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Minority report: How minorities' awareness of power asymmetry drives strategic preparation in opinion debates[☆]

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ABSTRACT

Minority influence research has focused on the processes through which minority influence can occur (i.e., deep processing) but neglected to test whether minorities actually solicit these processes (i.e., prepare stronger messages). The present research addresses this fundamental gap. We propose that people (i) intuitively grasp the need for the minority to be more prepared than a majority, and (ii) act accordingly. A pilot and five studies ($N = 1584$) tested these hypotheses using a debate paradigm. Studies 1–4 demonstrated that participants are generally aware of the asymmetry between majorities and minorities (defined by their representation in the general population rather than numbers involved in the interaction; Study 2). This awareness applied both when participants judged the behavior of others (Studies 1–3) and when personally involved in a debate situation, either imagined (Study 3) or anticipated as real (Study 4). The asymmetrical need to prepare is also manifested in preparatory behavior. Participants reported having prepared more when they expected to defend the minority position (Study 4) and objectively prepared more in a controlled laboratory setting (Study 5). Further, preparatory behavior was partially mediated by awareness of the greater need to prepare (Study 4). We discuss implications for minority influence, persuasion, and collective action research.

1. Introduction

Moscovici (1976)'s book, *Social influence and social change*, provoked a significant revolution in the field of social influence by proposing that minorities were at the root of social change. Fifty years on, ample evidence supports the principle of minority influence, and its boundary conditions are better understood (Butera et al., 2017; Wood et al., 1994). However, we argue that until now research has mainly focused on the conditions under which minority influence can occur but neglected to test the processes leading (or not) minorities to create these conditions as a path to influence. In other words, it remains unclear whether minorities correctly understand the conditions necessary for them to be influential and put effort into creating those conditions. Consequently, the scientific understanding of minority influence must go beyond the study of conditions under which minorities can be influential to also examine whether and how minorities may create them. The present

paper takes steps to address this fundamental gap. We propose that people intuitively grasp the need for the minority to be fully prepared for the battle of ideas and act accordingly.

1.1. What is a minority?

The terms minority/majority can refer to several group dimensions, including numerical size (Leonardelli & Brewer, 2001), social status (Tajfel, 1981), power (Roucek, 1956), or combinations of these factors (Sachdev & Bourhis, 1991; Seyranian et al., 2008). Here we focus on numerical size as the basis for distinguishing minority from majority groups. This choice aligns with the fact that most empirical studies in social influence rely on this dimension to operationalize minority/majority categories (Gardikiotis et al., 2004), as does a substantial proportion of research on minority/majority relations (Simon et al., 2003).

Focusing on the numerical dimension does not imply that other

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dimensions would be irrelevant for our theoretical proposition. Rather, it reflects our intention to isolate numerical size as the primary dimension of interest, while others, such as power, can be implicitly derived from group size (Lücken & Simon, 2005). It is also consistent with the dominant democratic ethos in many Western societies, where legitimacy is commonly derived from majority rule, and where numerical superiority obtained through voting authorizes the majority to impose its own values and corresponding social organization.

1.2. Minority and majority information processing levels

Conversion theory started as a critique of earlier group dynamics research on conformity, which had focused on influence solely as an issue of power. Crucially, conformity processes were unable to explain social change (Moscovici, 1976). In contrast, Moscovici argued that a minority could obtain influence by introducing alternative norms and maintaining divergence from the majority, i.e., an influence process grounded in conflict instead of power. Majorities were theorized mainly to obtain manifest influence, whereas minorities mainly obtain latent influence: a pattern of conversion (deep integration; Moscovici, 1980; Moscovici & Personnaz, 1980). Minority influence research then expanded greatly (for a review and summary, see e.g., Butera et al., 2017; De Dreu & De Vries, 2001; Forgas & Williams, 2001; Gardikiotis, 2011; Martin & Hewstone, 2010; Moscovici, 1985; Moscovici et al., 1994; Papastamou et al., 2017) and the literature generally concluded that minority influence does occur (Wood et al., 1994).

Drawing on dual-process models of persuasion (Chaiken et al., 1989; Petty & Cacioppo, 1986), a contention emerged from research showing that, depending on situational factors, both majorities and minorities can elicit a high level of message processing (Baker & Petty, 1994; Erb et al., 2002; Erb & Bohner, 2001; Mackie, 1987). To accommodate these contextual variations, Martin, Hewstone, and colleagues developed and tested a general framework of elaboration likelihood, stating that minorities would elicit high levels of message processing when the issue under debate reaches an intermediate level of importance for the target, which is the case for most social issues, whereas majorities would do so only when the issue reaches high importance (Martin et al., 2007, 2008; Martin & Hewstone, 2008, 2017).

1.3. Do minorities create the conditions necessary for influence?

While the conditions under which minorities (as compared to majorities) can obtain influence are now well understood, the literature does not seem to have addressed the question of whether groups actively shape these conditions, and more generally whether such conditions arise in real life. Consequently, a substantial gap in evidence exists as to whether minorities put themselves in a situation to benefit from those conditions. Because minorities elicit high levels of information processing whenever the issue reaches even a minimal level of importance for the target, their message is almost always subject to close scrutiny. Therefore, any weakness in the minority's line of reasoning is likely to be detected and to undermine their influence. In order to exert influence, minorities must spontaneously place themselves in conditions that foster the development of strong arguments capable of withstanding scrutiny. But do they in fact do so? The aim of the present article is to determine whether minorities indeed act in ways that place them in a more favorable position to withstand scrutiny and why they may do so.

We propose, first, that individuals know that confrontations of ideas between a minority and a majority are more difficult for the former than for the latter to win. Consequently, they may expect that minority members would need to prepare more thoroughly than majority members in order to succeed in persuading others. Second, if individuals recognize this need for greater preparation on the part of the minority, minority members themselves should behave accordingly, that is, they may prepare more extensively when they anticipate a confrontation of ideas with a majority.

1.4. Minorities' awareness of a greater need to prepare

While we do not expect laypeople to have a comprehensive understanding of complex influence dynamics, we believe they should have an intuitive understanding of the implications of numerical minority/majority asymmetry, and more specifically of the greater challenges that minorities face in obtaining influence. This implies that there should exist a shared lay belief that a minority needs to prepare more than the majority to be able to convince others.

There are at least two reasons why people might perceive a greater need for numerical minorities to prepare. First, minority members will expect to have to convince a larger number of people than majority members. Thus, the smaller the minority, the more people it must convince in order to establish a new majority, and the more difficult the task will be. Consistent with this argument, members of the minority report a lower sense of control over important outcomes (Guinote et al., 2006). No such necessity exists for members of the majority: because they already constitute a majority, their norms would remain dominant even if they did not persuade any minority members to join their side.

Second, it is common knowledge that minorities are often negatively perceived and even considered socially deviant. For this reason, individuals avoid expressing overt agreement with the minority, as doing so would imply identifying with the minority and endorsing its associated negative connotations (Mugny et al., 1983, 1984; Mugny & Papastamou, 1982). This, however, does not prevent people from processing the content of messages they preemptively disagree with; on the contrary, the easy rejection of the minority's position allows them to avoid a problematic identification with the minority and thus allows to process its message (see Mugny & Pérez, 1991). As people anticipate that the minority position is easily rejected, they should perceive it as weaker by default and thus might understand that the minority needs to work harder if it wants to overcome this disadvantage.

1.5. Minorities' greater preparedness

Because we refer here to general beliefs about whether minorities need to prepare in order to convince others, we expect such beliefs to be held by people regardless of their membership in a minority or majority group. However, one consequence of this should be that minority members themselves, being aware of this need, may take steps to address it and thus prepare more. Accordingly, it has been shown that people who perceive their group's position as weak, especially when they have lower confidence in that position, are more motivated to generate arguments to defend it (Akhtar et al., 2013).

In practical terms, preparing more means that minority group members need to study the topic more thoroughly and build up content knowledge (either through research or social exchange) to ultimately develop convincing arguments that would successfully throw doubt on the majority position (Sadler & Fowler, 2006; Simon et al., 2006). In other words, if it is seen as a necessity for minorities to be able to convince, minorities should indeed work harder to prepare by investing effort in acquiring relevant knowledge and building stronger arguments that enable them to persuade others.

We are aware of two studies that attempted to verify whether minorities do indeed prepare more (Levine & Russo, 1995; Van Hiel & Franssen, 2003). However, both studies were rather underpowered (15.6 participants per cell for Levine and Russo, and 17 participants per cell for Van Hiel and Franssen), casting doubt on the reliability of both significant (i.e., type I error) and non-significant effects (i.e., type II error). Levine and Russo (1995) measured the time participants spent reading different arguments when they were part of a majority or minority (with two sub-conditions: minority of one vs. two people). The study did not identify a reliable main effect of group membership, but only an interaction between group and type of argument (supporting vs. opposing one's own position). People acting as a minority of one spent more time reading arguments that supported their own position than

arguments that opposed it, whereas those in a minority of two did not. Further, the majority spent more time reading arguments supporting their own position when confronted with a minority of two, but not with a minority of one. However, the decomposition only compared sources within argument type, avoiding a direct minority/majority comparison of reading time. Directly building on this study, Van Hiel and Franssen (2003) later showed that minorities that expected to interact with a majority exhibited a bias (compared to majorities) toward acquiring information in problem-solving tasks. This effect emerged regardless of whether the decision had to be made by majority rule or by consensus.

1.6. Do majorities show the same level of preparedness?

Research on power and group dynamics shows that the easiest path to majority influence is through normative (conformity) pressure. Therefore, the majority does not need to improve the quality of its arguments to convince, but can instead rely on increasing social pressure on the non-conforming minority (Festinger, 1950). Minorities can be conceived as deviants who pose a threat because they challenge the positive differentiation of the ingroup from outgroups on a normative basis (Marques et al., 2001); agreement on social norms therefore increases their validity (Frings & Abrams, 2010). A consistent body of work illustrates how group members can pressure deviants (Schachter, 1951; Wesselmann et al., 2014) and exclude those who continue to question the group's norms (Rudert et al., 2023). As rejection by the group can be very painful (Wesselmann & Williams, 2017), people will be motivated to conform, especially in a face-to-face setting against the majority (Bond, 2005).

The pressure does not even need to be explicit: the mere number of people in the majority is enough to elicit pressure to conform, increasing conformity to the majority and decreasing minority influence (Clark III & Maass, 1990; Latané & Wolf, 1981). Moreover, simply knowing or even believing that others hold a particular view produces conformity, as the presence of a descriptive norm is a potent (de Leeuw et al., 2015) and underestimated (Nolan et al., 2008) pathway to influence. Thus, majorities can obtain influence simply by being majorities, and if that is insufficient, they can readily exert more direct pressure to ensure conformity. In the present research, we consider ad hominem strategies as an extreme—albeit nonphysical—way to socially intimidate disagreeing individuals. As ad hominem strategies epitomize powerful social pressure, our reasoning is that if one attributes the use of more extreme strategies to a group, this will also subsume other, less extreme, social pressure behaviors.

One may question why people may be willing to use such strategies, given that they are known to reduce approval and likability (e.g., Frimer & Skitka, 2018). The reputational cost, however, seems to be compensated for by an advantage in terms of power perception and, by extension, in terms of influence. First, these strategies generate an impression of greater dominance and power (Ng & Detenber, 2005). They thus lead to perceptions of low warmth but high competence (Carraro & Castelli, 2010), a combination typically associated with higher status or power. Violence from powerful actors is typically more tolerated when they express emotions fitting their power (Kamans et al., 2014), notably anger (an emotion linked to competence; Tiedens, 2001). Ad hominem strategies were thus found to increase the attacker's influence compared to more positive or civil messages (Carraro & Castelli, 2010).

