

# Effects of Intellectual Humility in the Context of Affective Polarization: Approaching and Avoiding Others in Controversial Political Discussions

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Affective polarization, the extent to which political actors treat each other as disliked outgroups, is challenging political exchange and deliberation, for example, via mistrust of the “political enemy” and unwillingness to discuss political topics with them. The present experiments address this problem and study what makes people approach, and not avoid, potential discussion partners in the context of polarized political topics in Germany. We hypothesized that intellectual humility, the recognition of one’s intellectual limitations, would predict both less affective polarization and higher approach and lower avoidance tendencies toward contrary-minded others. Across four preregistered online-survey experiments ( $N = 1,668$ ), we manipulated how intellectually humble a target person was perceived and measured participants’ self-reported (topic-specific) intellectual humility. Results revealed that participants’ intellectual humility was consistently negatively correlated with affective polarization. Additionally, intellectual humility of both the target person and the participants was beneficial, and sometimes even necessary, to make participants approach, and not avoid, the target person. Intellectual humility was more important than moral conviction, opinion, and opinion strength. Furthermore, the effects on approach and avoidance were mediated by more positive expectations regarding the debate, and the effects on future willingness for contact by higher target liking. Our findings suggest that intellectual humility is an important characteristic to enable political exchange as it leads to seeing political outgroups more positively and to a higher willingness to engage in intergroup contact. Implications for intergroup contact of political groups as well as ideas for future research are discussed.

**Keywords:** political polarization, affective polarization, intellectual humility, intergroup contact, controversial debates

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Societies are in conflict over many political issues such as building refugee shelters, pro-environmental measures, and COVID-19 vaccinations. For democracies, it is essential to debate issues constructively and find compromises across political parties and opinions (Helms, 2016; Levendusky, 2018b). But instead, controversial political debate is often avoided, potentially due to increasing affective polarization in many countries (Boxell et al., 2020). Thus, there is a need to understand how to enable people to approach, and not avoid, political opponents (Iyengar et al., 2019; Levendusky & Stecula, 2021). We address this need by investigating intellectual humility, that is, the recognition of one’s intellectual limitations (Porter, Baldwin, et al., 2022) and its influences on affective polarization and approaching (vs. avoiding) contrary-minded others in polarized political debates in Germany. In the following, we

first summarize recent findings about affective polarization and then elaborate on the role of intellectual humility in enabling people to approach others in controversial political discussions.

## Controversial Political Discussions in the Context of Affective Polarization

In democratic societies, political discussions and deliberation between citizens are essential (Conover et al., 2002; Mansbridge et al., 2012). Engaging in exchanges of different viewpoints offers individuals substantial benefits, such as reducing misunderstandings and facilitating the exchange of information, cooperation, and collective action (Goldberg et al., 2019; Myers et al., 2017; Swim et al., 2018). However, many individuals tend to avoid political

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exchanges (Geiger et al., 2023; Sanchez et al., 2022). They shy away from being exposed to different opinions (Frimer et al., 2017) and refrain from expressing dissent (Matthes et al., 2018). Consequently, most political discussions take place among individuals who share similar opinions (Gerber et al., 2012). This is problematic as this avoidance can strengthen ideological segregation and limit opportunities for discussing disagreements (Levy & Razin, 2019; Minozzi et al., 2020). People expect controversial political discussions to be unpleasant (Rothers, 2020) and perceive them as threatening (Koudenburg & Kashima, 2022; Sanchez et al., 2022; Simons & Green, 2018). These negative expectations, in turn, shape approach and avoidance behaviors, with anticipated discomfort in political discussions predicting hesitation to discuss political topics (Geiger et al., 2023; Sanchez et al., 2022).

Another challenge for political exchange is affective polarization (Levendusky, 2018b), the “extent to which partisans [or political groups more broadly] treat each other as a disliked outgroup” (Wojcieszak & Warner, 2020, p. 1). In contrast to ideological polarization, the difference between policy positions of different parties, affective polarization is rooted in social identities and group perceptions (Iyengar et al., 2019). The basic idea is that people prefer their political ingroups and dislike their political outgroups.

Measuring affective polarization in multiparty systems (such as Germany) can be challenging. Most research on affective polarization has been conducted in the United States (M. Wagner, 2021), where it is often operationalized as the difference between Republicans and Democrats on feeling thermometers (Iyengar et al., 2019). The feeling thermometer is a valid measurement instrument in multiparty systems as well (Gidron et al., 2022), but there are various ways to conceptualize affective polarization in such contexts (Röllicke, 2023; Rothers, 2023). Previous research has used the least liked group paradigm (Bäck et al., 2023; Hofman & Hanitzsch, 2018), considered several outgroup parties simultaneously (Harteveld, 2021; Renström et al., 2021; M. Wagner, 2021), studied attachment to ideological labels such as left–right blocks (Comellas & Torcal, 2023), or divisions based on political camps like the radical right versus other parties (Bantel, 2023). Another approach is to measure affective polarization toward opinion-based groups (Bliuc et al., 2007), as seen in studies related to the Brexit referendum (Hobolt et al., 2021; Simonsson et al., 2022), the Catalan independence conflict (Balcells & Kuo, 2023), issues related to migration (Simonsen & Bonikowski, 2022), or the COVID-19 crisis (Neumann et al., 2021; Schieferdecker, 2021). Focusing on opinion-based groups allows for a focus on politically charged discussions and horizontal affective polarization, reflecting dislike between citizens rather than vertical polarization toward political elites or parties (Harteveld et al., 2022).

### *Consequences of Affective Polarization*

Affective polarization is on the rise in many countries (Boxell et al., 2020). While this is a matter of concern for many scholars (Hartman et al., 2022; Iyengar et al., 2019), its causal effects on social cohesion and democratic decision making are debated (Broockman et al., 2023; Voelkel et al., 2023). Polarization can signal problems within a democratic system, such as some individuals feeling excluded from decision-making processes (Stavrakakis, 2018). Negative affect and polarization can be part of a struggle for recognition, particularly for historically disadvantaged group members (Balinhas, 2023; Dixon et al., 2012). Similarly, individuals in society do not have to tolerate

all beliefs, worldviews, and ideologies, for example, racist beliefs (Verkuyten et al., 2020). Despite the existence of negative perceptions of outgroup members across the political spectrum (Crawford & Brandt, 2020; Ditto et al., 2019; Iyengar et al., 2019; Stern & Crawford, 2021), there can be asymmetries in political prejudice and intolerance (Jost, 2017). For example, hate crimes in the United States are more often committed by people from the political right than from the political left (Badaan & Jost, 2020). Consequently, aversion toward political groups and parties can also be a sign of resistance, such as against the radical right (Meléndez & Rovira Kaltwasser, 2021), and affective polarization should be studied in the context of various societal debates (Balinhas, 2023).

Despite situations where disliking political groups may be justified, there is a substantial body of literature highlighting the negative correlates of affective polarization. Strong affective polarization restrains people from constructively dealing with dissidents, exchanging views and debating different policies in a rational manner (Levendusky, 2018b). It leads to distrust of the “political enemy” and an inability to compromise (Helms, 2016). Contrary-minded others are labeled as being hypocritical, selfish, and mean (Iyengar et al., 2012) and harming the nation (Hobolt et al., 2021; Schwalbe et al., 2020). Affective polarization also poses challenges to interpersonal relationships, affecting the willingness to have out-party neighbors (Broockman et al., 2023), and communication within families (Chen & Rohla, 2018; Kobayashi & Tse, 2022). Perceived hostility from individuals with differing opinions leads to avoidance of political discussions (Schieferdecker, 2021). Furthermore, elite polarization contributing to higher levels of affective polarization (Bäck et al., 2023; Kingzette et al., 2021; Stavrakakis, 2018) can lead to support for undemocratic norms (Kingzette et al., 2021; despite questions of the causality, see Broockman et al., 2023; Voelkel et al., 2023). This is especially concerning as right-wing elites in many countries attempt to undermine democratic principles by presenting themselves as the “moderate center” (Stavrakakis, 2018).

Notwithstanding the unanswered questions regarding the causal effects of affective polarization, we argue that the exchange of ideas among individuals with differing opinions is a crucial element of democracies. In democratic societies, political tolerance is a necessity, that is, tolerating a group despite disapproval of the respective beliefs (Verkuyten et al., 2020), as is fostering a lively democratic debate in an agonistic discussion climate (Stavrakakis, 2018). Instead of being affectively polarized toward groups of people holding specific views and avoiding them, approaching individuals holding such a belief and openly discussing opinions appears to be a more constructive approach for both the individual and society. Depolarization interventions can lead to a higher willingness to engage with those holding different views (Broockman et al., 2023; Harteveld et al., 2022). Consequently, we aim to identify psychological factors that allow for a constructive debate with both like-minded and contrary-minded others without fostering political apathy or indifference. Here, a promising concept is intellectual humility.

### **Intellectual Humility**

Defined as “recognizing one’s intellectual limitations” (Porter, Baldwin, et al., 2022, p. 2) or “recognizing that one’s beliefs and knowledge may be incorrect or limited” (Du & Cai, 2020, p. 1010), intellectual humility has gained attention in recent scientific work (Porter, Elnakouri, et al., 2022). There are a variety of scales

measuring intellectual humility making it difficult to compare findings across studies and understand which aspects of intellectual humility lead to which effects. For instance, some scales measure intellectual humility as a general trait (e.g., Alfano et al., 2017; Krumrei-Mancuso & Rouse, 2016); others measure it regarding a specific political topic (e.g., Hoyle et al., 2016). Moreover, there are informant-report scales (Meagher et al., 2015) as well as behavioral measures (Van Tongeren et al., 2023a, 2023b). To structure the variety of scales measuring intellectual humility, Porter, Baldwin, et al. (2022) developed a classification framework according to which items can be grouped on two dimensions: (1) whether they focus on the self versus others and (2) whether they are internal (cognitions) or external (expressed behaviors). Depending on the research question, different scales might be appropriate (Porter, Elnakouri, et al., 2022). Making use of this framework helps to understand which aspect of intellectual humility leads to which outcomes. When studying approach and avoidance tendencies in political discussions, it seems best to use an intellectual humility scale with cognitive items that can be fitted to the specific political issue (e.g., Hoyle et al., 2016) as more contextualized items are less influenced by social desirability bias than general scales (Porter, Elnakouri, et al., 2022).

There are several reasons why intellectual humility might be a promising construct to study how people can constructively deal with each other. First, intellectual humility is associated with positive outcomes regarding less biased information processing. For instance, intellectual humility is positively associated with more knowledge acquisition, for example, reflective and open-minded thinking, need for cognition, intellectual engagement, curiosity, cognitive flexibility, and intelligence (Krumrei-Mancuso et al., 2020; Zmigrod et al., 2019). Moreover, intellectually humble people pay more attention to the evidentiary basis of one's views (Hoyle et al., 2016) and show more recognition memory, meaning they are better at judging what they do and do not know (Deffler et al., 2016). These aspects of information processing also play an important role regarding political debates.

In the political context, intellectual humility has been found to be associated with greater openness to opposing political views and more respectful attributions of opponents' behavior (Porter & Schumann, 2018), greater political tolerance of others (Krumrei-Mancuso & Newman, 2021), lower levels of social dominance orientation, and a greater willingness to protect the political rights of groups one dislikes (Krumrei-Mancuso & Newman, 2020). Regarding political debates, intellectual humility is associated with believing less in under-supported political statements (Krumrei-Mancuso & Newman, 2020) and engaging more in fact checking regarding COVID-19 (Koetke et al., 2022). Therefore, intellectual humility might be ideal to reduce affective polarization (Jost et al., 2022; Porter, Elnakouri, et al., 2022) and make people deal constructively with contrary-minded others in controversial political debates (McLaughlin et al., 2022; Meagher et al., 2021).

## The Present Research

The aim of the present research was to test effects of intellectual humility on approach and avoidance tendencies toward a potential discussion partner in the context of affective polarization. To be able to make causal inference about intellectual humility (Porter, Elnakouri, et al., 2022), we conducted four preregistered online-

survey experiments ( $N = 1,668$ ). Across all experiments, we manipulated the intellectual humility of a presented target person and measured participants' topic-specific intellectual humility. This allowed us to test how the intellectual humilities of the participants and the target person interact; for example, a higher willingness to interact might be contingent on both being intellectually humble (Rodriguez et al., 2019). Besides measuring approach and avoidance tendencies toward the target person as a behavior intention (Porter, Elnakouri, et al., 2022), we always assessed affective polarization regarding opinion-based groups (Bliuc et al., 2007; Hobolt et al., 2021). To contribute to intellectual humility research outside the United States, we chose the context of polarized political debates in Germany. The experiments build on each other by addressing limitations and open questions of earlier experiments, and each experiment makes individual contributions. To summarize, our set of studies advances our understanding of intellectual humility in terms of its causal effects and underlying psychological mechanisms not only with regard to affective polarization but also approach and avoidance tendencies toward contrary-minded others, in various contexts of political debates outside of the United States.

Studies 1a and 1b investigate approaching contrary-minded others in controversial debates around the "use of gender-neutral language." Here, the contrary-minded target was introduced via a twitter profile (Study 1a) or a diary entry (Study 1b). In these experiments, we included a moral conviction scale to explore whether effects of intellectual humility are independent of moral conviction, as moral conviction has been shown to be associated with negative outgroup perceptions and difficulties to approach contrary-minded others (Skitka & Morgan, 2014). Moreover, we included participants' opinion strength as a control variable to test whether the effects of intellectual humility go beyond opinion strength (Lanzalotta, 2021; Teeny & Petty, 2022). Study 2 aims at replicating the findings from Study 1a concerning debates about unscientific COVID-19 beliefs, a debate where participants might perceive a strong opinion on what is "right or wrong." In Studies 1a, 1b, and 2, the target person was always contrary-minded to the participants because our principal aim was to understand whether intellectual humility makes people approach others in controversial discussions to enable positive political intergroup contact (Levendusky & Stecula, 2021). However, most political conversation takes place between people having a similar opinion (Gerber et al., 2012). Thus, we wanted to test whether beneficial effects of intellectual humility can also be found with like-minded target persons. In Study 3, we therefore manipulated the target person's opinion regarding compulsory COVID-19 vaccination in addition to manipulating intellectual humility.

