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Citation

Secret conversation opportunities facilitate minority influence in virtual groups: The influence on majority power, information processing, and decision quality

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Abstract

We examined the impact of secret conversation opportunities during virtual team discussions on majority opinion holders' motivation to attend to minority opinion holders. Studies 1a and b showed that majorities were more motivated to process others' arguments when secret conversation opportunities were available (vs. not), provided these arguments contained unique (vs. shared) information and this information was offered by the minority (vs. majority). Study 2 demonstrated that this effect occurs because secret opportunities made majorities feel less powerful after being exposed to unique information from the minority (Study 2a), especially when majority members expected others to use these channels (Study 2b). Study 3 used an interactive group decision-making task and demonstrated that the increased majority motivation triggered by secret opportunities increased group decision quality. Study 3 also examined whether secret opportunities influence the minority and whether the effect is robust across different communication settings.

1. Introduction

Work groups are often split into a majority of people holding a particular viewpoint about priorities, interests, or agendas and a minority of people who have a different view. However, majority viewpoints are not always correct and work groups can benefit from minority opinion holders expressing their dissenting views. Indeed, groups with norms and processes in place that encourage both expression and consideration of dissenting minority viewpoints, regardless of their accuracy, tend to process information more thoroughly, are more creative, learn more during group deliberations, and make better decisions (De Dreu and West, 2001, Goncalo and Staw, 2006, Gruenfeld, 1995, Nemeth et al., 2001, Nemeth et al., 2001, Nemeth and Goncalo, 2011, Phillips, 2003; for reviews see Mannix and Neale, 2005, Wood et al., 1994).

Despite these potential benefits, minority opinion holders often fail to express their views (Asch, 1951) and even if they do, majorities tend to discount their views (Moscovici, 1980, Moscovici, 1985). One promising solution to this problem is virtual communication environments, in which members engage in text-based interactions via a computer network (Mesmer-Magnus, DeChurch, Jimenez-Rodriguez, Wildman, & Shuffler, 2011). That is, the absence of vocal and visual cues during virtual group discussions can increase the influence of minority opinions because their minority status is less salient (Siegel et al., 1986, Sproull and Kiesler, 1986). The decrease in status cues, in turn, can dampen the negative impact of stereotyping (Bhappu et al., 1997, Giambatista and Bhappu, 2010), reduce conformity pressures (Pissarra & Jesuino, 2005) and promote the expression of minority opinions (Weisband, Schneider, & Connolly, 1995).

At the same time, other studies show that virtual communication environments do not guarantee that majority opinion holders will actually consider these minority viewpoints because they lack the motivation to attend to the minority opinion (e.g. Bazarova et al., 2012, Hollingshead, 1996, McLeod et al., 1997). This suggests that although communication environments sometimes entice minorities to express their views, they can also make it easier for majorities to ignore minority viewpoints. Collectively, these findings beg the question of how communication environments motivate majorities to integrate minority opinions. With more motivated majorities, minority opinions that are critical for success might have a better chance of being heard. The goal of the present research is to answer this question.

Our theoretical model starts with the assumption that for dissenting minority views to be influential, majority opinion holders must be motivated to scrutinize information from the minority opinion holder (e.g. De Dreu, Nijstad, & van Knippenberg, 2008). Majority opinion holders often reject dissenting minority viewpoints to restore their dominance when their power is threatened (Jetten & Hornsey, 2014). After all, the power of the majority is dependent on the ability to maintain its influence such that the entire group feels the normative and informational pressures to remain in line with the majority (Deutsch & Gerard, 1955). Thus, if communication environments reduce the power of majority opinion holders, it could motivate them to examine dissenting views from the minority more carefully (Naquin et al., 2008, Naquin et al., 2010).

We investigate one feature of communication environments as a mechanism for motivating information processing by the majority opinion holders: *the opportunity to engage in secret conversations with other team members*. Examining the influence of secret conversation opportunities on team dynamics is critical because communication technologies are increasingly enabling group members to have simultaneous conversations in their online and face-to-face discussions (Cameron and Webster, 2011, Reinsch et al., 2008). We propose that secret conversation opportunities can reduce majority opinion holders' perceived control over the expression and integration of minority viewpoints. These reduced feelings of power, in turn, can motivate majorities to process minority opinions more deeply and positively affect group decision quality. Moreover, we propose that these differences in power are likely to emerge after information has been offered that is both unique (vs. shared) and emanates from the minority (vs. majority), as it challenges the status quo.

Our research is consequential for theory and practice. First, including communication channels in models of minority influence enriches our understanding of the factors that facilitate the processing of dissent. We identify a clear circumstance under which majorities are motivated to process dissenting minority viewpoints – when unique

information accompanies the minority viewpoint and there are secret conversation opportunities available. Although using various communication opportunities can undermine the stability of relationships (Cameron and Webster, 2011, Stephens, 2012), these opportunities may also positively affect decision-making. Specifically, we argue that by reducing control over the group discussion, secret opportunities motivate majorities to open their minds to minority viewpoints that would otherwise be ignored. Second, our research responds to a recent call for a more thorough understanding of dissent in groups (Jetten & Hornsey, 2014, p. 479). The combination of controlled group simulations and interactive group discussions allows us to make both theoretically sound and ecologically valid conclusions. Third, because teams have become more diverse and dispersed (Ng & Van Dyne, 2001), our findings enable organizations to manage their workforce more effectively and to reap the benefits of diverging perspectives.

1.1. The influence of minority and majority opinion holders

It seems self-evident that minority opinion holders are generally less influential than majorities because majorities are larger and more powerful (Latané & Wolf, 1981). Moscovici conducted a program of research, in which he highlighted the ways in which majorities and minorities influence each other (Moscovici, 1980, Moscovici, 1985). First, majorities can influence minorities by inducing *public compliance* because minorities desire to gain approval from the majority. Second, minorities can influence majorities through a process called *private conversion*. Private conversion elicits a change in majority member's private opinions without any publicly stated agreement with the minority viewpoint (Moscovici, 1980, Moscovici, 1985). Although public compliance and private conversion have been the focus of much past research on minority and majority influence, we believe that a third type of influence is important to understand – the public conversion of majority opinion holders. By public conversion we mean that majorities will scrutinize minority arguments and their own, and eventually change their publicly stated opinion in favor of the minority opinion.

Although the mere expression of dissent can suffice to increase majority attention to minority opinions, it rarely leads to public conversion (Wood et al., 1994). In fact, the communication literature found mixed support for minority influence, showing that online, virtual communication environments can facilitate the expression of the minority opinion holders' viewpoints (Weisband et al., 1995) but also decrease majority opinion holders' willingness to listen to these viewpoints (McLeod et al., 1997). This happens because majority members are often reluctant to change their minds in front of others and prefer to remain consistent with their publicly stated views (Cialdini and Goldstein, 2004, Staw, 1997). These findings raise the question – when are minority opinion holders influential in virtual communication settings? Research by De Dreu and colleagues suggests that minority influence depends on the majority's motivation to hear alternative viewpoints and only occurs when situational factors motivate majority members to deeply process and scrutinize minority opinions (De Dreu, 2007, De Dreu and De Vries, 1996, De Vries et al., 1996). Thus, the key to facilitating minority influence lies in motivating the majority opinion holders to process minority viewpoints more deeply and publicly reconsider their stance in the face of dissent.

1.2. Secret conversation opportunities, majority power and motivated information processing

We propose that the presence of secret conversation opportunities can motivate majorities to integrate unique minority viewpoints because it lowers their sense of power to control the communication process. By secret conversation opportunities we mean a communication setting in which individual team members can secretly communicate with each other while also being immersed in a conversation with all other members. The availability of new technologies in today's workplace facilitates such secret conversations. For example, secret conversations can take place using different communication channels when team members decide to covertly send text messages to others in a face-to-face meeting without the rest of the group being aware, or when managers instruct their employees to discuss their work with each other without telling them whom they should include in their conversations. Secret conversations can also take place within the same communication channel; for

example, when team members decide to send each other secret emails while having an email discussion with the entire team.

We propose that the presence of secret conversation opportunities can have important consequences for the influence of minority opinion holders because it lowers the feelings of power of the majority over the group discussion after they have been exposed to unique minority information. When engaging in a discussion with a dissenting minority member, majority members experience greater difficulty to act in a unified way and to achieve their goals (Jetten & Hornsey, 2014). To manage this difficulty, majorities tend to exercise control over the communication process, for example by refusing to fully consider the minority viewpoints in public discussions (Jetten and Hornsey, 2014, Prislin et al., 2000, Turner, 1991). Thus, public forums that provide insight into who communicates with whom and about what should make it easier for majorities to maintain control over the dominant opinion. In contrast, the presence of secret opportunities can make it more challenging for majorities to maintain their dominant view because it signals that they have less power over the communication process.