Second, ad hominem strategies can successfully block the influence of an opposing source, even when the source is of high status or expertise themselves (e.g., Barnes et al., 2018). They may therefore be associated especially with people in power and thus perceived as more likely to be used as a pressure strategy by majorities than by minorities. In a nutshell, a majority need not rely on the strength of its arguments to the same extent as a minority does. It has simpler, easier, and less costly (i.e., less effortful) means of influence at its disposal.

2. The present research

2.1. Hypotheses and overview of studies

In summary, we suggest that people in general (i) are aware that the minority must prepare more than the majority to develop strong arguments if it wants to obtain influence, and (ii) act accordingly when finding themselves in such a social influence setting, i.e., prepare more when they are members of the minority rather than the majority. We propose the following hypotheses:

H1. Ahead of an influence attempt such as a debate, laypeople anticipate that, compared to the majority, the minority will need to prepare more and develop stronger arguments (*H1a*). In contrast, they anticipate that, compared to the minority, the majority will be more likely to rely on social pressure strategies (*H1b*).

H2. When put in a situation where they need to convince others, people adapt their behavior on the basis of this perception of influence dynamics. Therefore, people in a minority position will prepare more, compared to those in a majority position.

We conducted one pilot and five main studies to test our hypotheses, plus two supplementary studies reported in supplementary materials (ESM). The pilot study established the materials for measuring perceptions of debate strategies. It also provided an initial test of **H1** using a within-participant design. Studies 1–3 focused on the same hypothesis. *Study 1* (preregistered) aimed to replicate the preliminary results of the pilot study in a between-participant design. *Study 2* (preregistered) showed that the observed pattern was attributable to the majority/minority numerical representation in the general population and not to the sheer number of advocates participating in the interaction. *Study 3* (preregistered) compared ratings of strategies when participants judged the behavior of others versus when they evaluated their own behavior (i.e., self-involvement as a potential moderator). *Supplementary Study I* (ESM5) aimed at testing whether the results of the main studies were general or limited to certain types of interactions or situations (i.e., limited to opinion debates). *Supplementary Study II* (ESM6) ruled out an alternative explanation for the results based on a mere social loafing effect, due to the number of debaters present in the situation.

Studies 4 and 5 then turned to **H2** (actual behavior when anticipating a debate). *Study 4* adopted an ecological procedure: in anticipation of a debate, participants were given 15 days to prepare in any way they wished and with free materials; they then self-reported how, and how much, they had prepared. *Study 5* adopted a more controlled setting. Participants prepared for the debate in the laboratory with controlled material so we could objectively measure how much material they consulted and how long they prepared.

Early studies in the field manipulated the number of individuals in the majority/minority during group interactions (e.g., Moscovici, 1980). Subsequent studies adapted the methodology to present bogus information about the size of the majority/minority supporting conflicting positions (e.g., Martin et al., 2007; see also Gardikiotis, 2011). Here we integrated both ways to manipulate the construct (but see *Study 2* for an orthogonalized test of their possible respective effects). This makes the first set of studies investigating awareness fully comparable with the behavioral studies (*Studies 4–5*) where both pieces of information were associated to ensure the credibility of the scenario (see below).

2.2. Transparency and Openness

For each study described below, we report how we determined our sample size, all data exclusions, all manipulations and all measures in the studies. Data, codebook and code for the analyses are publicly available on the OSF: <https://osf.io/uhecq>. Data were analyzed and visualized using *RStudio* version 2023.06.0+421 (R Core Team, 2023), with packages *compute.es* (Del Re, 2013), *EFAtools* (Steiner & Grieder,

2020), *effectsize* (Ben-Shachar et al., 2020), *ggplot2* (Wickham, 2016), *lavaan* (Rosseel, 2012), *lme4* (Bates et al., 2019), *moments* (Komsta & Novomestky, 2022), *RcmdrMisc* (Fox et al., 2026), and *SuperPower* (Lakens & Caldwell, 2021). Links to preregistration are included in the method section for each preregistered study. The few deviations from preregistration are described and justified in ESM9. The studies were approved by the ethics committee of the School of Psychology at the University of Kent or by the ethics committee of the University of Geneva.

3. Pilot study

The pilot study ($N = 100$) tested items assessing each side's tendency to rely on *preparedness* strategies and the use of forceful *ad hominem* strategies as means of exerting powerful social pressure on one's opponents (see Study 1 for procedure detail). Items were presented twice in a within-participants design, once pertaining to the advocates of the minority position, and once of the majority position (counter-balanced order).

We conducted an exploratory factor analysis to assess the items' validity. This allowed us to develop two sets of four items (discarding underperforming items), corresponding to *ad hominem* and *preparedness* strategies, respectively. The analysis showed the two strategy types were clearly distinct and internally reliable. A single item did not fit the two-factor solution which assessed perceived difficulty of the debate rather than tendency to rely on a certain type of strategy. As the hypothesis implies that participants should perceive the debate as more difficult for the minority, this item was retained in Study 1 and Study 3. Moreover, and consistently, as difficulty should account for preparedness, non-preregistered mediation tests (available in ESM3) were conducted for each study including this item to test whether the more participants perceived the debate as difficult for the minority compared to the majority, the more they would consider that the minority had to prepare more to convince. A correlation matrix of the two sets of four items and the difficulty item is reported in Table S1.1 of ESM1. Item wordings of the eight retained items (*ad hominem* and *preparedness* strategies) are reported in Table S2.1 of ESM2.

Results showed that participants anticipated that the minority would have much more difficulty winning the debate. As predicted, they expected minority advocates would need to prepare more ahead of the debate and develop stronger arguments to convince (Cohen's $d = -3.73$; **H1a**). Conversely, they believed that majority advocates would rely more on *ad hominem* strategies—as an extreme form of social pressure strategy ($d = 1.14$; **H1b**). As a robustness check in this very first study we also conducted tests item by item; this yielded consistent results with each item showing a difference between minority/majority of similar magnitude. Results are fully described in ESM2.

The pilot study yielded very large effect sizes, indicating that participants clearly differentiate between how minority and majority members would behave in a debate. However, given the within-participant design for the two target groups, it could be argued that at least some of the effect is driven by the direct and explicit comparison between them. The purpose of the first main study was therefore to replicate these findings in a between-participant design for the target groups, i.e. majority vs. minority.

4. Study 1

Study 1 focused on **H1a** (greater attribution of preparedness strategies to minorities) and **H1b** (greater attribution of *ad hominem* strategies to majorities) and also considered perceived difficulty of winning the debate. The study design, hypotheses, analysis plan, sample size, and rules for exclusion were preregistered: <https://aspredicted.org/vryd-bfxw.pdf>.

4.1. Methods

4.1.1. Participants and procedure

Participants were recruited on the online crowdsourcing platform Prolific, with the requirement to be fluent in the language of the study (French). We determined sample size based on an a priori power analysis. Considering that at least part of the large effect size observed in the pilot study could be due to its within-participant design, we opted for a conservative approach and calculated power based on an effect as small as Cohen's $d = 0.30$ (power = 0.80, one-way ANOVA with two groups). The analysis recommended $N = 352$, which we round up to 360 to allow for exclusion. Unexpectedly, however, we were unable to recruit the targeted number from Prolific given the specific language inclusion criteria. When it became clear that no new respondents were entering the study after six days, we stopped data collection. A total of 334 participants completed the survey but 12 failed an attention check and were excluded from analysis. The final sample size was therefore $N = 322$ (196 men, 118 women, and 8 other/undisclosed; $M_{\text{age}} = 26.76$, $SD = 8.19$). A sensitivity power analysis showed this sample size would allow us to detect an effect as small as $d = 0.31$ with 0.80 power ($\alpha = 0.05$). In other words, the loss of power was minimal ($\Delta d = 0.01$).

The study was introduced as a “study on the perception of others in political and opinion debates” interested in understanding “how people perceive speakers in debates when there is a clear majority on one side and a minority on the other, who disagree”. Specifically, we asked participants to imagine they were about to watch a televised debate about an important social topic (no specific topic was mentioned to keep the scenario generic and not content-dependent), on which one position was defended by a majority of 70% of the population and the opposite position by a minority of 30%. We explained that the debate had been organized so that the numbers of debaters would be representative of each position in the general population. Thus, three guests would defend the minority position during the debate and seven guests would defend the majority position (information about the population distribution and number of debaters present during the debate was provided systematically in Studies 1–3). Participants then reported the type of behavior they would expect from the advocates of one position. They evaluated the behavior of advocates of either the minority ($n = 159$) or the majority position ($n = 163$; between-participant factor with random allocation). Instructional checks showed participants clearly understood the distinction between majority/minority (see ESM4.1).

4.1.2. Materials

Participants evaluated the behavior of advocates of the minority (vs. majority) position using the eight items retained from the pilot study. They first answered four items measuring preparedness strategies (e.g., “It is necessary for the [majority / minority] to prepare very well in advance to hope to win the debate”, “It is necessary for the advocates of the [majority / minority] position to have very good arguments in order to convince”; $\alpha = 0.93$) and then four items measuring *ad hominem* strategies (e.g., “Advocates of the [majority / minority] position tend to attack the character of their opponents”, “In such debates, advocates of the [majority / minority] position tend to associate negative labels with their opponents to discredit them”, $\alpha = 0.87$) on a 7-point Likert scale (1 = *Not at all* to 7 = *Absolutely*).

We also included one additional item assessing the perceived difficulty of winning the debate (“You expect this kind of debate to be rather difficult to win for the defenders of the [minority / majority] position”, 1 = *Not at all* to 7 = *Absolutely*). A correlation matrix of all dependent variables is reported in Table S1.2 of ESM1.

4.2. Results

4.2.1. Attribution of different strategies to the minority and majority

We conducted a mixed ANOVA including Strategy (within: *Ad hominem* vs. *Preparedness*), Group (between: *Minority* vs. *Majority*),

and their interaction (see Table 1). A main effect of Strategy showed that preparedness strategies were considered more likely overall ($M = 5.02$, $SD = 1.66$) than ad hominem strategies ($M = 4.20$, $SD = 1.31$). More importantly, this was qualified by a significant Strategy $\times$ Group interaction (see Fig. 1). Consistent with our hypothesis, simple effects decompositions revealed that preparedness strategies were rated as more likely for advocates of the minority ($M = 6.15$, $SD = 0.73$) than for those of the majority position ($M = 3.93$, $SD = 1.58$; **H1a**), $b = -1.11$, $SE = 0.07$, $t(320) = -16.11$, $p < .001$, $d = -1.80$, 95% CI $[-2.05, -1.53]$. Conversely, ad hominem strategies were rated as more likely for advocates of the majority ($M = 4.70$, $SD = 1.19$) than for those of the minority position ($M = 3.69$, $SD = 1.23$; **H1b**), $b = 0.50$, $SE = 0.07$, $t(320) = 7.49$, $p < .001$, Cohen's $d = 0.84$, 95% CI $[0.60, 1.06]$.

Looking at advocates of the minority position specifically, preparedness strategies were considered more likely than ad hominem strategies, $b = 2.46$, $SE = 0.15$, $t(320) = 16.66$, $p < .001$, $d = 1.86$, 95% CI $[1.59, 2.11]$. Conversely, ad hominem strategies were considered more likely than preparedness strategies for advocates for the majority position, $b = -0.77$, $SE = 0.16$, $t(320) = -5.27$, $p < .001$, $d = -0.59$, 95% CI $[-0.81, -0.36]$.

4.2.2. Perceived difficulty of winning the debate

Finally, we investigated perceived difficulty of winning the debate. A one-way ANOVA revealed a main effect of Group: participants estimated advocates of the minority would have much more difficulty winning the debate ($M = 5.69$, $SD = 1.28$) than advocates of the majority position ($M = 2.33$, $SD = 1.21$), $F(1, 320) = 586.10$, $p < .001$, $d = 2.70$, 95% CI $[2.39, 3.00]$.

