Group Composition and Confidence in Deliberative Group Discussions:

The Moderating Role of Gender

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PSB3E-BT15: Bachelor Thesis

Group number: 20

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June 26, 2025

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Abstract

In citizen assemblies, where equal participation is a central goal, confidence can play a role in who speaks and who remains silent. This study explores how group composition affects individuals' confidence to contribute in small, deliberative group discussions, with gender as a moderating factor. Participants ($N = 36$), mostly university students, took part in citizen-assembly style discussions on university budget cuts. Each participant took part in both a homogeneous (same-gender) and a heterogeneous (mixed-gender) discussion and reported their confidence after each discussion. Results revealed no statistically significant difference in confidence between homogeneous and heterogeneous groups, nor a significant interaction between gender and group composition. However, trends suggested that women tended to report higher confidence in all-female groups compared to mixed gender groups, while men's confidence remained stable across conditions. These findings indicate that all-female groups may foster greater confidence among women, but further research is needed to draw firm conclusions. As the study had a small sample size and was exploratory in nature, the results should be interpreted with caution.

Keywords: confidence, gender differences, citizen assemblies, deliberation, group composition, group discussion, participation

Group Composition and Confidence in Deliberative Group Discussions:

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Citizen assemblies are one of the clearest examples of deliberative group discussions – spaces meant to give everyone an equal say in decisions that affect their community. And in recent years, they regained attention as a tool for public decision-making. From climate policy to questions about national identity and global influence, governments are using these assemblies to involve ordinary people directly in shaping outcomes (Pilet et al., 2022). Yet, often only a few voices dominate the conversation. While some individuals confidently speak up, others hesitate, leading to no contributions to the matter. What determines who speaks up, and who stays silent?

Research shows that those who struggle the most with this are marginalized groups, including disabled individuals, older people, generally those considered "other", and women (Barnes et al. 2003).

Confidence is a key factor influencing deliberative group discussions, shaping who speaks, whose ideas are heard and ultimately, how decisions are made (Stadelmann-Steffen & Dermont, 2015). Notably, confidence does not always reflect competence – highly confident individuals can shape group decisions, even when their knowledge is limited (Fu et al., 2017). Conversely, less confident individuals may contribute less to discussions, even though they can add valuable insights and new perspectives (Fu et al., 2017).

Group composition has been shown to affect confidence levels in discussions. Studies indicate that being either in homogenous or heterogenous groups influence participants' confidence to speak, their perceived efficacy, and their ability to shape discussions (Greenwood et al., 2014; Kerschreiter et al., 2008; Sim, 1998). For example, people of the same ethnicity were found to feel more comfortable discussing with each other than in mixed-ethnicity groups (Greenwood et al., 2014).

Additionally, previous research finds that gender plays a role in confidence levels, with men reporting greater confidence than women, while others find that both men and women tend to exhibit overly high confidence (Bandiera et al., 2022; Born et al., 2020). They suggest that differences in confidence levels are quite context specific and cannot be generalized based on gender. Stadelmann-Steffen and Dermont (2015) argue that although women attend citizen assemblies at similar rates as men, their active participation tends to be much lower, partly due to a bigger fear of speaking up.

Given the mixed findings and limited research on group composition, deliberative settings, and gender, it is crucial to further investigate how these factors interact. This paper explores how confidence shifts across group compositions, with a focus on gender, to identify conditions that foster more inclusive citizen assemblies where everyone feels confident to participate.

The Role of Confidence in Group Discussions

Confidence has been defined in numerous ways throughout literature. These definitions generally include the belief in the accuracy or reliability of one's judgements or decisions, regardless of their actual correctness, and shaped by external factors, such as feedback, past experiences and environment (Perry, 2011; Sniezek, 1992). The concept also encompasses "self-confidence", referring to an intrinsic and generalized belief in one's own abilities and opinions, which is less reliant on external input and closely related to self-esteem. Higher self-confidence typically contributes to overall, context-independent confidence levels (Greenacre, 2014; Perry, 2011). However, confidence is also described as dynamic and can shift based on contextual factors (Perry, 2011). In this thesis, "confidence" is used as a general concept, including both general self-confidence and situational confidence. The primary focus, however, is on context-dependent expressions of confidence during deliberative group discussions, recognizing that these dimensions often overlap in practice.

