How can the double bias of mistakes block organizational intelligence? Gender and position analysis

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Abstract

Purpose – This study aims to examine whether double bias of mistakes (DBM) jeopardizes organizational learning and intelligence. Moreover, it verifies how female and male knowledge workers affected by the DBM impact organizational intelligence building.

Design/methodology/approach – The structural equation modeling method was used to analyze a large sample of 1,111 Polish knowledge workers (mixed sectors).

Findings – This study exposed that women managers, unlike men, are open to learning from mistakes and sharing knowledge gained this way.

Practical implications – The study results provoke the conclusion that patriarchy-dominated, less-inclusive organizations and societies will probably learn slower than inclusive ones representing gender variety, especially in management boards that shape organizational culture.

Originality/value – The essence of organizational success is what people can achieve together. So, collective, instead of individual, growth matters more. Organizational intelligence is not the sum of individual IQs but a collective ability to adapt smoothly together as a community. This pioneering study exposes that women are potentially better collective intelligence-building leaders than men.

Keywords The double bias of mistakes, Knowledge workers, Gender study, Knowledge sharing, Organizational intelligence building, The KLC approach, Knowledge culture, Learning culture, Collaboration culture, Inclusive leadership, Organizational learning, Learning from mistakes

Paper type Research paper

1. Introduction

The key to comprehending the dynamic nature of the surrounding environment is a perpetual commitment to learning. This principle applies to all employees, regardless of their age, gender or position within the organizational hierarchy. The lifelong learning (LLL) concept underscores the critical importance of continuously acquiring knowledge, skills, competencies, attitudes and behaviors throughout an individual's life, from early childhood through postretirement (Laal and Salamati, 2012). The dominant objectives of LLL include not just

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employment-related aspects but also active citizenship, personal fulfillment and social inclusion issues (Commission of the European Communities, 2001, p. 3). LLL – with its several possibilities of not only explicit but also tacit knowledge absorption – seems to be a remedy for isolating based mostly on explicit (formal) knowledge-driven organizations from real-life economic and sociocultural problems of the organizations. This is possible, thanks to employees' formal and informal learning, which happens through a dynamic in real-time knowledge absorption in the workplace (Kallen, 2013; Bryans, 2017) discovered that 80% of employee learning at work occurs informally and is entirely unplanned, incidental and mainly experiential. Therefore, most organizational learning is tacit. An example of such incidental, tacit learning is, e.g. learning from mistakes. It is easy to imagine how great results organizations and societies could achieve if they decided to support learning from mistakes.

Experts' admired inarticulate scientific knowledge supports their seemingly intuitive judgment, which is, in fact, rooted in the professional tacit knowledge collected from various practical contexts over time (Patel *et al.*, 1999; Boerma *et al.*, 2024) and as a result constitutes agile mindsets of leaders (Kucharska *et al.*, 2024, 2025). So, tacit knowledge-based experts' intuition generates innovative, contextual solutions. The informal aspects of practice are crucial for comprehending workplace learning and innovation (Derrick, 2020). That means it is essential to accept that the usage of informal practices like informal knowledge sharing, the intentional crossing of knowledge boundaries, perceiving the work peers as reviewers, contextual storytelling, metaphors usage, collective learning by doing and learning by interactions are source of innovations and competitive advantage (Derrick, 2019; Olaisen and Revang, 2018). The mastery of being an outstanding expert comes from experience, precisely from explicit knowledge, a solid base and constant contextual learning from all work-life experiences – from successes and failures. An expert not only experiences events but also stays mindful and takes profound lessons from these events – equally from good as harsh incidents – and also from mistakes.

Mistakes usually accompany efficient learning (Daw and Tobler, 2014). However, accepting mistakes as a source of organizational learning is usually problematic. The double bias of mistakes (DBM) phenomenon partially explains why accepting mistakes as a learning source is difficult at work. The essence of the bias of mistakes (BM) is the contradiction between an often-declared positive attitude toward learning from mistakes and, at the same time, the negative behaviors toward mistakes experienced (Kucharska and Kopytko, 2024a-b).

Authors who explored the bias of mistakes step by step studied first the impact of mistakes acceptance component of a learning culture (Kucharska and Bedford, 2020; Kucharska and Rebelo, 2022a, 2022b), the bias of mistakes (Rass *et al.*, 2023), especially the DBM on organizations (Hosseini *et al.*, 2024; Kucharska and Bedford, 2024) and found that it might severely affect intellectual capital, organizational learning, dynamic capabilities, intelligence building, innovativeness, sustainability and entire organizational. Moreover, Kucharska and Kopytko (2024b) discovered that gender and position matter for the perception of mistakes acceptance component of the learning culture view. Therefore, this study verifies how female and male knowledge workers affected by the DBM impact organizational intelligence building.

2. Conceptual framework

Transformative Learning Theory (Mezirow, 1995, 1997) claims that adult learning happens thanks to modified interpretations of the meanings of personal experiences and frames of reference through critical reflection. Critical reflection results from "intuitively becoming aware that something is wrong with the result of one's thought or challenging its validity through discourse with others of differing viewpoints and arriving at the best-informed judgment" (Mezirow, 1995, p. 46). So, Transformative Learning Theory clearly exposes that adults learn if they accept the fact that they are mistaken. It is known that there is no learning

without making mistakes. However, mistakes are perceived as indicators of negligence and poor performance in most organizations. Summing up, there is a need to change the attitude toward errors. However, it requires overcoming a vast mental barrier rooted in the DBM.

2.1 The double bias of mistakes and gender

The essence of the DBM is the contradiction between an often-declared positive attitude toward learning from mistakes and the experience of accompanying their negative consequences. This article investigates the potential threat posed by the DBM to organizational learning and, finally, organizational intelligence. Therefore, it is essential to understand the phenomenon of the cognitive bias of mistakes and its consequences. Without it, there is a risk that the entire idea of accepting mistakes as a potential source of learning will be simplified by biased minds to mistake tolerance and rejected as ridiculous. Therefore, it is critical to highlight that this study is not about promoting mistake tolerance. It is about accepting that even if we remain diligent, we can be mistaken, especially when we dynamically and contextually explore new areas of knowledge instead of statically exploiting old ones and keeping our "comfort zone." An organization needs a culture that promotes diligence but, at the same time, supports critical and creative thinking "out of the box," and acting that is risky by nature and may cause inevitable mistakes. In practice, accepting the fact that doing something the first time may cause mistakes and that such an event can also be a source of valuable lessons is not the same as being tolerant of mistakes. On the contrary, it is the first step to enhancing growth, managing risk and errors and creating effective systems to avoid mistakes through efficient lessons learned.

