Gender as a Moderator of the Double Bias of Mistakes: Knowledge Culture and Sharing Effects

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Abstract: There is no learning without mistakes. The essence of the double bias of mistakes is the contradiction between an often-declared positive attitude towards learning from mistakes, and negative experiences when mistakes occur. Financial and personal consequences, shame, and blame force desperate employees to hide their mistakes. These adverse outcomes are doubled in organizations by the common belief that managers never make mistakes, which makes the contradiction even more harmful. Double bias affected leaders select only easy tasks to secure their positions, and those who want to be promoted hide their mistakes to maintain the image of a "perfect employee". Avoiding the risk of failure is generally not wrong as long as doing so does not block organizational growth. It has been proven that the double bias of mistakes can present a serious hurdle for organizational learning and collective intelligence building. This study explores whether the double bias of mistakes is gender-related and how it affects tacit and explicit knowledge sharing. To do so, it is based on a sample of 183 Polish knowledge workers affected by the double bias of mistakes. The analysis method was ordinary least squares regression, which was conducted with SPSS PROCESS software. Results show that the double bias of mistakes generally causes more problems for female specialists than male specialists and more for male managers than female managers. Regarding managers, male managers probably tend to focus more on control at work. In contrast, women focus on supporting learning (they accept mistakes as a source of knowledge and share knowledge gained from them). Considering current challenges relating to collective intelligence building, women seem to have the potential to be better mentors and probably also better leaders than men. Such formulated conclusions are based on indirect inferences, so further research is necessary.

Keywords: Gender, Double Bias Of Mistakes, Tacit Knowledge Sharing, Explicit Knowledge Sharing, Mistakes Acceptance Component, Knowledge Culture

1. Introduction

The essence of the double bias of mistakes is the clash of often learned and next declared positive attitudes towards learning from mistakes (declared acceptance of mistakes as a potential source of learning) and negative experiences when mistakes are made (shame and blame consequences). This clash causes a cognitive bias. This bias is doubled when a particular society or group believes that "BOSS NEVER makes mistakes." Authors who revealed and explored the double bias of mistakes (DBM) consequences for organizations (Hosseini et al., 2023; Kucharska, Bedford, and Kopytko, 2023; Kucharska and Kopytko, 2023) found that it might severely affect organizational learning, intelligence, and growth. This study aims to explore whether the DBM is affected by gender and attempts to expose this relationship in the context of respondent position in an organization. Specifically, this study aims to determine whether the double bias of mistakes is gender-related and how it affects tacit and explicit knowledge sharing, which is critical for organizational learning and collective intelligence building. Recently, Heisig and Kannan's (2020) identified the need for studies exploring the dependency of knowledge sharing on gender. Moreover, Kucharska and Rebelo (2022) revealed that women accepted mistakes as a source of learning much better than men did, but at the same time, women were less likely than men to share the knowledge they gained from making mistakes. The authors explain that the reason is that women have lower self-confidence at work and that sharing knowledge gained from their own mistakes requires self-confidence, especially if they hold managerial positions. However, these authors did not examine the DBM phenomenon. Their study focused on the mistake acceptance component of learning culture as an antecedent of tacit knowledge sharing when it is moderated by gender. In contrast, Kucharska et al., 2023 and Kucharska and Kopytko (2023) examined the influence of DBM on tacit knowledge sharing, though they did not explore it concerning gender. So, this study aims to combine it and examine the relationship between the mistakes acceptance component of learning culture and knowledge sharing, including gender impact on these relations. The effect the DBM phenomenon has on organizations and societies is already interesting, and introducing gender makes the topic even more exciting. Kucharska et al. (2023; Figure 1) found that the DBM strongly affects the relationship between knowledge culture and the mistake acceptance component of learning culture, the relationship between learning culture mistake acceptance component and tacit knowledge sharing, and also the relationship between tacit and explicit knowledge sharing. This study aims to verify whether gender moderates these strongly affected by the DBM relationships. In Figure 1, these relationships are marked with red ellipses.

