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The effect of self-disclosure in icebreaker exercises on open communication and psychological safety in group discussion.

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Author: Thomas Brevoord, 6481620, t.j.brevoord@students.uu.nl

Supervisor: Madelijn Strick

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Abstract

Objective. The research investigates the impact of self-disclosure in icebreaker activities on open communication within teams and explores the mediating role of psychological safety. Open communication is crucial for teamwork and decision-making. Group decision-making is susceptible to biases such as shared information bias, ownership bias, and confirmation bias, which hinder the effective sharing of information. Psychological safety is essential for creating an environment where team members feel confident to express their thoughts without fear of embarrassment or rejection. This psychological safety fosters open communication. Self-disclosure is critical in establishing trust and psychological safety within teams, which may lead to more open communication. Hypotheses state that 1) more self-disclosure will lead to more open communication and 2) the effect of self-disclosure on open communication is mediated by psychological safety. Method. The study employed an experimental design involving 42 participants. Experiments were done in groups of three (N =14). Self-disclosure is manipulated through an icebreaker exercise. Open communication is measured using a group discussion through a hidden profile task and a survey. Psychological safety is measured with a survey. Results. The study showed that high self-disclosure did not lead to more open communication, and there was no mediating effect of psychological safety. The study conducted a manipulation check for self-disclosure, indicating an unsuccessful manipulation. Conclusion. The findings pointed to a significant relationship between the initial preference of the group and the chosen candidate, emphasizing biases such as ownership and confirmation bias in decision-making processes. Implications of these biases and other alternative explanations are discussed.

Keywords: self-disclosure, psychological safety, open communication, information sharing, icebreaker, discussion, decision-making, confirmation bias, ownership bias

The effect of self-disclosure in icebreaker exercises on open communication and psychological safety in group discussion.

On January 28, 1986, a group of engineers found a problem in the space shuttle Challenger that could make the flight risky, but no one dared to speak up until twelve hours before the launch. When the engineers eventually raised the safety issue in a video call, they were pressured by their superiors to withdraw their warning. The Challenger launched and crashed twelve hours later, which cost the lives of seven astronauts. This tragedy could have been avoided if people had spoken up about the dangers of the launch and if the people in charge had listened to their employees (Staff, 2023).

Unfortunately, in everyday life, there are many cases where employees do not express work-related issues and problems that can be encountered (Detert & Burris, 2007; Detert & Treviño, 2010; Morrison, 2014; Morrison & Milliken, 2000). Employees not speaking up has been associated with multiple organizational failures (Morrison, 2014). However, it can also influence daily situations. Namely, it can harm meeting effectiveness (Mesmer-Magnus & DeChurch, 2009), which has been proven to be positively related to job attitudes and employee well-being (Rogelberg et al., 2006), as well as job meaningfulness and engagement (Allen & Rogelberg, 2013). Expressing dissenting information improves team effectiveness (Nixon & Littlepage, 1992). This sharing of all relevant information, including dissenting information, is called open communication (Nixon & Littlepage, 1992; Törner, 2011). Open communication can influence meeting effectiveness through multiple processes, such as enhanced team socio-emotional functioning and creating the opportunity for sharing unique information (Mesmer-Magnus & DeChurch, 2009). It has also proven critical for cooperation and joint problem-solving (Mayo & Woolley, 2016).

Besides enhancing meeting effectiveness, open communication can support decision-making and discussion, an essential part of team meetings. Decision-making and discussion should explore relevant issues. However, this is often not the case (Stasser & Titus, 1985). One of the pitfalls in group decision-making is the shared information bias (Stasser & Titus, 1985; Van Swol, 2007). Research has shown that information all group members have access to is often more discussed than information only known by one group member. Statistically, shared information is more likely to be mentioned because more group members can mention it. Shared information is also repeated more often than unshared information (Wittenbaum, 1998), which

makes the perceived value of shared information larger than that of unshared information (Van Swol, 2007).

Another pitfall in group decision-making is that people stick to their initial preferences (Coffeng et al., 2020; Stasser & Titus, 2003). Group members, individually, often make up their minds based on information acquired before the meeting. These individuals evaluate this information as more valuable than new information brought up during the discussion (Van Swol et al., 2003). This is called the ownership bias (Van Swol, 2007). Besides that, individuals fall victim to the confirmation bias. They tend to seek information confirming their beliefs and are hesitant to change their initial judgment when others present contradictory facts (Brodbeck et al., 2007; Greitemeyer & Schulz-Hardt, 2003). This is why discussion often focuses on consensus-confirming subjects that fail to cover uncomfortable and often critical topics. These patterns might hinder the effective sharing of information and perpetuate biases that members bring to the group. Open communication can interrupt these patterns by creating opportunities for sharing consensus-contradicting information (Mesmer-Magnus & DeChurch, 2009). However, sharing consensus-contradicting information is seen as an interpersonal risk behavior related to humiliation, rejection, or embarrassment (Fryt & Szczygiel, 2021; Scully & Rowe, 2009).