Former studies showed that culturally shaped acceptance of mistakes as a source of learning differs among genders (Kucharska and Rebelo, 2022a). Therefore, because of its potentially severe consequences, this phenomenon is worth exploring, especially in the context of gender differences.

2.2 The knowledge, learning and collaboration cultures' approach and gender

The integration of knowledge, learning and collaboration cultures (KLC approach) is essential for the sustainable development of knowledge-driven organizations. These cultural elements are more impactful when combined than when considered separately (Kucharska, 2025; Kucharska and Bedford, 2024). In knowledge-oriented organizations, a culture of knowledge typically prevails, emphasizing the exploitation of static knowledge (Van Wijk *et al.*, 2012). In contrast, organizations prioritizing continuous innovation and challenging the existing "status quo" are characterized by a dominant learning culture. Notably, a knowledge culture provides a foundation for developing a learning culture. It is evident that organizations entrenched in a knowledge-oriented stage (exploitation), where the static use of knowledge and control outweighs exploration, risk undermining organizational learning. This is because, in such environments, new knowledge is often viewed as a threat and is therefore rejected to avoid potential mistakes. Consequently, new working methods are perceived as risky and are dismissed to maintain a sense of stability. Organizations that rely primarily on established knowledge tend to operate within their "comfort zone." As a result, employees may resist changes to protect the current state of affairs.

Conversely, a learning culture promotes active knowledge exploration through continuous and dynamic knowledge acquisition, driven by the concept of "intelligence in action" (Erickson and Rothberg, 2012). An organizational learning culture facilitates the creation and dissemination of tacit knowledge while discouraging the hoarding or concealment of such expertise (Weinzimmer and Esken, 2017). Although a knowledge culture alone does not inherently produce this effect, it serves as a foundation for fostering curiosity and identifying knowledge gaps that stimulate learning. This perspective is consistent with Webster and Pearce (2008), who emphasized the significance of situational learning, which is aligned with

the current context. Contextual learning is crucial for the acquisition of tacit knowledge, which is a substantial source of innovation. Therefore, the implementation of a continuous learning culture is particularly relevant in today's dynamic and rapidly evolving business environment.

Operating in a dynamic and unpredictable business environment involves a degree of experimentation that inherently carries risks and may result in mistakes. However, within a learning culture, such mistakes are not viewed as signs of negligence but rather as unintended consequences of action that can provide valuable lessons. The core of this approach is not the acceptance of negligence but rather the thorough examination of the mistake and the capture of new, context-specific knowledge. Therefore, a lack of an acceptance component for mistakes within a learning culture can hinder organizational learning from these errors, representing a significant missed opportunity. If a mistake occurs, it should at least serve as a learning opportunity. A learning culture lacking a developed component for accepting mistakes is merely an illusion of a true learning culture. Thus, an effective learning culture should include both a climate conducive to learning and an acceptance of mistakes as a potential source of learning (Kucharska and Bedford, 2020). Based on the above considerations, the following hypotheses have been developed:

H1a. Knowledge culture positively impacts the learning climate component of the learning culture.

H1b. Knowledge culture *negatively* impacts the acceptance of a learning culture's mistakes (as a source of learning) component.

H1c. The learning climate component of the learning culture positively impacts the acceptance of the mistakes (as a source of learning) component of a learning culture.

Organizational learning is not just a sum of individuals' learning attempts (Senge, 2006). The shared motivation of knowledge workers brings a synergy effect. So, company culture supporting collective growth is essential. Several studies showed that people in organizational environments supporting collective learning who work together and build social relations (formal and informal) gain more (Senge, 2006; Rebelo and Gomes, 2011). Furthermore, Kucharska and Bedford (2024) proved that synergy of knowledge, learning and collaboration (the KLC approach) brings the best learning results visible in organizational intelligence. Moreover, Daher-Moreno and Arnold (2024) proved that females in highly cooperative organizational cultures are more confident and open to taking on leading responsibilities. So, company culture affects gender behaviors and intelligence building. Therefore, this study focuses on both. Moreover, suppose an organization is understood as a collective of individuals working in coordination to achieve a goal that none could accomplish independently. In that case, a collaborative culture becomes fundamental to the organization's existence (Kucharska and Bedford, 2024). Organizational learning is inherently dependent on collaboration, as collaboration facilitates learning, which serves as a source of new knowledge; collaboration is a core competency that enables knowledge-driven organizations to develop relational knowledge capital (Derrick, 2020; Nugroho, 2018). Based on this discussion, the following hypotheses have been proposed:

H1d. Collaborative culture positively impacts the learning climate component of the learning culture.

H1e. Collaborative culture positively impacts the acceptance of the mistakes (as a source of learning) component of a learning culture.

Based on the findings of Kucharska and Bedford (2024), it has been empirically demonstrated that knowledge culture and collaborative culture are interrelated and promote the sharing of knowledge, particularly tacit knowledge. Therefore, the following hypothesis is proposed:

H1f. Knowledge culture and collaborative culture are correlated.

2.3 The knowledge, learning and collaboration approach's impact on knowledge sharing

Tacit knowledge, which is generated through personal experience and social interactions (Kucharska and Erickson, 2023; Olaisen and Revang, 2018; Derrick, 2020; Polanyi, 2009), represents a crucial source of a company's competitive advantage. This type of knowledge is stored in the minds of individuals and can only be shared voluntarily; any formal procedures or rules cannot compel it. The sharing of tacit knowledge relies on trust among colleagues and is influenced by an organizational culture that fosters learning, knowledge sharing and collaboration (Koskinen *et al*., 2003; Olaisen and Revang, 2018; Senge, 2006). Kucharska and Bedford (2024) proved that the KLC approach positively impacts organizational knowledge sharing (formal and informal). Therefore, hypotheses were formulated as below:

H2. Collaborative culture positively impacts explicit knowledge sharing.

H3a. The acceptance of mistakes (as a source of learning) component of learning culture, positively impacts explicit knowledge sharing.