The notion that majority opinion holders experience less power when secret conversation opportunities are present and minority members offer unique information has important consequences for their motivation to attend to the minority opinion holders' views. The majority's motivation to attend to dissenting group members, search for additional information, and ask for explanations is likely to be higher when majorities feel less powerful. Indeed, the situated focus theory of power (Guinote, 2007, Guinote, 2010) suggests that the powerful focus their attention on themselves because they are less dependent on others to achieve their objectives. The powerless, on the other hand, depend on others in the pursuit of their goals and are thus more motivated to pay attention to external stimuli. Consistent with this theorizing, people who feel less powerful are less likely to treat others in stereotypical ways (Goodwin, Gubin, Fiske, & Yzerbyt, 2000), more likely to take others' perspectives (Galinsky, Magee, Inesi, & Gruenfeld, 2006), and engage in more effortful and systematic information processing than those who feel more powerful (Smith & Trope, 2006), which are all critical for making high quality group decisions (De Dreu et al., 2008).

There is suggestive evidence for our assertion that secret conversation opportunities should make majority opinion holders feel less powerful in the face of dissent and subsequently motivate them to process information more deeply. For example, the pressure to remain in line with the dominant majority opinion is weaker when individual decisions are made in private individual settings compared to public collective settings (Deutsch and Gerard, 1955, Janis, 1972). Likewise, ingroup critics face weaker censure and are rated less negatively when they make their comments in private rather than in public (Elder et al., 2005, Hornsey et al., 2007, Hornsey et al., 2005).

Thus, the greater individual freedom signaled by the opportunity for all group members to engage in secret conversations can make majority opinion holders feel less powerful when confronted with a dissenting minority. And because feelings of powerlessness increase more effortful and systematic information processing, the presence of secret conversation opportunities should motivate majorities to more deeply process unique information coming from minorities, ultimately increasing overall group decision quality. These arguments suggest that the mere presence of secret conversation opportunities (i.e., the *idea* that these channels could be used) should make the majority feel less powerful. Moreover, our theory implies that the presence of secret conversation opportunities should be particularly consequential for majority opinion holders because majorities are motivated more strongly to maintain their (powerful) position when they are exposed to a dissenting minority than minorities facing a dissenting majority (Turner, 1991, p. 102). In contrast, changes in power are unlikely to affect the extent to which minorities offer their unique views. Indeed, research has found no direct link between power and voice in group settings (Islam & Zyphur, 2005). Thus, secret communication opportunities are likely to undermine the power of the majority and make them more willing to consider the minority viewpoint, but unlikely to encourage the minority to speak up.

1.3. Effects of information uniqueness and provider status

Our theory predicts that the presence of secret conversation opportunities can reduce majority opinion holders' perceived control over the discussion, which, in turn, motivates them to process minority opinions more deeply and positively affect group decision quality. Moreover, our theory suggests that these differences in power are only likely to emerge after information has been offered that is both unique (vs. shared) and emanates from the minority (vs. majority) because this particular situation challenges the status quo.

The argument that majorities should only be more motivated to process others' opinions after exposure to unique minority information is supported by prior research. For instance, majorities may attend to unique rather than shared information because exposure to unique (but not shared) information stimulates divergent thinking (Nemeth, 1985, Nemeth, 1986) and promotes curiosity (Loewenstein, 1994, Loewenstein et al., 1992). Moreover, majorities are more likely to attend to unique information when it comes from the minority rather than the majority. For example, information coming from out-group members (i.e., minorities) is often considered with greater interest than information from in-group members (i.e., majorities) (e.g. Antonio et al., 2004, Kane, 2010, Kane et al., 2005, Phillips et al., 2006, Sommers, 2006). In addition, group members engage in more perspective taking and divergent thinking in the presence of others who hold a different opinion (Gruenfeld et al., 1998, Nemeth, 1992). Finally, groups of MBA students reacted more positively to dissenting opinions expressed by an out-group member (i.e., a medical student) than an in-group member (i.e., fellow-MBA students) (Phillips, 2003).

Thus, we propose that secret conversation opportunities only lower majority members' feelings of power and increase their motivation to process others' information after they have been exposed to information that is both unique (vs. shared) and provided by a minority (vs. a majority) (see Fig. 1 for a visual representation of our theoretical model). This reasoning is also consistent with findings in the communication literature showing that human behavior is typically driven by an interaction between communication channels and peoples' characteristics and relationships rather than by the mere presence of specific communication channels (e.g., Postmes et al., 1998, Swaab et al., 2012).

Fig. 1. Theoretical model.

1.4. Overview of hypotheses and studies

This reasoning leads us to the following hypotheses:

H1

The presence of secret conversation opportunities (a) increases majority opinion holders' motivation to process dissent after being exposed to unique minority information because (b) this makes the majority feel less powerful.

Because high quality group decision outcomes require systematic information processing (De Dreu et al., 2008), we further hypothesize that:

H2

The presence of secret conversation opportunities (a) facilitates increased group decision quality because (b) it motivates majority opinion holders to process unique information offered by the minority more deeply.

We test these hypotheses in five experiments. Studies 1a and b use a simulated virtual team discussion and examine how majorities' motivation to process information is influenced by the joint impact of secret conversation opportunities, the uniqueness of information, and the status of the information provider (Hypothesis 1a). Studies 2a and b examine the majority opinion holders' feelings of power as a mediating mechanism (Hypothesis 1b). Study 2a also aims to rule out the alternative explanations that secret conversations trigger a need to stand out or a stronger endorsement of diversity, and Study 2b tests if these effects are further moderated by others' intentions to make use of the secret channel. We suggest that secret opportunities are less likely to reduce majorities' feelings of power if they believe the opportunities will not be utilized. Finally, Study 3 establishes the ecological validity of our predictions by using an interactive group decision-making task that required majorities to incorporate minority arguments and engage in public conversion to make a high quality group decision (Hypothesis 2a). Study 3 also examines whether secret opportunities increase group decision quality because they motivate majorities to process information more deeply (Hypothesis 2b), whether these opportunities affect minority opinion holders, and whether these effects are robust across communication channels. Building on prior research on interactive group decision-making, we operationalize minority and majority status as team members' pre-discussion opinions (e.g. McLeod et al., 1997, Phillips, 2003, Sinaceur et al., 2010).[1]

2. Study 1a

2.1. Method

2.1.1. Participants and design

Eighty-five undergraduate students (55 men and 30 women; $M_{age} = 21.75$, $SD_{age} = 2.19$) at a French university participated in a study in exchange for €12. Participants came to the lab in groups of four to eight and were randomly assigned to a condition where they could only communicate publicly or a condition where they also had secret conversation opportunities available.

2.1.2. Procedure

2.1.2.1. Materials

Participants read a decision-making task adapted from McLeod and colleagues (McLeod et al., 1997) in their individual cubicle. Participants took the role of a board member of an investment company and evaluated two companies available for acquisition using a specified set of investment criteria. To help them evaluate these companies, participants were told that their in-house financial analyst and a highly respected and successful investment-consulting firm, both researched and analyzed each company, and were given their reports in their information packets. They were further told that they first had to make an individual decision about which company to acquire (Company A or Company B) and would then discuss the information and their choices collectively as a team. However, in reality, a computer program simulated their fellow team members. They were given 20 min for this individual task.

Because our goal was to test whether secret conversation opportunities increased majorities' motivation to attend to unique information offered by the minority, participants were always assigned to the role of the majority. We designed the task such that after reading the individual task participants chose the majority opinion, Company B, to be their preferred investment. Participants received a set of questions to increase the likelihood that they would choose Company B. Because our focus was on the majority, we excluded one participant who did not choose the majority opinion.

2.1.2.2. Assignment to simulated groups

Participants then logged into their workstation. During the first 30 seconds, they received a message on their screen indicating that the chat program was forming groups. Participants were led to believe that they were grouped with others currently in the laboratory. They then proceeded to the next phase where they were asked to submit their preferred company. Then, participants received feedback about the preferred choices of the other (simulated) team members and learnt that two others also preferred Company B (fellow majority opinion holders) and a fourth member preferred Company A (minority opinion holder). To emphasize the distinction between minority and majority opinion holders, we asked participants to identify how many people in their group chose the same company as they did. All participants indicated that there was a majority of group members who preferred Company B.