When people within a team have concerns about interpersonal risks, this might be because of low psychological safety (Edmondson, 1999). Psychological safety is defined by Edmondson (1999) as “a shared belief that the team is safe for interpersonal risk-taking.” Team psychological safety involves feeling confident that team members will not embarrass, reject, or punish anyone for expressing their thoughts or concerns. This confidence arises from the mutual respect and trust shared among team members. Because of this mutual respect and trust, team members will speak up sooner and improve their performance. Psychological safety not only benefits speaking up but also improves general team performance. This is because a psychologically safe environment can create opportunities for personal growth, well-being, and inclusion for team members (Duell & Steinberg, 2019; Scully & Rowe, 2009), and it can improve team learning behavior (Edmondson, 1999) and information sharing (Kessel et al., 2012). Both personal and team learning can improve due to psychological safety because people feel safe bringing up errors and abnormal events without being seen as incompetent or harsh. By bringing this up, there is room for reflection and support, which will cause learning behavior. Not

bringing up errors and abnormal events allows people and teams to ignore and discount the negative consequences of their actions.

This study aims to find a way to improve open communication in teams by creating a psychologically safe environment. As mentioned before, a large part of psychological safety is trust. Self-disclosure is critical to establishing trust between individuals (Miller & Mandryk, 2021). Self-disclosure is the process of making the self known to other persons. Sharing self-disclosures creates a cycle in which people learn about each other, which creates trust, which helps with self-disclosure. Research has shown that receiving and reciprocating self-disclosure in initial meetings can increase mutual liking (Sprecher et al., 2013a; Sprecher et al., 2013b). Possible explanations for this increase are an increase in perceived familiarity (Berscheid & Reis, 1998), decreased uncertainty about the other (Berger & Calabrese, 1975), positive impressions received about the other (Collins & Miller, 1994), and suggested liking from the other by receiving disclosure (Altman & Taylor, 1973).

One way to evoke self-disclosure and develop trust and psychological safety is through social icebreakers. Icebreakers are introductory exercises to foster a positive atmosphere, ease tension, and encourage early participation and collaboration within the group (Jarusriboonchai et al., 2016). One example of an icebreaker is telling something peculiar about you or your family, for example, about a famous or infamous relative, a strange occurrence, or even an odd job (Depping et al., 2016; Vartabedian & Klinger, 2019). Icebreakers enable information exchange and a feeling of similarity, which help develop team trust. Researchers have noted that these rapport-building activities result in a stronger sense of community, better attendance, increased motivation, and group immediacy. Research by Allen et al. (2014) showed that small talk before a meeting improved meeting effectiveness by creating an environment for social cohesiveness among group members. Their research also showed no improved meeting effectiveness when the pre-meeting talk was about work, meeting preparation, or meeting effectiveness. This shows the importance of fostering a positive atmosphere, easing tension and social cohesiveness.

Research has been done on the importance of open communication and psychological safety in group discussions, self-disclosure, and establishing trust. However, research has yet to be done on the effects of self-disclosure on open communication and psychological safety in group discussions. This study aims to investigate this effect and add to the current knowledge on fostering a psychologically safe meeting environment. This can lead to fewer organizational

disasters and improve meeting effectiveness and problem-solving. It can also increase employee job satisfaction, well-being, and personal growth. Based on the found literature, this study hypothesizes that 1) more self-disclosure in icebreaker exercises will lead to more open communication and that 2) this effect is mediated by the level of psychological safety.

Methods

Design and participants

This experimental study used a between-subjects design to examine the effect of self-disclosure (independent variable) in an icebreaker activity on open communication (dependent variable) and the mediating role of psychological safety. Participants ($N = 42$) were recruited through Sona Systems, a participant recruitment and management website, and the researchers' social network. Thirty-three participants (79%) identified as female, 8 (19%) as male, and 1 (2.4%) as non-binary. The average age of the participants was 22 ($SD = 1.7$)

Instruments

Self-disclosure

Self-disclosure was manipulated through the icebreaker exercise. The participants received a list of 18 statements. In the low self-disclosure condition, the participants were given a list of statements that did not reveal personal information, such as “I can’t live without coffee,” “I hate going to the gym,” and “the snooze button is a dangerous invention.” In the high self-disclosure condition, the participants were given a list of statements that did reveal personal information, such as “if I had the chance, I would change my appearance,” “I act like I’m a careless person, but in reality, I’m one of the most paranoid people ever,” and “I am scared to be alone for the rest of my life.” This task was created for this study because no suitable tasks could be found in the literature.