H3b. The learning climate component of learning culture that positively impacts explicit knowledge sharing.

H3c. The acceptance of mistakes (as a source of learning), component of learning culture, positively impacts tacit knowledge sharing.

H3d. The learning climate component of learning culture that positively impacts tacit knowledge sharing.

H4. Knowledge culture positively impacts tacit knowledge sharing.

The acquisition and sharing of tacit knowledge are highly context-dependent. Tacit knowledge is acquired through intelligence, and intelligence, in turn, is enhanced by the acquisition of tacit knowledge, making it highly valuable. Tacit knowledge is a fundamental component in the creation of explicit knowledge (Nonaka and Takeuchi, 1995). As Polanyi (2009) posited, all knowledge is ultimately rooted in tacit knowledge. Based on this understanding, the following hypothesis is proposed:

H5. Tacit knowledge sharing positively impacts explicit knowledge sharing.

Knowledge is a critical asset in the modern economy because it is fundamental to the development of organizational intelligence (Rothberg and Erickson, 2017). Feuerstein *et al*. (1979) defined intelligence as the capacity to adapt to change. Building on this definition, an organization's collective capacity to adapt to change can be understood as its intelligence. This collective capacity extends beyond the mere sum of individual abilities. The essence of organizational intelligence lies in enhancing the ability to act and grow together as a cohesive community. The development of this collective intelligence yields significant returns, as coordinated, intelligent actions are essential for competing successfully in any market. The

sharing of tacit knowledge among colleagues fosters the generation of innovative ideas that enhance adaptability to change (Kucharska and Rebelo, 2022a), whereas explicit knowledge provides the procedural support necessary for implementing these changes. Therefore, the following hypotheses have been proposed:

H6. Tacit knowledge sharing positively impacts organizational adaptability (intelligence).

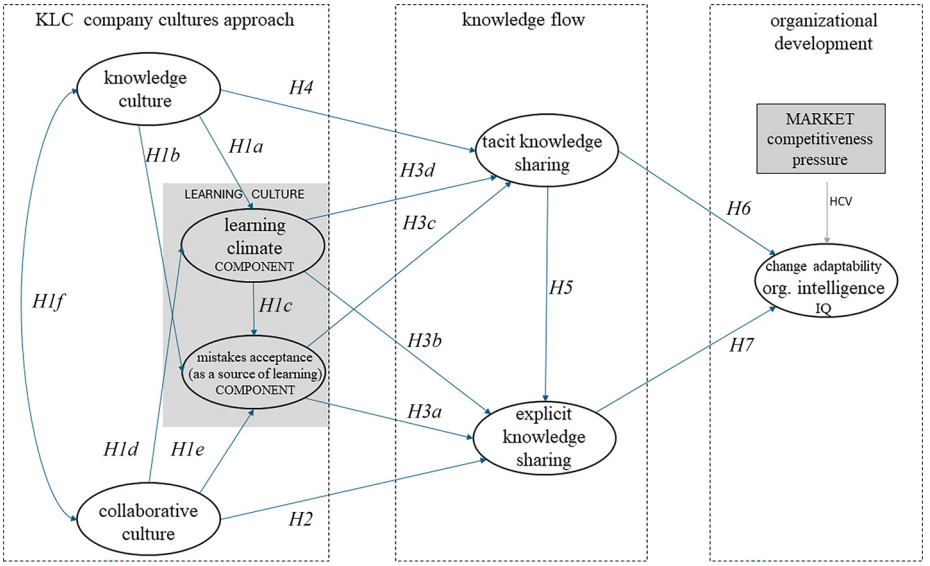
H7. Explicit knowledge sharing positively impacts organizational adaptability (intelligence).

2.4 Market pressure as a control variable

Control variable (CV) imputation enables the inclusion of extraneous variables that are not the focal point of thorough research but remain theoretically important (Becker *et al.*, 2016). Market pressure is an external power that significantly mobilizes the company to search for a competitive advantage. So, this variable is theoretically essential for this research. This is because market-oriented companies are more dynamic, agile and focused on intelligence building (Mulyana *et al.*, 2020). Therefore, this study includes the market pressure variable as a potentially critical moderator for organizational intelligence. Based on the above, the hypothesis is proposed as follows:

Hcv1. Market pressure fosters organizational adaptability (intelligence) building.

The theoretical model visualizes all the hypotheses' interrelations (Figure 1).



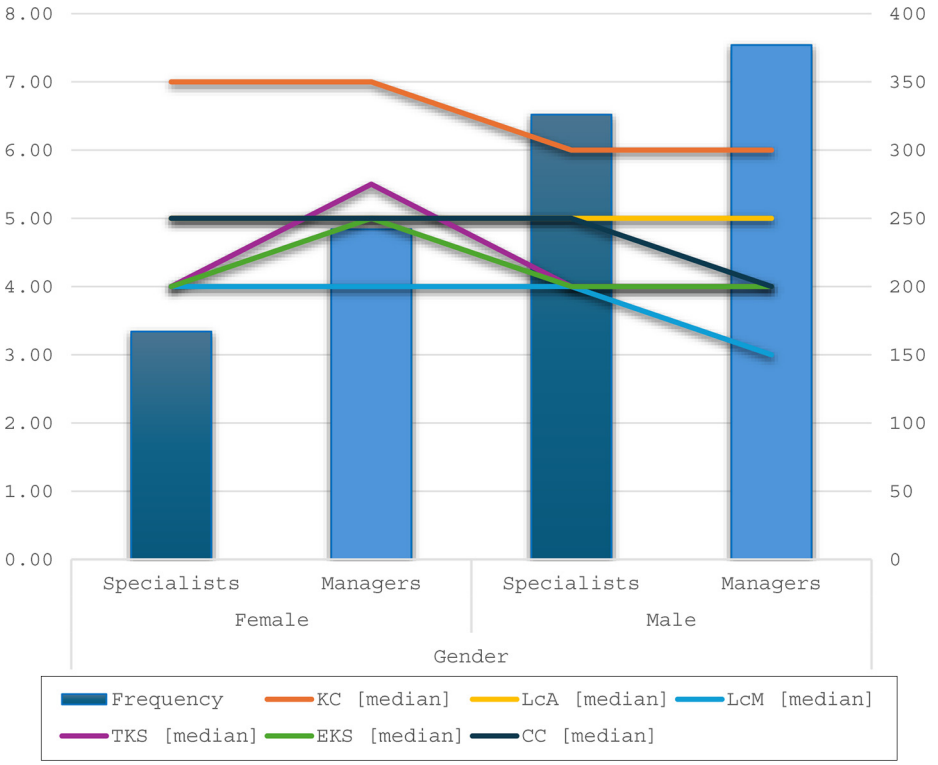
Source(s): Authors' own work

Figure 1. Theoretical model

3. Methodology

Sampling method. Data collection took place in March–April 2023. Respondents were selected randomly from the database owned by the research agency Biostat. The study targeted knowledge workers, identified as those whose first input and output at work are knowledge and who had worked for their current employer for at least one year.