Figure 1: The DBM affects organizations (Kucharska et al., 2023)

Note: n = 640/n = 327/**n = 183** (TOTAL/no bias/**DBM bias**) ML; χ2 = 1043.45(331)/*700.082(305)*/**638.55(305)**
CFI = .941/.939/**.896**   TLI = .933/.930/**.880**   RMSEA = .059/.063/**.078;**   Cmin/df = 3.15/2.27/**2.09;**   *p < .05
p < .01 ***p < .001; ns = not significant result; **DBM = the double bias of mistakes

2.   Conceptual Framework

The bias of mistakes is rooted in a specific cognitive bias (Tversky and Kahneman, 1981) called the framing effect (Clark 2009; Druckman 2001a; 2001b; Plous 1993). It is caused by claims that mistakes are a positive, natural part of humanity and learning processes, while, at the same time, the mistake event has negative consequences for the mistake maker (shame, blame, exclusion, etc.). This clash results in mistakes being framed negatively because negative experiences of personal consequences of mistakes affect us more powerfully than positive and encouraging statements to take the risk of making a mistake when trying something new and crossing the "comfort zone." The framing effect is observed when a particular phenomenon's negative or positive connotations (in this case, mistakes) influence perceptions and judgments about it. The framing bias is one of the most significant biases influencing situational judging and decision-making (Thomas and Millar, 2011). The negative framing effect of mistakes can be powerful in organizations and societies. Therefore, it is vital to explore its impact more in-depth. Furthermore, in organizations, this cognitive bias is often doubled by another solid, shared belief that 'managers never make mistakes', or, in other words, the belief that only excellent employees can be promoted and hold managerial positions. Mistakes are perceived as indicators of negligence and in strong contradiction to excellence and perfection. Therefore, employees hide their mistakes, fearing being labeled 'losers'. This situation creates an illusion of personal and organizational perfection.

Self-awareness is a crucial skill for building intelligence (Gallup 1998; Rai and Rai, 2024). Hence, maintaining the illusion that mistakes never occur kills intelligence, both individual and collective. In biased societies and organizations, people try to expose excellence and hide mistakes. Mistakes, if they are ignored, diminished, and hidden, cannot serve as lessons for either mistake-makers or the organization. Hiding mistakes jeopardizes personal and organizational learning, and the consequences of the cognitive bias of mistakes are severe. Bryans (2017) reports that 80% of employee learning occurs informally and is entirely unplanned, incidental, and mainly experiential. Therefore, most organizational learning is tacit. An example of incidental learning is learning from mistakes.

Moreover, Kucharska (2021a; 2021b) explained that to simulate all intellectual capital components development (human, relational, structural, and renewal), leaders must support both formal and informal knowledge (tacit and explicit). They can do this through an organizational culture that promotes knowledge and learning. Furthermore, to achieve the best results for transforming knowledge into intellectual capital, the learning culture must be shaped by two aspects: learning climate and acceptance of mistakes (Kucharska and Bedford,

2020). Based on the studies elaborated above and, specifically, the study of Kucharska et al. (2023) as visualized in Figure 1, the hypothesis is formulated that the DBM may cause tacit knowledge sharing to be problematic, even if mistakes are accepted as a potential source of learning. Moreover, based on the findings of Kucharska and Rebelo (2022) and Kucharska et al. (2022), it is assumed that the relation between the mistakes acceptance component of learning culture and knowledge sharing (tacit and explicit) can vary regarding gender. Summing up, the following hypothesis was formulated:

H1: *The DBM affects the relationship between the mistake acceptance component of learning culture and tacit knowledge sharing, and this is moderated by gender (moderating effect is expected).*

