

Leveling the Playing Field? Effects of Hybrid Work on the Psychological Safety of Minority Groups

Hilla Back
Aalto University School of Business
hilla.back@aalto.fi

Philipp Back
Aalto University School of Business
philipp.back@aalto.fi

Iaroslav Kriuchkov
Aalto University School of Business
iaroslav.kriuchkov@aalto.fi

Abstract

Psychological safety has been shown to be a vital component of team performance and well-being. It describes the shared belief that a team is safe for interpersonal risk-taking, thus encouraging the voicing of new ideas, collaboration, and experimentation. Today's teams are increasingly diverse in terms of social identity characteristics as well as work arrangements (on-site versus hybrid/virtual) – aspects that previous research has largely overlooked. Through a quantitative study at a Finnish university (N = 832), we investigate the impact of hybrid work on the psychological safety of minority groups. We find that racial minorities, women, and language minorities experience higher psychological safety in hybrid work (vs. on-site), while employees with sensory disabilities experience lower levels. Thus, this study offers partial support for the equalization effect of computer-mediated technologies and emphasizes the need for tailored diversity, equity, and inclusion initiatives that consider the individual needs of different minority groups.

Keywords: Hybrid work, psychological safety, status, equalization effect, minority group

1. Introduction

In contemporary organizations, teams are becoming increasingly diverse in terms of age, gender, race, disability, and language skills, among other characteristics (CIPD, 2020). In response to these changes, diversity, equity, and inclusion (DEI) initiatives have become core practices and values in many organizations. Inclusive organizations are characterized by a climate in which individuals of all identities are empowered to contribute to the larger collective as valuable members (Nishii, 2013). One key feature of inclusive organizations is psychological safety, defined by Edmondson (1999, p. 354) as a “shared belief held by members of a team that the team is safe for interpersonal risk-taking”. Psychological

safety helps create environments where the potential negative consequences of mistakes or proactive behavior are minimized. Such an environment allows teams to concentrate on tasks rather than interpersonal issues, thereby improving team performance (ibid).

As virtual and hybrid work arrangements are becoming the ‘norm’, the importance of fostering psychological safety within these new work arrangements is increasingly recognized (see, e.g. Nurmi & Koroma, 2020). However, most research on psychological safety remains focused on face-to-face (i.e. on-site) work. Initial studies by information systems (IS) scholars have found that psychological safety is more difficult to achieve and maintain in virtual settings (cf. Tkalich et al., 2022). Yet these studies linking psychological safety and virtual work have not taken into account differences between minority and majority groups, which management scholars have found to be significant in perceptions of psychological safety.

More specifically, research has indicated that perceptions of psychological safety are not equally distributed within teams, with minority groups experiencing lower psychological safety than majority groups (cf. Bienefeld & Grote, 2014; Singh, Winkel & Selvarajan, 2013). Bienefeld & Grote (2014) suggest that status is a key antecedent of psychological safety: the higher the status of the employee, the safer the individual will feel to speak up and share ideas. This disparity between the experiences of minority and majority groups is contradictory to the ideals of an inclusive organization. In this paper, we refer to minority groups not in terms of numerical count, but by socio-structurally constructed status differences and access to resources (Nkomo et al., 2019; Ridgeway, 1991). We follow the work of Mor Barak (2010) in noting that not all dimensions of diversity are considered equal, and that minority status is typically measured against the ‘norm’ of an able-bodied, middle-aged, Caucasian, native language speaking male (Zanoni et al., 2010).

Already since the 1990s, IS scholars have investigated the potential of information and communication technology (ICT) to equalize status differentials between minority and majority groups by dampening visual and behavioral cues (see, e.g., Dubrovsky, Kiesler, & Sethna, 1991). This so-called ‘equalization effect’ (ibid) has received increasing attention, with studies focusing, for example, on the effect of ICT on participation equality, production of unique ideas (Rains, 2005), and member dominance (Rains, 2005; Ocker, 2007). To date, however, psychological safety has received limited attention as an outcome variable of this proposed equalization. At the same time, studies on the equalization effect of ICT have yielded inconclusive results. As some studies provide support for the equalization hypothesis – and others do not (see Rains, 2005, for a meta-analysis) - further research has been called for on the factors that influence the equalization of status differentials in virtual work (Rains, 2005). Indeed, while technology may offer solutions that facilitate and encourage employee engagement, collaboration, and participation, thus aiding in the creation of inclusive organizations (Joshi & Deng, 2024), we still lack understanding of the conditions under which this occurs – and for whom.

In this study, we address this gap by investigating whether the recent shift to hybrid work may, in fact, ‘level the playing field’ for minority groups in terms of perceived psychological safety, thereby promoting equality between minority and majority groups. Combining the Status Characteristics Theory (Ridgeway, 1991) with the equalization effect (Dubrovsky, Kiesler, & Sethna, 1991) of technology through its additive and reductive features (Carte & Chidambaram, 2004), we first study how hybrid work affects perceptions of psychological safety overall, before turning to how minority groups (gender, race, language, and disability) perceive psychological safety in on-site versus hybrid work. We ask the following research questions:

1. What is the relationship between hybrid work and psychological safety?
2. How does hybrid work moderate the relationship between minority group status and perceived psychological safety?