In deliberative settings, such as citizen assemblies, confidence acts as a key communication tool. It shapes how much weight an individual's opinions carry in decision-making, as well as how others judge the credibility of a speaker (Bang et al., 2017). Research by Zarnoth and Sniezek (1997) demonstrates that self-reported confidence strongly predicts an individual's influence within a group. Highly confident participants are more likely to have their contributions accepted and to resist group pressures, even when their views differ from the group norm. Sekerdej and Szwed (2021) further emphasize that confidence is crucial for individuals to speak out against their group, especially when disagreeing with group norms or decisions. Similarly, Stadelmann-Steffen and Dermont (2015) highlight that confidence is especially important for active participation in deliberative settings – not only for speaking up, but also for influencing the direction of debate and persuading others. Together, these findings suggest that confidence not only shapes group acceptance but also determines who is willing to challenge established group views.

The strength and implications of confidence can also vary according to task type. Zarnoth and Sniezek (1997) found that the increased confidence has a stronger effect on intellective tasks, which involve right or wrong answers. Conversely, Trouche et al. (2014) found a stronger confidence effect in judgmental tasks, where subjective opinions are the focus. Supporting this view, Schwardmann and Van Der Weele (2019), emphasize that high confidence is more common in situations where abilities are difficult to measure and where persuasion is crucial. This is often the case in citizen assemblies, especially when it comes to decision-making and consensus-seeking. Furthermore, excessive confidence paired with limited competence can harm decision-making outcomes. In group contexts, this can lead to the dominance of overconfident individuals, overshadowing less confident individuals who may otherwise contribute valuable insights and diverse perspectives (Fu et al., 2017).

Collectively, this literature demonstrates that confidence clearly plays a central role in shaping participation and influence within group discussions. Simply having a diverse group does not guarantee equal participation or influence in group outcomes. Confidence levels can vary based on contextual factors, such as group composition, which can either encourage or inhibit individual contributions. This highlights the need to better understand how such factors affect confidence, particularly in deliberative settings like citizen assemblies, where inclusive and balanced participation is crucial.

Group Composition and Confidence

Group composition can play an important role in shaping individuals' confidence to contribute to discussions. One factor closely linked to confidence is interpersonal comfort – the degree to which people feel safe and at ease when expressing themselves in a group (Yarker, 2017). Higher comfort levels are associated with greater willingness to share opinions, especially on sensitive issues. One element that influences interpersonal comfort is the homogeneity and heterogeneity of a group, referring to the similarity or dissimilarity of group members based on characteristics such as background, personality and attitudes (Kandell, 1992; Kerschreiter et al., 2008).

These group dynamics may also impact individuals' confidence to speak. People in homogeneous groups may feel more aligned with others' views, adding to a greater sense of belonging and higher perceived confidence. Grønkjær et al. (2011) note that a certain degree of homogeneity is essential for group interaction and dynamics, as shared backgrounds or experiences can make participants more comfortable expressing themselves. Additionally, Sim (1998) notes that "the more homogeneous the membership of the group, in terms of social background, level of education, knowledge, and experience, the more confident individual group members are likely to be in voicing their own views" (p. 348). Even among strangers, there can be a sense of safety and openness when key characteristics are shared.

However, homogeneous groups also risk groupthink, a tendency toward conformity and limited critical discussion. In contrast, heterogeneous groups, though often richer in perspectives, may create discomfort, especially if individuals feel their opinions are less accepted or if they represent a numerical or social minority (Kandell, 1991).

This effect has been documented particularly among ethnic minorities. Greenwood et al. (2014) found that participants in ethnically homogeneous groups felt more comfortable discussing sensitive topics, such as cultural and ethnic identity. These groups were more open to addressing potentially controversial issues and more often mentioned ethnic differences, indicating a more open discussion atmosphere. Similarly, Li et al. (1999) found that Asian participants in ethnically homogeneous groups were perceived as more dominant and participated more actively, suggesting they may have felt more empowered and confident to speak up.

However, the effect may not rely on complete homogeneity. Li et al. (1999) also observed similar effects in balanced groups, where no single group held clear numerical dominance. This suggests that simply not being in a numerical minority, rather than requiring full homogeneity, might be enough to enhance confidence. Notably, their study included only male participants to ensure demographic consistency, raising the question about how gender might influence these dynamics.

Overall, research suggests that group composition influences interpersonal comfort and, in turn, individuals' confidence to participate. Homogeneous groups are often found to reach decisions more smoothly, with minority group members feeling more at ease contributing to the discussion (Greenwood et al., 2014; Kandell, 1991). Although much of the existing research focuses on ethnic homogeneity, similar patterns may apply to other social identities, such as gender.