## Transparency and Openness

All studies in this article were preregistered (Study 1a at <https://aspredicted.org/px9ha.pdf>; Study 1b at <https://aspredicted.org/mz464.pdf>; Study 2 at <https://aspredicted.org/34ba4.pdf>; and Study 3 at <https://aspredicted.org/3bc2j.pdf>). We follow Journal Article Reporting Standards (Kazak, 2018) and report how we determined our sample sizes, all data exclusions, all manipulations, and all measures in the studies. All manipulation materials, data, and analyses are available on open science framework (Knöchelmann, 2024). Data of all studies were analyzed using R, Version 4.3.1.

## Studies 1a and 1b: Approaching Contrary-Minded Others

With Studies 1a and 1b, we wanted to assess whether intellectual humility can lead to higher approach and lower avoidance tendencies toward contrary-minded others in controversial political discussions and to reduced affective polarization regarding the opinion-based outgroup. Participants were introduced to a contrary-minded target person via a twitter profile (Study 1a) or a diary entry (Study 1b; this was the only difference between the two studies). In both studies, we manipulated the target person's intellectual humility (high vs. low). Moreover, we included a moral conviction scale, a metacognition that a person's "attitude is grounded in core beliefs about fundamental right and wrong" (Skitka & Morgan, 2014, p. 96). Evidence suggests that people with high moral convictions might be those who are the most affectively polarized and those who find it the most difficult to approach contrary-minded others (Skitka & Morgan, 2014). Moreover, we considered participants' opinion strength as people tend to not want to interact with others holding a belief with certainty or extremity because their views are perceived to be less open and more difficult to be changed (Lanzalotta, 2021; Teeny & Petty, 2022).

We used the debate around the "use of gender-neutral language" (also gender-inclusive, gender-fair, or gender-equitable language). German is a grammatical gender language in which person nouns are gender marked. For instance, a male student is a "Student," a female student is a "Studentin." When referring to mixed groups or when the gender of the person(s) is unknown, traditionally the masculine form is used generically. Gender-neutral language refers to linguistic methods to render all genders visible in the language (Duden, 2023) by using words such as "StudentIn," "Student\*in," or "Student:in." Using gender-neutral language changes mental representations of a person or group (Gygax et al., 2008) and therefore has the potential to reduce gender stereotyping and discrimination (Sczesny et al., 2016). In Germany, more and more gender-neutral language is implemented—for instance at universities (Goncalves, 2020), in newspaper articles (Waldendorf, 2023), or in parliament (Stecker et al., 2021). At the same time, there is resistance to language change in Germany (Infratest Dimap, 2021; Waldendorf, 2023). Using gender-neutral or nonneutral language signals a person's attitudes toward gender equality (Adler & Hansen, 2020), thereby making political identification with an opinion-based group salient. This allowed us to easily manipulate a target person's opinion and intellectual humility and to measure affective polarization regarding the opinion-based groups.

As the two studies were identical except for the manipulation materials and conducted in parallel, we report them together except for the results section.

## Hypotheses

*Hypothesis 1:* Participants who are exposed to an intellectually humble (vs. not intellectually humble) contrary-minded target person show higher approach tendencies and lower avoidance tendencies regarding the target person and are less affectively polarized.

*Hypothesis 2:* Higher intellectual humility of the participants is associated with more approach tendencies and less avoidance

tendencies toward the target person and with less affective polarization.

*Hypothesis 3, exploratory:* How do the experimental condition (intellectually humble vs. not humble target person) and the participants' own intellectual humility interact? Is it sufficient that only one discussion partner is intellectually humble (McLaughlin et al., 2022), or is it necessary that both discussion partners are intellectually humble (Rodriguez et al., 2019) to create higher approach and lower avoidance tendencies as well as less affective polarization?

## Method

### Design, Data Collection, and Participants

Both studies used a two-group between-participants experimental design with an additional continuous predictor. We manipulated the target's intellectual humility (high vs. low Target IH) and measured participants' intellectual humility and were interested in how they interacted. Thus, we conducted an a priori power analysis for finding a small interaction effect ( $f^2 = 0.02$ ;  $\alpha = .05$ ,  $\beta = 0.20$ ) between a continuous and a dichotomous predictor in linear multiple regression in G\*Power (Version 3.1.9.7) (following recommendations by Perugini et al., 2018). Results revealed that we needed at least  $n = 395$  participants per experiment. We recruited German-speaking adults between May 27 and June 7, 2021 by posting the survey link on several social media and internet platforms, and using mailing lists and newsletters. We did not provide financial reimbursement but offered course credit to participants from our department ( $n_{\text{Study1}} = 65$ ;  $n_{\text{Study2}} = 60$ ).

In total,  $N = 1,108$  participated in the two experiments. Participants who reported being younger than 18 years old were filtered out in the beginning of the survey. As preregistered, we excluded participants who did not agree with the data protection guidelines ( $n = 6$ ), failed attention checks ( $n = 28$ ) or manipulation checks ( $n = 87$ ), or indicated that they did not answer the questions honestly ( $n = 10$ ). Afterward,  $N = 812$  participants remained ( $n = 414$  twitter study;  $n = 398$  diary study). Most participants (60%) indicated their gender as female, 315 participants as male (39%), and 9 as diverse. Mean age was 28.29 years ( $SD = 10.62$ , range = 18–76). Many participants held a university degree (43%) or had the Abitur, the German qualification to study at university (43%). The sample was politically somewhat left wing (10-point left–right self-placement:  $M = 3.99$ ,  $SD = 1.67$ , range = 1–10).

## Procedure

After clicking on the study link, participants saw a welcome page that provided information about the length and content of the study (personal opinions about the use of gender-neutral language) as well as a contact address. When starting the study, participants were informed about data protection guidelines and had to accept them to participate. Following this, participants indicated their gender, age, nationality, and position on the political topic of interest (use of gender-neutral language). Then, we randomly assigned participants to one of the two experimental conditions where a target person named Alex was portrayed as intellectually humble (high IH condition) or not (low IH condition). Participants were not aware of



condition assignment. In Study 1a, participants saw Alex's Twitter profile (see Figure 1A). In the profile description, we manipulated Alex's intellectual humility with statements as "Controversial discussions are informative and there to expand my limited knowledge [high IH] versus 'Controversial discussions are useless and not meant to make you feel good' [low IH]." Additionally, participants saw a Twitter post by Alex recommending either a book in favor or against a "feminist language." The book title

always was the opposite of the participant's own viewpoint. In Study 1b, participants saw a diary entry (see Figure 1B) and were instructed to read it as if they themselves had written it. The diary entry described a dinner among friends at which the topic of gender-neutral language was discussed. At the dinner, a person named Alex was present who was either in favor or against the use of language. Alex was either portrayed as insisting on their opinion and not listening (low IH) or as not insisting on their opinion and carefully

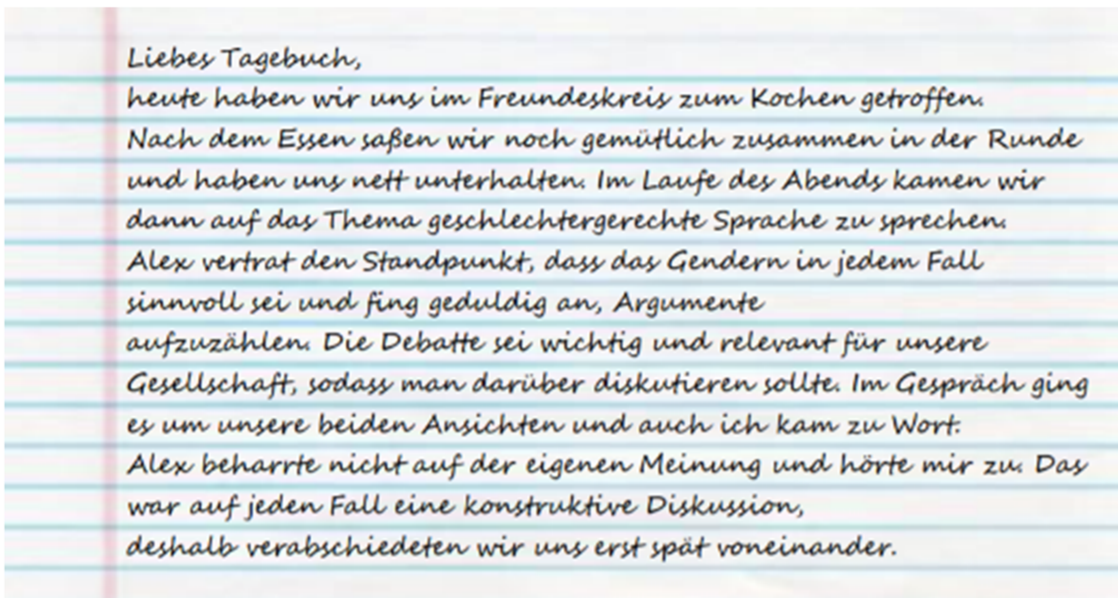
**Figure 1**

*Manipulation Material Examples in Studies 1a and 1b*

(A)



(B)



*Note.* Panel A displays example manipulation materials from Study 1a. Panel B displays an example manipulation from Study 1b. See the online article for the color version of this figure.

listening (high IH). The full manipulation materials can be found in Supplemental Materials A. We instructed participants to read the materials carefully and to answer questions about it afterward.

All participants then answered dependent variables (DVs) in randomized order. These were followed by manipulation checks, the self-report intellectual humility scale, the moral conviction scale, and questions assessing participants' political orientation. We decided to measure participants' IH after the manipulation to avoid order effects (Strack, 1992) or priming (Molden, 2014). Specifically, we wanted to avoid that filling out the IH measure before the manipulation would lead participants to pay more attention to the target person's level of IH than usual for first encounters. The order of items within scales were randomized. To assess the quality of data, we included two attention checks (Berinsky et al., 2014) and another question asking whether participants had answered the survey questions in a genuine manner. Finally, the purpose of the study was presented and participants could leave a comment in an open text field.

## Measures

**Participants' Opinion and Opinion Strength.** Participants' self-reported opinion on the use of gender-neutral language was measured on a 4-point Likert scale with the options *completely against* (1), *rather against* (2), *rather in favor* (3), and *completely in favor* (4) of the use of gender-neutral language, Study 1a:  $M = 2.68$ ,  $SD = 1.07$ ; Study 1b:  $M = 2.80$ ,  $SD = 1.05$ . We coded participants' opinion strength as 0 when they held a moderate opinion (rather against or rather in favor of the use of gender-neutral language,  $n_{\text{Study 1a}} = 223$ ,  $n_{\text{Study 1b}} = 212$ ) and as 1 when they had a strong opinion (completely against or completely in favor of the use of gender-neutral language,  $n_{\text{Study 1a}} = 191$ ,  $n_{\text{Study 1b}} = 186$ ).

**Intellectual Humility.** We measured intellectual humility specific to the use of gender-neutral language with an ad hoc translation of the Specific Intellectual Humility Scale (SIHS) by Hoyle et al. (2016) asking "Please indicate in how far these statements describe yourself." The nine items such as "My views about the use of gender-neutral language may change with additional evidence or information" were answered on a 5-point Likert scale ranging from 1 = *not at all like me* to 5 = *completely like me*; Study 1a:  $M = 3.37$ ,  $SD = 0.87$ ;  $\alpha = .89$ , Study 1b:  $M = 3.45$ ,  $SD = 0.89$ ,  $\alpha = .90$ .

**Dependent Variables.** Approach and avoidance tendencies were measured with three items taken from Turner et al. (2013), for example, "When I think about Alex, I want to spend time with Alex," on 7-point Likert scales ranging from 1 = *do not agree at all* to 7 = *completely agree*; approach: Study 1a:  $M = 2.85$ ,  $SD = 1.37$ ,  $\alpha = .79$ , Study 1b:  $M = 3.90$ ,  $SD = 1.54$ ,  $\alpha = .87$ ; avoidance: Study 1a:  $M = 4.70$ ,  $SD = 1.71$ ,  $\alpha = .94$ ; Study 1b:  $M = 3.31$ ,  $SD = 1.78$ ,  $\alpha = .96$ .

Affective polarization was measured as difference scores of ingroup and outgroup (supporters and opponents of the use of gender-neutral language, depending on the participants' self-reported opinion) ratings in two different ways. First, we used feeling thermometers from 1 = *cold* to 101 = *warm* (Gidron et al., 2022; Iyengar et al., 2012) so that the resulting affective polarization score could include values from -100 to 100, Study 1a:  $M = 42.69$ ,  $SD = 38.33$ , Study 1b:  $M = 40.03$ ,  $SD = 37.02$ . Second, we used trait ratings adapted from Levendusky (2018a; German translation by Hofman & Hanitzsch, 2018): Participants rated how selfish, hypocritical, mean, intelligent, generous, honest, and open-minded

they perceived the target groups on 5-point Likert scales ranging from 1 = *do not agree at all* to 5 = *completely agree*. Then, we created a difference score between ingroup and outgroup where higher values mean higher polarization; Study 1a:  $M = 0.92$ ,  $SD = 1.00$ ,  $\alpha = .81$ ; Study 1b:  $M = 0.91$ ,  $SD = 0.94$ ,  $\alpha = .80$ .

**Manipulation Checks and Quality of Data.** We included a manipulation check asking about the target person's opinion on gender-neutral language. The participants indicated the target's opinion on a 4-point Likert scale from 1 = *completely against the use of gender-neutral language* to 4 = *completely in favor of the use of gender-neutral language*. If the answer was wrong, for example, the target was in favor of the use of gender-neutral language and the participant indicated 1 or 2, the participant was excluded from the data set.