We choose to focus on hybrid work (instead of fully virtual) as this is the most prevalent type of remote work arrangement, with more than 70% of employees worldwide having a hybrid schedule of working from home approximately two days a week (Bloom, Han, & Liang, 2024). At the same time, hybrid work – but not fully virtual work – improves

employee retention without damaging work performance, showcasing the positive aspects of this arrangement (ibid). We acknowledge that prior literature on virtual work has largely focused on fully virtual work, e.g. in the context of global virtual teams (e.g. Fleischmann et al., 2023) or because of the COVID-pandemic (see e.g. Back & Back, 2024), yet argue that an increased focus on hybrid work is increasingly timely.

We empirically test our hypotheses using data from a DEI survey of employees at a Finnish university (N = 832). We use ordinary least squares (OLS) regression models for our empirical analysis. Our results indicate a significant positive effect of hybrid work (vs. on-site work) on psychological safety for some minority groups (race, gender, and language), but negative effects for employees with a sensory disability. Interestingly, we do not find a significant effect of hybrid work on psychological safety when testing for all employees jointly.

We advance IS research in two distinct ways. First, we advance the discussion on the equalization effect of ICT by using psychological safety as a novel outcome variable. Second, we shed light on the factors affecting when the equalization effect occurs, as called for by Rain (2005). Specifically, we show that hybrid work may dilute status differentials for some - but not all - minority groups due to both the additive and reductive features of ICT. Overall, through this study, we link IS research on the equalizing effect of technology to DEI outcomes and assert that hybrid work can indeed be used to foster the creation of inclusive organizations. However, we emphasize what was also aptly noted by Joshi and Deng (2024): “the favorable and unfavorable effects of ICTs are not distributed equally or uniformly across all contexts or populations in our society.” (p. 11). In short, socio-demographic differences matter.

The paper is structured as follows. First, we develop our hypotheses, focusing on psychological safety, Status Characteristics Theory (Ridgeway, 1991), and how the additive and reductive features of technology can facilitate the equalization effect. We then turn to the findings and discussion, highlighting the importance of steering away from a ‘one size fits all’ mentality when it comes to work arrangements and creating a psychologically safe environment.

2. Hypothesis development

In this section, we provide a concise overview of prior work on the construct of psychological safety and how psychological safety is impacted by hybrid work. Based on this, we then develop our conceptual model as shown in Figure 1.

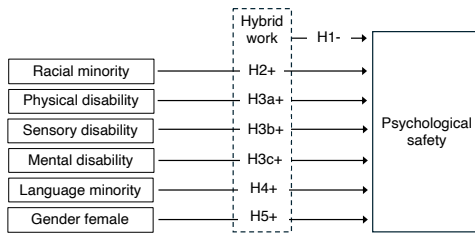


Figure 1. Conceptual model.

2.1 Psychological safety and virtual settings

Employees are increasingly required to engage in behaviors that promote continuous improvement of organizational processes and practices, for example by voicing new ideas, collaborating with other members of the organization, and experimenting with new methods (Edmondson, 1999). In order to feel comfortable doing this, psychological safety is a key prerequisite. A psychologically safe environment - where employees feel safe to voice ideas, collaborate, take risks, and experiment, and where they willingly seek and provide honest feedback - has been shown to positively influence information sharing, learning behaviors, employee engagement, satisfaction, and team members' commitment (Frazier et al., 2017). As a result, teams that exhibit high levels of psychological safety tend to outperform teams with lower levels (ibid). As organizations increasingly recognize the importance and benefits of psychological safety, a growing body of literature offers recommendations on how to foster such conditions (cf. Nurmi & Koroma, 2020). Nonetheless, most studies on psychological safety have been conducted in face-to-face contexts, with less attention being given to virtual work.

Accelerated by the COVID-19 pandemic, virtual work arrangements have become the new norm for knowledge workers. Virtual teams differ from on-site teams in that they communicate primarily (or even exclusively) through digital tools that do not allow for the same social and emotional cues in body language as face-to-face communication (Edmondson & Daley, 2020). Virtual collaboration has been shown to lead to challenges related to the social dimensions of teamwork, for example through more formal communication (Pérez-Mateo & Guitert, 2012), misunderstandings within the team (Usher & Barak, 2020), and impeded social interaction (Janssen & Kirschner, 2020). Some studies have suggested that psychological safety may be more difficult to achieve in virtual settings (see, e.g., Lee, 2021; Tkalich et al., 2022; Fleischmann et al., 2023), yet these studies remain sparse and largely focused on global virtual teams. In light of previous research, we hypothesize

that perceived psychological safety will be lower in hybrid work vis-a-vis on-site work:

H1: Hybrid work has a negative effect on perceptions of psychological safety.

2.2 Minorities and psychological safety in virtual settings

While activities involving ideation and 'speaking up' may benefit the organization, they also pose risks for the individuals involved. For example, voicing new ideas may challenge established ways of working, i.e. 'how things have always been done', and conflict with the interests of others in the organization (Detert & Burris, 2007, Edmondson, Bohmer, & Pisano, 2001). In addition, new ideas and approaches may ultimately turn out unsuccessful and be perceived as failures, thus reflecting negatively on the individuals involved (Van Dyne & LePine, 1998). Consequently, evidence suggests that these risks may deter employees from participating in innovation processes, thus hindering both individual and organizational learning (Detert & Burris, 2007).