To emphasize the distinction between majority and minority opinion holders during their discussion, participants used a pseudo name including their preferred Company rather than their actual names. Participants were always named "Orange-B", the other (simulated) majority members "Yellow-B" and "Red-B", and the (simulated) minority member "Green-A".

2.1.2.3. Manipulation of secret conversation opportunities

After assignment to their simulated team, participants received instructions about the communication setting on their computer screen. When secret conversation opportunities were *unavailable*, participants read "On the right hand side of the screen, you and your group members have one chat window available. Chat window #1: Everything you write will be recorded and viewed by all group members."

When secret conversation opportunities were *available*, participants read "On the right hand side of the screen, you and your group members have two chat windows available. Chat window #1: Everything you write will be recorded and viewed by all group members. Chat window #2: Everything you write will only be viewed by the group members you specify. Other group members will not have access to the information exchanged, nor will they know that any other group members are in discussion."

2.1.2.4. Simulated interaction

After participants tested the chat window(s), they were told that one group member was randomly chosen to start the conversation. The simulated minority opinion holder was chosen to speak first. Then, participants saw the simulated minority member "typing" a message in the public chat that contained a piece of unique information that they did not have in their own information packet. Specifically, the minority said that the external consultants estimated the rate of return for Company B to be lower than the estimated return given by their own analysts. As the majority members only had access to the estimated returns from the internal analysts, the information provided was unique and complemented the information the majority opinion holders held. Immediately following the message from the simulated minority, participants were told that they were randomly chosen to respond using the chat window(s). Specifically, they were instructed to think about their response to the message by the (simulated) group member and were reminded that they should use the chat window(s) to do so. Participants' submitted responses were then stored and the group discussion terminated.

2.1.3. Measures

2.1.3.1. Manipulation check

To check the manipulation, we asked participants "Even if you did not do so, to what extent was it possible for you to communicate with a single group member without the rest of the group being aware of it?" (1 = *Not at all*; 7 = *Very much*).

2.1.3.2. Majority opinion holders' motivation to process information

Two trained coders independently evaluated participants' written responses in terms of their *motivation to process information*. Because a stronger motivation is reflected in a greater curiosity and willingness to scrutinize information (De Dreu et al., 2008), coders rated the extent to which majorities were curious to learn about the

unique information provided by the minority opinion holder on a five point scale, ranging from "Very curious" (5) such as "*I actually thought what Green pointed out was interesting since I didn't think of it like that initially.*" "*What do you guys think? Did anybody have similar info to me or Green?,*" to "Not at all curious" (1), including statements such as "*So I chose [Company] B as well. The information says that Company B has a higher growth rate and is a market leader with a name that is known to the public.*" The correlations between the coders' ratings were high ($r = .88$) and remaining discrepancies were resolved in conference with the two coders.

2.2. Results

2.2.1. Manipulation check

The manipulation of secret opportunities was successful. Participants reported that they had more possibilities to communicate with a single member without the rest of the group being aware of when secret opportunities were available ($M = 5.20$, $SD = 2.26$) than when they were not ($M = 2.12$, $SD = 1.82$), $t(76.70) = 6.86$, $p < .001$, $\eta^2 = .36$.

2.2.2. Majority motivation to process information

The results supported Hypothesis 1. After exposure to unique minority information, majority opinion holders were more motivated to process these viewpoints when secret conversation opportunities were available ($M = 2.17$; $SD = 1.41$) than when they were not ($M = 1.25$; $SD = .70$), $t(53.57) = 3.64$, $p = .001$, $\eta^2 = .15$.[2]

2.2.3. Secret conversation use

Two participants (2%) used the secret conversation opportunity. The significance and direction of the results did not change when we controlled for them. This suggests that the effects of secret conversation opportunities are not contingent on their actual use and that their mere presence after exposure to unique minority information can be sufficient to motivate majorities to process information more deeply.

2.3. Discussion

Study 1a supported our prediction that majority opinion holders are more motivated to process minority opinions when unique information is offered and secret conversation opportunities are available than when they are not. However, participants in Study 1a always responded to unique information coming from the minority. To further test the assumption that the presence of secret conversation opportunities increases majorities' motivation after they have been exposed to unique information by the minority, Study 1b manipulated the nature of the information (unique vs. shared) and the person providing this (minority vs. majority).

3. Study 1b

3.1. Method

3.1.1. Participants and design

Two hundred thirty-two undergraduate students (87 men and 145 women; $M_{age} = 20.18$, $SD_{age} = 1.29$) at a Midwestern university in the United States participated in the laboratory study in exchange for $15. Participants came to the lab in groups of four to eight and were randomly assigned to one condition of a 2 (secret conversations: available vs. unavailable) × 2 (provider status: majority vs. minority) × 2 (information offered: unique vs. shared) between subjects factorial design.

3.1.1.1. Procedure

Participants read the same decision-making task and followed the same procedure as in Study 1a. Similar to Study 1a, we only focused on the majority perspective and excluded five participants who did not choose Company B and two participants who did not identify that there was a majority of group members who chose the same company as they did.

3.1.1.2. Manipulation of secret conversation opportunity

Secret conversation opportunities were manipulated in the exact same way as in Study 1a.

3.1.1.3. Provider status manipulation

As in Study 1a, participants were told that one member of the group was randomly being chosen to start the conversation. In the *minority condition*, the simulated minority opinion holder was chosen to speak first, whereas in the *majority condition*, one of the simulated majority opinion holders was chosen. Then, participants saw the simulated group member "typing" a message in the public chat.

3.1.1.4. Information manipulation

The simulated group member provided information in the same way as in Study 1. Half of the participants received a piece of information that they did not have in their own information packet (*unique information condition*) while the other half received a piece of information they had already read (*shared information condition*).

Immediately after the message by the simulated group member was presented, participants were told that they were randomly chosen to respond to this statement using the chat window(s). Participants' responses were then stored and the group discussion terminated.

3.1.2. Measures

3.1.2.1. Manipulation checks

After submitting their response, participants completed three manipulation checks. The manipulation check for secret conversation opportunities was the same as in Study 1a. The manipulation check for information provider status asked participants "What was the initial acquisition preference of the person who first provided the group with additional information about their choice?" (possible responses: Company A or B). To check the manipulation of information uniqueness, we asked participants to what extent they viewed the information offered as similar to their own on a seven-point scale (1 = *Not at all*; 7 = *Very much*). Participants were then debriefed and received their compensation.

3.1.2.2. Majority opinion holders' motivation to process information

We measured this variable in the same way as in Study 1a. The correlations between the coders' ratings were high ($r = .83$) and the remaining discrepancies were resolved in conference with the two coders.

3.2. Results

3.2.1. Manipulation checks

The manipulation of secret opportunities was successful. Participants reported that they had more possibilities to communicate with a single member without the rest being aware of when secret opportunities were available ($M = 6.21$, $SD = 1.66$) than when they were not ($M = 1.54$, $SD = 1.37$), $F(1, 217) = 551.10$, $p < .001$, $\eta^2 = .72$.

The manipulation of provider status was successful. Participants in the majority condition (99%) indicated that the group member providing information also preferred Company B whereas those in the minority condition (99%) indicated that the group member preferred Company A, $\chi^2(1, N = 225) = 217.06$, $p < .001$.

The manipulation of information uniqueness was also successful. Participants in the unique information condition reported that the information provided by the other player was less similar to their own information ($M = 3.90$, $SD = 1.83$) than those in the shared information condition ($M = 6.22$, $SD = 1.53$), $F(1, 217) = 111.26$, $p < .001$, $\eta^2 = .34$.

3.2.2. Majority opinion holders' motivation to process information

A contrast analysis revealed strong support for Hypothesis 1 stating that majority opinion holders would be more motivated to process information in the presence of secret conversation opportunities after exposure to unique information coming from the minority ($M = 2.86$; $SD = 1.67$) than in any other condition ($M = 1.42$; $SD = 1.03$), $F(1, 215) = 40.31$, $p < .001$, $\eta^2 = .16$ (Fig. 2). The main effects for secret conversation opportunities, $F(1, 209) = 13.06$, $p < .001$, $\eta^2 = .06$, provider status, $F(1, 209) = 10.34$, $p = .002$, $\eta^2 = .05$, and

information uniqueness, $F(1, 209) = 13.38$, $p < .001$, $\eta^2 = .06$, were all significant, showing that majority opinion holders were more motivated when secret opportunities were available (vs. not), information was unique (vs. shared), and when this information came from the minority (vs. majority). The interaction effect between information uniqueness and information provider status was also significant, $F(1, 209) = 11.25$, $p = .001$, $\eta^2 = .05$, showing that motivated information processing was particularly high when unique information was provided by a minority member. No other effects were significant.