We also included a second manipulation check assessing how intellectually humble the target person was perceived. We used a four-item scale adapted from Meagher et al. (2015) with items such as "[name of target person] is willing to learn from others," with a 6-point Likert scale ranging from 1 = *does not apply at all* to 6 = *completely applies*; Study 1a:  $M = 2.78$ ,  $SD = 1.10$ ,  $\alpha = .65$ , Study 1b:  $M = 3.09$ ,  $SD = 1.17$ ,  $\alpha = .73$ .

Additionally, we included an attention check, embedded in the moral conviction scale, asking "We are testing your attention here. Please indicate 'does not apply at all'". Participants who did not choose the correct option were excluded from the data set.

To assess the quality of the data, participants were asked: "Did you answer the questions in a genuine manner, so that we can use them for our study?" (single choice between *Yes, I answered the questions in a genuine manner* and *No, I just wanted to look and sometimes I clicked on something just for fun*). Participants who chose the latter were excluded from the data set.

**Further Variables.** We measured participants' moral conviction about the political topic (use of gender-neutral language) with a three-item scale adapted from Tagar et al. (2014) with items such as "My feelings about the use of gender-neutral language are deeply connected to my beliefs about 'right' and 'wrong'" on a 7-point Likert scale ranging from 1 = *does not apply at all* to 7 = *completely applies*; Study 1a:  $M = 3.99$ ,  $SD = 1.60$ ,  $\alpha = .79$ , Study 1b:  $M = 3.99$ ,  $SD = 1.64$ ,  $\alpha = .82$ .

As demographic variables, we measured participants' age, gender, and level of education. Moreover, we assessed participants' political orientation on three 101-point bipolar scales (socialist-market liberal; left-right; liberal-conservative); Study 1a:  $M = 39.26$ ,  $SD = 17.86$ ,  $\alpha = .77$ , Study 1b:  $M = 38.70$ ,  $SD = 16.63$ ,  $\alpha = .71$ .

Correlations between variables can be found in the Supplemental Materials B (Tables S1 and S7).

## Results

### Manipulation Checks

First, we tested whether the intellectual humility manipulation influenced the perceived target's intellectual humility but not the participants' self-reported intellectual humility. As expected, the target IH manipulation led to higher reported perceived intellectual humility of the target person for both the twitter manipulation,  $t(382) = -17.08$ ,  $p < .001$ ,  $d = 1.69$ , 95% CI [1.46; 1.91]; high:  $M = 3.49$ ,  $SD = 0.95$ ; low:  $M = 2.07$ ,  $SD = 0.72$ , and the diary

manipulation,  $t(373) = -26.64, p < .001, d = 2.64$  95% CI [2.37; 2.91], high:  $M = 3.98, SD = 0.81$ ; low:  $M = 2.12, SD = 0.57$ .

We measured participants' intellectual humility (to be used as a predictor variable) after the manipulation materials to avoid order or priming effects. As intended, the assigned condition did not influence levels of participants' reported intellectual humility, Study 1a: high:  $M = 3.36, SD = 0.86$ ; low:  $M = 3.37, SD = 0.88$ ;  $t(412) = 0.05, p = .96$ ; Study 1b: high:  $M = 3.51, SD = 0.91$ ; low:  $M = 3.38, SD = 0.87$ ;  $t(395) = -1.47, p = .14$ .

### Multiple Multivariate Linear Regression

To test our hypotheses, we conducted a set of multiple multivariate linear regressions for each experiment, which allow for entering several predictors and several dependent variables at the same time while considering shared covariances (Fox & Weisberg, 2019). We entered the dummy-coded target IH condition (1 = high, 0 = low), the  $z$ -standardized participants' topic-specific intellectual humility, and their interaction term as predictor variables. As dependent variables, we entered approach tendencies, avoidance tendencies, and the two affective polarization scores based on feeling thermometer and trait ratings (all  $z$ -standardized).

**Study 1a: Twitter Profiles.** The regression results are summarized in Table 1. Participants' intellectual humility was associated with less affective polarization measured via both feeling thermometers and trait ratings. However, the experimental condition had no effect on affective polarization measured via feeling thermometers or trait ratings. There were no interaction effects between the experimental condition and participants' intellectual humility on affective polarization.

Participants who saw an intellectually humble target person reported higher approach tendencies ( $M = 3.17, SD = 1.45$ ) and lower avoidance tendencies ( $M = 4.16, SD = 1.77$ ) than participants who saw a nonhumble target (approach:  $M = 2.52, SD = 1.21$ ; avoidance:  $M = 5.24, SD = 1.47$ ). This effect was qualified by a significant interaction of the experimental condition and participants' intellectual humility for both approach tendencies and avoidance tendencies, see Figure 2. Simple slope analysis showed that when the presented target was intellectually humble, participants' intellectual humility predicted higher approach ( $\beta = 0.39, p < .01$ ) and lower avoidance tendencies ( $\beta = -0.36, p < .01$ ). When the target was

nonhumble, participants' intellectual humility did not predict approach ( $\beta = 0.06, p = .38$ ) or avoidance tendencies ( $\beta = 0.00, p = .98$ ). The model explained  $R^2 = .13$  of the variance in approach tendencies and  $R^2 = .16$  of the variance in avoidance tendencies.

Robustness checks of the results (including demographic variables, excluding multivariate outliers) can be found in the Supplemental Materials B (Tables S4–S5).

**Study 1b: Diary Entries.** The regression results are summarized in Table 2. As in Study 1a, participants' intellectual humility was associated with less affective polarization measured via both feeling thermometers and trait ratings. Additionally, high (vs. low) target IH had an effect on the reported affective polarization based on trait ratings but not feeling thermometers. There were no interaction effects between the experimental condition and participants' intellectual humility on affective polarization.

Participants who saw an intellectually humble target reported higher approach tendencies ( $M = 4.50, SD = 1.39$ ) and lower avoidance tendencies ( $M = 2.47, SD = 1.48$ ) than participants who saw a nonhumble target (approach:  $M = 3.24, SD = 1.43$ ; avoidance:  $M = 4.23, SD = 1.62$ ). Additionally, participants' intellectual humility predicted higher approach tendencies and lower avoidance tendencies. For avoidance, this effect was qualified by a significant interaction between the condition and participants' intellectual humility, see Figure 3. Simple slope analysis revealed that participants' intellectual humility predicted less avoidance more strongly when the target was humble ( $\beta = -.32, p < .01$ ) than when the target was nonhumble ( $\beta = -.15, p = .02$ ). Robustness checks of the results (including demographic variables, excluding multivariate outliers) can be found in the Supplemental Materials B (Tables S10–S11).

### Further Analyses

**Moral Conviction and Opinion Strength.** To rule out that the effects of intellectual humility could be explained by potentially confounding variables, we explored how intellectual humility and moral conviction were related and included participants' opinion strength as a control variable.

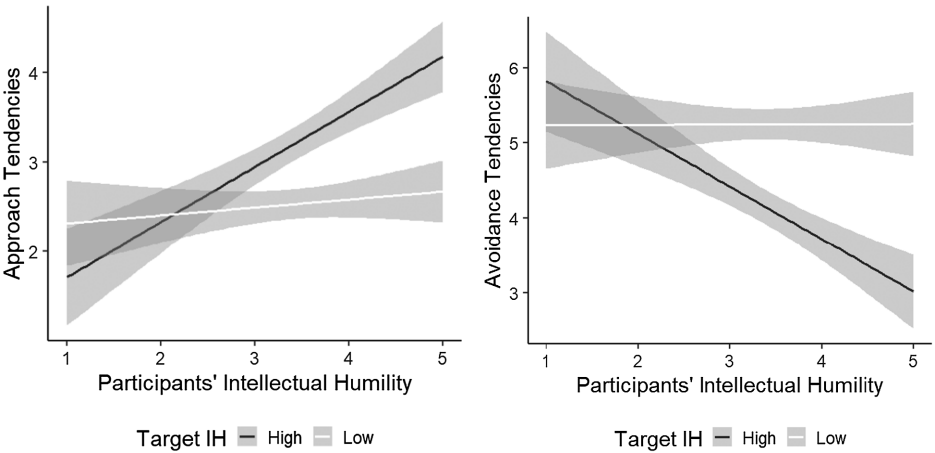
Correlational analyses revealed that, across both experiments, moral conviction about the political topic was not associated with intellectual humility (Study 1a:  $r = -.03, 95\% \text{ CI } [-.12; .07], p = .53$ ; Study 1b:  $r = -.05, 95\% \text{ CI } [-.16; .03], p = .23$ ). However, moral

**Table 1**  
*Effects of Participants' IH and Target's IH on Approach and Avoidance Tendencies and Affective Polarization in Study 1a*

Predictor	Affective polarization		Approach tendency	Avoidance tendency
	Feeling thermometer	Trait rating		
Intercept	−0.01 (.844) [−0.14, 0.12]	0.04 (.570) [−0.09, 0.17]	−0.24 (<.001) [−0.36, −0.11]	0.32 (<.001) [0.19, 0.44]
Target IH	0.03 (.780) [−0.16, 0.21]	−0.08 (.419) [−0.27, 0.11]	0.47 (<.001) [0.29, 0.65]	0.63 (<.001) [−0.81, −0.46]
Participant IH	−0.33 (<.001) [−0.46, −0.21]	−0.17 (.012) [−0.30, −0.04]	0.06 (.377) [−0.07, 0.18]	0.00 (.976) [−0.12, 0.13]
Target IH × Participant IH	0.01 (.956) [−0.18, 0.19]	−0.13 (.181) [−0.32, 0.06]	0.34 (<.001) [0.16, 0.52]	0.36 (<.001) [−0.54, −0.18]
$R^2$	.11	.06	.13	.16

*Note.*  $N = 414$ . Standardized regression weights with 95% CI in square brackets and  $p$  values in parentheses. Target IH = target IH condition (1 = high; 0 = low); Participant IH = participants' specific intellectual humility ( $z$ -standardized SIHS score); SIHS = Specific Intellectual Humility Scale; CI = confidence interval

**Figure 2**  
*Approach and Avoidance Tendencies as a Function of Participants' and Target's Intellectual Humility in Study 1a*



*Note.* High = high target intellectual humility; Low = low target intellectual humility; IH = intellectual humility.

conviction correlated with higher affective polarization measured via feeling thermometers (Study 1a:  $r = .43$ , 95% CI [.35; .51],  $p < .001$ ; Study 1b:  $r = .37$ , 95% CI [.28; .45],  $p < .001$ ) and trait ratings (Study 1a:  $r = .47$ , 95% CI [.40; .55],  $p < .001$ ; Study 1b:  $r = .48$ , 95% CI [.40; .55],  $p < .001$ ). Entering the  $z$ -standardized moral conviction and the respective interaction terms as additional predictors into the multiple multivariate regression reported above did not change the reported effects of the experimental condition and the participants' intellectual humility on approaching and avoiding the target person in a meaningful way (i.e., changing significance or changing patterns of results; see Supplemental Materials B [Tables S2 and S8]).

Additionally, we explored whether participants' opinion and opinion strength were associated with the level of reported intellectual humility. We built a regression model where opinion and opinion strength were entered as predictors of intellectual humility. We found that both participants' opinion and opinion strength predicted intellectual humility. The more participants were in favor of the use of gender-neutral language, the humbler they were, Study 1a:  $b = 0.42$ ,

$p < .001$ , Study 1b:  $b = 0.40$ ,  $p < .001$ . Participants who indicated a more moderate opinion on the use of gender-neutral language reported higher levels of intellectual humility than participants with a strong opinion, Study 1a:  $b = -0.86$ ,  $p < .001$ , Study 1b:  $-0.90$ ,  $p < .001$ , see Figure 4 for illustration using locally estimated scatterplot smoothing. However, entering opinion and opinion strength as additional predictors in the multivariate regression reported above did not change the effects in a meaningful way (see Supplemental Materials B [Tables S3 and S9]).

### Discussion

Across both studies, our hypotheses were partially confirmed. For the twitter manipulation (Study 1a), both the target person and the participant had to be intellectually humble to make participants report higher approach and lower avoidance tendencies. For the diary manipulation (Study 1b), however, we found two main effects of both target and participant intellectual humility, contributing

**Table 2**  
*Effects of Participants' IH and Target's IH on Approach and Avoidance Tendencies and Affective Polarization in Study 1b*

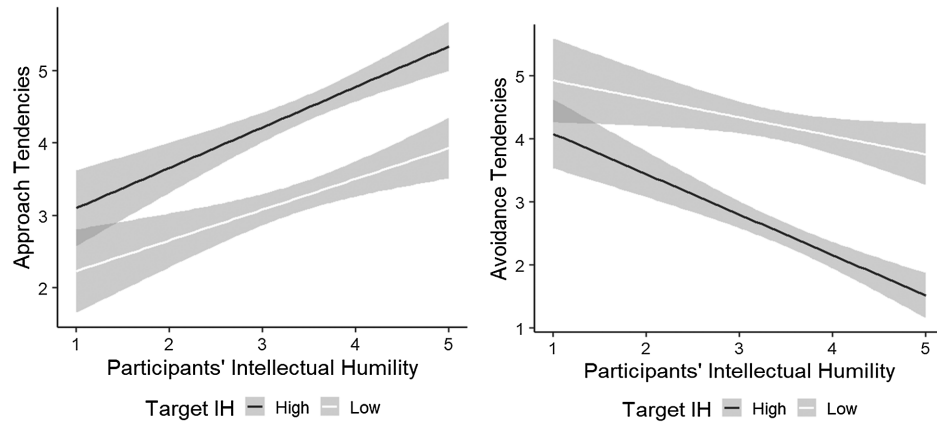
Predictor	Affective polarization		Approach tendency	Avoidance tendency
	Feeling thermometer	Trait rating		
Intercept	0.08 (.263) [−0.06, 0.21]	0.14 (.041) [0.01, 0.28]	−0.41 (<.001) [−0.53, −0.28]	0.51 (<.001) [0.39, 0.63]
Target IH	−0.14 (.137) [−0.32, 0.04]	−0.27 (.005) [−0.46, −0.08]	0.78 (<.001) [0.60, 0.95]	−0.96 (<.001) [−1.12, −0.79]
Participant IH	−0.34 (<.001) [−0.47, −0.20]	−0.19 (.007) [−0.34, −0.05]	0.25 (<.001) [0.12, 0.37]	−0.15 (.018) [−0.27, −0.03]
Target IH × Participant IH	−0.08 (.388) [−0.26, 0.10]	−0.06 (.553) [−0.25, 0.13]	0.08 (.376) [−0.09, 0.25]	−0.17 (.038) [−0.34, −0.01]
$R^2$	.16	.08	.25	.31

*Note.*  $N = 398$ . Standardized regression weights with 95% CI in square brackets and  $p$  values in parentheses. Target IH = target IH condition (1 = high; 0 = low); Participant IH = participants' specific intellectual humility ( $z$ -standardized SIHS score); SIHS = Specific Intellectual Humility Scale; CI = confidence interval



**Figure 3**

*Approach and Avoidance Tendencies as a Function of Participants' and Target's Intellectual Humility in Study 1b*



*Note.* High = high target intellectual humility; Low = low target intellectual humility; IH = intellectual humility.