Gender as a Moderator: How Men and Women's Confidence Levels Differ

Research consistently finds a robust gender gap in confidence, with men generally showing higher confidence levels, while women tend to underestimate their abilities (Born et al., 2020; Carlin et al., 2018; Casale, 2020; Yan et al., 2021). As previously mentioned, confidence is closely linked to the likelihood of participating in group discussions (Stadelmann-Steffen & Dermont, 2015). Therefore, women's lower confidence can translate into reduced participation and fewer contributions, which is especially problematic in citizen assemblies that rely on equal input from everyone.

Much of the research on gender and confidence has focused on work and educational settings. In workplaces, women in mixed-gender groups are often perceived as less competent, leading to reduced confidence and participation (Born et al., 2020; Karakowsky & Siegel, 1999). In contrast, female-majority groups foster more support, encourage risk-taking, and can lead to bolder group decisions (Carlin et al., 2018; Yan et al., 2022). In education, lack of confidence is a significant barrier to speaking up, especially for female students. However, in all-female after-school programs, girls report feeling more confident sharing their views without the pressure of male presence (Denner et al., 2004; Russel & Cahill-O'Callaghan, 2015). In both domains, female-majority groups foster greater support, risk-taking, and confidence for women (Carlin et al., 2018; Yan et al., 2022).

The confidence gap is not always consistent, as some evidence suggests it can depend greatly on context (Bandiera et al., 2021). For instance, when tasks emphasize stereotypical female traits (e.g., collaboration, nurturing), women's confidence may match or even exceed that of men, while the reverse holds for male-typed tasks (e.g., assertiveness, competition) (Karakowsky & Siegel, 1999). This has direct relevance for deliberative contexts like citizen assemblies, because political domains have historically been part of male roles and require assertiveness, which could undermine women's political contribution (Paxton, Kunovich, & Hughes, 2007). Although women attend citizen assemblies at similar rates as men, their active

participation tends to be lower, potentially due to a greater fear of speaking up in these settings (Stadelmann-Steffen & Dermont, 2015).

In summary, research shows individuals are generally more confident contributing in homogeneous groups, including those defined by gender (Carlin et al., 2018; Greenwood, 2014, Sim, 1998). Women, in particular, benefit from all-female groups, while men's confidence tends to remain more stable regardless of group composition. However, it is unclear whether these patterns show as strongly in deliberative settings. This study investigates whether the confidence gap seen in other domains also appears in gender-heterogeneous versus homogeneous deliberative group discussions. Therefore, while everyone may experience higher confidence in homogeneous groups compared to heterogeneous groups, this increase is expected to be especially higher for women.

Hypothesis 1. Individuals in homogenous groups will report higher confidence to contribute compared to those in heterogeneous groups.

Hypothesis 2. Gender will moderate the effect of group composition on confidence to contribute. Specifically, the positive effect of being in a homogeneous group on confidence is expected to be stronger for women than for men.

Methods

Participants

An a priori power analysis was conducted using *G*Power* (Faul et al., 2007) to determine the required sample size. For both hypotheses, the analysis indicated that a minimum of 52 participants was needed to detect a small to medium effect size. This was based on a one-tailed paired-samples t-test ($dz = 0.35$) for the first hypothesis and a mixed repeated-measures ANOVA ($f = 0.20$) for the second hypothesis, with 80% power at an alpha level of .05. However, due to recruitment difficulties, the present study was underpowered. A total of 36 individuals completed the full study (one male participant was excluded for not

completing both discussion rounds), comprising 44.4% women ($N = 16$) and 55.6% men ($N = 20$). No participants identified as non-binary. Participants were all over the age of 18, predominantly psychology students, with Dutch and German nationalities being the most common.

Participants were recruited through a combination of convenience and snowball sampling methods. First-year students at the University of Groningen (RUG) participated through the SONA platform in exchange for SONA credits. Additional participants were recruited through a digital flyer distributed via personal networks, social media platforms (e.g., Instagram), and university group chats (see Appendix A1 for the flyer). Due to recurring last-minute difficulties in assembling enough participants for each discussion round, some individuals were also approached and recruited in person, primarily in the Heymans Building. Non-SONA participants could enter a drawing to win one out of four €25 vouchers by providing their email address.

Research Design

This study employed a 2 x 2 mixed design, with group composition (homogeneous vs. heterogeneous) as a within-subjects factor and gender (male vs. female) as a between-subjects factor. Each participant took part in both a homogeneous (same-gender) and a heterogeneous (mixed-gender) group discussion. In the homogeneous condition, they were placed in same-gender groups; in the heterogeneous condition, they were assigned to groups with an approximately balanced number of men and women. The order was changed throughout the study to counteract potential order effects, with about half of the participants experiencing the homogeneous condition first, and the other half the heterogeneous first.