Fig. 2. Majority motivated information processing means by condition (Study 1b). *Note*. Majority opinion holders were more motivated to process information when secret conversation opportunities were available and minority opinion holders offered unique information than in all other conditions (all p's $< .01$). When secret conversations were unavailable, majority opinion holders were also more motivated to process information when minority opinion holders offered unique information than in all other conditions where secret conversations were unavailable (all p's $< .05$).
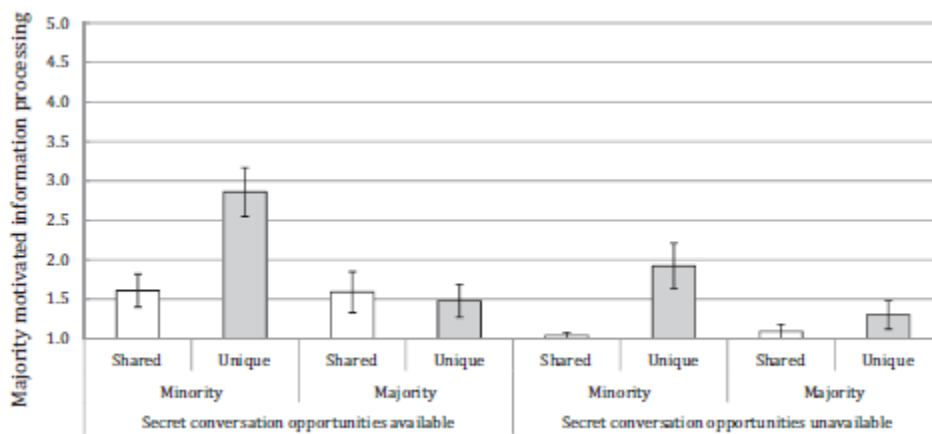
3.2.3. Secret conversation use

Fourteen participants (7%) used the secret chat opportunity. The direction or significance of the results did not change when we controlled for them. Within the secret conditions, chat use did not vary by provider status or information uniqueness (p's $> .20$).

3.3. Discussion

Studies 1a and b supported the theoretical model stating that majorities would be more motivated to process others' opinions when secret conversation opportunities are available and unique information is provided by the minority. Study 1b further showed that when secret conversation opportunities were unavailable, majorities were still more motivated to process unique (vs. shared) information coming from the minority (vs. majority). Although the majority members' motivation in this condition was significantly lower than in the same condition with secret opportunities (Fig. 2), this finding is consistent with research showing that majorities are more motivated to process unique information from out-group members (e.g. Loewenstein, 1994, Phillips, 2003), and our prediction that secret conversation opportunities reinforce this.

4. Study 2a

The aim of Study 2a was to replicate Study 1 and test whether secret conversation opportunities increase majorities' motivation to process dissent after exposure to unique information from the minority because this makes them feel less powerful (Hypothesis 1b). An alternative explanation for the finding in Study 1 is that the mere presence of secret opportunities primed majority members to see each other as a set of independent individuals rather than a unified majority faction, and therefore valued uniqueness or diversity more. Indeed, prior research has shown that features of the communication environment that individuate group members can lead to a

greater endorsement of uniqueness and diversity (Postmes et al., 1998) and motivate people to attend to dissent (Postmes, Spears, & Cihangir, 2001). Thus, Study 2a also tested whether majorities were more motivated to process minority information because the presence of secret opportunities led to a greater endorsement of uniqueness and diversity.

4.1. Method

4.1.1. Participants and design

Fifty-five undergraduate students (24 men and 31 women; $M_{age} = 21.56$, $SD_{age} = 2.09$) at a French university participated in the laboratory study in exchange for €12. Participants came in groups of four to eight to the lab and were randomly assigned to a condition where they could only communicate publicly or a condition where they also had secret conversation opportunities available.

4.1.2. Procedure

The task, procedure, and manipulation of secret conversation opportunities were identical to Studies 1a and 1b and translated into French. Participants interacted with a simulated majority and simulated minority who provided unique information. As in Study 1a and 1b, we excluded two participants who did not choose the majority opinion and two who did not identify that there was a majority who chose the same company as they did.

4.1.3. Measures

4.1.3.1. Manipulation check

Participants filled out the same manipulation check for secret communication opportunities as in Study 1a and 1b.

4.1.3.2. Mediating variable

After the minority opinion holder offered unique information but before participants had an opportunity to respond, we measured our mediating variable, power. We adapted four items from Schaerer, Swaab, and Galinsky (2015) (rate the extent to which you feel powerful; powerless [reversed scored]; in control; strong) using a 7-point Likert scale (1 = *not at all*, 7 = *very much*) and collapsed them to a single measure (Cronbach's $\alpha = .72$).

4.1.3.3. Alternative mechanisms

To test whether secret conversation opportunities primed the need to be unique and/or the endorsement of diversity, we measured each construct immediately after the introduction to the communication environment but before the minority opinion holder offered unique information. Need for uniqueness was measured using three items adapted from Lynn and Snyder (2002) (How much would you like to stand out within this group?; How much would you like to feel unique as you participate in this group?; How distinct and separate would you like to feel within this group?) on a seven-point Likert scale (1 = *Very much disagree*, 7 = *Very much agree*) (Cronbach's $\alpha = .87$). Diversity beliefs were measured using items adapted from van Knippenberg, Haslam, and Platow (2007) (Diversity of opinions is good for groups; I believe that diversity of opinions is good; I like to work with people with various opinions) on a seven-point Likert scale (1 = *Very much disagree*, 7 = *Very much agree*) (Cronbach's $\alpha = .84$).

4.1.3.4. Majority opinion holders' motivation to process information

Two coders independently coded all participant statements with respect to motivated information processing following the same procedure as in Study 1a and 1b. The correlations between the coders' ratings were high ($r = .83$) and the remaining discrepancies were resolved in conference with the two coders.

4.2. Results

Table 1 shows the inter-correlations between variables.

Table 1. Means, standard deviations, and correlations between variables in Study 2a.

	M	SD	1.	2.	3.
1. Power	4.45	1.15			
2. Need for uniqueness	4.31	1.41	.14		
3. Diversity beliefs	6.32	.80	−.07	−.07	
4. Majority information processing	1.81	.94	−.45**	−.18	−.22

* $p \leqslant .05$.
** $p \leqslant .01$.

4.2.1. Manipulation check

The manipulation of secret opportunities was successful. Participants reported that they had more possibilities to communicate with a single member without the rest of the group being aware of when secret opportunities were available ($M = 5.62$, $SD = 2.10$) than when they were not ($M = 1.88$, $SD = 1.56$), $t(49) = 7.19$, $p < .001$, $\eta^2 = .51$.

4.2.2. Mediating variables

After exposure to unique information coming from the minority, majorities felt significantly less powerful when secret conversation opportunities were available ($M = 4.10$; $SD = 1.13$) than when they were not ($M = 4.82$; $SD = 1.07$), $t(49) = 2.34$, $p = .023$, $\eta^2 = .10$. However, the need for uniqueness did not differ when secret conversation opportunities were available ($M = 4.28$; $SD = 1.26$) compared to when they were not ($M = 4.33$; $SD = 1.58$), $t(49) = .13$, $p = .90$, $\eta^2 = .00$. Majorities also did not differ in the strength of their diversity beliefs when secret conversation opportunities were available ($M = 6.22$; $SD = .92$) than when they were not ($M = 6.43$; $SD = .66$), $t(49) = .93$, $p = .36$, $\eta^2 = .02$. Thus, secret conversation opportunities did not prime a need for uniqueness or diversity beliefs. [3]

4.2.3. Majority motivation to process information

Support was found for Hypothesis 1a, stating that after exposure to unique minority information, majorities would be more motivated to process minority viewpoints when secret conversation opportunities were available ($M = 2.08$; $SD = .99$) than when they were not ($M = 1.50$; $SD = .82$), $t(45) = 2.18$, $p = .035$, $\eta^2 = .10$.