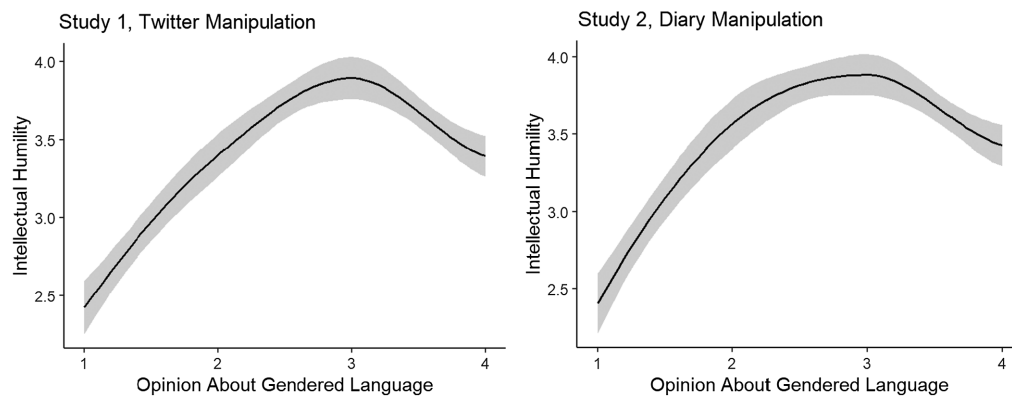
additively to higher approach and lower avoidance tendencies. The manipulation must be the reason for the differences in the results between the experiments, as everything else was identical. There may be two complementary explanations. First, the diary entry displayed a social interaction implying that the participant had some contact with the target. Thus, the diary manipulation might have functioned as an imagined intergroup contact intervention (Crisp et al., 2009). In contrast, the twitter manipulation implied that participants did not know the target person and did not interact with them—as participants only saw their social media profile. Second, compared to offline interactions, online discourse is often less civilized due to different norms such as being morally outraged (Crockett, 2017).

In both studies, intellectual humility of participants was consistently associated with less affective polarization measured via feeling thermometer and trait rating differences. However, high

(vs. low) target IH did not lead to less reported affective polarization, except for a small effect on trait rating differences in Study 1b. One reason might be effects known from the intergroup contact literature such as subtyping, that is, immunization strategies which inhibit belief updating (Pinquart et al., 2021). Thus, it might be the case that affective polarization cannot easily be influenced by exposure to only one outgroup member. Another reason why we found an effect of the diary manipulation on trait rating affective polarization scores but not of the twitter manipulation might be the intensity of the situation imagined: Because the diary entry offers more in-depth information than the twitter profile, this might have led to a more intense imagined intergroup contact which has a higher likelihood of changing beliefs about outgroups (Husnu & Crisp, 2011). Therefore, we refined our affective polarization hypothesis in subsequent studies. We did not anticipate a decrease in affective polarization merely by exposure to a humble target person from the outgroup

**Figure 4**

*Participants' Opinion Strength Predicting Intellectual Humility*



*Note.* Locally estimated scatterplot smoothing (LOESS) line (span = 0.75) with 95% confidence interval.

anymore. Instead, we solely hypothesized that participants' intellectual humility would be associated with lower affective polarization.

### Limitations

Studies 1 and 2 have several methodological limitations. First, we used ad hoc translations of Hoyle et al.'s (2016) intellectual humility scale, as no validated German version of the scale was available. In the meantime, there has been a more professional translation and validation of several intellectual humility scales in Germany (Knöchelmann et al., 2021), which we used in the following studies.

Second, a few participants indicated<sup>1</sup> that they did not understand one of the four manipulation check items ("Alex is intellectually humble"), which is accompanied by a relatively low  $\alpha$  of the perceived intellectual humility scale (Meagher et al., 2015). Thus, we modified this manipulation check for further studies.

Third, we used convenience samples and followed heterogeneous sampling strategies. This resulted in younger, more educated, rather left wing, and more female participants compared to the German population. All of these demographic characteristics are likely to be associated with being more in favor of the use of gender-neutral language. Thus, there might have been selection effects due to differential interests to participate in the study, limiting the generalizability of results. At the same time, participants were always exposed to a target person having the opposed opinion and participants' opinion and their opinion strength did not influence the results when entered as control variables.

Last, we cannot generalize our findings of the two experiments to other political topics. The use of gender-neutral language is a debate where there is no clear scientific "right or wrong." Of course there is research and scientific evidence that gender-neutral language has effects on humans, such as the potential to reduce stereotypes and discrimination against women (Szczesny et al., 2016). However, using gender-neutral language or not reflects a person's moral and political views (Adler & Hansen, 2020), including perceptions of gender equality. Specific intellectual humility can be measured regarding both more abstract and moral debates such as abortion as well as more concrete scientific debates such as health and fitness (Hoyle et al., 2016). However, this does not mean that we can find the beneficial effects of intellectual humility in other debates to the same extent, for example, in debates with clear scientific evidence. In the following studies, we therefore aimed to replicate the effects found with a different sample and a different political topic and address the limitations mentioned above.

### Study 2: Replication With a Different Political Topic

Study 2 aimed to replicate the results of Studies 1a and 1b by focusing on another politically polarized topic in Germany: Debates about (un)scientific COVID-19 beliefs (see Jungkunz, 2021; Stoetzer et al., 2023). During the pandemic, the so-called Querdenken movement and its populist discourse attracted many people, fueling both massive protests against COVID-19 measures (Satre et al., 2021) and the spread of unscientific claims online (Almodt, 2024). Qualitative interviews in this context revealed high levels of affective polarization, perceptions of two opposing opinion camps, hostility toward the outgroup, and avoidance of discussions about the topic (Schieferdecker, 2021).

Besides replicating the findings concerning a different topic with a potentially stronger perception of "right and wrong," Study 2

addressed two limitations of the first two studies: First, we adapted the manipulation and the manipulation check as some participants indicated they did not understand some sentences or words in these materials. Second, we used the German version of the SIHS validated by Knöchelmann et al. (2021). Additionally, we included a measure of general intellectual humility (Krumrei-Mancuso & Rouse, 2016) that covers all quadrants of the intellectual humility classification framework (Porter, Baldwin, et al., 2022). In addition to the SIHS, including such a multidimensional general scale might help us to understand intellectual humility in political discussions in more detail.

As in Study 1a, we manipulated the target person's intellectual humility (high vs. low) via a social media profile. The presented target had the opposite opinion regarding three COVID-19 beliefs to the participants.

### Hypotheses

As the target and their opinion was introduced via a social media profile, we hypothesized similar results as observed in Study 1a.

*Hypothesis 1:* Higher intellectual humility in participants is associated with less affective polarization.

*Hypothesis 2:* Only when both the participant and the presented target person are intellectually humble, participants will report higher approach and lower avoidance tendencies toward the contrary-minded target person.

### Method

#### Design, Data Collection, and Participants

As Study 1a, Study 2 was a two-group between-participants experimental design with an additional continuous predictor. We wanted to replicate the interaction between the manipulated target IH and participants' intellectual humility found in Study 1a. Therefore, we conducted an a priori power analysis for finding a small interaction effect,  $f^2 = 0.02$ ;  $\alpha = .05$ ,  $\beta = 0.20$ , between a continuous and a dichotomous predictor in linear multiple regression in G\*Power (Version 3.1.9.7) (Perugini et al., 2018). Based on the required sample size of  $N = 395$ , we preregistered to collect data until we either obtain  $N = 400$  participants or until April 30, 2022 due to time constraints. We included German-speaking adults who had not taken part in the previous studies. We sampled in diverse ways, online, for example, via mailing lists, as well as offline via postings in supermarkets or restaurants in the town where the university is

<sup>1</sup> Participants could leave anonymous comments at the end of the study, which  $n = 52$  (Study 1) and  $n = 56$  (Study 1b) participants made use of. For instance, several participants reported that they did not understand the manipulation check item "Alex is intellectually humble" or some of the political orientation questions (e.g., "market liberal"). Other participants felt the need to justify their opinion on gender-neutral language or reported negative emotions about the political topic. In addition, some participants were angry about reading in the debriefing that they had been randomly assigned to an experimental condition and that we included measures of affective polarization. Furthermore, some participants reported that they found the diary entry difficult to read or confusing. Overall, the open comments showed that the use of gender-neutral language is a heated topic in Germany and they were useful to improve our studies, for example, the manipulation check items.

located. To also sample participants who believe in unscientific COVID-19 claims, we posted our study in four Telegram groups in which people exchanged beliefs about anti-COVID measures and conspiracy beliefs. We did not provide financial reimbursement but offered course credit to eight participants from our department.

In total,  $N = 540$  participated in the online experiment. Participants who did not agree with the data protection guidelines or reported being younger than 18 years old were automatically filtered out by the survey program. In total,  $N = 395$  participants finished the online experiment. As preregistered, we excluded participants who failed attention checks ( $n = 20$ ) or manipulation checks ( $n = 29$ ) or indicated that they did not answer the questions honestly ( $n = 3$ ), resulting in  $N = 349$  participants (67% female;  $M_{\text{age}} = 36.26$ ,  $SD_{\text{age}} = 12.20$ ; 60% had a university degree).

### Procedure

The procedure was the same as in the previous studies, except for some changes. First, we excluded the moral conviction scale as it was not associated with intellectual humility in the previous two experiments and effects of intellectual humility on approach and avoidance tendencies persisted even when controlling for moral conviction. Second, we included a general intellectual humility scale, presented before the SIHS. Third, we adapted the social media manipulation materials from Study 1a. Based on the open comments from participants, we changed some words of the profile description

(e.g., changed the word “bubble” to “filter-bubble”) to make the materials accessible to a broader public (see Figure 5). Additionally, we created new posts that the target person Alex shared. Alex posted three pictures containing (un)scientific COVID-19 beliefs. Alex always had the opposite opinion to the participants regarding whether COVID-19 is influenced by 5 G, whether good nutrition can prevent getting COVID-19, and whether most COVID-19 deaths would still be alive without infection. The full manipulation materials can be found in Supplemental Materials A.

### Measures

**Participants’ COVID-19 Beliefs.** Participants’ COVID-19 beliefs were measured with 15 items taken from Rothmund et al. (2022), for example, “With proper diet, one can be protected from being infected with the coronavirus” answered on a 4-point Likert scale with the options *definitely false* (1), *rather false* (2), *rather true* (3), *definitely true* (4);  $M = 1.59$ ,  $SD = 0.38$ ,  $\alpha = .80$ . Most participants ( $n = 254$ , 73%) did not believe in any of the three unscientific COVID-19 beliefs used for our manipulation. However,  $n = 59$  believed in one,  $n = 31$  in two, and  $n = 5$  believed in all three.

**Intellectual Humility.** We measured Intellectual Humility specific to COVID-19 beliefs with the SIHS (Hoyle et al., 2016), validated by Knöchelmann et al. (2021), asking “Please indicate in how far these statements describe yourself.” The nine items such as “I am open to new information about COVID that might change

**Figure 5**  
Manipulation Material Examples in Study 2



*Note.* See the online article for the color version of this figure.

my view” were measured on a 5-point Likert scale ranging from 1 = *does not apply to me at all* to 5 = *completely applies to me*;  $M = 2.53$ ,  $SD = 0.80$ ,  $\alpha = .87$ .

General intellectual humility was measured with the Comprehensive Intellectual Humility Scale (Krumrei-Mancuso & Rouse, 2016), validated by Knöchelmann et al. (2021). The scale consists out of four subscales: Independence of Intellect and Ego ( $\alpha = .85$ ), Openness to Revising One’s Viewpoints ( $\alpha = .80$ ), Respect for Others Viewpoints ( $\alpha = .82$ ), and Lack of Intellectual Overconfidence ( $\alpha = .71$ ). Participants were asked to what extent the 22 statements such as “I can respect others, even if I disagree with them in important ways” described themselves on a 5-point Likert scale ranging from 1 = *do not agree at all* to 5 = *completely agree*;  $M = 3.90$ ,  $SD = 0.41$ ,  $\alpha_{\text{total}} = .83$ .

**Dependent Variables.** Approach and avoidance tendencies were measured as in Studies 1a and 1b with items taken from Turner et al. (2013); approach:  $M = 2.27$ ,  $SD = 1.37$ ,  $\alpha = .83$ , avoidance:  $M = 5.27$ ,  $SD = 1.81$ ,  $\alpha = .96$ .

Affective polarization was measured as in Studies 1a and 1b via feeling thermometer ( $M = 40.55$ ,  $SD = 27.26$ ) and trait ratings ( $M = 1.16$ ,  $SD = 0.89$ ;  $\alpha = .86$ ). The target groups were “People who have similar views regarding the coronavirus as I do” (ingroup) and “People who have different views regarding the coronavirus than I do” (outgroup).