A pilot study was conducted with an online survey to determine whether a statement was low or high self-disclosure. Participants were presented with 40 statements. After reading each statement, they were asked whether they agreed with it and to rate how difficult it was to admit to others (1 = *not difficult at all* to 100 = *very difficult*). Four statements were removed because, in the low self-disclosure condition, they scored higher than the lowest score of the high self-

disclosure statements and vice versa. Since it is necessary for the icebreaker activity that there are several statements that participants agree with, three statements with little agreement were adjusted to make them less extreme.

Open communication

A hidden profile task was used to test open communication. Originally, the hidden profile task was made to measure group decision-making (Lu et al., 2012). Information was distributed between group members. Some information was the same for all participants, while some information was unique for one group member. The shared information suggests a suboptimal decision, while all unique information combined will suggest the optimal decision. Thus, the optimal decision can only be made when all unique information is shared in the group discussion. This requires open communication. Therefore, open communication was measured by the number of unique information shared in the group discussion, as observed by the researchers, and whether the optimal decision was made. This research used the hidden-profile task designed by Coffeng et al. (2021). This task was chosen because it is written in Dutch and set in a setting relatable to Dutch people, selecting one out of three participants applying for a job as a board director at a fictitious medium-sized housing corporation. For this hidden profile task, the optimal decision is candidate B.

In addition to the hidden profile task, a self-report survey measured open communication (pooled $\alpha = .69$, 95% CI [0.54, 0.84]). It contained seven statements, such as “During the group task, I gave my opinion honestly, even when there were dissenting opinions,” and “During the group task, I dared to admit mistakes when they came up during the group task.” Participants were asked whether they agreed with the statements with a five-point Likert scale from 1 = “not at all” to 5 = “very much.” The item scores were averaged to do the analyses.

Psychological safety

A self-report survey measured psychological safety. Participants' sense of psychological safety was assessed using a modified version of the psychological safety scale created by Edmondson (1999) and further inspired by May et al. (2004), Detert & Burris (2007), and Kraus et al. (2011). Participants were asked whether they agreed with statements with a five-point Likert scale from 1 = “not at all” to 5 = “very much” (pooled $\alpha = 0.76$, 95% CI [0.06, 0.93]). The

item scores were averaged to do the analyses. These statements referred to participants' similarities to group members (6 items, e.g., "I feel I am visibly different from other group members."), psychological safety (11 items, e.g., "Do you feel you can be yourself in this group?"), social fear (6 items, e.g., "I worry about what kind of impression I make on someone."), and extraversion (6 items, e.g., "I love meeting new people.").

Initial preference

After reading the candidate information for the hidden profile task, the participants were asked: "Which candidate is currently your first personal preference?" Participants were asked to write down their answer: A, B, or C. The group's initial preference was determined by identifying the candidate who was preferred by the majority of the group. Possible outcomes were A, B, C, or None if all three participants chose a different candidate.

Manipulation check

To check for external effects, a survey was done regarding participants' enjoyment of the exercise, their familiarity with and liking of other group members, and, as a manipulation check for self-disclosure, whether the statements were difficult to admit in front of others.

Procedure

Upon arrival, the three participants were brought into the room and asked to sit at a table. They were seated in a triangle to ensure equal distance and distribution of attention. The participants were welcomed and explained that there would be two exercises with three surveys in between and that the study would take around 45 minutes. The researcher informed them that if they have any questions, they can ask them at any time. After this, the researcher asked the participants to read and fill in the informed consent form. The groups were randomly assigned to a condition through an online randomization tool.

The participants were told that they would choose a candidate for a job opening. First, they got ten minutes to read the information and select a candidate. They were told not to share information for now. After this, the experimenter introduced the icebreaker. The participants read through the statements and answered whether they agreed or disagreed with the statement. Depending on the condition, the participants were given a list of high or low self-disclosure

statements. They were told to pick a statement they agreed with and think the others agreed (low relevance) or disagreed with (high relevance). This manipulation was carried out because of the graduation research of another student, Phebe Leenen, and will not be considered further. After the icebreaker exercise, the participants were asked to complete the psychological safety survey.