Sample structure. The final study sample comprised 1,111 knowledge workers – 493 specialists and 619 managers, of whom 409 were women and 703 were men – representing primarily private (77%) companies in various sectors, characterized by the following sizes: 25% small and micro, 10% middle size and 65% big organizations. Where 758 were not, whereas 283 were affected by the DBM at their place of work and 71 were identified as exposing total "mistake aversion." This selection was made according to the DBM detection and measurement procedure used by Kucharska and Kopytko (2024a). Table A1 recalls this procedure. Table A2 presents the sample structure resulting from the bias-detecting procedure application. Whereas Table A3 and Figure 2 expose basic statistics analyzed per gender.



Note(s): $N = 1111$
Source(s): Authors' own work

Figure 2. Basic statistics per gender and position

Measures and method of analysis. Respondents rated latent constructs using a seven-point Likert scale. Table A1 provides scale statements and their sources. To measure the DBM, respondents declared their agreement or disagreement with statements by selecting a "true" or "false" response. Market pressure was measured by the respondent's perception that the market where her or his company operates is intensely competitive or is not (declaration: yes/no). Structural equation modeling, using SPSS Amos 26 software, was selected as an analysis method (Collier, 2020).

Sample quality: Kaiser–Meyer–Olkin test: 0.972; the Total Variance Extracted test: 86%; and Common Method Bias = 37% justify the good quality of the sample (Hair *et al.*, 2017). Moreover, Table A4 exposes that the reliability (CR > 0.7; Cronbach's alpha > 0.7) and validity (AVE > 0.5) met the requirements of the measures (Hair *et al.*, 2017). In addition, the Cross-Loadings Matrix (Appendix 2) proves that the measurement scales applied do not overlap (De Vellis, 2017).

Basic statistics show (Table A3 and Figure 2) that women managers share knowledge the most and that men managers are the group where the level of the mistake acceptance component (as a source of learning) is the lowest. Similarly, in the collaborative culture, male managers are also exposed to a lower level of collaboration than other groups. Females are generally exposed to a higher level of knowledge culture than men.

4. Results

Before analyzing the general results, we first ran the theoretical model based on the total sample (N = 1,111) with and without the control variable and compared the data fit. Following Aguinis and Vandenberg (2014) and Becker *et al.* (2016), further analysis can be performed with the CVs only if the model with CVs fits the data better than the model without it. Table 1 shows a comparison between models (with CVs and without CVs). Indeed, the model with *market pressure* as a CV fits the data better than the model without. Therefore, further analyses based on models with CV.

To verify the theoretical model (Figure 1) in the context of DBM and gender, we first divided the total sample based on detected bias (Figure 3) and then by gender (Figure 4).

General results showed that, except for the *H3b*, all hypotheses are sustained based on the model run with the total sample (N = 1111). The same model runs with a "no bias" sample (n = 758) and exposes similar results with small differences in the β coefficient's power. Significantly, different results were obtained for the model run with the DBM sample. Precisely, the knowledge culture (KC) expected the positive impact on the climate component of learning culture is weaker $\beta = 0.12^{*}$ (*H1a*) than observed for the total ($\beta = 0.19^{***}$) and "no bias" sample ($\beta = 0.23^{***}$). Furthermore, the expected negative impact of KC on the acceptance of the mistakes (as a source of learning) component is much stronger $\beta = -0.30^{***}$ (*H1b*) than observed for the total ($\beta = -0.19^{***}$) and "no bias" sample ($\beta = -0.15^{***}$). Another difference is observed for the *H1c* hypothesis about the positive impact between the learning culture components. Precisely, it is expected that the climate of learning (shared motivation) supports mistakes perception as a potential source of learning, and this assumption is confirmed for total ($\beta = 0.16^{***}$) and "no bias" ($\beta = 0.24^{***}$) samples, but for the DBM sample, it is noted as not significant and rejected. Similarly, the collaborative culture impact on explicit knowledge sharing is noted as positive for total ($\beta = 0.62^{***}$) and "no bias" ($\beta = 0.58^{***}$) samples and noted as not significant for the DBM sample. The same pattern is observed for the mistakes acceptance component impact of explicit (*H3a*) $\beta = 0.16^{***}$total / 0.24^{***} "no bias" and tacit knowledge (*H3c*) $\beta = 0.22^{***}$total / 0.24^{***} "no bias." The hypothesis about the positive impact of shared learning motivation (*H3b*) is rejected for all. However, its positive impact on