4.2.4. Mediation analyses

Support was also found for Hypothesis 1b, which stated that the effect of secret conversation opportunities on motivated information processing would be mediated by majorities' feelings of power. We ran a mediation analysis (Preacher & Hayes, 2004) to test whether there is a significant indirect path from secret conversation opportunities to motivated information processing. The result of 5000 resamples demonstrated that zero fell outside of the 95% confidence interval ($CI_{Low} = -.6401$; $CI_{High} = -.0513$). Thus, majorities were more motivated to process dissent because they felt less powerful (Fig. 3).
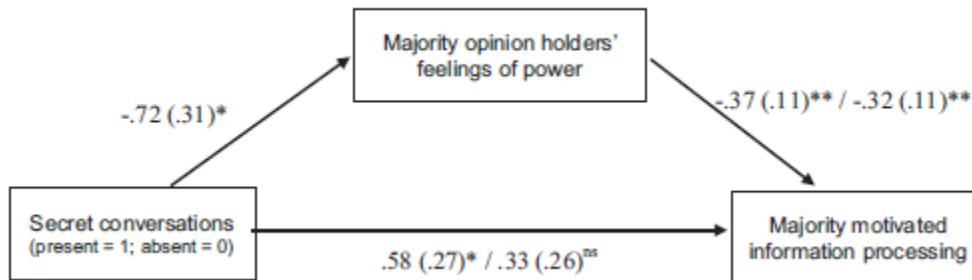
4.2.5. Secret conversation use

Only five participants (9%) initiated secret conversations. Despite a small drop for power (resulting in a $p = .069$ effect), the overall magnitude and direction of the results did not change when we controlled for these participants.

4.3. Discussion

Study 2a found that the opportunity for secret conversations motivates majorities to process unique information offered by the minority because their presence made them feel less powerful, and not because it primes a greater need for uniqueness or stronger diversity beliefs.

Fig. 3. Majority opinion holders' feelings of power mediated the relationship between secret conversation opportunities and motivated information processing (Study 2a). *Note.* Regression coefficients are unstandardized and SEs in parentheses. Coefficients to the right of the backslash represent simultaneous regression coefficients. * $p < .05$, ** $p < .01$.

5. Study 2b

The aim of Study 2b was to conceptually replicate Study 2a and test the idea that majorities feel less powerful because the presence of secret conversation opportunities after being exposed to unique information coming from the minority reduces their control over the communication process. To do so, Study 2b manipulated whether the other group members intended to use the secret opportunities or not. If the reduction in power is driven by lower perceptions of control over the communication process, secret conversation opportunities should only reduce majorities' power and increase their motivated information processing when others intend to use these opportunities, but not when others have no intention of using them.

5.1. Method

5.1.1. Participants and design

One hundred and fifty-three people (mean age = 35.87, *SD* = 12.44; 56.5% female) were recruited from Amazon's Mechanical Turk in exchange for $1.35 and randomly assigned to one of three conditions: (1) secret conversation opportunities unavailable, (2) secret conversation opportunities available and others do not intend to use these, (3) secret conversation opportunities available and others intend to use these.

5.1.2. Procedure

5.1.2.1. Materials

Because this study was conducted online, we developed a simplified and shorter version of the task used in the previous studies. Participants read a decision-making task asking them to recommend one of two job candidates for a sales position at a research institute. Participants took the role of a recruiting committee member and evaluated two candidates available for recommendation. They were told that they first had to make an individual decision about which candidate to recommend and would then discuss the information and their choices collectively as a team. In reality, their fellow team members were simulated by the online survey. Participants were always assigned to the majority opinion holder role. We designed the task such that after reading the information participants recommended the majority opinion, Candidate A.

5.1.2.2. Assignment to simulated groups

After participants recommended a candidate, they received a message on their screen indicating that the online program was forming groups. They then proceeded to the next page to submit their recommendation. Participants then received feedback on the preferred recommendation of the other (simulated) team members and learnt that two others preferred Candidate A (fellow majorities) and a fourth member preferred Candidate B (minority). To emphasize the distinction between majority and minority opinion holders, participants used a pseudo name including their preferred Candidate. Similar to the previous studies, we excluded eighteen participants who did

not choose Candidate A and four participants who did not identify that there was a majority who chose the same company as they did.

5.1.2.3. Manipulation of secret conversation opportunity

After assignment to their simulated team, participants read about the communication setting. When secret conversation opportunities were *unavailable*, participants read the same message as in the previous studies.

When secret conversation opportunities were *available and others' intended use was low*, participants first read the same message as in the secret conversation condition in the previous studies. They then indicated the likelihood that they would use these secret channels during the upcoming group discussion on a scale from 1 (not at all likely) to 7 (all the time). After this, participants received feedback showing that the other group members were not at all likely to use the secret opportunities. To make the false feedback more realistic, the (simulated) minority indicated 1/7 and the (simulated) majorities 1/7 and 2/7 respectively on the intended use scale.

Participants followed a similar procedure when secret conversation opportunities were *available and others' intended use was high*, with the only difference that they received (false) feedback that the other group members would use the secret opportunities: the (simulated) minority indicated 7/7 and the (simulated) majorities 7/7 and 6/7, respectively.

The simulated minority provided information that was unique and complemented the information from the majority opinion holders immediately after participants learnt the candidate recommendations of the others. Then, participants completed our dependent measures and subsequently responded to the unique information offered by the simulated minority (which we stored for content analysis). Finally, the interaction was terminated.

5.1.3. Measures

5.1.3.1. Manipulation check

Participants filled in the same check for secret communication opportunities as in the previous studies.

5.1.3.2. Mediating variable

After the minority opinion holder offered unique information but before participants had an opportunity to respond, we measured our mediating variable power with the same four items as in Study 2a (Cronbach's $\alpha = .84$).

5.1.3.3. Majority opinion holders' motivation to process information

Two coders independently coded all participant statements with respect to motivated information processing following the same procedure as in the previous studies. The correlations between the coders' ratings were high ($r = .92$) and the remaining discrepancies were resolved in conference with the two coders.

5.2. Results

5.2.1. Manipulation check

The effect of condition on the manipulation check was significant, $F(2, 127) = 60.67$, $p < .001$, $\eta^2 = .49$. Participants reported they had fewer opportunities to communicate with someone without the rest of the group being aware when secret opportunities were unavailable ($M = 2.47$; $SD = 2.04$) than when these opportunities were available and other intended use was either high ($M = 6.18$; $SD = 1.56$, $p < .001$) or low ($M = 6.07$; $SD = 1.72$, $p < .001$). There was no significant difference between the latter two conditions, $p = .77$.

5.2.2. Mediating variable

There was a significant effect of condition on feelings of power, $F(2, 128) = 5.94$, $p = .003$, $\eta^2 = .09$. After exposure to unique minority information, majorities felt less powerful when secret conversation opportunities were available and other intended use was high ($M = 3.91$; $SD = 1.40$) compared to when other intended use was low ($M = 4.51$; $SD = 1.19$, $p = .023$) or when secret opportunities were unavailable ($M = 4.77$; $SD = .95$, $p = .001$). There was no significant difference between the latter two conditions, $p = .30$ (Fig. 4, panel A).

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5.2.3. Majority motivation to process information

The overall effect of condition on majorities' motivation to process information was significant, $F(2, 115) = 5.94$, $p = .004$, $\eta^2 = .09$. After exposure to unique minority information, majorities were more motivated when secret conversation opportunities were available and other intended use was high ($M = 2.93$; $SD = 1.64$) compared to when other intended use was low ($M = 2.09$; $SD = 1.20$, $p = .007$) or when secret opportunities were unavailable ($M = 1.93$; $SD = 1.26$, $p = .002$). There was no significant difference between the latter two conditions, $p = .63$ (Fig. 4, panel B).

5.2.4. Mediation analyses

We examined whether majorities' feelings of power mediated the effect of the opportunity for secret conversations on motivated information processing (Hypothesis 1b). To do so, we dummy coded a contrast variable comparing the two conditions where secret conversation opportunities were available and others intended use was high (1) or low (−1). Zero fell outside of the 95% confidence interval for the indirect effect of power ($CI_{Low} = .0038$; $CI_{High} = .2105$) (Fig. 5). We also dummy coded a contrast variable predicting that majorities' power would be lower when they had secret conversation opportunities available and others intended use was high (2) versus low (−1) or when secret opportunities were unavailable (−1). Again, zero fell outside of the 95% confidence interval for the indirect effect of power ($CI_{Low} = .0016$; $CI_{High} = .1225$). Thus, majorities were more motivated to process dissent because they felt less powerful, especially when they expected others to use these opportunities.

