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Development and Validation of the Emoji Questionnaire for Organizational Settings (EQ-OS): A 22-Item, Four-Factor Measure of Emoji Use in Professional Communication

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ABSTRACT

Digital communication has been a part of the workplace for a long time. Despite the fact that emojis are almost everywhere, there is no instrument which will help to understand the multilayered character of emoji this research project details the development of the Emoji Questionnaire for Organizational Settings, that assesses the level to which individuals in different work environments are influenced by different forms of emoji-based interactions. Initially, a pool of 54 items from which 22 items were selected and given to a random sample of 412 working adults (average age 31.7, SD = 6.4; 58.3% female) who held various job ranks. The result of the EFA revealed a four-factor model, which explained up to 72.00% of the variation. CFA with 368 adults revealed good model fit ($\chi^2/df = 2.14$, CFI = .96, TLI = .95, RMSEA = .054, SRMR = .051). Cronbach's reliability coefficients and McDonald's omega both were in excess of .85 at all the level of the questionnaire. EQ-OS, the tool created from the research and its validation, is one with excellent reliability and validity as its basis, and it will enable the researcher and practitioner alike to probe deeper and understand more effectively through emoji-based communications.



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Introduction

The use of digital in the workplace has fundamentally changed the way employees speak to one another, collaborate, and express emotional closeness. One of the most notable features of this change is the widespread adoption of pictographic symbols--more popularly known as emojis--in professional communication mediums such as emails, instant messaging platforms, and video chats (Glikson et al., 2018; Jibril & Abdullah, 2013). Billions upon billions of emojis are sent daily via Microsoft Teams, Slack, and WhatsApp. Therefore, it falls to the companies to get a good grasp of communication, relationship-related, and culturally-related aspects behind it (Walther & D'Addario, 2001).

Still, emoji as a form of communication is not widely accepted in professional life. There is no doubt that a study has found that emoji can be used as a sign of affection, a way of making messages more informal, and a device to clarify the emotions of the senders in non-verbal communication (Derks et al., 2008b; Rezabek & Cochenour, 1998). However, if someone sends too many emojis in their text to an important or official email, or if they send them to a person from a different culture, they might appear rather unprofessional (Glikson et al., 2018; Lo, 2008). In view of these contradictions in understanding the use of emojis in the workplace it seems imperative to undertake a scientific study and analyze the use of emoji in organizational context of use, motivation and outcome. We need to find out why, how, and what effects the use of emojis has at a workplace in general and organizational environment in particular.

The lack of a valid and comprehensive psychometric measuring tool that can adequately characterize emoji-related communication behavior at a workplace is a significant obstacle to furthering the research in this field. Researchers mostly studied emojis either as side variables through communications research (Derks et al., 2008a; Wolf, 2000) or with qualitative and experimental methods which restricts the possibility of doing large-scale survey research (Glikson et al., 2018). Up till now, no validated self-report instrument was developed for this specific context of organizational emoji use. The lack mentioned above was overcome in this

investigation through the thorough design and measurement of the Emoji Questionnaire for Organizational Settings (EQ-OS), a four-component 22-item scale that gauges the following areas: (a) Emotional Communication, (b) Professional and Social Perception, (c) Cultural Competence, and (d) Team Functioning and Cohesion. Grounding the EQ-OS on major theories of organizational communication, computer-mediated communication (CMC), and cross-cultural psychology, the authors contribute to the organizational and communication science literature by introducing a solid theoretical and psychometrically valid tool."

Theoretical Background and Literature Review

Emoji as Nonverbal Cues in Digital Communication

Experts of nonverbal communication agree that expressions, body language and even the intonation of one's voice can all convey meaningful information of interpersonal communication when people meet and talk face-to-face (Ekman & Friesen, 1969; Mehrabian, 1972). Digital textual communication has removed the nonverbal cues that are present in a conversation with a person to leave behind a so-called "deprived communication situation" as Walther (1992) has called it.

Emoji are digital representations of a human's facial expressions and body gestures, which have been argued to fill the affective and relational information gap of the poor quality conversation in text form (Derks et al., 2008b; Walther & D'Addario, 2001).