**Manipulation Check and Quality of Data.** To assess whether participants perceived the target person’s COVID-19 beliefs correctly, we asked “How similar or dissimilar are Alex’s views to your own views about the coronavirus?” Participants could choose between *correspond to my views completely* (1), *correspond to my views somewhat* (2), *contradict my views somewhat* (3), and *contradict my views completely* (4). Participants who answered one of the first two options were excluded from the data set.

We adapted the second manipulation check assessing how intellectually humble the portrayed target person was perceived from Studies 1a and 1b (Meagher et al., 2015). We excluded the item “[name of target person] is intellectually humble” as this item was not understood clearly by several participants in the previous studies. The three remaining items were answered on a 5-point Likert scale ranging from 1 = *does not apply at all* to 5 = *applies completely*;  $M = 2.13$ ,  $SD = 0.92$ ,  $\alpha = .86$ .

Additionally, we included an attention check embedded in the general intellectual humility scale by asking “We are testing your attention here. Please indicate ‘completely agree’ here.” An additional quality of data question on whether participants had answered genuinely was the same as in Studies 1a and 1b.

**Further Variables.** As demographic variables, we measured participants’ age, gender, and level of education. We did not measure political orientation.

## Data Preparation

We excluded participants who indicated not to have answered the questions in a genuine manner ( $n = 3$ ), answered the attention check incorrectly ( $n = 20$ ), answered the manipulation check asking about the target’s opinion on COVID-19 beliefs incorrectly ( $n = 29$ ), or did not finish the survey ( $n = 132$ ). Participants who reported being younger than 18 years were automatically filtered out by survey program.

## Results

### Manipulation Checks

As in Studies 1a and 1b, we assessed participants’ IH after the manipulation to avoid order or priming effects. To make sure that the manipulation of the target person’s intellectual humility influenced only perceived target IH but not participants’ intellectual humility, we compared the two manipulation groups (target IH high vs. low) on the manipulation check with a two-sided  $t$  test as well as on the participants’ self-reported intellectual humility with a Hotelling’s  $T^2$  test, the multivariate extension of the  $t$  test. As intended, the manipulation did not influence levels of participants’ specific or general intellectual humility,  $T^2(5,343) = 0.61$ ,  $p = .693$ , but led to higher perceived intellectual humility of the target,  $t(321) = -10.67$ ,  $p < .001$ ,  $d = 1.15$ , 95% CI [0.91; 1.39]. Even though the manipulation led to a large increase in the target’s intellectual humility, the values even in the high IH condition were relatively low ( $M = 2.60$ ,  $SD = 0.90$ ; low IH condition:  $M = 1.68$ ,  $SD = 0.68$ ).

### Hypothesis Testing

To test our hypotheses, we conducted separate multiple multivariate linear regressions allowing to test several predictors and several dependent variables at the same time.

**Hypothesis 1: Affective Polarization.** Based on results from Study 1a, we hypothesized that intellectual humility would be associated with less affective polarization. We preregistered to enter participants’ specific and general intellectual humility as IVs and affective polarization difference scores measured via feeling thermometers and trait ratings as dependent variables. All variables were z-standardized. As hypothesized, participants’ specific and general intellectual humility overall score predicted less affective polarization measured both via feeling thermometers and trait ratings, see Table 3, Model 1. We then ran another model where we did not enter the general intellectual humility overall score but the mean scores of its four subfacets and the specific intellectual humility scale (see Table 3, Model 2). The subfacet Openness to Revising One’s Viewpoints predicted more polarization. The specific intellectual humility scale and the other three general intellectual humility subfacets negatively predicted affective polarization, as hypothesized. However, the positive prediction by Openness to Revising One’s Viewpoint should not be overinterpreted as the bivariate correlations with affective polarization were zero, feeling thermometer:  $r = -.01$ , 95% CI [−.11; .10]; trait ratings:  $r = -.01$ , 95% CI [−.11; .10].

**Hypothesis 2: Approaching and Avoiding the Contrary-Minded Target.** To test the second hypothesis, we built a preregistered model with the dummy-coded experimental condition, the participants’ specific intellectual humility,<sup>2</sup> and their interaction term as IVs and approach and avoidance tendencies as dependent variables (see Table 4). All continuous variables were z-standardized. Disconfirming the second hypothesis, the

<sup>2</sup> To replicate Study 1 and in line with our preregistration, we entered only participants’ specific intellectual humility (SIHS), and not the general intellectual humility (CIHS), into the model. However, we also explored effects of the CIHS as this multidimensional general scale might help us to understand intellectual humility in political discussions in more detail. These analyses can be found in the Supplemental Materials B (Table S14).



**Table 3***Effects of Participants' Intellectual Humility on Affective Polarization in Study 2*

Predictor	Feeling thermometer	Trait rating
Model 1		
Intercept	0.00 (>.999) [−0.10, 0.10]	0.00 (>.999) [−0.10, 0.10]
Specific participant IH	−0.32 (<.001) [−0.42, −0.22]	−0.36 (<.001) [−0.46, −0.27]
General participant IH	−0.20 (<.001) [−0.30, −0.10]	−0.10 (.044) [−0.20, 0.00]
$R^2$	.16	.15
Model 2		
Intercept	0.00 (>.999) [−0.09, 0.09]	0.00 (>.999) [−0.10, 0.10]
Specific participant IH	−0.34 (<.001) [−0.44, −0.24]	−0.37 (<.001) [−0.47, −0.27]
General participant IH		
Openness to revising one's viewpoints	.20 (<.001) [0.09, 0.30]	0.13 (.023) [0.02, 0.24]
Respect for others' viewpoints	−0.22 (<.001) [−0.33, −0.10]	−0.07 (.274) [−0.19, 0.05]
Lack of intellectual overconfidence	−0.07 (.177) [−0.16, 0.03]	−0.12 (.018) [−0.22, −0.02]
Independence of intellect and ego	−0.17 (.002) [−0.28, −0.07]	−0.09 (.097) [−0.20, 0.02]
$R^2$	.21	.17

*Note.*  $N = 349$ . Standardized regression weights with 95% CI in square brackets and  $p$  values in parentheses. Specific participant IH = participants' specific intellectual humility ( $z$ -standardized SIHS score); General participant IH = participants' general intellectual humility ( $z$ -standardized CIHS scores); SIHS = Specific Intellectual Humility Scale; CIHS = Comprehensive Intellectual Humility Scale; CI = confidence interval.

interaction terms between experimental condition and the intellectual humility scores did not predict higher approach or lower avoidance tendencies (all  $l$ 's < .82, all  $ps$  > .41). However, we found a main effect regarding approach tendencies: Approach tendencies were higher when target IH was high ( $M = 2.44$ ,  $SD = 1.37$ ) versus low ( $M = 2.11$ ,  $SD = 1.35$ ). All other regression coefficients were not significant (all  $l$ 's < 1.46, all  $ps$  > .14). Overall, we found a floor effect for approaching the target person ( $M = 2.27$ ,  $SD = 1.37$ ) and a ceiling effect for avoidance ( $M = 5.27$ ,  $SD = 1.81$ , see Figure 6).

**Table 4***Effects of Participants' and Target's Intellectual Humility on Approach and Avoidance Tendencies in Study 2*

Predictor	Approach tendency	Avoidance tendency
Intercept	−0.12 (.119) [−0.26, 0.03]	0.08 (.308) [−0.07, 0.23]
Target IH	0.24 (.027) [0.03, 0.45]	−0.16 (.147) [−0.37, 0.06]
Participant IH	0.07 (.291) [−0.06, 0.21]	−0.05 (.512) [−0.18, 0.09]
Target IH × Participant IH	−0.09 (.416) [−0.30, 0.12]	0.01 (.898) [−0.20, 0.23]
$R^2$	.02	.01

*Note.*  $N = 349$ . Standardized regression weights with 95% CI in square brackets and  $p$  values in parentheses. Target IH = target IH condition (1 = high; 0 = low); Participant IH = participants' specific intellectual humility scale ( $z$ -standardized SIHS score); SIHS = Specific Intellectual Humility Scale; CI = confidence interval.

Robustness checks of the results (including demographic variables, excluding multivariate outliers) can be found in the Supplemental Materials B (Tables S15–S19).

## Discussion

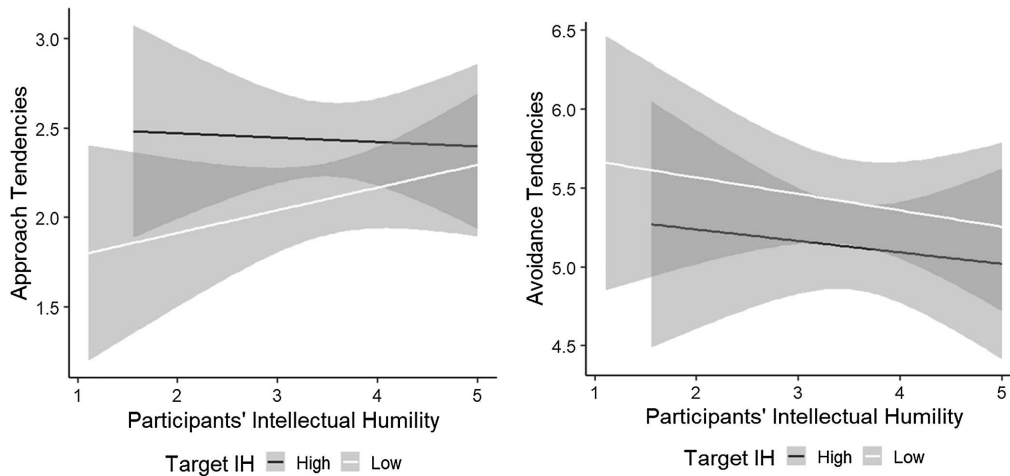
When using the same intellectual humility manipulation as in Study 1a and (un)scientific COVID-19 beliefs as a polarized political topic, we replicated that topic-specific intellectual humility (and found that the general intellectual humility score) predicted less affective polarization based on feeling thermometers and trait rating difference scores. However, in exploratory analyses, we found that one subfacet of the general intellectual humility scale, Openness to Revising One's Viewpoints, predicted more affective polarization. Further research is needed to replicate and understand this finding. Otherwise, Hypothesis 1 was confirmed.

Hypothesis 2 was not supported, missing replication. The interaction of the target person's intellectual humility and participants' intellectual humility did not lead to higher approach or lower avoidance tendencies. Instead, we found a main effect of high (vs. low) target intellectual humility on higher approach tendencies. However, as effect sizes were small and the effect was not significant when running the analyses without multivariate outliers (see Supplemental Materials B [Table S19]), these effects should be treated with caution.

The reason why we did not find any effects on avoidance tendencies might be a ceiling effect. Most participants showed very high avoidance and low approach tendencies toward the target person. Thus, participants wanted to avoid any interaction with a

**Figure 6**

*Approach and Avoidance Tendencies as a Function of Participants' and Target's Intellectual Humility in Study 2*



*Note.* High = high target intellectual humility; Low = low target intellectual humility; IH = intellectual humility.

person having very different COVID-19 beliefs from their own. One reason might be that the target person's beliefs were perceived as extreme, with the target's opinion manipulated via three social media posts (compared to one post in Study 1a). Seeing three posts might have made the intellectual humility manipulation less salient and the opinion appear very strong. In line with this interpretation, the intellectual humility manipulation led to low perceived intellectual humility of the target even in the high intellectual humility condition on our manipulation check question. Another reason might be that intellectual humility has limitations in debates when there is a perceived "right or wrong" or clear normative support—here believing in (un)scientific findings about COVID-19.

### Limitations

Study 2 also had some limitations (which we addressed in Study 3). First, we used convenience samples and recruited participants in heterogeneous ways. Therefore, we cannot rule out that the manipulation via social media profiles was not fitting or plausible to some participants. For instance, there might have been some participants unfamiliar with social media. To address this limitation, we adjusted the manipulation more specifically to the participants.

Second, regarding our manipulation material, the previous experiments manipulated the target persons' general intellectual humility. However, as the general intellectual humility and topic-specific intellectual humility of the participants had different outcomes regarding our dependent variables, the topic-specific intellectual humility of the target persons might be better suitable as a manipulation. Thus, in our last experiment, we manipulated the target person's topic-specific intellectual humility instead of a general intellectual humility statement.

Third, in the previous experiments, we relied on research showing that both the use of gender-neutral language as well as unscientific COVID-19 beliefs were polarized political topics in the German context. However, we never explicitly tested whether participants

actually perceived the political topics as polarizing in society. Therefore, we added a scale measuring perceived polarization of the political topic in Study 3.

Fourth, in the previous experiments, we did not investigate why intellectual humility can lead to higher approach and avoidance tendencies (Studies 1a and 1b) or not (Study 2). To address this question, we included two potential mediators (expectations about the debate and target liking) in Study 3.

Last, in our previous experiments, we exclusively examined the role of intellectual humility in approaching contrary-minded-others. However, within the broader context of affective polarization, individuals exhibit avoidance not only toward those with opposing views but also shy away from engaging in political exchanges in general (Geiger et al., 2023). This avoidance extends to exposure of other opinions (Frimer et al., 2017) and participation in discussions (Schieferdecker, 2021). Such reluctance to engage is problematic given that political exchange reduces misunderstandings and facilitates exchange of information, cooperation, and collective action (Goldberg et al., 2019; Myers et al., 2017; Swim et al., 2018). If our vision for democratic discourse entails cultivating an agonistic discussion climate (Stavrakakis, 2018), where people openly discuss their thoughts and opinions, it becomes crucial to identify psychological factors that make people approach discussions with both contrary- and like-minded others. Therefore, we explored whether the effects of intellectual humility can also yield benefits in discussions with like-minded others.