4.3. Discussion

Replicating the pilot study results, Study 1 showed that participants anticipated that the minority would have much more difficulty winning the debate. They considered that minority advocates would need to prepare more ahead of the debate and develop stronger arguments to convince (**H1a**). Conversely, they believed that majority advocates would prepare less and instead rely more on ad hominem strategies (**H1b**).

However, as described above, Study 1 conflated two types of numerical information about group size: *numbers in the group interaction* and *representation in the population*. This does not allow us to understand the respective weight of each. Prior work shows that they can both affect judgments when examined in isolation (e.g., [Moscovici, 1980](#); and [Martin et al., 2007](#), respectively), but their joint contribution remains unclear. Study 2 aimed to disentangle and test whether these effects are independent.

5. Study 2

How is information about numbers in the interaction and about representation in the population integrated? In the literature, both dimensions have been used separately and have shown similar effects. However, we propose that these two dimensions are not equivalent.

Representation in the population might be a key cue, whereas numbers in the interaction merely serve as a proxy when population information is unavailable (because people assume the local distribution in the situation reflects the population; see [Lerman et al., 2016](#)). If so,

Table 1
Debate strategies: results of the mixed ANOVA in Study 1.

Effect	F-test (1,320)	p-value	Partial eta squared and 95% CI
Group	46.70	< 0.001	0.127 [0.076, 1.00]
Strategy	63.42	< 0.001	0.165 [0.108, 1.00]
Strategy $\times$ Group	241.97	< 0.001	0.431 [0.367, 1.00]

Note. One-sided CIs: upper bound fixed at 1.

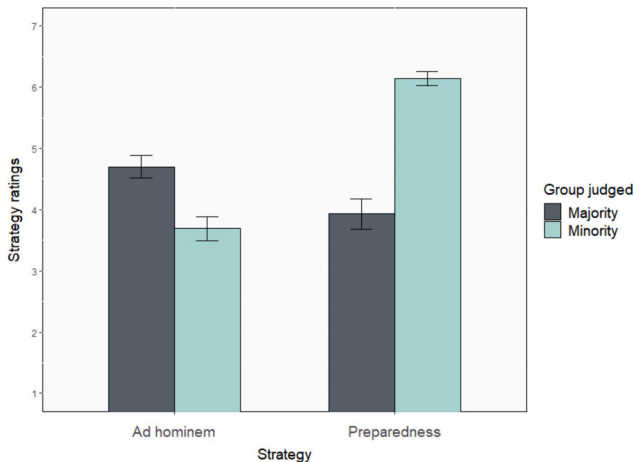


Fig. 1. Ratings of the use of preparedness and ad hominem strategies by advocates of majority and minority groups in Study 1.
Note. Higher scores represent greater likelihood that the strategy is used by the judged (majority or minority) group on a 7-point scale. Error bars are 95% confidence intervals.

once representation in the population is provided by the context, varying numbers in the interaction should add no important information and thus should not affect judgments on preparedness (or use of ad hominem strategies). Alternatively, people may integrate both cues, producing additive effects. In that case, numbers in the interaction should influence preparedness even when population information is available.

Study 2 tests these alternatives by comparing a 7-majority against 3-minority debate condition (as in Study 1) with a new 5-against-5 debate condition, as an orthogonal factor to the population (majority vs. minority) context. If numbers in the interaction produce an independent effect, differences in preparedness should diminish in the 5-against-5 condition. If, however, numbers in the interaction function only as a proxy for representation in the population, results should be affected only by population information, and not by debater proportions. Accordingly, we expected to replicate Study 1's effects (**H1a**, **H1b**) in the 7-against-3 condition and explored whether they would persist or attenuate (or even disappear) in the 5-against-5 condition.

The study adopted a 2 Strategy (within: ad hominem vs. preparedness) $\times$ 2 Group (between: population minority vs. population majority) $\times$ 2 Number of debaters (between: 7-against-3 vs. 5-against-5) design. The study design, hypotheses, analysis plan, sample size, and rules for exclusion were preregistered: <https://aspredicted.org/tr2v4k.pdf>.

5.1. Methods

5.1.1. Participants and procedure

Participants were recruited via Prolific, with the requirement to be a native English speaker, currently living in the UK. We determined sample size based on an a priori power analysis just as in previous studies (target effect size for the interaction: Cohen's $d = 0.30$), which recommended a sample size of 440. Slightly oversampling to allow for exclusions, we sought to recruit 450 participants. A total of 456 participants completed the survey but five failed two attention checks and were excluded from analysis. The final sample size was therefore $N = 451$ (223 men, 225 women, 2 non-binary, and 1 undisclosed; $M_{age} = 47.41$, $SD = 13.26$).

Participants were randomly allocated to one of the four conditions. The study's general introduction and instructions were identical to the preceding studies (with all participants being told opinions were split 70%–30% in the general population) except for two modifications pertaining to the new experimental manipulation of Number of debaters. First, in the 7-against-3 condition, it stated that “to ensure the debate is

representative of the respective positions in terms of numbers, the organizer has invited 10 people to the table, including 7 who defend the majority position and 3 who defend the minority position.” In the 5-against-5 condition, it stated, “to ensure each position is equally represented in the debate in terms of numbers, the organizer has invited 10 people to the table, including 5 who defend the majority position and 5 who defend the minority position.” Second, the instructions specified that each debater would be allocated the same speaking time individually. This served to ensure that higher preparedness was not inferred from a belief that debaters would speak for a different amount of time in the 7-against-3 situation.

Participants then rated the expected behavior of either minority or majority debaters (depending on the Group condition) with respect to ad hominem (presented first) and preparedness strategies (presented second). Because in Study 1 all participants rated the preparedness strategies first and the ad hominem strategies next, participants may have contrasted their ad hominem ratings with earlier preparedness ratings. To mitigate this possibility, here we reversed the order of presentation. Instructional checks showed participants understood and recalled both the majority/minority split of opinion in the general population, and the composition of the debate in terms of number of debaters (see ESM4.2).

5.1.2. Materials

The same four items as in the previous studies measured perceived reliance on ad hominem strategies by either the majority or the minority (e.g., “Advocates of the [majority / minority] position tend to attack the character of their opponents”; $\alpha = 0.90$). Four items also measured preparedness strategies (e.g., “It is necessary for the [majority / minority] to prepare very well in advance to hope to win the debate”; $\alpha = 0.94$). All items used a 7-point Likert scale (1 = *Not at all* to 7 = *Absolutely*; for the correlation matrix see Table S1.3 of ESM1).

5.2. Results

5.2.1. Attribution of different strategies to the minority and majority

We conducted a mixed ANOVA including Strategy (within), Group (between), Number of debaters (between), and all interactions. Results are reported in Table 2. The analysis revealed a main effect of Strategy: preparedness strategies were considered more likely overall ($M = 5.18$, $SD = 1.47$) than ad hominem ones ($M = 4.24$, $SD = 1.25$).

More important for our present purpose, the Strategy $\times$ Group interaction was also significant; and it was *not* qualified by the Strategy $\times$ Group $\times$ Number of debaters three-way interaction (Fig. 2), which was non-existent ($p = .99$). In other words, strategies were differentially attributed to the social majority and minority as defined by their representation in the population, but this was not moderated at all by the number of advocates representing each side in the debate. This translated into Strategy $\times$ Group interactions nearly identical in magnitude in the 7-against-3, $b = -1.11$, $SE = 0.115$, $t(447) = -9.67$, $p < .001$, Cohen's $d = -0.91$, 95% CI $[-1.11, -.072]$, and the 5-against-5 condition, $b = -1.11$, $SE = 0.115$, $t(447) = -9.68$, $p < .001$, Cohen's $d =$

Table 2

Debate strategies: results of the mixed ANOVA in Study 2.

Effect	F-test (1, 447)	p-value	Partial eta squared and 95% CI
Group	133.59	<0.001	0.230 [0.177, 1.00]
Number of debaters	0.03	0.87	0.000 [0.000, 1.00]
Group $\times$ Number of debaters	2.75	0.098	0.006 [0.000, 1.00]
Strategy	136.01	<0.001	0.233 [0.180, 1.00]
Strategy $\times$ Group	195.86	<0.001	0.305 [0.249, 1.00]
Strategy $\times$ Number of debaters	5.81	0.016	0.013 [0.001, 1.00]
Strategy $\times$ Group $\times$ Number of debaters	0.00	0.99	0.000 [0.000, 1.00]

Note. One-sided CIs: upper bound fixed at 1.

-0.91 , 95% CI $[-1.11, -.072]$.

5.2.2. Preparedness and ad hominem strategies

Decomposition of the Strategy $\times$ Group interaction revealed that preparedness strategies were rated as more likely for advocates of the minority ($M = 6.18$, $SD = 0.77$) than the majority position ($M = 4.19$, $SD = 1.32$), $b = -0.98$, $SE = 0.051$, $t(447) = -19.18$, $p < .001$, $d = 1.81$, 95% CI $[-2.03, -1.59]$. Conversely, ad hominem strategies were rated as more likely for advocates of the majority ($M = 4.38$, $SD = 1.21$) than the minority position ($M = 4.10$, $SD = 1.27$), $b = 0.13$, $SE = 0.058$, $t(447) = 2.21$, $p = .028$, $d = 0.21$, 95% CI $[0.02, 0.39]$.

5.3. Discussion

Study 2 fully replicated the results of Study 1. On a methodological note, it is worth noting that this appeared despite reversing the order of the two measures, showing that differences on one measure were not artificially driven by previous ratings on the other, thereby strengthening the results. More importantly, Study 2 disentangled the effect of information about the number of debaters in the interaction from the numerical representation of majority and minority groups within the general population. The study provides strong evidence that the differential need to prepare is attributable solely to the latter when both are presented together. This suggests that effects observed in minority influence studies in which numbers in the interaction were manipulated probably stem from the fact that people infer the representation of groups in the general population from these numbers.

6. Study 3

A limitation of the preceding studies is that participants only rated the expected behavior of *other* people. These studies do not address individuals' expectations of their own behavior in similar situations. Yet, our general line of reasoning suggests that people are not just aware of how social influence dynamics affect others, but that they also apply this tacit understanding of group dynamics to themselves (Abrams et al., 2009). We thus expect that there would be no difference in awareness of the minority's need to prepare regardless of whether people are themselves members of the minority. This is consistent with our contention that minority group members prepare more ahead of a debate because they understand that they need to, and not just that others expect them to. Study 3 was conducted to test this proposition. Replicating the general procedure of Study 1, Study 3 compared the attribution of preparedness and ad hominem strategies to the minority versus majority, adding the new experimental manipulation of whether the self or others are directly involved in the debate.

The study thus adopted a 2 Strategy (within: preparedness vs. ad hominem) $\times$ 2 Group (within: majority vs. minority) $\times$ 2 Involvement (between: self vs. others) mixed design. Differing from Studies 1–2 (that recruited Prolific samples) we invited university students to participate in the study with the aim of increasing the generalizability of the findings among a different population. The study design, hypotheses, analysis plan, sample size, and rules for exclusion were preregistered: <https://aspredicted.org/nmd6-gztt.pdf>.