Fig. 4. Majority feelings of power (panel A) and motivated information processing (panel B) by condition (Study 2b). *Note*. Majority opinion holders felt less powerful and more motivated to process information when secret conversation opportunities were available and intended use was high than in the other conditions (all p's < .05).
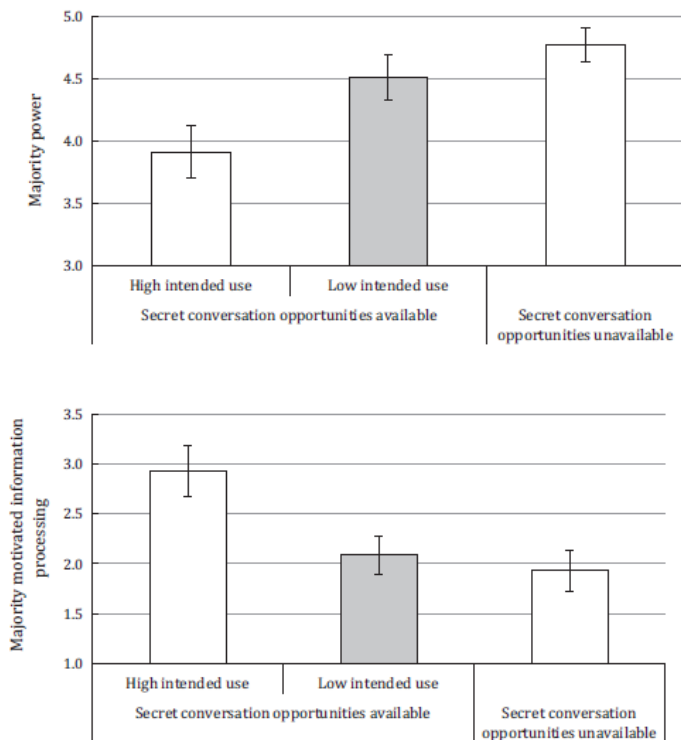
Fig. 5. Majority opinion holders' feelings of power mediated the relationship between other's intended use of secret conversation opportunities and motivated information processing (Study 2b). *Note.* Regression coefficients are unstandardized and SEs in parentheses. Coefficients to the right of the backslash represent simultaneous regression coefficients. * $p < .05$, ** $p < .01$.
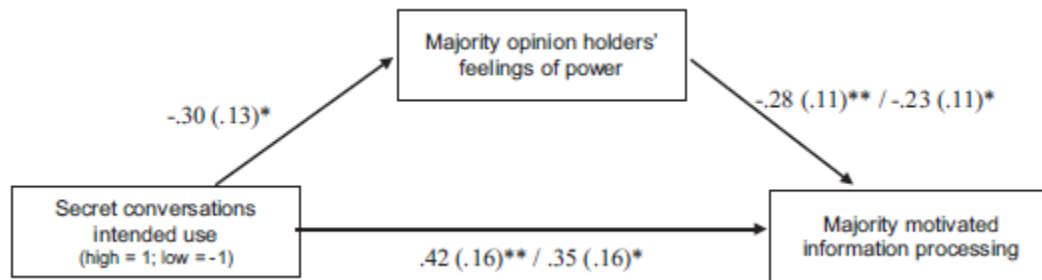
5.2.5. Secret conversation use

Six participants (14%) used a secret conversation when intended use was low and ten participants (20%) used the secret conversation when intended use was high, $\chi^2 = 1.38$, $p = .24$. However, the significance and direction of the results reported above did not change when we controlled for secret conversation use in our analyses.

5.3. Discussion

Study 2b replicated the effects from the previous studies and showed that after exposure to unique minority information, secret conversation opportunities increased the majority's motivation to process dissent, but only when participants thought that others would use the secret channel. Together, Studies 2a and 2b established power as a mediator, ruled out two alternative explanations (need for uniqueness, diversity beliefs), and identified an important boundary condition (intention to use the secret opportunity).

6. Study 3

Study 3 examined whether the findings in Studies 1 and 2 would also hold in an interactive context where the inclusion of minority opinion holders' information was critical to reaching a high quality group decision. In contrast to the previous studies that tightly controlled the behavior of minority opinion holders, we allowed minority behavior to vary freely to examine whether secret conversation opportunities also influence minority opinion holders.

Study 3 also sought to explore the impact of communication synchronicity – the pace at which the communication environment allows people to quickly assess, modify, and respond to a message (Dennis, Fuller, & Valacich, 2008). This is important because synchronicity is a structural feature that differs within various text-based virtual environments and is also likely to influence majorities' motivation to attend to the minority opinion. For example, whereas synchronous communication (e.g. instant messaging) increases openness to others' arguments and facilitates agreement (Loewenstein, Morris, Chakravarti, Thompson, & Kopelman, 2005), asynchronous communication (e.g. email) often results in online silences that tend to be interpreted too harshly by others and increase resistance to attend to others viewpoints (Byron, 2008, Panteli and Fineman, 2005), especially when these are expressed by low-status group members like minority opinion holders (Sheldon, Thomas-Hunt, & Proell, 2006). Given the setup of Studies 1 and 2 it is not clear if the positive impact of secret communication opportunities will hold across synchronous and asynchronous settings. Thus, an additional aim of Study 3 was to test whether secret conversation opportunities motivate majority opinion holders to process minority opinions more deeply across both synchronous and asynchronous virtual team settings.

Study 3 tested the prediction that high quality group decisions would be more likely to emerge when secret conversation opportunities are present than when they are not (Hypothesis 2a) and examined whether this effect remains robust across both synchronous and asynchronous communication channels. Because our key dependent variable so far – motivated information processing – is causally linked to high quality decisions (De Dreu et al., 2008), we also tested whether the effects of secret opportunities and synchronicity on decision quality were mediated by majority opinion holders' motivated information processing (Hypothesis 2b).

6.1. Method

6.1.1. Participants and design

One hundred and ninety-seven undergraduate and graduate students at a Midwestern University in the United States (99 men, 96 women, 2 unidentified; M_{age} = 20.02, SD_{age} = 3.13) participated in this laboratory study and received $15 for their participation. Individuals were assigned to 4-person virtual teams with a majority and a minority faction for a total of 50 teams. Teams were randomly assigned to experimental conditions in a 2 (secret conversation opportunity: available vs. unavailable) × 2 (communication synchronicity: asynchronous vs. synchronous) between-subjects factorial design. Due to scheduling problems it was not possible to have 4 people in all teams and an even number of teams per condition. There were five 3-person teams (with 1 minority and 2 majorities) and two 5-person teams (with 1 minority and 4 majorities), for which we controlled in all analyses. Omitting oddly sized teams did not change the direction or the significance of the findings reported below.

6.1.2. Procedure

6.1.2.1. Materials

Participants read a hidden profile task adapted from McLeod and colleagues (McLeod et al., 1997). Team members took the role of the board of directors of the ACME (Acquiring Companies Means Employment!) Investments Company to evaluate three companies available for acquisition. The team's task was to provide a rank ordering of the three companies' acquisition desirability to their CEO, using a specified set of investment criteria.

The task was designed such that the full set of information represented Company A as the best investment, followed by Company C and Company B. A hidden profile was created among the information that was shared and unique such that before team discussion, 3 of the 4 team members would rank order the companies B > C > A and the 4th member would favor the correct rank order, A > C > B. The minority opinion holder held all unique information necessary to make the best investment (Company A). Furthermore, participants were given a set of questions about the information provided to maximize the likelihood that they would process the information thoroughly and choose the designated rank order.

6.1.2.2. Team formation

After participants were seated in the laboratory they were provided copies of the task materials. The minority opinion holder was selected randomly. The participants were allowed 20 min to individually read the instructions and the company profiles, and then provided their private opinions of the rank ordering of the three companies. After members ranked the companies individually, their preferred choice was made public by including it in their pseudo name that was visible during the group discussion. For example, the minority opinion holder in team 4 received a screen name of "4-Green-A" and the three majority opinion holders "4-Orange-B", "4-Yellow-B", and "4-Red-B." The public disclosure of team members' initial preferences made opinion differences (i.e., majority vs. minority) clearly visible and enabled participants to identify majority opinion holders or minority opinion holder at all times during the discussion. We only ran the experiment when we had at least two teams present to avoid any suspicion that they were communicating with someone they had met while entering the lab. Participants could not verbally communicate with anyone during the study.

Participants were allowed 45 min for their discussion. A 10-min warning was given after 35 min. At the end of the discussion, group decisions were recorded and participants were debriefed and thanked for their participation.

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6.1.2.3. Manipulation of communication synchronicity

Synchronicity was manipulated using a software package developed to facilitate various forms of virtual team communication. For the *synchronous* conditions, we used the synchronous chat function.

In the *asynchronous* conditions, we used prefixed email accounts, which allowed us to simulate the nature of email communication.

6.1.2.4. Manipulation of secret conversations

When secret conversation opportunities were *unavailable*, all participants could see what the other team members wrote. Specifically, participants were told that "You cannot leave your (chat) room (email). Everything you write in the chat room (email) will be viewed by all parties in your discussion". In the synchronous communication condition, participants were only able to communicate in a public chatroom and in the asynchronous communication condition, participants could only send email to all others in the group by pressing a "reply to all" button. Thus, participants in these conditions were always aware of who said what to whom throughout their entire interaction.

