boundaries of the idea that overtly congruent online networks and information selectivity are linked by a process of mutual reinforcement and that political identity enhances effects of political congruence on social media. Such mechanisms

may be limited in politically depolarized societies in which political identities are not central aspects of individuals' self-concepts. Consequently, the likelihood for homogeneous online environments to form may largely depend on the societal context which should be taken into account by future research. According to our findings, a one-time exposure to opinion climates conveyed by SNS may not impact the relationship between political groups and selection behavior in a depolarized country. With this, the present study adds to the understanding of the psychological consequences that congruent and incongruent environments may (or may not) have for users and their online networks.

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References

- American Psychological Association. (2017). *Ethical Principles of Psychologists and Code of Conduct*. <https://www.apa.org/ethics/code/>
- Bail, C., Argyle, L., Brown, T., Bumpuss, J., Chen, H., Hunzaker, M. B., Lee, J., Mann, M., Merhout, F., & Volfovsky, A. (2018). Exposure to Opposing Views can Increase Political Polarization: Evidence from a Large-Scale Field Experiment on Social Media. *PNAS*, 115(37), 9216–9221. <https://doi.org/10.17605/osf.io/4ygux>
- Bright, J. (2016). Explaining the Emergence of Echo Chambers on Social Media: The Role of Ideology and Extremism. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2839728>
- Dvir-Gvirsman, S. (2018). Political social identity and selective exposure. *Media Psychology*, 22(6), 867–889. <https://doi.org/10.1080/15213269.2018.1554493>
- Fischer, P., Jonas, E., Frey, D., & Schulz-Hardt, S. (2005). Selective exposure to information: The impact of information limits. *European Journal of Social Psychology*, 35(4), 469–492. <https://doi.org/10.1002/ejsp.264>
- Flanagin, A., & Metzger, M. J. (2014). *Digital Media and Perceptions of Source Credibility in Political Communication* (K. Kenski & K. H. Jamieson, Eds.; Vol. 1). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199793471.013.65>
- Galinsky, A. D., Gruenfeld, D. H., & Magee, J. C. (2003). From Power to Action. *Journal of Personality and Social Psychology*, 85(3), 453–466. <https://doi.org/10.1037/0022-3514.85.3.453>
- Gervais, B. T. (2015). Incivility Online: Affective and Behavioral Reactions to Uncivil Political Posts in a Web-based Experiment. *Journal of Information Technology & Politics*, 12(2), 167–185. <https://doi.org/10.1080/19331681.2014.997416>
- Greene, S. (1999). Understanding Party Identification: A Social Identity Approach. *Political Psychology*, 20(2), 393–403. <https://doi.org/10.1111/0162-895X.00150>
- Habermas, J. (2007). Kommunikative Rationalität und grenzüberschreitende Politik: Eine Replik. In P. Niesen & B. Herborth (Eds.), *Anarchie der kommunikativen Freiheit. Jürgen Habermas und die Theorie der internationalen Politik*. (p. 431). Suhrkamp.
- Heatherly, K. A., Lu, Y., & Lee, J. K. (2017). Filtering out the other side? Cross-cutting and like-minded discussions on social networking sites. *New Media & Society*, 19(8), 1271–1289. <https://doi.org/10.1177/1461444816634677>
- Hopmann, D. N., Bjarnøe, C., & Wonneberger, A. (2019). Responding to Interpersonal Political Disagreement. *International Journal of Public Opinion Research*, 32(1), 66–88. <https://doi.org/10.1093/ijpor/edz011>