### Study 3: Like-Minded Others

In the previous studies, the target persons were always presented as contrary-minded others. We consistently found that intellectual humility was beneficial for higher approach and lower avoidance tendencies toward the contrary-minded target and was associated with less affective polarization. However, it remains unclear whether the beneficial effects of intellectual humility extend to debates with like-minded others. This would be of interest as most political

discussions take place between persons having a similar opinion (Gerber et al., 2012) and within-group effects are often understudied (Dixon et al., 2012). Therefore, we included a factor manipulating the target's opinion (like-minded vs. contrary-minded). The political topic was whether or not a COVID-19 vaccination should be mandatory—a polarized debate in Germany at the time the study was conducted (Henkel et al., 2023). At that point in time, identities based on vaccination status were salient and related to stereotyping of ingroup and outgroup members (M. Wagner & Eberl, 2022). To increase the external validity of the discussion context, we changed the scenario to an imagined encounter with a person that recently moved to the participant's neighborhood.

Moreover, we included a scale measuring willingness for future contact because our measure of approach and avoidance tendencies does not reflect whether people want to approach others to constructively talk to them or to purely convince them of their political opinion. Willingness for future contact is important for long-term exchange between political groups (Levendusky & Stecula, 2021). Last, we incorporated two potential mediators in our experiment. We hypothesized that effects on willingness for future contact would be mediated by more positive feelings toward the target person (Levendusky & Stecula, 2021). Specifically, we anticipated that both like-mindedness and intellectual humility would make the participant like the target person more. Simultaneously, within an agonistic discussions culture, people do not necessarily have to like contrary-minded discussion partners (Stavrakakis, 2018). Instead, they can engage in an exchange despite personal dislike (Verkuyten et al., 2020). For such discussions, we posit that expectations regarding the constructive nature of the debate are more crucial than warm feelings toward the discussion partner. The notion that expectations shape approach and avoidance tendencies is well-grounded in theoretical frameworks (Gollwitzer et al., 2018) as well as previous research (Geiger et al., 2023; Koudenburg & Kashima, 2022; Sanchez et al., 2022). Therefore, it is of great interest whether participants' negative expectations about controversial political discussions (Rothers, 2020; Sanchez et al., 2022; Simons & Green, 2018) are influenced by intellectual humility.

## Hypotheses

*Hypothesis 1:* Higher intellectual humility of participants is associated with less affective polarization.

*Hypothesis 2:* We predict an interaction between target IH (high vs. low) and the participants' intellectual humility. Additionally, there might be a three-way interaction with the factor target opinion (opposing vs. the same), where we would predict the following patterns:

*Hypothesis 2.1:* When the target person has the opposing opinion, participants only report higher (vs. lower) approach and lower (vs. higher) avoidance tendencies when both target IH is high (vs. low) and participants' intellectual humility is higher (vs. lower). Additionally, we explore when participants report higher (vs. lower) willingness for future contact with the target person.

*Hypothesis 2.2:* When the target person has the same opinion, we explore how participants' intellectual humility and target IH

(and their interaction) predict the level of approach and avoidance tendencies as well as willingness for future contact.

*Hypothesis 3: Mediations:*

*Hypothesis 3.1:* The effects found in Hypothesis 2 regarding higher approach and lower avoidance behavior toward the target person are mediated by more positive expectations regarding the discussion.

*Hypothesis 3.2:* The effects found in Hypothesis 2 regarding the willingness for future contact are mediated by more positive feelings toward the target.

## Method

### Design, Data Collection, and Participants

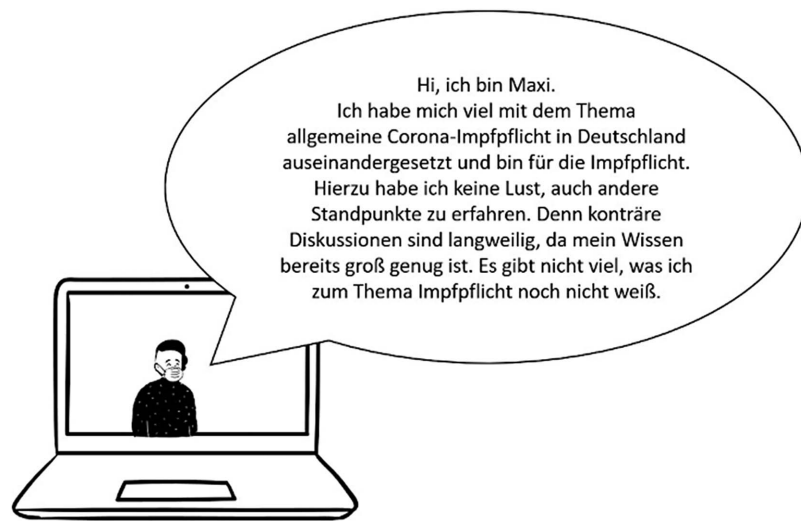
Study 3 was a  $2 \times 2$  between-participants experimental design with an additional continuous predictor. We manipulated the factors target IH (high vs. low) and target opinion (like-minded vs. contrary-minded) and measured participants' intellectual humility. An a priori power analysis accounting for the additional experimental factor revealed that we needed at least 449 participants when entering the small effect size of  $f^2 = .033$  observed in Study 1a (G\*Power Version 3.1.9.7, linear multiple regression, fixed model,  $R^2$  increase; seven predictors,  $\alpha = .05$ ,  $\beta = 0.20$ ). We sampled participants who were fluent in German, living in Germany, and at least 18 years old via prolific, a platform known for high data quality (Peer et al., 2017) and paid 1.35 £ (9 £ per hour) for participation. In total,  $N = 494$  participated in the online experiment in May 2022. Participants who did not agree with the data protection guidelines or reported being younger than 18 years were automatically filtered out by the survey program. In total,  $N = 487$  participants finished the online experiment. As preregistered, we excluded participants who failed the manipulation check ( $n = 36$ ). All participants correctly answered the attention check and indicated that they answered the questions honestly. Afterward,  $N = 451$  participants remained (50% female;  $M_{\text{age}} = 29.67$ ,  $SD_{\text{age}} = 9.58$ ). Many participants (44%) held a university degree.

### Procedure

The procedure was the same as in Study 2, except for excluding the general Comprehensive Intellectual Humility Scale. We excluded this scale as we could not formulate testable hypotheses based on the results of Study 2. Additionally, we wanted to keep the questionnaire short to not burden participants with too many questions given additional variables: perceived polarization of the political topic, willingness to engage in future contact, expectations regarding the debate, and target liking.

We asked participants to imagine an online meeting with a target person named Maxi who recently moved to their neighborhood. Participants saw Maxi on a laptop screen giving a statement provided in a speech bubble (Figure 7). We manipulated Maxi's IH with statements such as "controversial discussions are boring, because my knowledge is already big enough" (low IH) versus "controversial discussions are exciting, because then I can expand my limited knowledge" (high IH). Depending on the experimental condition, Maxi either had the same opinion or the opposite opinion compared

**Figure 7**  
*Manipulation Material Example in Study 3*



to participants about compulsory COVID-19 vaccinations. The full manipulation materials can be found in Supplemental Materials A.

### Measures

**Intellectual Humility.** We measured intellectual humility specific to the compulsory COVID-19 vaccination with the SIHS (Hoyle et al., 2016) already used in Study 2, due to human error only with eight out of nine items;  $M = 3.65$ ,  $SD = 0.75$ ,  $\alpha = .86$ .

**Dependent Variables.** Affective polarization was measured as in the previous studies via both feeling thermometers ( $M = 37.10$ ,  $SD = 30.40$ ) and trait ratings ( $M = 1.07$ ,  $SD = 0.98$ ,  $\alpha = .86$ ). The target groups were supporters and opponents of a compulsory COVID-19 vaccination.

Approach and avoidance tendencies were measured as in the previous studies; approach:  $M = 3.86$ ,  $SD = 1.49$ ,  $\alpha = .87$ , avoidance:  $M = 3.69$ ,  $SD = 1.82$ ,  $\alpha = .93$ .

Willingness to engage in future contact with the target person was measured with two items by Husnu and Crisp (2010), for example, "Would you like to spend time with Maxi in the future?" on a 7-point Likert scale ranging from 1 = *very reluctantly* to 7 = *with pleasure*;  $M = 3.58$ ,  $SD = 1.69$ ,  $r = .77$ .

**Mediators.** Expectations regarding the discussion were measured with eight items from Koudenburg and Kashima (2022) on 7-point bipolar scales. Participants rated how conflicted–consensual, aroused–calm, coarse–gentle, uncomfortable–comfortable, closed/restricted–open, hostile–harmonious, and stilted–flowing they expected the discussion to be;  $M = 3.81$ ,  $SD = 1.62$ ,  $\alpha = .94$ .

Target liking was measured on a 101-point feeling thermometer ranging from 1 = *cold/unpleasant* to 101 = *warm/pleasant*,  $M = 45.55$ ,  $SD = 26.80$ .

**Further Variables.** We included the same manipulations checks, attention check (in the SIHS) and self-reported quality of data question as in Study 2.

As demographic variables, we assessed participants' age, gender, education, and current country of residence.

We measured how politically polarizing participants perceived a compulsory COVID-19 vaccination to be with eight items such as "Germany is divided regarding the compulsory COVID-vaccination" adapted from Koudenburg and Kashima (2022) on a 7-point Likert scale from 1 = *do not agree at all* to 7 = *completely agree*;  $M = 5.18$ ,  $SD = 0.76$ ,  $\alpha = .69$ .

### Data Preparation

We excluded  $n = 36$  participants who incorrectly answered the manipulation check asking about the target person's opinion on the political topic. Participants who reported being younger than 18 years were automatically filtered out by survey program.

### Results

#### Manipulation Checks

To test whether participants perceived the political topic as polarizing, we included a scale about the perceived polarization of the debate around compulsory COVID-19 vaccinations in Germany. Exploratory analyses revealed that indeed participants perceived the debate to be polarized: On a 7-point scale, the mean was 5.18 ( $Mdn = 5.14$ ;  $SD = 0.76$ ; range 3.29–7). Then, we tested for effects of the experimental condition on intellectual humility. As intended, high target IH led to higher perceived intellectual humility of the target ( $M = 4.16$ ,  $SD = 0.57$ ) than low target IH ( $M = 1.65$ ,  $SD = 0.67$ ),  $t(447) = -42.79$ ,  $p < .001$ ,  $d = 4.01$ , 95% CI [3.69; 4.33]. Participants' intellectual humility was again measured after the manipulation materials to avoid priming or order effects. In contrast to the previous experiments, participants who saw a humble target were slightly more intellectually humble ( $M = 3.74$ ,  $SD = 0.77$ ) than those who saw a nonhumble target,  $M = 3.57$ ,  $SD = 0.73$ ;  $t(440) = -2.30$ ,  $p = .02$ ,  $d = 0.22$ , 95% CI [0.03, 0.40].



### Hypothesis Testing

**Hypothesis 1: Effects on Affective Polarization.** To test Hypothesis 1, we preregistered to run a multivariate regression analysis. We entered participants' intellectual humility as the predictor variable and both affective polarization scores as dependent variables. All variables were *z*-standardized. As hypothesized, intellectual humility predicted less affective polarization measured both via feeling thermometers ( $\beta = -.37, p < .001, R^2 = .13$ ) and trait ratings ( $\beta = -.38, p < .001, R^2 = .14$ ).

**Hypothesis 2: Effects on Approaching, Avoiding, and Willingness to Engage in Future Contact.** To test Hypothesis 2, we preregistered and conducted a multiple multivariate linear regression as explained in Study 2. In addition to approach and avoidance tendencies, we entered willingness for future contact as a third dependent variable. Moreover, we dummy coded the second experimental factor target opinion (1 = like-minded; 0 = contrary-minded). We entered this factor as well as its interaction terms with the factor target IH (1 = high; 0 = low) and the participants' intellectual humility into the regression equation. All continuous variables were *z*-standardized. The regression results are summarized in Table 5. Approach tendencies were predicted by main effects of all three predictor variables. These effects were qualified by a three-way interaction, see Figure 8.

When the target person was portrayed as high on intellectual humility, higher participant intellectual humility predicted higher approach tendencies for contrary-minded (simple slope:  $\beta = 0.24, p = .001$ ) but not like-minded target persons (simple slope:  $\beta = 0.15, p = .079$ ). The level of reported approach tendencies was similar across the target's opinion, indicated by the simple two-way interaction being nonsignificant ( $\beta = -0.09, p = .368$ ). When the target person was portrayed as low on intellectual humility, however, participants discriminated between contrary-minded and like-minded targets (simple two-way interaction:  $\beta = -0.41, p < .001$ ). Higher participants' intellectual humility predicted higher

approach tendencies toward contrary-minded (simple slope:  $\beta = 0.15, p = .044$ ) and lower approach tendencies toward like-minded target persons (simple slope:  $\beta = -0.26, p = .001$ ).

Put differently, nonhumble participants ( $M - 1 SD$ ) wanted to approach like-minded target persons more than contrary-minded targets (simple slopes: high target IH:  $\beta = 0.42, p = .011$ ; low target IH:  $\beta = 0.70, p < .001$ ). The same was true for participants with an average level of intellectual humility (simple slopes: high target IH:  $\beta = 0.33, p = .004$ ; low target IH:  $\beta = 0.29, p = .007$ ). In contrast, highly intellectually humble participants ( $M + 1 SD$ ) did not discriminate between the target person's opinion and reported wanting to approach both like-minded and contrary-minded targets to a similar extent (simple slopes: high target IH:  $\beta = 0.23, p = .119$ ; low target IH:  $\beta = -0.12, p = .440$ ).