Tacit knowledge refers to newly discovered knowledge. Explicit knowledge is an effect of the tacit form of knowledge (barely conscious) being transformed into a codified, conscious form of knowledge; the transformation is the result of social interactions (Nonaka 1994; Nonaka and Takeuchi, 1995). Moreover, the study by Kucharska et al. (2023; Figure 1) reveals that the DBM also affects the relationship between tacit and explicit knowledge. Therefore, the hypothesis was formulated as follows:

H2: *The DBM affects the relationship between sharing tacit and explicit knowledge, and this relationship is moderated by gender (moderating effect is expected).*

The study by Kucharska et al. (2023; Figure 1) reveals that the DBM affects the relationship between the knowledge culture and the mistakes acceptance component of learning culture. Because this study assumed that the DBM could be affected by gender, it was consequently assumed that knowledge culture and the mistakes acceptance component of the learning culture relationship could also be affected by gender (precisely, moderated by gender). Moreover, since knowledge and learning cultures depend strongly on leaders' attitudes (Kucharska and Rebelo 2022; Kucharska and Bedford 2023), moderation was expected to be doubled. We expected that the influence of knowledge culture on the mistake acceptance component of learning culture in the DBM sample would depend not only on gender but also on position in the company. The doubled moderation was hypothesized as follows:

H3: *The DBM affects the relationship between knowledge culture and the mistakes acceptance component of learning culture, and this relationship is moderated by gender and position (moderated moderation effect is expected).*

The next section will present the methodology we used to verify these hypotheses.

3. Methodology

<u>Sample</u>. The study sample was composed of 183 knowledge workers who were affected by the DBM at their place of work. These 183 DBM-affected knowledge workers were identified from the based sample composed of 640 Polish knowledge workers – 306 specialists and 334 managers, of whom 329 were women, and 311 were men – representing primarily private (77%) companies in various sectors. This selection was done according to the DBM detection and measurement procedure used by Kucharska and Kopytko (2023).

<u>Sampling method</u>. The study targeted respondents who had worked for their current employer for a minimum of one year and who declared themselves to be and were knowledge workers (that is, the first input and output of their work is knowledge). This characteristic mattered because it was expected that knowledge workers would have a higher-than-average employee rate of self-awareness, and results obtained for other types of workers might differ significantly.

<u>Data collection</u>. Data collection was done in March 2023.

<u>Measures</u>. Respondents rated latent constructs using a 7-point Likert scale. To measure DBM, respondents declared their agreement or disagreement with statements by selecting a 'true' or 'false' response. Kucharska et al. (2023) provide scale statements and their sources.

<u>Sample characteristics</u>: n = 183 Polish knowledge workers; gender: men = 54%, women = 46%; position: managers = 44%, specialists = 56%; respondents represented variety of sectors. Table 1 presents details of basic statistics of the DBM sample.

<u>Method of analysis</u>: ordinary least squares (OLS) SPSS PROCESS regression (Hayes, 2018).

Table 1: Basic statistics: the DBM per gender and position

DBM sample N = 183	Gender			
	Female		**Male**	
	Specialist	Manager	Specialist	Manager
Frequency	54	31	49	49
KC [mean]	4.05	4.64	4.67	4.02
LCm [mean]	3.78	4.66	3.78	3.62
TKS [mean]	3.83	4.26	3.54	3.34
EKS [mean]	4.03	4.09	3.55	3.17