First and foremost, we hypothesized that preparedness strategies would be attributed to a greater extent to the minority than the majority (H1a). We reasoned that participants should be equally aware of the greater necessity to prepare whoever is involved, so the main effect of Group should not be qualified by an interaction with Involvement. Second, while we hypothesized that ad hominem strategies would be more attributed to the majority than minority (H1b), we also expected that participants would be reluctant to admit relying on such strategies themselves, for obvious self-presentation motives (Cooper & Fazio, 1984). Indeed, ad hominem strategies negatively affect the reputation and likability of those who use them (Frimer & Skitka, 2018). Such admission would imply a negative change in one's self-concept, which

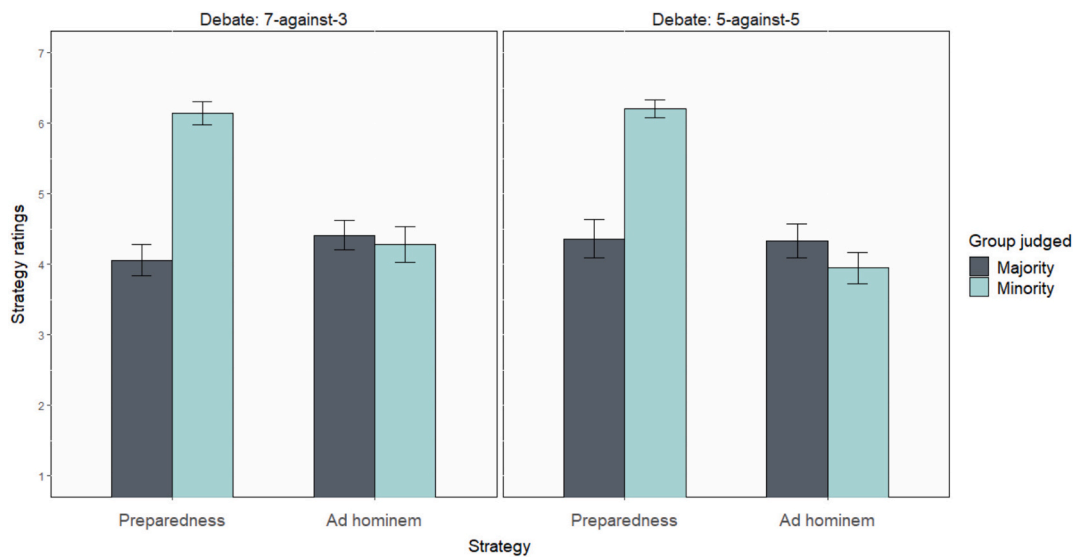


Fig. 2. Ratings of the use of preparedness and ad hominem strategies by advocates of majority and minority groups in Study 2.

Note. Higher scores represent greater likelihood that the strategy is used by the judged (majority or minority) group on a 7-point scale. Error bars are 95% confidence intervals.

people usually try and avoid (Aronson, 1999; Cooper & Worchel, 1970; Thibodeau & Aronson, 1992). Thus, while people may readily attribute these strategies to others, they might be reluctant to do so for themselves, even when they belong to the majority. We thus predicted a Group $\times$ Involvement interaction, so that participants would report lower reliance on ad hominem strategies when judging themselves as a majority group member than when judging others.

6.1. Methods

6.1.1. Participants and procedure

Participants were first-year undergraduate university students participating in exchange for course credits. Sample size was constrained by the size of the available cohort. A power analysis calibrated on the effect sizes observed in our previous study (*SuperPower* package) indicated that the anticipated sample size of approx. 180 participants would confer: for preparedness strategies, 1.00 power to detect a main effect of Group; for ad hominem strategies, 0.99 power for a main effect of Group, 1.00 power for a main effect of Involvement (and 0.83 power for an interaction). A total of 181 participants completed the survey but 13 failed an attention check and were excluded from analysis. The final sample size was therefore $N = 168$ (36 men, 131 women, and 1 other/undisclosed; $M_{\text{age}} = 21.76$, $SD = 5.28$). A sensitivity power analysis indicated that this sample size would allow us to detect a main effect of Group as small as $d = 0.22$ with 0.80 power ($\alpha = 0.05$).

The study used instructions identical to Study 1 (with a difference for the self-involvement condition, see below). In the other-involvement condition ($n = 84$), questions pertained to an imagined debate participants would witness but not directly participate in (as in Studies 1–2). In the self-involvement condition ($n = 84$), questions pertained to a debate in which the participant would personally participate as an advocate for the majority or the minority position. Questions therefore addressed how the participant themselves would behave in the situation.

6.1.2. Materials

Four items measured preparedness strategies ($\alpha = 0.76$) and four measured ad hominem strategies ($\alpha = 0.86$). Items were adapted with respect to the Involvement manipulation (e.g., Others: “It is necessary for the [minority / majority] to prepare very well in advance to hope to win the debate”; Self: “It is necessary for you, as an advocate of the [minority / majority] position, to prepare very well in advance to hope

to win the debate”). As in Study 1, one additional item assessed the perceived difficulty of winning the debate ($M = 4.09$, $SD = 0.84$). A correlation matrix of all dependent variables is reported in Table S1.4 of ESM1.

Table 3

Debate strategies: results of the mixed ANOVA in Study 3.

Effect	F-test (1, 164)	p-value	Partial eta squared and 95% CI
Involvement	24.68	< 0.001	0.131 [0.061, 1.00]
Order	0.69	0.41	0.004 [0.000, 1.00]
Involvement $\times$ Order	0.32	0.57	0.002 [0.000, 1.00]
Strategy	257.93	< 0.001	0.611 [0.539, 1.00]
Strategy $\times$ Involvement	87.15	< 0.001	0.347 [0.254, 1.00]
Strategy $\times$ Order	0.22	0.64	0.001 [0.000, 1.00]
Strategy $\times$ Involvement $\times$ Order	0.53	0.47	0.003 [0.000, 1.00]
Group	102.93	< 0.001	0.386 [0.293, 1.00]
Group $\times$ Involvement	0.32	0.57	0.002 [0.000, 1.00]
Group $\times$ Order	9.28	0.003	0.054 [0.011, 1.00]
Group $\times$ Involvement $\times$ Order	0.79	0.38	0.005 [0.000, 1.00]
Strategy $\times$ Group	216.80	< 0.001	0.569 [0.491, 1.00]
Strategy $\times$ Group $\times$ Involvement	16.59	< 0.001	0.092 [0.033, 1.00]
Strategy $\times$ Group $\times$ Order	0.24	0.62	0.001 [0.000, 1.00]
Strategy $\times$ Group $\times$ Involvement $\times$ Order	0.10	0.75	0.000 [0.000, 1.00]

Note. One-sided CIs: upper bound fixed at 1.

6.2. Results

6.2.1. Attribution of different strategies to the minority and majority

We conducted a mixed ANOVA including Strategy, Group, Involvement, Order of presentation, and all interactions. Results are reported in

Table 3. The analysis revealed a main effect of Strategy: preparedness strategies were considered more likely overall ($M = 5.30$, $SD = 1.44$) than ad hominem ones ($M = 3.72$, $SD = 1.43$).²

More important for our present purpose, the Strategy $\times$ Group and Strategy $\times$ Involvement two-way interactions were also significant and were further qualified by the Strategy $\times$ Group $\times$ Involvement interaction. We decomposed this interaction with respect to our hypotheses. First, we tested whether the Strategy $\times$ Group interaction held in both the Self and Others conditions. Replicating the findings from Studies 1–2, the Strategy $\times$ Group interaction was significant when participants judged the behavior of others (Others-involvement), $b = -3.10$, $SE = 0.23$, $t(164) = -13.29$, $p < .001$, Cohen's $d = -2.06$, 95% CI $[-2.44, -1.68]$. Although smaller in size (explaining both the Strategy $\times$ Group two-way interaction and the three-way interaction), the Strategy $\times$ Group interaction was also significant when participants judged their own behavior (Self-involvement), $b = -1.76$, $SE = 0.24$, $t(164) = -7.47$, $p < .001$, Cohen's $d = -1.16$, 95% CI $[-1.48, -0.83]$.

6.2.1.1. Judging others. We then turned more specifically to the ratings across groups and strategies in the Others condition (Fig. 3, left panel). Simple effects decompositions revealed that preparedness strategies were rated as more likely for advocates of the minority ($M = 6.23$, $SD = 0.66$) than for those of the majority position ($M = 3.92$, $SD = 1.32$; **H1a**), $b = -2.32$, $SE = 0.15$, $t(164) = -15.22$, $p < .001$, $d = -2.36$, 95% CI $[-2.75, -1.96]$. Conversely, ad hominem strategies were rated as more likely for advocates of the majority ($M = 4.81$, $SD = 1.14$) than for those of the minority position ($M = 4.02$, $SD = 1.09$; **H1b**), $b = 0.79$, $SE = 0.16$, $t(164) = 5.05$, $p < .001$, Cohen's $d = 0.78$, 95% CI $[0.46, 1.09]$. Looking at advocates of the minority position specifically, preparedness strategies were considered more likely than ad hominem strategies, $b = 2.21$, $SE = 0.15$, $t(164) = 15.19$, $p < .001$, $d = 2.36$, 95% CI $[1.96, 2.75]$. Conversely, ad hominem strategies were considered more likely than preparedness strategies for advocates for the majority position, $b = -0.89$, $SE = 0.21$, $t(164) = -4.23$, $p < .001$, $d = -0.66$, 95% CI $[-0.96, -0.34]$.

6.2.1.2. Judging the self. We then examined ratings across groups and strategies in the Self condition (Fig. 3, right panel). Again, and consistent with hypothesis, simple effects decompositions revealed that preparedness strategies were rated as more likely when the self was part of the minority ($M = 6.30$, $SD = 0.72$) than part of the majority ($M = 4.74$, $SD = 1.24$; **H1a**), $b = -1.54$, $SE = 0.15$, $t(164) = -10.03$, $p < .001$, $d = -1.56$, 95% CI $[-1.90, -1.21]$. However, and different from the ratings in the Others condition, participants did not rate ad hominem strategies more likely when the self was part of the majority ($M = 3.13$, $SD = 1.40$) or the minority ($M = 2.93$, $SD = 1.25$; **H1b**), $b = 0.22$, $SE = 0.16$, $t(164) = 1.40$, $p = .16$, Cohen's $d = 0.22$, 95% CI $[-0.08, 0.52]$. Looking at the minority position specifically, preparedness strategies were considered more likely for the self than ad hominem strategies, $b = 3.35$, $SE = 0.15$, $t(164) = 22.80$, $p < .001$, $d = 3.54$, 95% CI $[3.05, 4.02]$. However, looking at the majority position, it was again preparedness strategies that were considered more likely for the self than ad hominem strategies (rather than the other way around), $b = 1.59$, $SE = 0.21$, $t(164) = 7.47$, $p < .001$, $d = 1.16$, 95% CI $[0.83, 1.48]$.

We completed decomposing the interaction by investigating whether ratings of each strategy were affected by Involvement. Ratings of preparedness strategies for the minority were not function of involvement,

$b = 0.05$, $SE = 0.11$, $t(164) = 0.46$, $p = .65$, Cohen's $d = 0.07$, 95% CI $[-0.23, 0.37]$. However, ratings of preparedness strategies for the majority were higher when participants rated themselves than when they rated others, $b = 0.82$, $SE = 0.20$, $t(164) = 4.11$, $p < .001$, Cohen's $d = 0.64$, 95% CI $[0.32, 0.94]$. Conversely, ratings of ad hominem strategies were lower when participants rated themselves than when they rated others, as members of both the minority, $b = -1.09$, $SE = 0.19$, $t(164) = -6.08$, $p < .001$, Cohen's $d = -0.94$, 95% CI $[-1.26, -0.62]$, and the majority position, $b = -1.66$, $SE = 0.20$, $t(164) = -8.35$, $p < .001$, Cohen's $d = -1.30$, 95% CI $[-1.63, -0.96]$.