- Huckfeldt, R., Mendez, J. M., & Osborn, T. (2004). Disagreement, Ambivalence, and Engagement: The Political Consequences of Heterogeneous Networks. *Political Psychology*, 25(1), 65–95. <https://doi.org/10.1111/j.1467-9221.2004.00357.x>
- Iyengar, S., & Westwood, S. J. (2015). Fear and Loathing across Party Lines: New Evidence on Group Polarization. *American Journal of Political Science*, 59(3), 690–707. <https://doi.org/10.1111/ajps.12152>
- John, N. A., & Dvir-Gvirsman, S. (2015). “I Don’t Like You Any More”: Facebook Unfriending by Israelis During the Israel-Gaza Conflict of 2014. *Journal of Communication*, 65(6), 953–974. <https://doi.org/10.1111/jcom.12188>
- Jonas, K., Diehl, M., & Brömer, P. (1997). Effects of Attitudinal Ambivalence on Information Processing and Attitude-Intention Consistency. *Journal of Experimental Social Psychology*, 33(2), 190–210. <https://doi.org/10.1006/jesp.1996.1317>
- Kaczinski, A., Henning-Thurau, T., & Sattler, H. (2019). *Social Media—Society Report 2019. Wie Deutschland soziale Medien nutzt und was das für unsere Gesellschaft bedeutet*. https://www.marketingcenter.de/sites/mcm/files/downloads/research/lmm/literature/kaczinski_hennig-thurau_sattler_social_media_and_society_report_2019.pdf
- Kim, Y. (2015). Does Disagreement Mitigate Polarization? How Selective Exposure and Disagreement Affect Political Polarization. *Journalism & Mass Communication Quarterly*, 92(4), 915–937. <https://doi.org/10.1177/1077699015596328>
- Knobloch-Westerwick, S. (2015a). *Choice and preference in media use: Advances in selective exposure theory and research*. Routledge.
- Knobloch-Westerwick, S. (2015b). The Selective Exposure Self- and Affect-Management (SESAM) Model: Applications in the Realms of Race, Politics, and Health. *Communication Research*, 42(7), 959–985. <https://doi.org/10.1177/0093650214539173>
- Knobloch-Westerwick, S., Johnson, B. K., & Westerwick, A. (2015). Confirmation Bias in Online Searches: Impacts of Selective Exposure Before an Election on Political Attitude Strength and Shifts. *Journal of Computer-Mediated Communication*, 20(2), 171–187. <https://doi.org/10.1111/jcc4.12105>
- Knobloch-Westerwick, S., Mothes, C., Johnson, B. K., Westerwick, A., & Donsbach, W. (2015). Political Online Information Searching in Germany and the United States: Confirmation Bias, Source Credibility, and Attitude Impacts: Political Online Information Search in Germany and United States. *Journal of Communication*, 65(3), 489–511. <https://doi.org/10.1111/jcom.12154>
- Kruglanski, A. W., & Thompson, E. P. (1999). Persuasion by a Single Route: A View From