Before the hidden profile task started, the participants could read through the candidate information again for two minutes. After this, they had twenty minutes to discuss the right candidate for the job opening. After the participants chose a participant, or after twenty minutes, the participants completed the survey regarding open communication. Once this was done, the study was wrapped up, and the participants were debriefed.

Missing data

In the psychological safety survey, nine cases of missing data were found for items 1, 2, 3, 4, 7, 8, 9, 10, and 11. Multiple imputation was used with 10 datasets and 20 iterations for each data set to guarantee no deleted cases.

Results

The groups (N = 14) were randomly assigned to either the high or low self-disclosure condition. There were seven groups in each condition. A manipulation check was conducted for self-disclosure in the icebreaker statements using linear mixed analysis in R. Difficulty to admit was used as the dependent variable, and self-disclosure as the fixed effect. Additionally, the random intercept of the group was addressed to check potential group-level variability. High self-disclosure statements (M = 1.81, SD = 1.03) were not significantly more difficult to admit than low self-disclosure statements (M = 1.48, SD = 0.87), $F(1, 12) = 1.19$, $p = .298$. Therefore, the results indicate that the manipulation of self-disclosure was not successful.

A Pearson's product-moment correlation was conducted to assess the relationship between self-reported open communication (M = 3.62, SD = 0.62) and observed open communication behavior (M = 2.43, SD = 1.40) to assess the validity of observed open communication. The correlation was positive but non-significant ($r = .38$, $p = .094$, CI[-.07, .69]). Because a substantial part of the video recordings of the experiment were not stored correctly, only half of the observations could be scored. Too little data on observed open

communication behavior remained, and the remaining data did not correlate significantly to self-reported open communication; observed open communication was deemed invalid for statistical analysis. Hence, observed open communication was not used for the remaining analyses.

A regression analysis was used to measure Hypothesis 1, which stated that high self-disclosure will lead to more open communication. The analysis showed no significant effect of self-disclosure on open communication (b = .08, SE = .11, p = .648). Based on this analysis, Hypothesis 1 is rejected.

To further test Hypothesis 1, A chi-square test of independence was performed to test the effect of self-disclosure on the group decision. The relationship between these variables was not significant, χ^2 (1, N = 14) = 2.33, p = .13, V = .41. This also leads to the conclusion that Hypothesis 1 is rejected. The results of this analysis are shown in Table 2.

A mediation analysis was done with the Lavaan package in R with a sem function to test Hypothesis 2, which stated that the effect of self-disclosure on open communication is mediated by the level of psychological safety (M = 3.90, SD = 0.60). The analysis results showed no significant effect of self-disclosure on open communication (b = .08, SE = .10, p = .624), no significant effect of self-disclosure on psychological safety (b = -.01, SE = .18, p = .940), and no significant effect of psychological safety on self-reported open communication (b = .31, SE = .12, p = .14). No indirect effect was found (b < -.01, SE = .03, p = .940). Hypothesis 2 is rejected.

Table 2

Crosstabulation of the level of self-disclosure and whether the correct decision was made.

Self-disclosure	Correct decision	
	No	Yes
High	7	0
Low	5	2

An exploratory analysis was done to find an alternative explanation for why self-disclosure did not affect the group decision. A chi-square test of independence was performed to

evaluate the relationship between initial preference and the group decision. The relationship between these variables was significant, χ^2 (6, N = 14) = 28.00, p < .001, V = 1.00. Therefore, the preferred candidate at the start of the discussion predicted almost all the group decisions. The results can be seen in Table 3.

Table 3

Crosstabulation of the chosen candidate and initial preference

Chosen Candidate	Initial Preference			
	A	B	C	None
A	3	0	0	1
B	0	2	0	0
C	0	0	8	0

Discussion

This study was designed to investigate the impact of self-disclosure in icebreaker activities on open communication within teams. The study also aimed to explore the mediating role of psychological safety. An icebreaker exercise was used to stimulate different levels of self-disclosure by sharing personal information with the other group members. Open communication was measured with a hidden profile task, a questionnaire, and through observation. Unfortunately, the observation data could not be used due to problems with the video recordings. Psychological safety was assessed with a questionnaire. The results, however, were unexpected. No effect of self-disclosure on open communication was found (H1), and there was no mediating effect of psychological safety (H2).