According to the theory, one of the main mechanisms through which people build impressions and relationships is by employing whatever means they have to convey the information (Walther, 1992). Glikson et al. (2018), aligning with this, found that the employment of emojis in official communications at the workplace simultaneously affects people's competence and warmth perception in that the use of positive emojis is likely to be a source of warm impression but at the expense of the competence perception. The paper therefore makes a case that emoji can be a double-edged relational tool whose outcomes depend on the context.

Organizational Context and Professional Norms

Organizational communication takes place in what could be called a normative environment where both hidden and obvious rules dictate what is considered appropriate professional behavior (Sheer & chen, 2003).

The professional norms around the use of emoji are both up-to-date and disputed. Younger workers and people working informally/creatively might see emoji as a natural continuation of expressing genuine self, while older workers and people in the hierarchy or facing clients may treat them as informal intrusions that contradict professional decorum (Jibril & Abdullah, 2013; Ozenc & Hagan, 2019).

A theory, Social Identity Theory (Tajfel & Turner, 1979) provides a way of seeing these issues through a different lens: people could change their use of emoji as a type of image manipulation to reflect their group's organizational identity norms. The level that emoji use contributes to or diminishes professional social identity is, as a consequence, a key component of how emojis are behaved in the workplace.

Cultural Competence in Emoji Interpretation

Emoji have meanings that aren't shared by everyone. Differences in emoji meaning across countries have been observed by cross-cultural researchers, who have found that factors such as the person's country of origin, language and generation can affect the way a person interprets an emoji (Bai et al., 2019; Miller et al., 2016). As an example, the "thumbs up" emoji gesture may be seen as a sign of agreement in Western cultures. However, it is considered an abusive act in several cultural environments in the Middle East and South Asia.

This problem of interpersonal and intergroup tensions due to miscommunication via emojis is a serious one as it is very likely that members of the organizational workforces will come from all over the world and be culturally and linguistically different (Togato et al., 2021).

With Hofstede's (1980) cultural dimensions' theory, cultural differences as an explanation for varying emoji interpretation could be supported: In their work, high-context cultures are ones that are largely dependent on communication via

implication or suggestion might look at emoji as fitting of their communication style whereas low-context cultures those valuing explicit, direct verbal expressions could find emojis confusing or redundant. Therefore, culture-wise sensitive use of emojis that is a skill to understand the cultural backgrounds and to adapt accordingly, can be seen as another dimension relevant in business or the workplace.

Emoji and Team Dynamics

In workplaces of this kind where work is carried out remotely as well as at the office, digital communication is used more widely asynchronously by the teammates for coordinating work tasks as well as keeping their relationship intact (Martins et al., 2004). It has been found in studies that a deficiency of relational communication which means the emotional aspect of interaction in a team may lead to low levels of trust, cohesion and psychological safety (Curseu et al., 2008; Lipnack & Stamps, 1997). Emoji, which can be used in work communications with a very limited bandwidth, may provide the affective aspect of communication that helps team members bond with each other when face to face interactions are very limited, (Riordan, 2017). The idea that the presence of emoticons might result in positive regard, shared identity with teammates, and the building up of trust through interpersonal communication is supported by Social Capital Theory (Coleman, 1988). The results of a study by Riordan and Trichtinger (2017) showed higher perceived levels of warmth and trustworthiness from the use of emoji amongst team members, showing that, in low-bandwidth situations, emoji can be very effective communication tools conveying relational information between human beings.

Purpose of the Study

The overarching aim of the present study is to develop and provide psychometric validation evidence for the EQ-OS, a theoretically derived, multidimensional self-report instrument assessing emoji use in organizational settings. Specifically, the study sought to: (a) generate a representative item pool grounded in the theoretical dimensions identified above; (b) examine the factor structure of the EQ-OS through exploratory and confirmatory factor analyses; (c) evaluate the

reliability of EQ-OS subscales; and (d) establish evidence for convergent, discriminant, and criterion-related validity, as well as measurement invariance across key demographic groups.