The discussions, designed to resemble citizen assemblies, were used to measure participants' confidence to contribute, the main outcome variable of the study.

Measures

Confidence was the primary outcome variable (among other variables measured for separate purposes) and was assessed after each discussion using a 7-point Likert scale (*1 = strongly disagree*, 7 = *strongly agree*). Pre-discussion confidence, although not directly related to the main hypotheses, were also measured to capture baseline confidence, which may be relevant for interpreting patterns in confidence across gender. The items were self-developed but adapted from two validated scales: the Personal Report of Communication Apprehension (PRCA-24; McCroskey, 2005), and the Perceived Social Self-Efficacy scale (PSSE; Smith & Betz, 2000). The PRCA-24 includes items related to comfort during discussions (e.g., *"Generally, I am comfortable while participating in group discussions")* as well as confidence (e.g. *"I face the prospect of giving a speech with confidence")*. The PSSE includes items measuring confidence in social and public situations, such as: *"Express your opinion to a group of people discussing a subject that is of interest to you"*.

The pre-discussion questionnaire (Questionnaire 1), items included: *"I consider myself a confident person"*, *"I feel confident about expressing my opinions during group discussions"*, and *"I feel confident in contributing to decision-making processes"*.

Post-discussion questionnaires (Questionnaire 2 and 3) included items like: *"I felt confident in expressing my opinions"*, *"I felt confident in expressing my opinions, even when they differed from those of others"*, and *"I felt confident in contributing to the group's final decision"*. These items were designed to assess participants' confidence levels after each discussion and allowed for direct comparisons between the two group conditions. In particular, the inclusion of an item about confidence when disagreeing helped capture whether confidence was maintained even when disagreeing with the group. Reliability was calculated separately for each questionnaire, as they measured confidence at different stages of the study. Internal consistency for the confidence scales across all three questionnaires was high ($\alpha \geq$

.80). The pre- and post-discussion questionnaires are provided in Appendix A (see Appendix A2 and A3).

Procedure

Data collection took place during in-person discussion rounds held between April 16 and May 12, 2025. The study received approval from the Ethics Committee of the University of Groningen (PSY-2425-S-0266) prior to data collection.

All participants began in a shared base room with the researchers. Before the start of the study, they received detailed information and provided informed consent. Participants were not informed about the gender-based group composition manipulation, in order to prevent biasing their behavior. Each session included between six and 10 participants in total. At the start of each session, participants were given unique identifiers to ensure anonymity and to assign them to smaller discussion groups of three to five people, beginning with either the homogeneous or heterogeneous condition

First, participants completed Questionnaire 1, which gathered basic demographic information (e.g., profession/study program and nationality) and baseline measures of confidence related to group discussion. Participants were then taken to the discussion rooms together with their assigned group.

The discussion rounds were recorded for unrelated research purposes conducted by another student. These recordings were not used for the present study. Discussions were held in English and took place in quiet seminar rooms at the Heymans Building, without observers. Each discussion lasted 15-minutes. The topic was budget cuts, and the task was to collectively decide which two of six university programs to cut, which two to protect and which two they felt neutral about. Two of the programs were rather oriented towards women and minorities (e.g., Rosalind Franklin Fellowship and Diversity, Equity and Inclusion Team), and the others

were more broad (e.g., The Groningen University Institute for Drug Exploration). Each group noted their final decisions together on a shared paper (see Appendix B for group instructions).

After the first discussion, participants completed Questionnaire 2, assessing post-discussion confidence levels. Then, they took part in the second discussion round, in the opposite group composition, completing the same task. Some participants were led to a different room for this round. Finally, they completed Questionnaire 3, which was identical to Questionnaire 2 but ended with the opportunity to leave comments for the researchers. All questionnaires were completed in a paper-and-pencil format.

After the final questionnaire, participants came together in the baseroom and were fully debriefed about the purpose of the study. They were given the opportunity to ask questions and withdraw their consent if they wished.

Results

A total of 20 discussions (10 heterogeneous groups, 10 homogeneous groups) were conducted. One homogeneous, all-female group consisted of only two women due to last-minute participant dropouts.

Descriptives

All analyses were conducted using *JASP* (JASP Team, 2025). Confidence scores were calculated by averaging responses to the questionnaire items for each group condition (homogeneous and heterogeneous) and before the discussions. Table 1 shows the average confidence scores by group composition and gender.