One explanation for this result is the unsuccessful manipulation of self-disclosure in the current study. As mentioned, a pilot study was conducted to compose the list of statements used to manipulate self-disclosure. This pilot study showed that participants found the low self-disclosure statements significantly less difficult to admit than the high ones. This is why the unsuccessful manipulation of self-disclosure in the current study was unexpected. One reason for this unexpected result might be the setting of the research. The pilot study was conducted

through an online survey, where participants were asked hypothetically: “How difficult would it be to admit this to others assuming you agree?” It might be the case that people expect some statements to be more difficult to admit than in reality.

Another reason participants in the current study did not think the statements in the high self-disclosure condition were more difficult to admit is that multiple participants indicated that they knew each other. Miller and Mandryk (2021) suggest that sharing self-disclosures creates a cycle where you create trust, which helps with sharing self-disclosures. Perhaps some participants had already shared self-disclosing statements, creating trust before the experiment, and making sharing high self-disclosure statements in this experiment easier. This aligns with research by Sprecher et al. (2013a) and Sprecher et al. (2013b), who found that self-disclosure can increase mutual liking. This could also be why the average psychological safety score was high ($M = 3.90$). Some people have already built up trust and thus a psychologically safe environment.

There is an apparent relation between the initial preference of the group and the chosen candidate, as shown in Table 3. This aligns with the hidden profile study by Coffeng et al. (2021). The groups in the current study never decided on someone different from the initial majority preference, only when the group had no initial preference. This result confirms the importance of ownership and confirmation bias (Coffeng et al., 2021; Stasser & Titus, 2003; Van Swol et al., 2003; Van Swol, 2007). These biases highlight the importance of research into interventions to counter these biases, such as systematically writing down and pooling all information or using the advocacy procedure in which one person advocates only dissenting views (Coffeng et al., 2021). The advocacy procedure is supported by research by Van Swol (2007). The confirmation bias was less strong in groups with a minority opinion compared to a consensus group. The dissenting opinion of a minority decreases group confidence, which makes them more open to other information and different viewpoints.

However, a minority opinion still invites a different bias, namely the minority versus majority bias (Van Swol, 2007). In groups with minority and majority opinions, the minority group members tend to be more receptive to information from other group members because their confidence is lowered. The majority group members tend to perceive their own and their fellow majority group members' information as more valuable. This causes the majority to stick to their opinion and the minority to accept the majority opinion more quickly. The current

research showed that participants reported high psychological safety ($M = 3.90$, $SD = 0.60$) and high open communication ($M = 3.60$, $SD = 0.62$) during the hidden profile task, proven to improve decision-making. However, the candidate chosen was related entirely to the initial majority preference. This suggests that the problem might not be a lack of open communication by the minority group members but that the majority group members still stick to their initial preference in a psychologically safe environment. One way to remove this bias could be by having each group member prepare a different candidate and have a structured discussion. This way, there is no minority or majority, and every group member's information is equally valuable. Of course, this is not always possible in group discussions. Therefore, future research should focus on factors and interventions that make people more susceptible to dissenting information.

Limitations

One limitation of this study is that all the surveys were conducted in the presence of the other group members and the interviewer. The presence of the interviewer and bystanders can evoke social desirability bias (Larson, 2019). Social desirability bias occurs when participants change their answers on a survey because they want to look better to others, feel good about themselves, or because of identity management. This can lead to distorted results. According to a systematic review by Krumpal (2011), social desirability bias can be decreased by reducing the presence of the interviewer and bystanders. Thus, future research should focus on breaking the group into individual rooms during the survey.

Another limitation is that this research had few participants ($N = 42$) for the self-reported open communication and psychological safety tests, resulting in only 14 groups to analyze the outcomes of the hidden profile test. Because the video recordings were not saved properly, only seven groups ($N = 21$) could be observed for open communication, which was too little to use. This measurement of open communication could have involved a lot of valuable data since observed data is less susceptible to social desirability bias. Future research should be conducted more extensively with more participants and observed data.

The hidden profile task could still be the correct measure of open communication. However, future research should use a version of the hidden profile task with less information. In the task used in this study, the participants had to read and remember six different pieces of information per candidate, 18 pieces of information in total. During the discussion, participants

often mentioned that they needed to remember information and were busy trying to remember what they had read instead of discussing the candidates. This is a problem because an essential part of open communication is the decision to bring up dissenting or unique information. It is only possible for the participant to make that decision if they remember that dissenting or unique information; therefore, open communication cannot be measured correctly when there is too much information to remember. Research should be conducted to determine the optimal amount of information required to create a challenging hidden profile task while ensuring that all participants can remember the information on the candidates.

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