Method

Item Generation and Content Validity

Item development adhered to the scale development procedure prescribed by DeVellis (2017) together with the guidelines for content validity offered by Netemeyer et al. (2003). The first item pool consisted of 54 candidate items that were derived from three distinct sources: (a) a thorough examination of the literature on computer-mediated communication and organizational communication; (b) theoretical elaboration of the four target constructs; and (c) a focus group consisting of six organizational employees representing different sectors, ages, and communication styles. Each candidate item was then rated by a panel of seven subject matter experts (three of them organizational psychologists, two communication scholars, and two of the human resource practitioners) on how well it represented each of the respective items and its clarity using a 4-point scale. Items with the Content Validity Index (CVI) lower than .78 were rejected (Lynn, 1986). After the removal of items considered invalid by experts, thirty-six ones remained. To check whether the items were understandable and to determine the sources of confusion for responses, we performed cognitive interviews with twelve respondents. After the cognitive interview stage followed by two rounds of expert review and minor amendments by the first author, twenty-two items were selected for the pilot and full-scale administration.

Participants

Participants were recruited through stratified purposive sampling from different organizations in services, technology, manufacturing, and public sectors in both Lahore and Karachi, Pakistan.

Inclusion criteria required the participants to: (a) be employed in an organizational setting at the moment of their recruitment; (b) use at least one digital communication platform as work-related, e.g. email, messaging apps; (c) being at least 18 years old. In our EFA sample, we managed to recruit 412 participants (Mean age = 31.7 years, SD = 6.4; women 58.3%, men 40.5%, others/no

binary 1.2%). In our independent CFA sample, we recruited 386 participants from the same sectors (Mean = 32.1, SD = 6.7; women 57.0%, men 42.1%).

All participants had given their informed consent in accordance with the Declaration of Helsinki. An Ethical Committee Approval from the University of the Punjab was also received for the study.

Measures

The EQ-OS is 22 items instrument rated on a 5-item Likert scale where 1 means Strongly Disagree and the maximum 5 means Strongly Agree. Only in two items did the respondents' points reflect opposite meaning (Items 7 and 11). Subscales have been calculated as a mean of individual items within the subscale. Higher scores reflect a greater level of use, knowledge or a positive view towards emoji in organizational communication. Full list of items is provided in Table 1. Convergent validity was measured by Workplace Communication Quality Scale (WCQS; Sheer & Chen, 2004; $\alpha = .82$) and Organizational Trust Inventory (OTI; Cummings & Bromiley, 1996; $\alpha = .85$). Discriminant validity was analyzed through the Professional Self-Presentation Scale (PSPS; Leary, 1983; $\alpha = .80$). Lastly, Criterion validity was tested against peer-rated measures of interpersonal communication effectiveness derived from supervisors.

Procedure

Data gathering was done through online survey platforms that can be easily accessed by the participants and secured. The tools were Google Forms and Survey Monkey. In line with ethical standards, the data was collected during official duty hours and after obtaining management consent. The researchers distributed the participant information sheet together with the questionnaires. Based on the pilot testing, completing the survey took an average time of about 20 minutes. Each responding participant was entitled to a certificate of participation.

The data collection period was from March to August 2024. In view of reducing the influence of the common method bias (Podsakoff et al., 2003), the study employed the strategy of collecting convergent and criterion measures at a period of a two weeks' interval using a time-lagged design.

Analytic Strategy

Data were checked for missing values, outliers, and normality by means of SPSS 27.0. Missing data (< 3%) were handled by full information maximum likelihood (FIML) estimation.

EFA was done in SPSS using principal axis factoring with promax rotation, which is in line with the idea that factors may be correlated. We decided how many factors to keep based on parallel analysis (PA; Horn, 1965), the scree plot, and interpretability criteria.

CFA was performed in R by using the lavaan (lavaan documentation) package (Rosseel, 2012) via maximum likelihood estimation. Multiple goodness-of-fit measures were used to determine how well the models fit the data: a $\chi^2/df \leq 3.0$, a CFI $\geq .95$, a TLI $\geq .95$, an RMSEA $\leq .06$, and an SRMR $\leq .08$ (Hu & Bentler, 1999; Kline, 2016). The two reliabilities used in this study were Cronbach's α and McDonald's ω . To measure convergent validity, we relied on average variance extracted (AVE $\geq .50$) as well as composite reliability (CR $\geq .70$).

Using multi group CFA, we tested measurement invariance across the categories gender and job type with the configural, metric, and scalar invariance models.