In particular, minority groups may perceive an especially high risk involved with speaking up, i.e. lower psychological safety. Bienefeld & Grote (2014) suggest that the higher the status of the employee, the safer the individual will feel to speak up and share ideas. The scholars found that status differences can create feelings of superiority versus inferiority between individuals. Lower status team members may underestimate the value of their input, self-censor their contributions, and leave decisions to higher status team members (see also Driskell & Salas, 1991; Singh, Winkel & Selvarajan, 2013). Often, minority groups perceive lower status and majority groups higher status (Zanoni et al., 2010) due to socio-structural foundations. These findings are also in line with the Status Characteristics Theory (Ridgeway, 1991), which argues that social identity differences between group members only become psychologically meaningful when they are correlated with status rankings and access to resources.

How, then, would it be possible to dilute status differentials between minority and majority groups and achieve greater equality in perceived psychological safety? Status refers to the level of respect or influence associated with an individual as a result of characteristics such as age, ethnicity, gender, or education (see, e.g., Nembhard & Edmondson, 2006). Some status characteristics are 'diffuse' (i.e. applicable across a range of settings, such as age, gender, or ethnicity) and others are 'specific' (i.e. relative to a particular task, such as education) (ibid).

Individuals who possess more esteemed characteristics are judged as superior to those without those attributes. In this paper, we study whether 'diffuse' status characteristics in particular may be diluted in virtual settings, leading to a 'leveling of the playing field' in terms of perceived psychological safety.

Scholars have indeed proposed ICT to be a potential solution through its equalization effect (Dubrovsky, Kiesler, & Sethna, 1991). In practice, IS researchers have analyzed how the additive and reductive properties of ICT (Carte & Chidambaram, 2004) can serve to equalize and democratize group processes (Rain, 2005; Ocker, 2007). By additive, Carte & Chidambaram (2004) refer to features such as online chat options, which enhance communication reprocessability and rehearsability. Reductive, in turn, refers to ICT reducing the possibility to visually and vocally transmit social and nonverbal cues. It is the latter – the reductive features – which appear to alleviate social categorization processes and social evaluative pressures in virtual settings (Rain, 2005). The equalizing effect of ICT appears to be closely associated with a higher degree of visual anonymity in virtual settings, resulting in a dampening of both static cues (visible interpersonal differences) and dynamic cues (differences in behavior) (Dubrovsky, Kiesler, & Sethna, 1991).

Nonetheless, prior empirical studies on the equalizing effect of status differentials in virtual work have yielded inconclusive results (see, for example, Rains, 2005; Ocker, 2007). For example, in a meta-analysis of experimental studies on the influence of ICT-enabled virtual work on the equality of influence and participation, Rain (2005) found markedly mixed results. Overall, however, the results of the meta-analysis provide some support for the equalization hypothesis, especially through the increase in participation equality and unique idea production and the decrease in member dominance. Similarly, the study by Ocker (2007) found a decrease in member dominance in virtual vis-à-vis on-site work, but no evidence of equalization in the majority of teams studied.

With these mixed findings, further research has been called for particularly on what factors influence the equalization of status differentials in virtual work and under what conditions equalization occurs (Rains, 2005). Previous literature has also paid little attention to psychological safety as an outcome of the proposed equalization, or to whether minority groups differ in how they experience the equalizing of status differentials. We posit that the inconclusive findings are partly due to a lack of focus on individual minority groups. In the following, we draw on these theoretical

underpinnings and develop separate hypotheses for different minority groups: race, disability, language, and gender.

Race: Race is one of the most studied diversity characteristics (Nkomo, 2019). Numerous studies have discussed status differentials associated with race, with Caucasians receiving more access to resources and being seen as having a higher status than members of other racial groups (Berger et al. 1972; Ridgeway, 1991).

Studies have also shown that racially diverse workplaces benefit from virtual work arrangements. For example, a study by Robert et al. (2018) found that racially mixed teams (of both Caucasians and Asians) benefit from using text messaging for communication, as its impersonal (i.e. reductive) features facilitate the sharing of technical information in an objective way. Thus, we argue that the reductive features of ICT will render communication essentially 'color blind'—relieving status differentials between racial minority and majority groups. Hence, we hypothesize the following:

H2: Hybrid work will positively moderate the relationship between race and psychological safety.

Disability: Disabled employees – defined broadly in the literature and also in this study as individuals with chronic health conditions impairing their everyday lives (United Nations, 2006) – have largely been regarded as having lower status than able-bodied, 'ideal workers' (Jammaers, Zanoni, & Hardonk, 2016). These individuals face widespread discourses constructing them as inferior employees who are 'unable to do demanding work' (Elraz, 2018) or are 'less productive' (Jammaers, Zanoni, & Hardonk, 2016) than their able-bodied counterparts.

Previous research has suggested that virtual work arrangements may alleviate biases or negative stereotypes about workers with disabilities. For example, workers with disabilities who use 'enabling' technologies demonstrate greater functional independence, and are perceived by their managers as more capable of performing organizational tasks without constant supervision (Heath & Babu, 2017). This suggests that the additive features of technology may be of importance especially to those with sensory (particularly visual) disabilities, for example through enabling apps, built-in screen readers, or speech synthesizers (ibid). The additive features of ICT may also alleviate communication and interpersonal difficulties for individuals with other sensory or mental disabilities via the ability to use lean media and indirect, non-verbal contact opportunities (Tomczak,

2021). This is important, because it has been shown that employees with mental illness or sensory disabilities (particularly on the autism spectrum) have difficulties with ‘speaking up’ and communicating in on-site work (Follmer & Jones, 2018; Tomczak, 2021). The rehearsability and reprocessability offered by virtual work arrangements may thus give employees with sensory disabilities time to think about what they want to say as well as re-process previous conversations.