Note: KC: knowledge culture; LCm: learning culture mistake acceptance component; TKS: tacit knowledge sharing; EKS: explicit knowledge sharing
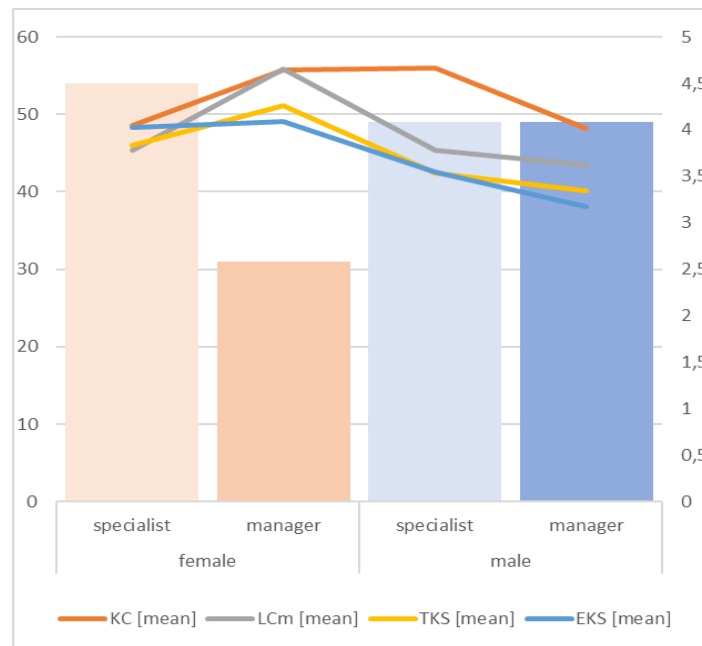
Figure 2: Basics statistics visualization: positions frequency per gender and mean values of measured variables for these frequencies

Basic statistical analysis of the respondents' statements provided mean values of measured variables. The DBM-biased sample reflects the statements of respondents who experienced a contradiction between attitudes and behavior in relation to mistakes. Regarding mistake acceptance as a potential source of value, it is clear that female DBM managers declared the greatest acceptance of mistakes and a tendency to share knowledge. Kucharska and Rebelo (2022) examined the higher education sector, and their findings, as expressed by basic statistics, were quite different – men similarly were less likely declared to accept mistakes as a source of learning than women were. Still, men were more likely declared to share the knowledge gained from mistakes than women. Nevertheless, basic statistics did not reveal the relationships between variables; therefore, this study aims to explore these relations. Specifically, this study aims to determine whether the double bias of mistakes is gender-related and how it affects tacit and explicit knowledge sharing, which is critical for organizational learning and collective intelligence building. Precisely, this study aims to verify whether 'gender' factor moderates identified earlier as strongly affected by the DBM following relationships:
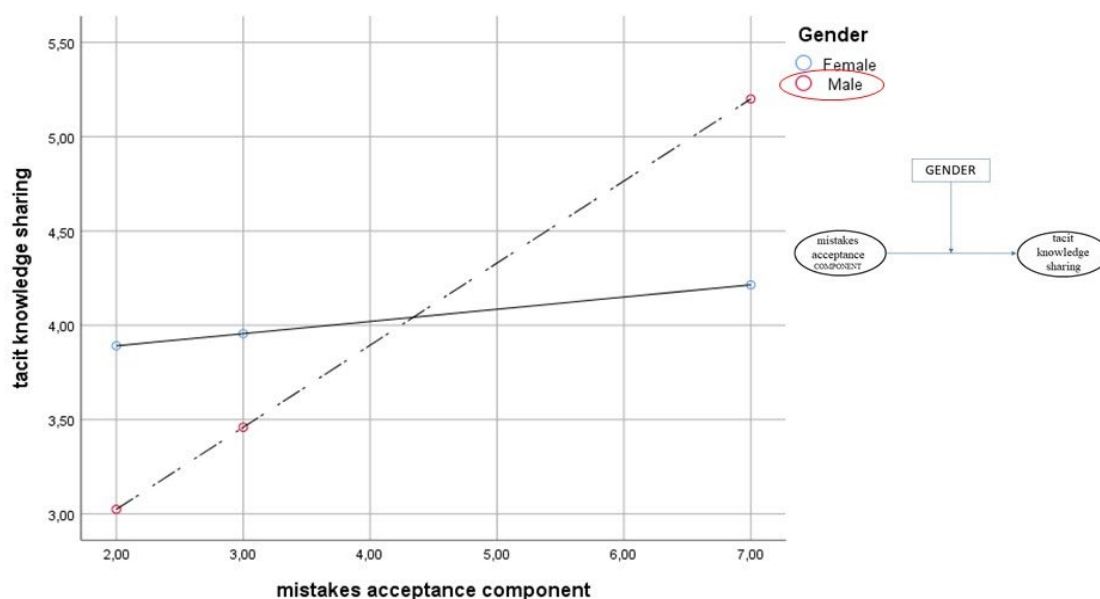
- the relationship between learning culture mistake acceptance component and tacit knowledge sharing,
- the relationship between tacit and explicit knowledge sharing,
- the relationship between knowledge culture and the mistake acceptance component of learning culture.