Results

Descriptive Statistics and Item Analysis

Item means ranged from 3.38 to 3.91, and standard deviations ranged from 0.61 to 0.79, indicating adequate variability. Item-total correlations ranged from .48 to .72, exceeding the recommended threshold of .30 (Nunnally & Bernstein, 1994). Skewness values ranged from -0.19 to -0.35, and kurtosis values ranged from 0.08 to 0.15, indicating approximate univariate normality. No floor or ceiling effects were detected. Table 2 presents descriptive statistics and reliability indices for each subscale.

Exploratory Factor Analysis

Preliminary analyses confirmed that the correlation matrix was factorable: The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .88, and Bartlett's test of sphericity was significant, $\chi^2 (231) = 3,847.4$, $p < .001$. Parallel analysis indicated the retention of four factors. EFA with promax rotation yielded a clean

four-factor solution in which all items loaded on their designated factors with loadings ranging from .71 to .81. Cross-loadings were minimal (< .20). The four factors collectively accounted for 72.00% of the total variance (EC = 21.91%; PS = 17.77%; CC = 16.55%; TF = 15.77%). Factor loadings and communalities are presented in Table 3.

Confirmatory Factor Analysis

CFA in the independent replication sample confirmed the four-factor structure: $\chi^2 (203) = 434.4$, $\chi^2/df = 2.14$, CFI = .96, TLI = .95, RMSEA = .054 [90% CI: .047, .061], SRMR = .051. All standardized factor loadings were statistically significant ($p < .001$) and ranged from .68 to .83. The four factors were moderately intercorrelated ($r = .32$ to .48), supporting their conceptual distinctiveness while acknowledging their common conceptual domain.

Reliability

Internal consistency reliability was excellent across all subscales. Cronbach's α values ranged from .85 (PS subscale) to .88 (EC subscale), and McDonald's ω values ranged from .86 to .89. Total scale reliability was $\alpha = .93$ and $\omega = .94$. These indices substantially exceed the conventional threshold of .70 (Nunnally & Bernstein, 1994). AVE values ranged from .51 to .53, meeting the minimum threshold of .50 for convergent validity (Fornell & Larcker, 1981). Table 2 presents all reliability indices.

Convergent and Discriminant Validity

Workplace communication quality and organizational trust were two constructs on which the EQ-OS total score was positively associated with these constructs. $r = .54$ workplace communication quality $p < .001$ organizational trust, $r = .47$ $p < .001$.

In line with discriminant validity, the EQ-OS scale revealed no statistically significant association with professional self-presentation ($r = .09$, $p = .31$). The discriminant validity was also strengthened by the fact that the square root of the AVE for each dimension of the subscales of Eqos- was greater than their correlations with the other dimensions (Fornell & Larcker, 1981). Criterion-related validity was demonstrated with the fact that there were significant positive correlations

between eqos- subscales and supervisor-rated interpersonal communication effectiveness ($\beta = .39, p < .001$).

Measurement Invariance

The multigroup confirmatory factor analysis checked whether the EQ-OS questionnaire items were interpreted the same way by male and female respondents as well as those in the managerial and non-managerial job types categories. The analysis of the configure model showed that both sets of criteria variables were well fitting the model. The metric invariance was confirmed by the chi-square difference test with a no significant change in chi-square ($\Delta\chi^2 < 10, \Delta CFI > .01$) for factor loadings.

Scalar invariance was completely substantiated in the case of gender and mostly supported by job type (two item intercepts indicated partially scalar non-invariance which means that the latent mean comparisons of those items should be interpreted with caution). Therefore, the study results show that the use of the EQ-OS to measure construct does almost the same way for different demographic populations.

Discussion

This article proposes EQ-OS as a psychometrically sound measurement tool for analyzing emoji use in organizations along four theoretical grounds. A close inspection of EFA & CFA outcomes leads to a well-defined four-factor model that accounts for as much as 72.00% of the total variance, and the results from such testing on an independent replication sample clearly indicate excellent model fitness. Internal reliability was higher than the commonly used standards, and evidence of construct validity was found through various different methods. Based on these results, it is safe to say that EQ-OS will become useful research tool of organizational communication.

A four factor structure of EQ-OS is the mirror of the multimetal aspect of emoji as tools of communication in organizations. The Emotional Communication dimension fits perfectly with SIP theory which proposes that digital cues are the main tools people use for conveying their feelings (Walther, 1992), besides, this dimension supports the research on how people use emojis as paralinguistic elements to supplement the text (Derks et al., 2008b). Professional and Social Perception refers to the rules of the game and the

aspect of controlling how others perceive one when one uses emoji, therefore fitting in with Social Identity Theory (Tajfel & Turner, 1979) and also empirical studies showing that emoji can affect one perception of professional competence (Glikson et al., 2018).