In addition to additive features, reductive features may offer disabled employees an opportunity to conceal noticeable (often physical) disabilities, thus diluting the salience of ‘diffuse’ status characteristics. We note that disabilities come in many forms and degrees of severity: physical, mental, sensory, and intellectual (United Nations, 2006), yet hypothesize that each group will benefit from the equalizing effect offered by ICT:

H3a: Hybrid work will positively moderate the relationship between physical disabilities and psychological safety.

H3b: Hybrid work will positively moderate the relationship between sensory disabilities and psychological safety.

H3c: Hybrid work will positively moderate the relationship between mental disabilities and psychological safety.

Language: Linguistic minorities are those who are linguistically different from the majority in organizations. These individuals often suffer from discrimination, less access to resources, and lower status in organizations (Back & Piekkari, 2024).

Research has suggested that both the additive and reductive features of ICT may lower status differentials, but differently than for other minority groups. Unlike other diversity characteristics, the ‘visibility’ of language differences cannot be diluted by virtual settings. However, with the additive features of translation aids, as well as the possibility for rehearsability and reprocessability offered by asynchronous communication, the ability to ‘speak up’ and discuss difficult topics may be easier for linguistic minorities in virtual settings than in on-site work. At the same time, the reductive features of ICT, particularly the dilution of non-verbal communication and the increased reliance on lean media, have been found to reduce the risk of social categorization and objectify the behavior of others in virtual work (Klitmøller & Lauring, 2016; Klitmøller, Schneider, & Jonsen, 2015). This, in turn, can reduce status differentials between language groups.

However, we also note that trust formation may be hindered in virtual work, as cultural and language differences have been found to be magnified in these settings (see, e.g., Hinds et al., 2014, Back & Back, 2024, Back & Piekkari, 2024). Despite these somewhat contradictory findings, we hypothesize the relationship to be overall positive, and assert that:

H4: Hybrid work will positively moderate the relationship between language and psychological safety.

Gender: Gender has remained one of the most studied diversity attributes, with women and non-binary individuals still encountering status differences in comparison to men (Ridgeway, 1991). Even in relatively gender-equal national contexts such as Finland, women still face systemic discrimination. We posit that the higher visual anonymity made possible by the reductive features of ICT has the effect of diluting the ‘diffuse’ status characteristic of gender, thus lowering social categorization processes and status differentials between genders.

At the same time, these reductive features can also dampen dynamic cues – i.e., behavioral differences (Dubrovsky, Kiesler, & Sethna, 1991). For example, men have been found to act more dominantly in group processes, crowding out opportunities for women to participate (ibid). This dominance behavior has partly been shown to be alleviated in virtual settings (Rain, 2005; Ocker, 2007). Thus, we hypothesize that:

H5: Hybrid work will positively moderate the relationship between gender and psychological safety.

3. Methodology

In this section, we outline our data collection process, sample, measures, and statistical processes.

3.1 Data collection

To test the proposed hypotheses, we conduct a quantitative study with survey data from employees at a university in Finland. The questionnaire link to Qualtrics was distributed via email to all employees at the university (in Finnish, Swedish, and English). All participants were informed about the purpose, data protection, and confidentiality before accepting the invitation to participate, and email addresses were not linked to survey responses to ensure anonymity. Data collection took place in June 2023. Three email reminders were sent during the process.

In total, we received responses from 1336 employees, for an overall response rate of 30%. Given

the scope of the study, we focus on those in either hybrid or on-site working arrangements, and thus exclude 480 responses that do not meet these criteria. We further exclude the small groups of non-binary genders and intellectual disabilities due to statistical factors, resulting in a final count of 832 responses.

In terms of demographics, 37 % of respondents work in service roles, and 63% in teaching and research. 54.7% report working on-site and 45.3% in a hybrid arrangement. 47.7% of participants are male, 79.1% are Caucasian, 63.7% have Finnish as their mother tongue, and 25.6% have a disability. The age of the respondents is fairly evenly distributed: despite the strong presence of younger generations (18-30: 30.3% of respondents), the proportion of older employees is still high (51 or over: 23.2%).

3.2 Measures

We use the following variables in this study. Independent variables consist of self-reported measures.

Work arrangement is measured by asking ‘how do you mainly work?’ and offering options in a drop-down menu (remotely, on-site, remotely and on-site equally, remote work not possible). Responses for ‘remotely’ are beyond the scope of this study. We encode ‘on-site’ and ‘remote work not possible’ as 0 and ‘remotely and on-site equally’ as 1.

Race is operationalized with the options of ‘Caucasian’, ‘Asian/Asian Pacific’, ‘Black/Caribbean/Afro-Caribbean’, ‘Hispanic/Latino’, ‘Mixed’, and ‘Other’. Race is transformed to a binary: 0-Race Caucasian, 1-Race non-Caucasian.

Disability is measured and grouped according to the taxonomy of the Finnish Institute for Health and Welfare (2023), which is consistent with Article 1 of the Convention on the Rights of Persons with Disabilities of the United Nations (2006). This includes the following groups: 1) Physical (e.g. epilepsy, asthma, chronic pain, diabetes, chronic migraine, Tourette syndrome); 2) Mental (e.g. depression, anxiety, eating disorder, post-traumatic stress disorder, OCD); 3) Sensory (e.g. autism spectrum disorder, ADHD, blindness, deafness, dyslexia); and 4) Intellectual (e.g. Down syndrome, developmental delay, fragile X syndrome). Intellectual disabilities are excluded from this study due to low representation in the set. For each type of disability, 0 indicates no disability and 1 – presence of a disability.