4. Results

Basic statistics reveal that the DBM affected men more than it affected women. To explore how gender moderates the relationship between sharing tacit and explicit knowledge, SPSS was used in applying the OLS regression method to verify hypotheses H1, H2, and H3. Figures 3 to 4 visualize the verification results. Below each figure, the 'Model Summary' exposes statistics of model quality.

Figure 3 reveals that the higher the mistake acceptance component of a learning culture (LCm), the more robustly the tacit knowledge was shared by men. For women, this relationship is not significant. Figure 4 shows that the more robust tacit knowledge sharing occurs, the more intensive explicit knowledge sharing is. This effect is stronger for men than for women, and this effect is significant for both. Figure 5 visualizes the effect of position on the effect of gender on the relation between the mistake acceptance component of learning culture and knowledge culture relation. This moderated moderation effect is significant only for managers.

All hypotheses are sustained. The OLS regression model results are visualized in Figures 3 to 5. Statistical summaries of each model are provided below, justifying hypotheses verification details.

Figure 3: The effect of gender on the relationship between the mistake acceptance component of learning culture and tacit knowledge sharing in the DBM sample (H1)

Note: The significant result is circled

Figure 3 exposes that the stronger the mistake acceptance as a potential source of learning in the double mistakes biased conditions, the more robust tacit knowledge sharing is observed. So, the development of this learning culture component matters for tacit knowledge sharing, and it matters more for men.