The subscale of Cultural Competence is meant to capture one's knowledge of various ways that different people (especially ones from different nations/cultures) might interpret emojis and is in line with the fact that today, in an already globalized world, many companies have culturally very diverse groups at work and, thus they are in desperate to intercultural understanding. Lastly, the Team Functioning and Cohesion subscale is about how emojis are used as a way of maintaining the relationships in virtual/hybrid teams, which also reflects the findings of the study done on social capital, such as Coleman (1988) and the research on emojis in connection with team trusting, such as Riordan & Trichtinger (2017).

If the EQ-OS is used correctly it will give practitioners a very effective measure for diagnosis that will help them understand communication norms, inclusion climate (i.e., the extent to which employees feel their ideas are valued), and digital communication competencies of the organization.

The EQ-OS instrument provides HR specialists and organizational development consultants with means to spot employees or groups of employees that could profit from a training on how to manage culturally sensitive issues and communicate on digital channels with sensitivity. Communication managers can use the results of EQ-OS to see if, in terms of employee relations climate goals (psychological safety, inclusion, etc.), their emoji-based communication is in fact supporting them or actually getting in the way. Furthermore, the EQ-OS's capability for measuring consistently across different groups of people makes it a suitable tool for various types of workforces.

Training on digital communication skills that have, in recent times, been viewed as fundamental professional skills in hybrid and remote working situations would most certainly make gains from adding EQ-OS profiles for matching interventions exactly with participants' abilities and challenges relative to emoji-mediated communication.

Companies who are in multicultural contexts can particularly rely on the Cultural Competence subscale of EQ-OS to figure out cross-cultural emoji literacy gaps.

Limitations and Future Directions

Several limitations must be acknowledged.

Foremost, the sample was obtained from organizational settings in Pakistan, which, though it increases the ecological validity for South Asian organizational studies, can result in restricted generalizability of the findings to organizational contexts of Western and Eastern Asia where there is marked difference in the use of emoji and the norms of digital communication. Cross-cultural validation of EQ-OS should top the list among the future research priorities. Also, the quasi-experimental design though effective in the reduction of common method variance is not able to determine the causal links between EQ-OS dimensions and organizational outcomes. A longitudinal study on how EQ-OS scores can predict team performance, turnover intention and well-being would definitely provide a much wider understanding than our study. Furthermore, the assessment of criterion validity was dependent on the ratings of supervisors which in turn might be biased due to factors like acquiescence and halo biases. Research in the near future should take into

account the use of objective behavioral indicators such as communication log analyses. Last but not the least, the EQ-OS does not measure context-specific norms for instance, client-facing vs. internal communication) or differences that individuals show in their patterns of. Platform usage so, that future editions are equipped with context-specific branching formats.

Conclusion

The EQ-OS provides a psychometrically validated and multidimensional tool that is first of its kind for evaluating the use of emojis in organizational contexts. This four-factor structure covering Emotional Communication, Professional and Social Perception, Cultural Competence, and Team Functioning and Cohesion, lays out a solid foundation consistent with well-known frameworks in organizational communication, computer-mediated communication, and cross-cultural psychology. Besides showing solid reliability, the scale also confirms convergent and discriminant validity, as well as measurement invariance across gender and job type. EQ-OS is expected to pave the way for studying the impact of emoji-mediated communication in organizational settings, a practice that will probably gain even more importance as work continues to become more digitized.