Language proficiency is measured by asking ‘what is your level of Finnish proficiency?’. Respondents report their perceived language proficiency based on CERF classifications. This is

transformed into a binary with 0-Non-native Finnish speaker/No proficiency, 1-Native Finnish speaker.

Gender is measured through the question ‘what gender do you identify with?’, with answer choices ‘Male’, ‘Female’, ‘Non-binary’, ‘Other’, and ‘Prefer not to disclose’. We exclude ‘non-binary’ and ‘other’ responses due to a low sample size. We encode males as 0 and females as 1.

We operationalize the dependent variable of **psychological safety** using the seven-item Team Psychological Safety Scale developed by Edmondson (1999). However, we remove the last item (“*Working with members of this team, my unique skills and talents are valued and utilized.*”) because it overlaps strongly with another inclusion-related construct that is a part of the larger DEI survey, but not included in this study. Cronbach’s alpha for our adjusted 6-item construct for psychological safety is 0.793, indicating a good level of reliability. An example of the items used in this study is: “*If you make a mistake in this work group, it is often held against you.*” Respondents rated the extent to which they agree with the set of statements regarding psychological safety in their team/group on a seven-point Likert scale (“1: strongly disagree” to “7: strongly agree”).

We include **age** as a control variable. Age diversity has been found to inhibit knowledge sharing in teams (Gerpott et al. 2021). Age can also be a marker of status and a basis for discrimination (‘ageism’) in organizations (Perry & Parlamis, 2006), and thus can influence psychological safety.

The items of all variables were translated from English into Finnish and Swedish by two translators and then back into English by another translator. The back-translations were then compared with the original items to assess whether they had retained their original meaning throughout the translation process.

3.3 Data analysis

We transform the psychological safety score, which is calculated as the mean of the Likert-scale items. The distribution of these scores has a strong negative skewness ($\gamma_1 = -0.81$). To ensure a linear relationship between the dependent variable and the moderators, a Box-Cox ($\lambda = 2.4$) transformation is applied to the original psychological safety scores. Since this is a monotonic transformation, it does not change the order of the scores. For the same reason, standardizing the transformed scores to a 0-10 scale preserves the order. The latter is done to facilitate the interpretation of the results.

Following the transformations, OLS models are formulated to answer the hypotheses. In all models, the transformed standardized psychological safety

score is the dependent variable, work arrangement is the independent variable, and age (continuous) is the control variable. An intercept is included in all models. Hypothesis 2 onwards the minority moderators are included as well as the term for the interaction effect between the minority group and work arrangement.

4. Results

Model (1) shows no significant effect of hybrid work on employees' perceived psychological safety, thus rejecting H1. Model (2) shows a *positive* and significant effect of hybrid work on the perceived psychological safety of racial minority groups ($\beta = 0.795, p < 0.056$) thus confirming H2. Non-Caucasians perceive higher psychological safety in hybrid work than in on-site work. The estimated coefficients along with standard errors for models (1) and (2) are presented in Table 1.

Table 1. Model results for hypotheses 1 and 2.

	Model (1)	Model (2)
Virtual work	0.019 (0.170)	-0.234 (0.0.185)
Race non-Caucasian	-	-1.575*** (0.250)
Virtual work × Race non-Caucasian	-	0.795* (0.415)
Age	-0.005 (0.007)	-0.01 (0.007)
Intercept	5.993*** (0.276)	6.612*** (0.285)
R ²	0.001	0.052
Number of observations: N = 832 Sig ≤ 0.001 ***, Sig ≤ 0.05 **, Sig ≤ 0.1 *		

Model (3b) shows a negative and significant effect of hybrid work on the perceived psychological safety for individuals with a sensory disability ($\beta = -1.502, p < 0.037$), thus rejecting H3b. However, we found no statistically significant effect of hybrid work for employees with a physical (H3a) or mental (H3c) disabilities. The estimated coefficients and standard errors for models (3a-c) are shown in Table 2.

Table 2. Model results for hypotheses 3a-c.

	Model (3a)	Model (3b)	Model (3c)
<i>Moderator</i>	<i>Physical disability</i>	<i>Sensory disability</i>	<i>Mental disability</i>
Virtual work	0.031 (0.179)	0.123 (0.175)	0.006 (0.184)
<i>Moderator</i>	-0.034 (0.373)	-0.009 (0.44)	-0.742** (0.302)
Virtual work × <i>Moderator</i>	-0.121 (0.549)	-1.502** (0.658)	0.161 (0.457)
Age	-0.004 (0.007)	-0.005 (0.007)	-0.009 (0.007)
Intercept	5.991*** (0.279)	6.02*** (0.277)	6.265*** (0.29)
R ²	0.001	0.012	0.011
Number of observations: N = 832 Sig ≤ 0.001-***, Sig ≤ 0.05-**, Sig ≤ 0.1-*			

Model (4) shows a *positive* and significant effect of hybrid work on the perceived psychological safety of language minorities ($\beta = 0.597, p < 0.09$), thus confirming H4. Model (5) shows a *positive* and significant effect of hybrid work on the perceived psychological safety of women ($\beta = 0.639, p < 0.06$), confirming H5. Table 3 presents the estimated coefficients and standard errors for models (4) and (5)

To check for the robustness of the empirical results the same model specifications were run on two sub-samples. The first sub-sample includes respondents who possess Finnish citizenship either by birth or naturalized (N=587). The second sub-sample includes respondents who do not have Finnish citizenship (N=245). Model (4) was not tested on the second sub-sample as it does not contain native speakers. The results for the subsamples are similar in terms of the significance of the estimated coefficients and their signs, with minor variations in magnitude.