When secret conversation opportunities were *available*, participants could also send individual messages to group members. Specifically, participants were told that "You have two opportunities to communicate with the other people in your group—you can chat in the common public chat room (email) or you can chat in a private chat room (email) with any of the other group members. The other people in the group will not have access to the information exchanged in this private chat room (email), nor will they know that an instant message (email) was sent or that an instant message (email) was received by the other party." Those using the synchronous medium had access to individual chatrooms to communicate with any (subset of) group member(s) in addition to their public chatroom. Those using the asynchronous medium could send individual emails to whomever they wanted without copying others in the team in addition to their public responses. Thus, if any members wanted to leave the public meeting space to talk secretly, the content of their communication remained in their secret conversational space. Importantly, team members were not informed when participants left for a secret conversation.

6.1.3. Dependent measures

6.1.3.1. Minority opinion holder expression

Minority opinion expression was operationalized by counting the total number of unshared pieces of information about Company A in the transcripts. We also measured the number of times these different pieces were repeated. The first measure represents information coverage, and the second persistence (McLeod et al., 1997).

6.1.3.2. Majority opinion holders' motivation to process information

To code majority opinion holders' motivation to process information, we examined the number of questions majority opinion holders raised about the minority viewpoint during the interaction, a behavior during the group interaction that would signal the extent to which majorities were motivated to achieve a rich and accurate understanding of the minority viewpoint (De Dreu et al., 2008). Specifically, two coders blind to the hypotheses coded motivated information processing by counting the number of questions majority opinion holders asked about Company A (i.e., the minority opinion) and about the information distribution, such as "*so you say A is better because there is more room for improvement long term?," "Green, do you have the same information as me?," "Do you think we all got different information ... or maybe just Green got diff info?,"* and *"do you guys have any information that I don't have?."* The correlation between the two coders' ratings was high ($r = .94$) and the remaining discrepancies were resolved in conference with the two coders. Five transcripts (3 in the asynchronous no secret condition, 2 in the asynchronous secret condition) were not captured because of malfunctioning of the program.

6.1.3.3. Group decision quality

Group decision quality was measured using the final decision made by the entire team. The influence of minority arguments was reflected in a higher quality decision because the correct answers could only be achieved after

team members incorporated the information contributed by the fully informed minority. Following McLeod et al. (1997), we created a variable capturing group decision quality based on the final company rank order. The two rank orders placing Company A first (A > C > B and A > B > C) were assigned values of 6 and 5 respectively. The two rank orders placing Company C first (C > A > B and C > B > A) were assigned values of 4 and 3 respectively. The two rank orders placing Company B first (B > A > C and B > C > A) were assigned values of 2 and 1 respectively. Teams that did not reach consensus were assigned a value of 0, because the purpose of the exercise was to make a recommendation (vs. impasse). Larger values indicated higher quality decisions. Because higher scores required majorities to scrutinize minority arguments and their own, and eventually change their publicly stated opinion, higher group decision quality reflected greater public conversion.

6.2. Results

Table 2 shows the inter-correlations between variables. To be sure that differences in our count variables could not be attributed to the fact that some teams exchanged more information than others, we controlled for the total number of words used during their discussion.

Table 2. Means, standard deviations, and correlations between variables in Study 3.

	M	SD	1.	2.	3.	4.	5.
1. Minority preference count	2.85	1.41					
2. Minority preference repetition	1.90	2.64	.40**				
3. Majority information processing	4.36	4.00	.28	.31*			
4. Group decision quality	2.24	1.66	.34*	.16	.57**		
5. Word count	1368.49	631.00	.22	.38*	.48**	.12	
6. Team size	3.94	.37	.21	.04	.04	−.01	−.04

* $p \leqslant .05$.
** $p \leqslant .01$.

6.2.1. Minority opinion holder expression

Neither manipulation had an effect on the number of pieces of unshared information the minority opinion holder presented about Company A (all p's > .21). The interaction effect was also not significant. Likewise, no main and interaction effects were found for the opportunity for secret conversations and communication synchronicity on the repetition of this information by the minority (all p's > .23). Thus, the expression of minority opinions did not differ by experimental condition.

6.2.2. Majority opinion holders' motivation to process information

Support was found for Hypothesis 1a. Majority opinion holders were more motivated to process information from the minority opinion holders when opportunities for secret conversations were available ($M = 6.35$; $SD = 4.23$; when synchronous $M = 7.53$; $SD = 4.17$ and when asynchronous $M = 4.13$; $SD = 3.56$) than when they were not ($M = 2.90$; $SD = 2.77$; when synchronous $M = 4.09$; $SD = 3.05$ and when asynchronous $M = 1.44$; $SD = 1.51$), $F(1, 37) = 5.94$, $p = .020$, $\eta^2 = .14$. In addition, majority opinion holders in the synchronous communication conditions were more motivated to process information from the minority opinion holder ($M = 6.08$; $SD = 4.06$) than those in the asynchronous communication conditions ($M = 2.71$; $SD = 2.93$), $F(1, 37) = 15.26$, $p < .001$, $\eta^2 = .29$. The interaction effect was not significant.

6.2.3. Group decision quality

Support was found for Hypothesis 2a. Group decision quality was higher when opportunities for secret conversations were available ($M = 2.70$; $SD = 1.77$; when synchronous $M = 2.73$; $SD = 1.57$ and when asynchronous $M = 2.67$; $SD = 1.88$) than when they were not ($M = 1.70$; $SD = 1.36$; when synchronous $M = 2.55$; $SD = 1.21$ and when asynchronous $M = .92$; $SD = 1.00$), $F(1, 46) = 4.97$, $p = .031$, $\eta^2 = .10$. In addition, a marginally significant effect was found for communication synchronicity, showing that group decision quality was also higher in the synchronous conditions ($M = 2.65$; $SD = 1.52$) than in the asynchronous conditions ($M = 1.79$; $SD = 1.72$), $F(1, 46) = 3.80$, $p = .057$, $\eta^2 = .08$. Finally, the interaction effect was marginally significant, showing that the effect of secret opportunities on group decision quality was stronger for the asynchronous condition than the synchronous condition, $F(1, 46) = 3.23$, $p = .079$, $\eta^2 = .07$.[4,5]

6.2.4. Mediation analyses

We examined whether majorities' motivated information processing mediated the effect of the opportunity for secret conversations and communication synchronicity on group decision quality. To do so, we dummy coded a contrast variable predicting that majorities' motivated information processing would be greater when teams had secret conversation opportunities available and when communication was synchronous. The result of 5000 resamples demonstrated that zero fell outside of the 95% confidence interval for the indirect effect of majorities' motivated information processing ($CI_{Low} = .1340$; $CI_{High} = .5343$). Majorities' motivated information processing also mediated the effect of secret conversations on group decision quality when excluding impasses ($CI_{Low} = .1518$; $CI_{High} = .6041$). These results support Hypothesis 2b, stating the opportunity for secret conversations increases decision quality because they motivate majorities to process information more deeply.

6.2.5. Secret conversation use

Again, only a small subset of team members actually used secret conversations (11.96%). Of the people that did, majorities (80%) were more likely to initiate this than minorities (20%). There were no differences for synchronicity. The significance and direction of results did not change when we controlled for the use of secret conversations.

6.3. Discussion

Study 3 replicates the finding documented in the previous studies, showing that secret conversation opportunities motivate majorities to process unique information offered by minorities. Moreover, Study 3 shows that this effect holds in an interactive group decision-making context, is robust across synchronous and asynchronous channels, and consequential for the final group decision: High quality group decisions were more likely to emerge when secret opportunities were present than when they were not and these effects were driven by majorities' motivated information processing, not because the minority participated more.

7. General discussion

Prior research has demonstrated that communication environments can increase the influence of minorities because their status is less salient (Bhappu et al., 1997) and thus facilitates minority opinion expression (Weisband et al., 1995). Yet, other studies have shown that these environments do not guarantee that majorities will actually adopt minority viewpoints because majorities are not motivated to do so (e.g. McLeod et al., 1997). The goal of this paper was to resolve this contradiction and answer when and why majority opinion holders integrate the views of minority opinion holders into their team discussions. We proposed and found that if the communication environment is designed in a way such that it reduces the power of the majority opinion holders, majorities are more motivated to listen to the minority opinion holder. We examined one such design feature of communication environments – the opportunity to engage in secret conversations with selected team members while also being immersed in a conversation with all other members.