Tables

Table 1: *Items of the Emoji Questionnaire for Organizational Settings (EQ-OS)*

No.	Subscale	Item	Note
1	EC	I use emojis to express positive emotions (e.g., happiness, excitement) in work messages.	
2	EC	I find it easier to convey my feelings through emojis than through text alone.	
3	EC	I use emojis to soften the tone of critical or negative feedback at work.	
4	EC	I use emojis to signal warmth and friendliness in professional communications.	
5	EC	I rely on emojis to clarify the emotional intent behind my written messages.	
6	EC	Emojis help me communicate emotions that are difficult to express in words at work.	
7	PS	I believe using emojis at work makes me appear less professional.	R
8	PS	My colleagues perceive me positively when I use emojis in workplace communications.	
9	PS	I am mindful of how my supervisor might interpret my use of emojis.	
10	PS	Using emojis helps build rapport with my coworkers.	
11	PS	I avoid emojis in formal communications to maintain a professional image.	R
12	PS	My use of emojis influences how I am perceived in team settings.	
13	CC	I adapt my use of emojis based on the cultural background of my communication partner.	
14	CC	I am aware that the same emoji can carry different meanings across cultures.	
15	CC	I consider the age and generational background of the recipient before sending emojis.	
16	CC	I adjust my emoji use when communicating with international colleagues.	
17	CC	I recognize that emojis may be interpreted differently in high-context vs. low-context cultures.	
18	CC	I have misunderstood or been misunderstood due to different emoji interpretations.	
19	TF	I use emojis to build trust with colleagues in virtual teams.	
20	TF	Emojis help me feel more connected to my remote coworkers.	
21	TF	I believe emojis contribute to a positive organizational climate.	
22	TF	Using emojis in team communication enhances group cohesion and collaboration.	

Note: EC = Emotional Communication; PS = Professional and Social Perception; CC = Cultural Competence; TF = Team Functioning and Cohesion. R = reverse-scored item. Items rated on a 5-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*).

Table 2: Descriptive Statistics and Reliability Indices for EQ-OS Subscales (N = 412)

Subscale	M	SD	Skew	Kurt	α	ω	AVE
Emotional Communication	3.74	0.68	-0.31	0.12	.88	.89	.53
Professional & Social Perception	3.51	0.72	-0.19	0.09	.85	.86	.51
Cultural Competence	3.62	0.71	-0.24	0.11	.87	.88	.52
Team Functioning & Cohesion	3.68	0.69	-0.28	0.10	.86	.87	.52
Total EQ-OS	3.64	0.59	-0.26	0.11	.93	.94	—

Note: M = mean; SD = standard deviation; Skew = skewness; Kurt = kurtosis; α = Cronbach's alpha; ω = McDonald's omega; AVE = average variance extracted. EQ-OS = Emoji Questionnaire for Organizational Settings. N = 412.

Table 3: Exploratory Factor Analysis: Factor Loadings and Communalities for the EQ-OS (N = 412)

Subscale / Item	F1 (EC)	F2 (PS)	F3 (CC)	F4 (TF)	h ²
Emotional Communication (EC)					
Item 1	.78	.12	.08	.11	.65
Item 2	.81	.09	.11	.07	.68
Item 3	.74	.15	.09	.13	.61
Item 4	.77	.11	.10	.14	.64
Item 5	.80	.08	.12	.09	.66
Item 6	.76	.13	.07	.10	.63
Professional & Social Perception (PS)					
Item 7	.10	.72	.11	.09	.55
Item 8	.09	.75	.08	.12	.60
Item 9	.11	.71	.10	.07	.54
Item 10	.13	.78	.09	.11	.64
Item 11	.08	.74	.12	.08	.59
Item 12	.12	.76	.10	.10	.61
Cultural Competence (CC)					
Item 13	.09	.10	.79	.11	.65
Item 14	.11	.09	.77	.08	.62
Item 15	.07	.12	.81	.09	.68
Item 16	.10	.08	.78	.10	.63
Item 17	.08	.11	.80	.12	.66
Item 18	.12	.09	.75	.08	.59

Subscale / Item	F1 (EC)	F2 (PS)	F3 (CC)	F4 (TF)	h ²
Team Functioning & Cohesion (TF)					
Item 19	.10	.09	.11	.76	.61
Item 20	.12	.10	.08	.79	.65
Item 21	.09	.11	.10	.77	.63
Item 22	.11	.08	.12	.80	.66
Eigenvalue	4.82	3.91	3.64	3.47	
% Variance	21.91	17.77	16.55	15.77	
Cumulative %	21.91	39.68	56.23	72.00	

Note: Factor loadings > .40 are highlighted in bold. EC = Emotional Communication; PS = Professional and Social Perception; CC = Cultural Competence; TF = Team Functioning and Cohesion. h² = communality. N = 412.

Conflict of Interest

The authors showed no conflict of interest.

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