Table 3. Model results for hypotheses 4 and 5.

	Model (4)	Model (5)
<i>Moderator</i>	<i>Non-native Finnish proficiency</i>	<i>Gender female</i>
Virtual work	-0.290 (0.205)	-0.259 (0.254)
<i>Moderator</i>	-1.172*** (0.228)	-0.579** (0.225)
Virtual work × <i>Moderator</i>	0.597* (0.352)	0.639* (0.340)
Age	-0.016** (0.007)	-0.005 (0.007)
Intercept	6.931*** (0.322)	6.268*** (0.295)
R ²	0.035	0.009
Number of observations: N = 832 Sig ≤ 0.001-***, Sig ≤ 0.05-**, Sig ≤ 0.1-*		

5. Discussion

In this study, we investigate how minority group members perceive psychological safety in hybrid work vis-à-vis on-site work. Despite the increasing prevalence of remote working arrangements (Bloom, Han, & Liang, 2024), research linking hybrid work, minority groups, and psychological safety has been limited. Our findings suggest that ICT-enabled hybrid work 'levels the playing field' for some, but not all, minority groups. Our study advances conversations on the equalization effect of ICT through highlighting the importance of socio-demographic factors. Through a novel focus on the outcome variable of psychological safety, we also contribute to the growing field of DEI in IS.

Interestingly, we obtain no significant results when testing for the effect of hybrid work on the psychological safety for all employees jointly. Had we concluded the analysis at the organization level – as is sometimes done with psychological safety (Frazier et al., 2017) – we may have asserted that the virtuality of

work is not a significant factor in creating a psychologically safe environment. However, a more nuanced picture emerges when we examine the effect of hybrid work on the psychological safety for different minority groups. Both virtuality and socio-demographic identities are important antecedents of psychological safety, indeed providing support for the equalization effect.

First, racial minorities (non-Caucasians in Finland) show higher psychological safety in hybrid work, likely due to the reductive features of virtuality that may render communication ‘color blind’ (Robert et al., 2018). On the flip side, the Caucasian majority reported lower levels of psychological safety in hybrid work, likely due to feeling only the repercussions but no direct benefit of virtuality (in line with, e.g. Tkalich et al., 2022).

Second, employees with sensory disabilities experience lower psychological safety in hybrid work than in on-site work. This finding contradicts previous research that has found ICT to alleviate the biases or negative stereotypes against employees who are not fully able-bodied (see e.g. Tomczak, 2021). However, the devil may (again) be in the details: sensory disabilities are largely invisible, so ICT may not offer the same concealing benefits compared to more visible physical disabilities. Instead, employees with sensory disabilities may struggle with ‘speaking up’ in virtual environments, where the social etiquette is different than in the office and the organization of work is often less structured (Moser & Axtell, 2013). At the same time, the lack of body language in video calls or the use of lean communication – i.e. the reductive features of ICT - may make interpretation more difficult and ambiguous (Mehrabian & Ferris, 1967), factors that may be especially important for the psychological safety of this minority group.

Third, language minorities, i.e. non-native Finnish speakers, experience higher levels of psychological safety in hybrid work. This aligns with previous research showing that the use of lean media in virtual spaces may reduce social categorization based on language proficiency (Klitmøller, Schneider, & Jonsen, 2015) and that reductive features of technology may render the non-inclusive language use of others to be seen more objectively in virtual spaces (Klitmøller & Lauring, 2016). In effect, additive features, such as ICT-enabled translation and transcription services, as well as asynchronous communication options, may alleviate the thresholds for linguistic minorities to ‘speak up’. Conversely, language majorities felt more psychological safety on-site than in hybrid work.

Finally, female employees reported higher levels of psychological safety in hybrid work than on-site

work. This is likely due to the dilution of visible socio-demographic traits in ICT, made possible by its reductive features. Nevertheless, we found the results surprising, given the university’s almost equal gender balance, and with Finland ranking 6th in the United Nations Global Inequality Index (2024). Similarly to racial and language majorities, also men reported lower levels of psychological safety in hybrid vis-à-vis on-site work. It appears that men are unlikely gain an advantage in virtual settings, but rather have more to lose (cf. Lee, 2021; Tkalich et al., 2022; Fleischmann et al., 2023).

5.1 Directions for future research

Like any study, this one too has limitations, providing fertile ground for future research. First, we treat virtuality as a two-level categorical variable: hybrid and on-site. Future research could consider virtuality on a continuous or ordinal scale to explore how different *degrees* of remoteness impact psychological safety. In addition, our data only specifies disability type (physical, sensory, mental), but not the exact disability. Therefore we cannot verify whether the results for sensory disability are driven by invisible forms (e.g., autism, ADHD, dyslexia) or more visible forms (e.g., blindness, deafness), yet urge future researchers to delve deeper into specific disability types.

Finally, our study provides a pathway for further research into smaller demographic groups and other DEI-related constructs. We excluded employees with non-binary gender identities due to statistical challenges but encourage further exploration of these groups. Also, while we focused only on psychological safety, constructs such as inclusion and climate for inclusion (Nishii, 2013) are also central to DEI initiatives. Exploring the dynamics of these constructs in hybrid work from minority group perspectives can help to identify boundary conditions and additional moderators of the equalization effect.