Table 1. Hypotheses verification

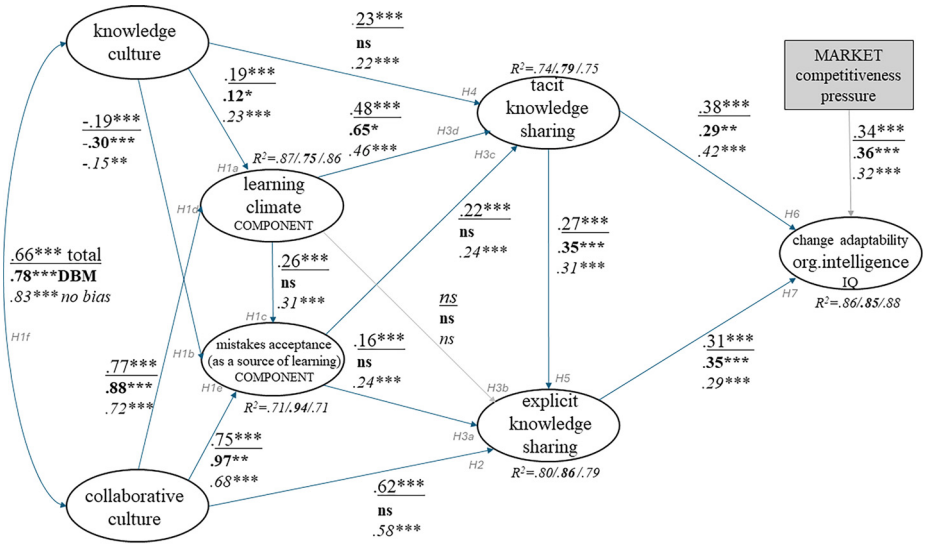
Hypothesis	Model without CV *N* = 1,111	Total *N* = 1,111	Models with CV **DBM** ***n* = 283**	 *No bias* *n = 758*	 FEMALE *n* = 408	 MALE *n* = 703	Verification
*H*cv	–	0.34***	**0.36*** **	*0.32***	0.15***	0.39***	sustained/ sustained/ **sustained**/ *sustained/ sustained/ sustained*
H1a	0.22***	0.19***	**0.12***	*0.23***	0.23***	0.18***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*
H1b	−0.19***	−0.19***	**−0.30*** **	*−0.15***	ns	−0.27***	sustained/ sustained/ **sustained**/ *sustained/ rejected/ sustained*
H1c	0.35***	0.26***	**ns**	*0.31***	0.35***	ns	sustained/ sustained/ **rejected**/ *sustained// sustained/ rejected*
H1d	0.73***	0.77***	**0.88*** **	*0.72***	0.57***	0.90***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*
H1e	0.67***	0.75***	**0.97*** **	*0.68***	0.71***	0.82***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*
H1f	0.80***	0.66***	**0.78*** **	*0.83***	0.80***	0.81***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*
H2	0.56***	0.62***	**ns**	*0.58***	0.44***	0.73***	sustained/ sustained/ **rejected**/ *sustained sustained/ sustained*
H3a	0.17***	0.16***	**ns**	*0.24***	0.26***	0.10*	sustained/ sustained/ **rejected**/ *sustained sustained/ sustained*
H3b	ns	Ns	**ns**	*ns*	ns	ns	rejected/ rejected/ **rejected**/ *rejected/ rejected/ rejected*
H3c	0.22***	0.48***	**ns**	*0.24***	0.27***	0.17***	sustained/ sustained/ **rejected**/ *sustained sustained/ sustained*
H3d	0.48***	0.16***	**0.65***	*0.46***	0.46***	0.58***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*
H4	0.23***	0.23***	**ns**	*0.22***	0.20***	0.22***	sustained/ sustained/ **rejected**/ *sustained sustained/ sustained*
H5	0.25***	0.27***	**0.35*** **	*0.31***	0.31***	0.35***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*

(*continued*)

Table 1. Continued

Hypothesis	Model without CV $N = 1{,}111$	Models with CV: Total $N = 1{,}111$	**DBM** $\boldsymbol{n = 283}$	*No bias* $n = 758$	FEMALE $n = 408$	MALE $n = 703$	Verification
H6	0.50***	0.38***	**0.29****	*0.42****	ns	0.36***	sustained/ sustained/ **sustained**/ *sustained/ rejected/ sustained*
H7	0.46***	0.31***	**0.35*****	*0.29****	0.78***	0.27***	sustained/ sustained/ **sustained**/ *sustained sustained/ sustained*
Model quality assessment	χ^2 = 1,114.7(192) CMIN.df = 5.8 CFI = 0.966 TLI = 0.960 RMSEA = 0.066	χ^2 = 1,069.5(190) CMIN.df = 5.62 CFI = 0.968 TLI = 0.961 RMSEA = 0.065	χ^2 = 528.5(190) CMIN.df = 2.78 CFI = 0.949 TLI = 0.939 RMSEA = 0.078	χ^2 = 821.5(190) CMIN.df = 4.3 CFI = 0.967 TLI = 0.960 RMSEA = 0.066	χ^2 = 743.93(190) CMIN.df = 3.19 CFI = 0.957 TLI = 0.949 RMSEA = 0.073	χ^2 = 849.02(190) CMIN.df = 4.5 CFI = 0.961 TLI = 0.952 RMSEA = 0.070	

Note(s): *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; ns – not significant result
Source(s): Authors' own work



Note(s): Total sample N = 1,111 / 283 = DBM / 758 = no bias; ML; $\chi 2\backslash$ = 1,069.48(190) / 528.52(190) / 821.45(190) CMIN/df = 5.62 / 2.78 / 4.3; CFI = 0.968 / 0.949 / 0.967; TLI = 0.961 / 0.939 / 0.960; RMSEA = 0.065 / 0.079 / 0.066; *p < 0.05; **p < 0.01; ***p < 0.001; ns = not significant result; DBM = double bias of mistake

Source(s): Authors' own work

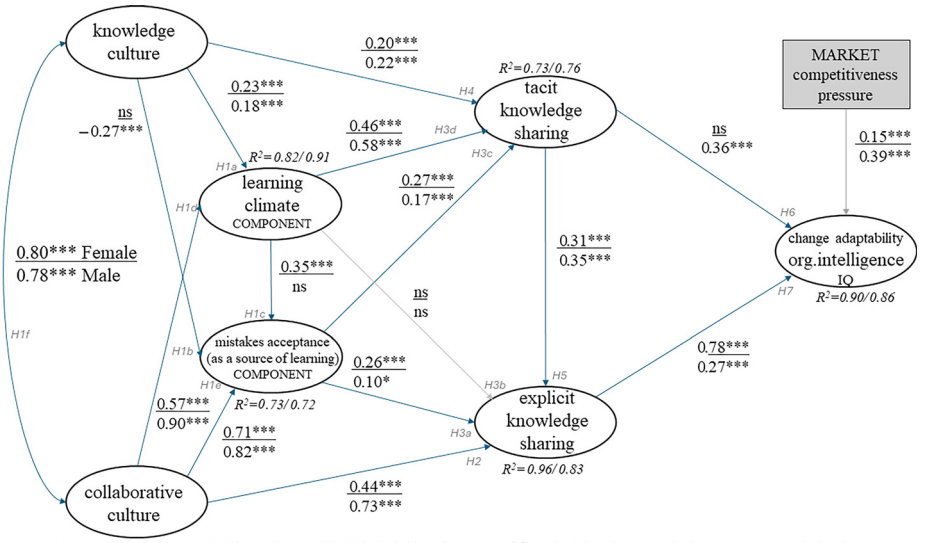
Figure 3. Empirical models based on the total sample, the DBM sample and the "no bias" sample

tacit knowledge sharing is confirmed for all groups (*H3d*). Similarly, the positive impact of tacit knowledge sharing on explicit (*H5*) is also confirmed for all samples. As well as tacit and explicit knowledge-sharing impact on organizational intelligence (*H6* and *H7*). The control variable: "market pressure," positive impact on organizational intelligence building (H_{cv}), is strong and confirmed for all (β = 0.34***/0.36***/0.32***).