Table 1

Descriptive Statistics for Confidence Scores by Group Composition and Gender

Condition		M	SD	N
Pre-discussion	Total	4.94	1.06	36
	Men	5.05	1.08	20

	Women	4.79	1.06	16
Heterogeneous	Total	5.52	0.87	36
	Men	5.43	0.87	20
	Women	5.62	0.89	16
Homogeneous	Total	5.73	1.23	36
	Men	5.47	1.30	20
	Women	6.06	1.08	16

Note. M = mean; SD = standard deviation, N = number of participants

Men reported slightly higher baseline confidence levels than women. Both men and women had a lower confidence score on average prior to any discussion. The mean confidence scores following each condition were all relatively high (≥ 5.4).

Assumption Checks

Prior to conducting inferential analyses, assumptions were examined. The primary assumption of normality of the difference scores was assessed using the Shapiro-Wilk test and visual inspection of a Q-Q plot. The Shapiro-Wilk test was non-significant, $p > .05$, indicating that the distribution of difference scores did not significantly deviate from normality. Additionally, no outliers were detected. Thus, assumptions for the paired t-test were met (see Appendix for Figure A1 and Table A1).

Pre-Discussion Confidence

Preliminary analyses using an independent samples t-test showed no significant differences in pre-discussion confidence levels between genders, $t(34) = .724, p = .237$. Therefore, it was not included in further analyses.
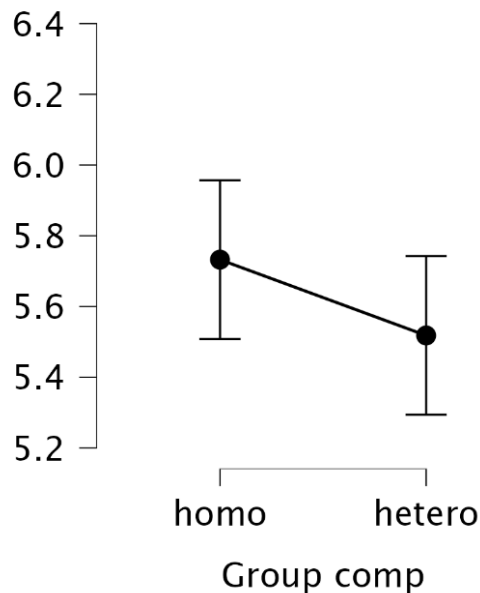
Hypothesis 1

A one tailed paired-samples t-test was conducted to compare participants' confidence levels after discussions in homogeneous versus heterogeneous group discussions. The analysis revealed no significant difference in confidence between the two group compositions

(t(35) = 1.37, p = .089, d = .23). Figure 1 shows the estimated marginal means of confidence for each group composition, illustrating a small visual difference between conditions.

Figure 1

*Estimated Marginal Means and Standard Error Bars of Confidence by Group Composition*

Note. Error bars represent 95% confidence intervals.

Hypothesis 2

A repeated-measures mixed ANOVA tested for an interaction between group composition and gender. No significant interaction effect was found, F(1, 34) = 1.69, p = .202, ω^2 = 0.004. As visualized in Figure 2, which displays the estimated marginal means, there appeared to be a trend toward higher confidence for women in same-gender groups, while men's confidence remained unchanged across conditions. The simple main effect of group composition for women approached significance, F(1, 34) = 4.02, p = .063, but was not significant for men, F(1, 34) = .025, p = .875.

Figure 2

Estimated Marginal Means and Standard Error Bars of Confidence by Group Composition and Gender
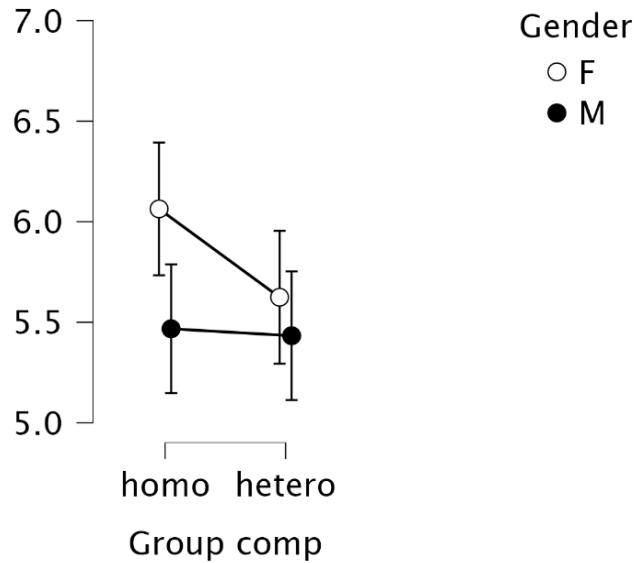
Note. Error bars represent 95% confidence intervals.