6.2.2. Perceived difficulty

Finally, as a complementary analysis, we investigated ratings of the perceived difficulty of winning the debate, with a mixed ANOVA including Group, Involvement, and their interaction. Results showed a main effect of Group: participants estimated the debate would be much more difficult to win for the advocates of the minority ($M = 5.69$, $SD = 1.32$) than for those of the majority position ($M = 2.49$, $SD = 1.28$), $F(1, 166) = 444.89$, $p < .001$, Cohen's $d = 3.26$, 95% CI $[2.79, 3.71]$. The main effect of Involvement, on the other hand, was not significant, $F(1, 166) = 0.02$, $p = .89$, Cohen's $d = 0.02$, 95% CI $[-0.28, 0.32]$, nor was the interaction, $F(1, 166) = 3.12$, $p = .079$, Cohen's $d = 0.27$, 95% CI $[-0.03, 0.57]$. In sum, perceived difficulty of winning the debate depended on the group but not on whether the self was directly involved in the debate.

6.3. Discussion

Study 3 compared people's expectations when either the self or others had to prepare for a debate as members of either the minority or majority. Participants anticipated again that the minority would have much more difficulty winning the debate (whether they would be part of that minority or not). Moreover, consistent with hypothesis, they considered minority advocates need to prepare more ahead of the debate and develop stronger arguments to convince (**H1a**). Importantly, this result held regardless of whether the self or others were advocating for the minority group. Conversely, participants believed that majority advocates would instead rely more on ad hominem strategies (**H1b**). This last finding, however, depended on the involvement of the self. As hypothesized, participants were reluctant to self-attribute ad hominem strategies, resulting to lower ratings for the self than for others in both the majority and minority conditions. In other words, while people believe (and say) that other majority group members would rely on ad hominem strategies, they also report that they would not do so themselves.

This study confirmed that participants considered that they personally need to prepare more to be able to win in a debate as member of the minority than as a member of the majority—the crucial test for our theoretical reasoning. Taken together with the preceding studies, the data therefore provide consistent evidence that laypeople anticipate that minority group members must prepare more when they want to exert influence. Study 2 showed that the greater need for preparedness stems from the numerical representation of the minority in the general population and not the numbers of its representatives present in the debate. Study 3 showed that this understanding applies both when people anticipate the efforts of other individuals serving as minority or majority advocates and when they themselves are advocates.

Our final two studies therefore turned to our second hypothesis, pertaining to people's actual behavior ahead of a debate. While a correspondence between beliefs and behavior should be expected, an ample body of work on the attitude-behavior and intention-behavior gap suggests the connection might not be direct or strong (e.g., Sheeran & Webb, 2016; Webb & Sheeran, 2006), making it important to test our prediction at the behavioral level directly. Specifically, we hypothesized that people should behave on the basis of their perception of influence dynamics as revealed in Studies 1–3. In other words, people would

² A significant Group $\times$ Order two-way interaction indicated that across all strategy ratings the significant differences in ratings of minority vs. majority were larger among participants who judged the majority first than among those who judged the minority first. Importantly, however, the difference remained significant in both cases (majority first: $b = -0.92$, $SE = 0.10$, $t(166) = -9.49$, $p < .001$, $d = -1.46$, 95% CI $[-1.80, -1.12]$; minority first: $b = -0.49$, $SE = 0.10$, $t(166) = -4.73$, $p < .001$, $d = -0.73$, 95% CI $[-1.04, -0.41]$).

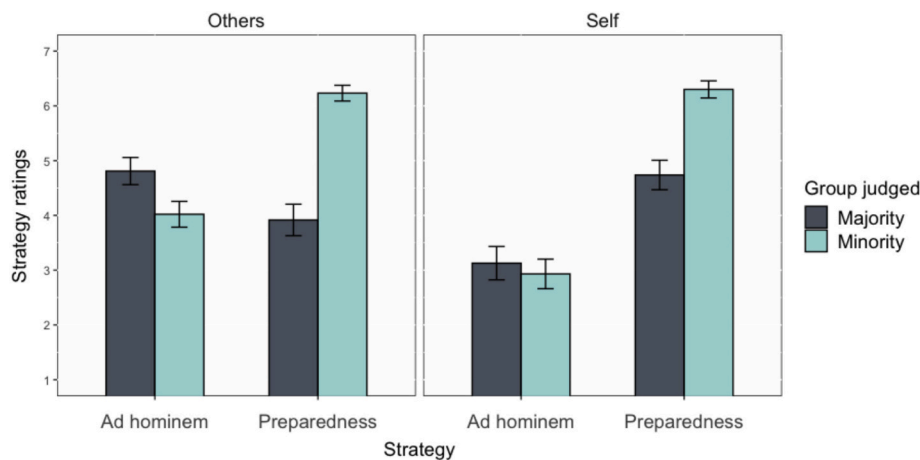


Fig. 3. Ratings of the use of preparedness and ad hominem strategies by advocates of majority and minority groups, depending on the target (self vs. others) in Study 3.

Note. Higher scores represent greater likelihood that the strategy is used by the judged (majority or minority) group on a 7-point scale. Error bars are 95% confidence intervals.

prepare more fully when they anticipate representing a minority that seeks to persuade a majority than vice versa. Our final studies therefore tested this hypothesis (H2), both in a more ecologically valid setting (Study 4) and then in a more controlled one (Study 5).

7. Study 4

Study 4 tests our general prediction at the behavioral level, assessing how much people would prepare in anticipation of a debate where they are part of either the minority or the majority. Specifically, participants were randomly assigned to advocate either a minority or majority position and we assessed their preparation strategies over a two-week period. In addition, Study 4 investigates the proposed causal link from beliefs to behavior, that is, from the awareness that the minority must prepare to a greater extent, to actual preparation. It therefore considers a mediation of the effect of group membership on preparation through preparedness beliefs.

There are many ways to prepare for a debate, from personal information gathering to a more social approach (e.g., consulting the opinions of others). As we had no prediction regarding exactly how people would prepare, and to maximize ecological validity, we decided to let participants freely decide how they wanted to prepare. This study was not preregistered.

7.1. Methods

7.1.1. Participants and procedure

University students enrolled in a psychology class participated in exchange for course credits. The sample size was therefore constrained to that of the available cohort. Two hundred eighty-seven participants completed the first session. Of those, we excluded from analyses $n = 52$ who did not complete the second session (or whose data could not be merged across sessions), $n = 19$ who failed an attention check, and $n = 9$ who lived outside of the geographical area of interest for the debate topic (and for whom the topic could therefore not be personally relevant; see below). The final sample was thus $N = 207$ (40 men, 163 women, and 4 other/undisclosed; $M_{\text{age}} = 21.54$, $SD = 4.77$). A sensitivity power analysis showed this sample size would allow us to detect a difference between the two experimental conditions (one-way ANOVA) as small as $d = 0.39$ with 0.80 power ($\alpha = 0.05$). In addition, it would be sufficient to detect an indirect effect in the mediation analysis where paths α and β are both of intermediate size or bigger (i.e., standardized value ≥ 0.26) with 0.80 power (Fritz & MacKinnon, 2007).

7.1.1.1. First session: taking position and anticipating the debate. The study was presented as an investigation of group interactions in two video conference sessions. In the first session the experimenter introduced the ostensible aim of the study, which was to observe how people debate in small groups. Participants then completed an online questionnaire to indicate which side they wanted to defend in the upcoming debate, which was to be held two weeks later.

The topic for debate was: *Should [local area] initiate and encourage the construction of new housing on its territory, or should it instead preserve and conserve its unbuilt land?* This was a recurring topic in local media as the local area, Geneva (Switzerland), faced both an ongoing housing crisis, leading to calls for more construction, and an environmental crisis because of a lack of green space (forests, fields, etc.), leading to calls to preserve these spaces. A pilot study had shown that opinions in the student population were mixed with almost as much support for either position. Participants were asked to select the one position they wanted to defend in the upcoming debate. We highlighted that they could not switch sides during the preparation time. Overall, 112 participants or 54% chose to defend the “green” side (Geneva should preserve its unbuilt land) and 95 participants or 46% chose the defend the “lodging” side (Geneva should build new housing).

They were then randomly pre-allocated to a discussion group, at which point the group manipulation was implemented. Participants believed that all groups were composed of psychology students who were present during the online session. After everyone in the session had expressed their choice, participants were told that the group's composition would reflect the distribution of those choices among the psychology students participating in the study. Consistent with the results of Study 2, it enabled participants to infer the distribution in their reference population from the number of debaters. They then read, “*You have now been assigned to a discussion group. You will discover during the interaction who the other members of your group are. To help you prepare, however, please note the composition of the group. There will be: 7 people defending [one side]; 3 people defending [the other side]. Total: 10 people.*”

The number of people indicated for each position was manipulated so that participants would find themselves anticipating defending either a majority ($n = 96$) or a minority ($n = 111$) position (randomized within each side). Participants then answered instructional checks and items measuring their anticipated perception of the upcoming debate (see below). The questionnaire ended with a reminder that the debate would happen in two weeks' time and that participants were free to prepare for it as they wished and were allowed but not obliged to search for relevant information online, in books, or any other format they chose.

7.1.1.2. Second session: reporting on preparation. Two weeks later, participants joined a new video conference session for the anticipated group debate. We asked them, first, to complete a short survey assessing how they had prepared during the two weeks, after which “they would be sent in small groups to different video conference rooms to have a 30-min debate.” In fact, the debate never happened. After completing the short survey, participants were informed that the study was now complete and were debriefed about its real aim.

7.1.2. Materials

7.1.2.1. First session. Instructional checks ensured participants understood the composition of the groups in the upcoming debate session (see ESM4.3). The four preparedness strategies items from the previous studies were adapted to measure the importance of the strategies for defenders of the participant's position (e.g., “It will be necessary for us to prepare very well in advance to hope to win the debate”; $\alpha = 0.78$). All items used a 7-point Likert scale ranging from 1 = *Not at all* to 7 = *Absolutely*. For consistency purposes we also included a measure of ad hominem strategies but adapted it to assess the likelihood that defenders of the opposing position would adopt such strategies in the upcoming debate (four items). The analysis of these items is reported in ESM7.

7.1.2.2. Second session. During the second session, participants reported how much they had prepared for the debate over the course of the two previous weeks (1 = *Not at all*, 7 = *Absolutely*). Two items assessed how much they had prepared on their own (e.g., “Did you consult any available documents on the topic (videos, podcasts, books, web pages...)?”). As the two items were positively correlated, $r(205) = 0.31$, $p < .001$, we aggregated them into an average score. Two other items assessed how much participants had prepared through discussion with others (e.g., “Did you discuss the topic during the week with relatives (family, friends...)?”). Again, we aggregated both items into an average score, $r(205) = 0.29$, $p < .001$. We had no particular a priori hypothesis about a difference between the two forms of preparation.³ In addition, participants reported how much time, in minutes, they had spent preparing for the debate. Responses ranged 0 to 600 min ($M = 70.19$, $SD = 72.13$, $Me = 50$). A correlation matrix of all dependent variables is reported in Table S1.5 of ESM1.

7.2. Results

7.2.1. Perception of strategies ahead of the debate (first session)

A one-way ANOVA revealed a main effect of Group on preparedness strategies ratings, $F(1, 205) = 21.39$, $p < .001$, Cohen's $d = 0.65$, 95% CI [0.36, 0.92]. Preparedness strategies were rated as more important in the minority condition ($M = 5.56$, $SD = 0.95$) than in the majority condition ($M = 4.92$, $SD = 1.03$). These results therefore replicate those of the Self-involvement condition in Study 3.

7.2.2. Preparation over the course of the two weeks (second session)

7.2.2.1. Preparation for the debate. We then turned to actual (self-reported) preparation for the debate over the course of two weeks (measured in the second session, immediately before the anticipated debate). A Preparation (within: alone vs. discussing with others) $\times$ Group (between: majority vs. minority) mixed ANOVA revealed a significant main effect of Preparation type: participants reported having prepared alone ($M = 4.23$, $SD = 1.53$) more than through discussion with others ($M = 2.67$, $SD = 1.50$), $F(1, 205) = 151.97$, $p < .001$, Cohen's

$d = 1.71$, 95% CI [1.39, 2.03].