Model Summary

```
            R        R-sq       MSE         F        df1        df2          p
        ,2918      ,0851     4,1147     3,6601     3,0000   118,0000      ,0145
Model       coeff        se         t          p       LLCI       ULCI
constant   5,3694     1,2959     4,1434      ,0001     2,8032     7,9356
LCm        -,3059      ,2999    -1,0200      ,3098     -,8998      ,2880
Gender    -1,6077      ,8021    -2,0045      ,0473    -3,1960     -,0194
Int_1       ,3705      ,1922     1,9282      ,0462     -,0100      ,7510


Product terms key:  Int_1    :        LCm     x        Gender
Test(s) of highest order unconditional interaction(s):
     R2-chng          F        df1        df2          p
X*W      ,0288     3,7180     1,0000   118,0000      ,0462
Conditional effects of the focal predictor at values of the moderator(s):
     Gender     Effect        se          t          p       LLCI       ULCI
     1,0000      ,0646      ,1329      ,4862      ,6277     -,1986      ,3279
     2,0000      ,4352      ,1388     3,1361      ,0022      ,1604      ,7099
Level of confidence for all confidence intervals in output:  95,0000
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Figure 3 reveals that men shared tacit knowledge more readily when the organization strongly developed the mistake-acceptance component. For women, this relation is not significant.

Based on all the above, hypothesis H1, about the moderated effect of gender on the mistake acceptance component on tacit knowledge sharing, is sustained.
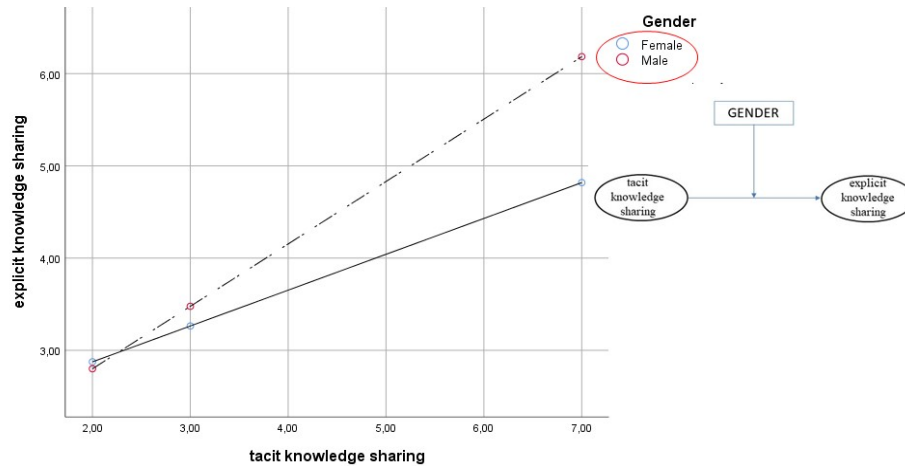

Figure 4: The effect of gender on the relationship between tacit and explicit knowledge sharing (H2)

Note: The significant result is circled

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Model Summary
        R        R-sq       MSE         F         df1        df2         p
     ,5550      ,3080     2,6806     17,5093    3,0000    118,0000      ,0000
Model       coeff        se          t          p        LLCI        ULCI
constant    2,7483     1,0253     2,6806      ,0084      ,7180      4,7786
F1           ,1008      ,2276      ,4428      ,6587     -,3499       ,5515
Gender      -,6507      ,6359    -1,0233      ,3083    -1,9099       ,6085
Int_1        ,2880      ,1490     1,9331      ,0456     -,0070       ,5830
Product terms key:  Int_1    :       TKS       x       Gender
Test(s) of highest order unconditional interaction(s):
       R2-chng        F         df1        df2         p
X*W      ,0219     3,7370     1,0000    118,0000      ,0456
Conditional effects of the focal predictor at values of the moderator(s):
     Gender     Effect      se          t          p        LLCI        ULCI
    1,0000      ,3887      ,0993     3,9132      ,0002      ,1920       ,5855
    2,0000      ,6767      ,1110     6,0963      ,0000      ,4569       ,8965
Level of confidence for all confidence intervals in output:  95,0000
```

Figure 4 shows that the stronger tacit knowledge sharing is, the more intensive its transformation to explicit form is. This relation is significant for men and women, though it is stronger for men.

Based on all the above, hypothesis H2, which refers to the moderating effect of gender on the relationship between sharing tacit and explicit knowledge, is sustained.
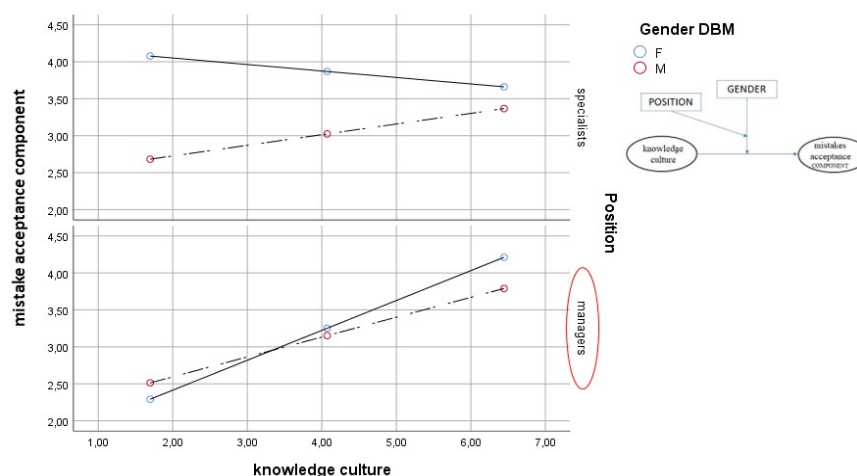