5.2 Implications

Our study offers managerial implications for using ICT to create psychologically safe organizations. First, we recommend providing employees with the autonomy to choose their preferred way of working. This flexibility can accommodate diverse needs and enhance overall psychological safety, but should not be mandated, as some minority groups may be further disadvantaged in hybrid work. In addition, while most minority groups benefit from hybrid work, majority groups’ psychological safety may suffer compared to on-site

arrangements. Managers need to understand these dynamics in order to address potential resistance within the organization, especially from those in traditionally powerful positions. Care should also be taken to ensure that not all minority group members work remotely, and majority group members on-site – although this may appear to increase psychological safety, it may also be detrimental to inclusion (see e.g. Back & Back, 2024).

Overall, we encourage organizations to avoid a one-size-fits-all approach and rather focus on understanding the unique needs of their employees, defined in part by their socio-demographic identity. Tailored strategies can better foster a psychologically safe environment for all – not just the majority.

6. Conclusion

While diversity, equity, and inclusion have become key values in contemporary organizations, our understanding of the role of technology in fostering or hindering DEI outcomes (Joshi and Deng, 2024) is still in its early stages. In this study we have advanced this understanding by analyzing how ICT can alleviate status differentials in hybrid work through a focus on perceived psychological safety of minority and majority groups. In particular, our study indicates that racial minorities, females, and language minorities feel greater psychological safety in hybrid settings than in on-site work, yet this equalization effect does not hold for employees with sensory disabilities. At the same time, majority groups perceive less psychological safety in hybrid work than on-site.

To conclude, we underscore the importance of socio-demographic identity and virtuality as antecedents of psychological safety. Hybrid work may indeed ‘level the playing field’ for some – but not all – minority groups. Understanding socio-demographic differences is crucial to creating a psychologically safe work environment in the age of increasing hybrid work arrangements.

7. References

- Back, H., & Back, P. (2024). Virtual Work and the Inclusion of Linguistic Minorities: A Double-Edged Sword. In *57th Hawaii International Conference on System Sciences* (pp. 6967-6976).
- Back, H., & Piekkari, R. (2024). Language-based discrimination in multilingual organizations: A comparative study of migrant professionals’ experiences across physical and virtual spaces. *Journal of World Business*, *59*(3), 1-13.
- Berger, J., Cohen, B. P., & Zelditch Jr, M. (1972). Status characteristics and social interaction. *American Sociological Review*, *24*1-255.
- Bienefeld, N., & Grote, G. (2014). Speaking up in ad hoc multiteam systems: Individual-level effects of psychological safety, status, and leadership within and across teams. *European Journal of Work and Organizational Psychology*, *23*(6), 930-945.
- Bloom, N., Han, R., & Liang, J. (2024). Hybrid working from home improves retention without damaging performance. *Nature*, 1-6.
- Buvik, M. P., & Tkalich, A. (2022). Psychological safety in agile software development teams: Work design antecedents and performance consequences. In *55th Hawaii International Conference on System Sciences* (pp. 7330-7339).
- Carte, T., & Chidambaram, L. (2004). A capabilities-based theory of technology deployment in diverse teams: Leapfrogging the pitfalls of diversity and leveraging its potential with collaborative technology. *Journal of the Association for Information Systems*, *5*(11), 4.
- CIPD. (2020). People profession 2030: A collective view of future trends. Report November.
- Detert, J. R., & Burris, E. R. (2007). Leadership behavior and employee voice: Is the door really open? *Academy of Management Journal*, *50*(4), 869-884.
- Driskell, J. E., & Salas, E. (1991). Group decision making under stress. *Journal of Applied Psychology*, *76*(3), 473.
- Dubrovsky, V. J., Kiesler, S., & Sethna, B. N. (1991). The equalization phenomenon: Status effects in computer-mediated and face-to-face decision-making groups. *Human-Computer Interaction*, *6*(2), 119-146.
- Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, *44*(2), 350-383.
- Edmondson, A. C., Bohmer, R. M., & Pisano, G. P. (2001). Disrupted routines: Team learning and new technology implementation in hospitals. *Administrative Science Quarterly*, *46*(4), 685-716.
- Edmondson, A. C., & Daley, G. (2020). How to foster psychological safety in virtual meetings. *Harvard Business Review*, *25*(08), 1-4.
- Elraz, H. (2018). Identity, mental health and work: How employees with mental health conditions recount stigma and the pejorative discourse of mental illness. *Human Relations*, *71*, 722–741.
- Finnish Institute for Health and Welfare. (2023, December 5): Vammaispalvelujen käsikirja [Disability service manual]. Retrieved from <https://thl.fi/julkaisut/kasikirjat/vammaispalvelujen-kasikirja/vammaisuus-yhteiskunnassa/vammaisuus> on June 9, 2023.
- Fleischmann, C., Seeber, I., Cardon, P., & Aritz, J. (2023). Fostering psychological safety in global virtual teams: The role of reminder nudges and team-based interventions. In *56th Hawaii International Conference on System Sciences* (pp. 365-374).
- Follmer, K. B., & Jones, K. S. (2018). Mental illness in the workplace: An interdisciplinary review and organizational research agenda. *Journal of Management*, *44*(1), 325-351.
- Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological safety: A meta-