More important and congruent with hypothesis, the main effect of Group was also significant, $F(1, 205) = 7.32$, $p = .007$, Cohen's $d = 0.38$, 95% CI [0.10, 0.65]. Participants reported having prepared for the debate to a greater extent when they were in the minority ($M = 3.66$, $SD = 1.72$) than when they were in the majority ($M = 3.21$, $SD = 1.66$), a finding that was not qualified by preparation method (non-significant interaction, $F(1, 205) = 0.01$, $p = .94$, Cohen's $d = 0.01$, 95% CI [-0.26, 0.28]; see Fig. 4A-B). Inspection of simple effects revealed that this was due to very similar effects of Group on both types of Preparation, both being significant and of similar magnitude (effect on preparation alone: $b = -0.23$, $SE = 0.11$, $t(205) = -2.18$, $p = .030$, $d = -0.30$, 95% CI [-0.57, -0.02]; effect on preparation through discussion: $b = -0.22$, $SE = 0.10$, $t(205) = -2.13$, $p = .034$, $d = -0.30$, 95% CI [-0.57, -0.02]).

7.2.2.2. Time spent preparing for the debate. As is often the case with measures pertaining to time, the distribution of time preparing (in minutes) was heavily skewed (Kurtosis = 16.82, $SE = 0.34$). We therefore applied a logarithmic transformation on the variable. A one-way ANOVA on this transformed variable revealed the expected main effect of Group, $F(1, 205) = 7.14$, $p = .008$, Cohen's $d = 0.37$, 95% CI [0.09, 0.64] (see Fig. 4C). Participants in the minority condition reported spending more time preparing (raw means: $M = 77.36$ min, $SD = 75.03$) than those in the majority condition ($M = 61.90$ min, $SD = 68.08$).

7.2.3. Mediation through perception of preparedness strategies

Having established the effect of the group manipulation on the perceived importance of preparedness strategies ahead of the debate and on preparation over two weeks, we proceeded to test whether the effect of minority/majority position on preparation was mediated through perceived importance of preparedness strategies. We conducted a path analysis (*lavaan* package) with Group as the independent variable, perceived importance of preparedness strategies as the mediator, and preparation as the outcome, constructing a latent variable based on the three indicators (preparation alone, preparation through discussion, and time spent preparing; standardized scores). Following recommendations, we ran a joint-significance test to examine the component paths, then relied on a bootstrap resampling method to examine the magnitude of the indirect effect (percentile bootstrap confidence intervals; Yzerbyt et al., 2018).

Results are depicted in Fig. 5. Consistent with the analyses reported above, the Group manipulation significantly impacted perceived importance of preparedness strategies, $b = -0.32$, $SE = 0.07$, 95% CI [-0.45, -0.18], z -test = -4.65, $p < .001$, $\beta = -0.31$. Perceived importance of preparedness strategies, in turn, was positively and significantly related to the latent indicator of preparation, $b = -0.10$, $SE = 0.05$, 95% CI [0.01, 0.19], z -test = 2.15, $p = .032$, $\beta = 0.17$. The indirect effect of Group through perception of preparedness strategies was at the threshold of significance (i.e., the upper boundary of the 95% CI was exactly zero), $b = -0.03$, $SE = 0.017$, 95% CI [-0.06, 0.00]. Its residual direct effect was reduced to $b = -0.10$, $SE = 0.049$, $z = -1.97$, $p = .049$, $\beta = -0.16$ (total effect: $b = -0.13$, $SE = 0.049$, $z = -2.63$, $p = .008$, $\beta = -0.21$), indicating partial mediation (the residual direct effect β was 24% smaller compared to the total effect).

7.2.4. Alternative mediation model

Conceptually, the rationale of the theoretical proposition relies on the idea that individuals' beliefs about how the source views their need to prepare determine the extent to which they actually prepare—based on that belief. It therefore makes little sense to consider a mediation in the opposite direction. Moreover, the perceived importance to prepare was measured two weeks before the actual (self-reported) preparation. Nevertheless, for completeness purpose we tested the alternative possible model, inverting the mediator and the dependent variable in

³ We initially tested whether all four items would form a reliable single score of preparation. However, the overall score lacked reliability, $\alpha = 0.53$. We therefore computed two separate indices of preparation: alone, and by interacting with others.

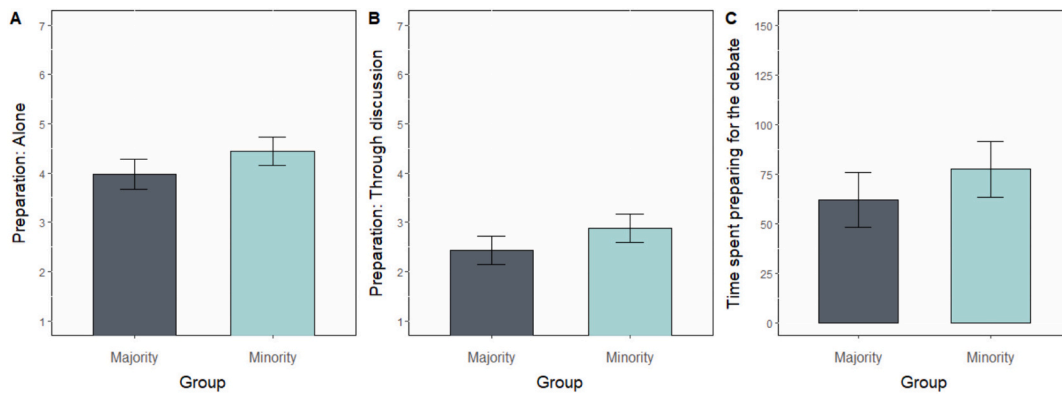


Fig. 4. Self-reported preparation effort ahead of the debate as a function of participants' position in the group (majority vs. minority) in Study 4: A) Amount of preparation alone; B) Amount of preparation through discussion; C) Time spent preparing in minutes.

Note. Preparation for the debate is measured on a 7-point scale. Time spent preparing is expressed in minutes (raw scores). Error bars are 95% confidence intervals.

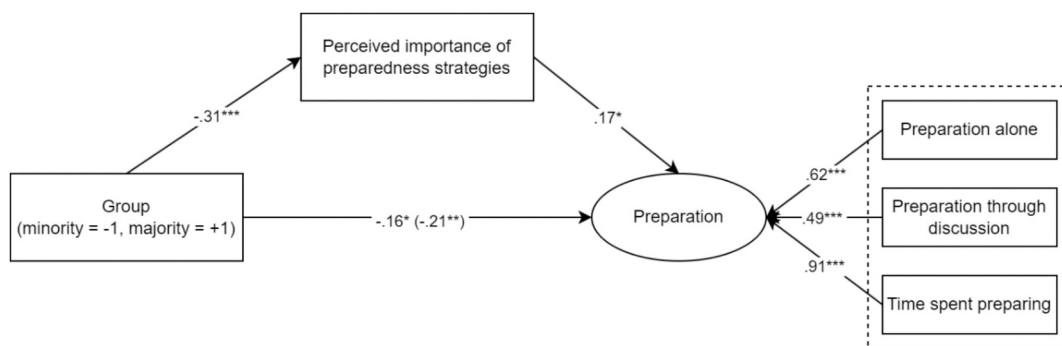


Fig. 5. Results of the path analysis testing a mediation effect through perceived importance of preparedness strategies in Study 4.

Note. Values reported are standardized coefficients (β). The total effect of Group is reported in brackets. * $p < .05$, ** $p < .01$, *** $p < .001$.

the sequence. First, both the direct effect and the total effect of the manipulated condition were highly significant ($b = -0.28$, $SE = 0.070$, $z = -4.05$, $p < .001$, $\beta = -0.27$; and $b = -0.32$, $SE = 0.069$, $z = -4.65$, $p < .001$, $\beta = -0.31$ respectively; the residual direct effect β was only 13% smaller compared to the total effect). Second, the indirect effect felt short of significance, $b = -0.04$, $SE = 0.021$, 95% CI $[-0.08, 0.004]$.

7.3. Discussion

Study 4 aimed to test our assumption that when put in a situation where they need to convince, people adapt their behavior on the basis of their perception of influence dynamics. Specifically, we hypothesized that people in a minority position would prepare more, compared to those in a majority position (H2). Results supported this hypothesis. Participants who expected they would be part of a minority in a debate in two weeks' time reported they prepared more ahead of the debate (as expressed in their subjective amount of preparation alone, through discussing with others, and the amount of time spent preparing) than those who expected they would be part of a majority. This study therefore extended the findings from Studies 1–3, establishing the behavioral concomitants of perceived need for preparation. The contention that a group's minority nature generates higher motivation to prepare for debate, and that greater preparation then ensues, was further supported by the mediation analysis, showing that beliefs about the necessity of preparedness partially mediated the effect of the group manipulation (i.e., being part of a minority vs. majority) on amount of preparation.

While the pattern of results was similar to that of the previous studies focusing on beliefs, the effect sizes are smaller for behavior than for beliefs. In other words, while beliefs translate into behavior, one does

not entirely account for the other. Behavior is a more complex phenomenon and other factors might come to play to influence it, beyond the rather epistemic beliefs that the present study focused on.

A limitation of Study 4 must be noted: behavior was self-reported, with no possibility for us to verify the accuracy of participants' subjective account. Participants also prepared in an ecological but uncontrolled environment, so we do not know the objective details of their preparation. Further, results may be colored by a bias in self-reported meta-perception (Nisbett & Bellows, 1977). A final study was therefore designed to address these limitations.

8. Study 5

Study 5 was designed to replicate Study 4 with objective measures of preparation in a fully controlled setting. Participants were invited to prepare for a debate in the laboratory, using only materials that we made available to them. This procedure allowed us to measure objectively how, and how much, participants prepared ahead of the debate, depending on whether they anticipated being in a minority or majority group. This study was not preregistered.

8.1. Methods

8.1.1. Participants and procedure

University students enrolled in a psychology class participated in exchange for course credits. As before, the sample size was constrained to that of the available cohort. Three hundred seventy-two participants completed the study; however, $n = 27$ encountered technical issues (e.g., the page crashed or did not redirect them correctly after reading one article from the available material) and had to be excluded from

analysis. Similar to Study 4, we also excluded $n = 9$ who lived outside of the geographical area of interest for the debate topic. This left a final sample of $N = 336$ (67 men, 267 women, and 2 other/undisclosed; $M_{\text{age}} = 21.17$, $SD = 4.90$). A sensitivity power analysis showed this sample size would allow us to detect a difference between the two experimental conditions (one-way ANOVA) as small as $d = 0.31$ with 0.80 power ($\alpha = 0.05$).

This study was again presented as an investigation of group interactions in two sessions. It was conducted in two large computer rooms of the university building, allowing for group participation of 30–50 people at the time. An experimenter welcomed all participants in the room and explained the procedure for the study. During this first session, participants would learn about the topic of the debate, decide which position they wanted to defend, and be pre-assigned to a discussion group. Ostensibly, the second session (which in fact never happened) would see the discussion groups engage in debate.

The topic for debate was identical to Study 4: *Should [local area] initiate and encourage the construction of new housing on its territory, or should it instead preserve and conserve its unbuilt land?* Overall, 171 participants or 51% chose to defend the “green” side (Geneva should preserve its unbuilt land) and 165 participants or 49% chose to defend the “lodging” side (Geneva should build new housing). They were then randomly pre-allocated to a discussion group, introducing the Group manipulation: the number of people indicated for each position (7 against 3) was manipulated so that the participant would either defend a majority ($n = 173$) or a minority position ($n = 163$).