Discussion

The purpose of this research was to investigate how group composition affects confidence in deliberative group discussion, and whether gender moderates this relationship. I hypothesized that individuals in homogeneous groups would report higher confidence to contribute than in heterogeneous groups, with this effect being especially pronounced for women. The results did not provide strong support for the first hypothesis, as there was no significant difference in confidence between the two group compositions. Similarly, evidence for the second hypothesis was suggestive, but did not reach statistical significance.

However, the patterns in the estimated marginal means, along with the simple main effect for women, suggested a possible gender effect. Women tended to report higher confidence in same-gender groups, indicating that all-female groups may enhance women's confidence. Women's confidence levels in heterogeneous groups were similar to those of mens. In contrast, women's confidence in heterogeneous groups was similar to that of men, and men's confidence remained stable across both group compositions. It was expected that all-male groups would show a slight increase in confidence, but this was not observed. To

make sense of these findings, it is useful to consider why confidence might vary, or not, across group composition and gender.

Relation to Previous Research

These findings may indicate that group composition together with gender play a more subtle role in deliberative discussions, at least in a university context. One possible explanation is that gender was not a strongly salient category for participants. As Sim (1998) notes, group homogeneity can increase confidence, but highlights factors such as social background, education level, knowledge and experience. Among university students, these shared characteristics may have shaped group identification more than gender.

This interpretation aligns with social identity research. Gaertner et al. (1993) argue that in multicultural or academic settings, individuals may see themselves as part of a shared, superordinate group, such as students, rather than gender. As a result, this could reduce the relevance of gender composition, and in turn, the expected confidence effects. Such dynamics may help explain why homogeneity effects based on gender were weaker in this study compared to other contexts, such as those involving ethnic identity or in the workplace (Carlin et al., 2018, Greenwood et al., 2014).

Nonetheless, a closer look at the results shows suggestive trends regarding women's increased confidence in same-gender groups. This pattern is consistent with a large body of research demonstrating that women often benefit from same-gender environments across workplace and educational contexts. Studies have found that all-female groups tend to foster more supportive and empowering dynamics, enabling women to develop greater confidence in their abilities (Carlin et al., 2018; Cox & Fisher, 2008; Denner et al., 2004). The present study extends these findings by suggesting that confidence benefits of same-gender environments for women may also be present in deliberative group discussions. Although this effect was weaker than expected, there was a trend indicating that all-female groups can

provide a more empowering and supportive atmosphere, fostering women's confidence to contribute in citizen assemblies.

Several factors may help explain this effect. Colarelli et al. (2006) find that men tend to adopt more dominant roles in mixed-gender settings, which may lead to women feeling less confident to contribute. They further suggest that the absence of men in general may foster a more collaborative environment among women. Additionally, women may display behaviors in discussions that enhance other women's confidence in verbal participation, such as establishing warmth, helpfulness and affiliation, as well as seeking higher intergroup connection (Baird, 1976; Hawkins & Power, 1999). For example, women are often more likely to ask questions and actively include others in the conversation, fostering a more inclusive group atmosphere and making women feel more confident to contribute their ideas in all-female groups.

As Simon et al. (2001) point out, women are often considered a minority or lower-status group in group discussions, regardless of their actual numbers, making them a social minority. As such, women may be particularly sensitive to group dynamics and feel more confident speaking around other women with the same status. In line with this, Koudenbourg et al. (2013) found that individuals with lower status in a group, such as women in mixed-gender groups, are especially sensitive to disruptions in conversational flow, like awkward silences. This heightened sensitivity may lead them to actively maintain a smooth and inclusive conversation, and to feel more confident contributing in all-female groups.

In summary, the observed trend in the present study may stem from both the structural absence of men, that is removing potential dominance dynamics, and the communicative strengths women bring to group interactions. However, this raises the question of why men did not experience a comparable increase in their confidence levels, suggesting that the factors influencing confidence may work differently for men.

Generally, men's masculinity tends to revolve around competition, emotional distance and against dependency and vulnerability (Sternbach, 2003). Research suggests that men may not value or seek intergroup connection as strongly as women do, which could help explain why they are less affected by changes in group composition (Hawkins & Power, 1999). In contrast to women, men, as the majority or higher-status in group discussion, tend to maintain stable confidence regardless of group composition, since their social position is rarely threatened. As a result, their confidence levels may remain stable regardless of such changes (Hawkins & Power, 1999; Simon et al., 2001).