- the Unimodel. *Psychological Inquiry*, 10(2), 83–109.
<https://doi.org/10.1207/S15327965PL100201>
- Lau, R. R., & Redlawsk, D. P. (2001). Advantages and Disadvantages of Cognitive Heuristics in Political Decision Making. *American Journal of Political Science*, 45(4), 951.
<https://doi.org/10.2307/2669334>
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37(11), 2098–2109. <https://doi.org/10.1037/0022-3514.37.11.2098>
- Lu, Y., & Lee, J. K. (2018). Stumbling upon the other side: Incidental learning of counter-attitudinal political information on Facebook. *New Media & Society*, 21(1), 248–265.
<https://doi.org/10.1177/1461444818793421>
- Marcus, G. E., Neuman, W. R., & MacKuen, M. (2000). *Affective intelligence and political judgment*. University of Chicago Press.
- Munzert, S., & Bauer, P. C. (2013). Political Depolarization in German Public Opinion, 1980–2010. *Political Science Research and Methods*, 1(1), 67–89.
<https://doi.org/10.1017/psrm.2013.7>
- Mutz, D. C. (2002a). Cross-cutting Social Networks: Testing Democratic Theory in Practice. *American Political Science Review*, 96(1), 111–126.
<https://doi.org/10.1017/S0003055402004264>
- Mutz, D. C. (2002b). The Consequences of Cross-Cutting Networks for Political Participation. *American Journal of Political Science*, 46(4), 838.
<https://doi.org/10.2307/3088437>
- Neubaum, G., & Krämer, N. C. (2016). Monitoring the Opinion of the Crowd: Psychological Mechanisms Underlying Public Opinion Perceptions on Social Media. *Media Psychology*, 20(3), 502–531. <https://doi.org/10.1080/15213269.2016.1211539>
- Neubaum, G., & Krämer, N. C. (2017). Opinion Climates in Social Media: Blending Mass and Interpersonal Communication: Opinion Climates in Social Media. *Human Communication Research*, 43(4), 464–476. <https://doi.org/10.1111/hcre.12118>
- O'Hara, K., & Stevens, D. (2015). Echo Chambers and Online Radicalism: Assessing the Internet's Complicity in Violent Extremism: The Internet's Complicity in Violent Extremism. *Policy & Internet*, 7(4), 401–422. <https://doi.org/10.1002/poi3.88>
- Parsons, B. M. (2010). Social Networks and the Affective Impact of Political Disagreement. *Political Behavior*, 32(2), 181–204. <https://doi.org/10.1007/s11109-009-9100-6>

- Petrocelli, J. V., Tormala, Z. L., & Rucker, D. D. (2007). Unpacking attitude certainty: Attitude clarity and attitude correctness. *Journal of Personality and Social Psychology*, 92(1), 30–41. <https://doi.org/10.1037/0022-3514.92.1.30>
- Petty, R. E., & Krosnick, J. A. (1995). *Attitude strength: Antecedents and consequences*. <http://site.ebrary.com/id/10828830>
- Postmes, T., Gordijn, E. H., van Zomeren, M., Greijdanus, H., de Vos, B., Täuber, S., & Kamans, E. (2014). Escalation and de-escalation of intergroup conflict: The role of communication within and between groups. In C. K. W. de Dreu (Ed.), *Conflicts within and between groups: Functions, dynamics and interventions* (pp. 93–116). Psychology Press.
- Postmes, T., & Spears, R. (2013). Psychology and the Internet: Building an Integrative Social Cognitive Research Agenda. *Psychological Inquiry*, 24(4), 326–332. <https://doi.org/10.1080/1047840X.2013.850149>
- Price, V., Cappella, J. N., & Nir, L. (2002). Does Disagreement Contribute to More Deliberative Opinion? *Political Communication*, 19(1), 95–112. <https://doi.org/10.1080/105846002317246506>
- Schneider, I. K., & Schwarz, N. (2017). Mixed feelings: The case of ambivalence. *Current Opinion in Behavioral Sciences*, 15, 39–45. <https://doi.org/10.1016/j.cobeha.2017.05.012>
- Siegel, A. A., Tucker, J. A., Nagler, J., & Bonneau, R. (2018). *Tweeting Beyond Tahrir: Ideological Diversity and Political Intolerance in Egyptian Twitter Networks*. Working Paper. New York University. <https://wp.nyu.edu/smapp/wp-content/uploads/sites/1693/2016/04/TweetingBeyondTahrir.pdf>
- Slater, M. D. (2007). Reinforcing Spirals: The Mutual Influence of Media Selectivity and Media Effects and Their Impact on Individual Behavior and Social Identity. *Communication Theory*, 17(3), 281–303. <https://doi.org/10.1111/j.1468-2885.2007.00296.x>
- Stroud, N. J. (2010). Polarization and Partisan Selective Exposure. *Journal of Communication*, 60(3), 556–576. <https://doi.org/10.1111/j.1460-2466.2010.01497.x>
- Stroud, N. J., & Muddiman, A. (2013). Selective Exposure, Tolerance, and Satirical News. *International Journal of Public Opinion Research*, 25(3), 271–290. <https://doi.org/10.1093/ijpor/edt013>
- Sunstein, C. R. (2017). *#Republic: Divided democracy in the age of social media*. Princeton University Press.
- Taber, C. S., & Lodge, M. (2006). Motivated Skepticism in the Evaluation of Political