Moreover, it is worth highlighting that the entire model explains the organizational intelligence (change adaptability) very well (R^2 = 0.86 total / 0.85DBM / 0.88 "no bias") – the best for the "no bias" sample. So, we can assume that organizations free from bias build intelligence more profoundly. It is confirmed that the DBM is a particularly threatening factor that can jeopardize deep, contextual organizational learning. Figure 3 below visualizes all the elaborated effects. Figure 3 and Table 1 show the results of the total, DBM and "no bias" samples.

This study also analyzed how female and male members contribute to organizational intelligence building. The model below (Figure 4) shows the effects obtained from this study's theoretical model (Figure 1), which was empirically verified with the same total sample but shared according to respondents' gender.

Figure 4 and Table 1 show the results of the gender samples. We observe that *H1a* about the positive impact of knowledge culture on the learning culture climate component (LcA) was sustained for females (β = 0.23***) and males (β = 0.18***). The hypothesis about the negative impact of KC on the mistakes component (LcM) is sustained only for males. For



Note(s): FEMALE = 408; $\chi 2$ = 743.93(190); CMIN.df = 3.19; CFI = 0.957; TLI = 0.949; RMSEA = 0.073; MALE = 703; $\chi 2$ = 849.02(190); CMIN.df = 4.5; CFI = 0.961; TLI = 0.952; RMSEA = 0.070
Source(s): Authors' own work

Figure 4. Empirical model based on gender

females, this result is not significant. Moreover, the male effect is very close to the effect obtained for the DBM sample and consistent with the given basic statistics (Figure 2 and Table A3). It suggests that DBM affects more males than females. *H1c* verification also seems to confirm it because the men's nonsignificant effect obtained for the LcA impact on LcM repeats the result exposed by the DBM sample (Figure 3). Hypotheses *H1d* and *H1e* were positively verified for women and men. However, it is worth highlighting that the men's positive impact of collaborative culture (CC) on LcA is exceptionally high (β = 0.90***MALE/β = 0.57***FEMALE).

Similarly, CC's impact on explicit knowledge sharing (EKS) is also more substantial in men than in the women sample (β = 0.73***MALE/β = 0.44***FEMALE). It suggests that for men, collaboration culture is a driving force. However, basic statistics (Table A3 and Figure 2) expose some deficits in men-managers collaboration comparably to men-specialists. Regarding hypothesis *H3a*, assuming the positive impact of LcM on EKS, it is sustained for males and females, but for males, it is weak (β = 0.10*). Similarly to the previous model, the hypothesis about the direct positive impact of LCA on EKS was not confirmed in any gender sample.

Regarding the impact of learning culture on tacit knowledge sharing (TKS), both components positively impacted both genders. Regarding the positive impact of KC on TKS (*H4*), TKS on EKS (*H5*) and EKS on organizational intelligence (*H7*), they were also confirmed for both genders. The *H6* about the direct positive impact of TKS on organizational intelligence was not confirmed for women. However, because the presented results showed that women are strongly exposed to learning culture and knowledge sharing, then the nonsignificant, direct impact of the TKS on IQ is expected to be mediated by the

EKS. Similarly, the other nonsignificant direct effects are hypothesized to be mediated (indirect) for the women sample. Precisely, the relation between the KC and LcM is expected to be mediated by the LcA, and the nonsignificant direct relation between the LcA and EKS is expected to be multiply mediated by the TKS and LcM. Appendix 3 shows that all the postdoc assumed mediated effects are confirmed. So, it means that the learning culture of both components, LcA, LcM and TKS, are critical for organizational intelligence building. Another variable requiring comment is the market pressure variable, which is observed as much stronger for men (β = 0.39***) than women (β = 0.15***). This means that external market pressure motivates more men than women to adapt to change. Finally, it is worth highlighting that both gender models explain the IQ phenomenon very well (R^2=0.90 female/ 0.86 male)

5. Discussion and further research directions

This study confirmed that knowledge, learning and collaboration cultures (the KLC) support knowledge sharing and foster organizational intelligence. Moreover, this process is more efficient for nonbiased than biased individuals (Figure 3 and Table 1) and more for women than men (Figure 4 and Table 1) – thanks to women's positive attitude toward knowledge, learning and collaboration (Figure 2). Moreover, basic statistics (Figure 2) show that female managers share knowledge (explicit and tacit) more intensively than other groups.

Comparing this study's findings with a study by Kucharska and Rebelo (2022a), which focused solely on the higher education sector, it was revealed that female managers view mistakes as learning opportunities more than their male counterparts. However, men tend to share their knowledge from these mistakes more openly despite struggling with acceptance. This indicates that men in top positions in higher education face similar acceptance issues as those in other sectors but may be less competitive and more self-confident.

Besides, the reluctance of female managers in higher education to share knowledge from mistakes, unlike women in other fields, warrants further exploration. A recent survey by Kucharska and Kopytko (2024b) showed that female managers share knowledge gained from mistakes better than female specialists and significantly more than male specialists. However, the small sample of female managers in their study weakens the conclusions about this group.