Avoidance tendencies were predicted by main effects of both experimental factors. Additionally, there was a two-way interaction between target opinion and participants' intellectual humility, see Figure 9. Simple slope analyses showed that less intellectually humble participants ( $M - 1 SD$ ) reported higher avoidance of contrary-minded than like-minded target persons ( $\beta = -0.78, p < .001$ ). The same was true for participants with an average level of intellectual humility ( $\beta = -0.45, p < .001$ ). In contrast, highly intellectually humble participants ( $M + 1 SD$ ) did not differentiate between contrary-minded and like-minded target persons in their avoidance tendencies ( $\beta = -0.13, p = .193$ ). Put differently, the higher the participants' intellectual humility, the more they avoided like-minded target persons (simple slope:  $\beta = 0.14, p = .007$ ) and the less they avoided contrary-minded target persons (simple slope:  $\beta = -0.18, p < .001$ ). The three-way interaction effect on avoidance tendencies was nonsignificant. Thus, the pattern of the two-way interaction existed for both for high and low target IH.

Willingness for future contact was predicted by the two main effects of both experimental factors. These effects were qualified by a three-way interaction between all three predictor variables (see Figure 10), similar to the three-way interaction on approach

**Table 5**

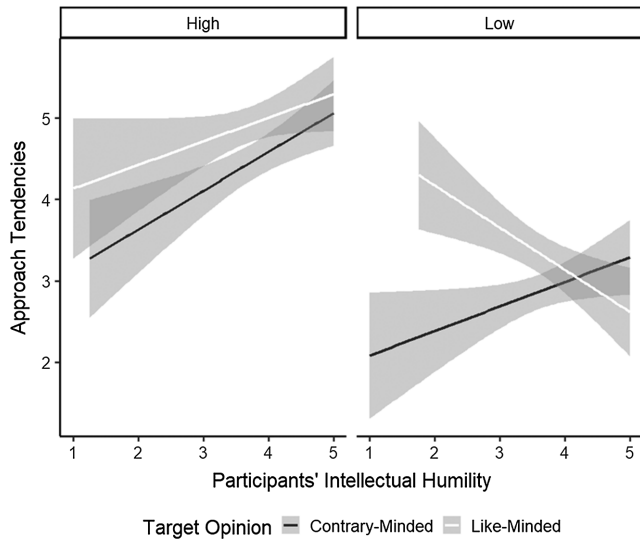
*Effects of Participants' IH and Target's IH on Approach and Avoidance Tendencies and Willingness for Future Contact in Study 3*

Predictor	Approach tendency	Avoidance tendency	Future contact willingness
Intercept	-0.66 (<.001) [-0.80, -0.51]	0.82 (<.001) [0.69, 0.95]	-0.79 (<.001) [-0.93, -0.65]
Target IH	1.03 (<.001) [0.82, 1.25]	-1.21 (<.001) [-1.41, -1.02]	1.21 (<.001) [1.00, 1.41]
Target OP	0.29 (.007) [0.08, 0.50]	-0.49 (<.001) [-0.68, -0.29]	0.49 (<.001) [0.29, 0.69]
Participant IH	0.15 (.044) [0.00, 0.30]	-0.10 (.139) [-0.24, 0.03]	0.10 (.165) [-0.04, 0.24]
Target IH × Target OP	0.04 (.815) [-0.27, 0.34]	0.06 (.669) [-0.22, 0.34]	-0.16 (.279) [-0.45, 0.13]
Target IH × Participant IH	0.09 (.393) [-0.12, 0.29]	-0.17 (.075) [-0.36, 0.02]	0.07 (.476) [-0.13, 0.27]
Target OP × Participant IH	-0.41 (<.001) [-0.63, -0.20]	0.38 (<.001) [0.18, 0.57]	-0.39 (<.001) [-0.60, -0.19]
Target IH × Target OP × Participant IH	0.32 (.040) [0.01, 0.62]	-0.10 (.474) [-0.38, 0.18]	0.33 (.029) [0.03, 0.62]
<i>R</i> <sup>2</sup>	.35	.45	.40

*Note.* *N* = 451. Standardized regression weights with 95% CI in square brackets and *p* values in parentheses. Target IH = target IH condition (1 = high; 0 = low); Target OP = target opinion condition (1 = like-minded; 0 = contrary-minded); Participant IH = participants' specific intellectual humility (*z*-standardized SIHS score); SIHS = Specific Intellectual Humility Scale; CI = confidence interval.

**Figure 8**

*Approach Tendencies as a Function of Participants' and Target's Intellectual Humility as Well as Target Opinion in Study 3*



Note. High = high target intellectual humility; Low = low target intellectual humility.

tendencies. When the target was portrayed as high on intellectual humility, higher participant intellectual humility predicted higher willingness for future contact for contrary-minded (simple slope:  $\beta = 0.17, p = .013$ ) but not like-minded target persons (simple slope:  $\beta = 0.10, p = .194$ ). The level of reported willingness for future contact was similar across the target person's opinion, indicated by the simple two-way interaction being nonsignificant ( $\beta = -0.07, p = .519$ ).

When the target was portrayed as low on intellectual humility, however, participants discriminated between contrary-minded and like-minded targets (simple two-way interaction:  $\beta = -0.39, p < .001$ ): Higher participants' intellectual humility predicted less future contact willingness with like-minded target persons (simple slope:  $\beta = -0.29, p < .001$ ) but not with contrary-minded target persons (simple slope:  $\beta = 0.10, p = .165$ ).

Put differently, nonhumble participants ( $M - 1 SD$ ) were more willing to engage in future contact with like-minded target persons than with contrary-minded targets (simple slopes: high target IH:  $\beta = 0.40, p = .012$ ; low target IH:  $\beta = 0.88, p < .001$ ). The same was true for participants with an average level of intellectual humility (simple slopes: high target IH:  $\beta = 0.33, p = .002$ ; low target IH:  $\beta = 0.49, p < .001$ ). In contrast, highly intellectually humble participants ( $M + 1 SD$ ) did not discriminate between the target person's opinion and reported a similar extent of willingness for future contact with both like-minded and contrary-minded targets (simple slopes: high target IH:  $\beta = 0.26, p = .067$ ; low target IH:  $\beta = 0.10, p = .538$ ).

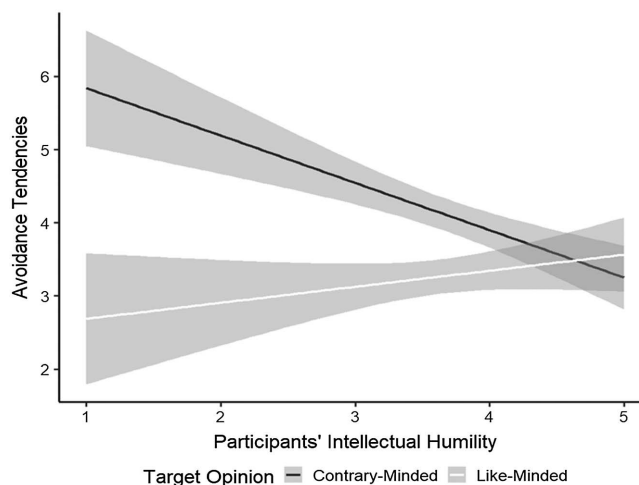
Robustness checks of the results (including demographic variables, excluding multivariate outliers) can be found in the Supplemental Materials B (Tables S24–S27).

**Hypothesis 3: Mediations via Expectations and Target Liking.** An additional aim of Study 3 was to test potential mechanisms explaining why intellectual humility has effects on approach and avoidance tendencies as well as willingness for future contact. We hypothesized that effects on approach and avoidance tendencies would be mediated by participants' expectations about the debate. Moreover, we hypothesized that effects on willingness for future contact would be mediated by target liking.

When testing Hypothesis 2, we found that there were main effects of target IH and target opinion on all three dependent variables (approach and avoidance tendencies, and willingness for future contact). Additionally, there were significant two-way interactions

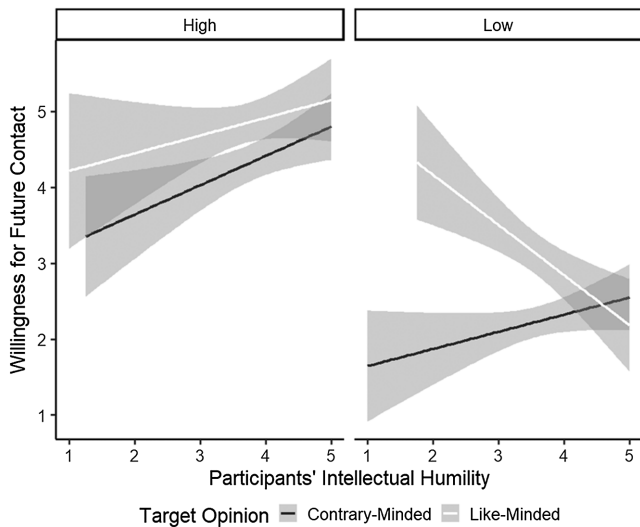
**Figure 9**

*Avoidance Tendencies as a Function of Participants' Intellectual Humility and Target Opinion in Study 3*



**Figure 10**

*Willingness for Future Contact as a Function of Participants' and Target's Intellectual Humility as Well as Target Opinion in Study 4*



*Note.* High = high target intellectual humility; Low = low target intellectual humility.

between target Opinion and participants' intellectual humility on all three dependent variables and three-way interactions between the predictor variables on approach tendencies and willingness for future contact. To account for these different types of main effects and interactions, we ran different types of mediation models.

First, we tested mediation paths separately by testing effects of one predictor variable on one mediator and one dependent variable, one at a time. Second, we entered all three predictor variables (but no interactions) and both mediators in mediation models on all three dependent variables together. Here, we used nonparametric bootstrap CIs with percentile method (5,000 sims) to test the direct, indirect, and total effects with the R package mediation (Tingley et al., 2014). Last, we accounted for all possible interactions and ran a mediated moderation analysis (Muller et al., 2005) in the R package psych (Revelle, 2023).

The detailed results can be found in Supplemental Materials B, pp. 30–41. All analyses converged in suggesting that expectations about the debate as well as target liking were mediating the effects of target IH and target Opinion on all dependent variables. The patterns and path weights were similar for each of the three dependent variables (see Figure 11). Expectations about the debate and target liking also mediated several two-way interaction effects. Thus, other than hypothesized, the results do not suggest that target liking is more important for future contact willingness than for approach and avoidance tendencies. Rather, both mediators simultaneously play a role in explaining effects of target IH and target opinion on all dependent variables.

## Discussion

In our last experiment, we tested whether intellectual humility would be beneficial also for debates with like-minded others. We replicated that participants' intellectual humility predicted less

affective polarization in relation to debates about a compulsory COVID-19 vaccination. We had hypothesized that participants would only approach contrary-minded targets when both conversation partners were intellectually humble. Indeed, participants reported the highest approach and lowest avoidance tendencies as well as highest willingness for future contact when both the contrary-minded target and the participants showed high (vs. low) intellectual humility. However, highly humble participants also approached targets with low intellectual humility. Thus, even though we did not confirm the interaction hypothesis, we found strong evidence that intellectual humility has positive effects on approaching, and not avoiding, contrary-minded others as well as higher willingness for future contact. Therefore, intellectual humility clearly is beneficial in controversial political discussions.

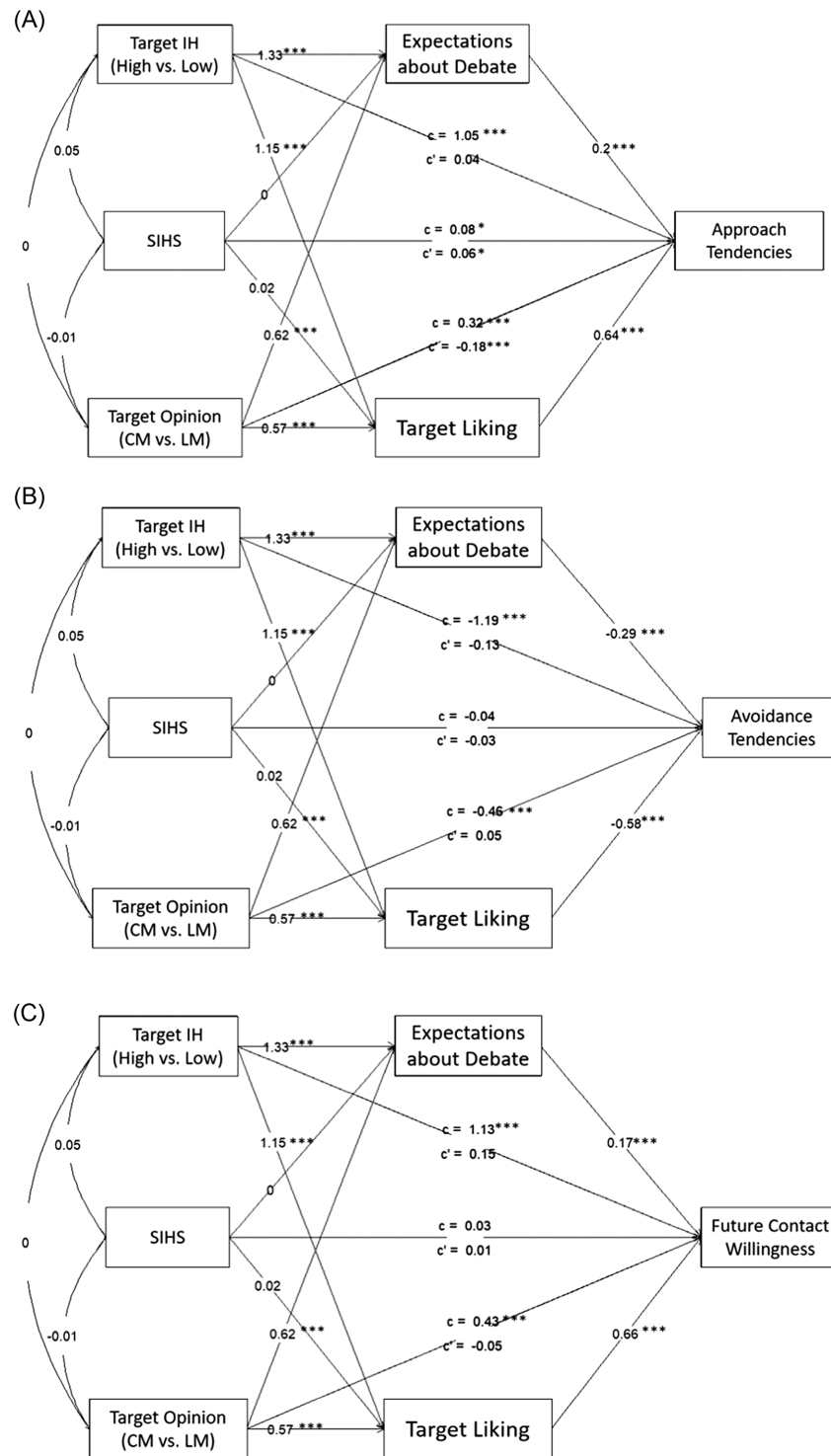
Regarding like-minded others, we tested the effects exploratorily and found an interesting pattern. Participants who were not intellectually humble differentiated between those target persons who have the same versus opposite opinion and preferred to interact with those who have the same opinion—even when these target persons were not intellectually humble. In contrast, intellectually humble participants did not discriminate between those having a different or the same opinion. This finding suggests that the similarity-attraction hypothesis (Byrne, 1961) does not apply for highly intellectually humble people in this context. Thus, intellectual humility might be one buffer against so-called echo chambers. This is in line with previous research showing that intellectually humble participants are those who actively seek information that contradicts their opinion (e.g., Koetke et al., 2022).