In deliberative settings such as citizen assemblies and political discourse, these contexts may still be considered male-dominated, especially in collective decision-making environments. Established norms and group dynamics have historically favored male voices. Research consistently shows that men continue to outnumber women in political leadership roles and active participation worldwide, which may further reinforce men's stable confidence across group contexts (Paxton, Kunovich, & Hughes, 2007).

In sum, although this study did not find a statistically significant impact of group composition or gender on confidence in deliberative discussions, the observed patterns still give meaningful insights. Women generally felt more confident to contribute in all-female groups, while men's confidence appeared unaffected by group composition. This suggests that gender dynamics can subtly shape how participants experience and contribute to group discussions, even if these effects are less pronounced in a university setting where gender may not be the most salient identity. Although these effects were weaker than expected, they highlight the complexity of group dynamics and the importance of addressing both structural and psychological factors to promote equal participation in citizen assemblies.

Limitations and Future Directions

This study is subject to several limitations. First, the confidence-related questionnaire items were self-developed and have not been validated in prior research, which may limit the reliability and comparability of the findings. Additionally, as confidence levels were self-reported, the data offer limited insight into how confidence was actually expressed in group behavior. While participants rated their confidence to contribute, their actual influence on the discussion or how confident they were perceived by others was not assessed. As a result, no conclusions can be drawn about the relationship between self-reported confidence and actual group impact. Future research could incorporate observational measures or peer-ratings to investigate whether reported confidence aligns with actual contributions or influence.

Another limitation is conceptual, as there may be a difference between situational confidence to contribute, and general self-confidence or self-efficacy, which was not controlled for in this study. While pre-discussion confidence was measured, the scope of this research did not allow for an in-depth exploration of these related constructs. Future research should better distinguish between these constructs, as pre-existing self-confidence or self-efficacy may interact with situational confidence.

Sample characteristics also limit the generalizability of the findings. The relatively small sample size, which made the study statistically underpowered, along with the fact that participants were mostly (psychology) students may not reflect the diversity of the general population. Although participants were randomly assigned to start in either a homogeneous or heterogeneous group, potential order effects may have still influenced the results.

Furthermore, while participants were grouped into homogeneous and heterogeneous conditions based on gender, it is important to note that they were all similar in other aspects. Thus, despite the gender manipulation, the groups may have been homogeneous in terms of age, education, and other social characteristics. As a result, the impact of group composition

on confidence may have been influenced by this underlying homogeneity, potentially hiding stronger effects. Future studies should use larger, and more representative samples of the population in terms of age, education, background or socioeconomic status to better generalize the findings. Considering intersectionality, that is how these social categories interact, can help researchers further understand how different identities may shape confidence and participation in group discussions.

Finally, other confounding variables, such as participants' prior group experiences, personality traits, familiarity with group members, or language proficiency were not assessed but may have influenced the results. This is especially relevant given that the discussions were conducted in English, which was not the native language for all participants, and may have impacted their confidence to contribute.

Practical Implications

The observed trends highlight the importance of creating conditions that foster confidence and more equal participation in deliberative discussions. One strategy supported by previous research is caucusing, where participants temporarily meet in identity-based groups before rejoining the larger discussion, such as in citizen assemblies. According to the ASPIRe model (Haslam et al., 2003), such subgroup discussions allow participants to express their social identities more comfortably, which can foster psychological safety and build confidence to speak up. Creating opportunities for women to first develop and share their ideas in a supportive, same-gender environment may therefore help increase confidence and participation when the group comes together as a whole.

Furthermore, workshops can be a helpful way to build confidence. For example, Denner et al. (2004) found that all-female workshops held after school helped girls become more confident and engage in critical discussions, especially when respectful disagreement was encouraged. Offering similar workshops more regularly, and across multiple settings such

as universities and workplaces, could help in developing key communication skills, including assertiveness and confidence in group discussions. Introducing such programs early in life may help reduce long-term confidence gaps between social groups.

Additionally, the way discussions are structured can also affect participation. Trained moderators can help by encouraging turn-taking, limiting dominance from more vocal members, and making sure everyone's voice is getting heard. This can be especially important in mixed-gender or diverse groups, where confidence and thus, contributions, may vary between participants.

Conclusion

While this study did not yield statistically significant effects of group composition or its interaction with gender, the observed trend was noteworthy: women appeared to feel more confident in all-female groups, while men's confidence remained stable across group types. These findings should be interpreted with caution due to the exploratory nature and limited sample size, but the consistency of this pattern suggests a potentially meaningful difference in how group composition shapes confidence.