Participants could then use the remaining time (up to one and a half hours) to prepare for the debate, which ostensibly would happen over the following week. To this end, we provided them with different articles they could decide to read or not (see below). For the sake of the cover story, they were also enabled to take notes while reading, which the experimenter explained they could use during the debate.⁴ After they had read all the articles they had selected, participants answered a few final questions. These include instructional checks (see ESM4.4), and exploratory questions on their perception of what they were doing during the preparation process.⁵ We also measured the perceived importance of the topic of debate as we wanted to be able to account for any possible differences in topic importance between groups. Because perceived importance did not differ between conditions, nor relate to actual preparation or moderate the effect of the experimental conditions, we do not discuss it further (see detail in ESM8).

8.1.2. Materials

In order to assess objectively how much participants would prepare ahead of the debate we provided them with a list of 10 articles that they could choose to read. The position was clearly expressed in the title of each article so as to ensure that it would be obvious which side the article was defending. Five articles were in favor of the “green” side (e.g., “Urban planning and nature preservation: Citizens fight against uncoordinated densification”) and five were in favor of the “lodging” side (e.g., “The housing shortage and its impact on commuter traffic: What are the solutions?”). Articles defending each side were interspersed in the list, and the order was counter-balanced across participants. All articles were taken from real sources but slightly edited to be roughly similar in length

⁴ We initially checked the content of these notes to assess whether they could be coded in any way to provide further evidence into the preparation process. Unfortunately, the notes consisted mostly in copy-pasted text from the articles participants were reading or in bullet-point key words they noted down for themselves, and could not be coded in any usable way.

⁵ Specifically, nine items asked about the preparation work the participant had just completed (e.g., “I mainly read articles that supported my position”, “I mainly read articles that supported the opposite position”). These items were included exploratorily to see if people were aware of what they were doing. They are not central to the hypotheses and are not discussed further.

and uniformly formatted.

After viewing the entire list participants decided whether they wanted to read each article in turn. Each article selected was displayed on a subsequent page of the questionnaire. Participants spent as much time as they wanted on each article and could then click their way back to the list and decide whether to read the next article. We recorded how many articles participants read, distinguishing between those in favor of their own and the opposite position. We also recorded how much time they spent reading, again distinguishing articles in favor of their own and the opposite position.

We did not have any directional hypothesis regarding a possible difference between pro and anti-articles. On the one hand, minority group members may anticipate that winning the debate would imply not only building strong arguments but also disrupting the other side's argument; thus, reading them would be necessary, which would lead to a difference between groups on both types of articles. Consistent with this possibility, Zdzianuk and Levine (1996) showed that, although people display a general bias in favor of their own position, this bias is reduced in minority groups, with participants producing more thoughts unfavorable to their own position compared to majority groups—suggesting that they also process the alternative position. On the other hand, congruent with a confirmation bias, minority group members could mainly focus on pro articles (and disregard anti-articles), which would lead to a difference between groups on pro articles only. This second possibility is congruent with Mojzisch et al. (2008) who showed that when searching for information minorities produce a stronger confirmatory bias toward their position than majorities, although only when they expect a discussion.

8.2. Results

8.2.1. Number of articles read

Number of articles read constitutes a discrete or count variable (ranging 0 to 5 for each type of article) that did not follow a Gaussian distribution. We therefore relied on a generalized linear model (Poisson distribution), introducing Type of article (1 = pro, −1 = anti) as the within-participant predictor, Group (1 = majority, −1 = minority) as the between-participant predictor, and their interaction. The model yielded a significant main effect of the Type of article, $b = 1.17$, $SE = 0.07$, 95% CI [1.04, 1.30], $z\text{-test} = 17.56$, $p < .001$: participants read significantly more articles supporting their position ($M = 4.09$, $SD = 1.12$) than supporting the opposite position ($M = 2.12$, $SD = 1.66$), Cohen's $d_z = 0.95$. More interestingly, the main effect of Group was also significant, $b = 0.37$, $SE = 0.12$, 95% CI [0.13, 0.60], $z\text{-test} = 3.01$, $p = .003$. Participants in the minority condition read more articles ($M = 6.39$, $SD = 1.93$) than those in the majority condition ($M = 6.03$, $SD = 1.94$), Cohen's $d = 0.19$.

This effect was further qualified by a two-way interaction, $b = -0.18$, $SE = 0.07$, 95% CI [−0.32, −0.05], $z\text{-test} = -2.70$, $p = .007$. Simple effect decompositions showed a significant effect of group for articles in favor of the participant's position, so that participants in the minority condition ($M = 4.26$, $SD = 1.05$) read more articles in favor of their own position than those in the majority condition ($M = 3.92$, $SD = 1.17$), $b = 0.19$, $SE = 0.06$, 95% CI [0.07, 0.30], $z\text{-test} = 3.17$, $p = .002$. However, there was no significant difference for articles in favor of the opposite position (minority: $M = 2.13$, $SD = 1.66$; majority: $M = 2.10$, $SD = 1.66$), $b = 0.01$, $SE = 0.03$, 95% CI [−0.05, 0.06], $z\text{-test} = 0.17$, $p = .87$ (Fig. 6A).

8.2.2. Time spent reading

Time spent reading followed a normal distribution (articles pro: Skewness = 0.93, $SE = 0.13$, Kurtosis = 2.04, $SE = 0.27$; articles anti: Skewness = 0.72, $SE = 0.13$, Kurtosis = −0.22, $SE = 0.27$). We therefore conducted a classical least squares analysis, investigating the effect of Type of article (pro vs. anti) as the within-participant predictor, Group as the between-participant predictor, and their interaction, on time

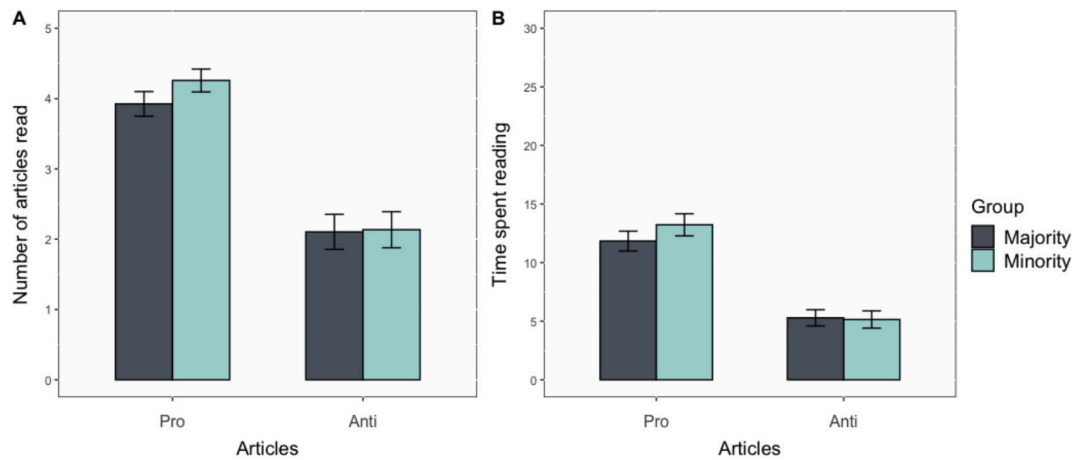


Fig. 6. Preparation effort ahead of the debate as a function of participants' position in the group (majority vs. minority) in Study 5. A: Number of articles read (pro or anti); B: Time spent reading, in minutes.

Note. Number of articles read ranges 0–5. Time spent reading is expressed in minutes. Error bars are 95% confidence intervals.

spent reading.

Results showed a significant main effect of Type of article, $F(1, 334) = 287.19, p < .001$, Cohen's $d = 1.85$, 95% CI [1.59, 2.10]: participants spent significantly more time reading articles supporting their position ($M = 12.51$ min, $SD = 5.91$) than supporting the opposite position ($M = 5.22$ min, $SD = 4.67$). The main effect of Group was not significant, $F(1, 334) = 2.56, p = .11$, Cohen's $d = 0.18$, 95% CI [−0.04, 0.38]. However, the Type of article $\times$ Group interaction was marginally significant, $F(1, 334) = 3.17, p = .076$, Cohen's $d = 0.19$, 95% CI [−0.02, 0.40]. Given the consistency of the pattern of results with the previous analysis on number of articles read, we cautiously decomposed the interaction.

Congruent with the effect observed on number of articles read, simple effects showed a significant effect of Group on reading time for articles in favor of the participant's position, $t(334) = -2.16, p = .031$, Cohen's $d = -0.24$, 95% CI [−0.45, −0.02], $b = -41.65$, $SE = 19.24$. Participants in the minority condition ($M = 13.23$ min, $SD = 6.11$) spent more time reading those than participants in the majority condition ($M = 11.84$ min, $SD = 5.65$). For time spent reading articles in favor of the opposite position, however, there was no significant difference (minority: $M = 5.14$ min, $SD = 4.76$; majority: $M = 5.29$ min, $SD = 4.60$), $b = 4.38$, $SE = 15.32$, $t(334) = 0.29, p = .78$, Cohen's $d = 0.03$, 95% CI [−0.18, 0.24] (Fig. 6B).

We conducted a final supplementary analysis controlling for number of articles read, to determine whether the effect on time spent reading was a direct consequence of participants reading more articles in the minority condition, or whether they were also spending more time on each article. For time on articles in favor of the participant's own position, the effect of Group disappeared ($b = -18.68$, $SE = 17.55$, $t(333) = -1.07, p = .29$, Cohen's $d = -0.12$, 95% CI [−0.33, 0.09]), while the number of articles read was a significant predictor in the model ($b = 137.99$, $SE = 15.64$, $t(333) = 8.82, p < .001$, Cohen's $d = 0.96$, 95% CI [0.73, 1.19]). For time on articles supporting the opposite position, the number of articles read was strongly related to time spent reading, $b = 136.44$, $SE = 5.48$, $t(333) = 24.89, p < .001$, Cohen's $d = 2.72$, 95% CI [2.42, 3.01], but the effect of Group remained non-significant, $b = 6.49$, $SE = 9.07$, $t(333) = 0.72, p = .48$, Cohen's $d = 0.08$, 95% CI [−0.13, 0.29]. Time spent reading was thus directly related to the number of articles that participants read ($r = 0.38, p < .001$).

8.3. Discussion

Study 5 tested whether participants would objectively prepare more in anticipation of a debate when they believed they were part of the minority (vs. majority). To this end, we provided participants with controlled materials in the lab and measured how many articles they

voluntarily read and how long they spent reading them. Results supported our hypothesis (H2). Participants in the minority condition read more articles, specifically, articles supporting the position they would defend in the debate, than did those in the majority condition. This effect appeared in conjunction with a strong confirmatory bias, showing that an increase in efforts to find information and prepare does not correct cognitive biases. This suggests that participants were looking for arguments merely to defend their view in the debate rather than for ways to counter the other side's arguments. As a reflection of this increased effort, they also spent more time reading overall, which was completely explained by the number of articles they consulted. Therefore, it seems that participants in the minority condition were neither faster nor slower when reading, but really devoted more time to reading additional articles—they prepared more.

In sum, this study reinforced the findings of Study 4 by using an objective (rather than self-reported) measure of preparation. This addresses its limitations and correspondingly discounts an alternative explanation of an artefactual result in Study 4 that might have been attributed to a bias in self-reported meta-perception.

9. General discussion

In this paper we proposed that people intuitively grasp that minorities encounter greater difficulty making their voice heard and can only do so through greater preparation ahead of a discussion or debate. We also argued that people would adapt their own behavior accordingly, preparing more when they anticipate having to defend a minority position, compared to a majority position.