- analytic review and extension. *Personnel Psychology*, 70(1), 113-165.
- Gerpott, F.H., Lehmann-Willenbrock N., Wenzel R. & Voelpel S.C. (2021). Age diversity and learning outcomes in organizational training groups: the role of knowledge sharing and psychological safety. *The International Journal of Human Resource Management*, 32(18), 3777–3804.
- Heath, D., & Babu, R. (2017). Theorizing managerial perceptions, enabling IT, and the social inclusion of workers with disabilities. *Information and Organization*, 27(4), 211-225.
- Hinds, P. J., Neeley, B., & Cramton, C. D. (2014). Language as a lightning rod: Power contests, emotion regulation, and subgroup dynamics in global teams. *Journal of International Business Studies*, 45(5), 536- 561.
- Jammaers, E., Zanoni, P., & Hardonk, S. (2016). Constructing positive identities in ableist workplaces: Disabled employees' discursive practices engaging with the discourse of lower productivity. *Human Relations*, 69, 1365–1386.
- Janssen, J., & Kirschner, P. A. (2020). Applying collaborative cognitive load theory to computer-supported collaborative learning: Towards a research agenda. *Educational Technology Research and Development*, 68(2), 783-805.
- Joshi, K. D., & Deng, X. (2024). IT Research in Marginalized Contexts: An Evolving Landscape. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 55(2), 6-13.
- Klitmøller, A., & Lauring, J. (2016). When distance is good: A construal level perspective on perceptions of inclusive international language use. *International Business Review*, 25(1), 276-285.
- Klitmøller, A., Schneider, S. C., & Jonsen, K. (2015). Speaking of global virtual teams: language differences, social categorization and media choice. *Personnel Review*, 44(2), 270-285.
- Lee, H. (2021). Changes in workplace practices during the COVID-19 pandemic: the roles of emotion, psychological safety and organisation support. *Journal of Organizational Effectiveness: People and Performance*, 8(1), 97-128.
- Mehrabian, A., & Ferris, S. R. (1967). Inference of attitudes from nonverbal communication in two channels. *Journal of Consulting Psychology*, 31(3), 248.
- Mor Barak, M. E. (2010). Managing diversity: Toward a globally inclusive workplace:
- Moser, S., & Axtell, M. (2013). The role of norms in virtual work. *Journal of Personnel Psychology*. 12(1), 1-6.
- Nembhard, I. M., & Edmondson, A. C. (2006). Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. *Journal of Organizational Behavior*, 27(7), 941-966.
- Nishii, L. H. (2013). The benefits of climate for inclusion for gender-diverse groups. *Academy of Management Journal*, 56(6), 1754-1774.
- Nkomo, S. M., Bell, M. P., Roberts, L. M., Joshi, A., & Thatcher, S. M. (2019). Diversity at a critical juncture: New theories for a complex phenomenon. *Academy of Management Review*, 44(3), 498-517.
- Nurmi, N., & Koroma, J. (2020). The emotional benefits and performance costs of building a psychologically safe language climate in MNCs. *Journal of World Business*, 55(4), 1-15.
- Ocker, R. J. (2007). A balancing act: The interplay of status effects on dominance in virtual teams. *IEEE Transactions on Professional Communication*, 50(3), 204-218.
- Pérez-Mateo, M., & Guitert, M. (2012). Which social elements are visible in virtual groups? Addressing the categorization of social expressions. *Computers & Education*, 58(4), 1234-1246.
- Perry, E. L., & Parlamis, J. D. (2006). Age and ageism in organizations. In Konrad, A., Pringle, J. & Prasad, P. (Eds.). *Handbook of workplace diversity*, pp. 345-370.
- Rains, S.A. 2005. Leveling the organizational playing field—virtually: A meta-analysis of experimental research assessing the impact of group support system use on member influence behaviors. *Communication Research*, 32(2): 193–234.
- Ridgeway, C. (1991). The social construction of status value: Gender and other nominal characteristics. *Social Forces*, 70(2), 367-386.
- Robert Jr, L. P., Dennis, A. R., & Ahuja, M. K. (2018). Differences are different: Examining the effects of communication media on the impacts of racial and gender diversity in decision-making teams. *Information Systems Research*, 29(3), 525-545.
- Singh, B., Winkel, D. E., & Selvarajan, T. T. (2013). Managing diversity at work: Does psychological safety hold the key to racial differences in employee performance? *Journal of Occupational and Organizational Psychology*, 86(2), 242-263.
- Tkalich, A., Šmite, D., Andersen, N. H., & Moe, N. B. (2022). What happens to psychological safety when going remote? *IEEE Software*, pp. 1-9.
- Tomczak, M. T. (2021). Employees with autism spectrum disorders in the digitized work environment: Perspectives for the future. *Journal of Disability Policy Studies*, 31(4), 195-205.
- United Nations (2006). Convention on the rights of persons with disabilities (CRPD): Article 1 – Purpose. *United Nations Department of Economic and Social Affairs*.
- United Nations (2024). Human development report 2023/2024 – Table 5: Gender inequality index. *United Nations Development Program*.
- Usher, M., & Barak, M. (2020). Team diversity as a predictor of innovation in team projects of face-to-face and online learners. *Computers & Education*, 144, 103702.
- Van Dyne, L., & LePine, J. A. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management journal*, 41(1), 108-119.
- Zanoni, P., Janssens, M., Benschop, Y., & Nkomo, S. (2010). Guest editorial: Unpacking diversity, grasping inequality: Rethinking difference through critical perspectives. *Organization*, 17(1), 9-29.