This imbalance points to the possibility that women's confidence is more sensitive to group dynamics, whereas men's is less influenced by who is present. Even in university settings, where equality is often assumed, group composition may still affect how confident individuals feel to contribute. Promoting equal participation requires more than simply assembling diverse participants. It means establishing environments in which all individuals, especially those from marginalized groups, feel supported and safe to speak. Confidence is not fixed but it is shaped by the social environment and group dynamics. To create inclusive citizen assemblies, closer attention must be paid to who speaks, who hesitates, whose voice is heard – and why.

Acknowledgements

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Appendix A

A1

Recruitment Flyer

A2

Pre-discussion questionnaire

1. On a scale from 1 (Strongly disagree) to 7 (Strongly agree), please indicate how much you agree with the following statements.

    In general…

	Strongly Disagree (1)	2	3	Neutral (4)	5	6	Strongly Agree (7)
… I consider myself a confident person.	❏	❏	❏	❏	❏	❏	❏
… I feel confident about expressing my opinions during group discussions	❏	❏	❏	❏	❏	❏	❏
… I feel confident in contributing to decision-making processes	❏	❏	❏	❏	❏	❏	❏

A3

Post-discussion questionnaire

1. **Your role in the discussion**

    On a scale from 1 (Strongly disagree) to 7 (Strongly agree), please indicate how much you agree with the following statements:

	Strongly Disagree (1)	2	3	Neutral (4)	5	6	Strongly Agree (7)
I felt confident in expressing my opinions	❏	❏	❏	❏	❏	❏	❏
I felt confident in expressing my opinions, even when they differed from those of others	❏	❏	❏	❏	❏	❏	❏
I felt confident in contributing to the group's final decision	❏	❏	❏	❏	❏	❏	❏

Appendix B

Instruction sheet

Budget cuts at the University

As recently highlighted in the media and during protests and strikes, the Dutch government is reducing funding for the education sector. This means that universities, including the University of Groningen (RUG), will receive less financial support.

Your task: Below is a list of six programmes at the University of Groningen. Each programme uses an equal amount of resources (e.g. money).

As a group, discuss and decide on:

- **Two programmes the university should cut** (no longer receive funding)

- **Two programmes the university should keep** (continue to receive funding)

Details about the programs can be found at the back.

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		Cut	Protect	Neutral
1	Center for Social Safety	❏	❏	❏
2	Diversity, Equity and Inclusion Team	❏	❏	❏
3	Elite Sports Student Grant	❏	❏	❏
4	Rosalind Franklin Fellowship	❏	❏	❏
5	The Groningen University Institute for Drug Exploration	❏	❏	❏
6	Student Service Centre	❏	❏	❏

1. Center for Social Safety

A safe, confidential space for students and staff to seek support around harassment, intimidation, sexism or boundary-crossing behavior. The Center for Social Safety (CSS) offers trauma-informed guidance, peer support, and prevention training. With over 60 Active Bystander training sessions held, we empower our community to speak up, step in, and support others.

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2. Diversity, Equity and Inclusion Team

The Diversity, Equity, and Inclusion (DEI) team aims to make students and staff feel at home at the UG and experience a sense of belonging, regardless of gender or other differences. They drive an active diversity and inclusion policy that ensures to create equal opportunities as well as a stimulating and inclusive work and study environment for everyone.

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3. Elite Sports Student Grant

Many top athletes are studying at the UG. The Elite Sports Student Programme helps them to combine their studies with their sport. Students with an elite sports student status are also eligible for financial compensation: the elite sports student grant, a joint scheme offered by Hanze UAS and the University of Groningen.

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4. Rosalind Franklin Fellowship

The Rosalind Franklin Fellowship programme promotes the advancement of international female researchers. It gives talented female scientists the opportunity to secure a tenure-track position leading to full professorship.

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5. The Groningen University Institute for Drug Exploration (GUIDE)

GUIDE performs and stimulates innovative and drug-oriented research. These new insights lead to the development of new drugs and/or treatment options or optimization of existing therapies. The research revolves around central themes like healthy ageing, personalized medicine, and suicide prevention – a concern of great importance, particularly given the rising mental health challenges observed among younger populations.

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6. Student Service Centre

Many students encounter stress, identity struggles, anxiety, or depression during their studies. The Student Service Centre (SSC) supports students through study-related and psychological challenges. The SSC has launched a therapeutic app to provide education, resources, and access to therapists and specialized treatment programs.

Appendix C

Table C1

Test of Normality (Shapiro-Wilk)

	W	*p*
Homo score - Hetero score	*0.968*	*0.377*

Figure C1

Q-Q Plots

Homo score – Hetero score