- Beliefs. *American Journal of Political Science*, 50(3), 755–769.
<https://doi.org/10.1111/j.1540-5907.2006.00214.x>
- Taylor, S., Pickering, B., Grace, P., Boniface, M., Bakir, V., boyd, danah, Engesser, S., Epstein, R., Fawzi, N., Fernbach, P., Fisher, D., Gardner, B. G., Jacobs, K., Jacobson, S., Krämer, B., Kucharski, A., McStay, A., Mercier, H., Metzger, M., ... Zubiaga, A. (2018). *Opinion Forming in the Digital Age*. Zenodo. <https://doi.org/10.5281/zenodo.1468575>
- Turner, J. C. (1988). *Rediscovering the social group: A self-categorization theory*. Blackwell.
- Turner, J. C., & Reynolds, K. J. (2012). Self-Categorization Theory. In P. Van Lange, A. Kruglanski, & E. Higgins, *Handbook of Theories of Social Psychology* (pp. 399–417). SAGE Publications Ltd. <https://doi.org/10.4135/9781446249222.n46>
- Wang, Y. A., Sparks, J., Gonzales, J. E., Hess, Y. D., & Ledgerwood, A. (2017). Using independent covariates in experimental designs: Quantifying the trade-off between power boost and Type I error inflation. *Journal of Experimental Social Psychology*, 72, 118–124. <https://doi.org/10.1016/j.jesp.2017.04.011>
- Weeks, B. E., Lane, D. S., Kim, D. H., Lee, S. S., & Kwak, N. (2017). Incidental Exposure, Selective Exposure, and Political Information Sharing: Integrating Online Exposure Patterns and Expression on Social Media. *Journal of Computer-Mediated Communication*, 22(6), 363–379. <https://doi.org/10.1111/jcc4.12199>
- Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2007). Understanding the Role of the Self in Prime-to-Behavior Effects: The Active-Self Account. *Personality and Social Psychology Review*, 11(3), 234–261. <https://doi.org/10.1177/1088868307302223>
- Wojcieszak, M., & Garrett, R. K. (2018). Social Identity, Selective Exposure, and Affective Polarization: How Priming National Identity Shapes Attitudes Toward Immigrants Via News Selection. *Human Communication Research*, 44(3), 247–273.
<https://doi.org/10.1093/hcr/hqx010>
- Yang, J., Barnidge, M., & Rojas, H. (2017). The politics of “Unfriending”: User filtration in response to political disagreement on social media. *Computers in Human Behavior*, 70, 22–29. <https://doi.org/10.1016/j.chb.2016.12.079>
- Yardi, S., & Boyd, D. (2010). Dynamic Debates: An Analysis of Group Polarization Over Time on Twitter. *Bulletin of Science, Technology & Society*, 30(5), 316–327.
<https://doi.org/10.1177/0270467610380011>
- Zhu, Q., Skoric, M., & Shen, F. (2017). I Shield Myself From Thee: Selective Avoidance on Social Media During Political Protests. *Political Communication*, 34(1), 112–131.
<https://doi.org/10.1080/10584609.2016.1222471>

Zillmann, D., & Bryant, J. (Eds.). (1985). *Selective exposure to communication*. L. Erlbaum Associates.

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Notes

¹ The time-stamped pre-registration of hypotheses and data analyses can be found [here](#).

² Items within multi-item scales were presented in random order. [Psychometric values](#) and full wordings of all [measures](#) can be retrieved online.

³ [Original data](#) and the [analysis syntax](#) can be retrieved online.

⁴ See [online materials](#) for more details on the exploratory analyses and a [correlation table](#).

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