The results of one pilot and five main studies (and two supplementary studies) supported these hypotheses. First, there is a general awareness of the asymmetry between majorities and minorities (H1): people consider that the confrontation with the opposite side is more challenging for the minority than the majority. Thus, minorities would need to prepare more and come up with better arguments if they hoped to win a debate in the public arena of confrontation of opinions and political ideas. The same beliefs are expressed regardless of whether people judge the behavior of others (Studies 1–3) or are personally involved in the debate situation, either imagined (Study 3) or anticipated as real (Study 4).

In contrast, people consider the majority as more inclined to rely on social pressure, presently conceptualized as ad hominem strategies. However, while people clearly attribute ad hominem tactics to majorities (Studies 1–3), they deny engaging in it themselves (Study 3), probably for motives related to social desirability and self-concept positivity. Finally, the distinction between minority and majority

clearly pertains to their numerical representation in the general population and not to the sheer number of representatives present during the interaction (Study 2). These first studies yielded large effect sizes, suggesting a very clear lay perception of the differences in the debate dynamics depending on the group.

Does this awareness of the asymmetrical need to prepare translate into behavioral differences? Studies 4–5 both confirmed that it does (H2). When participants were free to decide how and how much they would prepare at home for two weeks, they reported having prepared more in anticipation of a debate when they would defend a minority rather than a majority position (Study 4). They also objectively prepared more in a fully controlled setting in the laboratory (Study 5). Consistent with our theoretical position, preparedness behavior is partially mediated by awareness of the greater need to prepare. Specifically, being in the minority leads to greater anticipation that preparation was necessary, which in turn leads to greater preparedness behavior (Study 4). In sum, we find consistent evidence for our hypotheses.

9.1. Implications

The present results are essential for minority influence as a field. In *Social influence and social change*, Moscovici (1976) theorized minority influence as the process through which social change was made possible. However, while research had focused on the conditions under which minority influence can occur and the mechanisms leading targets to accept it, it neglected to test whether minorities actually create these conditions for themselves. In other words, the literature took for granted that minorities are indeed the root for social change but along the way forgot to test it (see Prislín, 2022, for a similar critic). Thus, a fundamental unresolved issue was whether discoveries from past work in the field are likely to have traction in the real world. In addressing this gap, the present paper makes a crucial step forward for establishing necessary evidence for the plausibility of a major tenet of minority influence theory that minorities not only need, but *typically pursue*, a distinctive strategy that is congruent with Moscovici's (and in fact the whole field's) claim that minority brings about social change.

In addition, by taking the less-studied perspective of the *persuader* (the one creating the communication) rather than the *persuadee* (the one exposed to it), this work highlights new paths for future research in minority influence. We show here how being in the minority impacts willingness to engage efforts in preparing more to produce stronger arguments. But other factors in other settings may also influence this willingness. Future work could investigate, for example, whether individual characteristics (e.g., self-consciousness, conscientiousness, need for cognition, anxiety) make people invest more efforts to be convincing and credible (see Oreg & Sverdlík, 2014). It may also be valuable for future research to consider different contexts of persuasion, comparing for example intergroup with intragroup contexts. In the latter case, factors related to group dynamics and style of leadership would also be relevant to study in conjunction with people's efforts to convince their fellow group members to change their opinions.

This work is also of relevance for the neighboring field of persuasion. Source characteristics have been extensively studied in persuasion research (e.g., its credibility, attractiveness, power, speed of speech, similarity; see Petty & Wegener, 1998). However, this has rarely been done through the lens of the source's motivation—namely, the source's effort to produce stronger arguments to persuade the target (for an exception, see e.g., Shestowsky et al., 1998). Motivational processes have primarily been studied as a characteristic of the target at a cognitive as well as metacognitive level (Briñol & Petty, 2009) with the idea that the target's motivation (and ability) determines the type of cognitive processing, or as a property of the message itself (i.e., the strength of the message). Our line of work outlines new opportunity for research to also study how the context may increase the *source's* motivation to persuade, and thus to produce strong rather than weak arguments (for a similar approach in the teaching and learning literature, see e.g.,

Wijekumar et al., 2019).

Finally, the present work may be considered in the light of collective action literature. Collective action is typically defined as “any action that individuals undertake as group members, to pursue group goals such as social change” (van Zomeren et al., 2018, p. 122). It is most often studied as a behavior from minority group members who act to challenge the status quo and ameliorate their situation (although an emerging body of work is turning to reactionary collective action that aims to maintain the status quo, Thomas & Osborne, 2022; and others consider dynamics of outgroup solidarity and allyship, Radke et al., 2020). Yet, collective action is most often considered through the lens of activism (petition signing, donating, demonstration and protest, etc.) and not through that of persuasion. The present work suggests that the dynamics of minority influence—and more specifically, the efforts invested by minority group members to prepare and thus produce better arguments—may be considered as a form of collective action aiming to challenge the status quo through means of communication and persuasion. This suggests that there might be new insights to emerge through bringing together separate literatures on social influence and on collective action with this new lens. On the one hand, collective action research could draw from minority influence research to highlight and explore a different form of collective action building on social influence and persuasion dynamics, as highlighted above. On the other hand, minority influence research would benefit from integrating findings from the collective action literature to better delimit the conditions necessary to successful minority action. Specifically, research building on the social identity model of collective action highlights the positive role of four motivation components: collective efficacy beliefs, group identification, group-based anger (as a consequence of the perceived unfairness of the situation), and perceived violation of moral standards (van Zomeren, 2013). This suggests that a minority's effortful preparation of effective communication might be moderated by (a combination of) these factors—an intriguing possibility that future research may investigate.

9.2. Limitations and Avenues for Future Research

Some caveats and limitations of the present research must be acknowledged. First, the effect sizes observed for behavioral measures (Studies 4–5) are smaller than those for awareness of the need to prepare (Studies 1–4). This points to the existence of other factors above and beyond the minority-majority dimension that impact preparedness behavior; it also speaks to the widely documented attitude-behavior (and intention-behavior) gap (Sheeran & Webb, 2016; Webb & Sheeran, 2006).

Second, the strong asymmetry in the orientation of the information accessed in Study 5 shows that the difference of preparedness between majority and minority appears only for content supporting one's own position. This points to additional factors (beyond the scope of the present work) that might contribute to explaining why people prepare more when in the minority. First, it is possible that the situation induces a reduced sense of control for minority group members (Guinote et al., 2006). As a result, preparing by focusing on content that validates one's own position could serve to restore this sense of control. Relatedly, potential rejection by the majority may induce anxiety. One way to cope with such anxiety is through self-presentation (Leary & Jongman-Sereno, 2014): minority members may be motivated to project a positive image of their position—and by extension, of themselves—to the audience they aim to persuade (Jones & Pittman, 1982). Another goal behind maximizing the search for arguments supporting one's own position may thus be to create a favorable impression of the group, and its defended position, to the audience (Baumeister & Hutton, 1987) in order to foster acceptance rather than rejection. Future research will need to explore such possibilities further.

Third, as the experimental setting involves anticipating opinion debates, one may question the generalizability of the results beyond

debates themselves. However, the setting is not about debates per se but about the *expectation* of having to debate. Our experimental context required participants to choose a position and to get ready to defend it. This corresponds to contexts in the real world where minorities may have to uphold their social norms in social interaction taking the form of conflicting discussion or controversies. This need to defend one's position aligns with theoretical concepts related to minority influence, such as minorities with unsatisfied goals in times of anomy and structural strain (Merton, 1938, 1995), minority dissent (Packer, 2008), or consistency (Moscovici & Lage, 1976). Each of these perspectives highlights minorities or deviants who seek to introduce normative conflict against the majority, i.e., those challenging the status quo and striving to have their own norms accepted. Members of nomic minorities (i.e., individuals who exhibit strong identification with their in-group and high motivation to defend their position) might be those who engage the most in greater preparation efforts in order to effectively meet the challenge of the confrontation with the majority (Levine & Butera, 2025). Conversely, members of anomic minorities (i.e., those who do not identify with the minority and/or are not motivated to prevail) should be least likely to demonstrate high preparedness. A procedural detail in our experiments implicitly put participants in a more nomic minority: the fact that they could not change their stance once chosen. As a consequence, the setting of the present studies should not be viewed as a limited artificial situation constrained to opinion debates. Rather, it serves as an experimental reproduction of the conditions faced by minorities who are considered at the origin of social change and of what allows it to happen. Therefore, we argue it has high ecological validity.

Reciprocally, this reasoning suggests that the present findings on preparedness may not apply to all minority/majority confrontations but only to those situations where minorities are actively seeking to drive social change and do not fear confrontation with the majority. Thus, in line with the Spiral of Silence Theory (Noelle-Neumann, 1974), individuals who are reluctant to engage in confrontation because they dread social rejection or isolation are likely to remain silent and to conform once they perceive themselves as being in the minority. These individuals will most likely not prepare more to defend their ideas; on the contrary, they may not prepare at all. In this respect one can also consider that leniency toward the minority (Crano, 2000; Crano & Seyranian, 2009) might affect how much minority group members are willing to maintain strong conflict on social norms and thus impact how much they will actually consider that they need to prepare more and do so. Conversely, there might be confrontations where it is the minority rather than majority who will rely more on ad hominem strategies. Those, however, should specifically concern minority groups located at the extremes of the political spectrum, or those holding extreme religious views. Such groups are indeed often more inclined to use physical violence to achieve their political objectives (Jasko et al., 2022; Jugl et al., 2021).

Last but not least, we cannot be certain of the outcomes that could have flowed from minority group members' higher preparation in the present studies. We did not assess whether they would have gone on to produce stronger messages than their majority counterparts, or whether their messages might have exerted stronger influence. This limitation applies to the literature in general and reflects the high cost and difficulty in conducting such behavioral studies. Most of the influence and persuasion literature relies on paradigms where persuasive messages are prepared by the researchers themselves. In some cases, messages are prepared as intentionally strong versus weak to test for processing dynamics (e.g., Martin et al., 2008; Martin & Hewstone, 2008). In others, we must assume that the researchers prepared strong messages given that the studies found significant minority influence—but message strength is then an empirical artifact. Although costly, it would be beneficial for future studies to turn to the next step of the sequence: invite participants to generate entire persuasive messages and assess their strength. A consistent body of literature on effort and motivation supports the idea that the greater preparedness of minorities, that is,

greater effort they invested in the task, should translate into better performance (e.g., Bandura, 1997; Locke & Latham, 1990, 2013; Vroom, 1964). The present work opens such future research endeavors.

9.3. Conclusion

Through five experimental studies, we demonstrate that people anticipate that it is much more difficult for a numerical minority to make their case on opinion issues, requiring the minority group members to prepare more intensively ahead of a debate or discussion than do members of the majority. Further, people adapt their own behavior according to this anticipation, and invest more effort in preparing for a debate when they expect they will defend a minority position. This work builds on a tradition of minority influence research and addresses a major gap in testing of theory. The research corroborates key theoretical assumptions and thereby strengthens Moscovici (1976)'s account of how minority influence can be at the root of enduring societal change. It opens many intriguing questions for future research at the intersection of different literatures such as motivation and performance, group dynamics, and collective action.

Open practices

Data, codebook and code for the analyses are publicly available on the OSF: <https://osf.io/uhecq>. Links to preregistration are the following (Studies 4–5 were not preregistered):

Study 1: <https://aspredicted.org/vryd-bfxw.pdf>

Study 2: <https://aspredicted.org/tr2v4k.pdf>

Study 3: <https://aspredicted.org/nmd6-gztt.pdf>

Supplementary Study I: <https://aspredicted.org/7rb5mw.pdf>

Supplementary Study II: <https://aspredicted.org/tfwd-sjp8.pdf>

CRedit authorship contribution statement

Alain Quiamzade: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Fanny Lalot:** Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Dominic Abrams:** Writing – review & editing, Conceptualization.

Declaration of competing interest

We certified that we have no conflict of interest, neither financial nor personal, regarding the submitted article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jesp.2026.104927>.

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