As this comparison summary, men, especially managers, generally have a more challenging time accepting mistakes as sources of learning compared to women. In addition, female managers are more open to learning from mistakes and sharing that knowledge than female specialists. This raises the question of why this disparity exists. It may be that it is a self-confidence issue (Yoong, 2023). Guillen *et al.* (2018) noted that women are usually less self-confident at work than men, and this is particularly visible in STEM fields (Diez *et al.*, 2023). Self-confident, successful women accept their mistakes, whereas young women in the early stages of their careers often hesitate to share theirs for fear of damaging their fragile image. That is in line with the *Congruity Theory* (Eagly and Karau, 2002), which suggests that women's leadership behaviors are less favorably received due to prevailing male leadership models, which may deter young or less self-confident women from claiming mistakes and sharing knowledge gained from mistakes in DBM-biased environments to protect their image. These assumptions and interpretations are, however, circumstantial and require further investigations.

Moreover, women cooperating with DBM-affected men work under constant perfection pressure to prove themselves to be equal to men, which is an efficient motivator for women to learn, be flexible and adapt. If so, this suggests that the personal characteristics of women holding top positions and accepting mistakes as a source of learning are worth further investigation, especially in contrast to those women who do not do it, even if working in the

same conditions (e.g. the same level of the DBM-affection in the workplace). Comparing these results with men's characteristics would bring more light to the entire study path.

Another issue worth discussing is competitiveness. Cashdan (1998), Niederle and Vesterlund (2011) and Vandegrift and Yavas (2009) indicated that women are less competitive than men. This study's findings confirm that. Market pressure fosters change adaptability (Kurniawan *et al.*, 2021). This external motivational power is observed to be a stronger adaptability motivator for men (β = 0.78***) than for women (β = 0.15***). So, for women, the key motivation for change adaptability is not as much the need to win the market game as to use the knowledge for the company's good.

Furthermore, former studies exposed that women in supervisory positions, compared to men, provided more support to subordinates in terms of respect, recognition, encouraging development and giving feedback crucial for learning (Suarez-Ortega *et al.*, 2024). Considering the current study findings, women managers are potentially better leaders of collective intelligence building than men.

Another important issue related to gender is sensitivity (Hall and Schmid Mast, 2008). Women, by nature, are more intuitive, so they are more open to tacit (contextual) knowledge. Tacit knowledge is exceptionally personal and barely conscious in its early stage. So, it might be that women, by nature being more sensitive and empathetic, absorb tacit knowledge more smoothly than men. Considering all the current study findings, women managers have a higher potential for being leaders of collective intelligence building in organizations than men, and the fact that women are often underrepresented in management boards (Stephens, 2013) is a waste.

6. Practical implications

This research has several practical implications.

(1) This study showed that women managers have a higher potential to support collective intelligence building. The direct, practical conclusion is that, consequently, patriarchy-dominated and this way less-inclusive organizations learn slower than inclusive ones representing gender variety, especially in management boards.

   a. Therefore, including women in leadership roles is imperative.

   b. However, we must critically evaluate the effectiveness of policies promoting equal inclusion, especially when men still hold the power to select their female counterparts. Often, men choose women who conform to their standards rather than those who advocate for feminist principles.

   c. To achieve the desired female impact on organizations, we need to promote the value of diverse perspectives in corporate and social leadership.

   d. The qualities of female leaders greatly impact how women in top positions are perceived, affecting equality and inclusion. Thus, the quality of women's leadership is vital for their upliftment.

(2) An organization is a group of people who want to achieve together an aim that each member cannot complete alone. So, for any organization's success, it does not matter what people can achieve alone, but what people can achieve together. Consequently, organizational intelligence is not the sum of individual IQs but a collective ability to adapt smoothly together as a community. Therefore:

   a. implementing the KLC approach is vital to fostering collective intelligence building; and

   b. accepting mistakes as a learning source does not promote negligence among knowledge workers; it promotes constant learning from all possible sources and contexts (long-life contextual learning) that fosters collective intelligence building.

(3) Because the DBM can severely jeopardize organizational learning, it must be neutralized. Therefore, we must shift our approach to stop punishing people for their mistakes but encourage them to report mistakes with a focus on learning and improvements to avoid such mistakes in the future. Instead *of blame and shame*, we should focus on collective critical thinking, improvement and the constant journey toward progress that the KLC approach offers.

(4) Experts and organization leaders should be the best examples of the learning behaviors they want to see in your organization's members. Therefore, leaders should proactively drive change and learn from successes and failures. Mistakes can be costly lessons, providing valuable insights that should not be wasted. By openly claiming mistakes and sharing the knowledge gained, leaders can model the learning behaviors they want to see in their organizations.

7. Limitations

The fundamental limitation is that this study, similar to the majority conducted regarding the DBM, is based on the Polish sample only. National cultures can shape attitudes and experiences regarding mistakes, so studying this phenomenon from other countries' perspectives would be beneficial. The other limitation is interpretations of gender-related findings. Logic and literature indirectly support these interpretations given in the discussion section, but direct qualitative studies would be helpful for a deeper understanding of the phenomena. Furthermore, it is worth highlighting that the essence of quantitative DBM measurement is detecting the contradiction between attitudes and behaviors toward mistakes. Qualitative studies are much more complicated due to the phenomenon's high sensitivity and biased nature. Still, they are critically needed to let us understand, more in-depth, the antecedents and behavioral mechanisms related to the DBM.

8. Conclusion

This study then examined whether the DBM jeopardized organizational intelligence and examined how female and male members contribute to building organizational intelligence. Results showed that the DBM negatively impacts organizational learning and, as a result, organizational intelligence building. Regarding gender impact analysis, findings revealed that accepting mistakes as a source of learning is more problematic for specialists than managers and more for male managers than female managers. Management practice shapes organizational culture. Based on the study results, we can conclude that women are potentially better collective intelligence-building leaders than men through their higher potential to expose and, this way, implement the KLC culture synergy, with special attention to the culture of learning from mistakes.