Additionally, we gained insight into potential causal mechanisms underlying the effects of intellectual humility on approaching and avoiding others. We found that the effects on approach and avoidance tendencies as well as effects on willingness for future contact were mediated by more positive expectations and higher target liking. These findings might be a starting point for further research on what exactly makes intellectual humility a promising characteristic to tackle political polarization.

Last, participants who saw a humble target were slightly more intellectually humble than those seeing a nonhumble target. Observing intellectual humility in other humans (our manipulations) might make participants slightly humbler toward specific political topics. On the one hand, this finding might limit the causal inference of our experiments as it indicates that the target person's and participants' intellectual humility might not have been completely independent from each other. On the other hand, such effects are encouraging regarding using intellectual humility in interventions as it suggests that intellectual humility can be increased. To understand these findings better, future research is needed that analyzes effects of each person's intellectual humility on others' intellectual humility in a political discussion (i.e., actor and partner effects as well as their interaction; Cook & Kenny, 2005)—ideally using both self- and informant measures (Meagher, 2022).

## General Discussion

With the studies presented in this article, we systematically tested the role of intellectual humility in approaching potential discussion partners in the context of affective polarization. We conducted four preregistered online-survey experiments in the context of polarized political debates in Germany. Across all

**Figure 11***Entering Both Expectations About the Debate and Target Liking as Mediators*

*Note.* Mediated moderation analyses with 5,000 bootstrap replications. All continuous variables have been  $z$ -standardized. IH = intellectual humility; High = high target intellectual humility; Low = low target intellectual humility;  $c$  = total effect;  $c'$  = direct effect; CM = contrary-minded; LM = like-minded; SIHS = Specific Intellectual Humility Scale.

\*  $p < .05$ . \*\*\*  $p < .001$ .



experiments, we manipulated the intellectual humility of a presented target person and measured participants' topic-specific intellectual humility. As key dependent variables, we always assessed affective polarization as well as approach and avoidance tendencies toward the respective target. The experiments built on each other by addressing limitations and open questions of earlier experiments. Via different manipulations (diary entry, social media profiles and tweets, imagined contact), we manipulated a target person's intellectual humility and opinion.

A first aim of the experiments was to test whether intellectual humility would predict less affective polarization regarding opinion-based groups. We confirmed our hypotheses and found that across all studies, participants' topic-specific intellectual humility was consistently associated with less affective polarization measured via feeling thermometer and trait rating differences. In contrast, results were less clear regarding the more general, multidimensional intellectual humility measure (Study 2). These findings support the idea of using intellectual humility measures with a more focused scope (Porter, Baldwin, et al., 2022) when studying affective polarization regarding opinion-based groups.

A second aim was to experimentally test effects of intellectual humility on approaching, and not avoiding, others in heated political discussions. Here, we found that intellectual humility of both the participants and the target person was always beneficial to make participants approach the contrary-minded other. Sometimes it was even necessary that both participants and the target person were humble to find such effects (Study 1a). However, we found evidence that intellectual humility also has its limitations in debates when there is a perceived "right or wrong" or clear normative support—for example, believing in (un)scientific findings about COVID-19 (Study 2). This result might be relevant for researchers studying the role of intellectual humility in believing in unscientific claims, including fake news and conspiracy beliefs. Moreover, our research shows that intellectually humble participants discriminated less between those having the same versus another political opinion and approached both of them to a similar degree (Study 4). In contrast, participants with low levels of intellectual humility clearly preferred discussing with like-minded others and avoided target persons with a different opinion.

Third, we gained initial insights into some causal mechanisms underlying the effects of intellectual humility. Mediation models suggested that the effects on approach and avoidance tendencies were due to expectations regarding the discussion and higher liking of the target person. Moreover, we could rule out that intellectual humility only makes people approach others to convince them by finding that a target person's intellectual humility, mediated by the same two variables, made participants also more willing for future contact.

In the following, we discuss implications of the experiments as well as limitations and ideas for future research.

## Implications

Our research implies that intellectual humility might be one of the few characteristics enabling political intergroup contact in the context of affective polarization. Exchange of different viewpoints is essential for democratic societies (Conover et al., 2002; Mansbridge et al., 2012) and beneficial for their members (Goldberg et al., 2019; Myers et al., 2017; Swim et al., 2018). Moreover, intergroup contact

lessens animosity of political outgroups—even in the context of high affective polarization (Levendusky & Stecula, 2021) or severe political intergroup conflicts (Al Ramiah & Hewstone, 2013; U. Wagner & Hewstone, 2012). Intellectual humility leading to more political intergroup contact might also counteract tendencies of people staying in their so-called "echo-chambers," that is, having circles of friends with very similar opinions (see also Bowes et al., 2022).

Second, our research underlines the importance of experimental research when aiming at understanding effects of intellectual humility. Thanks to our experimental manipulations, we gained insights into the causality of the effects of a discussion partner's intellectual humility and opinion in a controversial political debate. We replicated the effects across different study designs and contentious topics. The results were very robust, even when excluding multivariate outliers, considering demographic variables as well as including potential confounding variables such as moral conviction. By making use of open science principles such as preregistering our hypotheses, data exclusion rules, and analysis plan, we received well-powered studies of high-quality data (achieved by, for instance, attention checks, manipulation checks). Thus, we can encourage other researchers studying intellectual humility and controversial political discussions to also make use of experimental methods.

As a third implication, our findings underline the importance of carefully choosing the intellectual humility measure (Porter, Baldwin, et al., 2022; Porter, Elnakouri, et al., 2022). We used an intellectual humility scale tailored to the specific political topic (Hoyle et al., 2016). According to the intellectual humility classification framework, this scale showed a clear scope—all items measure internal (vs. external) and self-directed (vs. other directed) intellectual humility (Porter, Baldwin, et al., 2022). This clear scope makes it easier to understand which facet of intellectual humility drives the effects compared to multidimensional measures (Porter, Elnakouri, et al., 2022). Moreover, the topic-SIHS showed best results regarding discriminant and incremental validities in a validation study in the German context (Knöchelmann et al., 2021). In Study 2, we also included a multidimensional intellectual humility measure (Krumrei-Mancuso & Rouse, 2016) which covers all facets of the intellectual humility classification framework, but which is more likely to be confounded with social desirability bias than specific intellectual humility measures (Porter, Elnakouri, et al., 2022). We found that the topic-specific and the multidimensional measure sometimes led to different results and results for the multidimensional measure were different depending on its subfacets. However, this also led to interesting exploratory results and ideas for further research regarding people believing in nonscientific COVID-19 beliefs which we could not have found with the unidimensional topic-specific measure. Thus, researchers studying intellectual humility should carefully consider which measure they want to include in their research.

## Limitations and Future Research

Our research also has several limitations which can inspire future research. Based on the insights of our experiments as well as their strengths and limitations, we suggest several avenues for further research on how intellectual humility can help reducing affective polarization and make people constructively deal with contrary-minded others.

First, our experiments are online-survey experiments using self-report measures. Such online studies are also criticized for their limited external validity, for example, a gap between self-reported approaching/avoiding behaviors and real behavior. However, focusing on online experiments had the advantage that we could safely recruit participants during the COVID-19 pandemic where lab studies were difficult to conduct. Additionally, internal validity of our experiments is high because all participants received the very same information about the interaction partner (compared to social interactions in real life, Bombari et al., 2015). In addition, in the context of highly polarized political debates, participants might feel a high burden to actually meet someone in person. It might even be possible that exclusively participants with a relatively high degree of intellectual humility would have joined such in-person studies or that social desirability bias would have been high in such settings. Nonetheless, conducting experiments where participants come together, discuss (Levendusky & Stecula, 2021; Meagher et al., 2021), and evaluate other's intellectual humility via informant questionnaires (Meagher, 2022) or behavioral measures (Van Tongeren et al., 2023a, 2023b) might add to our findings in future studies.

Second, researchers should carefully decide when to assess or manipulate which person's intellectual humility. In our experiments, we always assessed participants' intellectual humility after manipulating the target person's intellectual humility. We did so to avoid priming or order effects (Molden, 2014; Strack, 1992). We wanted to avoid that filling out the intellectual humility questionnaire could make participants pay more attention to the target's intellectual humility than they typically would in a natural setting. In the first three experiments, participants' intellectual humility was not different between those groups seeing a humble or a nonhumble target person. However, in our last experiment, participants who saw a humble target were slightly more intellectually humble than those seeing a nonhumble target. Thus, observing intellectual humility in other humans (or manipulations) might make participants slightly humbler toward specific political topics. Therefore, future research is needed that randomizes when participants' intellectual humility is assessed (see Montgomery et al., 2018) and analyzes effects of each person's intellectual humility on others' intellectual humility in a political discussion (i.e., actor and partner effects as well as their interaction; Cook & Kenny, 2005).

Third, future research could further aim at understanding which aspects of intellectual humility lead to beneficial outcomes for which reason. Our research was a starting point to understand why intellectual humility is beneficial in the context of affective polarization. In our studies, intellectual humility increased the willingness to interact with contrary-minded others due to more positive expectations about the political debate and liking the target person more. However, as relationships between the mediator and the dependent variables were correlational, these paths need to be tested experimentally to make stronger claims about their causality. Investigating such effects might help to understand the effects of intellectual humility better and design interventions making use of its positive effects in political debates.

Fourth, we did not manipulate participants' intellectual humility, so these effects are correlational and causal inference is limited. This was because it remains unclear in how far intellectual humility can be manipulated or changed in individuals. Therefore, one important avenue for future research is to explore how to experimentally

manipulate intellectual humility in the context of controversial debates. Insights from studies focused on fostering intellectual humility could provide inspiration, for example, work on the explanatory depth approach (e.g., Sloman & Vives, 2022; Vaupotič et al., 2021) or interventions implemented at schools (e.g., Ellerton et al., 2022; Meagher et al., 2019; Porter, Catalán Molina, et al., 2022; Porter & Schumann, 2018; Porter et al., 2020).

Moreover, we cannot claim generalizability of positive effects of intellectual humility across different contexts and irrespective of power structures and a person's social status. In our experiments, we did not provide information on the target persons that might be associated with social status, for example, age, gender, or ethnicity/race. However, the extent to which the expression of intellectual humility is perceived as desirable depends on context norms (Davis et al., 2022; Porter & Cimpian, 2023) and can depend on perceived social status of the evaluated (Michalec et al., 2021). For example, in the organizational context, expressing intellectual humility can be beneficial for leaders for many reasons, for example, because of achieving higher satisfaction of their followers (Krumrei-Mancuso & Begin, 2022). At the same time, humble leaders can also be perceived as less competent (Cojuharenco & Karellaia, 2020), especially if they are female (Owens & Hekman, 2012).

Our results show promise that intellectual humility reduces affective polarization and increases willingness to interact with contrary-minded targets in the context of political polarization. Therefore, how to increase intellectual humility might be valuable for preventions and interventions aiming at stabilizing democracy, for example, teaching democracy and debating about policies at school (Stitzlein, 2022) or at events bringing people with different opinions together (e.g., "Deutschland spricht" [Germany talks], see Stötzer, 2020). However, psychological processes that lead to intergroup understanding and harmony can at the same time undermine efforts toward equality among precarious groups (Dixon et al., 2010; Wright & Lubensky, 2009). This is because structural inequality is normalized largely by preserving (the appearance of) harmony between the advantaged and disadvantaged (Täuber & Moughalian, 2022). Therefore, interventions that bear the potential to pacify intergroup conflict should be scrutinized as to whether they foster harmony by obscuring structural inequality among the disadvantaged—as demonstrated in the irony of harmony effect of intergroup contact (Saguy et al., 2009). Intellectual humility holds promise in fostering a vibrant democratic exchange among individuals with diverse political opinions. However, before claiming that it is a "side-effect-free remedy," researchers should investigate the interplay between power relations and intellectual humility in contexts marked by structural inequality.

## Conclusion

Across four preregistered online-survey experiments, we found that topic-specific intellectual humility in controversial debates was associated with less affective polarization across political topics. Additionally, we found that intellectual humility was beneficial, and sometimes even necessary, for higher approach and lower avoidance tendencies toward others in controversial political debates. These effects were independent of the target person's or participant's opinion, opinion strength, or moral conviction. Therefore, we argue that intellectual humility might be one of the few psychological underpinnings that can help to tackle affective polarization as it

leads to both seeing outgroups more favorably and creating a higher likelihood for intergroup contact. However, before fostering intellectual humility in depolarization interventions, future work is needed to examine the interaction between power relations and intellectual humility in political intergroup contact.

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