Figure 5 The effect of position on the moderating effect of gender on the relationship between knowledge culture and the mistake acceptance component of learning culture

Note: The significant result is circled

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Model Summary
          R      R-sq       MSE          F       df1        df2          p
       ,3657     ,1338    2,9129     3,8608    7,0000   175,0000      ,0006
Model       coeff        se          t          p       LLCI       ULCI
constant  10,8733     2,4759     4,3916      ,0000     5,9867    15,7599
KC        -1,1784      ,5234    -2,2514      ,0256    -2,2115     -,1454
Gender    -4,0269     1,5600    -2,5814      ,0107    -7,1057     -,9482
Int_1       ,5988      ,3273     1,8297      ,0690     -,0471     1,2447
Position  -4,8595     1,7224    -2,8213      ,0053    -8,2589    -1,4601
Int_2       ,8590      ,3548     2,4213      ,0165      ,1588     1,5593
Int_3      2,2391     1,0479     2,1367      ,0340      ,1709     4,3074
Product terms key:
 Int_1    :        KC       x       Gender
 Int_2    :        KC       x       Position
 Int_3    :     Gender      x       Position
Conditional effects of the focal predictor at values of the moderator(s):
    Gender   Position    Effect        se          t          p       LLCI       ULCI
    1,0000    1,0000     -,0877      ,0995     -,8813      ,3794     -,2841      ,1087
    1,0000    2,0000      ,4043      ,1265     3,1952      ,0017      ,1546      ,6540
    2,0000    1,0000      ,1440      ,0987     1,4583      ,1466     -,0509      ,3389
    2,0000    2,0000      ,2689      ,1117     2,4076      ,0171      ,0485      ,4893
Level of confidence for all confidence intervals in output:  95,0000
```

Note: 1-female   2- male   1- specialist   2-manager

Figure 5 shows that the stronger the knowledge culture, the stronger the mistake acceptance component of a learning culture. This relationship is significant only for managers and stronger for women than for men. A study on the total sample (Kucharska et al. 2023, Figure 1) found the opposite effect. Specifically, the more robust the knowledge culture, the weaker the mistake acceptance component of the learning culture. Based on this figure exposition, we can assume that specialists being stimulated by a strong knowledge culture caused the effect noted by Kucharska et al. (2023) – high appreciation for knowledge excludes mistakes acceptance even as a source of learning. This may cause serious trouble with learning from them.

5. Discussion

This study found that the DBM is, indeed, affected by gender. Specifically, the relationship between knowledge culture and the mistake acceptance component of learning culture, the relationship between the learning culture mistake acceptance component and tacit knowledge sharing, and the relationship between tacit and explicit knowledge sharing were moderated by gender in the DBM sample. Results reveal that gender moderates all the relationships that were explored in the double-biased sample. The effect was stronger for men than for women, except for women managers. This means that the DBM generally causes greater problems for women in specialist positions than men in specialist positions and more for male managers than female managers. This conclusion is based on the finding that the DBM does not prevent men from sharing tacit knowledge (H1), whereas women are affected by DBM and experience problems when they share tacit knowledge acquired from making mistakes. Regarding the transformation of tacit to explicit knowledge, it is stronger for men (H2). Moreover, DBM causes more problems for male managers than for female managers when motivated by the knowledge culture, men accept mistakes as a potential source of new learning at work (H3). Considering studies that explored the relationship between knowledge and learning cultures (Kucharska and Bedford, 2023), this finding suggests that male managers focus more on controlling others than supporting others learning at work, whereas female managers do the opposite.

Discussing this particular finding in the broader context of previous studies, it can be assumed that this is probably a stronger effect for specialists that male managers manage mostly by control that is doubly focused on mistake avoidance. The focus on mistake avoidance probably affects women more than men because female specialists are usually less confident than men at work (Das and Jha, 2023; Guillen et al., 2018). It is because they probably feel the pressure to expose the extraordinary 'perfection' to receive the same treatment at work as men have.