We found robust support for our theory that the mere presence of secret conversation opportunities can reduce majority opinion holders' feelings of power and lead them to be more motivated to process dissent after exposure to unique information coming from the minority. Studies 1a and b established the causal effects of secret conversation opportunities on majority information processing after being exposed to unique information offered by a minority member. Studies 2a and b replicated these findings and also showed that secret conversation opportunities increased the majority's motivated information processing after exposure to unique minority information because it made them feel less powerful. Study 3 replicated these effects in an interactive group decision-making context and demonstrated that the effects on majorities' motivated information processing were robust across different communication channels and consequential for the quality of the final group decision.

7.1. Theoretical contributions

Our findings contribute to theory and research on communication, minority influence, diversity, and power in a number of important ways. First, the focus on secret opportunities in the current research is different from the focus on private opportunities in prior research (Swaab, Phillips, Diermeier, & Medvec, 2008). While during private communication other group members are aware that communication is occurring and between whom the conversation is taking place, secret conversations allow group members to engage in covert discussions completely outside the awareness of others and are more likely to mirror the reality in today's workplace. Second, the present research not only focused on group outcomes but also examined how conversation opportunities affect the psychological experience of majority opinion holders and the decision making process. Third, our studies identify important boundary conditions of secret opportunities and rule out alternative explanations.

Although our findings are consistent with prior research showing that peoples' behaviors are driven by an interaction between both the communication environment and group member characteristics and relationships (e.g., Postmes et al., 1998, Swaab et al., 2012), they also extend minority influence research on virtual communication environments (e.g. Bazarova et al., 2012, McLeod et al., 1997) by showing that majorities are motivated to listen to minority viewpoints when they feel less powerful, which can be triggered by features such as secret conversation opportunities. Interestingly, the opportunity to engage in secret conversations after the exposure to unique minority information was sufficient to influence majorities' feelings of power and motivated information processing. The fact that participants rarely used this opportunity, yet behaved very differently from those for whom these channels were unavailable, suggests that secret opportunities affect the psychological experience of being in the majority. This is consistent with research showing that technological configurations can accentuate social boundaries between group members and influence their interaction (Postmes et al., 1998, Swaab and Swaab, 2009). Finally, our findings extend multicommunication research by identifying positive effects of secret conversations for group decision-making, as opposed to its disruptive impact (Cameron & Webster, 2011).

To the minority influence literature, our findings suggest that communication conditions play an important role in shaping majority opinion holders' motivation to systematically process information from the minority opinion holder and to publicly converge. The results, especially of Study 3, which showed that communication conditions did not increase minority opinion expression but majority members' systematic information processing, provide support for the view that minorities are only influential when majorities are motivated to attend to their arguments (De Dreu, 2007, De Vries et al., 1996). Importantly, our findings extend this literature by suggesting that secret conversation opportunities further enhance this motivation after exposure to unique minority information because they lower majorities' feelings of power and increases their willingness to publically converge (i.e., higher quality group decisions).

Our findings are consistent with research on diversity in groups (Phillips, 2003, Phillips and Loyd, 2006, Phillips et al., 2006) showing that unique information can easily get lost in situations where individuals think alike. Our findings also extend this research by showing that unique information is more likely to be considered when it comes from an out-group member (i.e. minority opinion holder) and when the communication environment reduces the majority's feelings of power. The finding that unique information offered by a majority member did not lead to greater information processing (Study 1b) helps explain why groupthink (e.g. Janis, 1972) occurs even

when individuals in the group might have access to the unique information. Unique information never gets integrated, even if it is shared as it was in Study 1b, because it is not seen as novel or as useful as it really is.

7.2. Implications, limitations and questions for future research

Our findings have implications for managing team discussions as the availability of technology in the workplace often facilitates secret conversation opportunities and group members are not always aware of this. For instance, when managers expect majority and minority factions to emerge and unique perspectives need to surface to make better decisions, they may want to emphasize the various conversation opportunities that team members have in order to limit the majority's powerful position. Vice versa, when managers seek compliance to a majority opinion, they may want to enhance the majority's dominance by limiting team members' use of secret conversation opportunities. Future research could also examine the negative effects of secret conversations. For example, knowingly having secret conversations may reduce group cohesion or even trigger retaliatory responses from majority members.

The current research also has limitations that are important to address in future research. Although the creativity literature makes a distinction between ideas that are novel and/or useful (Amabile, 1983), the present research leaves the relative importance of each dimension unclear because the information offered by the minority was both novel and useful. Future research that manipulates these dimensions independently is needed to provide more conclusive answers. It is likely that information is most consequential for group decisions when it is both novel and useful because this captures majorities' attention as well as helps them make higher quality decisions. Because we based minority and majority status on participants' pre-discussion opinions, it remains unclear whether our effects also hold in situations where members of face-to-face teams express dissenting opinions or where minority status is based on surface level characteristics (e.g. gender, ethnicity). Our theoretical model suggests that the effects of secret conversation opportunities should hold as long as the information provided is perceived as novel and/or useful and minority and majority factions are experienced as relevant. Future studies could manipulate the status of minority opinion holders to test whether secret conversation opportunities have an even stronger effect when minorities have high, rather than low, status. Although the present research focused on the effect of secret opportunities on majorities, future research could also more thoroughly examine their impact on minorities. On the one hand, minorities might be even more vocal when secret opportunities are available, sensing an increased power given the decreased power of the majority. On the other hand, minorities might find secret opportunities threatening because they fear the potential for majority members to build coalitions in the secret communication channels that would solidify their majority stance (an explanation consistent with Study 3 as minorities were less likely to initiate secret chats than majorities). Thus, further research on the psychology experienced by the minority in the face of secret conversation opportunities may prove fruitful.

One interesting finding that emerged from our studies is the fact that secret conversation opportunities were rarely used. Although our theory suggests that the mere presence of such opportunities combined with the exposure to unique minority information lowers the majority's power, future research could test whether the actual use would lead to different findings. Similar to the research showing that the use of multiple communication opportunities undermines stable relationships (e.g., Cameron & Webster, 2011), it is possible that actually using secret conversations could have the opposite effect and make majority opinion holders more reluctant to consider minority viewpoints. Identifying when team members use secret conversations may also be an interesting area for future research. It is likely that the effects of secret opportunities are particularly strong during the early stages of the interaction because pressures to conform are particularly strong when the group has just formed (Agazarian and Gantt, 2003, Worchel, 1998), dissent is more likely to be viewed with suspicion early rather than late (Rink and Ellemers, 2009, Van Dyne and Saavedra, 1996), and communication channels have a more direct impact on behavior in the absence of any pre-existing relationships (Swaab et al., 2012).

Because our studies all used virtual formats, future research might consider how our findings extend to face-to-face discussions. Although prior research has found that expectations triggered by the communication environment have similar effects in face-to-face and online settings (Postmes et al., 2001), online communication makes information exchange more difficult (Swaab et al., 2012) and social boundaries between the ingroup and

outgroup more salient (Postmes et al., 1998). These findings suggest that secret conversation opportunities affect both online and face-to-face communication, but affect virtual communication more strongly.

7.3. Conclusion

Making sure minority viewpoints get heard in discussions can be critical for group performance. Communication settings have been found to increase the expression of minority viewpoints but also decrease the influence of their arguments. The present research focused on understanding how to facilitate *public conversion* of the majority. Combining insights from the literatures on dissent in groups and minority influence, we proposed that secret conversation opportunities lead majority opinion holders' to feel less powerful over the communication process which motivated them to actively search for additional information when confronted with unique information from a minority opinion holder. This focus on majority opinion holders' willingness to process minority opinion holders' viewpoints is critical because even if minority views are expressed they can only be influential if the majority is willing to hear them.

Appendix A

For exploratory purposes, we also included other established scales across studies to address reviewers' concerns and rule out alternative mechanisms. To assess reactions to the secret opportunities prior to minority information exposure, we included personal autonomy (Sheldon & Bettencourt, 2002, Studies 1a and 2a), horizontal individualism (Triandis & Gelfand, 1998, Studies 1a and 2a), receptiveness (Alderton & Frey, 1983, Studies 1a and 2a), and group identification (Postmes, Spears, & Lea, 1999, Studies 1a and 2a). There were no significant effects of secret conversation opportunities for any of these scales. To capture majorities' reactions after the exposure of minority information, we included information usage (Dennis, 1996, Studies 1a and 2a), warmth (Fiske, Cuddy, Glick, & Xu, 2002, Study 1b), and competence (Fiske et al., 2002, Study 1b). There were no significant effects of secret conversation opportunities for any of these scales.

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