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Appendix 1

Table A1. Scales and their sources

Knowledge culture (Kucharska and Bedford, 2020)	• All employees perceive knowledge as a valuable resource • We have a common language to support knowledge exchange • We are encouraged to share knowledge, ideas and thoughts • We care about the quality of knowledge that we share
Learning culture (Kucharska and Bedford, 2020)	Learning climate component • All staff demonstrate a high learning disposition • We are encouraged to engage in personal development • We are encouraged to implement new ideas every day • We are encouraged to engage in seeking new solutions Mistakes acceptance component • People know that mistakes are a learning consequence and tolerate it up to a certain limit • Most people freely declare mistakes • We discuss problems openly without blaming others • Mistakes are tolerated and treated as learning opportunities
Collaborative culture (Kucharska and Bedford, 2020)	• My company supports cooperation between workers • Cooperation among the different duties, teams and departments was encouraged • Coworkers volunteer their support even without being asked People support each other
Tacit knowledge sharing (Kucharska and Erickson, 2023)	• I share knowledge learned from my own experience • I have the opportunity to learn from the experiences of others • Colleagues share new ideas with me • Colleagues include me in discussions about the best practices
Explicit knowledge sharing (Kucharska and Kopytko, 2024a)	• There is a formal policy encouraging knowledge sharing at my place of work • Knowledge is shared among people in my team and division • Other teams and divisions share knowledge with us • We share our knowledge with other teams and divisions
Change adaptability (org. intelligence – IQ) (Kucharska and Bedford, 2020)	• We are flexible to changes • We can adjust ourselves to changes • We adapt to changes easily • We used changes
Market competitiveness pressure Authors' own designed query	• How do you perceive the competitiveness of the market in which your company operates (high/low)?

(*continued*)

Table A1. Continued

The DBM Kucharska and Kopytko (2024a)	PERSONAL LEVEL • I know that mistakes are inevitable when acting in high-uncertainty conditions or new contexts (attitude) • I never hide mistakes (behavior) COMPANY LEVEL • Mistakes are perceived as a natural consequence of the learning process, searching for new solutions and experimenting (attitude) • People report mistakes in my workplace (behavior). BOSS LEVEL • Our boss claims that mistakes happen and are worth admitting (attitude) • I never saw people experience shame or blame when they admit mistakes in my workplace (behavior) (TRUE/FALSE) If the contradiction between ATTITUDE/BEHAVIOR is detected, then the bias is detected; if there is no contradiction, there is no bias; if there is bias at personal and organizational or boss level detected – then the bias is doubled. Kucharska and Kopytko (2024) revealed that because leaders shape organizational behavior, these two are often closely related and treated as the same)

Source(s): Authors' own work

Table A2. Sample structure based on the DBM detected

Identified subsamples	Position	*F*		*M*		Sum per position	Sum per subsample
DBM	s	54	134	95	149	149	283
	m	10	47%	124	53%	134	
NoB	s	105	334	196	424	301	758
	m	229	44%	228	56%	457	
A	s	8	11	35	60	43	70
	m	3	15%	25	85%	27	

Note(s): DBM – the double bias of mistakes; NoB – no bias detected; A – mistakes aversion; s- specialist; m-manager; F- female; M-Male
Source(s): Authors' own work

Table A3. Basic statistics per gender and position

	Gender			
N = 1,111	Female		Male	
Total sample	Specialists	Managers	Specialists	Managers
Frequency	167	242	326	376
KC [median]	7.00	7.00	6.00	6.00
LcA [median]	5.00	5.00	5.00	5.00
LcM [median]	4.00	4.00	4.00	3.00
TKS [median]	4.00	5.00	4.00	4.00
EKS [median]	4.00	5.00	4.00	4.00
CC [median]	5.00	5.00	5.00	4.00

Source(s): Authors' own work

Table A4. Basic statistics and square root of the AVE

	Mean	SD	AVE	CR	Cronbach alpha	Market	CC	KC	LcA	LcM	TKS	KS	IQ
Market	–	–	–	–	–								
CC	4.37	2.10	0.73	0.86	0.916	0.823	*0.853**						
KC	4.82	2.43	0.83	0.94	0.936	0.657	0.807	*0.912**					
LcA	4.44	2.18	0.77	0.91	0.908	0.762	0.828	0.815	*0.877**				
LcM	3.98	2.05	0.87	0.95	0.951	0.689	0.837	0.627	0.801	*0.931**			
TKS	4.32	2.09	0.82	0.93	0.924	0.668	0.814	0.758	0.843	0.747	*0.905**		
KS	4.2	1.95	0.77	0.87	0.876	0.718	0.874	0.717	0.823	0.794	0.802	*0.879**	
IQ	4.39	2.07	0.77	0.91	0.911	0.817	0.859	0.733	0.833	0.763	0.855	0.857	*0.877**

Note(s): *The square root of the AVE in the diagonal; (*) KS correlation with CC exceeds AVE root square in the diagonal, but these constructs' meanings are clearly di ferent, and their scales do not overlap (Table A5). So, it should be interpreted not as a measurement instrument error but as a natural correlation between measured phenomena (Rönkkö and Cho, 2022)

Source(s): Authors' own work

Appendix 2

Table A5. Cross-loadings matrix

	Factors						
	1	2	3	4	5	6	7
KC1	*0.983*						
KC2	*0.920*						
KC3	*0.785*				0.132		
LcA2	0.171				*0.546*		,171
LcA3					*0.850*		
LcA4		0.140			*0.557*		
LcA1		*0.875*					
LcA2		*0.940*					
LcM3		*0.878*					0.106
C1	0.163		0.165		−0.113	0.111	*0.614*
C2	0.144	0.100					*0.711*
C3					0.110	0.112	*0.722*
C4			0.252				*0.597*
EKS1	0.225		0.173	*0.546*			0.190
EKS2		0.118		*0.586*			0.127
EKS3				*0.947*			
TKS1			*0.785*			0.134	
TKS3			*0.790*				
TKS4			*0.892*				
IQ1			0.142			*0.741*	
IQ3						*0.642*	
IQ4		0.109				*731*	

Note(s): Loadings extraction method – maximum reliability. Rotation method – promax with Kaiser normalization The rotation converged in six iterations
Source(s): Authors' own work

Appendix 3

Table A6. Mediation analysis – female sample

Mediation analysis	Direct	Indirect	Confidence interval Lower	Upper	*p*-Value	Mediation type observed
FEMALE sample						
KC → LcA → LcM	−0.051 (0.46)	0.25(*)	0.008	0.19	0.049	Full mediation
TKS → EKS → IQ	0.055 (0.71)	0.24(**)	0.08	0.53	0.009	Full mediation
LcA → TKS → EKS	0.048 (0.70)	0.43(***)	0.34	0.53	0.001	Full mediation
LcA → LcM → EKS	0.058 (0.73)	0.31(***)	0.23	0.40	0.001	Full mediation

Note(s): $N = 409$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Source(s): Authors' own work

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