Considering the challenges organizations face today in relation to building collective intelligence and adapting to collective change, women may have the potential to be better leaders than men. The future is female; as Werner (2021) says, this study's findings seem to confirm it. The data suggests that the 'managing like a man' style could be outdated (Wajcman 2015; Arduini and Beck, 2023). However, gender stereotypes are still strong, and gender equality is still not a strategic priority of boards, which are usually dominated by men (Genin, Laroche and Marchadour, 2022). This means new strategies for women's actions are required to reverse the course of action exposed by this study, e.g., feminist resistance (Berglund et al., 2023; Yoong, 2023). Women need to learn to resist if they are not treated fair. This process may take some time. Women need to learn how to perceive

themselves as organization members. Nothing will change in men's perception of women at work if women do not change how they see themselves and expose themselves.

6.   Practical Implications

This study confirmed that DBM is gender-related. So, from the practical perspective of knowledge-driven organizations that are focused on development in the rapidly changing conditions of the reality of business, continuous learning, rather than controlling the status quo, is the preferred strategy. This study found that female leaders' potential to support organizational learning and growth is evident. At the same time, this study found that female specialists are more affected by DBM than men are, which, from an organizational perspective, might cause serious harm to collective intelligence building. Therefore, securing equal conditions, expectations, and safety for all employees is important for knowledge-driven organizations that wish to build collective intelligence. The practical implication for women, regardless of their positions, is feminist resistance development – a learning process to resist the view men have about women and to create women's own views. However, nothing will change for women at work if they do not change how they see themselves and how they behave at work. Nevertheless, it is essential to emphasize that women have learned this self-protective behavior (denial or hiding) under the influence of the existing DBM and strong stereotypes. So, if we want to support women, we need to be aware of the DBM and reduce gender stereotypes; to do so, we must change the workplace culture. The gender-balanced, inclusive culture-building matters as much as women's active care for their contribution recognition.

Shared attitudes, beliefs, and behaviors create a culture or a particular team, group, organization, or society. Culture is best learned when it is experienced. Organizational culture is learned at work from personal experiences and observations. So, leaders' behavior should create a particular company culture and, in this way, create standards at work.

7.   Limitations and Further Studies

This study and that of Kucharska et al. (2023), to which this research refers, are based on the Polish population and present a Polish perspective. Other nations' perspectives are needed to understand the DBM and gender relations in greater depth. Moreover, further studies should involve comparatively larger samples. This is because the mistakes employees make are very sensitive issues. Therefore, detecting a DBM and examining it in complex structures or comparing effects obtained for subsamples with and without DBM requires larger cohorts. A large sample will help us fully understand the particular phenomenon, for instance, the structural equation modeling method of analysis, for which rather large samples of at least 300 per cohort are recommended (depending on the number of variables included in the model). Moreover, in light of the presented findings and current challenges relating to collective intelligence building, the assumptions and conclusions regarding managers were made that women seem to have the potential to be better mentors and probably also better leaders than men. However, such formulated findings are based on indirect inferences, so further, more direct evidence delivery would significantly contribute to gender studies regarding the DBM, leadership, knowledge sharing, learning, and organizational intelligence building.

8.   Conclusion

The results of this study show that the DBM generally causes more problems for specialist women than for specialist men and more for male managers than for female managers. Therefore, in light of previous studies that explored the relationship between knowledge and learning cultures for collective intelligence building, which mistakes the acceptance component of learning culture supports and the DBM block, we conclude that women have the potential to be better leaders than men. The critical issue is to activate this potential.

Collective intelligence and change adaptability are what organizations need to develop today to secure competitiveness and successful survival in the unpredictable future. Women leaders can contribute to the development of such abilities in their organizations. The future is female - as Werner (2021) says, this study's conclusion seems to confirm it.

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